MEAN

Municipal Energy Agency of Nebraska

2022 Integrated Resource Plan

Approved by the Western Area Power Administration (WAPA) 12/27/22

NMPP ENERGY

NMPP MEAN NPGA RCE

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LIST OF ABBREVIATIONS

APPA	American Public Power Association
ARR	Auction Revenue Rights
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
BTMG	Behind the Meter Generation
BTU	British Thermal Unit
CCR	Coal Combustion Residuals
CCS	Carbon Capture and Sequestration
CDD	Cooling Degree Days
CF	Capacity Factor
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CP	Coincident Peak
CPP	Clean Power Plan
CRSP	Colorado River Storage Project
CSAPR	Cross-State Air Pollution Rule
DG	Distributed Generation
DLC	Direct Load Control
DMEA	Delta-Montrose Electric Association
DOE	Department of Energy
DSM	Demand-Side Management
EGS	Enhanced Geothermal Systems
EIA	Energy Information Administration
EIS	Energy Imbalance Service
EPA	Environmental Protection Agency
EPAct	Energy Policy Act of 1992
EPRI	Electric Power Research Institute
ERPA	Electrical Resources Pooling Agreement
FCRC	Fixed Cost Recovery Charge

FERC	Federal Energy Regulatory Commission
FTR	Financial Transmission Rights
FY	Fiscal Year
GGS	Gerald Gentleman Station
GHG	Greenhouse Gasses
HDD	Heating Degree Days
HVAC	Heating, Ventilating, and Air Conditioning
IM	Integrated Marketplace
IMU	Indianola Municipal Utilities
IRP	Integrated Resource Plan
ITC	Investment Tax Credit
kW	Kilowatt
kWh	Kilowatt-Hour
LAP	Loveland Area Projects
LED	Light Emitting Diode
LES	Lincoln Electric System
LF	Load Factor
LFG	Landfill Gas
LMP	Locational Marginal Price
LTCR	Long-Term Congestion Rights
MATS	Mercury and Air Toxics Standards
MBA	Member Based Association
MCF	Thousand Cubic Feet
MEAN	Municipal Energy Agency of Nebraska
MEC	MidAmerican Energy Company
MISO	Midcontinent Independent System Operator
MSW	Municipal Solid Waste
MUP	Multi-Unit Participation Agreement
MW	Megawatt
MWh	Megawatt-Hour
NAAQS	National Ambient Air Quality Standards
NCP	Non-Coincident Peak

NESHAP	National Emissions Standards for Hazardous Air Pollutants
NGCC	Natural Gas Combined Cycle
NGCT	Natural Gas Combustion Turbine
NITSA	Network Integration Transmission Service Agreement
NMPP	Nebraska Municipal Power Pool
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrous Oxide
NPPD	Nebraska Public Power District
NREL	National Renewable Energy Laboratory
PCT	Participant Cost Test
PHES	Pumped Hydropower Energy Storage
PM	Particulate Matter
PPA	Purchased Power Agreement
PPGA	Public Power Generation Agency
PRM	Planning Reserve Margin
PSD	Prevention of Significant Deterioration
PTC	Production Tax Credit
PTP	Point-To-Point Transmission
RCRA	Resource Conservation and Recovery Act
RDF	Refuse-Derived Fuel
RECS	Residential Energy Consumption Survey
RICE	Reciprocating Internal Combustion Engine
RMR	Rocky Mountain Region
RPS	Renewable Portfolio Standard
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SLCA	Salt Lake City Area
SO_2	Sulfur Dioxide
SPP	Southwest Power Pool
TCR	Transmission Congestion Rights
TDF	Tire-Derived Fuel
TES	Thermal Energy Storage

TO	Transmission Owner
TRC	Total Resource Cost
TRP	Total Requirements Participant
UCT	Utility Cost Test
UGP	Upper Great Plains
WAPA	Western Area Power Administration
WEC	Whelan Energy Center
WECC	Western Electricity Coordinating Council
WSEC	Walter Scott Energy Center
WU	Waverly Utilities

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I. Executive Summary

A. IRP Requirements

Integrated resource planning was mandated by the Energy Policy Act of 1992 (*"EPAct"*).

EPAct requires all Western Area Power Administration (*"WAPA"*) customers to submit Integrated Resource Plans (*"IRPs"*) to WAPA every five years. The requirement is included in WAPA's power sales contracts with long-term firm electric service customers.

WAPA has identified the following criteria for customer IRPs:

- Identify and compare all practicable energy efficiency and energy supply resource options.
- Include action plan with timing set by customer.
- Describe efforts to minimize adverse environmental effects of new resource acquisitions.
- Provide ample opportunity for full public participation.
- Conduct load forecasting.
- Include brief description of measurement strategies for options identified in IRP to determine whether objectives are being met.

IRPs and alternative reports will be evaluated by WAPA on the basis of:

- Meeting all criteria in 10 CFR 905
- Reasonableness of the plan with regard to: customer size, type, resource needs, geographic area and competitive situation
- Resource choice selection (EPAct 1992 section 114)

B. Introduction

1. Purpose

The purpose of this Integrated Resource Plan is to develop long-range implementation plans to serve MEAN's Total Requirements Participants' power supply requirements consistent with prudent utility planning practices utilizing the lowest cost, environmentally responsible energy supply. The IRP serves as MEAN's guidance for future plans to achieve its 2050 Vision for carbon neutrality.

This plan is also designed to fulfill the requirements of the Western Area Power Administration according to the Energy Policy Act of 1992, as described in section II.A.

2. Scope

This resource plan encompasses a time period of 15 years on the basis of MEAN's fiscal year. MEAN's fiscal year begins April 1st and ends March 31st. This IRP is inclusive of the planning period of FY 2022-23 to FY 2037-38.

The IRP conducts resource planning for MEAN's entire service footprint as a whole, as well as within the individual Regional Transmission Organizations ("*RTO*") regions in which MEAN's designated resources are assigned. MEAN operates in the Southwest Power Pool ("*SPP*") RTO, Midcontinent Independent System Operator ("*MISO*") RTO, and in the West region. Resources must be designated to meet the load and required reserve margin of

each region separately. However, there are several metrics that MEAN evaluates on an accumulated basis for the entire service area.

This IRP will consider all reasonable options for supply side resources and demand side management. Supply side and demand side options will be given equal consideration for incorporation into the future resource portfolio.

3. Methodology

The IRP analysis will begin with a high-level evaluation of all resource options. Criteria for resource selection are determined and weighted according to input from the MEAN membership. Using static performance and cost characteristics of each option, the complete list of resources will be narrowed to a smaller list of qualified options that receive the highest ranking in accordance with the weighted criteria.

The qualified resource options will be subject to an economic analysis that applies resource availability and cost to MEAN's hourly loads and projected market conditions. The sum of the hourly costs and revenues over the study period will be calculated to arrive at a total revenue requirement for each option for comparison purposes. This represents the total net revenue that MEAN must realize to cover the costs of the portfolio. The economic analysis will be repeated under various load and pricing sensitivity scenarios to calculate the impact of potential changes to key inputs. The variation caused by these scenarios is considered the volatility, or risk, inherent in each portfolio.

In addition to the total cost parameters, the resource options will be compared in terms of their carbon emissions impact. MEAN's future resource acquisitions will be selected not only in terms of financial cost and reliability to serve load, but also in their ability to advance MEAN toward the 2050 Vision of carbon neutrality. This means that each future resource should contribute toward a decrease in the net emission of the portfolio.

The combined results of the base case revenue requirement, the variability due to sensitivity cases, and the carbon emissions impact will ultimately lead to the determination of a preferred portfolio for future resource acquisition planning.

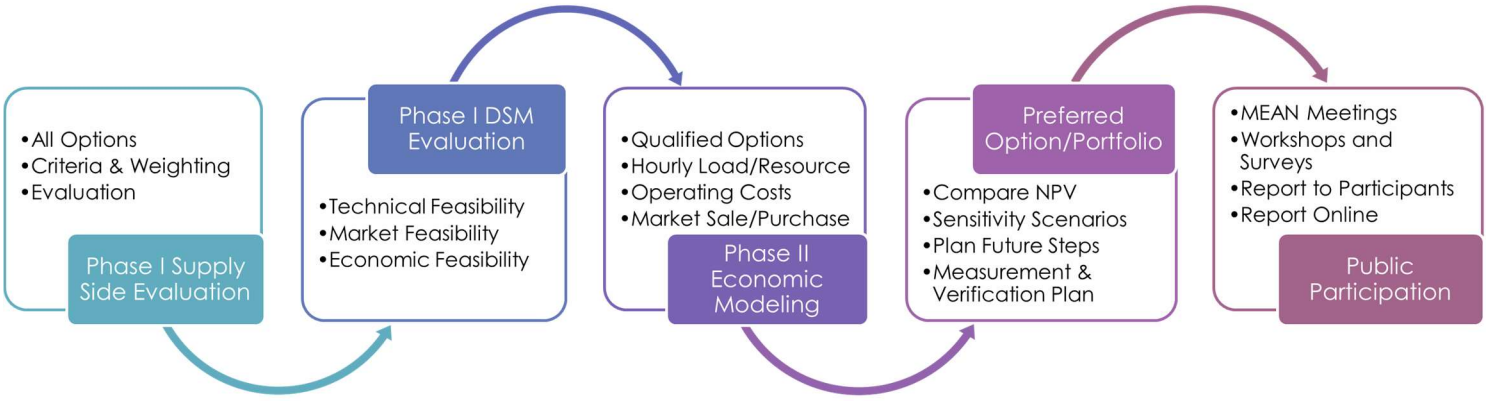


Figure I-1

4. About MEAN

The Municipal Energy Agency of Nebraska ("MEAN") is a body corporate and politic under the laws of the State of Nebraska. MEAN was created on June 22, 1981 under the Municipal Cooperative Financing Act, Sections 18-2401 through 18-2485, Reissue Revised Statutes of Nebraska (the "Act"). MEAN was created for the purpose of planning, acquiring, financing and operating facilities to generate and transmit electric power and energy.

MEAN's power supply system consists of ownership and contractual rights and interests in various electric generating and transmission resources and supplies (the "Power Supply System"). MEAN uses the Power Supply System to provide wholesale power supply, transmission and ancillary services to its participating municipal utilities ("Participants"). MEAN's services include power supply, dispatching, energy load forecasting, wheeling arrangements, load research, limited political action, demand-side management, load factor improvement, training, community development, compliance reporting, and energy cost analysis. Through its professional staff, MEAN also provides planning, engineering, financing, regulatory, and governmental affairs services to its Participants.

MEAN's 70 Participants currently include 42 municipalities and one public power district in Nebraska, 14 municipalities and one joint action agency in Colorado, two Wyoming municipalities and 10 Iowa municipalities. Each of the Participants owns and operates an electrical utility system that provides electric service to consumers. 62 of the Participants (the *"Total Requirements Participants"*) receive "total-requirements" electric supply services from MEAN, exclusive only of their allocations of firm power and energy from the Western Area Power Administration of the U.S. Department of Energy (*"WAPA"*), except for certain generating facilities of Waverly Utilities (a municipal utility of the City of Waverly, Iowa) and the City of Aspen, Colorado.

Together, the Total Requirements Participants provide electric utility service at retail to approximately 102,723 residential, commercial, institutional, agricultural and industrial customers, representing a total population of approximately 174,800.

MEAN's participant communities are mapped in *Figure I-2*.



Figure I-2

MEAN's regional footprint stretches from Central Iowa across Nebraska and into Colorado and Wyoming. Due to this footprint, MEAN is required to operate in two regional transmission organizations, MISO and SPP. Both MISO and SPP operate day-ahead and real-time energy markets. Market participants must pay for costs to serve load and receive revenue for their electrical generation. MEAN also operates in the western United States through the Western Electricity Coordinating Council (*"WECC"*) and participates in the Western Energy Imbalance Service (*"WEIS"*) market. In July of 2021, the SPP board of directors and Strategic Planning Committee approved the terms and conditions for regional transmission organization (RTO) expansion in the Western Interconnection. MEAN has communicated its intent to join a future SPP West RTO.

C. Uncertainties/Limitations

There are many parameters that impact the inputs to the IRP analysis. Many of these parameters have been calculated or assigned with certain assumptions. Should these assumptions be incorrect or prove to change over time, the outcome of the analysis could potentially change as well. This section explores some of the uncertainties and limitations underlying these variable inputs to the analysis.

1. Environmental Legislation

Electric utilities are subject to evolving environmental regulation. Various environmental permits and approvals from state and federal agencies are necessary in order to operate the Power Supply System. To date, MEAN reports that all environmental permits and approvals necessary for the operation of the Power Supply System have been obtained. However, federal, state, and local standards and procedures that regulate the environmental impact of electric utilities are subject to change. These changes may arise from continuing legislative, regulatory and judicial action regarding such standards and procedures. Consequently, there is no assurance that the Power Supply System and the

utility facilities owned or operated by the Participants will remain subject to the regulations currently in effect or indefinitely maintain current compliance status. An inability to comply with environmental standards could result in reduced operating levels, increased capital or operating costs, or the complete shutdown of individual electric generating units.

There is increased concern by the public, the scientific community, and Congress regarding environmental damage resulting from the use of fossil fuels. There are a number of pending or recently enacted legislative proposals in Congress and state legislatures that may affect the electric utility industry. Increased environmental regulation has created and may create additional barriers to new facility development and modification of existing facilities, both physically and operationally. The additional expenses, including time, human resources, uncertainty and delay, could increase the cost of electricity from affected resources and ultimately reduce their market dispatch. This type of legislation may ultimately have significant influence on nationwide or regional resource mixes and market operations as some types of resources experience increased costs of compliance or compulsory carbon taxes while other types of resources avoid such costs or receive financial incentives for generation, thereby effecting the feasibility of resource retirement and new construction. Further regulation may impose additional costs and long-term investments in retirement and decommissioning activities when a facility ceases operation.

2. Load Forecast

MEAN employs a robust statistical method for forecasting load. A number of input variables are used to formulate a forward-looking equation to calculate the monthly peak demand and monthly energy usage for each participant community for the entirety of the study period. However, the statistical analysis is dependent upon several variables, such as weather data, population, and income. Changes in any of these factors will impart changes in the load forecast.

Extreme weather events have made a notable impact on energy markets in recent years. In 2020, Hurricane Laura hit MISO's Gulf Coast region, resulting in a 500-MW load shed and massive transmission and distribution system destruction. In February 2021, Winter Storm Uri effected fuel supply and resource availability as well as load levels for several days in the SPP and ERCOT regions, leading to massive outages and extraordinarily high energy pricing. This type of weather event is unforeseeable and is not included in the weather projections used for load forecasting.

Throughout the MEAN footprint, demand side management (*"DSM"*) measures are being adopted by utilities and end-use customers in participant communities. DSM measures act to reduce either the peak demand for electricity or the total electricity consumption.

Distributed Generation (*"DG"*) is customer and/or community ownership of generating assets to serve end use load. Each installation of DG removes energy consumption from the MEAN system and thereby decreases the resource need, either on a capacity or energy basis depending on the timing of DG energy supply. Recent MEAN policy changes allow for an increased installation of DG resources as a percentage of energy consumption. The future rate of DG installation and therefore its impact on load projections is unknown.

Recent years have seen an emphasis on energy efficiency and energy conservation on all levels: residential, commercial, and industrial. The widespread use of these practices has led to a decrease in the growth rate of electric loads, and is a trend which is likely to continue, but at a pace that is difficult to predict.

3. Electrification

Electrification refers to the process of replacing technologies that use fossil fuels with technologies that use electricity as a source of energy. As more carbon-free resources are integrated into the grid to generate electricity, electrification can potentially reduce carbon emissions from the transportation, building, and industrial sectors. Given the adoption of state and federal regulations to reduce emissions, electrification activities are likely to proliferate. This gives entities more opportunity to reduce overall system carbon emissions with the possibility of serving this load with carbon free resources.

This move toward electrification will alter MEAN's resource portfolio as demand and consumption increase and end users require more carbon-free power. This change will also result in changes in the operations and economics of the energy markets. Evidence of a trend toward electrification would prompt a recalibration of resource planning to resize planned acquisitions or add incremental acquisitions in the appropriate future years.

4. Energy Markets

In the integrated markets, loads are served and resources dispatched according to market dynamics and the balance of bids and offers in an attempt to cost effectively optimize the pool of resources. Since the establishment of the SPP and MISO Integrated Markets, several changes have been introduced that have changed the way resources are designated to load, the way resources are dispatched into the marketplace, and energy prices and cost recovery for generation resources. Given the fast pace of developments in the markets, it is likely that changes will continue in the future.

Within the integrated markets, market prices are determined by variable costs of generating units throughout the entire market. Therefore, the construction of new units and retirement of existing units has the potential to change the order of economic dispatch of resources and, as a result, marginal pricing. The integration of non-dispatchable, renewable generation into the resource mix impacts the operation of other resources, particularly peaking units dispatched in response to supply fluctuations and cycling coal plants.

Effective Load Carrying Capability (*"ELCC"*) study results indicate that with increasing penetrations of wind and solar resources, the capacity value provided by those resources as a percent of nameplate capacity generally tends to decrease. This has impacts on the magnitude of resources needed to serve load, which directly affect the inputs and results of this analysis.

The existing markets and potential creation of future markets present significant opportunity for uncertainty.

5. Fuel Pricing

Fuel pricing is an obvious source of uncertainty.

Recent natural gas pricing has been elevated compared to historical pricing and has seen higher volatility in recent months. As a global resource, natural gas is subject to the influence of global supply and demand. This relationship carries with it the risk of price fluctuations in response to market occurrences elsewhere. Fuel pricing projections assume high pricing and volatility in the near future. However, this contains inherent uncertainty.

Coal prices are similarly subject to external influence and resulting volatility. Despite some years of uncertainty due to the dynamics of domestic and foreign coal consumption, recently coal prices have stabilized and remained relatively low. Coal in most regions has seen flat or declining pricing over the past five years. However, fuel prices respond to a number of factors and the impacts of overseas markets can be difficult to predict.

Sensitivity cases are included in the economic analysis to capture the effects of changes in fuel pricing.

6. Existing Resource Contracts

MEAN is a party to a number of long-term resource contracts. Existing resources are detailed in Section VI. These contracts represent a limitation on the changes MEAN can make in the future portfolio. Contract terms dictate that MEAN must receive and pay for the output of the resources and/or pay the costs incurred by the resource. MEAN is required to pay the costs of these resources through the contract term, and in so doing, it becomes the most economical option to use the generation of these resources to serve load. To increase future carbon free energy purchases to replace the generation of carbon-emitting resources under contract or to generate far in excess of load needs would result in unnecessary cost increases to MEAN members. Non-compliance with the terms of the contracts would result in additional financial penalties. Therefore, future portfolios are sized with the assumption that MEAN will continue to utilize the output of resources to which MEAN is contractually obligated.

D. System Load Forecast

1. Methodology

MEAN employed multiple regression analysis to forecast the non-coincident peaks for each of its Total Requirement Participants for FY 2022-2023 (annual forecast) through FY 2037-38 (15-year forecast). The model took into consideration three main factors as independent variables: economic factors such as population growth and income growth; temperature factors such as average daily temperature, heating degree days (*"HDD"*) and cooling degree days (*"CDD"*); and calendar factors such as weekdays and month.

The coincident peak forecast is calculated as MEAN's non-coincident peak multiplied by the coincidence factor. The coincidence factor was forecasted based upon regression analysis of the difference between the mean temperature and the max temperature at the time of historical peaks.

With many unknown factors potentially impacting MEAN's future load obligations, the IRP considers resource needs under a variety of future load scenarios. Five scenarios were investigated:

Load Scenario 1: Reference case load forecast, which is based on normalized weather and represents the 50% confidence interval of the statistical distribution.

Load Scenario 2: Low load scenario, which is based on normalized weather and represents the 10% confidence interval of the statistical distribution.

Load Scenario 3: High load scenario, which is based on normalized weather and represents the 90% confidence interval of the statistical distribution.

Load Scenario 4: Electrification scenario, which is based on normalized weather and assumes a high rate of electrification throughout the footprint resulting in a much higher annual growth rate. The inputs to this scenario were informed by NREL's Electrification Futures Study. This load scenario was not modeled however, as it would require a completely different resource acquisition schedule that would not be comparable to the other scenarios.

Load Scenario 5: Recession scenario, which is based on normalized weather and represents a scenario in which an economic recession takes place mid-way through the time period. Recovery follows historical patterns.

2. MEAN System

MEAN's load forecast for peak demand and energy consumption for the entire system for the 15-year study period is shown in the graphs in *Figures I-3* and *I-4* illustrating all five load scenarios:

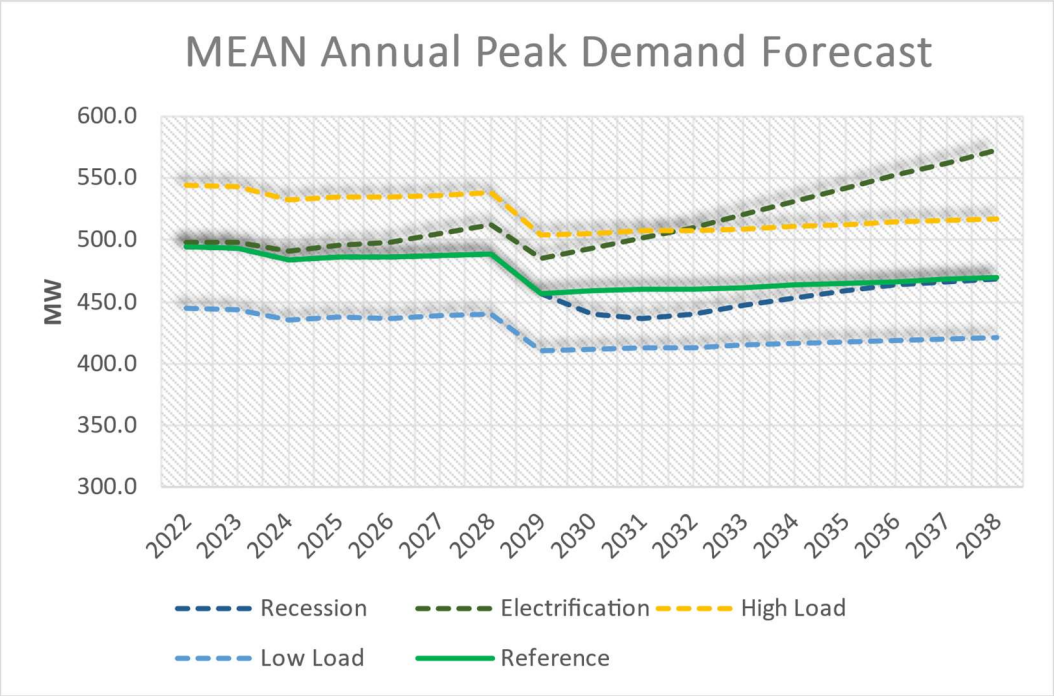


Figure I-3

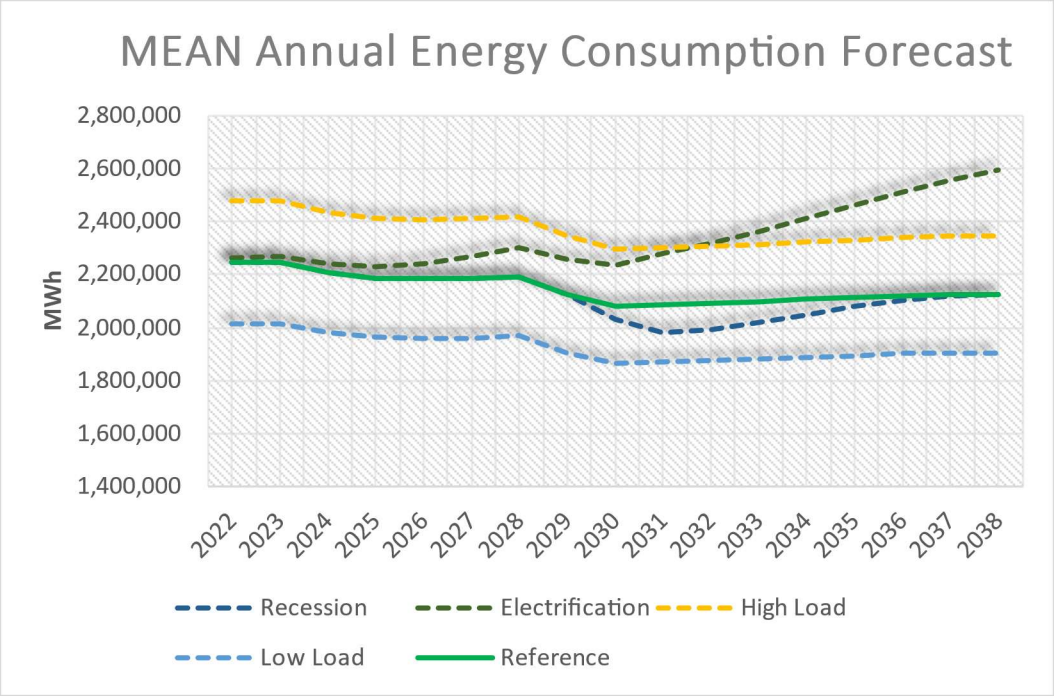


Figure I-4

Load Forecast figures for each region are shown in Section V of the report for each of the load scenarios as well as seasonal breakouts of demand and energy.

3. Reserve Margin and Transmission Losses

MEAN must maintain capacity to serve not only the forecasted load in each region, but the total resource obligation which adds to the peak demand a reserve margin and transmission losses.

The SPP and MISO market constructs require each load serving entity to maintain a designated percentage of reserve capacity in addition to the entity's forecasted peak load. In SPP, the established required Reserve Margin is 12%. For the 2022/23 planning year, the MISO Planning Reserve Margin (*"PRM"*) is 9.4%. As the MISO definition of the PRM is specific to the operation of the upcoming year, the PRM changes annually.

For loads and resources in the west, there is no prescribed reserve margin. MEAN incorporates a 12% reserve margin in addition to forecasted load when determining the load and resource balance in the west.

MEAN's total obligation for service must also include the losses that occur throughout the transmission system. The rate of loss depends on the transmission system and is typically reported to MEAN on an annual basis. However, MEAN does not have to provide for transmission loss on WAPA allocations. Therefore, this amount is deducted from the calculations. In total, MEAN serves network load on six transmission systems.

MEAN adds the required margins to the forecasted peak demand to determine the total obligation for service in each region. This value is reflected in the figures throughout this report.

E. System Resources

1. Summary

The Power Supply System consists of owned, leased and purchased power supply resources as well as transmission system arrangements used to transmit resources to the Total Requirements Participants. MEAN receives transmission services provided by SPP, MISO and multiple transmission providers in the Western Interconnected System (the *"Western Interconnection"*).

MEAN is party to a number of long-term resource commitments. However, MEAN is not a majority owner or operator of any of its resource contracts. As such, many of these resources will remain in MEAN's resource portfolio for the entire service life of the asset, despite MEAN's 2050 Vision for carbon neutrality. Although this poses a challenge in terms of carbon emissions and the required offsets to achieve neutrality, MEAN acknowledges the reliability and resource adequacy offered by such resources. In fact, many of these resources supply the capacity necessary to qualify renewable intermittent resources that generate energy with a low accredited capacity. As market conditions change and continue to favor the economics of renewable resources, fossil fuel plants will likely be dispatched at lower levels, which will decrease the energy generation and therefore the emissions without reducing the capacity contribution.

The table in *Figure I-5* summarizes MEAN's long-term power supply resources as of the date of this report:

Resource	MEAN Nameplate Capacity	Primary Energy Source	Market Region[1]	% MEAN Capacity	Contract Term
Total Requirements Committed Facilities (Participant Owned Generation)	124.2 MW	Oil/Gas	MISO (69.5 MW), SPP (48.3 MW), WEST (6.4 MW)	18.9%	Life of the Power Supply Agreement for Participant.
WAPA [2]	124.7 MW	Hydroelectric	MISO (7.5 MW), SPP (29.1 MW), WEST (88.1 MW)	19.0%	9/30/2054 Tribes agreements terminate on one-year notice.
Whelan Energy Center Unit 2	80 MW	Coal	SPP	12.2%	Later of life of the Project through decommissioning, or date all debt is paid.
WAPA Displacement Agreement [3]	61.9 MW	Hydroelectric	WECC	9.4%	5/31/2029
Walter Scott Energy Center Unit 4	56.0 MW	Coal	MISO	8.5%	Life of Unit
Walter Scott Energy Center Unit 4 Assignment	3.2 MW	Coal	MISO	0.49%	Termination of Waverly's SSM.
NPPD Multi-Unit Participation					12/31/2023
Cooper Nuclear Station	26 MW	Nuclear	SPP	4.0%	
Gerald Gentleman Station	24 MW	Coal	SPP	3.7%	
Kimball Wind LLC	30 MW	Wind	WECC	4.6%	6/28/2038
Laramie River Station Unit 1	9.9 MW	Coal	SPP	1.5%	Life of Project
Laramie River Station Unit 2 & Unit 3	18.6 MW	Coal	WECC	2.8%	Life of Project
Wygen Unit I	20 MW	Coal	WECC	3.0%	Initial term 40 years, then three automatic renewals of 20 years each unless terminated by agreement of the parties.
Black Hills Power Purchase Agreement					5/31/2028 with early termination option for 5/31/2023.
Neil Simpson Unit 2 [4]	8 MW	Coal	WECC	1.2%	
Wygen Unit III [4]	7MW	Coal	WECC	1.1%	
Wessington Springs Wind Project	10 MW	Wind	SPP	1.5%	12/26/2039
Louisa Generating Station	8.2 MW	Coal	MISO	1.2%	Termination of Waverly's SSM.
NPPD Elkhorn Ridge Wind Plant	8 MW	Wind	SPP	1.2%	2/28/2029
NPPD Laredo Ridge Wind Project	8 MW	Wind	SPP	1.2%	1/31/2031
DMEA Shavano Falls/Drop 4 & Drop 6	7.6 MW	Hydroelectric	WECC	1.2%	6/23/2037
NPPD Ainsworth Wind Energy Facility	7 MW	Wind	SPP	1.1%	9/30/2025
Whelan Energy Center Unit 1	5.3 MW	Coal	SPP	0.8%	Date WEC 1 and/or its associated transmission system is removed from service.
Waste Management Landfill Gas	4.8 MW	Landfill Gas	MISO	0.7%	3/1/2034
NPPD Crofton Bluffs Wind Project	4.2 MW	Wind	SPP	0.6%	10/31/2032
TOTAL	656.6 MW				

(1) Resources located in MISO and SPP are dispatched by MISO and SPP.

(2) All but approximately 7 MW constitutes North American Tribes' and Total Requirements Participants' WAPA allocations.

(3) Under the WAPA displacement agreement, MEAN receives hydroelectric energy (excluding renewable energy credits) in WECC from the capacity in the agreement. Operationally, MEAN provides an equal amount of capacity to WAPA's customers in SPP from various MEAN contracted resources. The contracted resources designated for WAPA's customers in SPP may vary throughout the term of the agreement.

(4) Per contract, total capacity available to MEAN from Neil Simpson 2 / Wygen III was 20 MW in 2017-18, is currently 15 MW and reduces to 10 MW in 2023.

Figure I-5

2. Regional Markets and Energy Dispatch

The values of energy shown in the resource mix charts are indications of available energy from each resource, primarily based on operating characteristics, outage schedules, and historical performance. However, this may not be an accurate projection of actual energy generated in the future as it does not reflect the effects that increased renewable generation will have on reducing the economic dispatch of fossil fuel units.

In the SPP and MISO integrated markets, each resource is dispatched by the market according to its offer price in comparison to the locational marginal price (LMP) at the unit's specific location, which is a value that changes every five minutes based on the conditions of the entire market and transmission system. In the RTO markets, the offer prices for generating resources are most typically equal to the unit's variable operating costs, consisting primarily of fuel cost. The low or zero cost of fuel for renewable resources lowers the market price at which resources will be dispatched. Therefore, the higher the penetration level of renewables, the lower the market price, and the less often conventional resources will be dispatched.

The proliferation of low-cost renewable resources has driven market prices down in recent years. Future environmental regulations are likely to increase the operating cost of fossil fuel units, which will cause the market to dispatch these units less often.

3. Resource Mix by Fuel Type

It is very important to note in the following section that the values shown simply represent the currently contracted capacity. It is quite obvious that the relative values will (and sometimes do) change if MEAN's total capacity changes. Increase or decrease in relative percentages does not always correlate to the same magnitude of increase or decrease in MWs, given that the totals change. The varying capacity factors and accreditation values of different types of resources, particularly renewable resources, also mean that the "Future" capacity values represent accredited capacity that is required and are not necessarily predictive of the actual nameplate capacity of future assets. MEAN will size future resources to satisfy the energy needs of our total forecasted load as well as resource adequacy requirements.

For each region, a chart is included in Section VI of the report to show the resource mix in 2022 and 2038 as well as an intermediate year that represents change in the region. When presenting resource mix metrics, resource capacity is listed according to unit nameplate.

In terms of energy, future projections are based on a combination of availability as a function of historical operation and economic dispatch in response to changing market prices. As the total resource mix of each market changes, the operation of MEAN's resources may change from the projected profiles.

MEAN Capacity

In 2022, 51% of MEAN's resource mix is provided by fossil fueled resources in terms of capacity, divided between coal and participant owned generation. Hydro from WAPA allocations and the WAPA Displacement agreement supply 31% of the total. Renewable resources, including wind, small hydro, and landfill gas, account for 14% of MEAN's capacity. 4% of MEAN's capacity mix is nuclear powered.

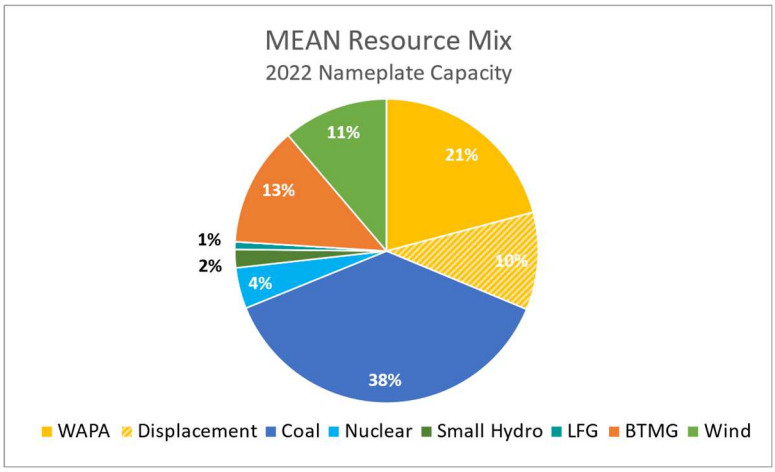


Figure I-6

In 2029, the percentage of fossil fueled capacity remains roughly the same at 53% despite the expiration of the Black Hills PPA and the NPPD Multi-Unit Participation Agreement. WAPA power is now at 19%, since the Displacement agreement has expired, and the renewable total has increased slightly to 19%. 9% of accredited capacity needed for resource adequacy will be supplied by future resources.

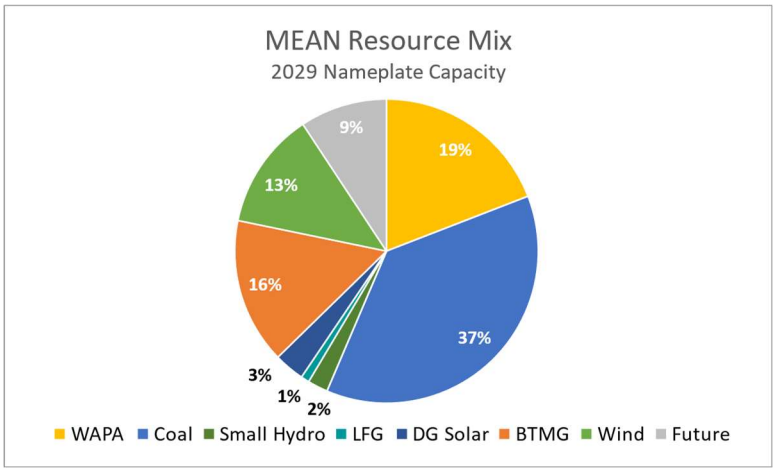


Figure I-7

By 2038, the Landfill Gas PPA will terminate, along with several wind PPAs. The capacity percentages see little change, and 14% of MEAN's total required accredited capacity will be supplied by future resources.

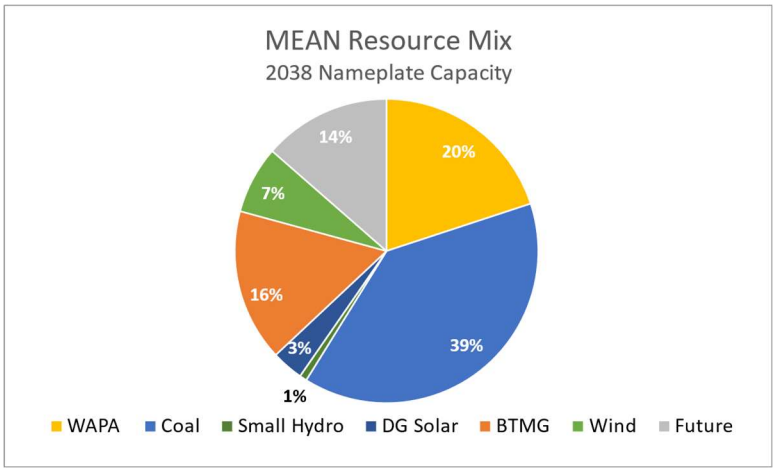


Figure I-8

MEAN Energy

MEAN's resource mix in 2022 in terms of energy generation capability shows that the largest contribution comes from coal resources, at 54% of the total. Non-emitting resources make up the remaining 46%. 24% of the total energy is supplied by WAPA allocations and the WAPA Displacement agreement, 13% of MEAN's energy is renewable, and 8% is generated by a nuclear resource. MEAN entered into a short-term energy purchase to hedge against high market prices in 2022.

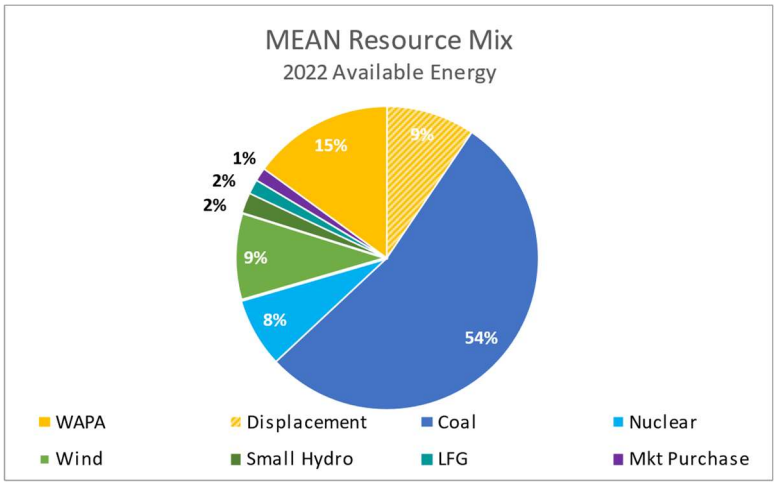


Figure I-9

Into the future, the energy availability of coal resources decreases slightly to 49% of the total, the contribution of WAPA allocations decreases to 19%, and the renewable resource percentage increases to 16% with the installation of DG Solar. Only 16% of MEAN's total energy in 2029 must be generated by future resources.

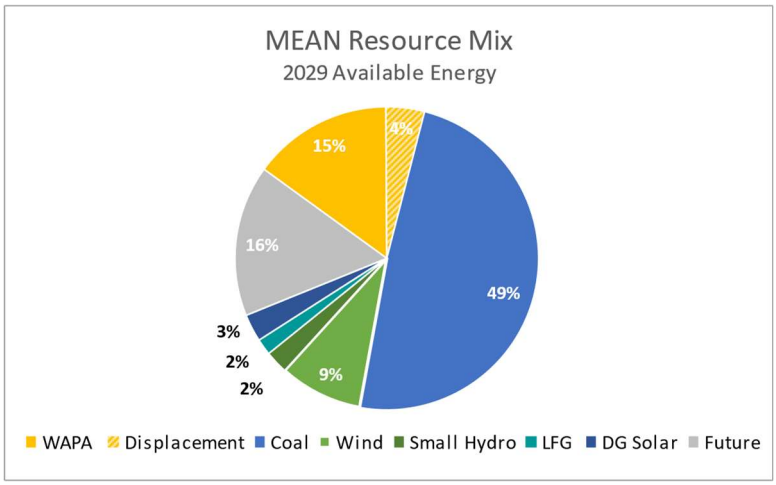


Figure I-10

Out into 2038, MEAN's energy from coal is projected to remain constant at 50%. WAPA drops to 15% with the expiration of the WAPA Displacement Agreement. Renewables decrease to 8% as Wind PPAs, the Landfill Gas PPA, and the Shavano Falls Hydro PPA end. MEAN will require an estimated 27% of energy in 2038 from future resources.

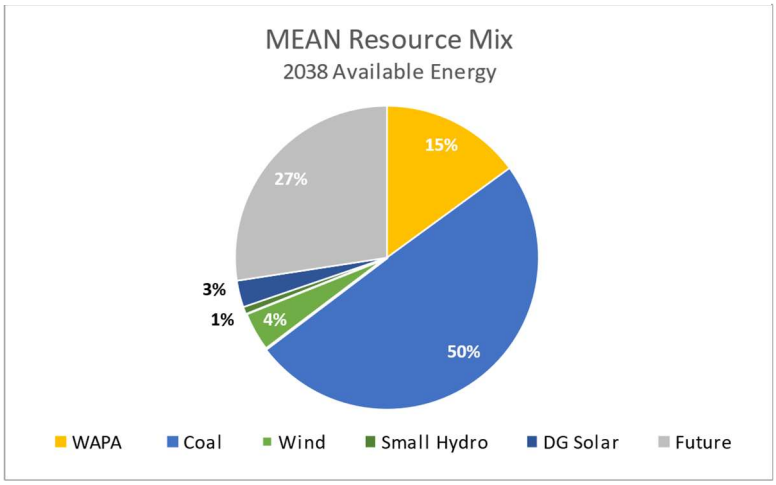


Figure I-11

F. Distributed Generation

1. Renewable Distributed Generation Policy

MEAN adopted a Renewable Distributed Generation Policy (the *"DG Policy"*) in 2016 that, in limited amounts and in certain circumstances, allows the Total Requirements Participants to (a) permit their retail customers to utilize output from qualifying renewable generation resources to supply all or a portion of their own loads, (b) purchase output from qualifying renewable generation resources owned by their retail customers, which shall be treated as a sale to MEAN if the resource has an estimated rated generating capacity of 25 kW or more, and (c) subject to a cap set forth in the DG Policy, own and operate qualifying renewable generation resources, to participate in qualifying community solar projects, or to enter into power purchase agreements under certain limited circumstances to purchase the output of qualifying renewable generation resources, to offset their total requirements purchases from MEAN.

In November of 2019, the MEAN Executive Committee, acting on behalf of the Board, approved an increase in the policy limits, allowing Participants to install one or more qualifying distributed renewable generating resources capable of generating up to 5% of the Participant's average annual energy needs served by MEAN, or the energy generated by 100 kW, whichever is greater. The type of resource determines the capacity factor, and therefore the allowable capacity of the installed resource.

A 2016 MEAN Participant survey found that throughout the entire MEAN footprint, there is a total installed grandfathered DG capacity of 2,875 kW. Since the establishment of the grandfathered distributed generation, MEAN Participants have installed a total of 4,932 kW of distributed generation.

2. Community Solar Request for Proposals

In 2019, MEAN surveyed member communities regarding interest in installation of community-owned solar assets. On behalf of these interested communities, MEAN released a Request for Proposals for community-owned solar facilities. The aggregated Request for Proposals was pursued as the increased volume of solar installation required of the combined projects provided advantageous pricing compared to a standalone project in one community. The RFP was released in July 2021 and bids received in September 2021. After evaluation of bids and consultation with members, MEAN awarded the bid for a total of 14.2 MW-DC of community-sited and -owned solar facilities. Since that time, the total installed capacity of the project has increased to 27.4 MW-DC. Project installation is scheduled to begin in Summer 2022 with all commercial operation dates by Spring 2023.

G. Existing Demand Side Management

MEAN has conducted several Demand Side Management ("*DSM*") programs in the past, with varying degrees of adoption and impact. Currently MEAN provides a suite of five energy efficiency programs that offer cash incentives paid directly to customers to help cover the cost of energy efficient upgrades.

1. Commercial Programs

LED Lighting Program: This program provides cash incentives paid directly to commercial customers to help cover the cost of lighting upgrades and replacements to existing facilities. The energy and demand savings achieved through this program in FY21-22 are listed below:

Equipment Info (Conversion)	Fixtures Retrofitted	KW Savings	Hours ran (annual)	Coincidence	Annual KWh Savings	Peak KW Savings
High Bay: 9-65 watts LED	354	14.2	4,160	95%	55,960	13.5
High Bay: 66-130 watts LED	78	5.1	4,160	95%	20,037	4.8
High Bay: 131-240 watts LED	197	19.7	4,160	95%	77,854	18.7
Linear Replace/Retrofit: 9-22 watt LED	5,170	93.1	5,200	95%	459,716	88.4
Linear Replace/Retrofit: 23-45 watt LED	663	13.3	5,200	95%	65,504	12.6
Linear Replace/Retrofit: 46-68 watt LED	436	15.3	5,200	95%	75,384	14.5
Linear Replace/Retrofit: 69-90 watt LED	335	16.8	5,200	95%	82,745	15.9
LED Exit: under 8 watts	371	7.4	8,672	95%	61,129	7.0
LED Refrigerator	26	1.0	8,672	95%	8,568	1.0
Customized Application Fixtures (Linear)	697	19.5	5,200	95%	96,409	18.5
FY21-22 Totals	**8,327**	**205**			**1,003,307**	**195**

Figure I-12

2. Residential Programs

Smart Thermostat Program: Provides a cash incentive from $25 to $100 paid directly to residential customers to help cover the cost of installing a qualifying smart thermostat.

Attic Insulation Program: Provides cash incentives of $0.15/per square foot with a maximum incentive of $300 per existing residential dwelling for attic insulation.

Cooling System Tune-Up Program: Provides a $30 cash incentive to residential homeowners who have their cooling system tuned up by a HVAC contractor, regardless of what type or age of cooling system (air conditioner/air or water source heat pump).

High Efficiency Heat Pump Program: Provides cash incentives ranging from $400 to $3,000 to residential homeowners who are installing a new high efficiency heat pump system to their residential single-family dwelling.

As these programs were initiated in 2020, there are no measured results of energy or demand savings to date. In FY21-22, eighteen MEAN communities participated in the residential energy efficiency programs and 48 projects were completed. This was up significantly from FY20-21 which saw 34 projects completed.

3. Community Programs

The 2016 Participant DSM survey revealed a total of 17 communities with 33 DSM programs in place. The non-coincident sum of the demand and energy savings from these DSM programs is 4.03 MW and 2,635 MWh. Of this total, a large portion of the available demand savings is in the form of interruptible load supplied to irrigation wells. The projected annual savings of the community DSM programs are summarized in *Figure I-13*.

Region	Communities	Programs	Total Demand Under Control (kW)	Total Demand Savings (kW)	Total Energy Savings (kWh)
MISO	5	9	2,500	415	218,116
SPP	8	12	14,468	2,136	2,386,085
West	4	12	0	1,477	31,052

Figure I-13

H. Renewable Energy Resources

1. 2050 Vision

In 2020, the Board approved a resolution laying out a vision to work toward transitioning MEAN's wholesale power resource portfolio to achieve carbon neutrality by 2050 through the elimination of carbon emissions or balancing emissions with carbon removal through carbon offset mechanisms. The resolution authorizes MEAN's staff to work collaboratively with the MEAN Power Supply Committee to develop policies around resource planning, portfolio optimization and emissions reduction to support future actions to achieve the 2050 carbon neutral goal. The formation of the plan will begin with resource analysis and the portfolios recommended as part of this IRP. MEAN's current resource capacity portfolio consists of 49 percent non-carbon resources from projects around the region, including Total Requirements Participant allocations of federal hydropower from WAPA. MEAN's actual energy generation from carbon free resources in FY20-21 was over 50% of the total. The IRP is exploring the opportunities in the coming years to transition toward higher levels of carbon neutrality as power purchase agreement contracts expire and capital debt is paid on its shared ownership of power resources with other utilities

2. Renewable Resource Mix

As contract terms for existing assets expire, MEAN looks to replace the energy and capacity with carbon-free resources. As part of the 2050 Vision, MEAN aims to make resource acquisitions that only decrease the total carbon emissions of our portfolio.

The future resources considered for this resource planning analysis will be evaluated in part on their ability to decrease the carbon emissions in MEAN's current portfolio. Although environmental impact ranked 9th in MEAN's member survey of the importance of resource evaluation criteria, the equivalent carbon emissions factor was an element of scoring in the Phase I supply side resource evaluation. Also factored into this evaluation was the sensitivity of resource options to a future carbon tax and future changes in environmental legislation, which largely correspond with emissions levels. Finally, the performance of each future resource is calculated in terms of the change in carbon intensity of the MEAN resource portfolio.

3. Renewable Resource Pools

To respond to the disparity in local goals for renewable or carbon-free energy, MEAN offers a Wind Pool and a Landfill Gas Pool where participants can elect to purchase specified amounts of those resources in terms of energy or the environmental attributes earned by those resources from MEAN's portfolio. This allows individual communities to control their own resource mix. MEAN communicates annually to participants to inform

them of their actual energy mix for the prior year. The rates for these pools are established by the Board of Directors in accordance with policy.

Currently, the Wind Pool is fully subscribed with all MWh allocated to participants per contract. The Landfill Gas Pool was 34.2% subscribed in 2021. As MEAN expands its portfolio in terms of carbon-free resources, the resource pools and the energy rates for these resources may evolve accordingly. The pools may need to expand to accommodate the acquisition of future carbon free resources and varying demand for carbon free energy from individual MEAN member communities.

I. Load and Resource Balance

Previous sections of this report have quantified the forecasted total load obligation that MEAN expects to serve in future years, in various future scenarios, as well as the capacity and energy available to MEAN for service of this load. To determine the timing and magnitude of MEAN's future resource needs, the annual peak demand must be compared to the resource capacity available during the peak and the total annual energy consumption must be compared against the expected and/or available generation of the portfolio's resources.

For the calculation of load and resource balance, resources will be quantified according to accredited capacity, or the maximum capacity that is expected to be available during the system peak load. The peak demand as shown in the load and resource balance in the total service obligation, which includes not only the forecasted peak load, but also the required reserve margin and the expected transmission losses. Resource capability in terms of capacity and energy is classified by fuel type.

The load and resource balance for the entire MEAN system is shown below. However, since MEAN serves load and procures resources on a regional basis, the regional load and resource balance values are utilized for resource planning to determine the need for future resources. These regional balance figures are shown in Section X of the report.

1. MEAN System

The graph in *Figure I-14* shows the balance of peak demand and resource capacity for MEAN's entire footprint. Available capacity is sufficient to serve load until 2024. At that point, MEAN has a slowly growing capacity need into the future. The total picture of MEAN's total energy balance begins with an energy deficit in 2029 of approximately 16% of load, which grows to a 27% deficit in 2038.

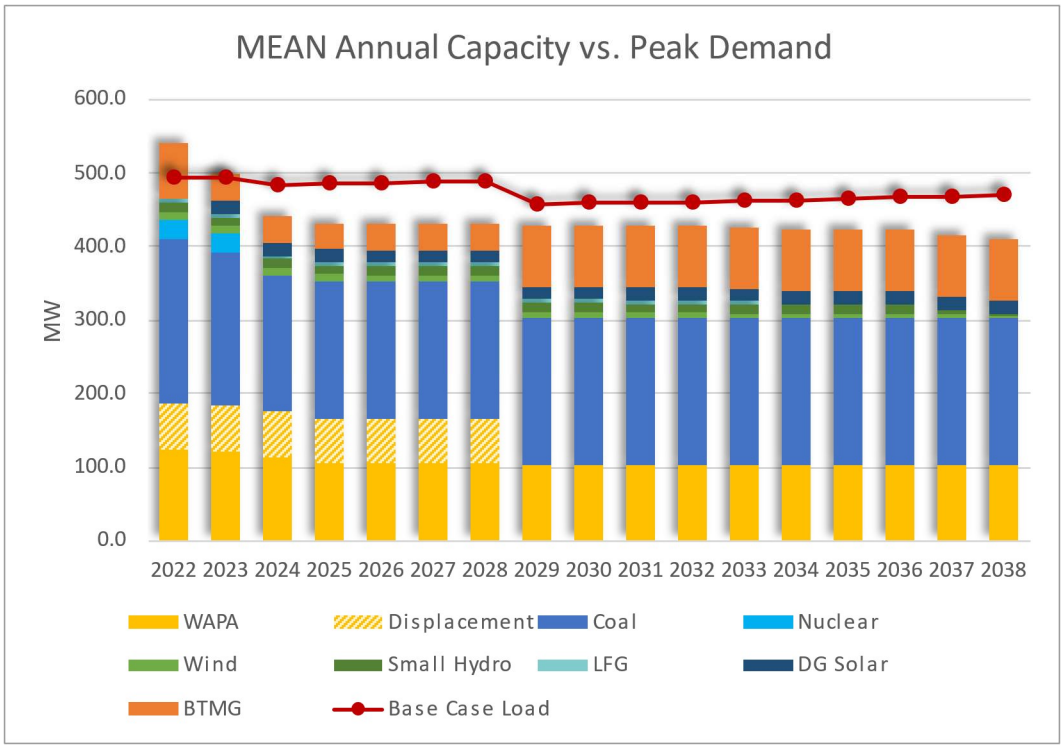


Figure I-14

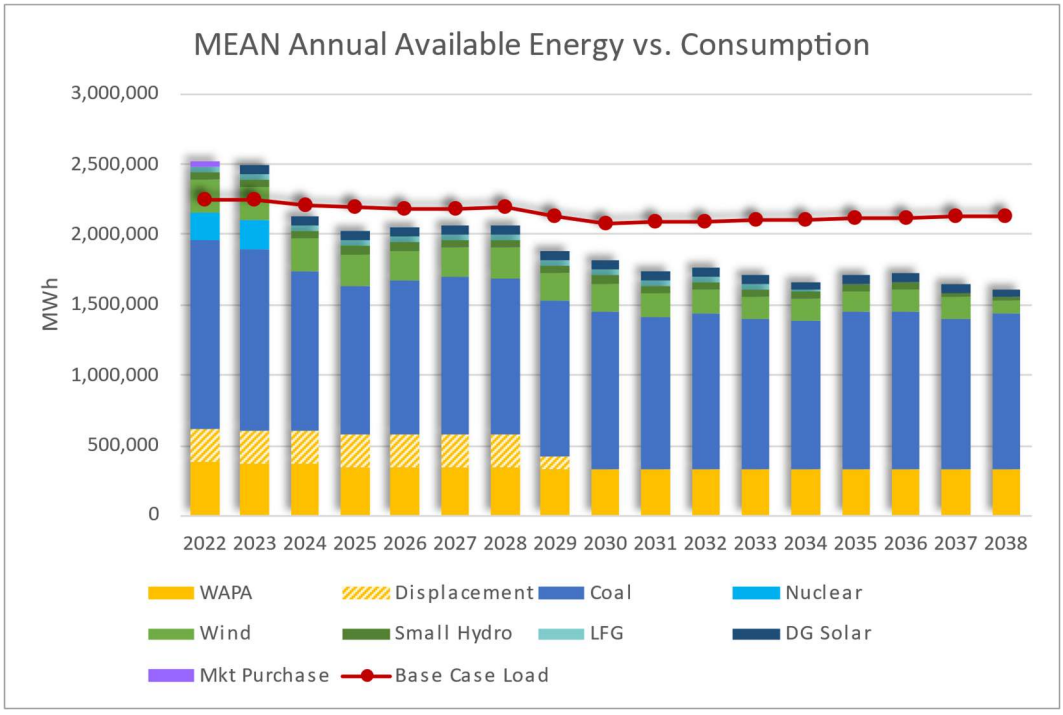


Figure I-15

1. Projected Capacity and Energy Needs

Assigning the capacity needs into regional resource deficits, SPP has a need for approximately 55 MW of capacity from 2024 to 2028. The end of the WAPA Displacement Agreement eliminates the need for capacity in SPP in 2029. The West region first sees a capacity deficit of approximately 10 MW in 24, which increases sharply to 45 MW in 2029

and increases throughout the remainder of the study period to 65 MW in 2038. MISO has a very minor capacity deficit of less than 5 MW from 2034 to 2038.

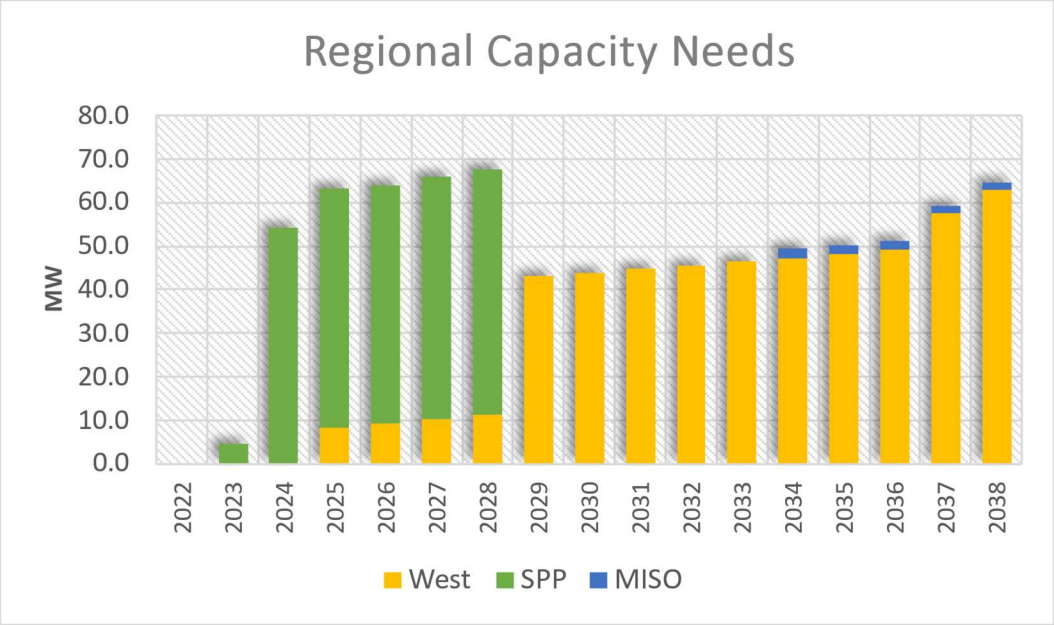


Figure I-16

The regional energy needs look very different. Both SPP and the West have an energy deficit from 2024 until 2038. SPP's energy need starts at 118,000 MWh in 2024 and increases to 250,000 MWh in 2038. In the West, resources are needed to supply 46,000 MWh in 2024 and grow to 358,000 MWh in 2038. MISO has no energy needs in the future.

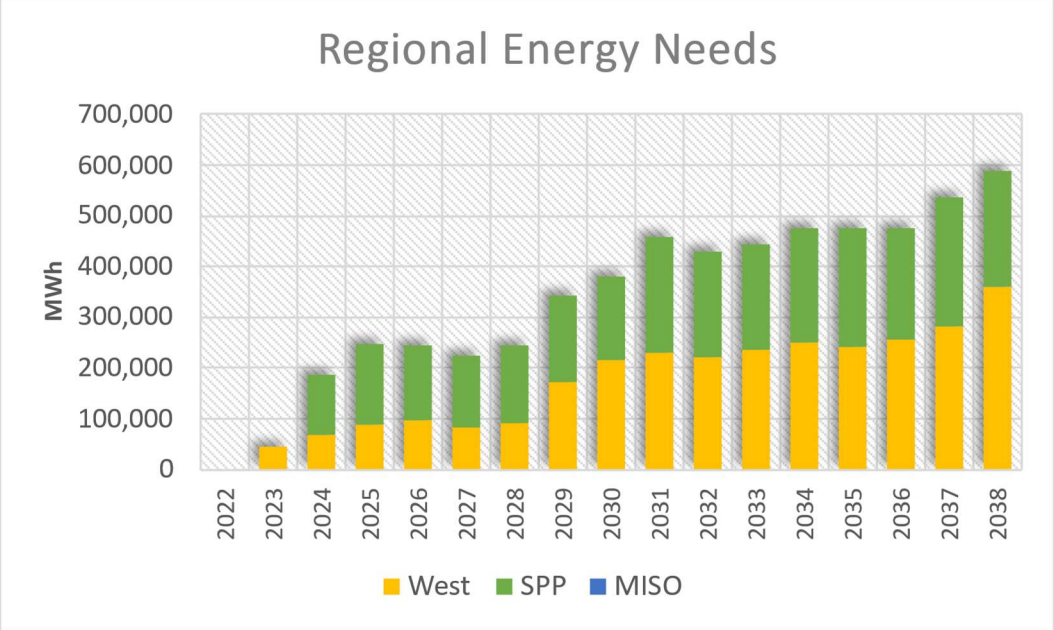


Figure I-17

J. Transmission

MEAN is a transmission-dependent utility and receives transmission services provided by SPP, MISO and multiple transmission providers in the Western Interconnection.

SPP and MISO network and point-to-point transmission service agreements provide MEAN with sufficient access to transmission facilities to deliver energy to the MEAN Participants, to participate in the SPP and MISO energy markets, and to sell excess generation and purchase replacement energy when generation is not available or it is economically beneficial

MEAN has several agreements with Black Hills Power which provide for firm point-to-point transmission service and non-firm point-to-point transmission service for use in making deliveries to Participant loads, resource deliveries to adjacent transmission networks, as well as energy sales to other regional utilities. WAPA-RMR and WAPA-CRCM provide network integration transmission service to MEAN Participants connected to these two transmission systems. MEAN's point-to-point transmission service agreements with WAPA-RMR permit electricity produced from certain west resources to be moved to the transmission networks of other providers. MEAN contracts for network transmission service, short-term point-to-point transmission service, and non-firm point-to-point transmission service with Tri-State and PSCo.

MEAN has recently requested rights to transfer energy from east to west across the DC Tie at the Sidney Converter Station. MEAN's request under study would grant rights to transfer 34 MW beginning in 2024. A request has been submitted to obtain additional rights when they become available in future years. This allows MEAN to expand the application of resources to load with the ability to utilize SPP resources in the West. However, transmission across the DC Ties has associated costs, which have yet to be defined or quantified as the SPP West RTO is being developed

K. Phase I Supply Side Resource Evaluation

1. Phase I Supply Side Evaluation Objectives

Phase I is a preliminary evaluation undertaken to investigate a comprehensive list of supply side options and focus this list down to fewer qualified options that prove to be feasible potential additions to the MEAN portfolio. The Phase I evaluation is in large part qualitative and based on simplified, static metrics. A more in-depth economic analysis is reserved for the qualified options in Phase II.

2. Supply Side Options

To follow in *Figure I-18* is the complete list of the supply side options included in the Phase I evaluation for MEAN's future resource needs.

	Supply-Side Resource Options
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

*with and without CCS

Figure I-18

3. Criteria

The goal of Phase I was to narrow the complete list of supply side options to a list of qualified options that represent the most feasible supply side resources for MEAN to input into the portfolio model. To select the qualified options, appropriate criteria had to be assigned. To this end, MEAN conducted an online survey wherein the participants were asked to rank a list of criteria in terms of importance in resource selection.

The results of the survey indicated that the participants' most important criteria in resource selection is Cost. This was followed by Long Term Debt, Transmission Availability and Cost, Local Benefit, Resource Adequacy, and Future Capital and Decommissioning Costs. The lowest priorities were Fuel Diversity, PPA vs. Ownership, and Environmental Policy Risk. The complete results are shown in the graph in *Figure I-19*.

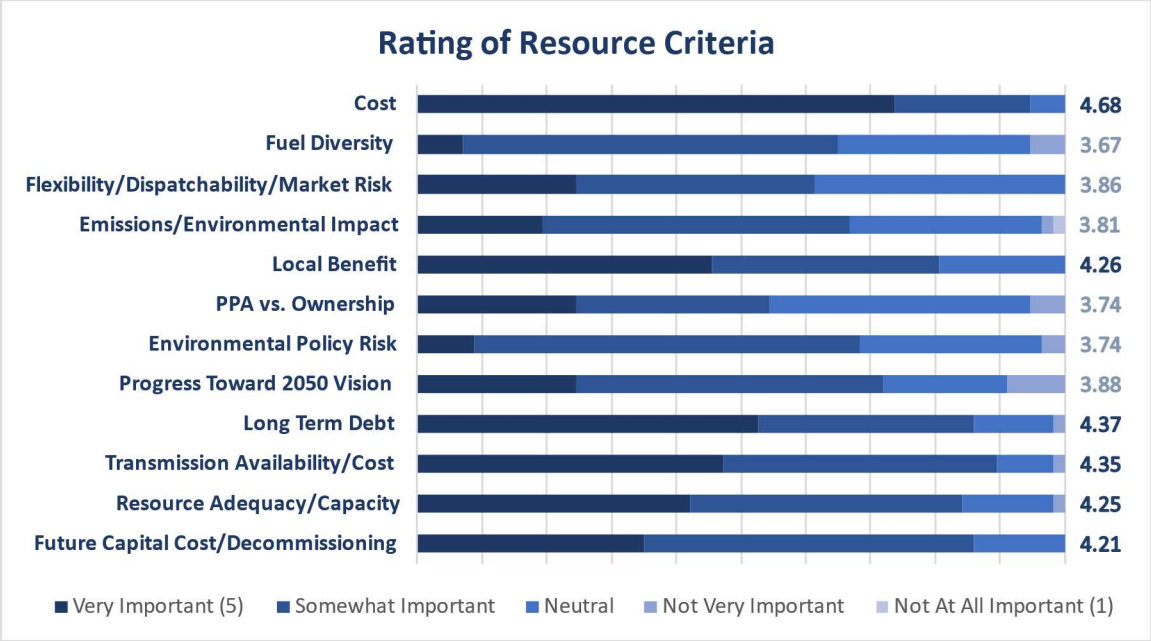


Figure I-19

The chart in *Figure I-20* shows the total combined weighted score for each of the supply side options. The individual components of the score are color coded by criteria as described above. Input data for this evaluation is located in Appendix B.

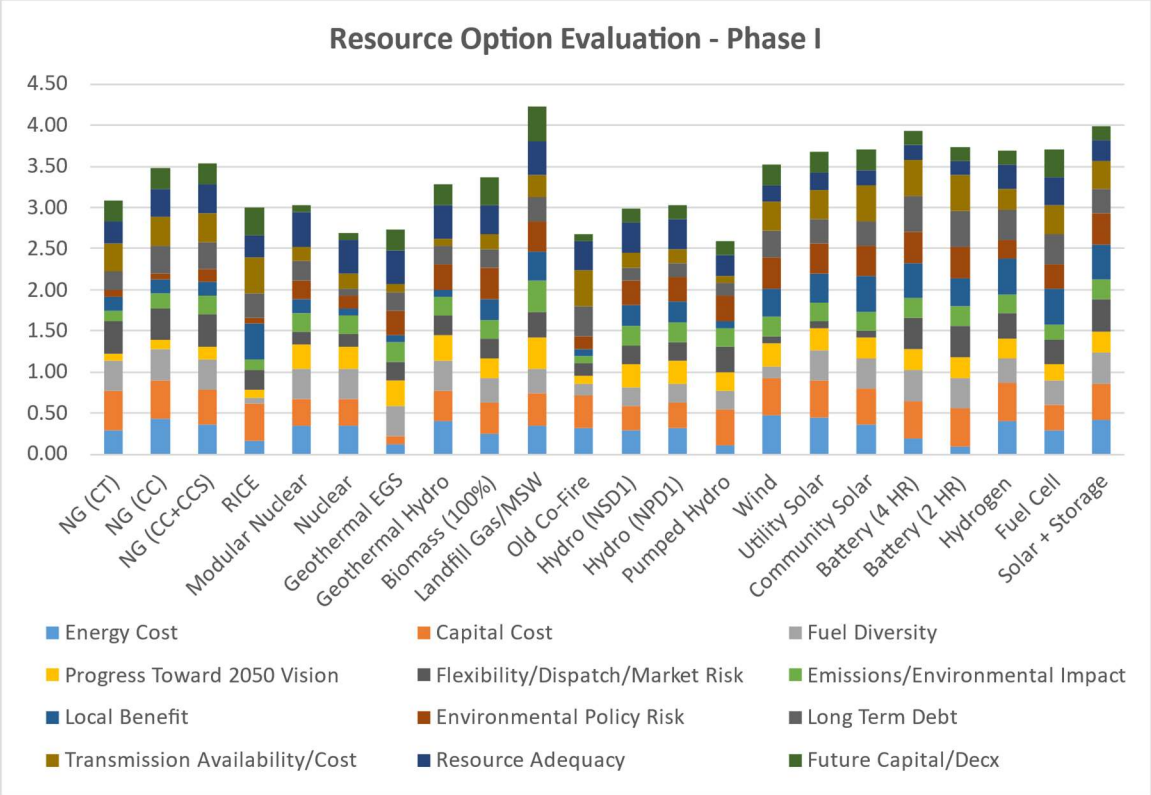


Figure I-20

4. Qualified Options

The Phase I evaluation resulted in final combined weighted scores for each of the supply side options defined at the beginning of the process. Because the criteria were weighted according to the participants' survey, the scores reflect the options most likely to achieve the priorities of the participants. The top scoring options were:

- Landfill Gas/Municipal Solid Waste
- Solar+Storage
- Battery Storage
- Utility/Community Solar
- Fuel Cell
- Wind
- Hydrogen Storage
- Natural Gas Combined Cycle

In discussions at the Power Supply Committee meetings and discussions with individual member representatives, participants suggested adding to the qualified options determined by the Phase I evaluation.

Next Era Solar: MEAN is in discussions with NextEra Energy regarding a proposed solar installation near the town of Sidney, Nebraska.

Local Hydropower: Although hydropower scored too low in the Phase I evaluation to qualify for Phase 2 modeling, MEAN has considered specific potential local hydropower projects for Power Purchase Agreement participation.

Participant Owned Generation: Several workshop attendees favorably discussed the option of allowing participants to install new behind-the-meter generation to their community fleet and add these units to MEAN's portfolio through the same contract by which MEAN leases existing generation. This is an option that would fulfill capacity needs in portfolios that add intermittent generation with low capacity accreditation.

Extension of PPAs: MEAN is party to several Power Purchase Agreements that are scheduled to expire during the study period. An extension of a PPA for power from Cooper Nuclear Station was added as an option. This has not been officially offered or discussed with NPPD and is only added as a studied option to determine its viability compared to other supply side resources.

Extension of Marketing Agent Arrangements: Under the Marketing Agent Agreement, MEAN leases certain capacity amounts termed Short-Term Leased Capacity and Excess Capacity at different payment terms for 2-3 year time periods. This agreement includes a total of approximately 40 MW. The current contract term extends through the MISO Planning year 2022-23. Of the total behind-the-meter generation of IMU and WU, a portion is exported from MISO to SPP. Extension of these contracts would provide SPP with additional capacity needed for resource adequacy to allow future renewable generation resources that carry low accredited capacity.

L. Demand Side Option Evaluation

Demand side management (*"DSM"*) programs can be utilized to reduce peak demand and thereby eliminate or delay the need for future capacity additions. Alternately, DSM measures can be designed to lower energy consumption to decrease the energy generation required by existing and future resources. Since MEAN's load and resource balance shows a future deficit in terms of both capacity and energy, both types of DSM are viable solutions.

In an attempt to minimize the required supply side resources to meet MEAN's total obligation, a demand side resource evaluation was performed to determine the value of proposed DSM programs.

1. Market Feasibility

The first step in the analysis was to determine the market feasibility of the potential programs. In January 2021 MEAN conducted an online survey to ask each community's MEAN representative to rate the potential implementation in their community of each of the prospective DSM programs. The results of the survey are shown in *Figure I-21*.

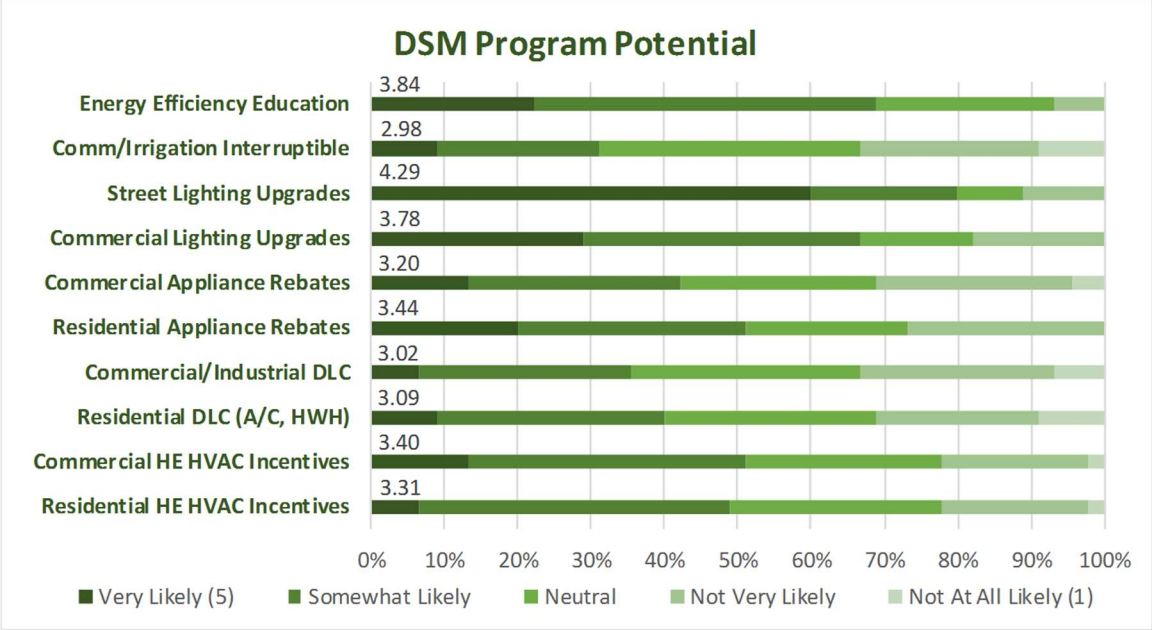


Figure I-21

2. Qualified Options

Based on the results of the Participant survey, the qualified options were Residential and Commercial Appliance Rebates and Residential and Commercial High Efficiency HVAC Incentives. In order to perform a more accurate analysis, these categories were studied and more specific programs defined for the next step in the analysis. The following DSM programs were advanced to the final analysis:

Residential and Commercial Appliance Rebate Programs:

- Refrigerator Rebate
- Freezer Rebate

Residential and Commercial High Efficiency HVAC Incentives:

- Heat Pump Water Heater Incentive
- Room Air Conditioner Upgrade Incentive
- Central Air Conditioner Upgrade Incentive

3. Economic Feasibility

The costs and benefits of the proposed DSM programs were compared using three different calculation methods, all of which are commonly used by utilities for this purpose. These three tests consider the costs and benefits of the DSM programs from different perspectives. A calculated ratio greater than 1 indicates benefits that exceed costs.

- The Utility Cost Test (*"UCT"*), also called the Program Administrator Cost Test. This test measures cost-effectiveness from the viewpoint of MEAN.

- Participant Cost Test (*"PCT"*). This test measures benefits and costs to the retail end-use customers participating in DSM programs.

- Total Resource Cost Test (*"TRC"*). This test examines each program from the viewpoint of the entire system, from MEAN to the retail end-use customer.

The table in *Figure I-22* summarizes the benefits and costs included in the calculations of the ratios.

TEST	BENEFITS	COSTS
Utility Cost Test	Utility Avoided Costs	• Program Administration Costs • Incentives/Rebates Paid
Participant Cost Test	Net Bill Savings	• Incremental Cost of Investment (Net of Incentive/Rebate)
Total Resource Cost Test	Utility Avoided Costs	• Program Administration Costs • Incremental Cost of Investment

Figure I-22

4. Results

The costs and benefits as described above were applied to the number of potential market participants for each of the proposed DSM programs. The costs were escalated and summed for a ten-year period. Finally, a Net Present Value was calculated for the annual costs and benefits and this value used to determine the final benefit/cost ratio. The results of the three Benefit/Cost tests are shown in *Figure I-23*.

DSM PROGRAM	UTILITY COST TEST (Benefit/Cost)	PARTICIPANT COST TEST (Benefit/Cost)	TOTAL RESOURCE COST TEST (Benefit/Cost)
Room Air Conditioner Rebate	0.0310	1.2112	0.0365
Central Air Conditioner Incentive	0.0706	0.0931	0.0396
Refrigerator Rebate	0.0246	0.0468	0.0147
Freezer Rebate	0.1473	0.8461	0.1831
Heat Pump Water Heater Rebate	0.2425	0.5353	0.2179

Figure I-23

As stated initially, only a ratio greater than 1 would indicate that a program is likely to result in benefits that outweigh its costs and therefore provide a net positive impact to MEAN or the end-use customer, depending on the test. In total, only one program had a favorable result, and in only one of the tests. Therefore, none of the potential programs would prove beneficial to MEAN and the end-use customer to a point that would compensate for the required costs.

5. Other Future DSM Projects

- Through work with the Nebraska Municipal Power Pool organization and other statewide utilities, MEAN continues to seek opportunities to assist communities with energy efficiency education efforts. Recent educational sessions have been made available for MEAN member communities on topics including Electric Vehicle Charging Stations and Specifications as well as Community Solar Projects. MEAN's Services Committee regularly evaluates the potential for future programs and continuing education opportunities that align with overall member interest and budget limitations

- MEAN and Pool will be exploring the implementation of an incentive for residential electric vehicle charging stations. MEAN anticipates that several communities will have a high degree of interest to participate. The potential applications and developments of this project could prompt a high level of collaboration between MEAN staff and member community staff and intense study of community interest, use profiles, and retail rate structure.

- MEAN is working on a project to provide advanced metering infrastructure (AMI) services to member communities. In response to member community interest, MEAN conducted an RFP for pricing of an aggregate AMI procurement. Fifteen (15) communities have signed letters of intent to participate in this project, representing a total of approximately 9,200 electric meters. Participating communities could use this system to perform demand side management at the individual meter level. With the proliferation of residential distributed generation, electric vehicle charging, and residential energy storage, AMI offers significant opportunity for demand control for the enhancement of DSM technologies. The use of DSM allows communities to control their energy peak and by extension, potentially reduce the need for MEAN to procure additional resources in the future.

M. Phase II Analysis and Results

The qualified options from the Phase I supply side evaluation are combined with MEAN's existing contracted resources to create a number of future resource portfolios for study in the Phase II economic analysis. Each resource was sized to provide for the energy deficit of the region, and additional required capacity above the accredited capacity of the resource was modeled as a capacity purchase, prioritizing the lease of member owned generation resources. The date on which a resource is modeled to begin generation is aligned with the timing of the regional resource deficit.

1. Studied Portfolios

SPP

- Portfolio 1: Natural Gas Combined Cycle
- Portfolio 1A: Natural Gas Combined Cycle with Carbon Capture
- Portfolio 2: Landfill Gas
- Portfolio 3: Municipal Solid Waste
- Portfolio 4: Utility Scale Wind
- Portfolio 5: Utility Scale Solar
- Portfolio 6: Natural Gas Fuel Cell
- Portfolio 7: Hydropower
- Portfolio 8: Wind + Battery Energy Storage
- Portfolio 9: Solar + Battery Energy Storage
- Portfolio 10: Extension of Cooper Nuclear Station PPA

West Region

- Portfolio 1: Natural Gas Combined Cycle
- Portfolio 1A: Natural Gas Combined Cycle with Carbon Capture
- Portfolio 2: Landfill Gas
- Portfolio 3: Municipal Solid Waste
- Portfolio 4: Utility Scale Wind
- Portfolio 5: Utility Scale Solar
- Portfolio 6: Natural Gas Fuel Cell
- Portfolio 7: Hydropower
- Portfolio 8: Wind + Battery Energy Storage
- Portfolio 9: Solar + Battery Energy Storage

2. Economic System Model

The Economic System Model used for the portfolio analysis is depicted in the *Figure I-24* graphic:

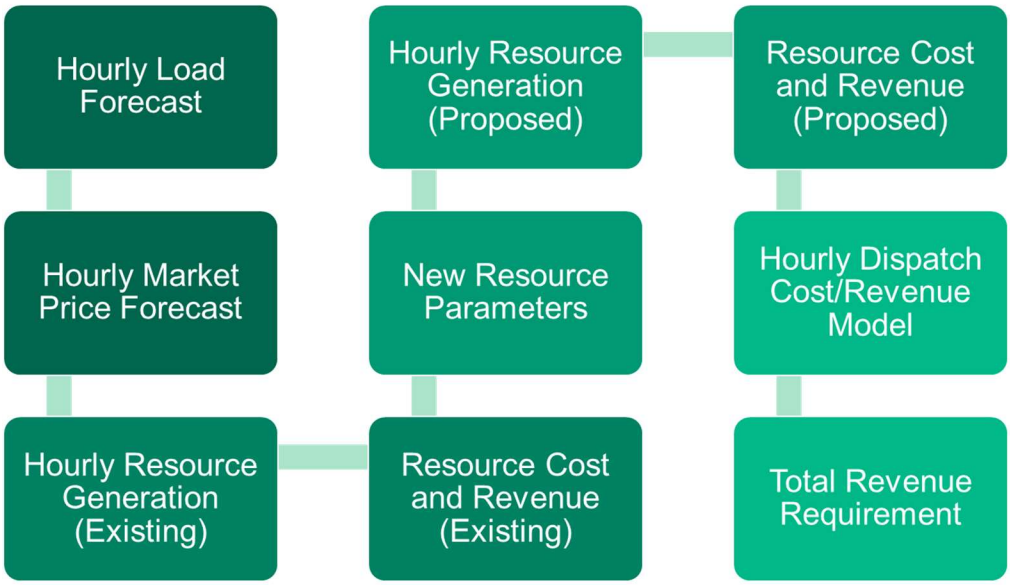


Figure I-24

3. Sensitivity Scenario Analysis

The model was expanded to include the effects of a number of different scenarios. As external conditions change, generation costs and market costs change. This alters the economics of each portfolio in a different way. Three very significant factors that affect generation are system load, natural gas prices, and the potential of a carbon tax.

The sensitivity analysis included three levels of system load and natural gas pricing: low (lower than current projections), base (equal to current projections), and high (higher than current projections). These variables were combined with two different carbon tax structures. In this way, comparisons between different scenarios can isolate the impact of load, natural gas pricing, and carbon cost, as the other variables are held constant.

The table in *Figure I-25* displays the scenarios under which the model was simulated. Each portfolio was entered into the model for each sensitivity.

Scenario	System Load	NG Pricing	CO_2 Tax
Scenario 1: Reference	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 2: High Load	High Load	Base Case NG	No CO_2 Tax
Scenario 3: Low Load	Low Load	Base Case NG	No CO_2 Tax
Scenario 4: High NG	Base Case Load	High NG	No CO_2 Tax
Scenario 5: Low NG	Base Case Load	Low NG	No CO_2 Tax
Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

*Zero Carbon Scenario assumes regulatory conditions that allow no future addition of carbon emitting resources.

Figure I-25

For the model results, Scenario 1, which included the base case load, base case natural gas pricing and no carbon tax, was considered the base case. Other scenarios indicate a variation from the base case conditions.

4. SPP Model Results

Figure I-26 shows the results of the SPP model for all eleven portfolios listed in Section I.M.1. and all nine scenarios shown in *Figure I-25*. The dark blue bar represents the base case total revenue requirement for each portfolio. The light blue vertical line shows the range between the maximum revenue requirement of the sensitivity scenarios and the minimum revenue requirement of the sensitivity scenarios. This range is termed the "scenario variance".

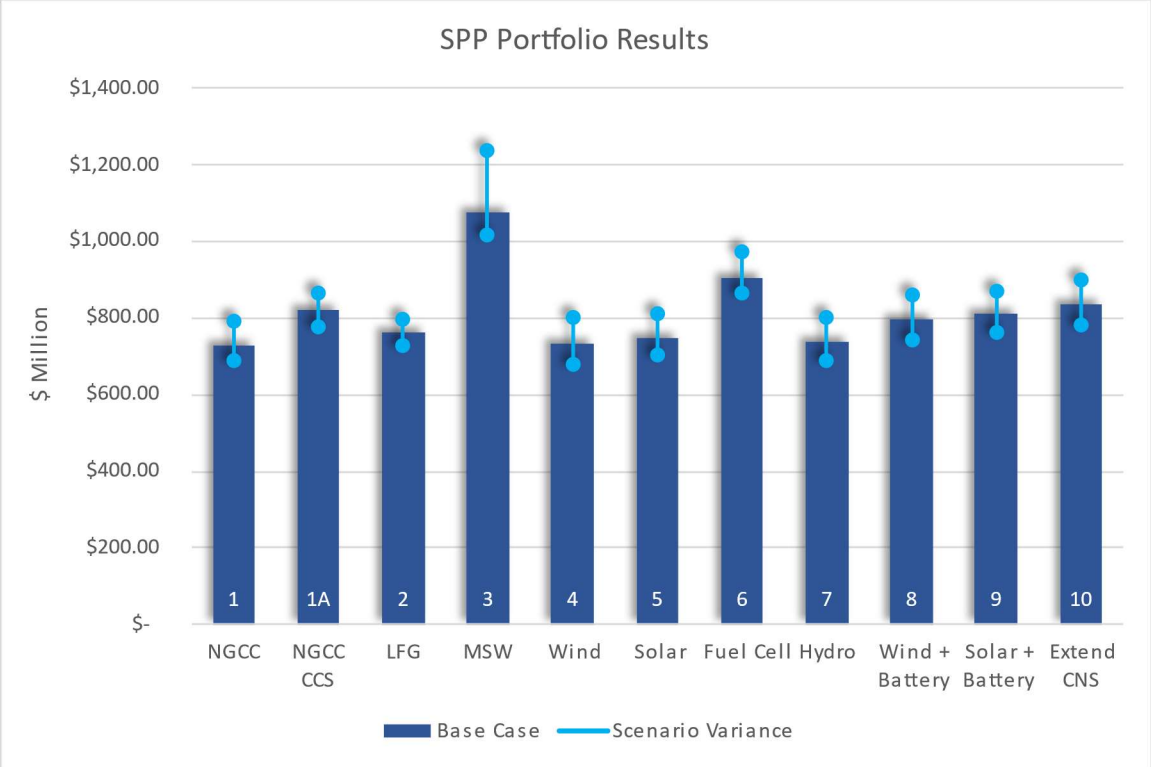


Figure I-26

The positive variance, or the differential between the maximum scenario revenue requirement and the base case revenue requirement, quantifies the volatility or risk inherent in each portfolio relative to possible changes in system load, fuel pricing, and carbon tax levels. Plotting the base case revenue requirement against this variance allows a concurrent view of cost and risk for each of the SPP Portfolios. To get a more distinct picture of the relative positions of the portfolios, Portfolio 3 is omitted from the graph in *Figure I-27* to follow as its outlying position distorted the scale of the graph.

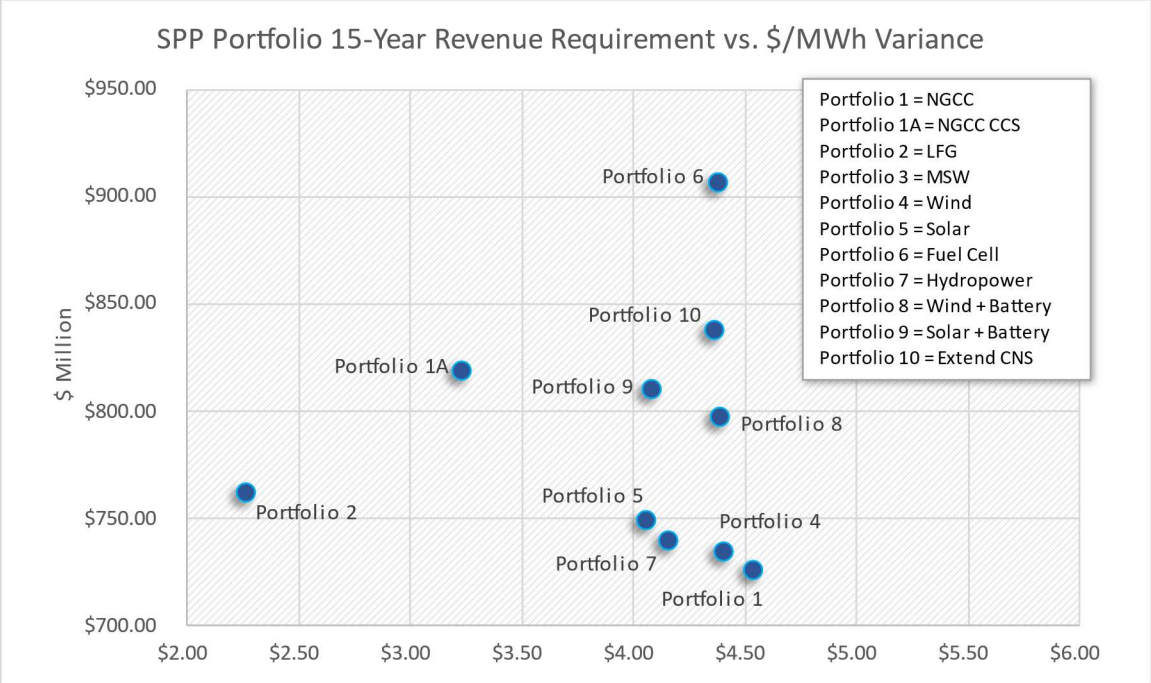


Figure I-27

The values and graphical results show that Portfolio 1, the natural gas combined plant, has the lowest revenue requirement. However, Portfolio 4 (Wind), Portfolio 7 (Hydro), Portfolio 5 (Solar) also have low revenue requirements and have variance levels that are as low or lower than Portfolio 1. Portfolio 2 (LFG) has a slightly higher revenue requirement and a much lower variance level.

5. West Region Model Results

Figure I-28 shows the results of the west model for all nine portfolios and all nine scenarios. The dark green bar represents the base case total revenue requirement for each portfolio. The light green vertical line shows the range between the maximum revenue requirement of the sensitivity scenarios and the minimum revenue requirement of the sensitivity scenarios. This range is termed the "scenario variance".

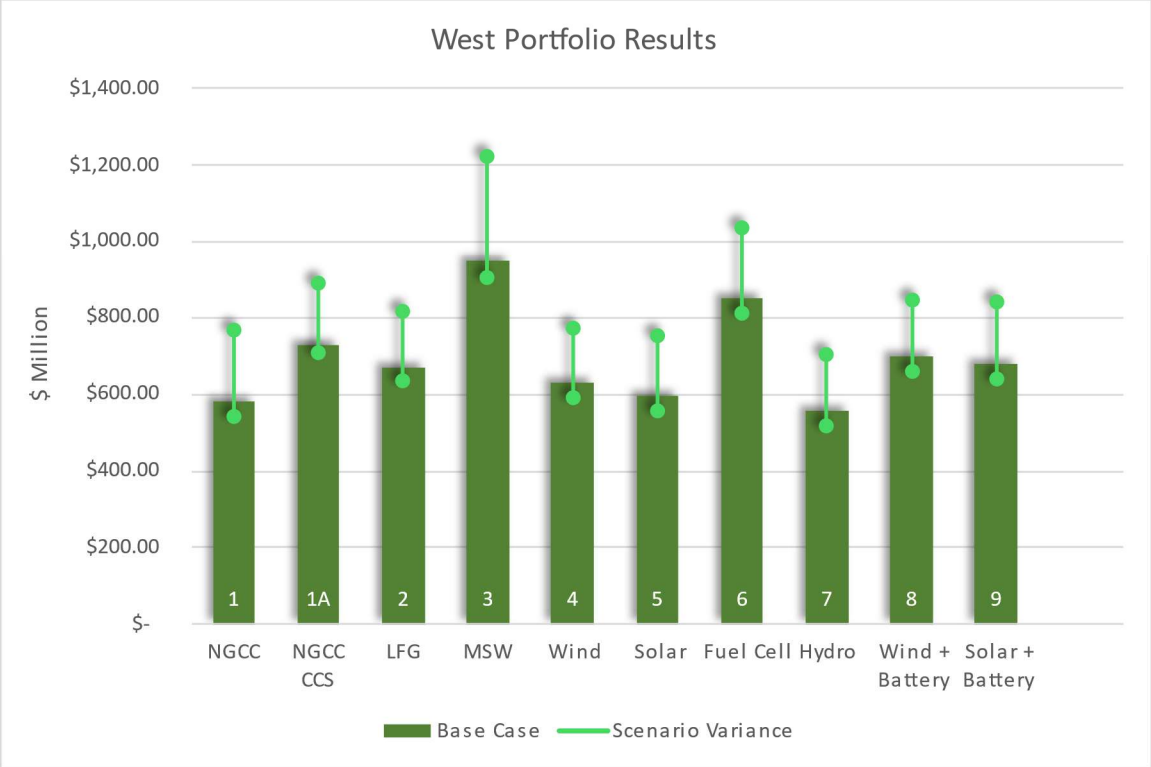


Figure I-28

The positive variance, or the differential between the maximum scenario revenue requirement and the base case revenue requirement, quantifies the volatility or risk inherent in each portfolio relative to possible changes in system load, fuel pricing, and carbon tax levels. Plotting the base case revenue requirement against this variance allows a concurrent view of cost and risk for each of the west Portfolios. To get a more distinct picture of the relative positions of the portfolios, Portfolio 3 is omitted from the graph in *Figure I-29* to follow.

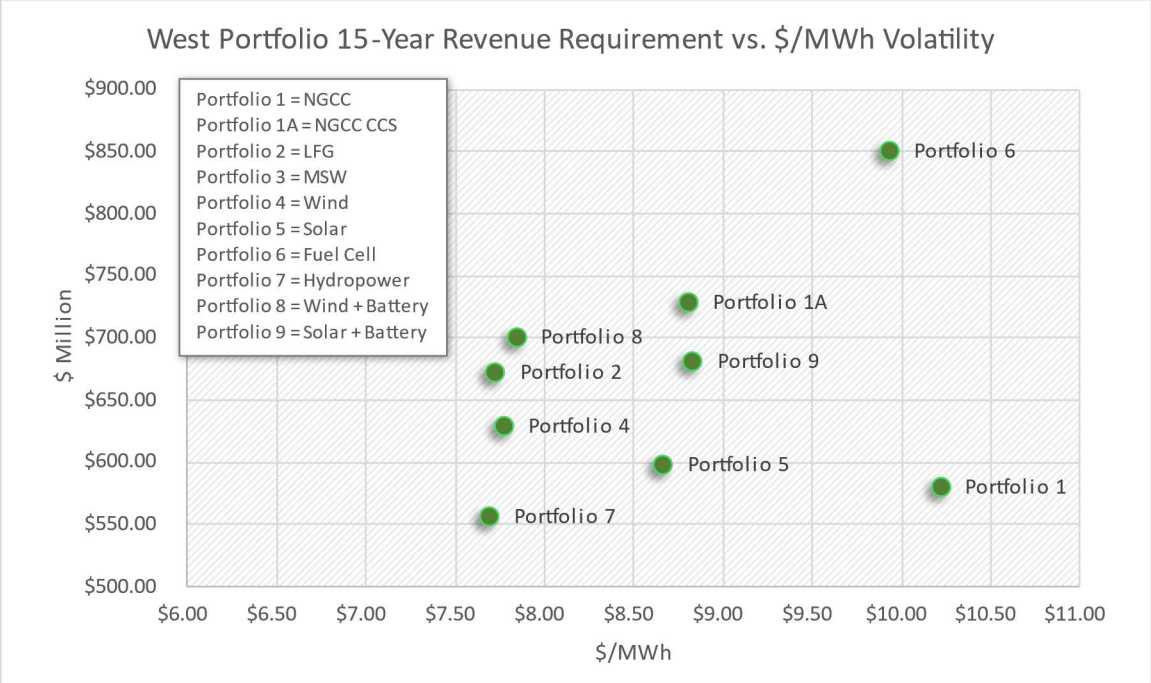


Figure I-29

The values and graphical results show that Portfolio 7, the hydropower plant, has the lowest revenue requirement, and the lowest variance level. However, Portfolio 5 (Solar) and Portfolio 4 (Wind) and revenue requirements and variance levels similar to that of Portfolio 7. Portfolio 1 (NGCC) resulted in a low revenue requirement, but a much higher level of variance. Portfolio 8 (Wind +Battery) and Portfolio 9 (Solar + Battery) align well with the corresponding Portfolios 4 and 5 but have the expected higher cost. Portfolio 2 (LFG) has a low variance level and a moderate revenue requirement.

N. Environmental Impact

1. Existing Environmental Considerations

MEAN is subject to environmental and other regulations, in varying degrees, at federal, state and local levels. As part of a long-term strategy, MEAN has invested in environmental regulation compliant base load generating resources expected to provide highly reliable base load generation for the Participants' present and future energy requirements. In addition to these state-of-the-art coal facilities and WAPA allocations, MEAN has acquired renewable resources and nuclear capacity.

MEAN has adopted the 2050 Vision which aims to create a carbon neutral resource portfolio by the year 2050. Future resource planning will follow the direction of the 2050 Vision, transitioning toward replacing certain carbon emitting resources with carbon free resources as existing contracts expire or resources reach the end of their operating life.

In the Phase I evaluation of supply side options, environmental impact was considered for all options as part of the scoring process.

2. Portfolio Carbon Intensity

To comply with the internal 2050 Vision direction to reduce the emissions of MEAN's resource portfolio with the goal of reaching carbon neutrality by 2050, resources must be evaluated on their impact to the portfolio's carbon intensity, or the tons of carbon emitted per MWh of energy generated.

Using the resultant energy generation of each resource in the candidate portfolios, both existing resources and future proposed resources, and the known emissions factor and heat rate of each resource, the carbon intensity of the portfolio can be calculated on the basis of tons of carbon emissions per MWh of electricity generated. This calculation is shown for all portfolios in the graphs below. *Figure I-30* shows all SPP Portfolios, while *Figure I-31* excludes Portfolio 3 to better show the comparative scale of the remaining Portfolios.

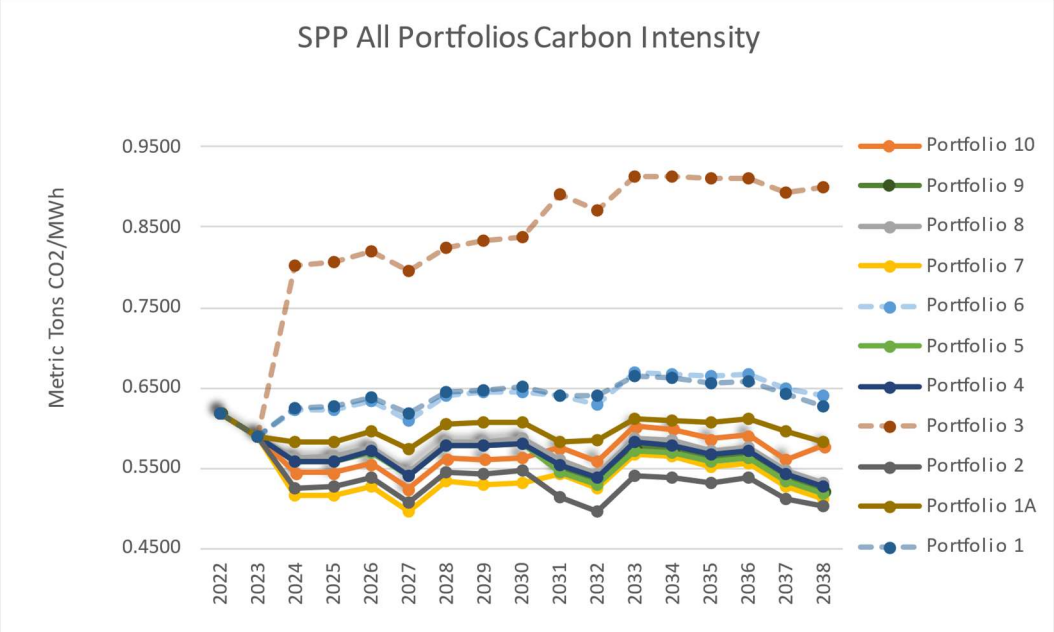


Figure I-30

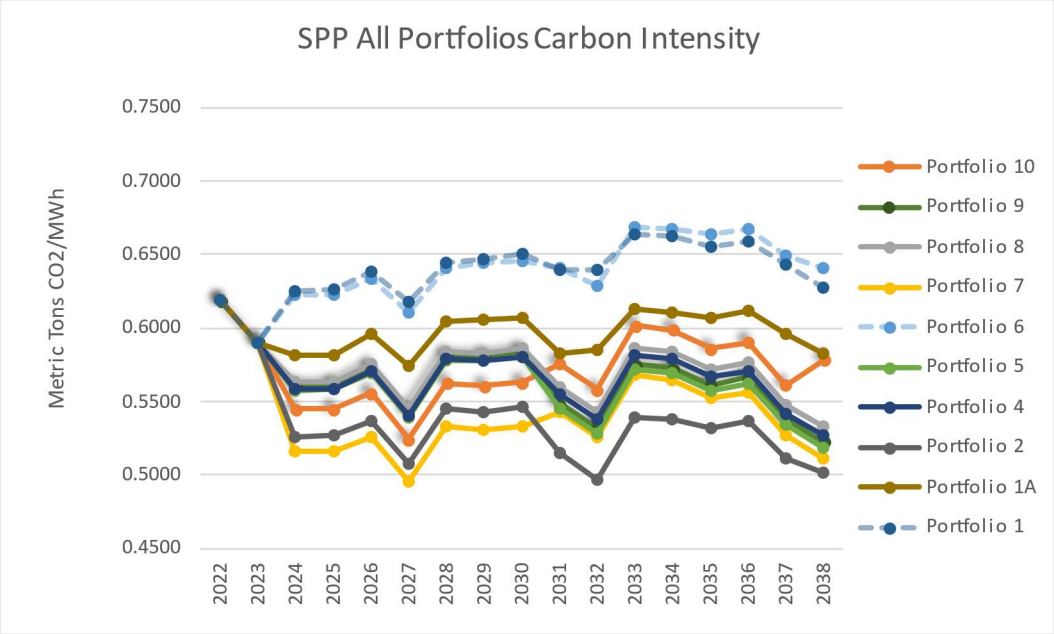


Figure I-31

Figure I-32 shows all West Portfolios, while *Figure I-33* excludes Portfolio 3 to better show the comparative scale of the remaining Portfolios.

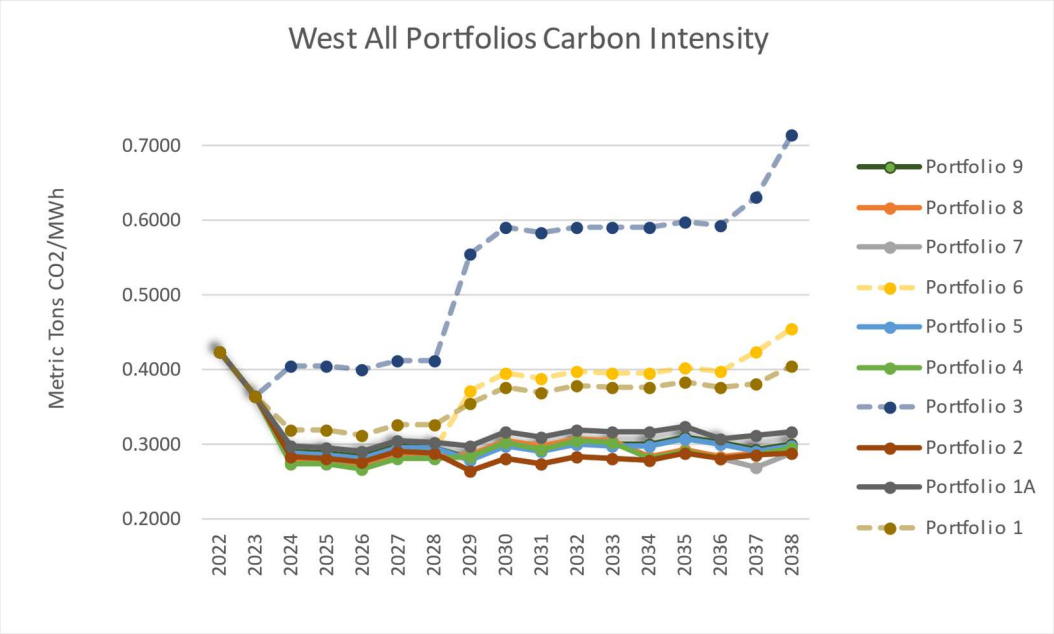


Figure I-32

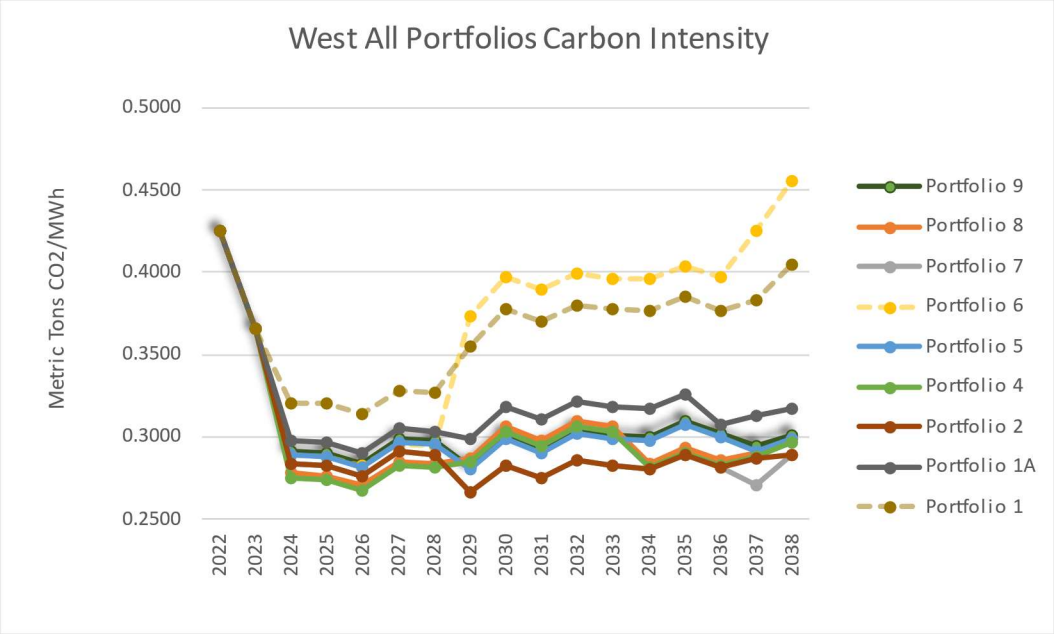


Figure I-33

3. Carbon Cost Scenario Impact

The inclusion of the carbon tax sensitivity scenarios provides a method by which the impact of carbon emissions can be financially quantified for each portfolio as a whole. For each level of natural gas pricing, the results for the scenarios with no carbon tax can be compared against the results for the scenarios with a carbon tax to show the consequence of the carbon emissions level in the portfolio. The average variance resulting from only the carbon tax (holding the natural gas pricing constant) is shown in *Figures I-34* and *I-35.*

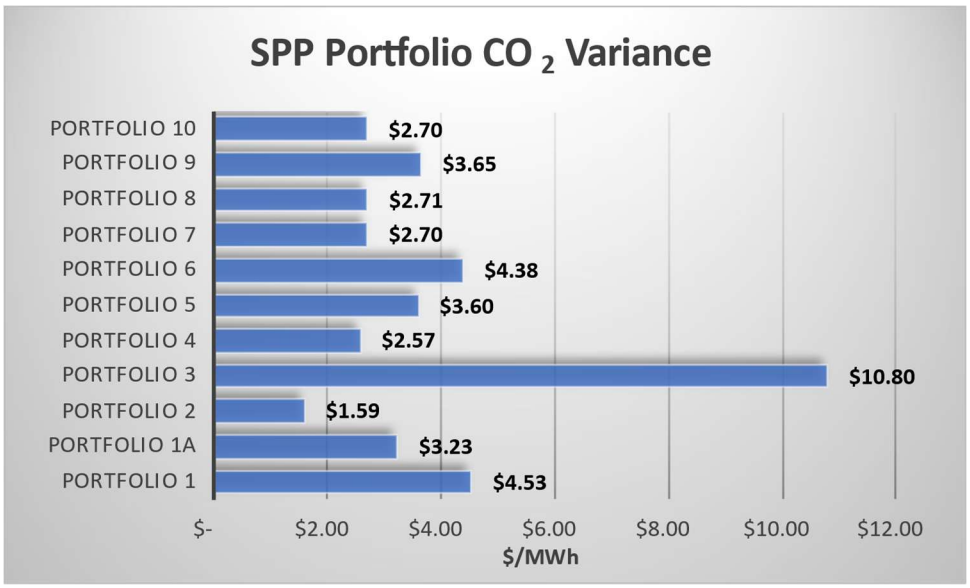


Figure I-34

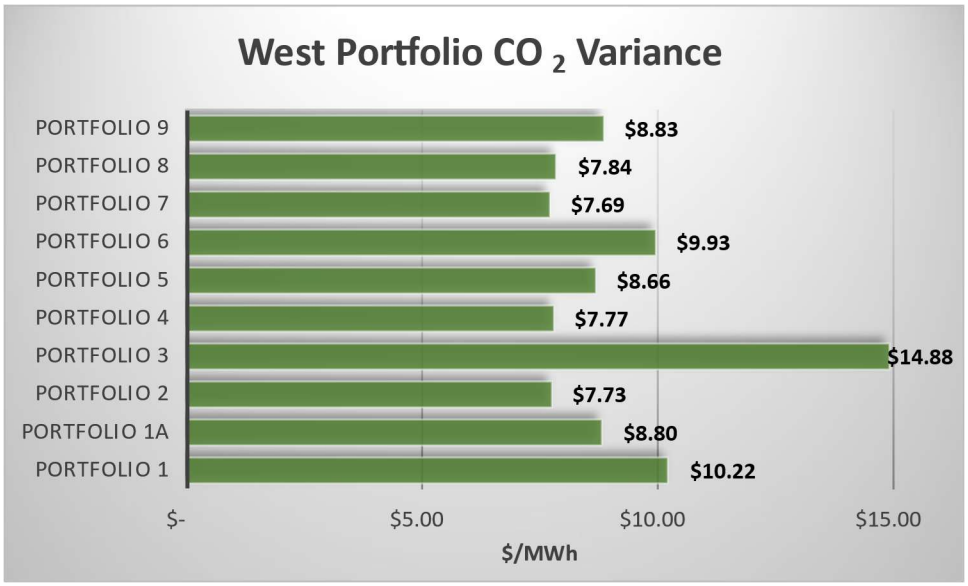


Figure I-35

These results show an expected relation. Portfolios that include more fossil fueled generation see a higher cost impact from a carbon tax. In this way, higher emitting resources are "penalized" in the model with a higher degree of variance. The effects of carbon emissions were included in the variance factor used in the analysis of the final portfolio results.

O. Conclusions and Recommended Action Plan

Based on the data and analysis in this IRP report, MEAN has developed conclusions relative to proposed demand side solutions and supply side solutions.

1. MEAN's Future Resource Needs - Conclusions

In the SPP service territory, MEAN has a need for capacity in the near term only. A capacity deficit of approximately 55-60 MW occurs from 2024-29 and is resolved when the WAPA Displacement Agreement ends. The energy deficit occurs throughout the study period, increasing with time.

In the West region, MEAN has capacity deficit of approximately 10 MW from 2025-28, which then increases to 45 MW when the WAPA Displacement Agreement ends and grows for the remainder of the study period to about 65 MW in 2038. The West region has a need for energy throughout the entire 15 years, which increases each year.

2. Demand Side Management – Conclusions

New DSM Programs: The costs and benefits of the five proposed new DSM programs were compared using three different calculation methods. In total, only one of the new proposed programs had a favorable result, but in only one of the three tests. Therefore, none of the potential programs prove beneficial to MEAN and the end-use customer to a point that would compensate for required costs. MEAN has plans to investigate future energy efficiency education opportunities and incentives for residential EV chargers. Data will be presented to the MEAN Services Committee for approval in the coming months.

MEAN's existing programs (identified below) continue to perform well and demonstrate their value, therefore MEAN will maintain these programs.

Commercial LED Lighting Upgrade Program: The average annual energy savings achieved by the program are approximately 1,247 MWh, and the peak demand savings per year has been approximately 249 kW.

Residential Energy Efficiency Programs: After the successful introduction of these programs in FY21-22, incentives available for Cooling System Tune-Ups, Attic Insulation, High Efficiency Heat Pumps, and Smart Thermostat Installations will continue to be offered to MEAN participants.

Advanced Metering Infrastructure: MEAN is working to provide advanced metering infrastructure (AMI) services to member communities. To date, fifteen communities have signed letters of intent to participate in this project, representing a total of approximately 9,200 electric meters. AMI has the potential to increase the impact and functionality of existing and future DSM programs.

Participant DSM Programs: The 2021 Participant DSM survey revealed a total of 17 communities with 33 DSM programs in place. The non-coincident sum of the demand and energy savings from these DSM programs is 4.03 MW and 2,635 MWh, respectively. These community programs are expected to be maintained in future years.

3. Supply Side Resources – Conclusions

Based on multiple opportunities for member feedback, analysis has prioritized future resource portfolios that achieve a low 15-year revenue requirement, offer progress toward the 2050 Vision by reducing carbon intensity, maintain flexibility required to appropriately respond to market changes, and present potential for local benefit. Measurement of these priorities has been incorporated into the quantitative results.

SPP Top Performing Portfolios:

- The portfolio in SPP that best achieved the primary goal of low cost was Portfolio 1, the addition of capacity and energy from a natural gas combined cycle plant located in the SPP footprint. This option provides for operational flexibility and fuel diversity, but not local benefit. Portfolio 1 does not result in a decrease in carbon intensity for the SPP portfolio.

- Portfolio 4, a wind resource for energy generation accompanied by a capacity purchase sized as required for resource adequacy, has a 15-year revenue requirement only marginally higher than that of the lowest cost option, and resulted in a lower cost variance across the pricing scenarios. In addition, Portfolio 4 allows for a 14.8% reduction in SPP portfolio carbon intensity.

- Portfolio 7, the hydropower option, also resulted in a low revenue requirement, a low cost variance, and a 17.4% reduction in carbon intensity for SPP. In SPP there is not likely to be a hydropower resource that provides benefit to a MEAN community.

- The solar resource in Portfolio 5 had the lowest modeled cost variance and a 15-year revenue requirement that was similar to the lowest cost options. This option is also emissions free and therefore leads to a 16.2% reduction in the portfolio's carbon intensity over time. Additional required capacity would be provided by leased member generation as available.

- Portfolio 2, the landfill gas resource, has a lower than average revenue requirement and a much lower variance level. A landfill gas plant also has the potential to provide local benefit and lowers the carbon intensity of the SPP portfolio.

- Portfolios 8 and 9, wind and solar with battery storage, may prove to be viable options in the future if the incremental cost of batteries decreases as expected in the future.

West Top Performing Portfolios:

- The portfolio in the west that best achieved the primary goal of low cost was Portfolio 7, the hydropower resource. This portfolio also saw a very low level of cost variance, or cost risk. Being a carbon free resource, the addition of hydropower resulted in a 32.2% reduction in the carbon intensity of the West portfolio. MEAN is aware of hydropower options that allow for a benefit to a MEAN community.

- The next lowest cost option in the West was Portfolio 5, the solar resource, with additional leased capacity from member generation. This portfolio carried increased volatility as compared to the hydro option. Solar also offers a local benefit potential and a reduction in carbon intensity of 29.9% in the West.

- The wind resource, Portfolio 4, has many of the same benefits. This option is lower than average revenue requirement, low cost variance, and reduces the carbon intensity of the west portfolio by 30.3%. Additional capacity is acquired through the lease of member generation.

- Portfolio 1, the Natural Gas Combined Cycle plant, results in a very low 15-year revenue requirement, but unfortunately carries a high variance risk as this option is impacted by natural gas pricing and CO_2 tax. This option also provides for operational flexibility and fuel diversity, but not local benefit. This resource only achieves a modest 4.9% reduction in carbon intensity.

- Portfolios 8 and 9, wind and solar with batteries, once again show the potential to be feasible options should the capital cost of battery storage decrease in the future.

4. Proposed Future Portfolios

Following the presentation of the Phase II Economic Modeling results and the relative revenue requirements, cost variance risk, and impact to carbon intensity resulting from each proposed portfolio, the Power Supply Committee considered and discussed the portfolios in light of the conclusions described above. The Committee voted unanimously in favor of a resolution recommending to the Board of Directors the following preferred portfolio(s) for each region:

SPP: Portfolio 1A (Natural Gas Combined Cycle with Carbon Capture)
Portfolio 2 (Landfill Gas)
Portfolio 7 (Hydropower)
Portfolio 8 (Wind with Battery Storage)
Portfolio 9 (Solar with Battery Storage)

West: Portfolio 1A (Natural Gas Combined Cycle with Carbon Capture)
Portfolio 2 (Landfill Gas)
Portfolio 7 (Hydropower)
Portfolio 8 (Wind with Battery Storage)
Portfolio 9 (Solar with Battery Storage)

5. Short-Term Recommended Action Plan (0-5 Years)

MEAN will continue to administer all current DSM programs. MEAN's Services Committee will regularly evaluate potential new DSM programs and implement those with a favorable benefit to cost ratio. MEAN will perform analysis to determine the participation and economic feasibility of a residential EV charger incentive program. Participants will be encouraged to continue existing DSM programs and initiate any new measures welcomed by their communities.

MEAN will continue to pursue the aggregated Advanced Metering Infrastructure project to assist member communities with the installation of hardware and software systems to facilitate smart metering and load control.

In SPP, MEAN will proceed toward the recommended portfolio option(s) to address the impending need for capacity and energy. MEAN has initiated discussions with and has received proposed cost and performance data from developers and resource owners in SPP for projects that align with MEAN's needs. MEAN Staff will continue discussions and present available contract terms for the resources types within the Board resolution .

In the West, MEAN will pursue the recommended portfolio(s) option to address the impending need for capacity and energy. MEAN has contracted to prepare and release a Request for Information to solicit offers for qualified resources in the West. This will provide cost and performance data on projects in development and available to fulfill MEAN's short-term resource needs.

In the fall of 2022 installation is scheduled to begin on the community solar projects MEAN is facilitating for member communities. MEAN will guide communities through the construction period and monitor system performance as individual facilities come online in 2023. MEAN will continue efforts to assist members with analysis and procurement of distributed generation systems.

MEAN will continue the investigation of new MEAN-contracted renewable generation opportunities located in Participant communities as an option for future resources in accordance with the IRP conclusions and recommendation. MEAN initiated discussion on this concept with the Membership as it relates to potential solar facilities, and policy is being developed with the Power Supply Committee in 2022. MEAN will then pursue this resource option based on established policy.

MEAN will continue to monitor actual participant load and compare against the load forecast and against existing capabilities. Any significant change will trigger a revised resource plan and future actions. MEAN will continue to survey members annually to gather input and verification of load and load-impacting developments in member communities. In anticipation of future trends toward electrification, MEAN is planning a load and resource study for the case of high rates of electrification.

MEAN will continue to study the operation and performance of existing resources. In conjunction with changes to the RTO market constructs and the renewable penetration within these markets, MEAN will determine the immediate impact to capacity accreditation and unit dispatch and the resulting load and capability balance.

In the short-term, MEAN will maintain communication with WAPA and review the hydrological forecasts pertaining to WAPA hydropower assets. If indications of future drought conditions persist, MEAN will prepare future load and capability scenarios to plan for long-term reductions in available power from these resources and the acquisition of required replacement power.

Throughout MEAN's footprint, continual efforts will be made to acquire additional load. This development would allow further additions of carbon free resources to effect additional change to the portfolio's carbon intensity. Strategic load that can be shaped in the off-peak can also contribute to more efficient use of MEAN's energy generation.

6. Long -Term Recommended Action Plan (5-15 Years)

MEAN will regularly evaluate the impact and implementation of existing DSM programs. Based on the results of the evaluation, MEAN will continue to administer successful programs. MEAN will reevaluate the addition of new programs on a regular basis. Participants will be encouraged to continue existing DSM programs and initiate any new measures with potential benefits in excess of system costs.

MEAN will explore opportunities to assist additional communities with optimizing AMI systems for load study and possible applications in load control and demand side management.

In SPP, in accordance with the Board-approved resolution, MEAN will secure a long-term solution for an energy resource for future years. MEAN will need to supplement the resource acquired in the short-term plan to generate additional energy in the out years.

With cost and performance data available from the new short-term resource contract, future costs of new resources, and future market changes MEAN will perform updated analysis to determine if the resource portfolio recommended in this report is still the optimal selection.

In the West, MEAN will explore options to acquire contracts for the recommended resources for capacity and energy as determined by the Board. The long-term balance in the West requires a resource or multiple resources to provide capacity and energy in addition to new resources in the short-term time frame. Concurrently, MEAN will solicit its participants for opportunities to lease new or existing participant owned generation. Resource planning will require updated data and analysis in response to changes in resource costs, fuel costs, regulatory and market conditions, and current generation projections for existing resources.

MEAN will continue to monitor actual load compared against the load forecast and against existing capabilities. A revised resource plan will be prepared in the event of significant load changes. MEAN will pay particular attention to electrification activities in member communities and study the anticipated changes in load profile and load growth. The long-term plan will respond to any actionable conclusions of the planned electrification study.

As discussions and development continues regarding plans to expand SPP to a West RTO, MEAN will remain engaged in the design of market structures and rules and will be prepared to optimize the current and future resource portfolio within the anticipated parameters of this new market. In the absence of an SPP West RTO, MEAN will closely monitor efforts in the Colorado legislature to enforce mandatory participation in an RTO.

MEAN will continue to study the operation and performance of existing resources. As the market constructs evolve and renewable penetration increases within these markets, MEAN will determine the ongoing impact to capacity accreditation and unit dispatch and the resulting change to the long-term load and capability balance.

MEAN will monitor federal, state, and local legislation to ensure that resources remain in compliance with all applicable regulations. Particular attention will be paid to regulations requiring investment in environmental controls and future resource transition plans. MEAN will also follow all portfolio standards and system emissions reduction requirements.

Throughout MEAN's footprint, continual efforts will be made to acquire strategic load and extend short-term contracts for member power supply. Depending on the load profile in comparison to the rest of MEAN's system load and resource additions made in the short term, there may be opportunities to supply energy without additional capacity investment. Opportunities to add off-peak load or control specific loads may change the utilization and economics of some resources.

P. Tracking/Measurement Strategy

MEAN will employ the following Measurement Strategies to gauge the progress and impacts of the Recommended Action Plans described above.

METRIC	MEASUREMENT STRATEGY	MEASUREMENT BASELINE
Load vs. Forecast	MEAN will annually compare the actual peak demand and energy consumption against the forecast values. Data will be tracked by participant, region, and system. MEAN also conducts an annual load survey to aid in this measurement.	• Annual Load Forecast • 15-Year Load Forecast • Hourly/Monthly Participant Load Data • Participant Load Survey
Load vs. Capability	On a semi-annual basis, MEAN is required to calculate and present to the Board the upcoming peak season Load and Capability balance for planning purposes. MEAN typically presents a long-term outlook. In this way, changes in the timing of deficits can be foreseen to prepare via resource planning.	• Annual Load Forecast • 15-Year Load Forecast • Resource Contracts • Hourly Resource Generation Data • Outage Schedules • Current Season Load and Capability Report
DSM Savings/Impact	MEAN conducts an annual DSM survey to all participants to gather data on the programs offered and the expected demand and energy savings. Responses will be compared year-to-year to verify savings. This is valuable in the contemplation of future programs. MEAN also tracks data on its administered Lighting Upgrade Program for estimated power savings.	• Previous Year Hourly Participant Load Data – Peak and Energy Usage • DSM Survey Responses • Energy Star® Energy Efficiency Calculation Tools
Distributed Generation	MEAN will continue to support efforts by member communities to install qualified projects under the DG Policy. Discussions initiated to explore other distributed technologies, such as energy storage and fuel cells, will continue as well. MEAN will explore the installation of MEAN-owned systems located in member communities and collaborations available with this approach. Load and meter data will be collected to measure the performance of the DG systems as available. This will be compared to expected generation. MEAN will update load forecasts and anticipated capacity and energy needs.	• Member Meter Data – Load • Member Meter Data – Generation • DG System Performance • Evolving Costs of DG Installations
Existing Resource Performance	MEAN tracks the operation, performance, and cost of its contracted resources. This is measured against expected, budgeted, and contracted values and can be used to gauge the cost-effectiveness of existing and future resources. In the SPP and MISO markets, MEAN also tracks the locational marginal price to determine the actual total cost of the resource.	• Resource Contracts • Previous Year Hourly Resource Generation Data • Resource Invoices • LMP Data

New Resource Parameters	MEAN regularly tracks research on the costs and parameters of new resources. Understanding the performance of established and emerging technologies and the total generating cost in relation to market conditions will prepare MEAN for future resource acquisition. MEAN regularly discusses with developers their projects in the interconnection queue or under investigation.	• Resource Data Used for IRP (EIA, NREL, DOE) • Market Pricing • Developer Project Data
Market Construct Parameters	MEAN is actively involved with SPP, MISO, and WEIS Stakeholder Groups to engage in discussions regarding market constructs and rules. MEAN is also monitoring potential developments of a resource adequacy program in the West and the possible formation of the Markets+ service. In resource planning activities, MEAN will prepare a variety of future scenarios responsive to contemplated changes to quantify the impact to the MEAN system and inform future plans.	• Resource Adequacy Models • Resource Accreditation • SPP, MISO, and WEIS Tariffs • Current Market Constructs
Environmental Regulation	MEAN continually monitors environmental regulations, paying particular attention to future legislation affecting the power supply industry. When changes are proposed or adopted, MEAN projects the impacts on existing or potential future resources. Currently, MEAN is alert for changes in the status of the Clean Power Plan and power resource tax credits.	• Status Quo Regulations • MEAN's current compliance status

Figure I-36

II. IRP Requirements and Checklist

A. WAPA Requirements

Integrated resource planning was mandated by the Energy Policy Act of 1992 (*"EPAct"*).

EPAct requires all Western Area Power Administration (*"WAPA"*) customers to submit Integrated Resource Plans (*"IRPs"*) to WAPA every five years. The requirement is included in WAPA's power sales contracts with long-term firm electric service customers. The current Resource Planning Approval Criteria (10 CFR Part 905) went into effect May 1, 2000, after WAPA reviewed the original regulations and completed a public process.

WAPA has identified the following criteria for customer IRPs:

- Identify and compare all practicable energy efficiency and energy supply resource options.
- Include action plan with timing set by customer.
- Describe efforts to minimize adverse environmental effects of new resource acquisitions.
- Provide ample opportunity for full public participation.
- Conduct load forecasting.
- Include brief description of measurement strategies for options identified in IRP to determine whether objectives are being met.

IRPs and alternative reports will be evaluated by WAPA on the basis of:

- Meeting all criteria in 10 CFR 905
- Reasonableness of the plan with regard to: customer size, type, resource needs, geographic area, and competitive situation
- Resource choice selection (EPAct 1992 section 114)

B. WAPA Utility/Customer Overview

The following customer profile data listed in *Figure II-1* is submitted to the U.S. Energy Information Administration (EIA) as part of the form EIA-861, summarizing MEAN's service obligations during the most recent annual reporting period.

Reporting Period	
Reporting Period Start Date (mm/dd/yyyy)	01/01/2021
Reporting Period End Date (mm/dd/yyyy)	12/31/2021
Energy Sales & Usage	
Energy sales to Ultimate End Customers (MWh)	0
Energy sales for Resale (MWh)	1,982,845
Energy Furnished Without Charge (MWh)	0
Energy Consumed by Respondent Without Charge (MWh)	0
Total Energy Losses (MWh entered as positive number)	86,206
Total Energy Usage (sum of previous 5 lines in MWh)	2,069,051

Peak Demand (Reporting Period)	
Highest Hourly Summer (Jun. – Sept.) Peak Demand (MW)	477.0
Highest Hourly Winter (Dec. – Mar.) Peak Demand (MW)	399.0
Date of Highest Hourly Peak Demand (mm/dd/yyyy)	07/28/2021
Hour of Highest Hourly Peak Demand (hh AM/PM)	05 PM
Peak Demand (Historical)	
All-Time Highest Hourly System Peak Demand (MW)	536.1
Date of All-Time Hourly System Peak Demand (mm/dd/yyyy)	07/23/2012
Hour of All-Time Hourly Peak System Demand (hh AM/PM)	04 PM
Number of Customers/Meters (Year End of Reporting Period)	
Number of Residential Customers	84,066
Number of Commercial Customers	18,238*
Number of Industrial Customers	419
Other (Specify):	

*This is a calculated number as not all Participants report numbers based on customer type. The total is as reported.

Figure II-1

Historical Energy Use: The peak system demand and total annual energy use for the preceding ten (10) reporting years is listed below in *Figure II-2*. Values listed are by calendar year.

Reporting Year	Peak Demand (MW)	Total Energy (MWh)
2012	536.1	2,557,670
2013	518.5	2,593,620
2014	502.8	2,525,660
2015	467.9	2,352,270
2016	434.0	2,270,592
2017	434.0	2,388,559
2018	477.0	2,497,995
2019	480.0	2,010,413
2020	477.0	1,883,643
2021	477.0	1,982,845

Figure II-2

C. Checklist

The checklist of questions in *Figure II-3* is provided by WAPA as a means for customers to determine the completion of their IRP document and satisfaction of WAPA standards for IRP reporting. MEAN has indicated the section of the report wherein the question is addressed.

1. Does the IRP evaluate the full range of alternatives for new energy resources (905.11(a))?	
• New generating capacity?	Section XII.C.
• Power purchases?	Section XII.C. Section XII.G.
• Energy conservation and efficiency?	Section XIII
• Cogeneration and district heating/cooling applications?	Section XII.C.
• Renewable energy resources?	Section XII.C.
2. Does the IRP provide adequate and reliable service to the customer's electric consumers (905.11(a))?	Section X.
3. Does the IRP take into account the necessary features for system operation (905.11(a))?	
• Diversity?	Section XII.D.
• Reliability?	Section XII.D.
• Dispatchability?	Section XII.D.
• Other risk factors?	Section XIV.F.-G. Section XV.B.
4. Does the IRP take into account the ability to verify energy savings achieved through energy efficiency (905.11(a))?	Section VIII.C.,D.,E. Section XIII.E. Section XVI.D.
5. Does the IRP take into account the projected durability of such savings measured over time (905.11(a))?	Section XIII.E. Section XIV.G. Appendix C
6. Does the IRP treat demand and supply resources on a consistent and integrated basis (905.11(a))?	Section XIII.E. Section XIV.B. Section XIV.G. Section XVI.A.,C.,D.
7. Does the IRP consider electrical energy resource needs? (905.11(b)).	Section X.
8. Does the IRP identify and compare resource options? The customer must conduct an assessment and comparison of available existing and future supply and demand-side resource options based on its size, type, resource needs, geographic location and competitive situation. The options should relate to the customer's unique resource situation as determined by profile data (service area, geographical characteristics, customer mix, historical loads, projected growth, existing system data, rates and financial information) (905.11(b)(1)).	
• Supply-side options include, but are not limited to, purchased power contracts, and conventional and renewable generation options (905.11(b)(1)(i)).	Section XII. Section XIV.
• Demand-side options alter the customer's use pattern to provide for an improved combination of energy services to the customer and ultimate consumer (905.11(b)(1)(ii)).	Section VII. Section VIII. Section XIII. Section XIV.
• Considerations that may be used to develop potential options include cost, market potential, consumer preferences, environmental impacts, demand or energy impacts, implementation issues, revenue impacts, and commercial availability (905.11(b)(1)(iii)).	Section XII. Section XIII. Section XIV.
9. Does the IRP clearly demonstrate that decisions were based on a reasonable analysis of the options (905.11(b)(1)(iv))?	Section XII. Section XIV.
10. Does the IRP include an action plan describing specific actions the customer will take to implement the IRP (905.11(b)(2))?	Section XVI.C.

11. Does the IRP list the time period that the action plan covers (905.11(b)(2)(i))?	Section XVI.C.
12. Does the IRP include an action plan summary consisting of (905.11(b)(2)(ii)(a-c):	
• Actions the customer expects to take in accomplishing the goals identified in the IRP?	Section XVI.B.,C.,D.
• Milestones to evaluate accomplishment of those actions during implementation?	Section XVI.D.
• Estimated energy and capacity benefits for each action planned?	Section XIV. Section XV.
13. Does the IRP, to the extent practicable, minimize adverse environmental effects of new resource acquisitions and document these efforts (905.11(b)(3))?	Section XV.
14. Does the IRP include a qualitative analysis of environmental effects in a summary format (905.11(b)(3))?	Section XII.D.,F. Section XV.
15. Does the IRP provide ample opportunity for full public participation in preparing and developing the IRP (905.11(b)(4))?	Section II.D. Appendix A
16. Does the IRP include a brief description of public involvement activities (905.11(b)(4))?	
• How the customer gathered information from the public?	Section II.D. Appendix E
• How public concerns were identified?	Section II.D. Section XII.G.2. Appendix E
• How information was shared with the public?	Section II.D. Appendix A
• How public comments were responded to?	Section II.D. Section XII.G.2. Appendix E
17. Does the IRP document that each MBA member approved the IRP, confirming that all requirements have been met (905.11(b)(4)(i))? [Effective July 21, 2008, IRPs submitted by member-based associations no longer need unanimous approval of the MBA's members.]	Section XVI.B. Appendix F
18. Does the IRP contain the signature of each MBA member's responsible official, or document passage of an approval resolution by the appropriate governing body (905.11(b)(4)(i))?	Section XVI.B. Appendix F
19. Does the IRP contain a statement that the customer conducted load forecasting, including specific data (905.11(b)(5))?	Section V.
20. Does the IRP contain a brief description of measurement strategies for identified options to determine whether the IRP's objectives are being met (905.11(b)(6))?	Section XVI.D.
21. Does the IRP identify a baseline from which the customer will measure the benefits of IRP implementation (905.11(b)(6))?	Section XVI.D.
22. Does the IRP specify the responsibilities and participation levels of individual members of the MBA and the MBA (905.12(b)(2))?	Section III.E.,F.

Figure II-3

D. Public Participation

The following actions were taken by MEAN to ensure the provision of ample opportunity for public participation throughout the IRP process. All MEAN Committee and Board meetings are public meetings subject to the State of Nebraska Public Meetings Act and the requirements contained therein. All Committee and Board meetings are publicly noticed with agenda published and available in advance.

1. Board and Committee Meetings – November 2019

MEAN Quarterly Board and Committee Meetings were held on November 20-21, 2019 in Kearney, NE. On November 20, the Power Supply Committee met to hear presentations and vote on issues under the purview of the committee. The IRP falls under the jurisdiction of this committee. All members of the Power Supply Committee (see description of this committee in Section III.E.) are invited to attend, and a quorum must be present to conduct the meeting. On November 21, the MEAN Board of Directors met to hear presentations and vote on recommendations from the committees that met the previous day. All members of the Board are invited, and a quorum must be present to conduct the meeting and vote on proposed resolutions. A presentation on MEAN's Resource Planning and future parameters surrounding MEAN's resource portfolio was presented at each of these meetings. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

2. Board and Committee Meeting – January 2020

On January 22-23, 2020, MEAN conducted its quarterly Board and Committee Meetings in Kearney, NE. On January 22, the Power Supply Committee convened. The presentation included discussion of the 2050 Vision, the process and direction of the IRP, resource timelines in terms of capacity and energy, potential future portfolio mix, MEAN's mission, policies and pathways, future resource options, limitations and challenges, and necessary future developments. The next day on January 23, the MEAN Board of Directors met and were presented a summarized version of the same material. Additional meeting locations in Colorado and Nebraska were listed on the public notice, and a virtual option for attendance was provided. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

3. Board and Committee Meeting – August 2020

On August 12-13, 2020, MEAN conducted its quarterly Board and Committee Meetings via electronic platform. The Power Supply Committee meeting took place on August 12. The Committee presentation included information on resources being considered for the IRP, legislative considerations, and resource timelines. The next day on August 13, the MEAN Board of Directors met and were presented the same material. Additional public building addresses of attendees in Colorado, Iowa, and Nebraska were listed on the public notice. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

4. Board and Committee Meeting – November 2020

On November 12-13, 2020, MEAN conducted its quarterly Board and Committee Meetings via electronic platform. On November 12, the Power Supply Committee convened. A presentation was conducted to preview the process of the upcoming Phase I Resource Evaluation and the online survey to be sent to all members. The presentation

included an explanation of the evaluation criteria and the supply side resources under consideration. The next day on November 13, the MEAN Board of Directors met and were presented the same material. Public meeting addresses of meeting attendees in Colorado, Iowa, and Nebraska were listed in the public notice. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

5. Online Survey – January 2021

In January 2021, as part of the IRP public participation process, an online survey was sent to all MEAN participants to gather input for the IRP Phase I evaluation. Questions were asked regarding MEAN's resource mix, renewable energy, local renewable goals, resource procurement criteria, and demand side management. The survey questions and responses are included in Appendix A.

6. Board and Committee Meeting – January 2021

On January 20-21, 2021, MEAN conducted its quarterly Board and Committee Meetings via electronic platform. The Power Supply Committee met first on January 20. One of the topics presented was the progress of the IRP and potential supply side resources. The presentation included an explanation of the Phase II supply side modeling and the risk metrics to be utilized for evaluation of the candidate portfolios. The next day on January 21, the MEAN Board of Directors met. The board presentations were an abbreviated version of the material presented to the Power Supply Committee. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

7. Board and Committee Meeting – May 2021

On May 19-20, 2021, MEAN conducted its quarterly Board and Committee Meetings in Lincoln, NE. On May 19, the Power Supply Committee convened. The presentation to the committee centered around the results of the IRP survey from January, including local carbon-free goals, demand side management participation, resource evaluation criteria, and supply side options. The presentation also reviewed the results of the Phase I resource evaluation. The next day on May 21, the MEAN Board of Directors met. The presentations at the May board meeting included the same topics presented to the Power Supply Committee. A virtual attendance option was provided and listed in the public notice. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

8. Board and Committee Meeting – August 2021

On August 18-19, 2021, MEAN conducted its quarterly Board and Committee Meetings in Kearney, NE. The Power Supply Committee met on August 18. One of the topics presented at the meeting was the progress of the IRP. The presentation included load and capability projections, results of the Phase I evaluation, planned scenarios for load forecasts and market pricing to be used in Phase II, and applicable legislative actions. The next day on the 18th, the MEAN Board of Directors met and were presented an abbreviated version of the same materials. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

9. Online Survey – September 2021

In September 2021, to gather additional input for the IRP, an online survey was sent to all MEAN participants regarding renewable energy. Questions were asked regarding each community's goals for renewable energy in relation to MEAN's 2050 Vision, renewable

energy pricing, and electric vehicle adoption. The survey questions and responses are included in Appendix A.

10. Board and Committee Meeting – November 2021

On November 17-18, 2021, MEAN conducted its quarterly Board and Committee Meetings in Kearney, NE. On November 17, the Power Supply Committee was presented with the results of the renewable energy survey, specific supply side resource evaluations, and upcoming opportunities for discussion and participation on the IRP. The next day on the 18th, the MEAN Board of Directors reviewed and discussed the same presentation topics. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

11. Board and Committee Meeting – January 2022

On January 19-20, 2022, MEAN held its quarterly Board and Committee Meetings in Kearney, NE. On the 19th, the Power Supply Committee convened and discussed the IRP in detail. Topics included upcoming action items and meeting opportunities, the portfolio modeling process, assumptions and sensitivity analysis, review of Phase I, a preview of the Phase II and DSM analyses, and load and capability projections. The material also included information on distributed generation and resource options under investigation. The MEAN Board of Directors met on January 20 to discuss the same topics and review the presentations. A virtual option for attendance was also provided and listed in the public notice. The meeting notice, agenda, minutes, and presentation material are included in Appendix A.

12. Website Announcement

MEAN created announcements and links on its website to information regarding the April 2022 IRP workshop. An IRP website was also created to describe IRP requirements, link to the draft report, and provide instructions for public comment and participation in the workshop.

13. Power Supply Committee Workshop – April 2022

A public workshop of the Power Supply Committee was held on April 21, 2022. The purpose of this workshop was to guide attendees through the draft IRP report and gather input from committee members as well as members of the public. The committee utilized this workshop to prepare to make a recommendation to the Board at the May Board Meeting. This workshop was advertised on MEAN's website with a link to access the virtual meeting. The meeting notice, agenda, minutes, and presentation material are included in Appendix A. Public comments were received at this workshop.

14. Distribution of Draft Report – April 2022

An up-to-date draft version of the IRP document in pdf format was distributed to all MEAN participants via email on April 19, 2022 and was posted to the MEAN IRP website on that date. At this time, an email address dedicated to receipt of comments and questions related to the IRP was established and communicated to participants for direction of responses to the draft. Participants were invited to make the draft report and email address available to their community members in either hard copy or electronic format and to advertise the availability of the document. It was communicated that public comment would be accepted for 25 days following the posting of the draft IRP document.

15. Board and Committee Meeting – May 2022

On May 18-19, 2022, MEAN held its quarterly Board and Committee Meetings in Kearney, NE. A meeting of the Power Supply Committee on the 18th included a detailed presentation to review the draft IRP report and results. The committee held discussions which resulted in the selection of preferred resource portfolios and the Power Supply Committee recommendation to the Board of Directors to approve the IRP with the preferred portfolios. At this meeting, members of the Finance Committee and the Risk Oversight Committee were also asked for comment or discussion on the IRP. The MEAN Board of Directors met on May 19th and received the same presentation for consideration. In addition, summarized public comments were communicated to the Board at this meeting. Ultimately, the Board voted unanimously to approve the IRP with the preferred portfolios as recommended by the Power Supply Committee. The meeting notice, agenda, minutes, and presentation material are included in Appendix A. The resolution approved by the Board is included in Appendix E.

16. Public Comment

As explained throughout this report, comment and direction received from the MEAN participants was incorporated into each step of the IRP process and is reflected in the conclusions and recommended plans for MEAN's future resource planning. All MEAN Board and Power Supply Committee meetings are public meetings at which public comment is accepted. MEAN was purposeful in presenting the procedures and results of each step of the IRP to the board and committee members to solicit input and gather feedback. All public comment received is summarized in Appendix D with MEAN responses and references to how the comments were addressed within the final report.

17. Distribution and Submittal of Final IRP Report

All comments received from internal and external stakeholders were collected for evaluation throughout the IRP process. This narrative points to instances where MEAN participants guided the process in terms of priorities and options and finally the determination of the recommended action plan. The final report incorporates conclusions from participant discussions and ultimately reflects the directives of the Participants. The final report is completed with this input, at which time it is submitted to WAPA, posted to the NMPP Energy website, and distributed to all Participant representatives.

E. MEAN Strategic Plan

1. Overview

The Mission Statement of MEAN is *"To collaborate with municipal utilities to provide economical and dependable power supply and utility related services that support local control and community needs and are consistent with environmental and regulatory stewardship."*

In 2016, MEAN completed a company-wide Strategic Plan. The planning process involved MEAN staff as well as the members of the Executive Committee. In defining the strategic initiatives of the organization, goals were prioritized and assigned action plans for implementation. Timelines and staff assignments were established for each goal. "Resource Management," one of the five Strategic Goals, identifies a Tier One Goal to "Develop a Comprehensive Integrated Resource Plan."

MEAN has budgeted for an updated Strategic Plan to be developed in September 2022. New goals and action items specific to the IRP and resource planning in general will be used to direct long-term and short-term resource acquisitions and planning.

2. Resource Planning

MEAN's Strategic Plan calls for the IRP to be utilized as a strategic and operational working document. The individual tasks outlined to achieve this goal include the following:

- Evaluate existing owned resource obligations
- Energy efficiency and demand side management (*"DSM"*)
- Investigate new generation opportunities and maintain existing generation in participant communities in line with Distributed Generation concepts

III. Introduction

A. Purpose

The purpose of this Integrated Resource Plan is to develop long-range implementation plans to serve MEAN's Total Requirements Participants' power supply requirements consistent with prudent utility planning practices utilizing the lowest cost, environmentally responsible energy supply. The IRP serves as MEAN's guidance for future plans to achieve its 2050 Vision for carbon neutrality.

The Strategic Plan put in place by MEAN's leadership has called for a comprehensive Integrated Resource Plan to guide future resource acquisition and portfolio planning. The plan is to be a living document that is consulted prior to resource decisions and revisited when circumstances change.

This plan is also designed to fulfill the requirements of the Western Area Power Administration according to the Energy Policy Act of 1992, as described in section II.A.

B. Scope

This resource plan encompasses a time period of 15 years on the basis of MEAN's fiscal year. MEAN's fiscal year begins April 1st and ends March 31st. This IRP is inclusive of the planning period of FY 2022-23 to FY 2037-38.

The IRP conducts resource planning for MEAN's entire service footprint as a whole, as well as within the individual Regional Transmission Organizations ("RTO") regions in which MEAN's designated resources are assigned. MEAN operates in the Southwest Power Pool ("SPP") RTO, Midcontinent Independent System Operator ("MISO") RTO, and in the West region. Resources must be designated to meet the load and required reserve margin of each region separately. However, there are several metrics that MEAN evaluates on an accumulated basis for the entire service area.

C. Approach/Methodology

This IRP will consider all reasonable options for supply side resources and demand side management. Supply side and demand side options will be given equal consideration for incorporation into the future resource portfolio.

The IRP analysis will begin with a high-level evaluation of all resource options. Criteria for resource selection are determined and weighted according to input from the MEAN membership. Using static performance and cost characteristics of each option, the complete list of resources will be narrowed to a smaller list of qualified options that receive the highest ranking in accordance with the weighted criteria.

The qualified options will be subject to an economic analysis that applies resource availability and cost to MEAN's hourly loads and projected market conditions. The sum of the hourly costs and revenues over the 15-year study period will be calculated to arrive at a revenue requirement for each option for comparison purposes. This represents the total net revenue that MEAN must realize to cover the costs of the portfolio.

Lastly, the economic analysis will be repeated under various sensitivity scenarios to calculate the impact of potential changes to key inputs. This input-sensitive variability will quantify the risk inherent in each portfolio.

In addition to the total cost parameters, the resource options will be compared in terms of their carbon emissions impact. MEAN's future resource acquisitions will be selected not only in terms of financial cost and reliability to serve load, but also in their ability to advance MEAN toward the 2050 Vision of carbon neutrality. This means that each future resource should contribute toward a decrease in the net emission of the portfolio.

The combined results of the base case revenue requirement and the variability due to sensitivity cases will ultimately lead to the determination of a preferred portfolio for future resource acquisition planning.

This methodology is displayed graphically in *Figure III-1*.

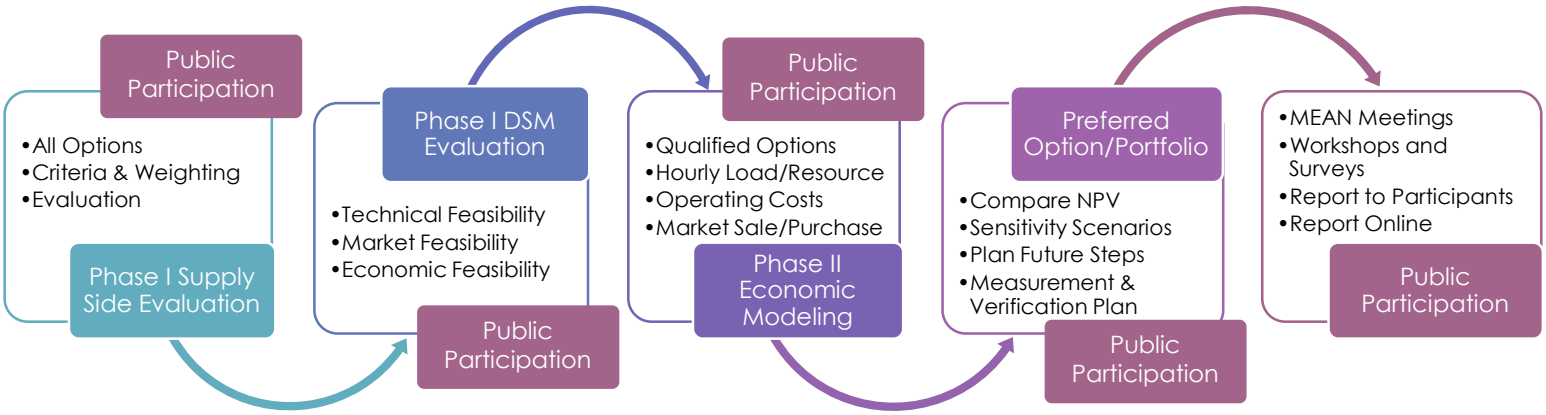


Figure III-1

D. MEAN Overview

The Municipal Energy Agency of Nebraska ("MEAN") is a body corporate and politic under the laws of the State of Nebraska. MEAN was created on June 22, 1981 under the Municipal Cooperative Financing Act, Sections 18-2401 through 18-2485, Reissue Revised Statutes of Nebraska (the "Act"). MEAN was created for the purpose of planning, acquiring, financing and operating facilities to generate and transmit electric power and energy.

MEAN's power supply system consists of ownership and contractual rights and interests in various electric generating and transmission resources and supplies (the "Power Supply System"). MEAN uses the Power Supply System to provide wholesale power supply, transmission and ancillary services to its participating municipal utilities ("Participants"). MEAN's services include power supply, dispatching, energy load forecasting, wheeling arrangements, load research, limited political action, demand-side management, load factor improvement, training, community development, compliance reporting, and energy cost analysis. Through its professional staff, MEAN also provides planning, engineering, financing, regulatory, and governmental affairs services to its Participants.

The Municipal Cooperative Financing Act ("The Act") authorizes MEAN to plan, construct, operate, participate in or acquire facilities, within or outside the State of Nebraska, for the generation, transmission or distribution of electric power and energy, solely or in common with others. Under the Act, MEAN may sell or exchange excess capacity of any project or electric power or energy owned, purchased, or leased by MEAN not required by its Participants. The Act authorizes MEAN to issue its bonds, notes and other evidences of indebtedness. In the acquisition of property, MEAN may exercise the power of eminent domain.

E. MEAN Membership

MEAN's 70 Participants currently include 42 municipalities and one public power district in Nebraska, 14 municipalities and one joint action agency in Colorado, two Wyoming municipalities and 10 Iowa municipalities. Each of the Participants owns and operates an electrical utility system that provides electric service to consumers. 62 of the Participants (the *"Total Requirements Participants"*) receive "total-requirements" electric supply services from MEAN, exclusive only of their allocations of firm power and energy from the Western Area Power Administration of the U.S. Department of Energy (*"WAPA"*), except for certain generating facilities of Waverly Utilities (a municipal utility of the City of Waverly, Iowa) and the City of Aspen, Colorado. Additional municipalities may become Participants of MEAN with the approval of the Board of Directors of MEAN.

Together, the Total Requirements Participants provide electric utility service at retail to approximately 102,723 residential, commercial, institutional, agricultural and industrial customers, representing a total population of approximately 174,800. Participants' total energy usage for MEAN's fiscal year ended March 31, 2022 was 2,200,763 MWh (which includes 371,508 MWh of Participant WAPA allocations).

MEAN's participant communities are mapped in *Figure III-2*.

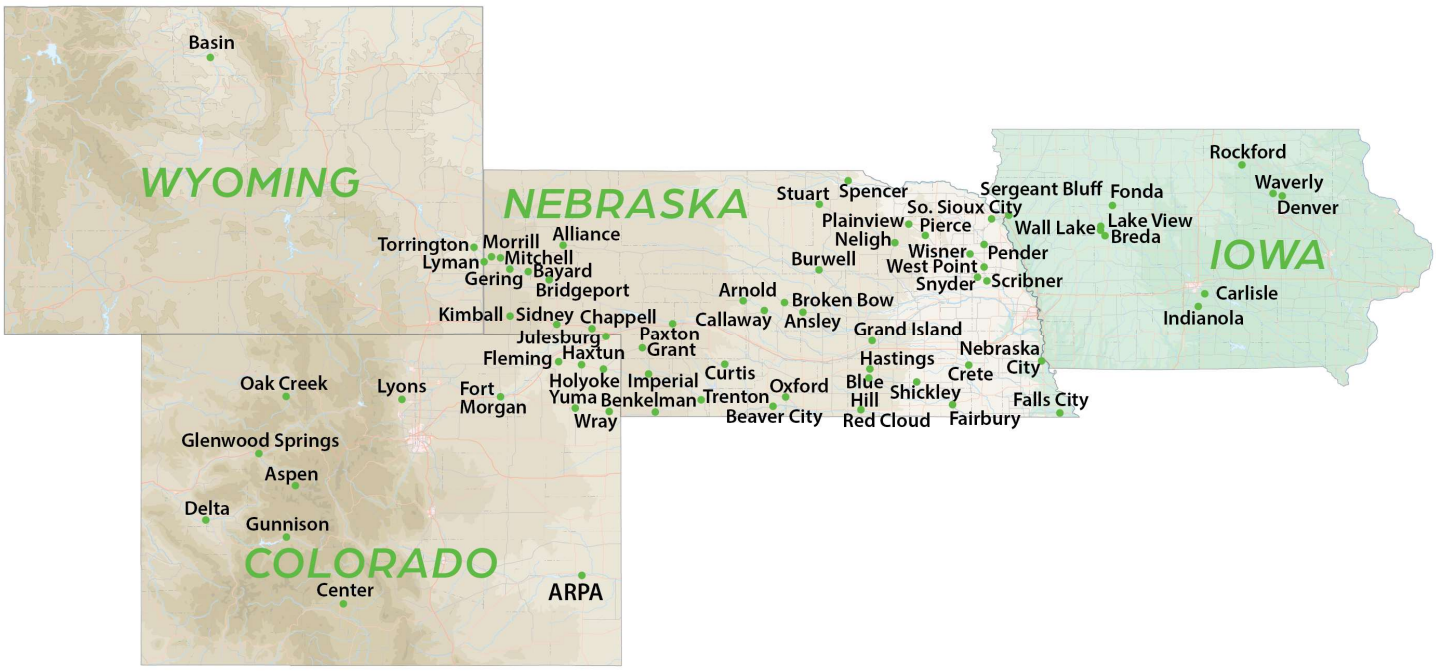


Figure III-2

Participants may take additional steps to become members of MEAN (*"Members"*) under the Act by making application with the Nebraska Power Review Board. Each Member appoints and is represented by a director on the MEAN Board of Directors, as described below. MEAN currently has 57 Members, which are indicated in *Figure III-3*.

COMMUNITY	MEMBER	ASSOCIATE	SUPPORTER CLASS	LONG-TERM TRP	SHORT-TERM TRP
COLORADO					
Arkansas River Power Authority		X			
Aspen	X			X	
Center	X		X		X
Delta	X			X	
Fleming	X			X	
Fort Morgan	X			X	
Glenwood Springs	X				X
Gunnison	X			X	
Haxtun	X			X	
Holyoke		X			X
Julesburg	X			X	
Lyons	X			X	
Oak Creek	X			X	
Wray	X				X
Yuma	X			X	
IOWA					
Breda	X			X	
Carlisle	X			X	
Denver	X			X	
Fonda			X	X	
Indianola Municipal Utilities	X			X	
Lake View		X			X
Rockford		X		X	
Sergeant Bluff	X			X	
Wall Lake	X			X	
Waverly Municipal Electric Utility	X			X	
NEBRASKA					
Alliance	X			X	
Ansley	X			X	
Arnold	X			X	
Bayard	X			X	
Beaver City	X			X	
Benkelman	X			X	
Blue Hill	X			X	
Bridgeport	X			X	
Broken Bow	X			X	
Burwell	X			X	
Callaway	X			X	
Chappell	X			X	
Crete	X			X	
Curtis	X			X	

COMMUNITY	MEMBER	ASSOCIATE	SUPPORTER CLASS	LONG-TERM TRP	SHORT-TERM TRP
Fairbury	X			X	
Falls City	X				
Gering	X			X	
Grand Island		X			
Grant	X			X	
Hastings			X		
Imperial Public Power District	X			X	
Kimball	X			X	
Lyman	X			X	
Mitchell	X			X	
Morrill	X			X	
Nebraska City	X				
Neligh	X				
Oxford	X			X	
Paxton			X		X
Pender	X			X	
Pierce	X			X	
Plainview	X			X	
Red Cloud	X			X	
Scribner			X		
Shickley	X			X	
Sidney	X			X	
Snyder			X		X
South Sioux City			X		
Spencer		X		X	
Stuart	X			X	
Trenton			X		X
West Point	X			X	
Wisner	X			X	
WYOMING					
Basin	X			X	
Torrington	X			X	

Figure III-3

A Participant may elect to become a Total Requirements Participant, in which case it receives all power and energy from MEAN (exclusive only of its firm power and energy allocations from WAPA). Alternatively, a Participant may elect to become a Service Schedule Participant, in which case it retains full responsibility for meeting its power and energy requirements and may enter into buy/sell power and energy or other transactions with MEAN.

Fifty-four of the Participants (the *"Long-Term Total Requirements Participants"*) have entered into Service Schedule M contracts (the *"Long-Term Power Supply Contracts"*). The Long-Term Total Requirements Participants, with the limited exception of Aspen, Colorado and Waverly Utilities, have agreed to purchase all their firm electric requirements from MEAN, exclusive of any firm power and energy allocated to such Long-Term Total Requirements Participants by WAPA. The term of the Long-Term Power Supply Contracts is concurrent with the life of MEAN's bond debt and other resource obligations. Waverly and Aspen have certain external contracts for renewable energy.

Eight of the Total Requirements Participants (*"Limited-Term Total Requirements Participants"*) have contracted with MEAN for total-requirements electric supply services by entering into a Supplemental Agreement to Service Schedule J contract (*"Service Schedule J Participants"*) or Service Schedule K or K-1 contract (*"Service Schedule K and K-1 Participants"*). Such Participants have agreed to purchase all their electric requirements from MEAN, exclusive of any firm power and energy allocated to such Limited-Term Total Requirements Participants by WAPA. These agreements vary in length, but generally have terms of five to ten years. Collectively, the Long-Term Total Requirements Participants and the Limited-Term Total Requirements Participants are referred to herein as the "*Total Requirements Participants*."

Eight of the Participants (*"Service Schedule Participants"*) do not receive total-requirements electric supply services from MEAN, and instead may enter into buy/sell power and energy or other transactions with MEAN from time to time. Five of the Service Schedule Participants currently receive only agent and scheduling services from MEAN with respect to transactions in the Southwest Power Pool (*"SPP"*) Integrated Marketplace (*"IM"*). MEAN also enters into other agreements and interchange sales with non-Participant electric utilities and organizations such as SPP and Midcontinent Independent System Operator (*"MISO"*) markets.

MEAN Participant membership is governed by the General Terms and Conditions, which replaced this function of the former Electric Resources Pooling Agreement ("ERPA"). In addition, terms of MEAN's lease of member-owned behind-the-meter generation ("BTMG") are detailed in the Asset Management Policies and Procedures ("AMPP") document, formerly documented in the ERPA.

F. MEAN Organization

MEAN is governed by a board of directors (*"Board of Directors"*) consisting of one director for each of the Members, appointed by the mayor or chair of each Member, and approved by the governing body of each Member. Each director serves until his or her successor is appointed and is entitled to one vote unless he or she has been suspended or unless the Member is an Inactive Member as defined by MEAN's by-laws. A director may be removed for any cause at any time by the governing body of the Member that such director represents or may be suspended or removed by the MEAN Board of Directors for any cause by at least a two-thirds of the votes cast in any regular or special meeting of the Board of Directors whenever in the Board of Director's judgment the best interest of MEAN will be served thereby. The amendment of MEAN's charter requires a majority vote of the directors. Most other actions require an affirmative vote of the majority of the votes which the directors present are entitled to cast.

The Act authorizes the Board of Directors to create one or more project committees to which the Board of Directors may delegate such powers and duties with respect to a project as the Board of Directors shall specify. The Board of Directors has created the following standing committees: Executive Committee, Power Supply Committee, Services Committee, Finance Committee, Risk Oversight Committee. Oversight of the IRP process falls under the purview of the Power Supply Committee.

The officers of MEAN are elected each January by the Board of Directors of MEAN to serve terms of one year beginning April 1.

G. NMPP Energy

MEAN, Nebraska Municipal Power Pool, Public Alliance for Community Energy and National Public Gas Agency comprise a coalition referred to by the trade name NMPP Energy pursuant to a Joint Operating Committee Agreement. MEAN and the other participating organizations share administrative resources and staff, allowing them to more efficiently run their operations and their systems. The coalition provides substantial benefits to MEAN and the other participating organizations, including: (i) the development and utilization of a highly skilled and professional staff with specialized technical expertise in business management, administration, engineering, finance, accounting, governmental affairs, law, and other disciplines; (ii) achieving economies of scale and the sharing of facilities and overheads; (iii) the development and execution of projects, plans, and services that benefit multiple organizations; and (iv) the sharing of institutional experience through the Joint Operating Committee. MEAN and each of the other organizations included in NMPP Energy is an independent financial entity. None of the organizations are financially liable for the debts or obligations of any other associated organization.

H. Regional Energy Markets and Coordination

MEAN's regional footprint stretches from Central Iowa across Nebraska and into Colorado and Wyoming. Due to this footprint, MEAN is required to operate in two regional transmission organizations, MISO and SPP. Both MISO and SPP operate day-ahead and real-time energy markets. Market participants must pay for costs to serve load and receive revenue for their electrical generation. MEAN also operates in the western United States through the Western Electricity Coordinating Council (*"WECC"*) and participates in the Western Energy Imbalance Service (*"WEIS"*) market.

SPP was founded in 1941, incorporated as a nonprofit entity in 1994 and became a FERC-approved Regional Transmission Organization in 2004. SPP's members, including investor-owned utilities, municipalities, cooperatives, state power agencies, independent power producers, power marketers, independent transmission companies and federal agencies, serve over 18 million people. SPP provides transmission services on more than 70,000 miles of transmission lines in 14 states: Nebraska, Kansas, Missouri, Oklahoma, Arkansas, New Mexico, Texas, Louisiana, Iowa, Minnesota, Montana, North Dakota, South Dakota and Wyoming.

The SPP Integrated Market (*"IM"*), which was launched on March 1, 2014, replaced the Energy Imbalance Service (*"EIS"*) market that SPP had operated since 2007. The IM restructured the EIS market by establishing a day-ahead market along with a real-time energy and operating reserve market. Consolidating 16 balancing authorities into a single SPP-operated balancing authority was designed to maximize energy efficiency and reduce transaction costs. The IM also utilizes locational-marginal pricing, transmission congestion rights, and virtual transactions.

MEAN became a member of SPP on October 20, 2015. As a member, MEAN works with other SPP members to identify ways to improve market operations and overall organizational effectiveness.

MISO is an independent organization whose purpose is to ensure the reliability of its integrated, regional electrical transmission system, to facilitate a regional wholesale marketplace, to provide non-discriminatory access to the transmission system and to maintain and improve system reliability. Its members include vertically-integrated utilities, stand-alone transmission owners, load-serving entities, energy marketers, state regulatory authorities and independent power producers.

MEAN became a non-transmission owning member of MISO on October 22, 2015.

MEAN also operates in the western United States through WECC. For operations in WECC, MEAN enters into other agreements and transactions with various electric utilities that are not MEAN Participants pursuant to which such electric utilities may purchase power and energy from MEAN or sell power and energy to MEAN.

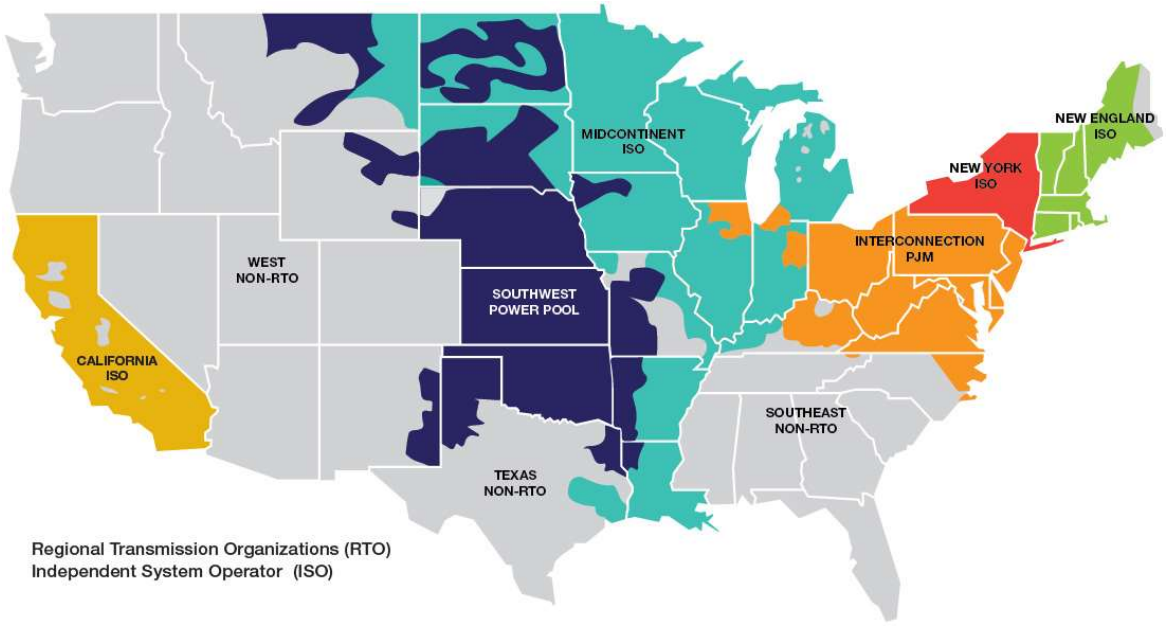


Figure III-4

MEAN and several other regional utilities are participants in SPP's Western Energy Imbalance Service (WEIS) market which went live February 1, 2021. SPP's WEIS market balances generation and load regionally in real time by centrally dispatching energy from participating resources every five minutes for participants in the Western Interconnection. As WEIS administrator, SPP maintains reliability of the region's transmission system and meets demand with the most cost-effective generation available. Market participants submit offers for registered resources for use by the WEIS market, and the WEIS market dispatches the resources based on economic offers submitted while honoring resource parameters and transmission limitations. SPP delivers energy between participating generators and load in WEIS using a form of intra-hour non-firm transmission service. The WEIS market also allows parties to continue to trade bilaterally. SPP posts scheduled settlement statements for a given set of operating dates, and on a weekly basis invoices cumulative market activity for each market participant. For governance and stakeholder involvement, SPP's Western Markets Working Group is the forum for customers of WEIS to engage in matters of WEIS Market related governance and strategy with other stakeholders.

SPP's Markets+ is a bundle of services proposed by SPP that would centralize day-ahead and real-time unit commitment and dispatch, provide hurdle-free transmission service across its footprint, and facilitate the reliable integration of renewable generation. It is a voluntary market offering that is intended to go beyond current imbalance market service offerings to enhance system reliability and increase economic opportunity while providing participants with a meaningful voice. Markets+ is not an extension of SPP's Western Energy Imbalance Service (WEIS), but rather it is anticipated that it will replace WEIS. The schedule for Markets+ is to have a final service offering in November

2022, and in Q1 2023 commitments to investigate with financially binding agreement to scope implementation.

In July of 2021, the SPP board of directors and Strategic Planning Committee approved the terms and conditions for regional transmission organization (RTO) expansion in the Western Interconnection. This formation would extend SPP's market structure into the West, including day-ahead wholesale electricity market administration, transmission planning, reliability coordination, and resource adequacy. MEAN has communicated its intent to join a future SPP West RTO. Current projections state that the SPP West RTO could begin operation in Q2 of 2025.

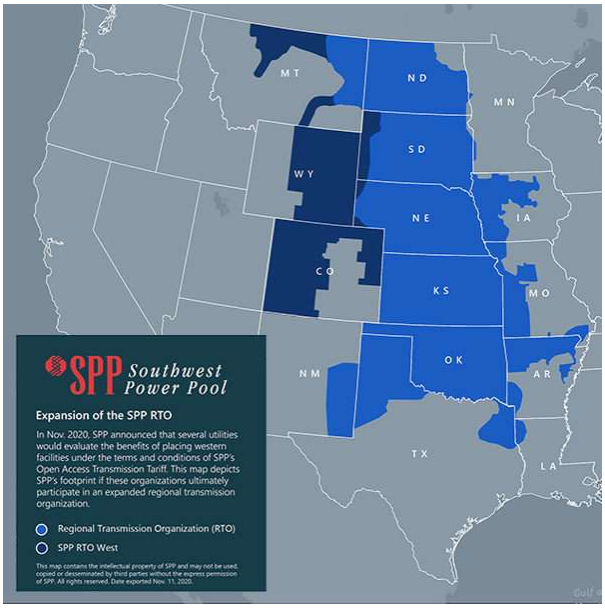


Figure III-5

IV. Uncertainties/Limitations

There are many factors that impact the inputs to the IRP analysis. Many of these parameters are uncertain and have therefore been calculated or assigned with certain assumptions. Should these assumptions be incorrect or prove to change over time, the outcome of the analysis could potentially change as well. This section explores some of the uncertainties and limitations underlying these variable inputs to the analysis.

A. Environmental Legislation

Electric utilities are subject to evolving environmental regulation. Various environmental permits and approvals from state and federal agencies are necessary in order to operate the Power Supply System. To date, MEAN reports that all environmental permits and approvals necessary for the operation of the Power Supply System have been obtained. However, federal, state, and local standards and procedures that regulate the environmental impact of electric utilities are subject to change. These changes may arise from continuing legislative, regulatory and judicial action regarding such standards and procedures. Consequently, there is no assurance that the Power Supply System and the utility facilities owned or operated by the Participants will remain subject to the regulations currently in effect or indefinitely maintain current compliance status. An inability to comply with environmental standards could result in reduced operating levels, increased capital or operating costs, or the complete shutdown of individual electric generating units.

There is increased concern by the public, the scientific community, and Congress regarding environmental damage resulting from the use of fossil fuels. There are a number of pending or recently enacted legislative proposals in Congress and state legislatures that may affect the electric utility industry. Increased environmental regulation has created and may create additional barriers to new facility development and modification of existing facilities, both physically and operationally. The additional expenses, including time, human resources, uncertainty and delay, could increase the cost of electricity from affected resources and ultimately reduce their market dispatch. This type of legislation may ultimately have significant influence on nationwide or regional resource mixes and market operations as some types of resources experience increased costs of compliance or compulsory carbon taxes while other types of resources avoid such costs or receive financial incentives for generation, thereby effecting the feasibility of resource retirement and new construction. Further regulation may impose additional costs and long-term investments in retirement and decommissioning activities when a facility ceases operation.

1. Renewable Portfolio Standards

Several states have implemented renewable portfolio standards (*"RPS"*) requiring electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date.

One of the first states in the country to do so, Iowa adopted a renewable portfolio standard only for investor-owned utilities in 1983. The minimal requirements of this RPS have been long surpassed by Iowa's IOUs.

In 2004, Colorado adopted a renewable portfolio standard affecting investor-owned utilities, electric cooperatives and municipal utilities, except municipal utilities serving less than 40,000 customers. For affected Colorado utilities, the RPS requires that the utility provide the following percentages of renewable energy from eligible resources: 30% by 2020 for IOUs, 10% or 20% for municipal utilities and electric cooperatives

depending on size, and 100% clean energy by 2050 for utilities serving 500,0000 or more customers. Presently, this RPS is not affecting MEAN's Colorado Participants.

Nebraska and Wyoming have not adopted an RPS.

Other state legislation has directed a schedule of reductions in electric utility carbon emissions as compared to a baseline year's emissions. Typically states have set targets specific to the electric utility industry, designated separately from state-wide targets and targets for other industries. In 2019, Colorado enacted such legislation, calling for state-wide emissions reductions of 26% by 2025, 50% by 2030, and 90% by 2050 and delegating authority to the Air Quality Control Commission to adopt rules to make progress towards those goals. Specific to electric utilities, the 2019 legislation states that a utility shall not be subject to additional emissions reduction mandates if the utility files a clean energy plan demonstrating a minimum 80% reduction from 2005 levels by 2030. Currently, MEAN and its member utilities are not under the jurisdiction of this legislation as it applies to utilities serving 500,000 or more customers. Further energy legislation continues to be introduced in the Colorado legislature, and MEAN regularly follows these developments. Nebraska, Iowa, and Wyoming do not have any emissions reduction regulations.

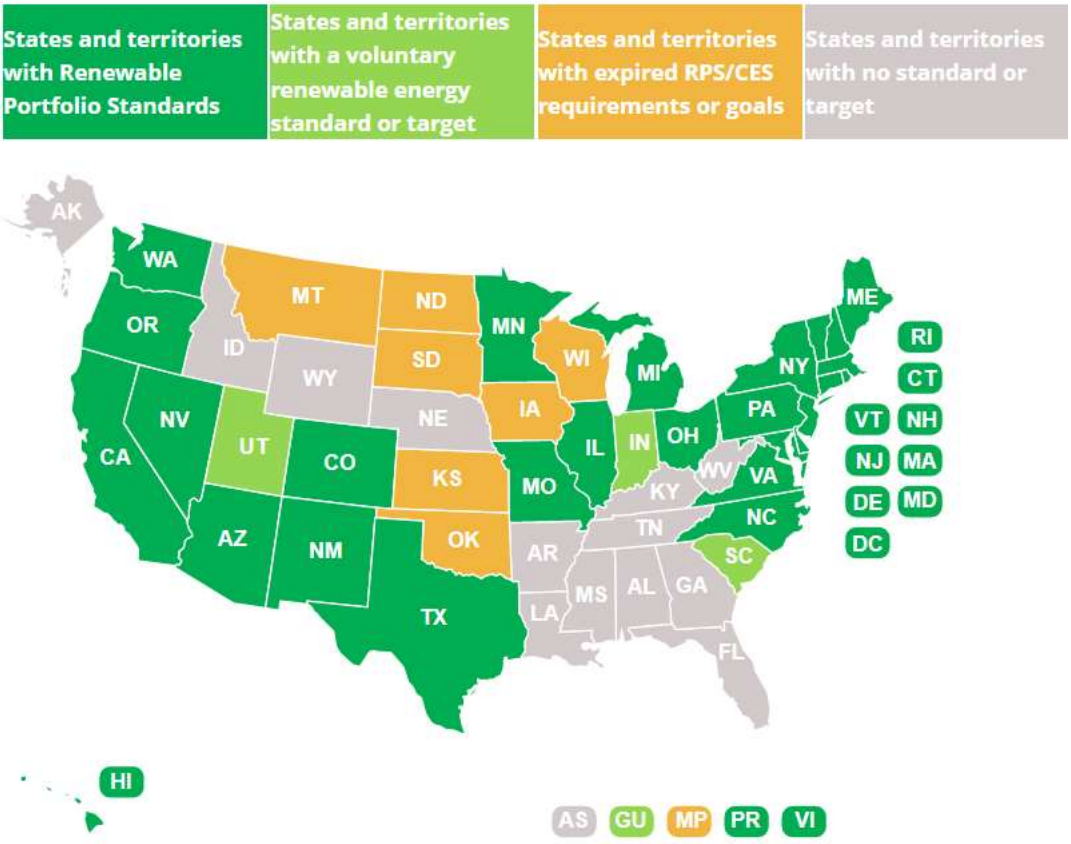


Figure IV-1

For the IRP base case scenario, it is assumed that RPS and emissions reduction requirements will remain as currently mandated.

2. Clean Air Act

The 1990 Amendments to the Clean Air Act seek to improve the ambient air quality throughout the United States by reducing sulfur dioxide (SO_2) and nitrogen oxide (NO_x), emissions caused by electric utility power plants, particularly those fueled by coal. This is administered through a cap and trade system of emission allowances. Currently, all of MEAN's coal-fired generation resources meet the NO_X compliance requirements. Additionally, MEAN purchases allowances for SO_2 emissions to cover annual requirements for the plants impacted by the EPA Acid Rain Program. SO_2 and NO_X emissions are monitored continuously and reported quarterly in compliance with EPA regulations.

In recent years, legislative bills have been introduced in both the House and Senate that if enacted, would require the addition of pollution control equipment to further reduce emissions of SO2, NOX, mercury and carbon dioxide ("CO_2") from coal fired electric power plants. Regulations promulgated by the EPA or by state governments could have a similar effect. MEAN's generating resources have installed the required mercury reduction capability and further mandatory CO_2 reductions could substantially increase MEAN's operations and maintenance expenses and possibly require switching fuel from coal to natural gas. MEAN continually monitors emissions reduction legislation.

3. Clean Power Plan and Affordable Clean Energy Rule

The EPA released a statement on February 12, 2021 that it "does not expect states to take any further action to develop and submit plans under Clean Air Act section 111(d) with respect to greenhouse gas emissions from power plants at this time."

On August 3, 2015, EPA released its final Clean Power Plan under Section 111(d) of the Clean Air Act ("Clean Power Plan") which sets performance standards for existing power plants to reduce carbon dioxide (CO_2) emissions. The Clean Power Plan required each state to reduce its CO_2 emissions rate from existing fossil fuel plants relative to 2005 emission levels to meet state-specific standards starting in 2022, with a final rate for 2030 and beyond. The Clean Power Plan was challenged in court and never went into effect.

On July 8, 2019 the EPA concurrently repealed the CPP and published the Affordable Clean Energy ("ACE") Rule. ACE provided states with new emission guidelines and delegated to the states the development of standards of performance to reduce carbon dioxide emissions from existing coal-fired electric generating units (*"EGUs"*). ACE established heat rate improvement (*"HRI"*), or efficiency improvement, as the best system of emissions reduction (BSER) for CO_2 from coal-fired EGUs, with the goal of more efficiently generating electricity with less carbon intensity. The ACE rule was also challenged in the courts and on January 19, 2021, the District of Columbia Circuit Court vacated the ACE Rule remanding it back to the EPA. In October 2021, the Supreme Court agreed to review the D.C. Circuit's decision. While there are still legal proceedings relative to the ACE Rule, it is expected that the EPA will undertake new rulemaking to replace the ACE Rule.

Although the Clean Power Plan and the ACE Rule were not fully implemented, the structure of this legislation stands as an indication of future efforts to reduce the environmental impact of power generation facilities.

4. Cross-State Air Pollution Rule

In July 2011, the EPA finalized the Cross-State Air Pollution Rule (*"CSAPR"*), which would require the reduction of NO_x and SO_2 in 28 targeted states in the eastern and mid-western

United States by reducing power plant emissions that contribute to ozone and/or fine particle pollution in other states. Under CSAPR, EPA sets a pollution limit (referred to as a "budget") for each state covered by the rule. CSAPR allows sources in each state to determine how to meet the emission budgets, including unlimited trading of emissions allowances between power plants in the same state and limited interstate trading under certain conditions.

Various legal challenges resulted in the EPA issuing the CSAPR Update rule which became final on September 7, 2016, and went into effect beginning with the May 1, 2017 to September 30, 2017 ozone season. The CSAPR Update rule did not replace CSAPR; however, it did require additional reductions in NOx emissions from utilities in 22 states in the eastern United States, during the ozone season. In September and October 2019, the U.S. Court of Appeals for the D.C. Circuit remanded the rule to the EPA for further consideration. Following the court remand, the EPA published a final Revised CSAPR Update Rule in the Federal Register, and that rule became effective on June 29, 2021. The Revised CSAPR Update places additional ozone season emission reductions on electric utilities in 12 states. Several eastern states, including Iowa, may see reductions in NOx ozone season allowances under the Revised CSAPR Update Rule. Litigation regarding this new CSAPR regulation is ongoing.

Nebraska and Iowa are among the 28 states that are subject to CSAPR's requirements to reduce annual emissions of NO_x and SO_2. MEAN believes its generating resources are well positioned to meet any requirements relating to CSAPR's implementation. MEAN does not anticipate that CSAPR or the CSAPR Update Rule will have a material impact on the Power Supply System or its generating resources.

5. Mercury and Air Toxics Standards

On December 16, 2011, the EPA issued final rules titled "Mercury and Air Toxics Standards" (*"MATS"*). The rules establish national emission standards for mercury and other hazardous air pollutants from coal- and oil-fired power plants. They require significant reductions in mercury and acid gas emissions from coal-fired power plants and apply to electric generating units greater than 25 MW.

The Supreme Court initially rejected the final MATS rule in 2015, and in December of that year, the D.C. Circuit remanded the rule to EPA without vacating the rule. On April 14, 2016, EPA issued its final supplemental finding stating that, after consideration of costs, it is appropriate and necessary to set standards for emissions of air toxics from coal-and oil-fired power plants.

MEAN's impacted facilities are all currently MATS compliant. WSEC 4 was originally constructed with emissions controls which enable the plant to comply with MATS. Included with the purchase of the Air Quality Control System for WEC 2 was the necessary equipment to use activated carbon injection as a control of mercury emission to enable compliance with MATS. Wygen Unit I's current emission control equipment enables the plant to comply with MATS. Laramie River Station completed installation of equipment in order to meet a June 2015 compliance deadline to comply with MATS. Ongoing compliance with MATS must be demonstrated by each affected facility.

6. Reciprocating Internal Combustion Engine Subpart ZZZZ

Beginning in May of 2013, the National Emissions Standards for Hazardous Air Pollutants (*"NESHAP"*) for Stationary Reciprocating Internal Combustion Engines (*"RICE"*) (40 CFR, Part 63, Subpart ZZZZ) were updated by the EPA. The RICE NESHAP update included a required reduction of emissions of hazardous air pollutants from covered engines located at major sources of hazardous air pollutant emissions such as power plant sites. For most of the effected units, this required the installation of an oxidation catalyst on the exhaust stack to reduce the emissions of carbon monoxide (CO). In addition, a monitoring system was required to verify and report the performance of the catalyst. All of MEAN's applicable Committed Facilities have installed the required catalyst and monitoring equipment. MEAN staff worked extensively with participants to ensure that all necessary policies and procedures were adopted and continues efforts to assist participants in compliance with the RICE NESHAP regulations and annual testing and reporting.

7. Regional Haze Rule

The EPA's Regional Haze Rule requires emissions controls using best available retrofit technology (*"BART"*) for industrial facilities emitting air pollutants that impair visibility in Class I areas (national parks and wilderness areas). Such pollutants include fine particulate matter ($PM_{2.5}$) and compounds that contribute to $PM_{2.5}$ such as NOx, SO_2, certain volatile organic compounds, and ammonia. Each state is required to submit a State Implementation Plan (*"SIP"*) to demonstrate compliance.

Nebraska, as a CSAPR-affected state, will be able to substitute CSAPR for any requirements related to the Regional Haze Rule. WEC 2 is well positioned to meet any requirements relating to CSAPR's implementation. Based on a determination by the state of Iowa, WSEC 4 is not subject to the Regional Haze Rule. Wygen Unit I is not currently subject to CSAPR, though it is well positioned to meet any requirements relating to CSAPR's implementation.

In 2014 the EPA issued a final ruling on the Wyoming state implementation plan for Laramie River Station that required installation of selective catalytic reduction (*"SCR"*) technology for all three units at Laramie River Station. The Wyoming Department of Environmental Quality and coal plant operators evaluated various options for Laramie River Station compliance and ultimately negotiated a settlement with the EPA. In 2019, selective noncatalytic reduction controls were installed on two units and SCR control on one unit to meet these compliance standards.

8. National Ambient Air Quality Standards

The EPA promulgated final rules and guidance for fine particulate matter, known as the $PM_{2.5}$ Standard, under the National Ambient Air Quality Standards (*"NAAQS"*), which regulates particles less than 2.5 microns in diameter. No county in Colorado, Iowa, Nebraska or Wyoming has been included in the EPA's list of $PM_{2.5}$ "non-attainment" areas, *i.e.*, not in compliance with air quality standards.

In 2008, the EPA promulgated new primary and secondary national ambient air quality standards for ozone, with revised NAAQS for ground-level ozone becoming effective in 2015. The revision set stricter standards and requires modeling and low ambient air testing to confirm compliance. Based on current data and public information, all areas of Colorado, Iowa, Nebraska and Wyoming are either in attainment or are unclassifiable.

The EPA Good Neighbor Plan would establish an allowance-based ozone season trading program with nitrogen oxides (NOX) emissions budgets for fossil fuel-fired power plants in 25 states. Wyoming is the only state in the MEAN footprint that would be impacted by this proposed update to the NAAQS.

9. Greenhouse Gas and Climate Change Issues

In April 2009, the EPA issued final findings that the current and projected concentrations of the mix of six key greenhouse gases (*"GHG"s*)—carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.

On May 13, 2010, the EPA issued a final rule that requires Prevention of Significant Deterioration (*"PSD"*) and Title V operating permits to be obtained by stationary sources, including power plants. PSD permitting requirements for compliance with GHG emission criteria require a "best available control technology" (*"BACT"*) analysis. WEC 2, WSEC 4 and Wygen Unit I are all operated under BACT standards. WEC 2, WSEC 4, Wygen Unit 1, and Laramie River Station currently have the necessary Title V operating permits and acid rain permits. Title IV of the Clean Air Act created an SO2 allowance trading program as part of the federal acid rain program. Sufficient allowances are held for Wygen Unit I and WEC 2.

On August 3, 2015, the EPA finalized performance standards for new, modified and reconstructed fossil fuel-fired electric generating units. Under the rule, new coal-fired power plants will be required to employ partial carbon capture and sequestration technology to meet emission standards for carbon dioxide. For new natural gas-fired units, EPA has concluded that compliance should be achievable without additional controls. The performance standards will not apply to existing plants.

There have been numerous other judicial and legislative challenges to the EPA's efforts to regulate GHGs that may impact the regulatory status outlined above.

10. Coal Combustion Residuals

The Disposal of Coal Combustion Residuals (*"CCRs"*) from Electric Utilities rule (the *"CCR Rule"*) which became effective on October 19, 2015, regulates coal combustion byproducts ("CCBs") under Subtitle D of the Resource Conservation and Recovery Act as non-hazardous solid waste. The CCR Rule establishes guidelines and new minimum standards for the disposal of CCBs in landfills and surface impoundments and mandates closure of unlined surface impoundments upon a specified triggering event. Under the CCR Rule, if after multiple levels of monitoring and an alternate source demonstration, a statistically significant level of contamination cannot be attributed to another source, a company was required to retrofit or close the pond. In August 2018, the D.C. Circuit Court ordered that the CCR Rule be vacated with respect to the provisions that permit unlined surface impoundments to continue receiving coal ash unless they leak. On several instances in 2019 and 2020, the EPA further amended the CCR Rule. Key features of these amendments include: the reconsideration of beneficial use criteria, reclassification of clay-lined impoundments to be considered unlined, limited permission for some unlined surface impoundments to continue to operate, and revision of the alternate closure provisions.

The EPA's August 28, 2020 amendments require all impoundments that do not meet the liner requirements outlined in the Rule to cease receiving CCR and non-CCR waste streams CCR material and initiate closure by April 11, 2021, regardless of compliance status. If not technically feasible, an alternate date to cease receiving CCR material and initiate closure could be secured from the EPA through an extension request process, to be submitted to the EPA no later than November 30, 2020.

Basin Electric Power Cooperative ("BEPC"), as the Operating Agent for Laramie River Station, hired a consultant to conduct detection monitoring in 2016 and 2017. The consultant detected a statistically significant increase ("SSI") in one or more of the indicator constituents from the Laramie River Station ash pond. BEPC worked with the consultant to determine if the SSI could be attributed to an alternative source. The consultant analyzed soil samples and performed further groundwater monitoring. The consultant who ultimately could not determine that the SSI came from an alternate source. BEPC concluded that the CCR Rule required a corrective action for the ash pond and proceeded with design and engineering work to meet the revised deadline of April 11, 2021 for all unlined CCR surface impoundments and surface impoundments that fail the aquifer location restrictions to initiate closure or retrofit.

PPGA is currently in the process of groundwater monitoring at WEC 2, working with a third-party consultant. The results of the comprehensive monitoring and modeling will determine the extent and source of contaminants, which will direct the course of action with regard to the need for an ash pond liner. PPGA is also actively marketing WEC 2's ash in an attempt to decrease the size and mitigate the effects of the coal ash pond. PPGA has not yet determined the cost or the extent of any potential corrective action required. PPGA has requested an extension from the EPA.

11. Effluent Limitation Guidelines

EPA promulgated the Steam Electric Power Generating Effluent Guidelines and Standards in 1974 and amended the regulations several times since. The regulations cover wastewater discharges from power plants operating as utilities. The Steam Electric regulations are incorporated into NPDES permits. The EPA has in recent years adopted more stringent limits for new pollutants and parameters for individual wastewater streams generated by steam electric power plants, with a particular focus on coal fired power plants.

Under a new rule which became effective on January 4, 2016, new requirements for existing power plants will be phased in between 2018 and 2023. The rule established wastewater limits for heavy metals from coal combustion residual products. Following legal challenges and petitions for administrative reconsideration to such rule, on November 22, 2019, the EPA issued a proposed rule revising the 2015 rule. The proposed rule was finalized on October 13, 2020 and updated what constitutes "best available technology" (BAT) guidelines for bottom ash transport water and FGD wastewater. The updated rule extended the deadline for meeting the BAT limitations to no later than December 31, 2025. Consistent with Executive Order 13990 issued by President Biden, the EPA has also filed an August 2, 2021 notice in the Federal Register indicating it intends to initiate a supplemental Effluent Limitation Guidelines rulemaking to strengthen certain discharge limits in the Steam Electric Generating category. According to the EPA, the new rule is expected to be issued in 2022.

12. Water Quality

The Federal Clean Water Act regulates the discharge of process wastewater and certain storm water under the National Pollutant Discharge Elimination System permit program. WSEC 4 is not impacted by the Clean Water Act. WEC 2, Wygen Unit I and Laramie River Station have proper permitting in place under the Clean Water Act.

In 2015, the act was revised with regard to the regulatory definition of the term "waters of the United States." However, later that year the US Court of Appeals for the Sixth Circuit issued a stay on the revision. In response, federal agencies reverted to the prior definition for enforcement. In February 2017, the President issued an executive order directing the EPA and Army Corps of Engineers to review and revise or rescind the 2015 rule. As recently as November 2021, the EPA again proposed to revert to the pre-2015 definition of WOTUS. The manner in which this term is defined will impact requirements for wastewater discharge from power plants located upstream of community water sources.

13. Future Legislation and Rules

In recent years various Congressional bills have been introduced in both the House of Representatives and the Senate that would require increased generation of carbon-free energy and the further reduction of emissions of sulfur dioxides, nitrogen oxides, mercury and carbon dioxide from coal-fired electric generating units. In addition, recent efforts to expand and extend tax credits for carbon capture technologies have been introduced in Congress. Proposed bills such as the Green New Deal, the CLEAN Future Act, and the Clean Electricity Performance Program indicate support for enacting significant economic incentives for increased clean energy production and corresponding penalties for carbon emissions.

In December 2020, Congress passed an omnibus package which includes the first major energy policy since 2007. The bipartisan bill includes research and development and deployment for clean energy technologies, clean energy tax incentives, and directs EPA to phase down the production and consumption of hydrofluorocarbons.

MEAN cannot predict at this time whether any additional legislation or rules will be enacted in the future that will affect the operations of the Power Supply System, MEAN or the Participants, and if such laws or rules are enacted, what the costs to MEAN and the Participants might be in the future because of such action.

MEAN is continually monitoring, and evaluating the best ways to meet, the requirements of current federal and state air quality and other environmental laws.

B. Load Forecast

MEAN employs a robust statistical method for forecasting load. As fully described in Section V. System Load Forecast, a number of input variables are used to formulate a forward-looking equation to calculate the monthly peak demand and monthly energy usage for each participant community for the entirety of the study period. The individual participant load forecasts are combined to result in a total load forecast for each region. However, the statistical analysis is dependent upon several variables, such as weather data, population, and income. Changes in any of these factors will impart changes in the load forecast.

Extreme weather events have made a notable impact on energy markets in recent years. In 2020, Hurricane Laura hit MISO's Gulf Coast region, resulting in a 500-MW load shed and massive transmission and distribution system destruction. In February 2021, Winter Storm Uri effected fuel supply and resource availability as well as load levels for several days in the SPP and ERCOT regions, leading to massive outages and extraordinarily high energy pricing. This type of weather event is unforeseeable and is not included in the weather projections used for load forecasting.

In addition to the variables identified as inputs to the load forecast calculation, throughout the MEAN footprint, demand side management (*"DSM"*) measures are being adopted by utilities and end-use customers in participant communities, encouraged and supported by MEAN and NMPP. DSM measures act to reduce either the peak demand for electricity or the total electricity consumption. Consumers are gaining interest and knowledge in the control and reduction of their energy consumption and carbon footprint. As such, we can expect the deployment and adoption of DSM to continue and likely increase in the future, leading to a decrease in load. This effect is fully explored in the Demand Side Management section of this report, although the actual future use of DSM is difficult to accurately forecast. And element of DSM impact is included in the load forecast.

In addition to controlling and reducing their energy consumption, some customers also have interest in providing for their own energy supply. Distributed Generation (*"DG"*) is customer and/or community ownership of generating assets to serve end use load. DG, particularly in terms of wind, solar, and combined heat and power, are becoming more popular "behind the meter" installations. Also of recent increased interest are residential energy storage systems, particularly in the territories of utilities that have instituted time-of-day rates. Each installation of DG removes energy consumption from the MEAN system and thereby decreases the resource need, either on a capacity or energy basis depending on the timing of DG energy supply. Recent MEAN policy changes allow for an increased installation of DG resources as a percentage of energy consumption. The future rate of DG installation and therefore its impact on load projections is unknown.

Recent years have seen an emphasis on energy efficiency and energy conservation on all levels: residential, commercial, and industrial. From improved performance of household appliances to the use of energy efficient materials in building construction to conscious selection of efficient HVAC systems, customers are making choices to decrease their energy usage and cost. The widespread use of these practices has led to a decrease in the growth rate of electric loads, and is a trend which is likely to continue, but at a pace that is difficult to predict.

C. Electrification

Electrification refers to the process of replacing technologies that use fossil fuels with technologies that use electricity as a source of energy. As more carbon-free resources are integrated into the grid to generate electricity, electrification can potentially reduce carbon emissions from the transportation, building, and industrial sectors. Given the adoption of state and federal regulations to reduce emissions, electrification activities are likely to proliferate. This gives entities more opportunity to reduce overall system carbon emissions with the possibility of serving this load with carbon free resources.

This move toward electrification would alter MEAN's resource portfolio as demand and consumption increase and end users require more carbon-free power. This change will also result in changes in the operations and economics of the energy markets.

Although the actual adoption rates and impacts are unknown, the report does show a load forecast that assumes a level of electrification corresponding to the NREL Electrification Futures Study. This load scenario was not modeled however, as it would require a completely different resource acquisition schedule that would not be comparable to the other scenarios.

To explore one aspect of future Electrification, MEAN asked member communities about their interest in one of the biggest drivers of increased electric load: electric vehicles. To begin a determination of future load growth due to electric vehicle load, MEAN asked about the installation of charging infrastructure and the interest in the application of funding sources for these installations. The response indicated that this increased load may be developing in several MEAN communities in the coming years. The survey questions and responses are illustrated below:

Is your community interested in the installation of electric vehicle charging infrastructure?

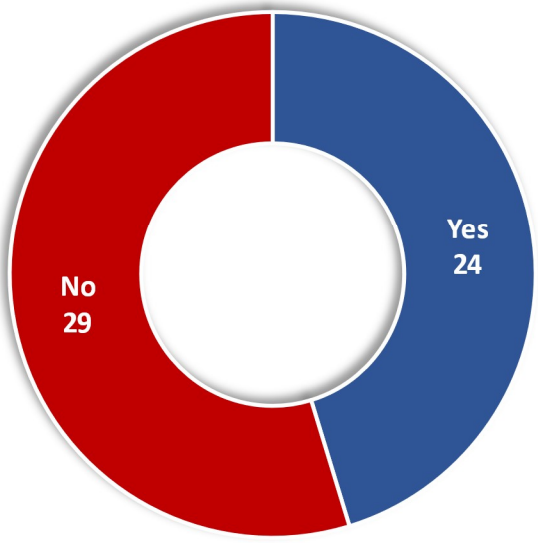


Figure IV-2

Would your community be interested in funding opportunities for electric vehicle infrastructure if state or local funds were available for this purpose?

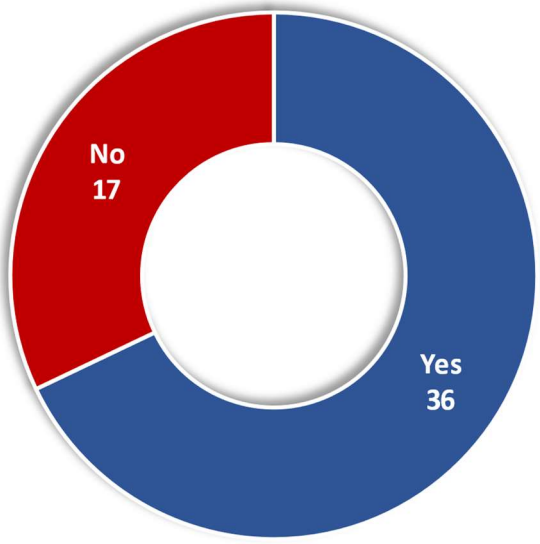


Figure IV-3

D. Future Load Acquisition

MEAN maintains a goal toward strategic growth to benefit the membership and the long-term health of the organization. This means adding new load when it can be economically served. When Requests for Proposals for power supply are released, MEAN conducts a statistical analysis to determine the cost at which the load can be served by the existing Power Supply System or future resources if needed. Adding load, particularly when new resources are not required, benefits the remainder of the total requirements participants as MEAN's fixed costs are allocated among more communities.

Obviously, although load addition is a priority for MEAN, it cannot be accurately forecast. Therefore, this represents an unknown potential change in MEAN's load and resource balance and the timing and magnitude of future resource needs.

E. Energy Markets

In the integrated markets, loads are served and resources dispatched according to market dynamics and the balance of bids and offers in an attempt to cost effectively optimize the pool of resources. In addition, the Transmission Congestion Rights markets give participants a financial hedge against the market price fluctuations that occur due to transmission congestion.

Since the establishment of the SPP and MISO Integrated Markets, several changes have been introduced that have changed the way resources are designated to load, the way resources are dispatched into the marketplace, and energy prices and cost recovery for generation resources. Given the fast pace of developments in the markets, it is likely that changes will continue in the future.

Within the integrated markets, market prices are determined by variable costs of generating units throughout the entire market. Therefore, the construction of new units and retirement of existing units has the potential to change the order of economic dispatch of resources and, as a result, marginal pricing. The integration of non-dispatchable, renewable generation into the resource mix impacts the operation of other resources, particularly peaking units dispatched in response to supply fluctuations and cycling coal plants.

SPP and MISO perform Effective Load Carrying Capability (*"ELCC"*) studies to calculate the capacity value of renewable capacity and determine the impacts of continued renewable capacity growth. ELCC is defined as the amount of incremental load a resource can reliably serve, while also considering probabilistic parameters of unserved load caused by forced outages, load uncertainty, and other factors. ELCC study results indicate that with increasing penetrations of wind and solar resources, the capacity value provided by those resources as a percent of nameplate capacity generally tends to decrease. This has impacts on the magnitude of resources needed to serve load, which directly affect the inputs and results of this analysis.

Both SPP and MISO are also contemplating changes to resource accreditation, resource adequacy, outage scheduling, and seasonality of the market construct, among other investigations.

Adding to all of these market uncertainties the possibility of the SPP West or CAISO expansions in the west region increases the potential for unforeseen circumstances within MEAN's power supply system.

F. Fuel Pricing

1. Natural Gas

Recent natural gas pricing has been extraordinarily high and has experienced considerable volatility, as shown in *Figure IV-4*.

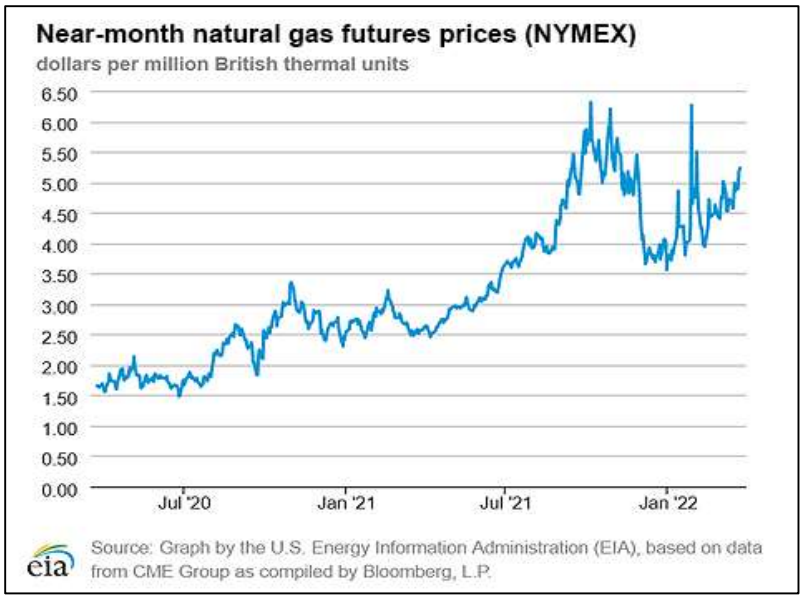


Figure IV-4

There are myriad factors influencing this natural gas price hike. Domestic demand is rebounding after the lull in consumer and manufacturing activity caused by the Covid-19 pandemic. Simultaneously, the supply side has slowed as natural gas producers are still at the reduced levels of the pandemic economy.

The European energy climate also caused upward pressure on prices. Storage levels in Europe were down due to a more intense winter season in 2020. Wind and hydropower output were low on the European continent as well, meaning increased demand for natural gas-fired power. Europe relies heavily on natural gas from Russia, which has slowed exports due to political frictions. Recent upticks in demand from Asia are also tightening the supply market.

The months-long escalation in natural gas pricing has an obvious correlation with energy prices. The following figure from the *SPP MMU State of the Market Report* illustrates these recent trends.

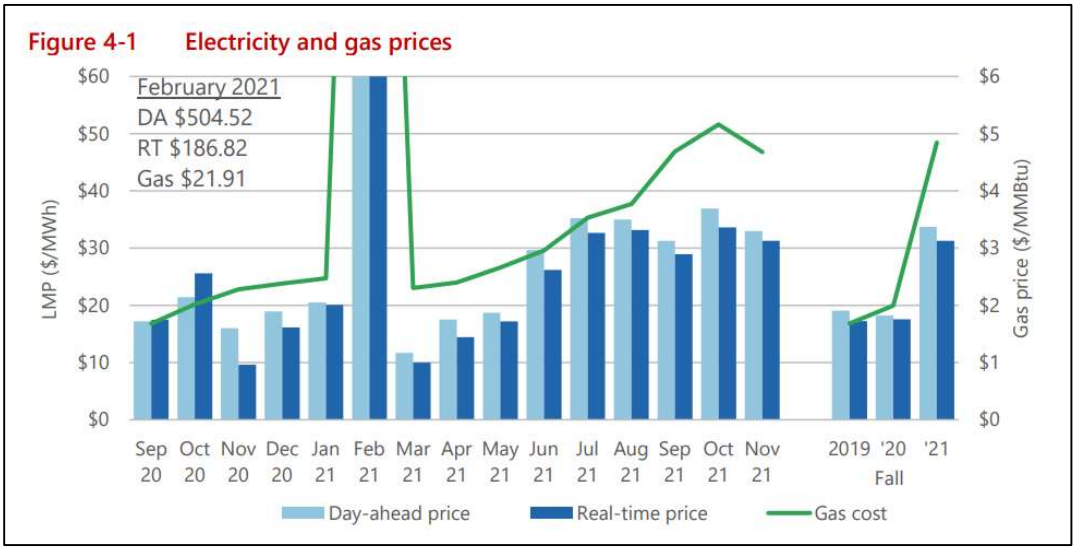


Figure IV-5

Not only are prices high, but pricing has been experiencing considerable volatility, which makes economic projections and modeling less reliable.

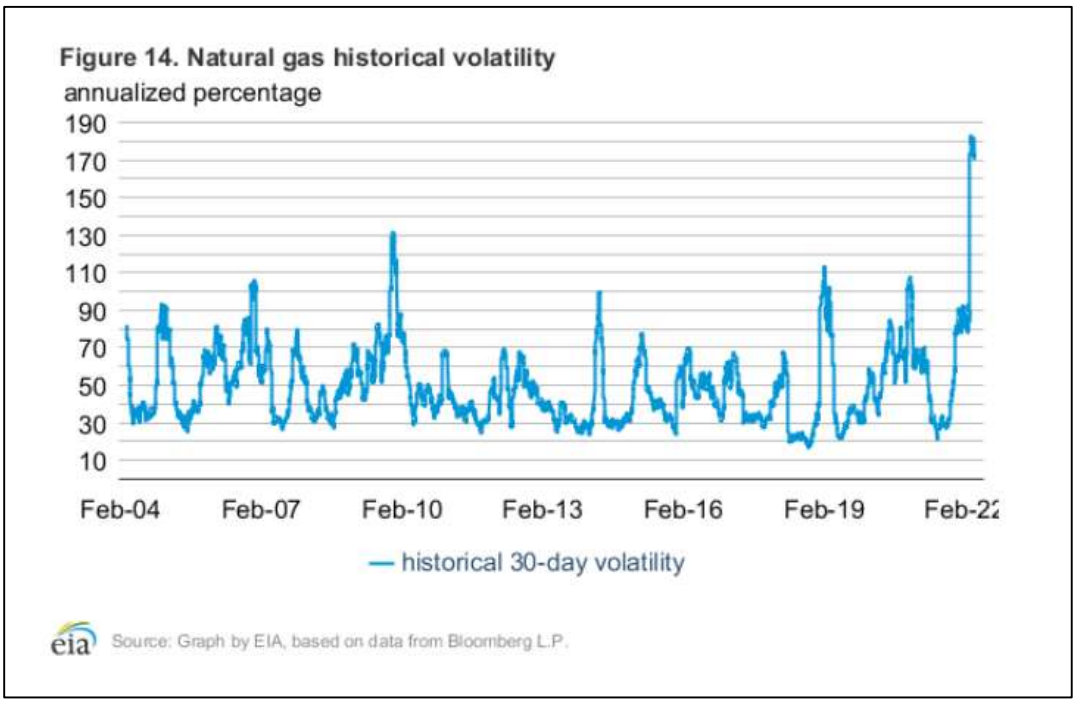


Figure IV-6

Natural gas prices are likely to remain elevated for years to come. The EIA Short-Term Energy Outlook from January 2022 predicts a continuation of prices around the $4 per MMBtu range.

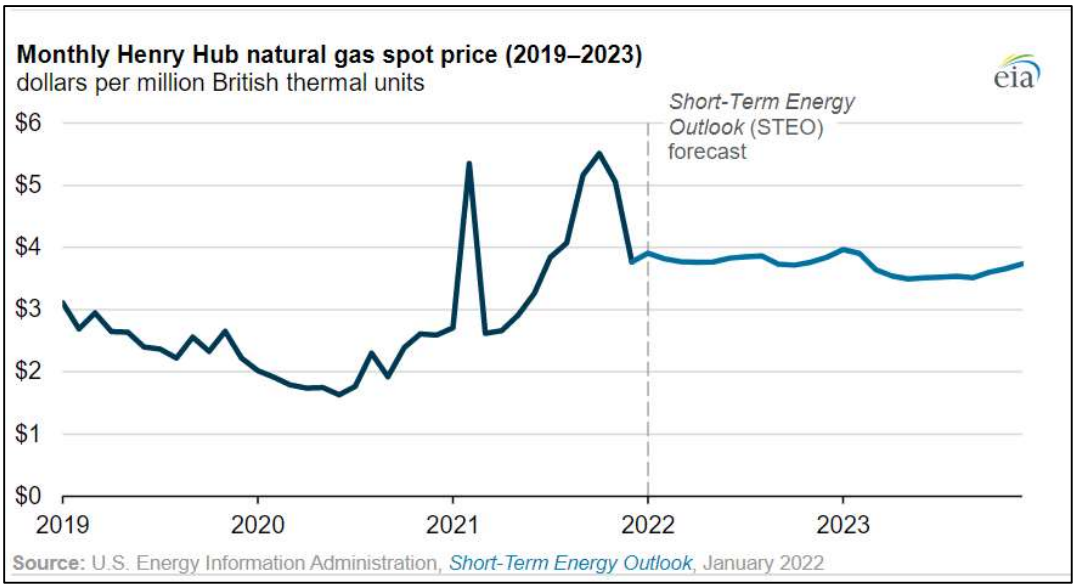


Figure IV-7

Due to the number of factors that influence natural gas pricing and the interconnection of those factors, this input remains an item of inherent uncertainty.

2. Coal

Coal prices in the US have stabilized in recent years and remained relatively low. Coal in most regions has seen flat or declining pricing over the past ten years. Coal for electricity production is typically purchased, at least in part, on long term contracts, thereby dampening the pricing volatility. A ten-year trend is shown in *Figure IV-8*.

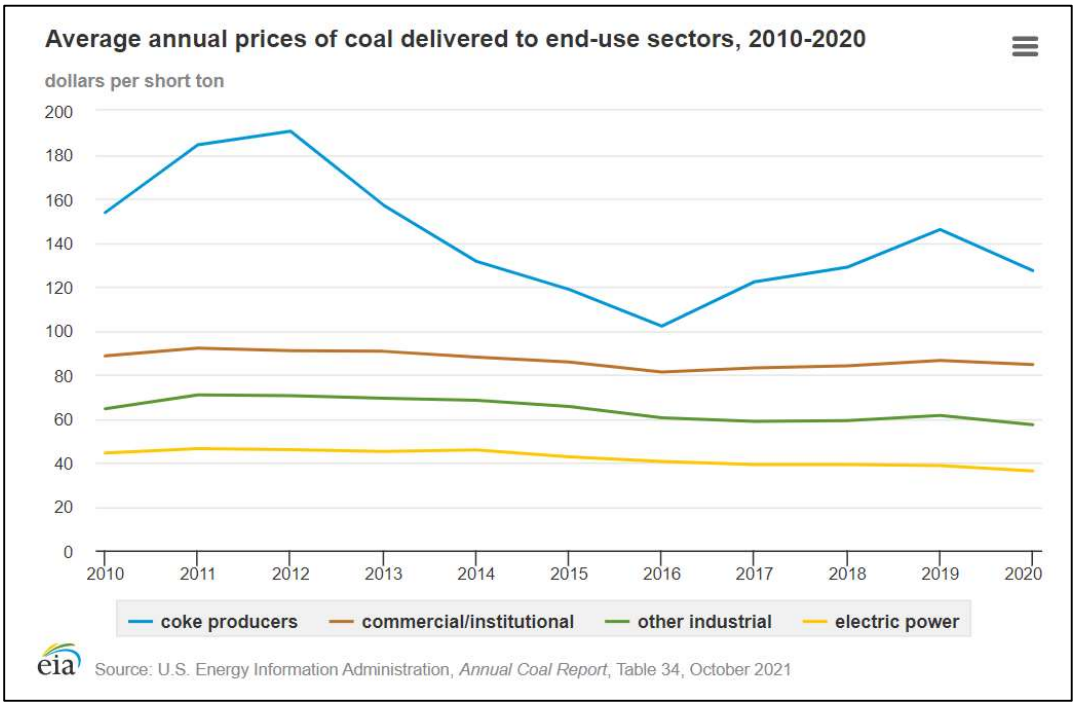


Figure IV-8

Particularly in contrast to the recent upsurge and unpredictability of natural gas prices (depicted as Henry Hub spot price below), coal prices are very constant and look to remain so for at least the short term.

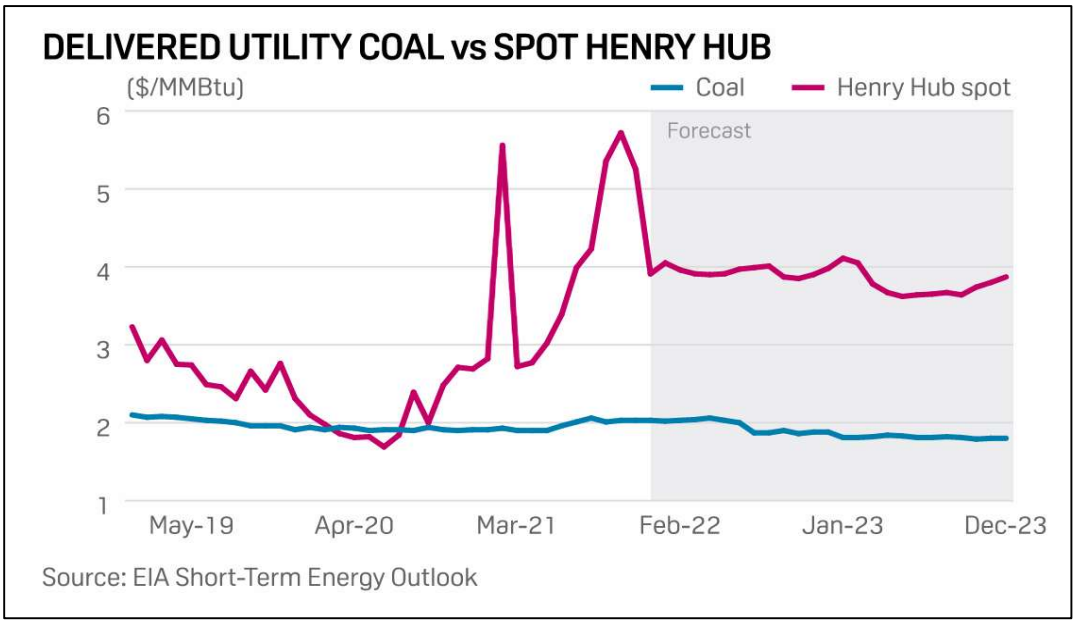


Figure IV-9

Global power markets and economics will certainly play a part in future coal prices, and supply conditions will also factor in as mining and transport companies attempt to weather the impacts of the changing domestic market.

G. Existing Resource Contracts

MEAN is a party to a number of long-term resource contracts. Existing resources are detailed in Section VI. These contracts represent a limitation on the changes MEAN can make in the future portfolio. Contract terms dictate that MEAN must receive and pay for the output of the resources and/or pay the costs incurred by the resource. MEAN is required to pay the costs of these resources through the contract term, and in so doing, it becomes the most economical option to use the generation of these resources to serve load. To increase future carbon free energy purchases to replace the generation of carbon-emitting resources under contract or to generate far in excess of load needs would result in unnecessary cost increases to MEAN members. Non-compliance with the terms of the contracts would result in additional financial penalties. Therefore, future portfolios are sized with the assumption that MEAN will continue to utilize the output of resources to which MEAN is contractually obligated.

H. Other Factors

In addition to these items described above, a number of other factors are having or may have significant impacts on the electric utility industry generally and on the financial and operating condition of individual utilities. These factors include, among other things:

- corporate or utility clean energy goals
- commercial viability and development of new generating technologies or environmental controls.
- the development and impact of alternate energy sources, and government changes to tax credits and grants for renewable energy projects;
- the lack of a comprehensive national energy policy;
- effects of competition from other electric utilities (including increased competition resulting from mergers, acquisitions and strategic alliances of competing electric and natural gas utilities), independent power producers and marketers, brokers and federal power marketing agencies
- grid expansion allowing the transmission of less expensive electricity from greater distances over an interconnected system;
- changes in state regulations that determine the pricing and incentives for distributed generation, including net metering rate structures;
- volatility in the price of energy purchased on the wholesale market that may occur in times of high peak demand;
- local, regional and national economic conditions.

It is not possible to predict what impact these and other factors will have on the financial and operating position of MEAN or the Participants. The foregoing discussion is a general summary of complex matters. This discussion is not comprehensive or definitive and the matters discussed are subject to change.

V. System Load Forecast

A. Methodology

1. Non-Coincident Peak Demand

MEAN employed multiple regression analysis to forecast the non-coincident peaks for each of its Total Requirement Participants for FY 2022-2023 (annual forecast) thru FY 2037-38 (15-year forecast). The annual forecast model utilized the daily peak demand data from 2006 to 2021 as a dependent variable, while the 15-year forecast model used monthly peak demand data of the same period. Both models took into consideration three main categories of independent variables: economic factors such as population growth and income growth; temperature factors such as average daily temperature, heating degree days (*"HDD"*) and cooling degree days (*"CDD"*); and calendar factors such as weekdays and month. Historical average daily temperatures, HDD and CDDs were gathered from NOAA station data, historical population data were gathered from the U.S. Census Bureau, and historical income data was sourced from the Bureau of Labor Statistics. The estimated population and income data used for the forecast were calculated from separate simple linear regressions.

To ensure that monthly peak demand was forecasted under normalized weather conditions for each town, actual weather data from the past ten years was used, and ten sets of monthly peak demand were forecasted. The median was used as the normalized peak demand of the town for the given month. Non-coincident peak demand was then calculated by summing all the normalized peak demands of each town for each month.

2. Energy for load forecast

The same methodology used in the 15-year peak demand forecast was used for energy forecasts for each town. The only modification was the change of the dependent variable from monthly peak demand to monthly energy usage. All data was obtained from the same resources as in the demand forecast, and the same weather normalization process used in the demand forecast was used in the energy forecast.

3. Coincident Peak Forecast

The coincident peak forecast is calculated as MEAN's non-coincident peak multiplied by the coincidence factor. The coincidence factor was forecasted based upon regression analysis of the difference between the mean temperature and the max temperature at the time of historical peaks. The historical weather data used in the regression was based on NOAA station data. The historical coincidence factor used for regression was derived by using the dates and times of historical peak. In the detailed regression analysis, a stepwise selection procedure was used and two variables, Max Temperature Differential and Mean Temperature Differential, were selected to define the equation for the coincidence factor.

To arrive at the expected weather normal coincidence peak, MEAN looked at historical mean temperature differences and the max temperature differences for all the dates and times of historical peaks. The medians were then calculated and reinserted into the regression equation to find the expected coincidence factor. The final expected coincident factor was 96.24% in SPP, 93.94% in MISO, and 96.43% in the West.

The regression analysis also resulted in the below statistical output:

- Model description and fit
- Residual Analysis
- Variance Inflation Factors (Collinearity Analysis)
- ANOVA (Analysis of Variance)
- Confidence Intervals
- Forecast Evaluation Statistics

4. Annual Participant Load Survey

To validate the load forecast statistical calculations, MEAN conducts an annual load survey to all participants. MEAN presents the results of its 15-year forecast for the participant community and asks the representatives to review it with their knowledge of the community's peak load and energy consumption.

Specifically, the survey asks if there are any recent or planned additions to load or losses of load. Any information collected in response to the survey is then incorporated into the community's load forecast and the regional and system-wide forecasts are corrected accordingly.

B. Factors Affecting Load Growth

MEAN Participants and their end-use customers are implementing demand side management (*"DSM"*) measures to reduce peak demand and/or energy use. MEAN administers DSM programs to control peak demand to minimize the need for future resources. Participant utilities adopt DSM programs to decrease their peak demand in an effort to lower the Fixed Cost Recovery Charge paid to MEAN, which is based on the 3-year historical average peak. End-use customers participate in DSM programs to reduce their utility bill. Although the actual impact of these measures is often difficult to measure or predict, successful DSM programs will ultimately slow the rate of load growth into the future.

Growing awareness of energy issues and pricing has increased customer interest in owning generation to serve their own load. As technologies become more available and affordable, MEAN Participants and their end-use customers will have more incentive to install distributed generation assets. From residential rooftop solar to industrial combined heat and power to community wind and solar, distributed generation is being aggressively marketed and eagerly adopted. These assets ultimately decrease the load obligation that MEAN has to serve by increasing behind-the-meter capacity. MEAN's Renewable Distributed Generation policy was updated in November of 2019 to increase the size of allowable installation of community-owned and locally-sited renewable resources from 2% of annual energy consumption to 5% of annual energy consumption. MEAN does not limit distributed generation installations of retail end-use customers.

Energy efficiency and energy conservation are widely promoted initiatives and are becoming easier to integrate into everyday life. As electricity rates increase, the economic benefit of efficiency and conservation gives consumers, businesses, and institutions ample reason to adopt behaviors and make purchases with the goal of reducing energy consumption. This has a long-term effect on all load profiles.

C. Recent Developments

Since the submittal of the 2017 IRP, MEAN's load has been impacted by a few changes to the organization's membership.

1. Load Loss

Since 2017, no MEAN power supply Participants have discontinued their contracts, and therefore MEAN has not lost wholesale load customers. However, some MEAN participants have recently lost load within their individual communities. MEAN and NMPP continually work with the membership to prevent and mitigate negative impacts of such load loss.

2. Load Additions

Since the 2017 IRP, MEAN has engaged the following additional power supply obligations:

- Center, Colorado signed a 5-year SSJ contract for limited term total requirements power supply in excess of their WAPA allocations. The contract effective date was April 1, 2020.
- Glenwood Springs, Colorado extended their SSK-1 contract for limited term total requirements power supply in excess of their WAPA allocation, which was originally set to expire on December 31, 2022. The new contract effective date was June 1,2019 with a 10-year term.
- Holyoke, Colorado extended their SSJ contract for limited term total requirements power supply in excess of their WAPA allocations, which expired on September 30, 2018. The new contract effective date was October 1, 2018 with a 5-year term.
- Wray, Colorado extended their SSJ contract for limited term total requirements power supply in excess of their WAPA allocations, which expired on June 30, 2018. The new contract effective date was July 1, 2018 with a 5-year term.
- Lake View, Iowa extended their SSJ limited term total requirements power supply contract for power needs in excess of their WAPA allocation, which was originally set to expire on May 31, 2021. The new contract effective date was June 1, 2021 with a 3-year term.
- Snyder, Nebraska extended their SSJ limited term total requirements power supply contract, which was originally set to expire on May 31, 2021. The new contract effective date was June 1, 2020 with a 6-year term.
- Trenton extended their SSJ limited term total requirements power supply contract, which was originally set to expire on December 31, 2021. The new contract effective date was January 1, 2021 with a 10-year term.

As opportunities are announced via Requests for Proposals, MEAN engages in deliberate analysis to determine the benefits and costs of service additions and responds to all viable requests. MEAN continues to pursue additional load, through the initiation of new contracts and assisting existing communities with economic development to grow loads within their territories.

D. Reserves and Transmission Losses

MEAN must maintain capacity to serve not only the forecasted load in each region, but the total resource obligation which adds to the peak demand a reserve margin and transmission losses.

1. Reserve Margin

The SPP and MISO market constructs require each load serving entity to maintain a designated percentage of reserve capacity in addition to the entity's forecasted peak load.

The SPP Open Access Transmission Tariff requires a Load Responsible Entity (LRE) to maintain adequate capacity to meet its Resource Adequacy Requirement for the upcoming summer season. Maintaining appropriate planning reserves ensures that SPP will have sufficient capacity to serve peak demand obligations. The Planning Criteria defines the Planning Reserve Margin (PRM) as 12% for each LRE, unless the LRE's capacity is comprised of at least 75% hydro-based generation, in which case the PRM for the LRE is 9.89%.

In MISO, the required Planning Reserve Margin (*"PRM"*) is calculated such that the Loss of Load Expectation (*"LOLE"*) for the next planning year is one day in 10 years. The minimum amount of capacity above Coincident Peak Demand in the MISO region required to meet the reliability criteria is used to establish the PRM. The PRM is established as an unforced capacity requirement based upon the weighted average forced outage rate of all Planning Resources in the MISO Region. For the 2021-22 planning year, the PRM is 9.4%. As the MISO definition of the PRM is specific to the operation of the upcoming year, the PRM changes annually. The most recent LOLE study shows the PRM trending slightly lower in future years.

For loads and resources in the west, there is no prescribed reserve margin. MEAN incorporates a 12% reserve margin in addition to forecasted load when determining the load and resource balance in the west. The Western Power Pool is currently collaborating with SPP to design a resource adequacy program, termed the Western Resource Adequacy Program, which would establish a reserve margin in the west region. Enforcement and compliance of this program is undetermined at this time.

MEAN adds the required margins to the forecasted peak demand to determine the total obligation for service in each region. This value is reflected in the figures throughout this section.

2. Transmission Losses

MEAN's total obligation for service must also include the losses that occur throughout the transmission system. The rate of loss depends on the transmission system and is typically reported to MEAN on an annual basis. However, MEAN does not have to provide for transmission loss on WAPA allocations. Therefore, this amount is deducted from the calculations. In total, MEAN serves network load on six transmission systems. Because of variation in WAPA allocations as a percentage of load and locations on different transmission systems, the calculated loss factor for each Participant community is unique.

Calculated transmission loss is included in the charts shown throughout this section.

E. Load Forecast Scenarios

With many unknown factors potentially impacting MEAN's future load obligations, the IRP considers resource needs under a variety of future load scenarios. Five scenarios were investigated:

1. Load Scenario 1: Reference Case

Load Scenario 1: Reference case load forecast, which is based on normalized weather and represents the 50% confidence interval of the statistical distribution. Annual load growth is approximately 0.11% over the 15-year time period.

2. Load Scenario 2: Low Load

Load Scenario 2: Low load scenario, which is based on normalized weather and represents the 10% confidence interval of the statistical distribution. Annual load growth is approximately 0.11% over the 15-year time period.

3. Load Scenario 3: High Load

Load Scenario 3: High load scenario, which is based on normalized weather and represents the 90% confidence interval of the statistical distribution. Annual load growth is approximately 0.11% over the 15-year time period.

4. Load Scenario 4: Electrification

Load Scenario 4: Electrification scenario, which is based on normalized weather and assumes a high rate of electrification throughout the footprint. This may be facilitated by electric home appliances, conversion of building heating and cooling systems, electric vehicle adoption, and other methods of replacing technologies traditionally powered by fossil fuels with those powered by electricity. The inputs to this load forecast scenario were informed by NREL's Electrification Futures Study. Annual load growth is approximately 1.4% over the 15-year time period. This load scenario was not modeled, as it would require a completely different resource acquisition schedule that would not be comparable to the other scenarios.

5. Load Scenario 5: Recession

Load Scenario 5: Recession scenario, which is based on normalized weather and represents a scenario in which an economic recession takes place mid-way through the time period. Recovery follows historical patterns. Annual load growth is varying throughout the time period as conditions change.

The graphs illustrating regional and system load forecasts below show all five scenarios. The first set of graphs per region groups the scenarios together on an annual basis for comparison. The next set of graphs per region breaks out the scenarios and shows seasonal data for each scenario.

F. SPP

As shown in *Figure V-1* for the period of 2022 to 2037, the summer peak demand for SPP is expected to increase slightly from 184,950 kW to 186,810 kW. If not renewed, the contracts of Paxton, Snyder, and Trenton will expire in 2024, 2026, and 2031 respectively but don't have a major influence on the SPP total demand. The minor reduction in demand from 2028 to 2029 represents the expiration of the WAPA Displacement contract at which time MEAN will no longer

have the load obligation for WAPA's customers' reserve margin. The remainder of the years see an average 0.5% increase in peak demand.

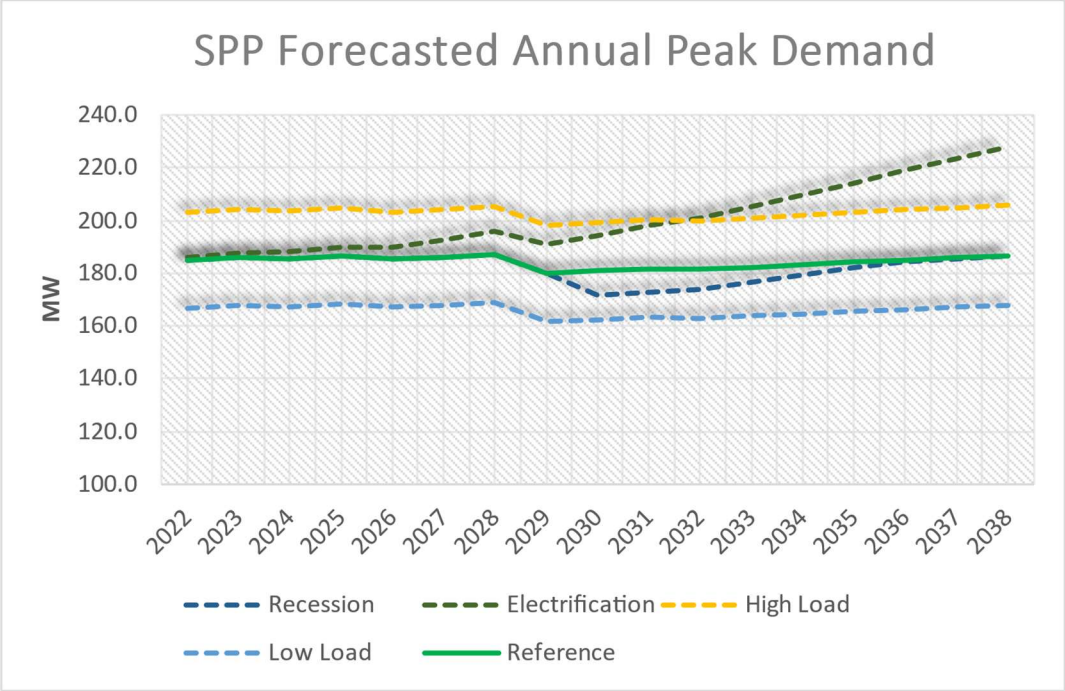


Figure V-1

The energy forecast for SPP looks much the same as peak demand. Over the 15-year study period, energy consumption increases an average of 0.19% year-over-year.

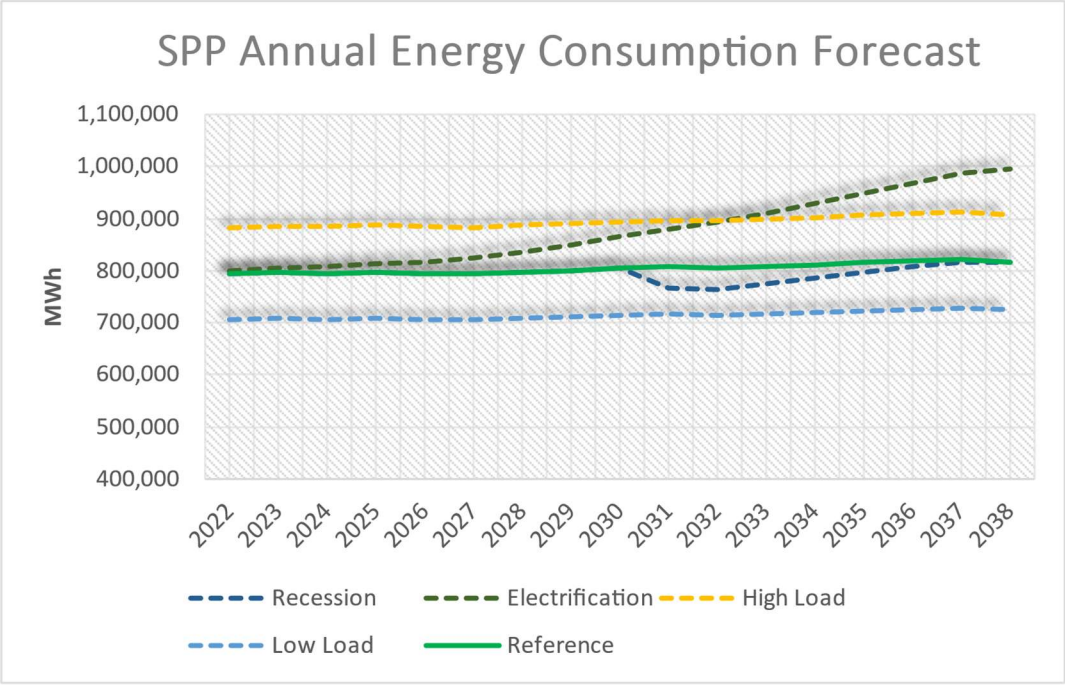
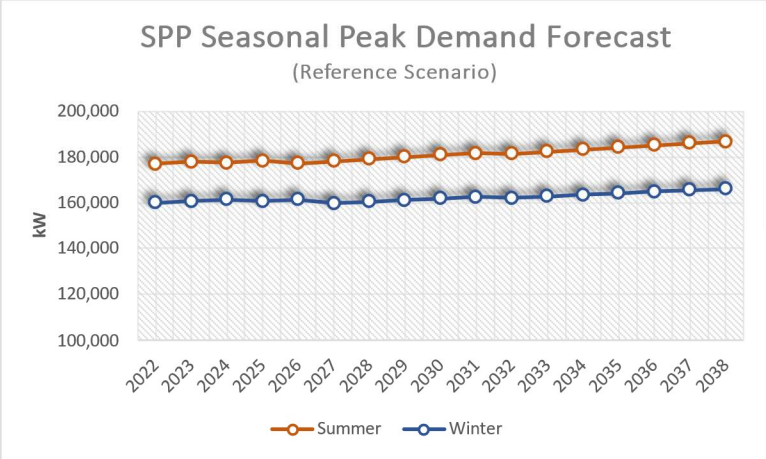


Figure V-2

For a seasonal view, the following charts illustrate the SPP peak demand and energy consumption for each of the load forecast scenarios.



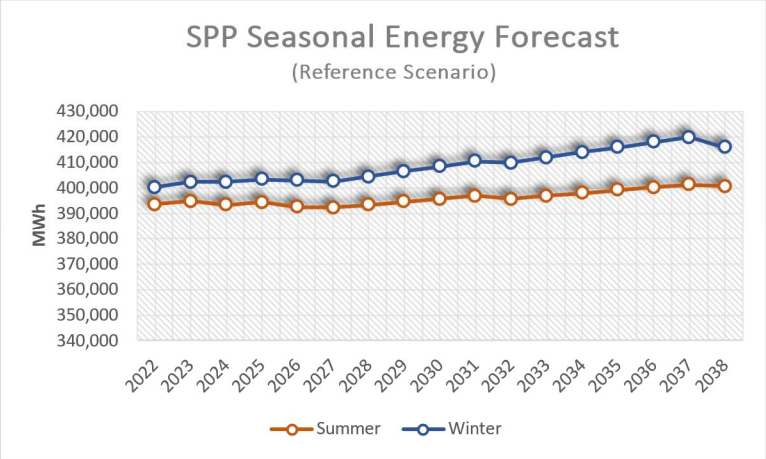
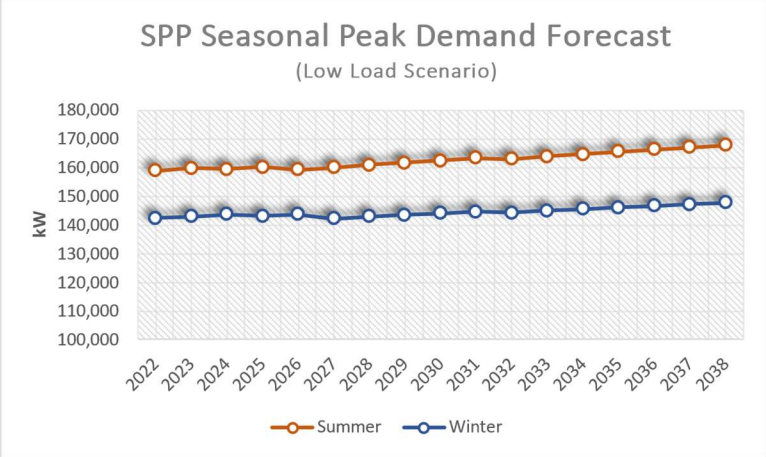


Figure V-3



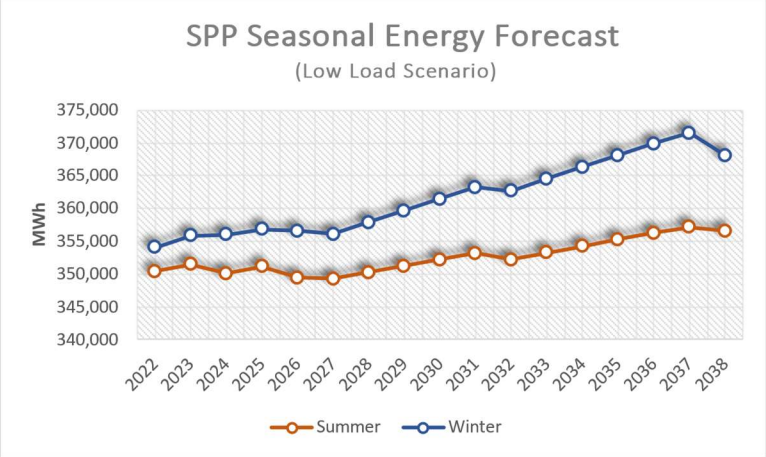
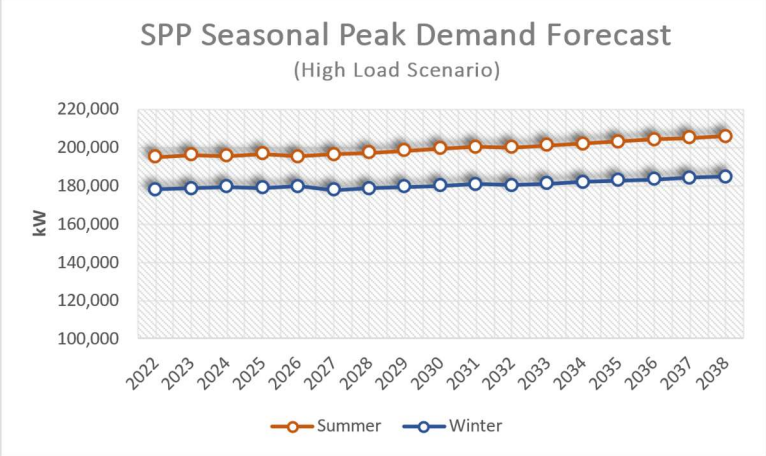


Figure V-4



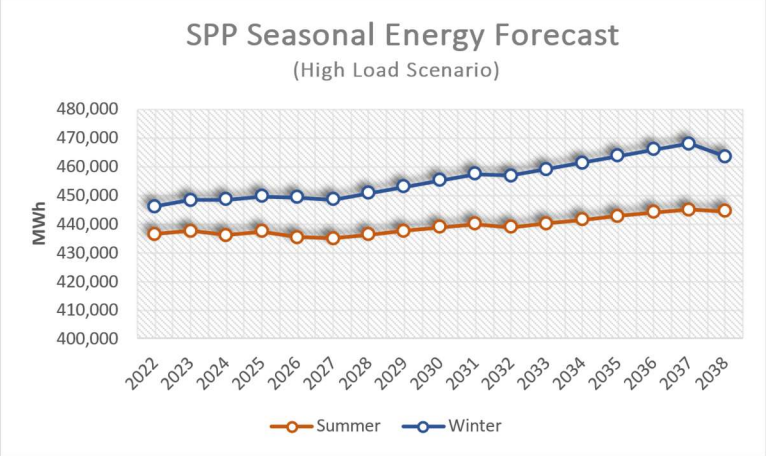
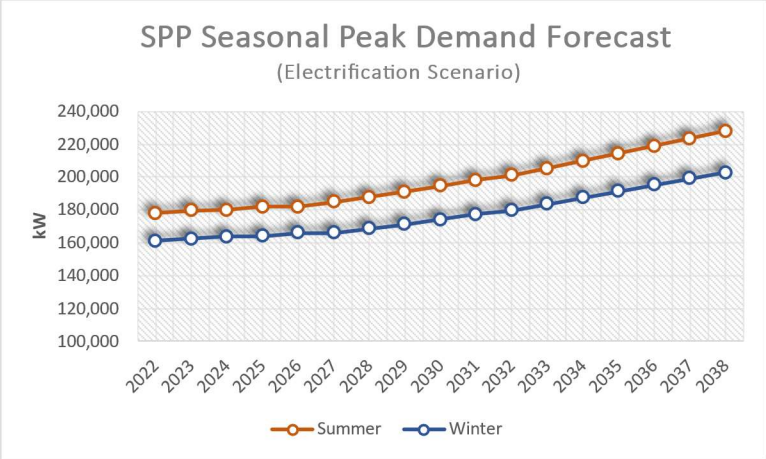


Figure V-5



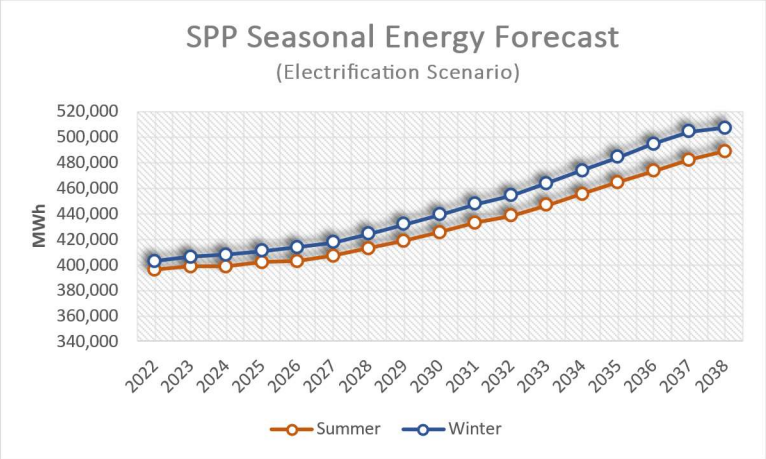
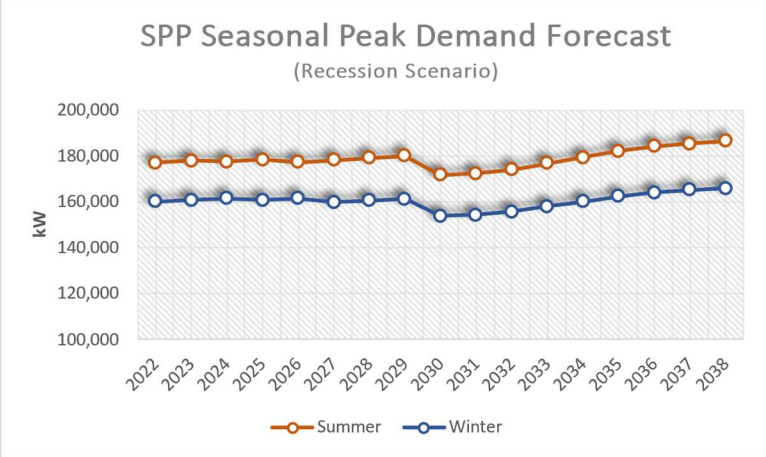


Figure V-6



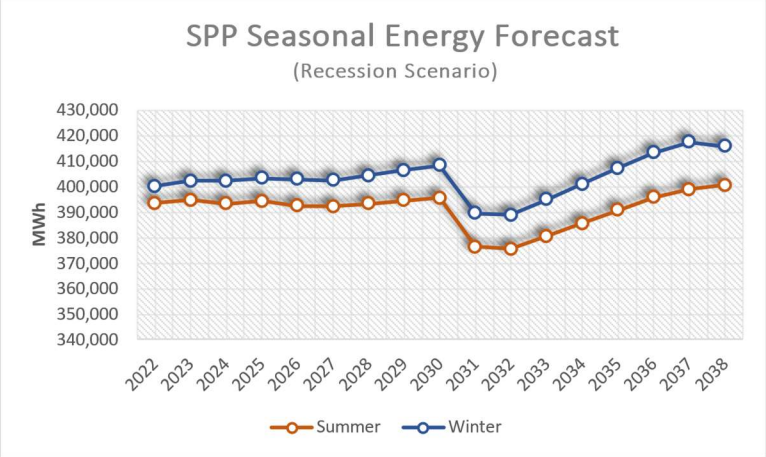


Figure V-7

Figure V-8 summarizes the SPP participant contracts that were initiated or are set to expire from the date of the previous IRP submittal through the end of the study period.

SPP Region Participants Schedule Start Dates 2017-2022			
Town	Schedule	RTO	Schedule Start Date
Snyder	J	SPP	6/1/2020
Trenton	J	SPP	1/1/2021
SPP Region Participants Schedule End Dates 2017-2037			
Town	Schedule	RTO	Schedule End Date
Sargent	K	SPP	2/28/2017
Paxton	K	SPP	2/28/2024
Snyder	J	SPP	5/31/2026
Trenton	J	SPP	12/31/2031

Figure V-8

G. West

As shown in *Figure V-9*, for the period of 2017 to 2032, the peak demand for the west is expected to decrease from 215,480 kw to 194.880 kW. If the contracts are not renewed, decreases will

occur due to the contract expiration of Wray and Holyoke in 2023, Center in 2025, and Glenwood Springs in 2029. In years without terminations, the average load increase is 0.4% annually.

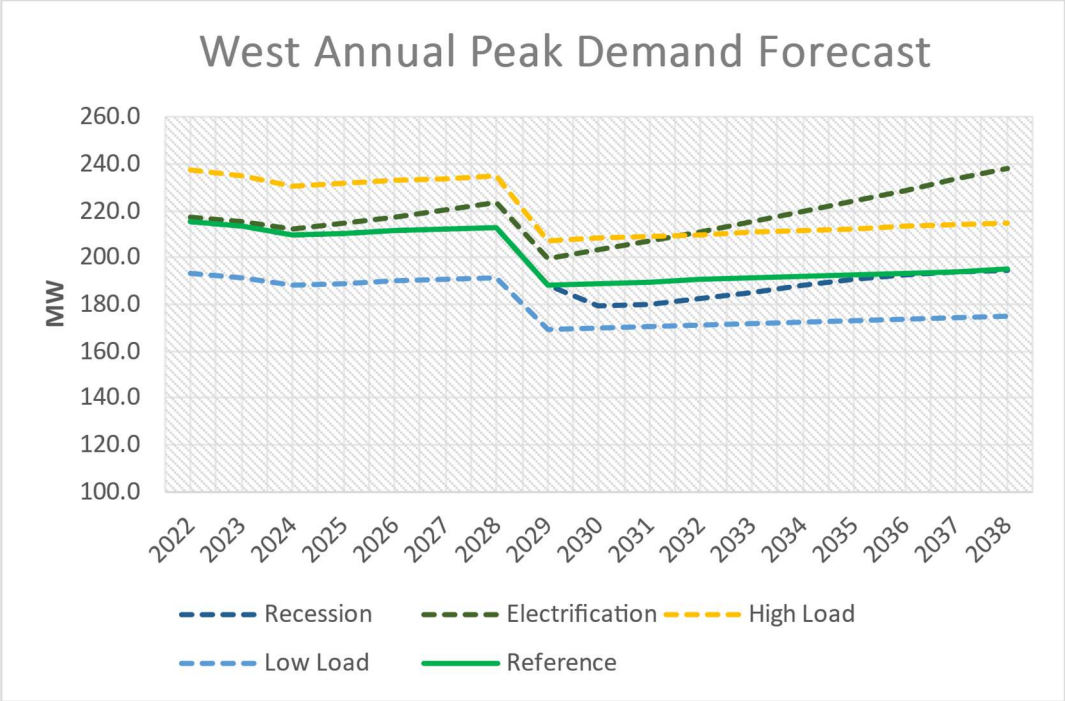


Figure V-9

As shown in *Figure V-10*, for the period of 2017 to 2032, the annual energy requirement is expected to decrease at varying rates until 2029, and then increase at a modest average rate of 0.49%. Once again, the decreases will occur in the energy requirement due to the contract expiration (if not renewed) of Wray and Holyoke in 2023, and of Glenwood Springs in 2029.

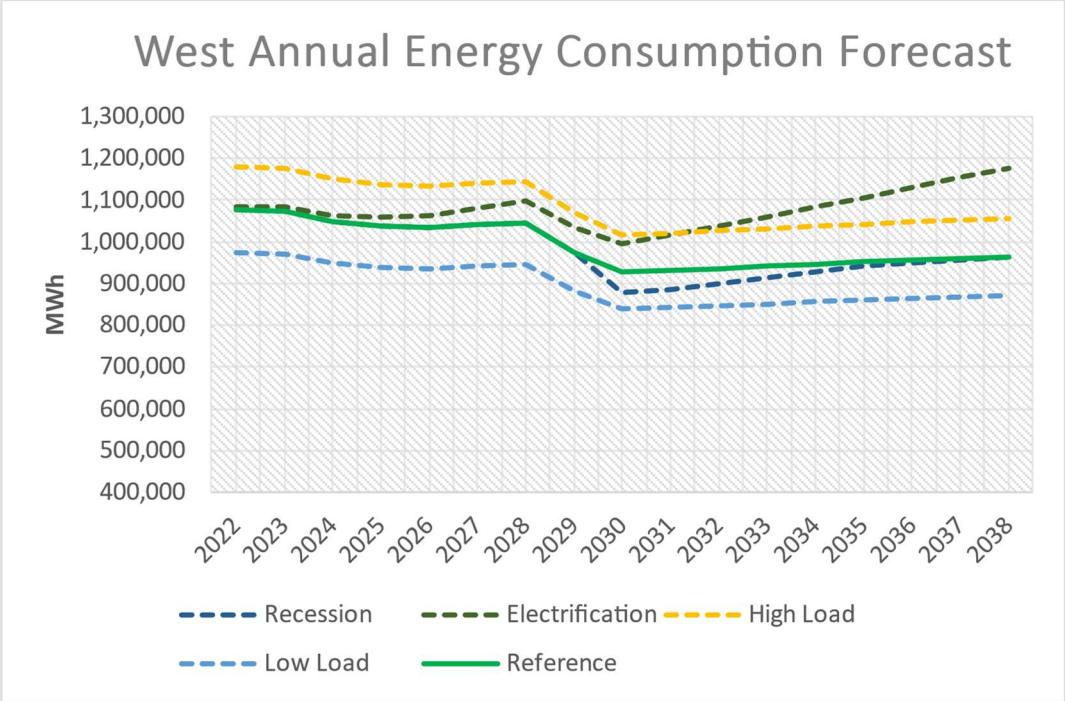
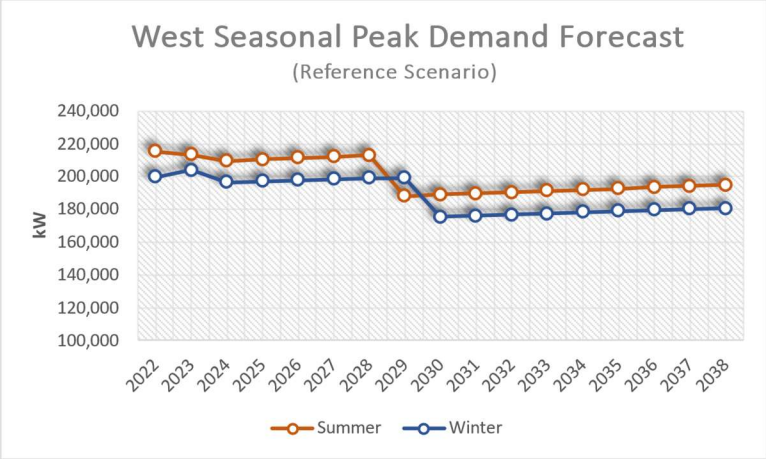


Figure V-10

The unique load profile of the West can be seen clearly in the following graphs, which represent the seasonal peak demand and energy for each of the load scenarios.



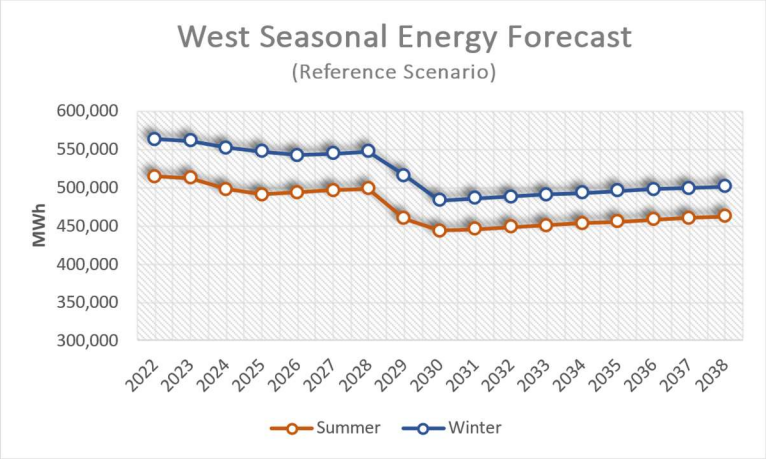
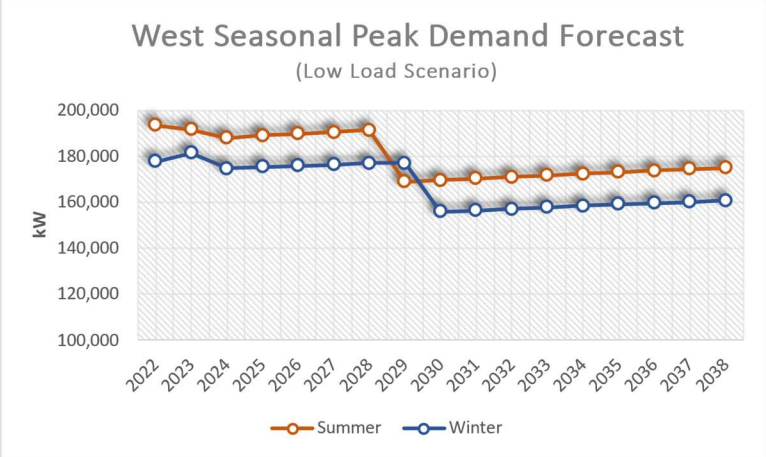


Figure V-11



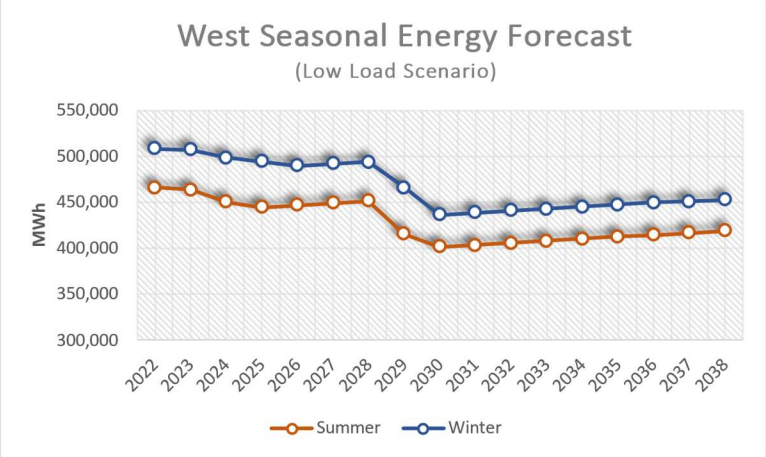
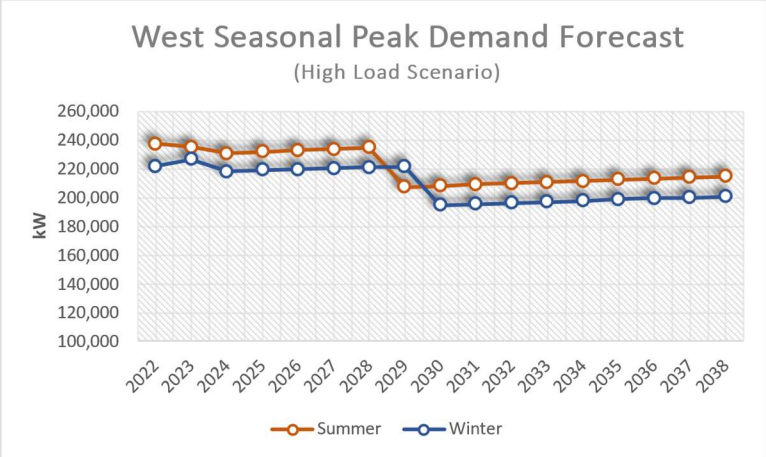


Figure V-12



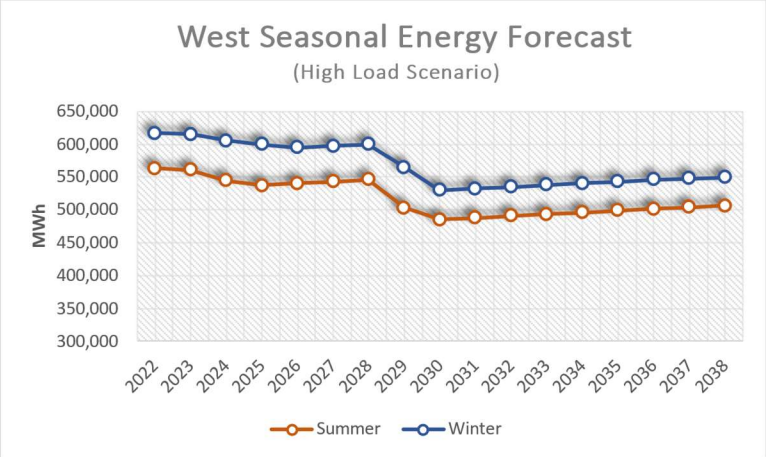
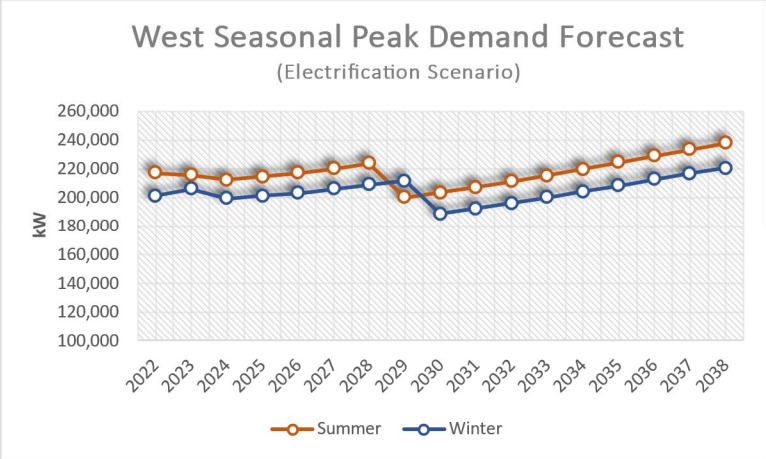


Figure V-13



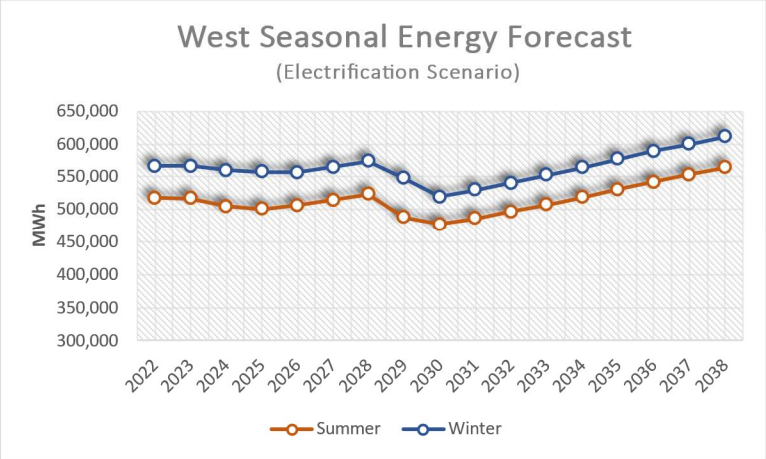
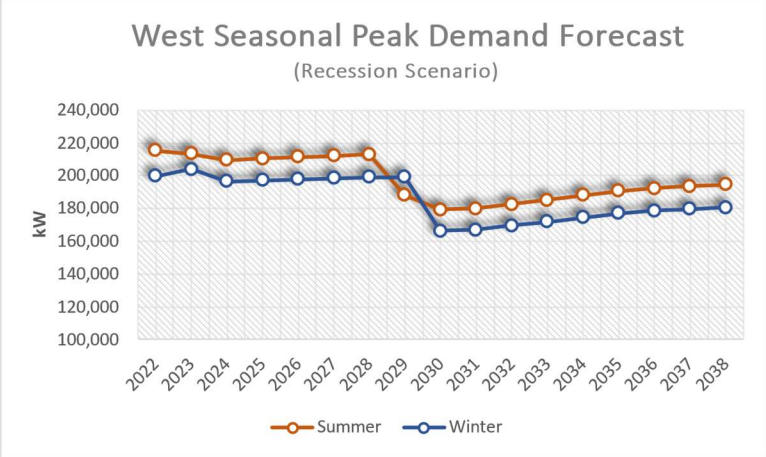


Figure V-14



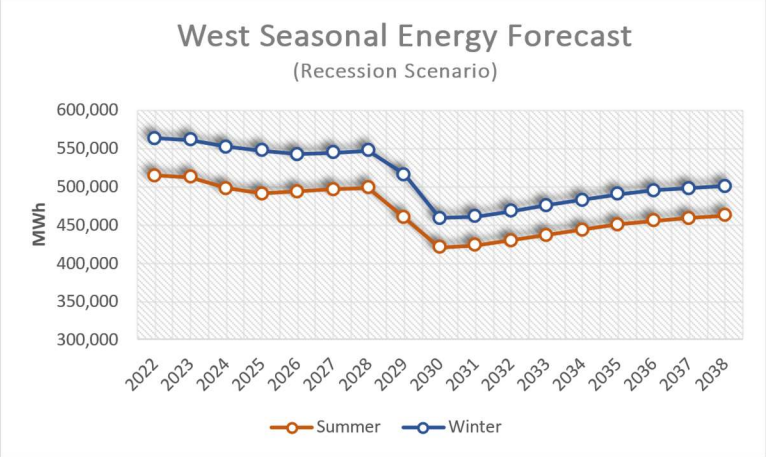


Figure V-15

Figure V-16 summarizes the west region participant contracts that were initiated or are set to expire from the date of the previous IRP submittal through the end of the study period.

West Region Participants Schedule Start Dates 2017-2022			
Town	Schedule	RTO	Schedule Start Date
Wray	J	West	7/1/2018
Holyoke	J	West	10/1/2018
Glenwood Springs	K-1	West	1/1/2013
Center	J	West	4/1/2020
West Region Participants Schedule End Dates 2017-2037			
Town	Schedule	RTO	Schedule End Date
Wray	J	West	6/30/2023
Holyoke	J	West	9/30/2023
Center	J	West	3/31/2025
Glenwood Springs	K-1	West	5/31/2029

Figure V-16

H. MISO

MISO experiences a very consistent load curve. A slight decrease in peak demand will occur from 2023 to 2024 due to the contract expiration of Lake View (if not renewed). The average year-over-year load decreases 0.127% after this load reduction for an essentially flat long-term load forecast.

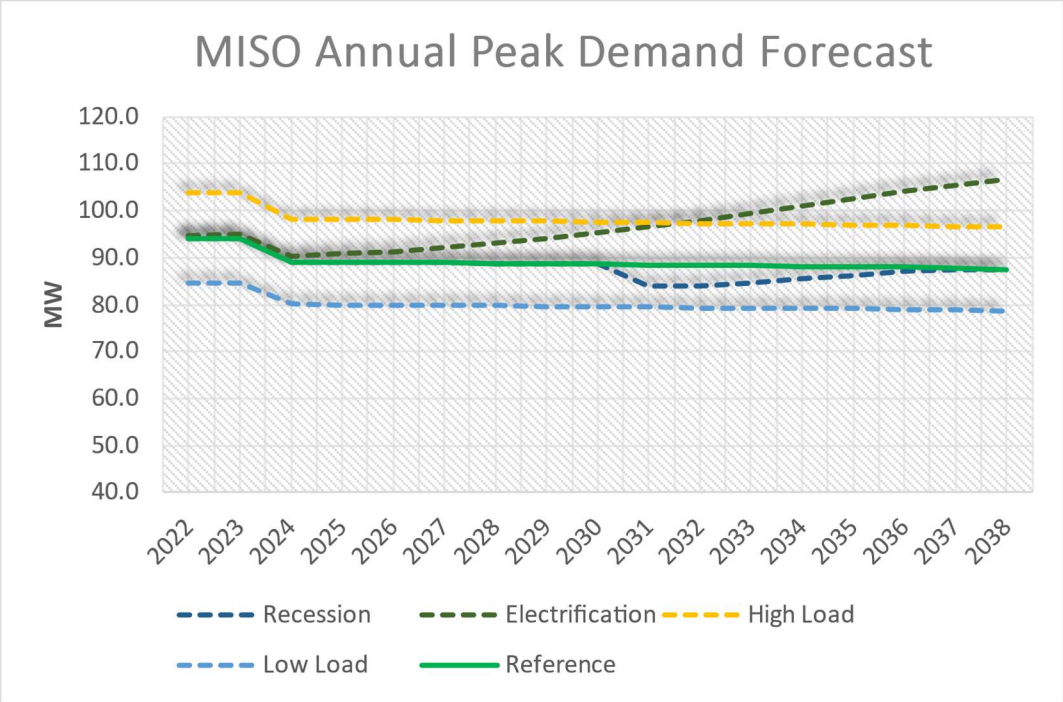


Figure V-17

As with peak demand, the energy consumption in MISO sees little change on an annual basis. A slight energy requirement decrease will occur in 2024 due to the contract expiration of Lake View (if not renewed). For the years following, the energy requirements in MISO decrease by 0.14% each year.

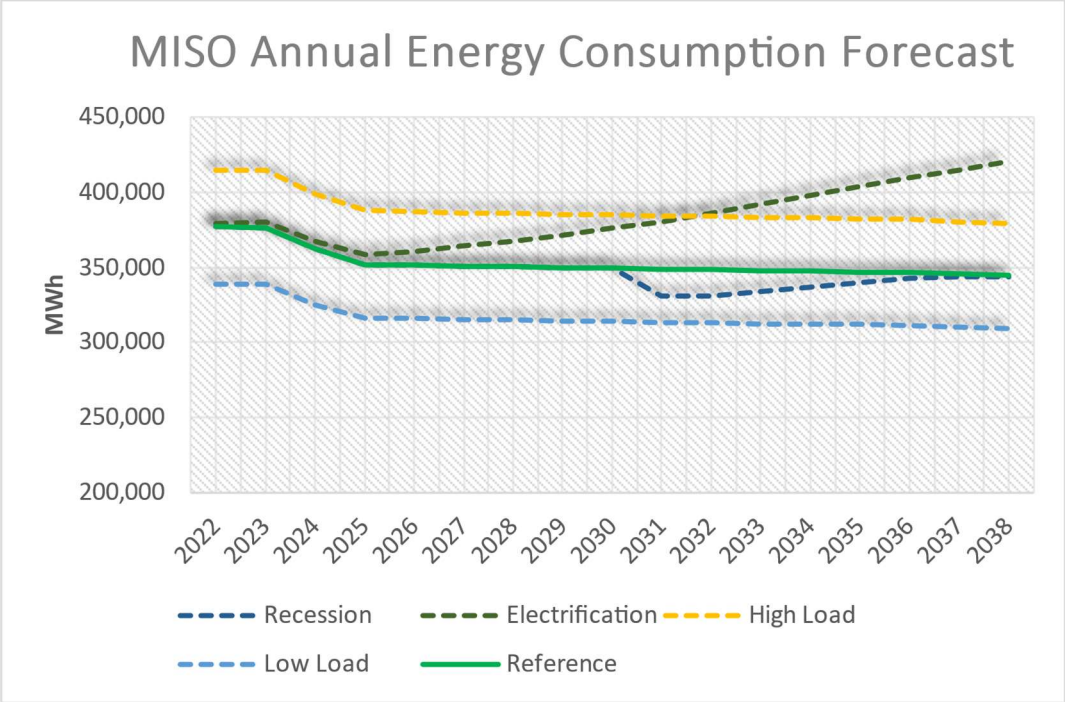


Figure V-18

Seasonal forecasts for MISO for both peak demand and energy consumption are shown below for each load forecast scenario:

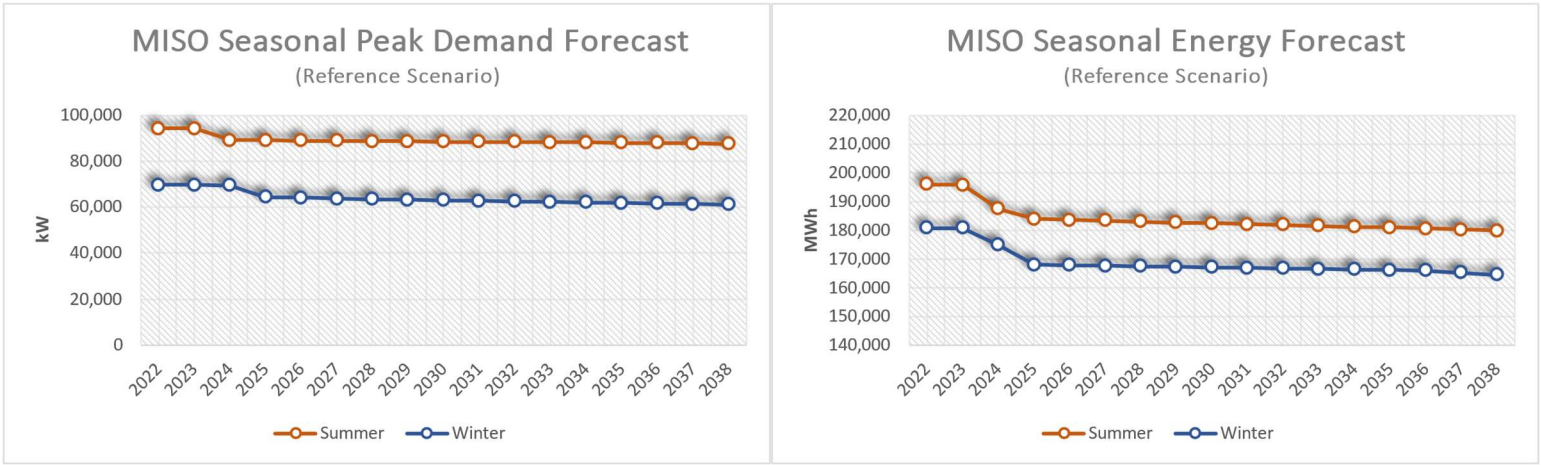
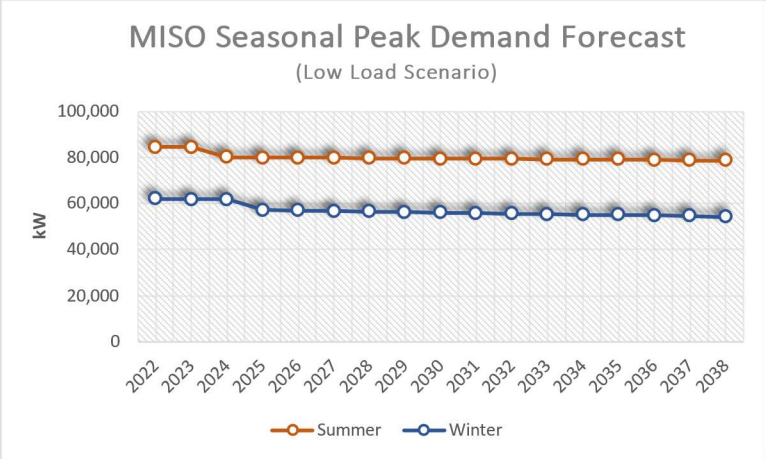


Figure V-19



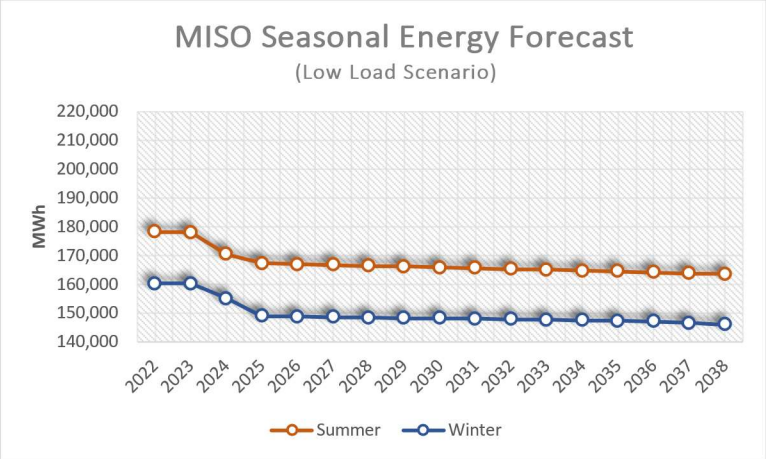
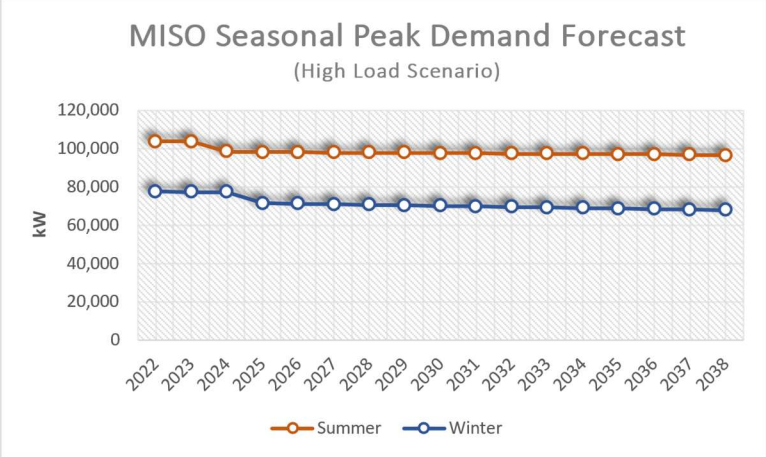


Figure V-20



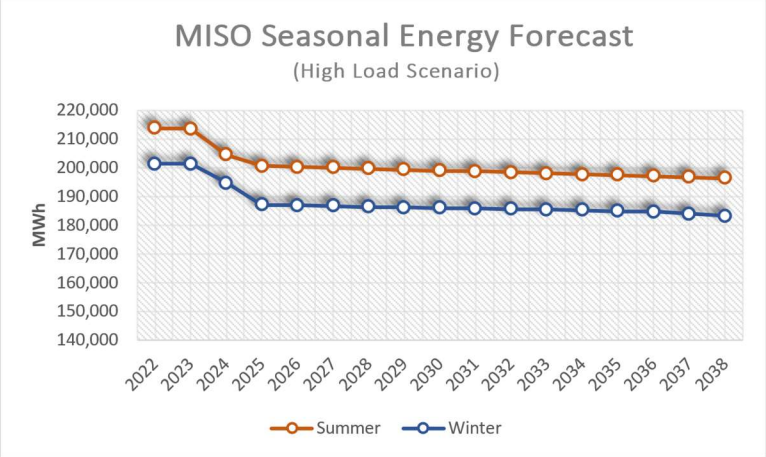
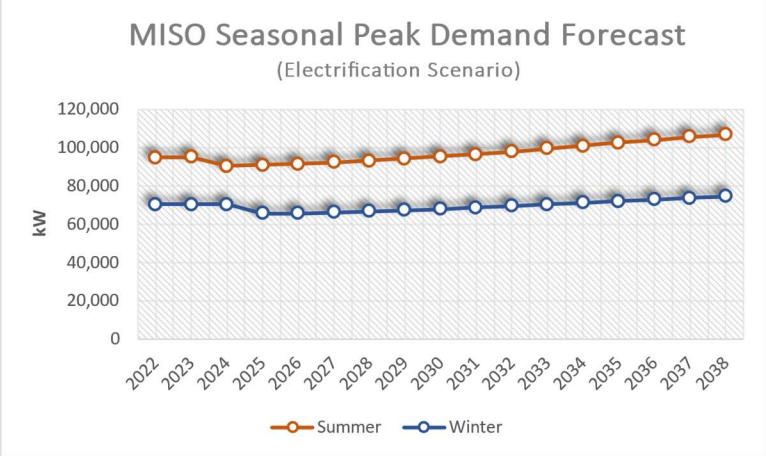


Figure V-21



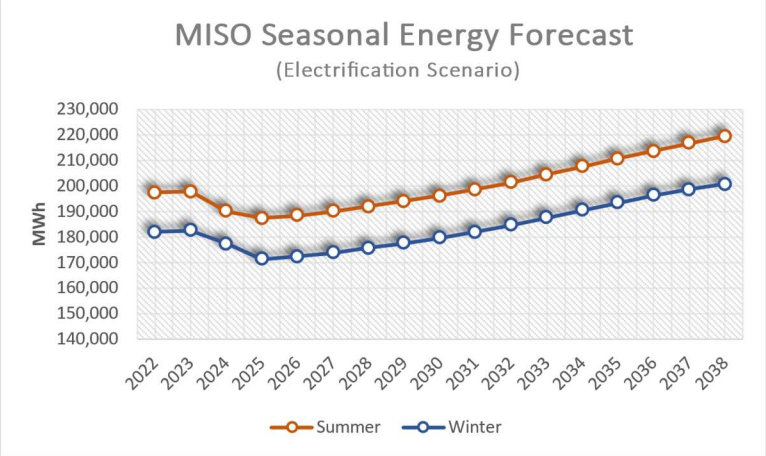
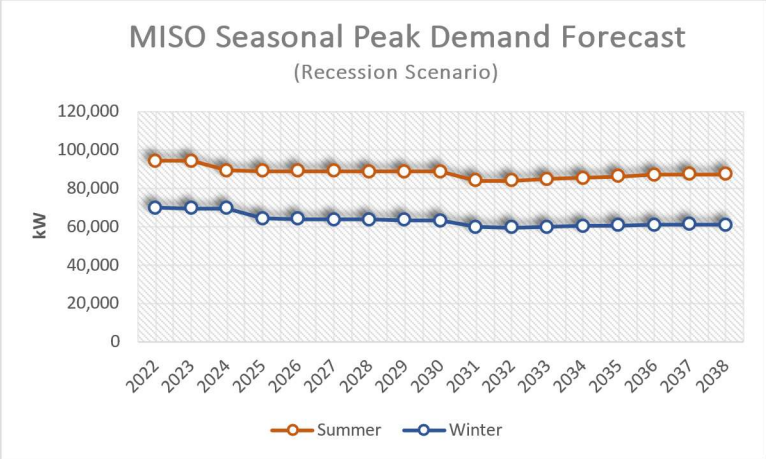


Figure V-22



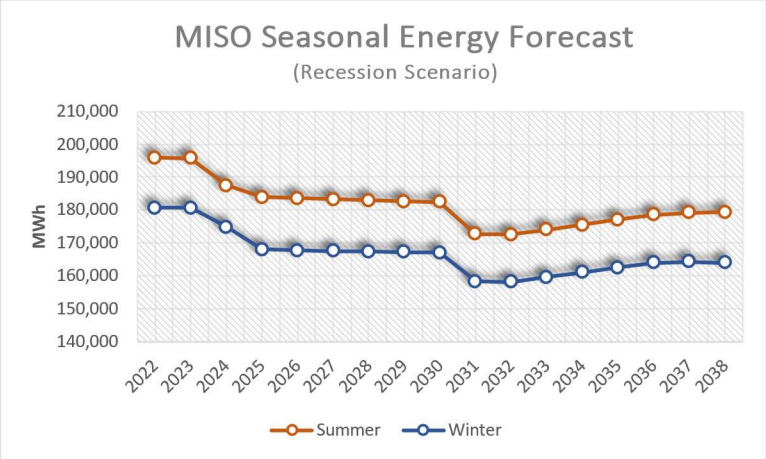


Figure V-23

The table in *Figure V-24* summarizes the MISO participant contracts that were initiated from the date of the previous IRP submittal or are set to expire through the end of the study period.

MISO Region Participants Schedule Start Dates 2017-2022			
Town	Schedule	RTO	Schedule Start Date
Lake View	J	MISO	6/1/2021
MISO Region Participants Schedule End Dates 2017-2037			
Town	Schedule	RTO	Schedule End Date
Lake View	J	MISO	5/31/2024

Figure V-24

I. MEAN System

As shown in *Figure V-25*, for the period 2022 to 2037, the system peak demand will decrease from 494,570 kW to 469,240 kW. Notable load changes occur at the expiration of Glenwood Springs' SSK-1 contract and the expiration of the SSJ contracts with Holyoke and Wray. After these dates, the peak demand increases at an annual average of 0.3%.

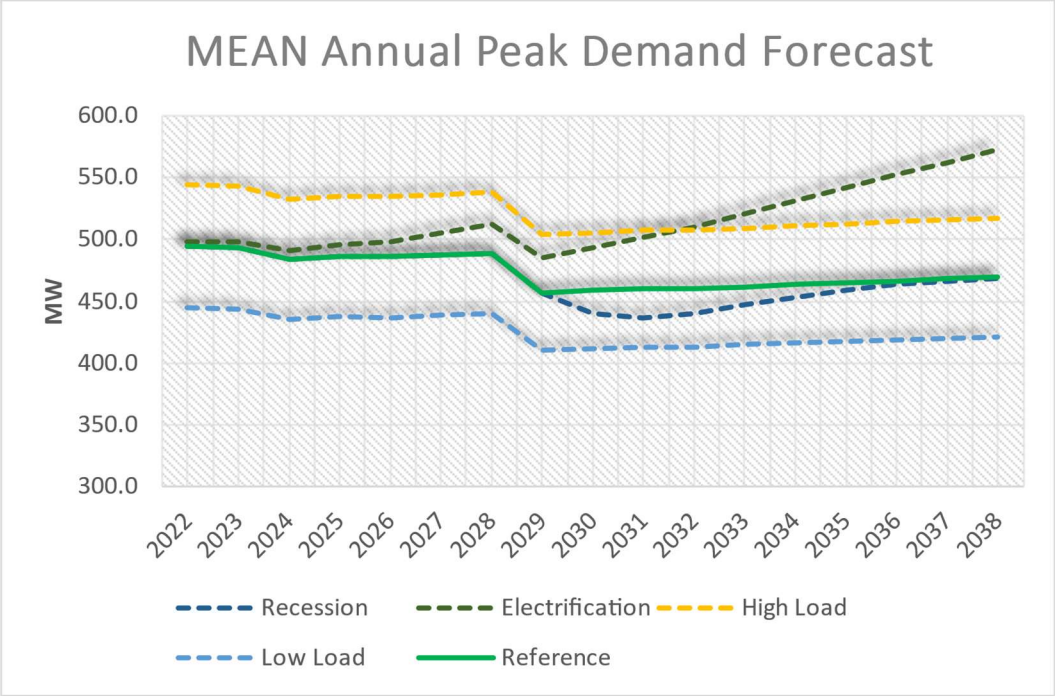


Figure V-25

The energy consumption forecast looks similar with most of the decrease in load occurring due to scheduled contract terminations. Following these events, the energy consumption increases at an average of 0.265% year-over-year.

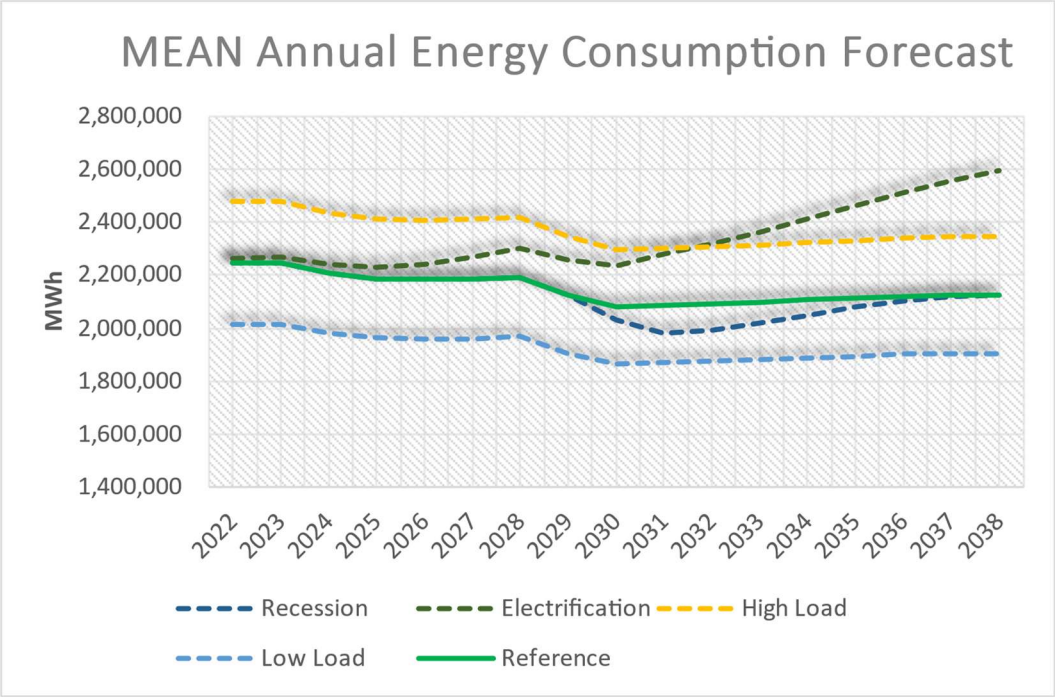
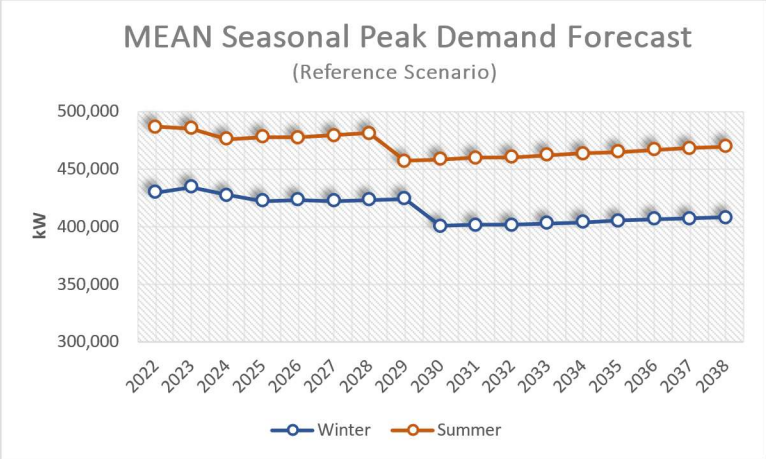


Figure V-26



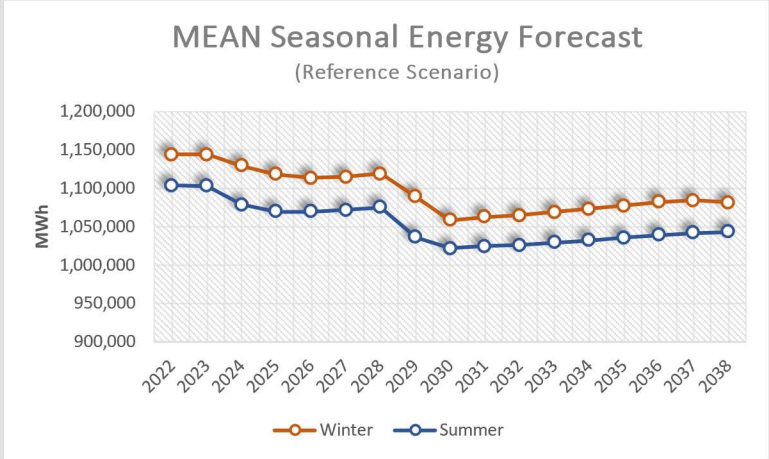
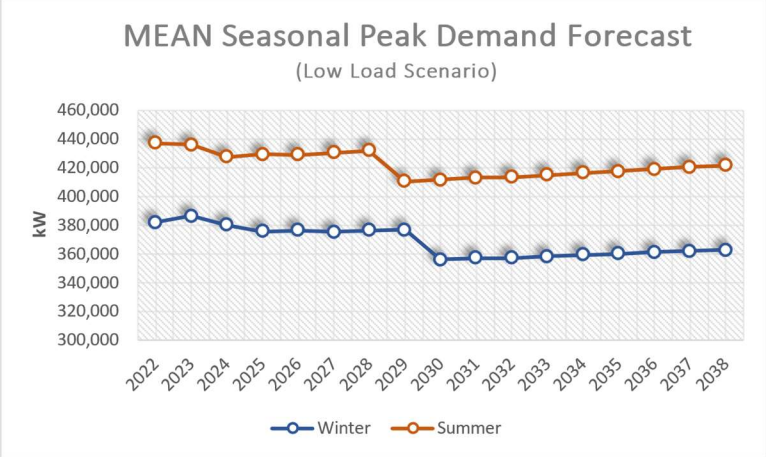


Figure V-27



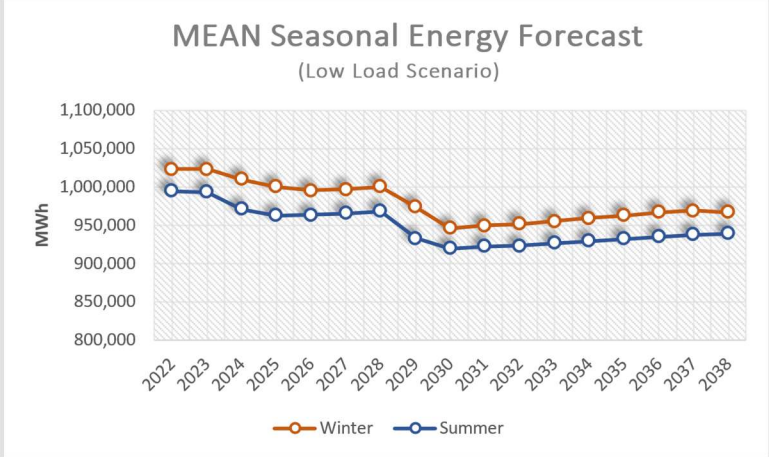
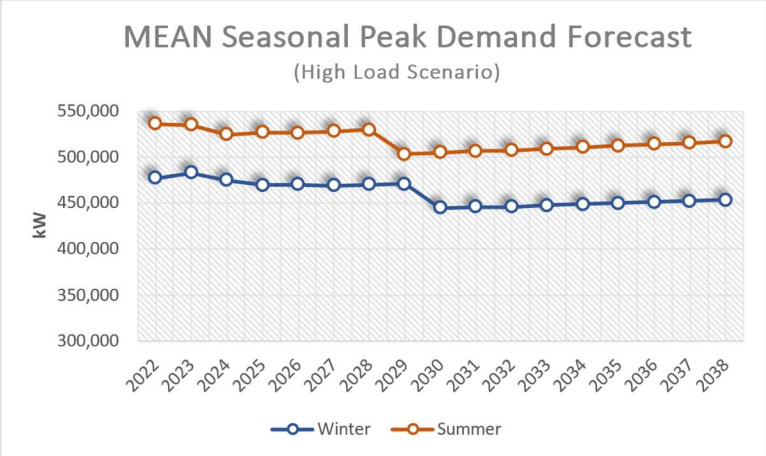


Figure V-28



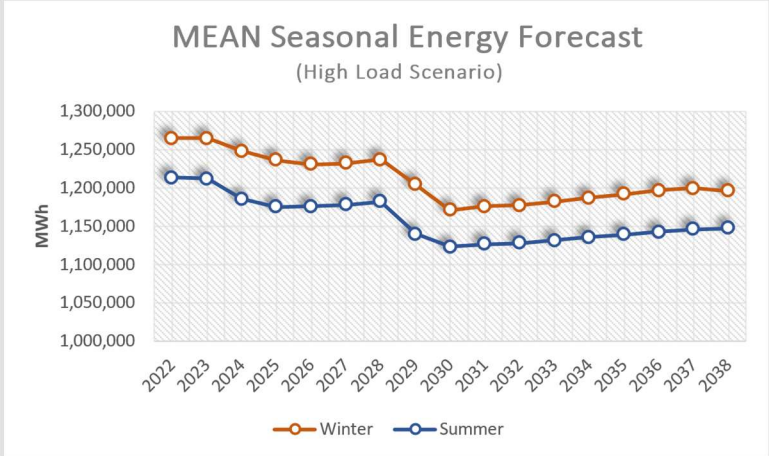
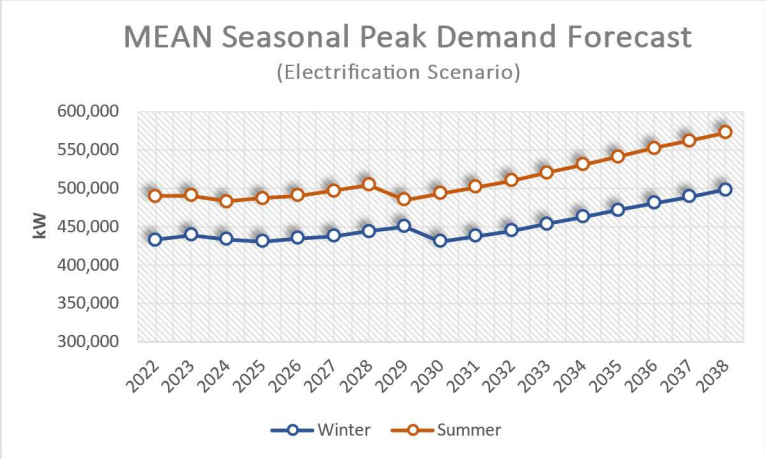


Figure V-29



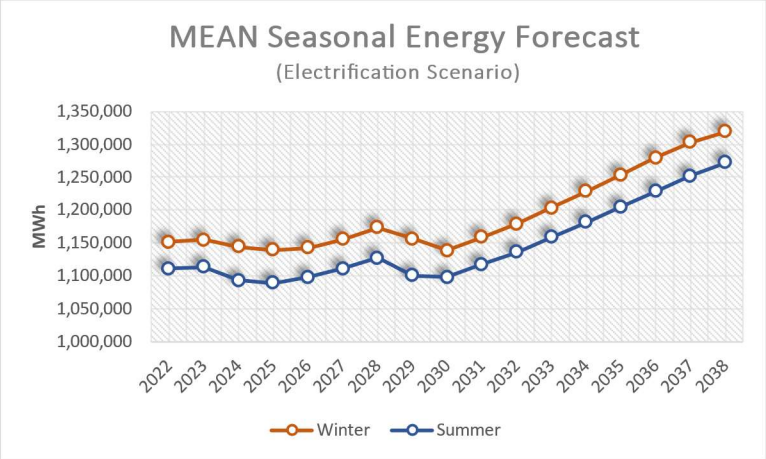
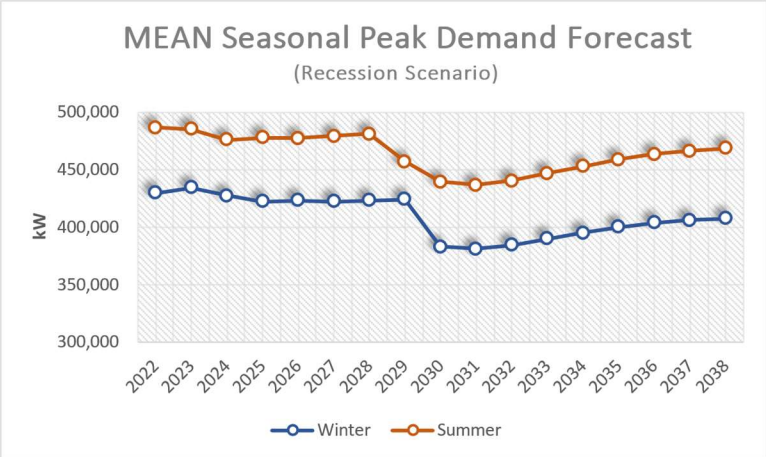


Figure V-30



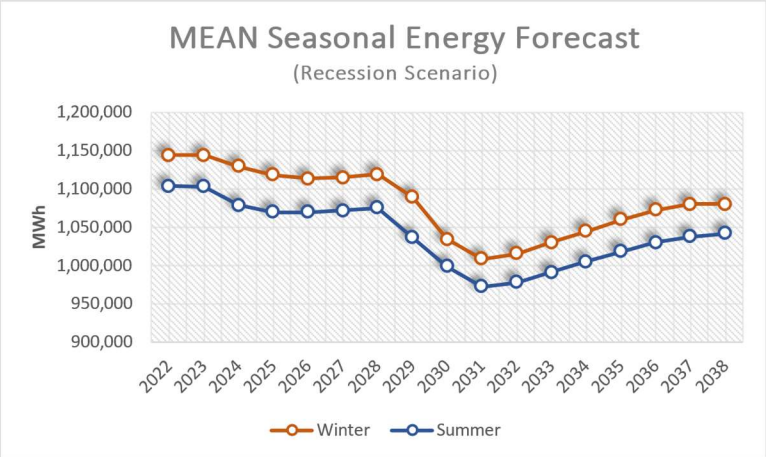


Figure V-31

VI. System Resources

A. Summary

The Power Supply System consists of owned, leased and purchased power supply resources as well as transmission system arrangements used to transmit resources to the Total Requirements Participants. MEAN receives transmission services provided by SPP, MISO and multiple transmission providers in the Western Interconnected System (the *"Western Interconnection"*).

MEAN adheres to a strategic and integrated resource plan that includes a variety of resources providing stable and economical power and energy to the Participants. MEAN has a policy in place establishing a goal to receive no more than 15% of MEAN's capacity from a single generating unit. In the event that a generation unit does represent more than 15% of MEAN's capacity, MEAN will investigate potential exchanges or insurance products to reduce the potential cost impacts and disruption of service that could be caused by a major unit outage. The Risk Oversight Committee and the Power Supply Committee will continue to evaluate this policy as the MEAN portfolio evolves to ensure that it still reflects participant goals and provides adequate protection to MEAN's financial position.

MEAN is party to a number of long-term resource commitments. However, MEAN is not a majority owner or operator of any of its resource contracts. As such, many of these resources will remain in MEAN's resource portfolio for the entire service life of the asset, despite MEAN's 2050 Vision for carbon neutrality. Although this poses a challenge in terms of carbon emissions and the required offsets to achieve neutrality, MEAN acknowledges the reliability and resource adequacy offered by such resources. In fact, many of these resources supply the capacity necessary to qualify MEAN's resource adequacy when operating renewable intermittent resources that generate energy with a low accredited capacity. As market conditions change and continue to favor the economics of renewable resources, fossil fuel plants will likely be dispatched at lower levels, which will decrease the energy generation and therefore the emissions without reducing the capacity contribution.

Figure VI-1 summarizes MEAN's long-term power supply resources as of the date of this report, and the table in *Figure VI-2* shows the amounts of energy obtained by MEAN from its principal power supply resources for MEAN'S last five fiscal years:

Resource	MEAN Nameplate Capacity	Primary Energy Source	Market Region[1]	% MEAN Capacity	Contract Term
Total Requirements Committed Facilities (Participant Owned Generation)	124.2 MW	Oil/Gas	MISO (69.5 MW), SPP (48.3 MW), WEST (6.4 MW)	18.9%	Life of the Power Supply Agreement for Participant.
WAPA [2]	124.7 MW	Hydroelectric	MISO (7.5 MW), SPP (29.1 MW), WEST (88.1 MW)	19.0%	9/30/2054 Tribes agreements terminate on one-year notice.
Whelan Energy Center Unit 2	80 MW	Coal	SPP	12.2%	Later of life of the Project through decommissioning, or date all debt is paid.
WAPA Displacement Agreement [3]	61.9 MW	Hydroelectric	WECC	9.4%	5/31/2029
Walter Scott Energy Center Unit 4	56.0 MW	Coal	MISO	8.5%	Life of Unit
Walter Scott Energy Center Unit 4 Assignment	3.2 MW	Coal	MISO	0.49%	Termination of Waverly's SSM.
NPPD Multi-Unit Participation					12/31/2023
Cooper Nuclear Station	26 MW	Nuclear	SPP	4.0%	
Gerald Gentleman Station	24 MW	Coal	SPP	3.7%	
Kimball Wind LLC	30 MW	Wind	WECC	4.6%	6/28/2038
Laramie River Station Unit 1	9.9 MW	Coal	SPP	1.5%	Life of Project
Laramie River Station Unit 2 & Unit 3	18.6 MW	Coal	WECC	2.8%	Life of Project
Wygen Unit I	20 MW	Coal	WECC	3.0%	Initial term 40 years, then three automatic renewals of 20 years each unless terminated by agreement of the parties.
Black Hills Power Purchase Agreement					5/31/2028 with early termination option for 5/31/2023.
Neil Simpson Unit 2 [4]	8 MW	Coal	WECC	1.2%	
Wygen Unit III [4]	7MW	Coal	WECC	1.1%	
Wessington Springs Wind Project	10 MW	Wind	SPP	1.5%	12/26/2039
Louisa Generating Station	8.2 MW	Coal	MISO	1.2%	Termination of Waverly's SSM.
NPPD Elkhorn Ridge Wind Plant	8 MW	Wind	SPP	1.2%	2/28/2029
NPPD Laredo Ridge Wind Project	8 MW	Wind	SPP	1.2%	1/31/2031
DMEA Shavano Falls/Drop 4 & Drop 6	7.6 MW	Hydroelectric	WECC	1.2%	6/23/2037
NPPD Ainsworth Wind Energy Facility	7 MW	Wind	SPP	1.1%	9/30/2025
Whelan Energy Center Unit 1	5.3 MW	Coal	SPP	0.8%	Date WEC 1 and/or its associated transmission system is removed from service.
Waste Management Landfill Gas	4.8 MW	Landfill Gas	MISO	0.7%	3/1/2034
NPPD Crofton Bluffs Wind Project	4.2 MW	Wind	SPP	0.6%	10/31/2032
TOTAL	656.6 MW				

(1) Resources located in MISO and SPP are dispatched by MISO and SPP.

(2) All but approximately 7 MW constitutes North American Tribes' and Total Requirements Participants' WAPA allocations.

(3) Under the WAPA displacement agreement, MEAN receives hydroelectric energy (excluding renewable energy credits) in WECC from the capacity in the agreement. Operationally, MEAN provides an equal amount of capacity to WAPA's customers in SPP from various MEAN contracted resources. The contracted resources designated for WAPA's customers in SPP may vary throughout the term of the agreement.

(4) Per contract, total capacity available to MEAN from Neil Simpson 2 / Wygen III was 20 MW in 2017-18, is currently 15 MW and reduces to 10 MW in 2023.

Figure VI-1

ENERGY SUPPLY FOR FISCAL YEAR ENDED MARCH 31
(GWH AND % OF TOTAL)

	2021		2020		2019		2018		2017	
Total Requirements Committed Facilities	3.5	0.2%	1.2	0.1%	1.6	0.1%	1.5	0.1%	1.4	0.1%
WAPA [1]	406.9	18.6%	401.3	16.5%	411.4	14.4%	411.0	15.2%	400.3	15.2%
WAPA Displacement Agreement [2]	237.1	10.8%	237.1	9.8%	237.1	8.3%	238.4	8.8%	237.1	9.0%
Whelan Energy Center Unit 2 [3]	243.5	11.1%	376.6	15.5%	405.1	14.2%	307.5	11.4%	349.8	13.4%
Walter Scott Jr. Energy Center Unit 4 [4]	189.6	8.6%	261.1	10.7%	434.2	15.2%	342.1	12.6%	259.8	9.9%
NPPD Multi Unit Participation										
Gerald Gentleman Station Units 1 and 2	108.2	4.9%	132.5	5.5%	135.7	4.8%	133.2	4.9%	131.2	5.0%
Cooper Nuclear Station	178.4	8.1%	216.8	8.9%	183.4	6.4%	205.2	7.6%	189.1	7.2%
Laramie River Station	124.3	5.7%	146.4	6.0%	191.7	6.7%	184.1	6.8%	188.7	7.2%
Wygen Unit I	156.5	7.1%	162.8	6.7%	150.2	5.3%	166.8	6.2%	167.9	6.4%
Wygen Unit III and Neil Simpson Unit 2	123.5	5.6%	112.7	4.6%	136.5	4.8%	163.2	6.0%	171.8	6.5%
Wind Project at Kimball [5]							0.4	0.0%	8.7	0.3%
Kimball Wind Facility [6]	122.8	5.6%	119.8	4.9%	88.9	3.1%				
Wessington Springs Wind Project	42.2	1.9%	36.6	1.5%	34.4	1.2%	38.3	1.4%	42.4	1.6%
NPPD Elkhorn Ridge Wind Plant	16.0	0.7%	21.0	0.9%	22.2	0.8%	24.4	0.9%	25.7	1.0%
NPPD Laredo Ridge Wind Project	22.8	1.0%	26.4	1.1%	29.1	1.0%	30.3	1.1%	32.6	1.2%
Louisa Generating Station	27.5	1.3%	28.5	1.2%	54.4	1.9%	40.9	1.5%	42.0	1.6%
DMEA Shavano Falls/Drop 4 & 6	33.9	1.5%	31.8	1.3%	31.0	1.1%	33.3	1.2%	30.0	1.1%
NPPD Ainsworth Wind Energy Facility	12.0	0.5%	15.6	0.6%	17.7	0.6%	19.4	0.7%	20.7	0.8%
Whelan Energy Center Unit 1	24.3	1.1%	18.6	0.8%	21.8	0.8%	19.8	0.7%	18.9	0.7%
WM Des Moines Landfill Gas Facility	38.6	1.8%	40.1	1.7%	39.0	1.4%	38.9	1.4%	38.8	1.5%
NPPD Crofton Bluffs Wind Project	16.3	0.7%	16.1	0.7%	15.3	0.5%	16.1	0.6%	17.4	0.7%
All Others [7]	65.3	3.2%	27.1	1.0%	207.0	7.4%	294.3	10.9%	260.2	9.6%
TOTAL	2,193.2	100.0%	2,430.1	100.0%	2,847.7	100.0%	2,709.1	100.0%	2,634.5	100.0%

(1) Comprised mostly of Long-Term Total Requirements Participant allocations. MEAN serves as purchasing agent for the majority of MEAN Total Requirements Participants. Amounts shown include all Total Requirements Participant WAPA allocations regardless of whether MEAN serves as purchasing agent.
(2) Under the WAPA Displacement Agreement, MEAN receives hydroelectric generated energy in WECC from the 61.9 MW of capacity in the agreement. Under a Bilateral Settlement Schedule, MEAN pays SPP for the related energy for WAPA's customers in SPP. MEAN also provides an equal amount of capacity to WAPA's customers in SPP from various MEAN contracted resources. MEAN does not receive Renewable Energy Credits for this resource.
(3) Includes MEAN's participation in Public Power Generation Agency (PPGA). Also includes power sales agreement between MEAN and Hastings Utilities through April 30, 2018.
(4) Includes MEAN ownership interest and assignment from Waverly Utilities.
(5) Wind Project at Kimball was decommissioned during the fiscal year ended March 31, 2018.
(6) Began commercial operation in June 2018.
(7) Includes economy and short-term firm purchases.

Figure VI-2

B. Description of Resources

Participant Owned Generation



By execution of the AMPP and a firm power service agreement under the applicable service schedule, 18 Total Requirements Participants commit to MEAN all of the output of all existing compliant generation facilities owned by them for the common benefit of the Total Requirements Participants, except the power and energy generated by three hydroelectric plants owned or contracted by Aspen, Colorado, and by three hydroelectric plants and three wind turbines owned by Waverly Utilities. The aggregate capacity of the generating facilities that the Total Requirements Participants have committed to MEAN (the "Participant Owned Generation") under the ERPA as of the date of this report is 124.2 MW. All of Participant Owned Generation units are fueled by natural gas and/or fuel oil.

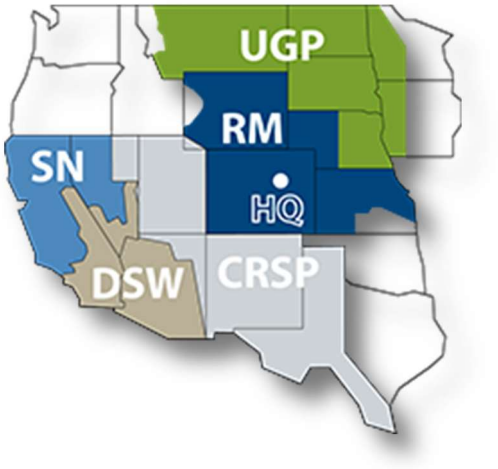
Under the AMPP, each of these Total Requirements Participants is required, upon MEAN's request, to supply to MEAN the total committed capacity of its Participant Owned Generation. Each such Total Requirements Participant is required to maintain its Participant Owned Generation in good operating condition. The MEAN Board voted at the May 2017 quarterly meeting to approve a new requirement for Participants to exercise the Participant Owned Generation at least quarterly, with MEAN paying for the fuel consumed during these exercises. Scheduled outages must be coordinated with MEAN. Each Total Requirements Participant retains the right to retire its Participant Owned Generation from service with proper notice as defined in the AMPP.

The Participant Owned Generation units are primarily electric generators that are located within the service areas of the Total Requirements Participants. Three facilities totaling 69.5 MW of nameplate capacity are located in MISO. Fifteen facilities totaling 48.3 MW of nameplate capacity are located in SPP. Two facilities totaling 6.4 MW of nameplate capacity are located in the Western Interconnect. The hydroelectric and wind generating facilities owned by Aspen, Colorado and Waverly Utilities as described above are not Participant Owned Generation under the Participant's AMPP but are part of the respective Participant's overall resource mix as exceptions to the general rule of leasing all power production back to MEAN as part of the Long-Term Power Supply Contracts.

Western Area Power Administration

WAPA is one of four power marketing administrations within the U.S. Department of Energy. WAPA's role is to market and transmit wholesale electricity from multi-use water projects. WAPA's service area encompasses a 15-state region of the central and western U.S. where WAPA's more than 17,000 circuit mile transmission system carries electricity from 57 hydropower plants operated

by the Bureau of Reclamation, U.S. Army Corps of Engineers and the International Boundary and Water Commission. WAPA also markets power from the Navajo Generating Station coal-fired plant near Page, Arizona. Together, these plants have an installed capacity of 10,504 megawatts. WAPA sells power to preference customers such as federal and state agencies, cities and towns, rural electric cooperatives, public utility districts, irrigation districts and Native American tribes. These entities provide retail electric service to millions of consumers in the West.



MEAN has an allocation from the U.S. Department of Energy, through WAPA, of firm power under contract from Loveland Area Projects hydroelectric plants of approximately 7 MW. MEAN recently executed an extension of this contract through 2054.

MEAN has entered into Benefit Crediting Agreements with WAPA and four Native American Tribes. Under these Agreements MEAN manages the allocations which represent 8 MW from the Loveland Area Projects. MEAN receives the energy from WAPA in exchange for providing a financial credit to the tribes. These contracts are set to terminate in 2024.

MEAN has also signed a Capacity and Energy Displacement Agreement ("WAPA Displacement Agreement") whereby WAPA provides to MEAN additional allocations of approximately 62 MW of capacity and 237,097 MWh of energy in the LAP footprint, and MEAN provides equivalent capacity and energy to WAPA eastern interconnection customers in Nebraska and Kansas. MEAN commits 47 MW of behind-the-meter participant owned generation and 15 MW of capacity from the WEC 2 coal-fired plant located in SPP to the WAPA Displacement Agreement. The MEAN Board of Directors approved the extension of the Displacement Agreement until May 31, 2029.

The Total Requirements Participants have allocations through WAPA totaling approximately 109.5 MW. Electric capacity and energy generated by WAPA has been and continues to be a low-cost capacity and energy resource for the Total Requirements Participants. WAPA reviews its energy rates annually to ensure that such rates generate sufficient revenues to cover its operating and other expenses.

MEAN acts only as an agent with respect to Participant WAPA allocations. MEAN provides these services on a cost pass-through basis to the Total Requirements Participants and has no beneficial interest in the Total Requirements Participants' power allocations as the power allocations are retained by the Total Requirements Participants, and the Total Requirements Participants are financially responsible for paying all costs associated with their power allocation(s). MEAN has contracted to collect payments for WAPA capacity and energy purchased by certain Total Requirements Participants and remits these payments to WAPA. Since MEAN is only acting as an agent, these amounts are not reflected as revenue or expense in MEAN's financial statements.

Total Requirements Participants receiving WAPA allocations are located in the WAPA Rocky Mountain Region Marketing Area, the WAPA Upper Great Plains Marketing Area and the WAPA Salt Lake City Area/Integrated Projects (commonly known as *"CRSP"*) Marketing Area. The WAPA Upper Great Plains Marketing Area contracts extend through December 31, 2050. The WAPA Rocky

Mountain Region Marketing Area contracts extend through September 30, 2054, and the CRSP allocation contracts extend through September 30, 2057.

Due to current and expected continuation of drought conditions in the West, certain WAPA hydropower facilities are anticipating lower generation in upcoming years. As a result, WAPA has reduced the monthly Deliverable Sales Amount guaranteed to Colorado River Storage Project (*"CRSP"*) customers through December 2022. WAPA will purchase replacement power at market rates to supply the reduced energy as requested by customers. Accordingly, this will increase WAPA's rates during that time period. MEAN has committed to supply this power to TRPs that receive CRSP allocations, thereby increasing MEAN's load obligation.

Whelan Energy Center Unit 2

MEAN is a participant in the Public Power Generation Agency ("PPGA") which was created solely for the purpose of owning, financing, acquiring, constructing and operating the Whelan Energy Center Unit 2 ("WEC2"). WEC2 is a nominally rated 220 MW pulverized coal-fired steam electric generating facility and related electric interconnection, transmission, rail car storage, and other facilities located near Hastings, Nebraska. Its commercial operation began in May, 2011. The unit includes pollution control equipment, a cooling tower, water treatment facilities, material storage facilities, control and administrative buildings, and other ancillary facilities. The unit is connected to the regional transmission grid through a network of 115 kV transmission lines. Hastings Utilities is the operating agent for WEC 2.



MEAN holds a 36.36% Entitlement Share of WEC2 representing approximately 80 MW of output of WEC2. Under its Participation Agreement with PPGA, MEAN has agreed to pay a corresponding percentage of all of PPGA's costs of owning and operating WEC2, including debt service on PPGA's bonds, regardless of whether or not WEC2 or any portion thereof is operable, or operating, and notwithstanding suspension, interruption, interference, reduction or curtailment of the WEC2 output or services of the WEC2. Payments to PPGA pursuant to the Participation Agreement are included in MEAN's operating expenses. The previous power sales agreement dated June 9, 2008, between Hastings Utilities and MEAN, whereby Hastings Utilities agreed to sell annual amounts of capacity and associated energy from its Entitlement Share under its Participation Agreement with PPGA at cost expired on April 2018.

Walter Scott, Jr. Energy Center Unit 4



MEAN entered into a Joint Ownership Agreement with MidAmerican Energy Company ("MEC") and other entities to develop, design, construct, own and operate Walter Scott, Jr. Energy Center Unit 4 ("WSEC 4"), a 790 net MW super-critical, coal-fired steam electric generating plant fueled with low-sulfur coal located near the city of Council Bluffs, Iowa. The plant began commercial operation in June 2007. MEC is the majority owner, developer and operator of WSEC4. MEAN originally owned an undivided 6.67% interest in WSEC4. In 2012, MEAN acquired an additional 0.25% interest in WSEC4, for a total undivided interest of 6.92%, or 56 MW. In addition, Waverly Utilities granted MEAN a partial assignment of Waverly Utilities' interest in WSEC4, which includes rights to receive 0.4% (approximately 3 MW) of the output from WSEC4 and continues through the term of Waverly Utilities' Long-Term Power Supply Contract with MEAN.

MEAN's ownership interest and partial assignment of interest in WSEC4 provides MEAN with approximately 59 MW of capacity and energy, providing MEAN with a long-term, cost-based source of power and energy.

Nebraska Public Power District Multi-Unit Participation



MEAN and NPPD entered into a Multi-Unit Participation Agreement that became effective January 1, 2011 (the "NPPD MUP Agreement"). Under the NPPD Agreement, NPPD provides MEAN with 50 MW of capacity and related energy. NPPD's obligation to deliver capacity and related energy to MEAN pursuant to the NPPD Agreement is contingent on availability and operation of NPPD's Gerald Gentleman Station Units No. 1 (12 MW) and No. 2 (12 MW) located near Sutherland, Nebraska, and NPPD's Cooper Nuclear Station (26 MW) located near Brownville, Nebraska. The NPPD Agreement is effective through December 31, 2023. In the event NPPD and MEAN participate in the same new baseload generation unit prior to December 31, 2023, MEAN has the right, but not the obligation, to terminate the NPPD Agreement upon the commercial operation of such unit.

Laramie River Station



In 1982, MEAN and Lincoln Electric System ("LES") entered into two agreements ("Laramie River Agreements") which collectively provide for the sale to MEAN of a portion of LES's undivided interest in the Laramie River Electric Generating Station ("Laramie River Station") and an associated transmission system. Laramie River Station is a coal-fired steam-electric generating station that consists of three units totaling 1,697 MW. It is located in Platte County, Wyoming on the Laramie River and is owned by LES and five other utilities, as tenants in common. The three units of the Laramie River Station began commercial operation in 1980 and 1982. MEAN began making purchases of electric power and energy under its original agreement with LES on June 1, 1982. MEAN's total interest in Laramie River Station is 1.67% or 28 MW. Basin Electric Power Cooperative operates and maintains the Laramie River Station.

MEAN pays to LES: (1) MEAN's proportionate share of operation and maintenance costs, capital improvements, repairs, administrative costs, and all other fixed costs relating to ownership interest in Laramie River Station; (2) the costs related to the production of energy in proportion to the energy scheduled and produced from Laramie River Station for MEAN during each month; and (3) any costs incurred by LES directly related to the scheduling and dispatching of MEAN's power and energy generated by Laramie River Station. Laramie River Station Unit 1 is dispatched by SPP while Laramie River Station Unit 2 and Unit 3 are in the Western Interconnection.

Under a Displacement Contract dated as of July 1, 1986, between MEAN and Basin Electric Power Cooperative, MEAN receives scheduling and delivery rights in the Western Interconnection for Laramie River Station's West Side units (known as "West Allotment") and delivery rights in the associated transmission system. MEAN's West Allotment entitles MEAN to schedule and deliver up to 8.3% of the LES entitlement of power and energy from Laramie River Station.

Wygen Unit I



In 2009, MEAN acquired an undivided 23.5% interest in the Wygen Unit I which provides MEAN approximately 20 MW of capacity and energy. The Wygen Unit I, located in Campbell County, Wyoming, near the town of Gillette, is an approximately 85 MW coal-fired electric generating plant fueled with low-sulfur Powder River Basin Coal. Wygen I is collocated with the Wyodak coal mine, which supplies fuel to the plant. Black Hills Wyoming, Inc. developed, designed, constructed and operates the Wygen Unit I, which began commercial operation in February 2003, and owns the remaining 76.5% of the Wygen Unit I.

Neil Simpson Unit 2 and Wygen Unit III

MEAN has entered into a series of Power Purchase Agreements with Black Hills Power, Inc. ("Black Hills Power") that became effective April 1, 2010. The current Power Purchase Agreement is unit contingent on Neil Simpson Unit 2 and Wygen Unit III. Under the original Power Purchase Agreement, Black Hills Power agreed to provide MEAN with the capacity and related energy output in the following amounts:



CONTRACT YEAR	CAPACITY (MW)
4/1/2010 – 5/31/2018	20 MW (10 MW from Wygen Unit III and 10 MW from Neil Simpson Unit 2)
6/1/2018 – 5/31/2020	15 MW (10 MW from Wygen Unit III and 5 MW from Neil Simpson Unit 2)
6/1/2020 – 5/31/2022	12 MW (6 MW from Wygen Unit III and 6 MW from Neil Simpson Unit 2)
6/1/2022 – 5/31/2023	10 MW (5 MW from Wygen Unit III and 5 MW from Neil Simpson Unit 2)

In 2019, MEAN and Black Hills renegotiated the terms of the Power Purchase Agreement. MEAN will now receive a combined 15 MW of capacity and energy from the two units until May 31, 2023. At the end of this term, the purchase will continue at 10 MW until May 31, 2028 unless unilaterally terminated by MEAN.

Louisa Generating Station

MEAN purchases the power and energy associated with Waverly Utilities' interest in the Louisa Generating Station, a coal-fired generating unit which began commercial operation in October 1983. The power sales agreement includes rights to receive 1.1% or approximately 8 MW of the output from the Louisa Generating Station and continues for the term of Waverly Utilities' Long-Term Power Supply Contract.



Delta-Montrose Electric Association Shavano Falls/Drop 4 and Drop 6



MEAN entered into a 22-year power purchase agreement with Delta-Montrose Electric Association ("DMEA") for the purchase of renewable hydro energy from the Shavano Falls hydro project. MEAN's share of the project includes 2.8 MW from Drop 6 and 4.8 MW from Drop 4. The project began commercial operation in May 2015. Shavano is a run-of-river facility from which MEAN receives capacity and energy during the months of operation, typically March through October.

Whelan Energy Center Unit 1



Pursuant to the Participation Power Sales Agreement between MEAN and the City of Hastings, Nebraska, MEAN purchases 6.95%, or approximately 5.3 MW, of the electric power and energy generated by Whelan Energy Center Unit 1, a 77 MW coal-fired steam electric generating station operated by Hastings Utilities and located in Adams County, Nebraska (the "Whelan Energy Center"). The Participation Power Sales Agreement terminates on the later of the date of (i) the final maturity of the indebtedness incurred by Hastings to pay the costs of the Whelan Energy Center or capital additions thereto, which occurred on January 1, 2019, or (ii) the date Hastings removes the Whelan Energy Center and/or its associated transmission system from commercial operation.

Waste Management Des Moines Landfill Gas Facility



MEAN has entered into a long-term Power Purchase Agreement with Waste Management for the total output of the facility, which has 4.8 MW total nameplate capacity, until March 2034. The facility utilizes methane gas extracted at the Metro Park East landfill located in Mitchellville, Iowa, which is converted to renewable energy in four (4) 1.2 MW nameplate units.

Wind Resources



The following is a summary of MEAN's owned or purchased wind resources:

- *Wind Project at Kimball.*

MEAN previously owned and operated a 10.5 MW wind project located near Kimball, Nebraska, which began commercial operation on October 1, 2002. This project was decommissioned during the summer of 2017. MEAN exectured a 20-year Purchase Power Agreement with Kimball Wind LLC to purchase the energy output of a new 30 MW wind farm constructed on the same and adjacent site. The new wind farm began commercial operation in June 2018.

- *Wessington Springs Wind Project.*

Heartland Consumers Power District purchases all the output of the 51.15 MW Wessington Springs Wind Project and resells 19.55% (10 MW) of the output to MEAN under the agreement. The original agreement was written to expire in February 2029. However, the facility owner repowered the site in December 2020 to increase the efficiency of the generators. As a result, Heartland and MEAN signed contract extensions through the end of 2039.

- *NPPD Elkhorn Ridge Wind Plant.*

MEAN purchases from NPPD 10.0% of the output of the Elkhorn Ridge Wind Plant, or approximately 8 MW of the 80 MW nameplate capacity, under a contract ending March 2029.

- *NPPD Laredo Ridge Wind Project.*

MEAN purchases from NPPD 10.0% of the output of the Laredo Ridge Wind Project, or approximately 8 MW of the 80 MW nameplate capacity, under a contract ending February 2031.

- *NPPD Ainsworth Wind Energy Facility.*

MEAN purchases from NPPD 11.78% of the output of the Ainsworth Wind Energy Facility, or approximately 7 MW of 60 MW nameplate capacity, under a contract ending October 2025 which may be extended for terms of 5 years each or until the end of the operational life of the facility.

- *NPPD Crofton Bluffs Wind Project.*

MEAN purchases from NPPD 10.0% of the output of the Crofton Bluffs Wind Project, or approximately 4.2 MW of 42 MW nameplate capacity, under a contract ending November 2032.

Market Purchases

MEAN utilizes short-term purchases of market energy to meet MEAN's load and reserve obligations when circumstances prevent our contracted resources from supplying our full obligations. MEAN enters into purchase and sale transactions in the MISO, SPP, and WECC markets.

Ruedi/Maroon Creek



The City of Aspen, Colorado owns and operates the Ruedi hydroelectric plant under a permit issued by the Federal Energy Regulatory Commission ("FERC") with a rated capacity of 5 MW and a hydroelectric project known as Maroon Creek with a rated capacity of 0.5 MW. These projects are used to supply capacity and energy to Aspen for resale to its customers. MEAN and the City of Aspen have executed an agreement whereby Aspen's energy purchases from MEAN are reduced by the output of Ruedi, and the generation is treated similar to a WAPA allocation. The term of the Ruedi agreement between Aspen and MEAN is concurrent with Aspen's Total Requirements contract with MEAN.

For resource planning purposes therefore, Ruedi and Maroon Creek are counted as resources to credit against Aspen's load.

Ridgway

Aspen has acquired an interest in a portion of the output of the Ridgway Hydropower Project ("Ridgway"). Specifically, Aspen has rights to all of the plant's capacity and energy during the months of October through May. Aspen has assigned to MEAN the exclusive responsibility for scheduling and managing the City's share of the Ridgway output. MEAN uses and schedules 4.5 MW of the Ridgway output as a designated network resource for MEAN's designated network load on the Tri-State transmission system. For resource planning purposes therefore, Ridgway is counted as a resource and included in resource mix allocations. Aspen's contract with Tri-County Water Conservancy District for the Ridgway output extends to 2034.

C. Regional Energy Markets and Coordination

The SPP Integrated Marketplace (*"IM"*), which was launched on March 1, 2014, replaced the Energy Imbalance Service (*"EIS"*) market that SPP had operated since 2007. The IM restructured the EIS market by establishing a day-ahead market along with a real-time energy and operating reserve market. Consolidating 16 balancing authorities into a single SPP-operated balancing authority that was designed to maximize cost-effectiveness of generation and reduce transaction costs. The IM also utilizes locational-marginal pricing, transmission congestion rights, and virtual transactions.

The IM allows generators to submit offers to sell energy and operating reserves. Additionally, it allows load serving entities to submit bids to purchase energy. After day-ahead submissions, SPP clears the offers and bids via security-constrained unit commitment and security-constrained economic dispatch algorithms. A financially binding schedule matches sale offers with demand bids to meet operating reserve requirements.

Financial transmission rights (termed Transmission Congestion Rights (*"TCRs"*) in SPP and Financial Transmission Rights (*"FTRs"*) in MISO) are used to mitigate variances between Location Marginal Prices (*"LMPs"*) at load locations and LMPs at generation locations due to transmission congestion. Long-Term Congestion Rights (*"LTCRs"*) and Auction Revenue Rights (*"ARRs"*) are awarded to market participants based on firm transmission rights on the SPP network. Transmission congestion rights are automatically converted from awarded LTCRs and can be converted from awarded ARRs.

The SPP IM added market functionality and coordinates next-day generation across the region. The IM maximizes cost-effectiveness, provides participants with greater access to reserve energy, improves regional balancing of electricity supply and demand, and facilitates the integration of renewable resources.

Like SPP, MISO allows generators to submit offers to sell energy and operating reserves and load serving entities to submit bids to purchase energy, after which MISO clears the offers and bids via security-constrained unit commitment and economic dispatch algorithms. The end product is a financially binding schedule that matches sale offers with demand bids and satisfies operating reserve requirements. Similar to SPP, MISO also operates auction revenue rights and a financial transmission rights auction. In addition, MISO administers a capacity market where market participants can purchase or sell excess deliverable capacity facilitated in an annual auction. MISO has filed with FERC to modify their market construct to be conducted on a seasonal basis rather than annual, which would impact unit accreditation, outage scheduling, and the capacity auction, among other functions.

The impacts of the RTOs' facilitation and integration of renewable resources have been very noticeable in the past five years with the build out of renewables. Noteworthy levels of renewable integration have been achieved in SPP as Wind surpassed Coal and Natural Gas as the most abundant annual fuel source in 2020. In addition, in March 2022, SPP set a new renewable energy penetration record of 90.2%. This means SPP served 90.2% of the demand for electricity across its 14-state service territory with renewable energy sources, which marks the first time a regional transmission organization served more than 90% of its load with renewables; 88.5% of the 90.2% was served by wind. This abundance of low-cost wind and other renewable resources reduces the need to operate traditional fossil fuel resources during high wind periods and in turn reduces carbon emissions.

MEAN also operates in the western United States through WECC within the Western Area Power Administration, Colorado-Missouri (WACM) and Public Service Company of Colorado (PSCo) Balancing Authorities. For operations in WECC, MEAN enters into other agreements and transactions with various electric marketers and power suppliers that are not MEAN Participants pursuant to which such electric utilities may purchase capacity and energy from MEAN or sell capacity and energy to MEAN. Regional markets are emerging and are in initial stages in WECC. In WACM, MEAN is currently participating in the recently formed Western Energy Imbalance Service (WEIS) operated by SPP. The initial WEIS members are pursuing membership in an expanded SPP RTO market to the west. PSCO recently initiated participation in the WEIS market but is also exploring the SPP Markets+ market in the initial stages of development.

D. Available Energy vs. Dispatched Energy

The values of energy shown in the resource mix charts (in Section E. below) are indications of available energy from each resource, primarily based on operating characteristics, outage schedules, and historical performance. However, this may not be an accurate projection of actual energy generated in the future as it does not reflect the effects that increased renewable generation will have on reducing the economic dispatch of fossil fuel units.

In the SPP and MISO integrated markets, each resource is dispatched by the market according to its offer price in comparison to the locational marginal price (LMP) at the unit's specific location, which is a value that changes every five minutes based on the conditions of the entire market and transmission system. In the RTO markets, the offer prices for generating resources are most typically equal to the unit's variable operating costs, consisting primarily of fuel cost. Wind and solar resources generally have no cost associated with the fuel source. With tax credits, the resources can often be offered in with a negative offer price to ensure the resource is dispatched and produces energy (dispatched energy) to receive the tax credits. This creates a situation where fossil fuel units are not economic to operate, and the market will not dispatch them. The chart below, from the EIA, reflects some of this impact showing the reduction of energy produced by coal plants not only from retirements, but reduced energy production from lower utilization of the facilities that remain in service.

The proliferation of low-cost renewable resources has driven market prices down in recent years. Future environmental regulations are likely to increase the operating cost of fossil fuel units, which will cause the market to dispatch them less often. We have seen the effects of this already. From 2008 to 2020, coal generation has diminished 29% due to unit retirements, and another 32% due to lower utilization.

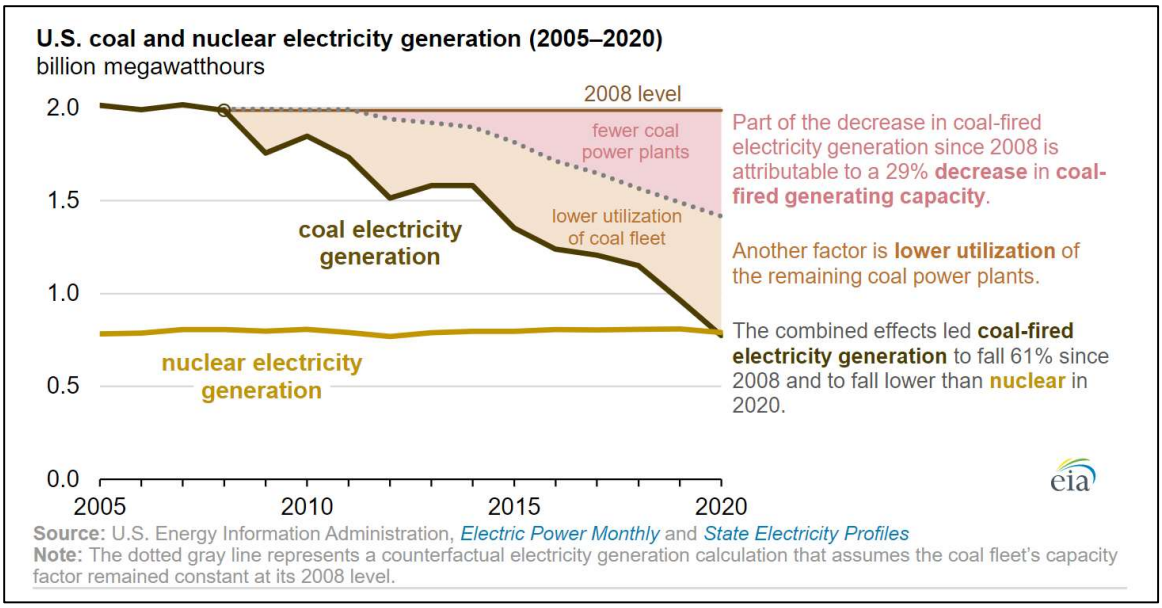


Figure VI-3

Capacity factor is the measure of how often a power plant runs over a specific period of time. It is expressed as a percentage and calculated by dividing the actual unit electricity output by the maximum possible output. This ratio is important because it indicates how fully a unit's capacity is used. Typical capacity factors vary considerably by plant and fuel type as shown in the chart below.

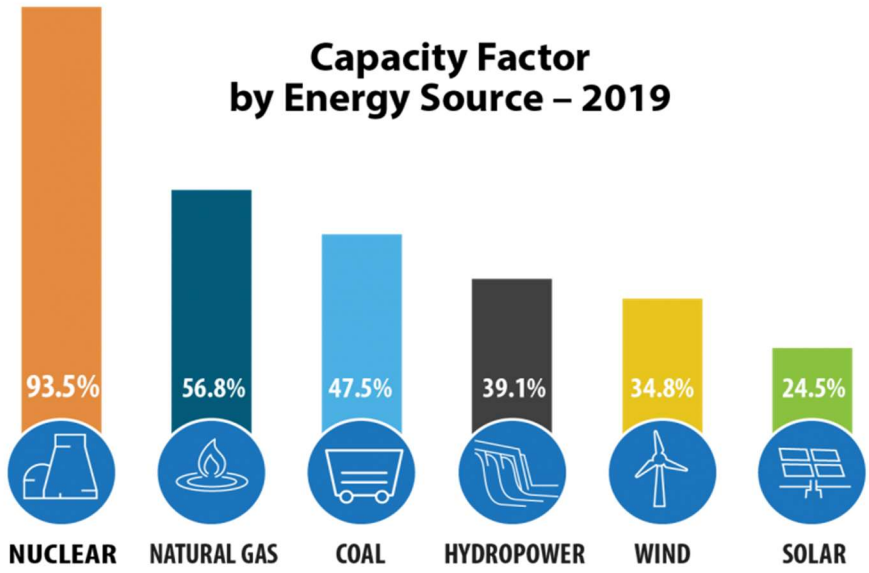


Figure VI-4

Source: U.S. Energy Information Administration

Capacity factors can be impacted by many factors such as plant maintenance outages, fuel availability, economic dispatch, and the resource type. Nuclear plants generally have very high capacity factors because nuclear fuel produces energy at a very steady level, and these units are generally not designed to be operated below design output levels. Natural gas and coal plants are often operated based on economics, which is becoming more prevalent in the RTO markets. If these units generated whenever physically capable (available energy) their capacity factor would increase.

However, dispatched economically (dispatched energy), their capacity factor decreases. In contrast, wind and solar resources generally operate at less than 50% capacity factors because of the variability of wind and sunshine – consider that the wind would need be at maximum design speed every hour of the year for them to achieve a 100% capacity factor.

In fact, the coal units in MEAN's portfolio have experienced this as well, largely as a result of operating based on economic dispatch in the SPP and MISO markets. Since 2011, the weighted capacity factor of MEAN's coal fleet has decreased from 77.4% to 47.8%. Looking specifically at the coal units that operate in the SPP and MISO integrated markets, the weighted capacity factor has fallen from 71.4% to 37.9%. If this trend continues, and the volume of renewables in the SPP and MISO interconnection queues indicates that it will, we can reasonably expect MEAN's coal units to generate at lower levels in the future.

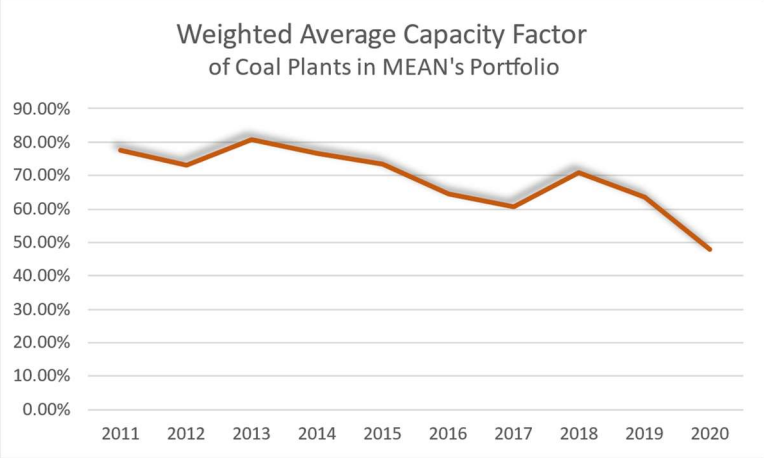


Figure VI-5

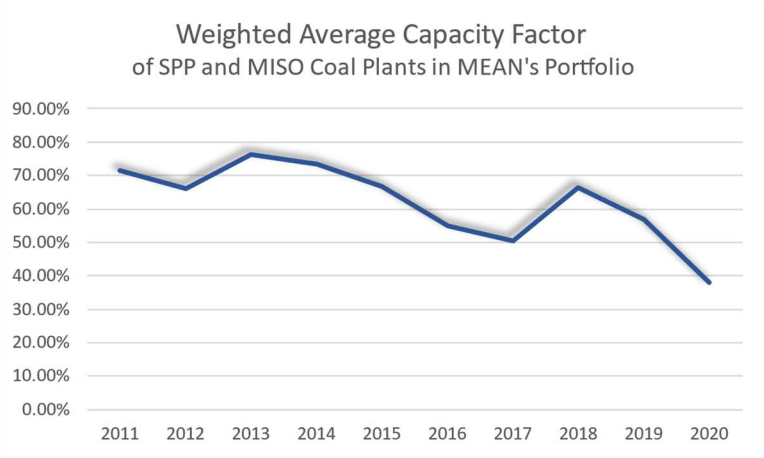


Figure VI-6

E. Resource Mix by Fuel Type

1. Capacity

When presenting resource mix metrics, resource capacity is listed according to unit nameplate. This is notable in relation to intermittent resources, namely existing wind contracts. "BTMG" represents Participant Owned Generation, or "Behind-the-Meter Generation."

It is very important to note in the following section that the values shown simply represent the currently contracted capacity. It is quite obvious that the relative values will (and sometimes do) change if MEAN's total capacity changes. Increase or decrease in relative percentages does not always correlate to the same magnitude of increase or decrease in MWs, given that the totals change. The varying capacity factors and accreditation values of different types of resources, particularly renewable resources, also mean that the "Future" capacity values represent accredited capacity that is required and are not necessarily predictive of the actual nameplate capacity of future assets. MEAN will size future resources to satisfy the energy needs of our total forecasted load as well as resource adequacy requirements.

For each region, a chart is included to show the resource mix in 2022 and 2038 as well as an intermediate year that represents change in the region.

SPP capacity is supplied largely by fossil fuel resources. Coal and participant owned generation account for a total of 64% of the capacity in 2022. (This participant owned generation includes 40 MW imported from MISO.) In SPP, WAPA allocations total only 9% of the region's capacity. The wind farms provide renewable capacity of 16%. Lastly, Cooper Nuclear Station (included in the NPPD Multi-Unit Participation Agreement) totals approximately 11% of SPP capacity.

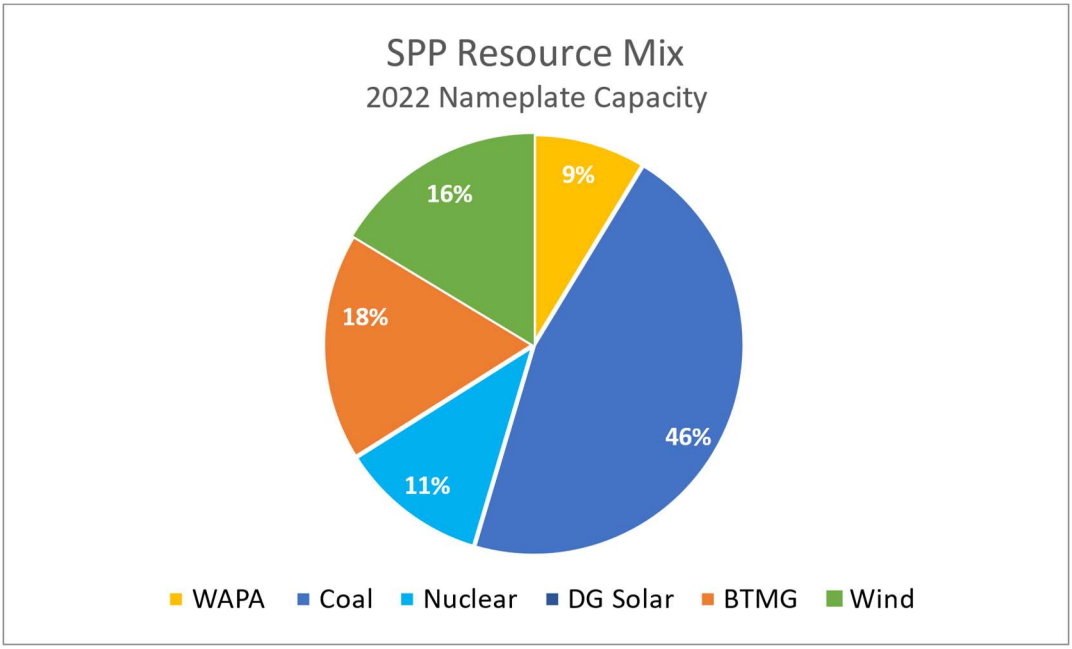


Figure VI-7

For the interim SPP graph, 2028 was selected rather than 2029 because of the need for capacity reources up to this year. In 2029, SPP no longer has a capacity need. In 2028 the coal and nuclear decrease with the expiration of the NPPD Multi-Unit Participation Agreement. The total of participant owned generation imported from MISO reduces as the Marketing Agent Arrangement with IMU and WU expires in 2023. Other WAPA allocations see little change, providing 9% of 2028 capacity. Renewable capacity reduces to 14% of the total as some of the wind PPAs will have expired by this year, but new community-owned solar Distributed Generation facilities will be operational. Therefore 27% of the required 2029 capacity must be furnished by future resources.

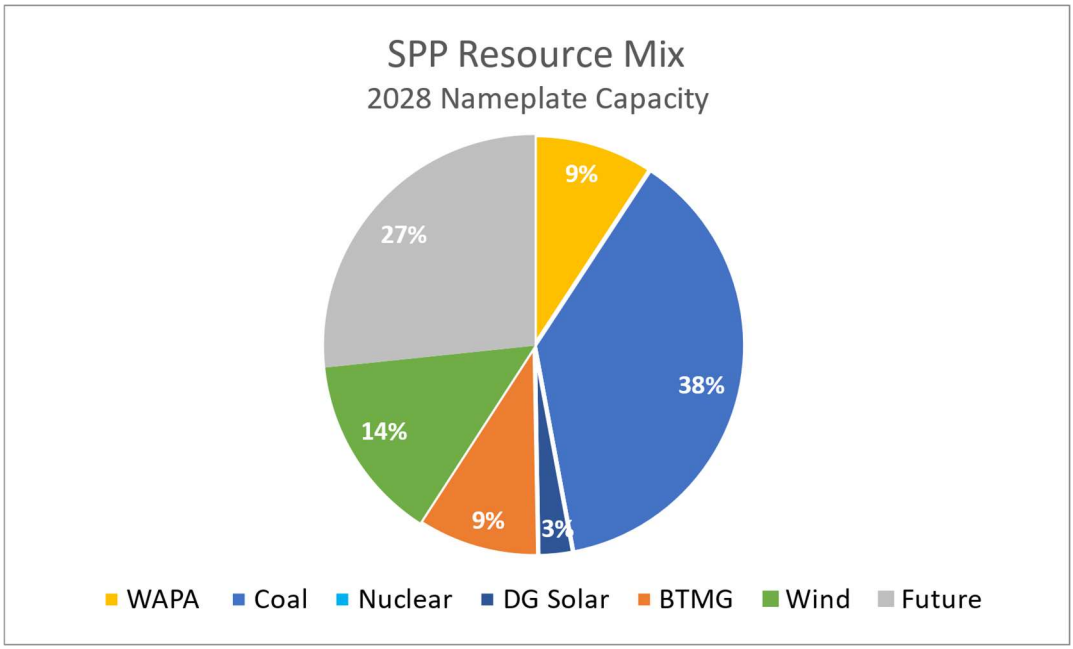


Figure VI-8

2038 sees significant change as the expiration of the WAPA Displacement Agreement means the member generation previously utilized to serve WAPA's Kansas load now returns to MEAN's portfolio. No future capacity is needed in 2038.

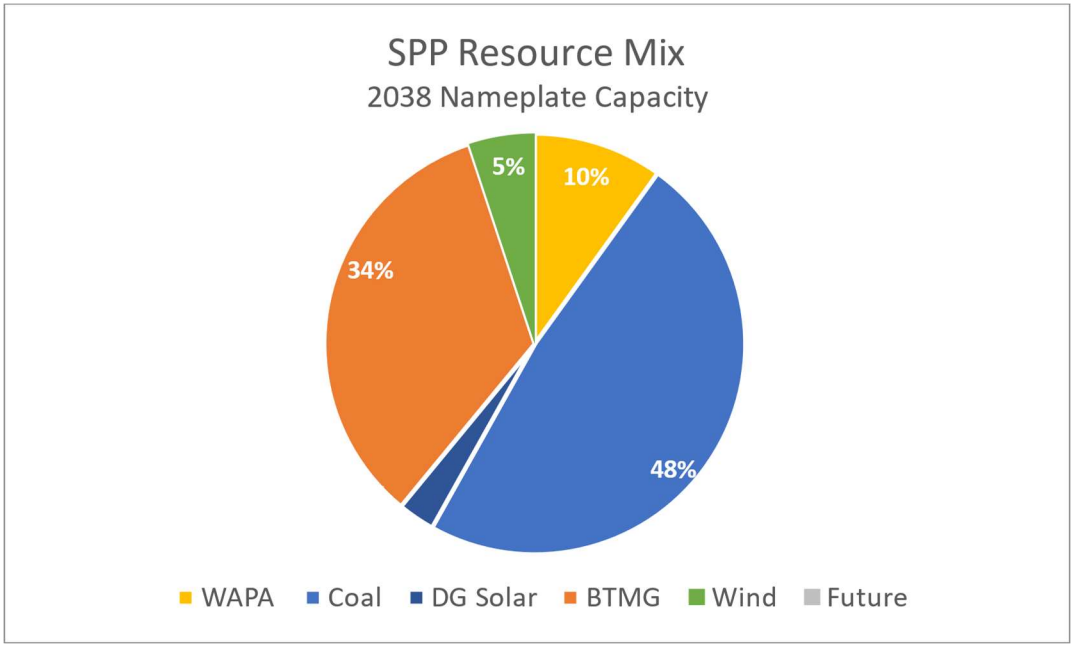


Figure VI-9

In the west region the majority of the existing capacity, 61%, is provided by WAPA allocations and the WAPA Displacement Agreement. This means only 22% of the west capacity is fossil fueled, from coal resources and participant owned generation, a much lower percentage than in other regions. The remaining 17% of capacity in the west is renewable, comprised of wind and small hydropower.

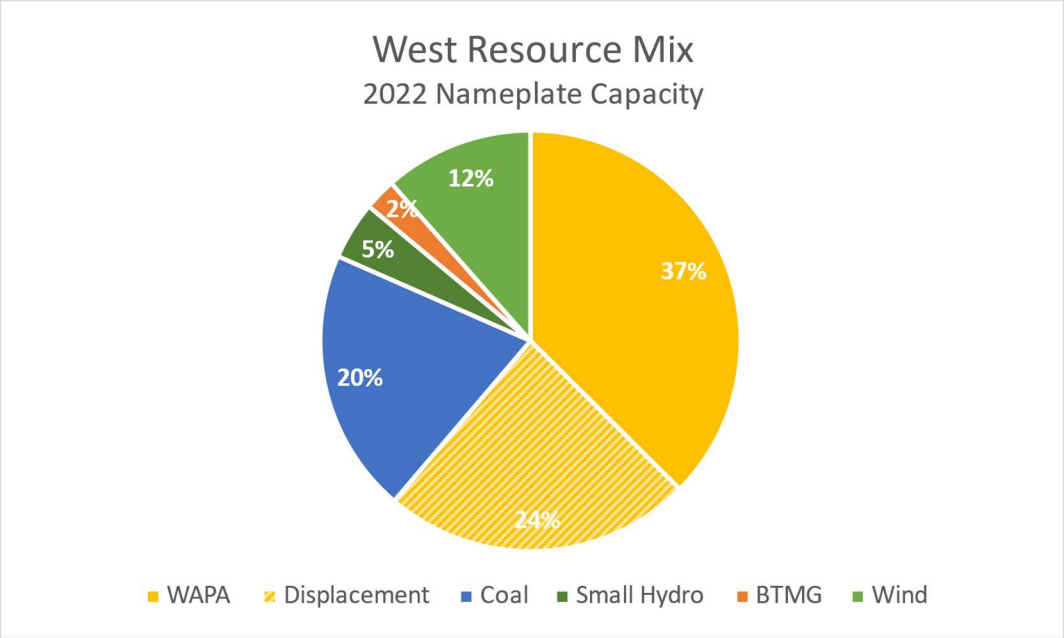


Figure VI-10

In the 2029 snapshot, the total WAPA capacity decreases dramatically due to the expiration of the WAPA Displacement contract in that year. The coal share also decreases with the termination of the Black Hills PPA in 2023. The newly planned Distributed Generation in the form of community-owned solar generation contributes a small portion in 2029. This leaves 21% of the required capacity to be supplied by future resources.

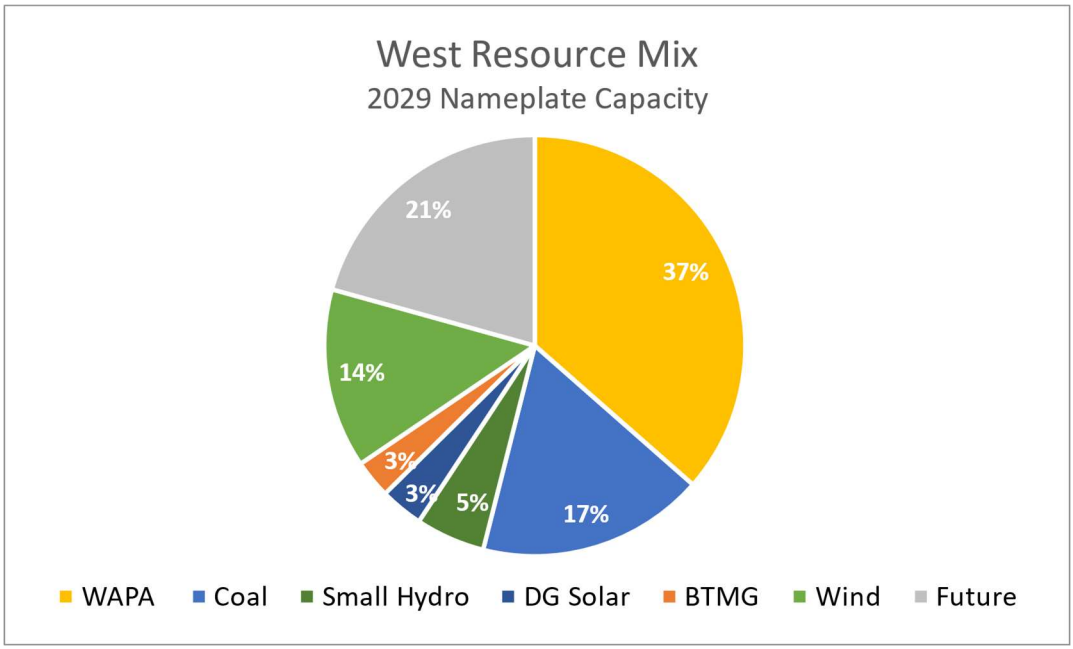


Figure VI-11

By 2038 the Kimball Wind Farm PPA and the Shavano Falls PPA will have expired. Most other resources in the portfolio remain, leaving 32% of required capacity to be provided

by future resources. Again, due to the reduced accreditation of most renewable resources, this nameplate capacity percentage is likely to be higher.

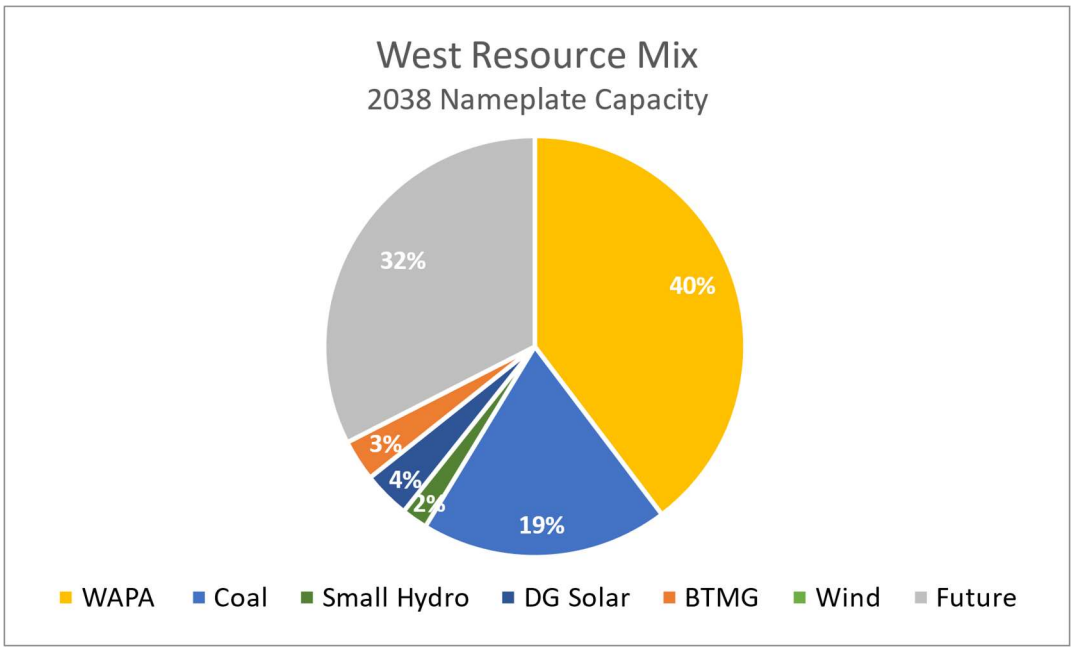


Figure VI-12

With coal at 62% and participant owned generation at 27%, MISO capacity is largely fossil fueled. Only 7% of capacity is provided by WAPA allocations and 4% by renewable resources in the form of landfill gas.

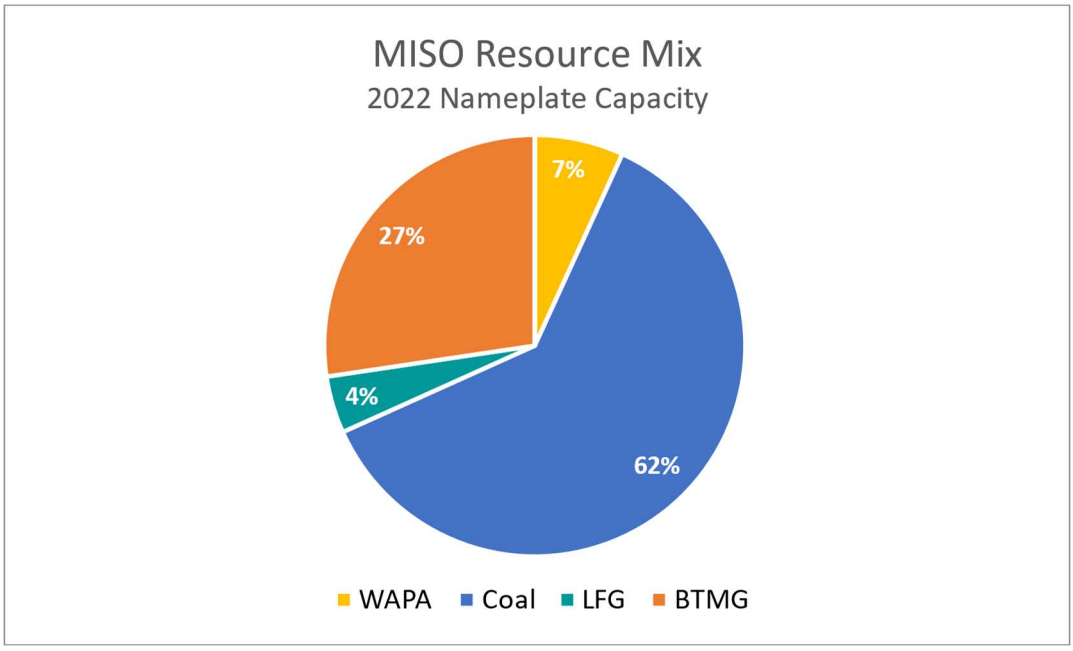


Figure VI-13

The MISO picture changes very little in the future. Behind the Meter Generation accounts for slightly less with contract expiration of the Marketing Agent Agreement, although it is likely that this same generation will provide needed capacity to backup intermmittent resources in MEAN's SPP footprint. The total in WAPA allocations decreases with the

expiration of one of the participant service contracts. The contribution of community-owned solar adds capacity in the Distributed Generation category. No future resources are required in MISO.

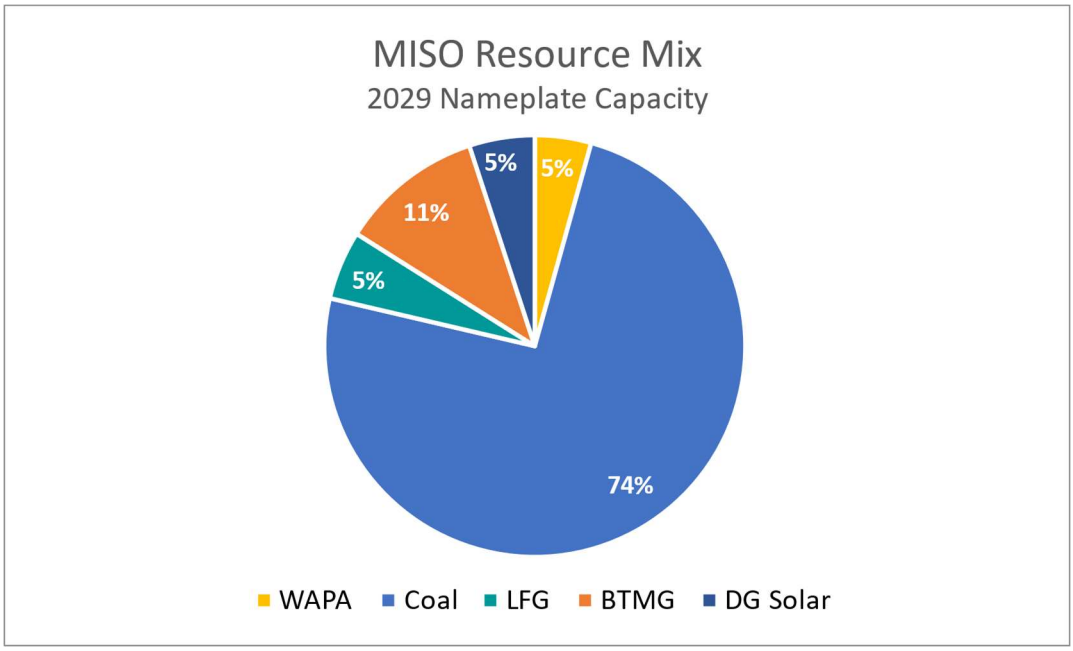


Figure VI-14

In 2038, the LFG contract expires, leaving a small need for future resources to replace this capacity. The MISO region remains essentially resource adequate throughout the study period.

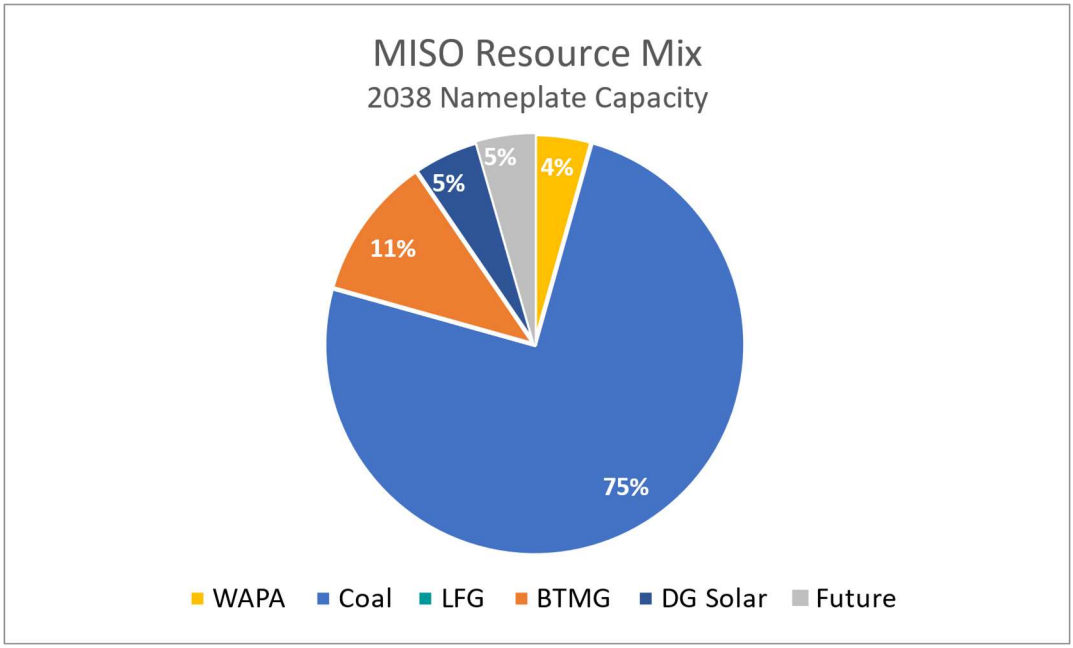


Figure VI-15

In 2022, 51% of MEAN's resource mix is provided by fossil fueled resources in terms of capacity, divided between coal and participant owned generation. Hydro from WAPA allocations and the WAPA Displacement agreement supply 31% of the total. Renewable

resources, including wind, small hydro, and landfill gas, account for 14% of MEAN's capacity. 4% of MEAN's capacity mix is nuclear powered.

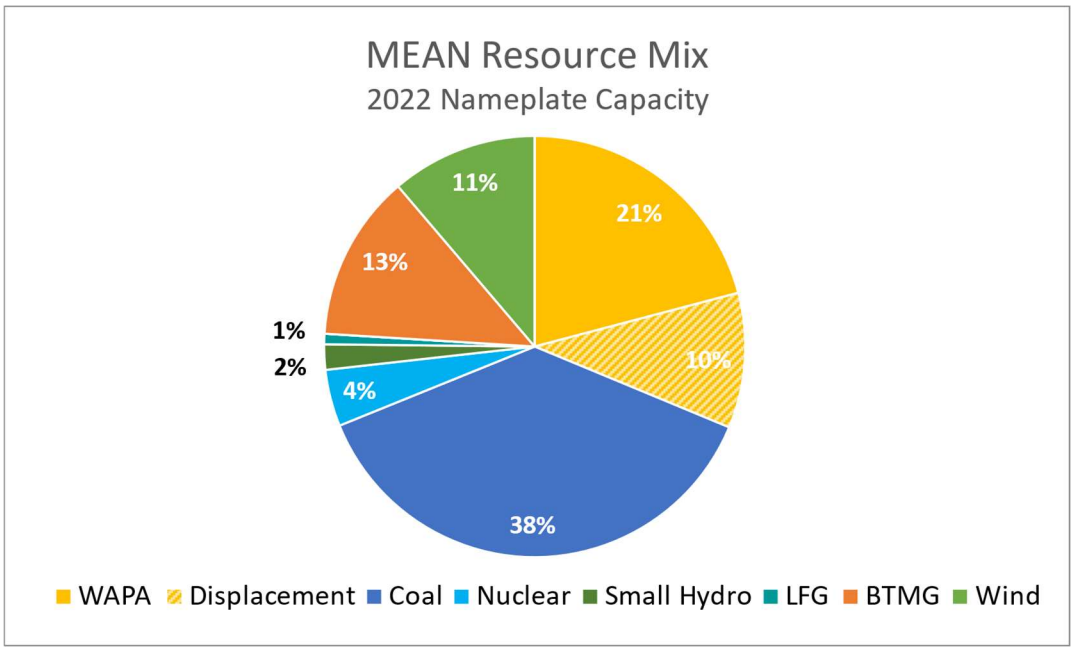


Figure VI-16

In 2029, the percentage of fossil fueled capacity remains roughly the same at 53%. WAPA power is now at 19%, since the Displacement agreement has expired, and the renewable total has increased slightly to 19%. 9% of accredited capacity needed for resource adequacy will be supplied by future resources.

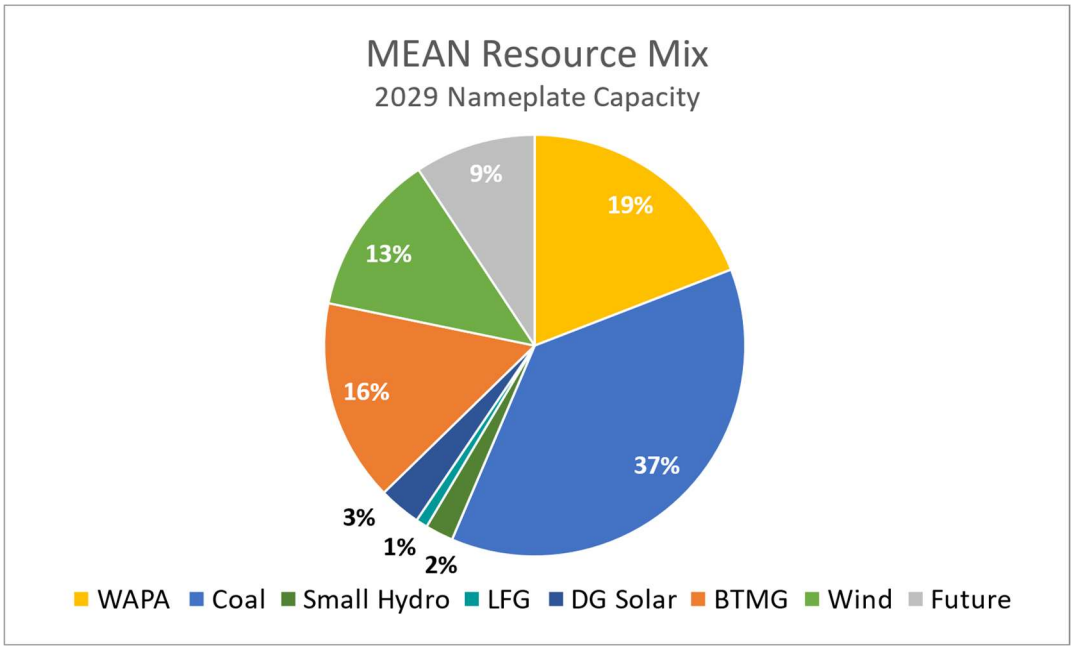


Figure VI-17

By 2038, the Landfill Gas PPA will terminate, along with several wind PPAs. The capacity percentages see little change, and 14% of MEAN's total required accredited capacity will be supplied by future resources.

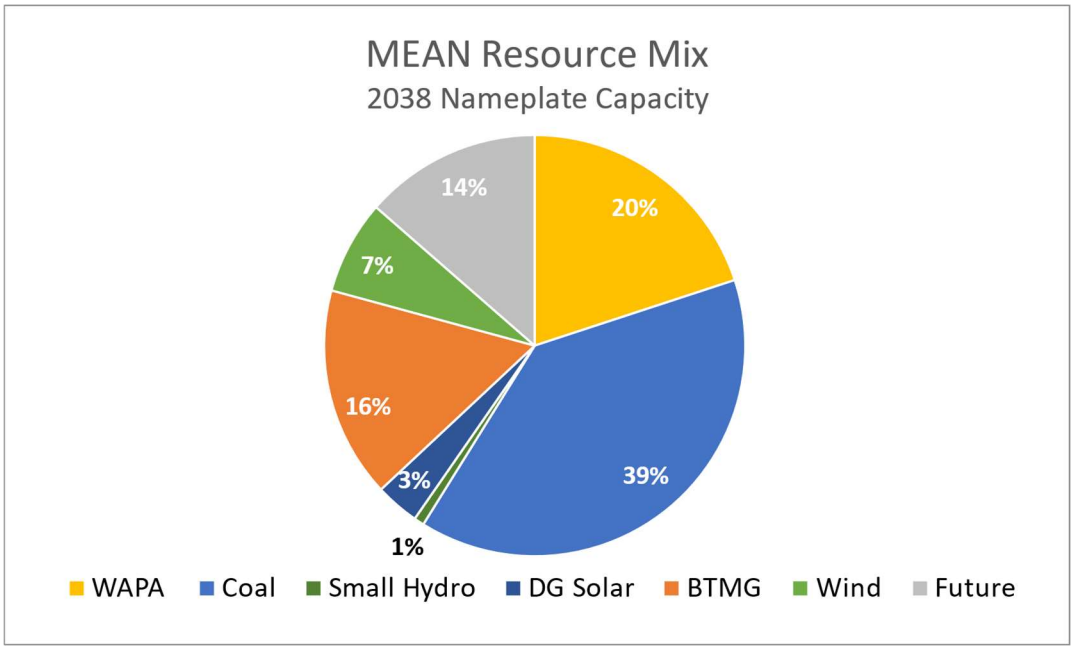


Figure VI-18

2. Energy

In terms of energy, future projections are based on a combination of availability as a function of historical operation and economic dispatch in response to changing market prices. As the total resource mix of each market changes, the operation of MEAN's resources may change from the projected profiles.

The baseload operation of coal and nuclear assets in SPP is evident in the high percentage of energy generated by these units. In total, 79% of MEAN's SPP energy in 2022 is produced by these resources. WAPA hydro operates at a lower capacity factor as shown by the relative contribution to the total energy at only 9%. The renewable resources in SPP consist of wind turbines, which also achieve a lower annual capacity factor and constitute 12% of MEAN's energy in SPP. Again, the behind the meter participant owned generation contributes virtually no energy on an annual basis.

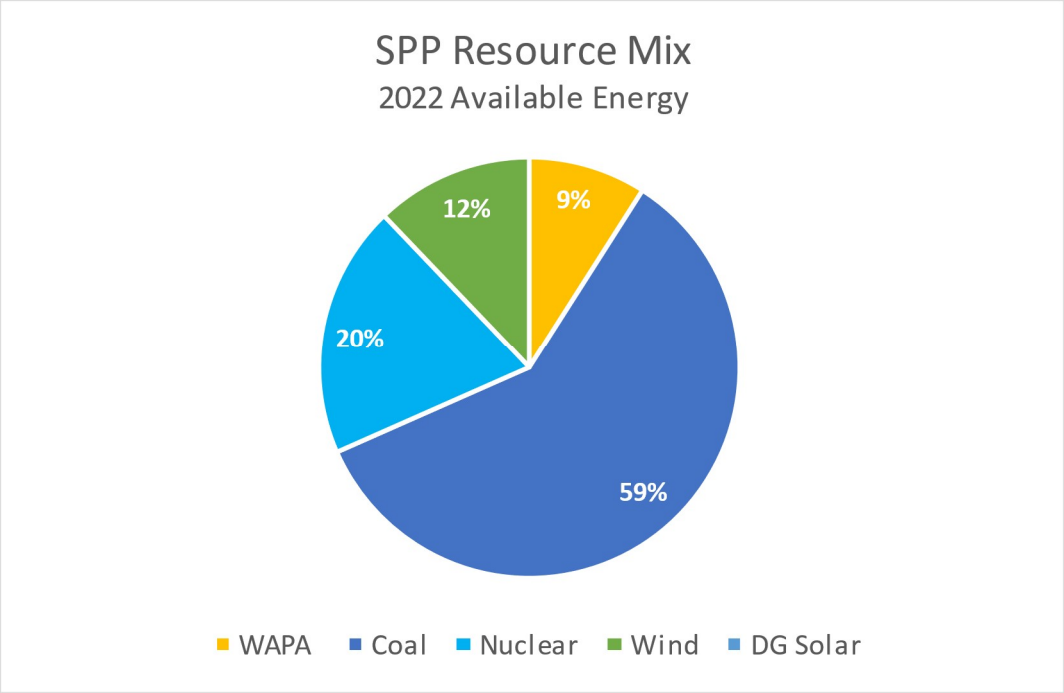


Figure VI-19

In the future, as the MUP contract with NPPD is discontinued and the wind PPAs expire, there is a decrease in energy from coal, nuclear, and wind generation. The WAPA energy changes little, and the DG Solar makes up a small percentage. The amount of energy to be produced by future resources in 2029 is approximately 23%.

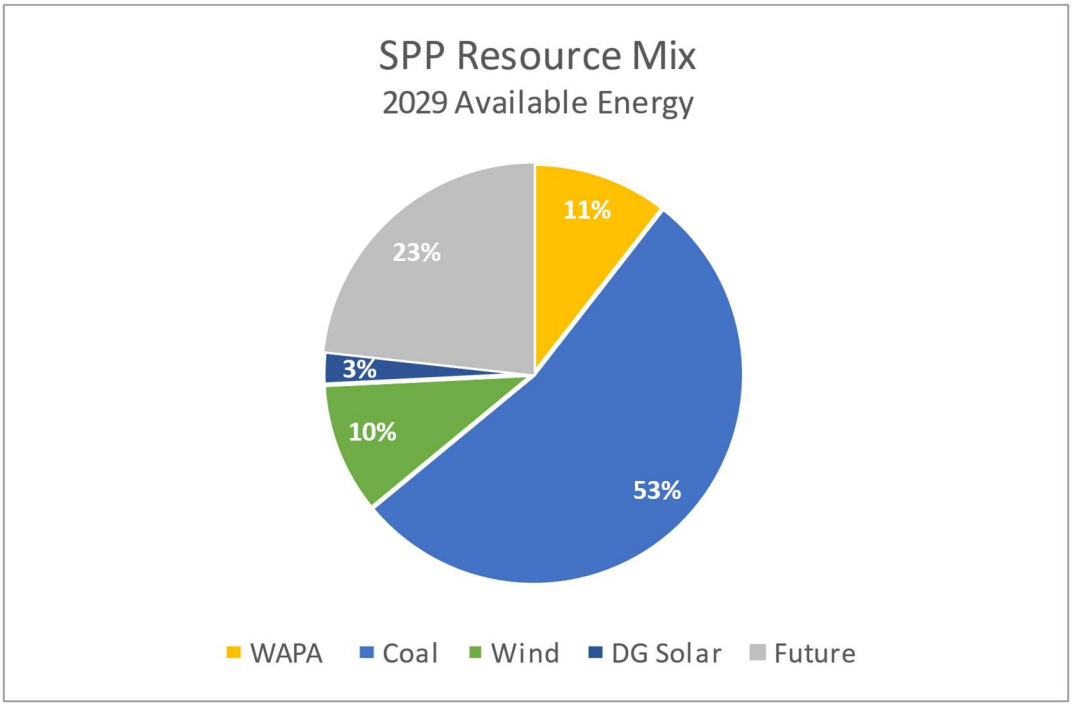


Figure VI-20

In 2038, SPP still has an energy need to be supplied by future resources, which has now grown to 30%. Coal generation and WAPA allocations remain constant. Wind generation decreases with the termination of several wind PPAs.

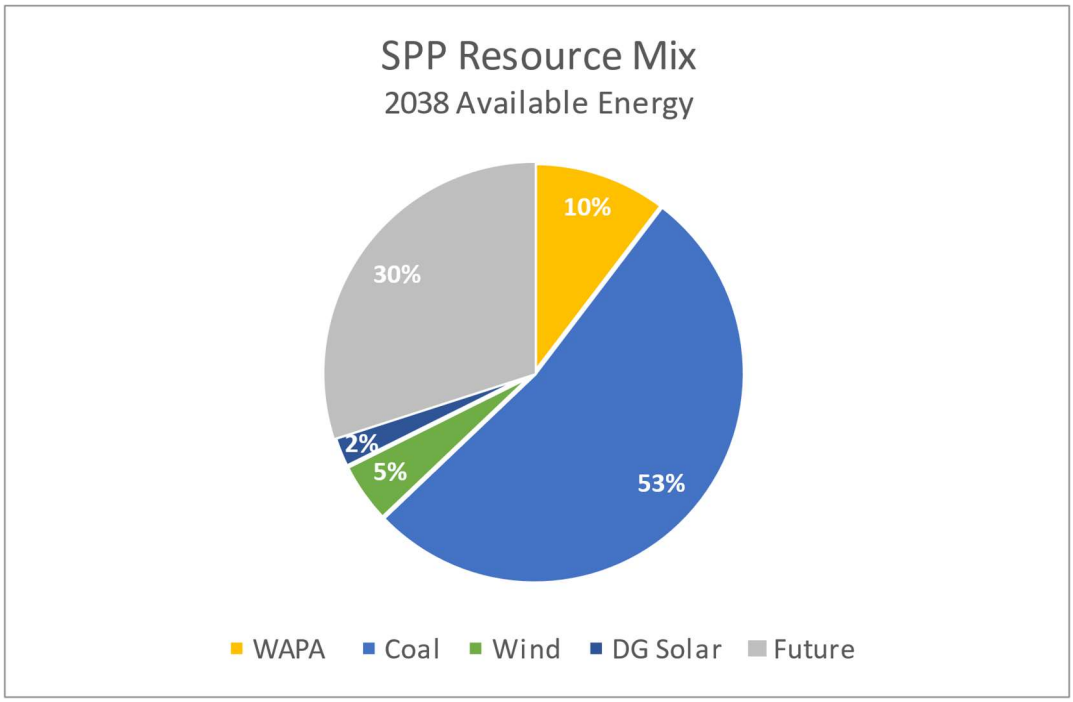


Figure VI-21

The energy proportions in the west show the contribution of baseload coal units. Due to the high capacity factor of these units, the 36% of MEAN energy produced by the coal resources is a larger percentage than MEAN's coal capacity in the west. Conversely, WAPA resources operate at a lower capacity factor, and therefore WAPA provides a smaller percentage of energy than capacity. The intermittent nature of renewable resources is also reflected in the low amount of energy produced relative to the capacity. Participant owned generation is generally not called to operate many hours of the year, and therefore does not produce a notable amount of energy.

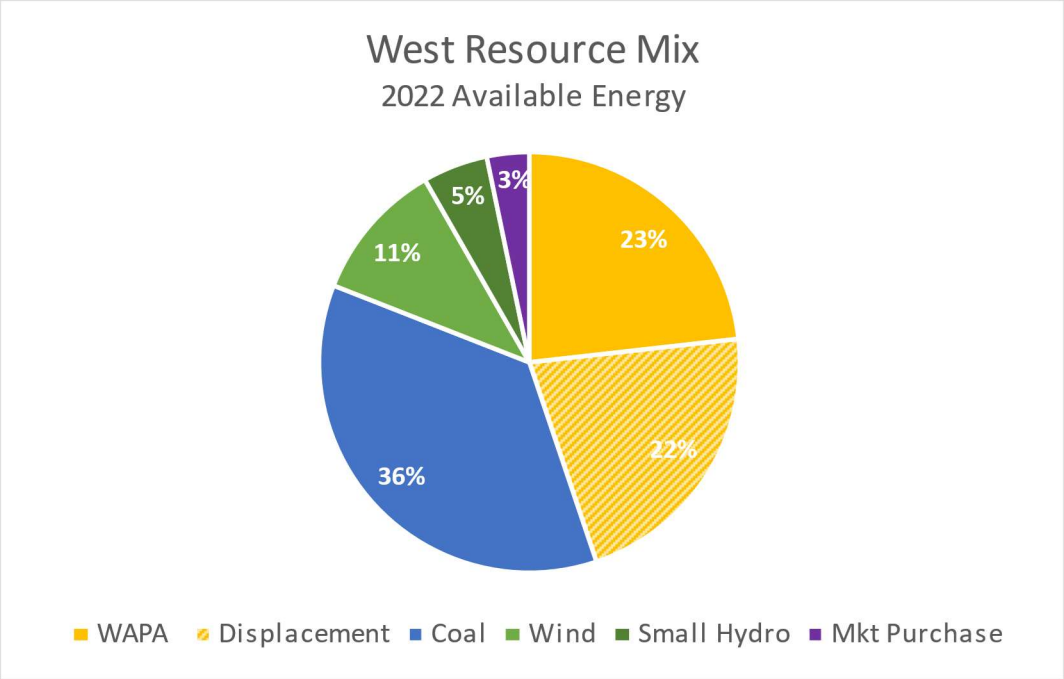


Figure VI-22

In 2029, the coal generation in the West decreases due to the expiration of the Black Hills PPA in 2023. The energy supplied by the WAPA Displacement Agreement is reduced as that contract ends in June of that year. Renewables contribute the same energy percentages. In the west region, 18% of energy in 2029 will come from future resources.

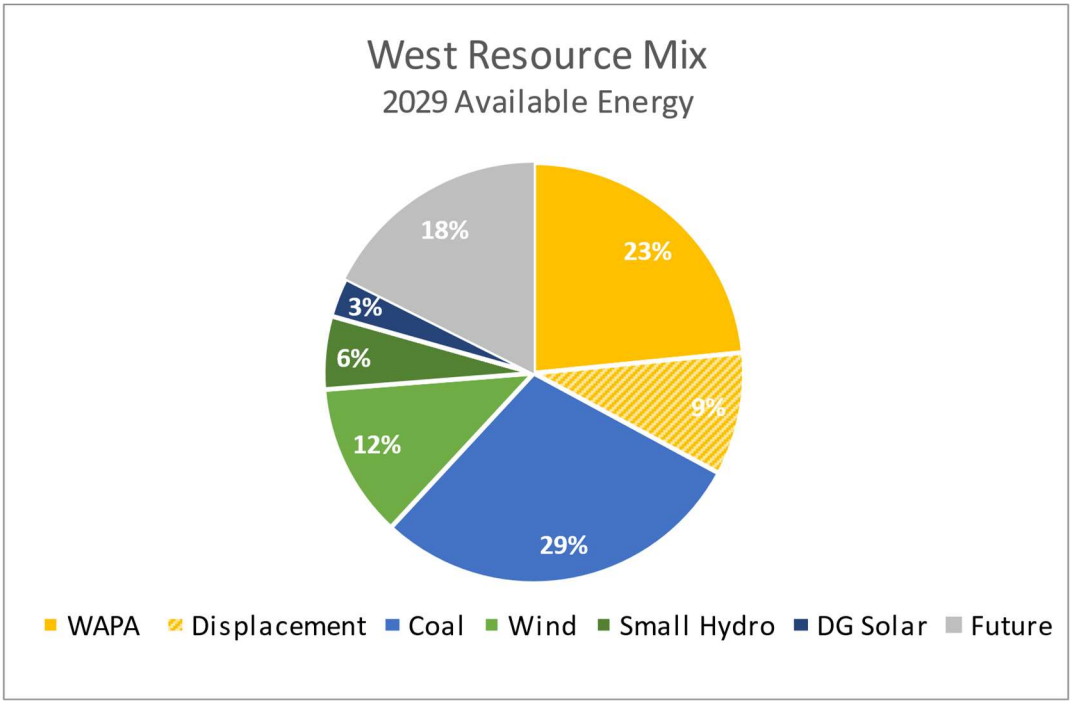


Figure VI-23

By 2038, the Kimball Wind PPA and the Shavano Hydro PPA will have expired, increasing the need for future energy resources to 37% of the west portfolio.

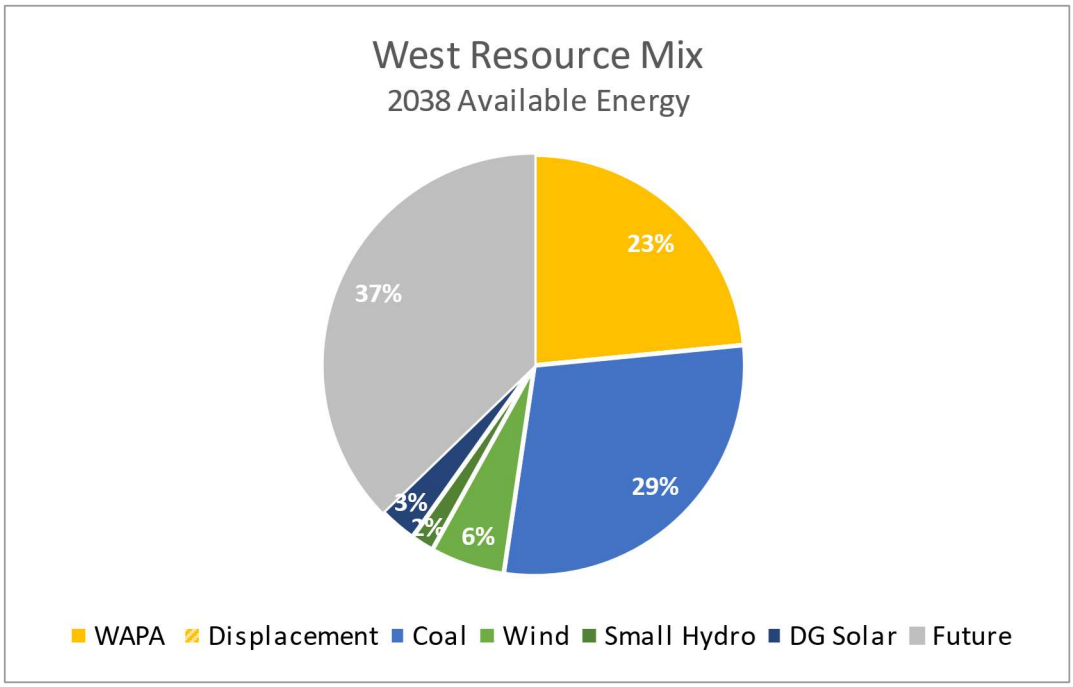


Figure VI-24

In MISO, an overwhelming majority of the MEAN energy generated is sourced from coal units. Only 17% of the total energy comes from non-fossil fueled sources, with 8% from WAPA allocations and 9% from renewables.

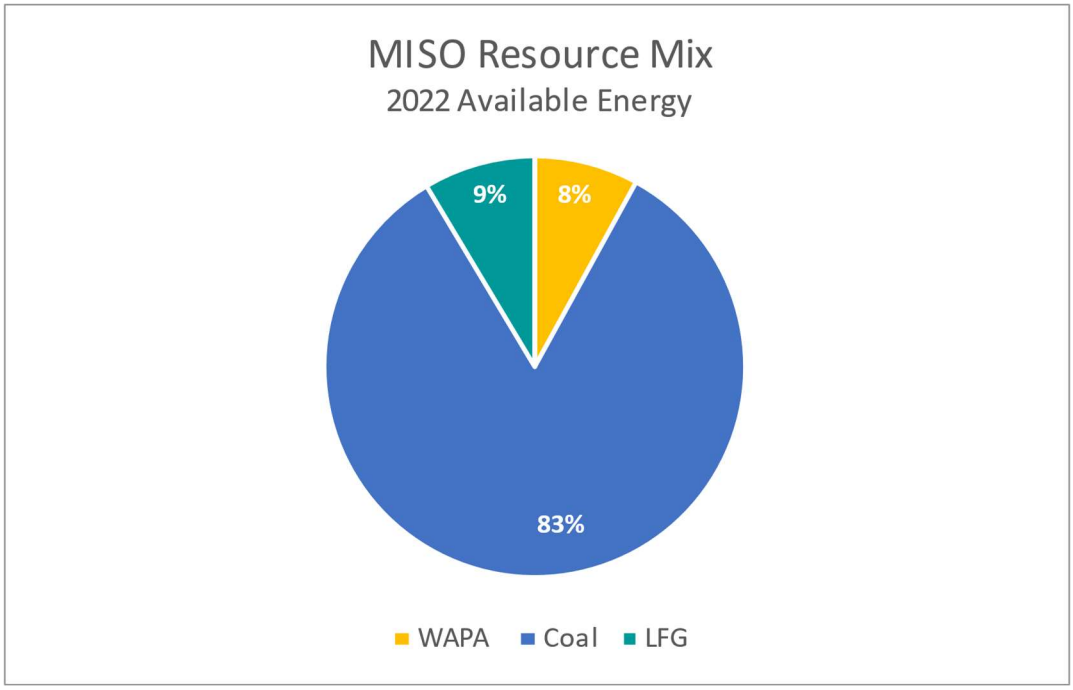


Figure VI-25

The only change in MISO to occur by 2029 is the decrease in WAPA allocations with the expiration of a short-term power supply contract and the introduction of DG Solar.

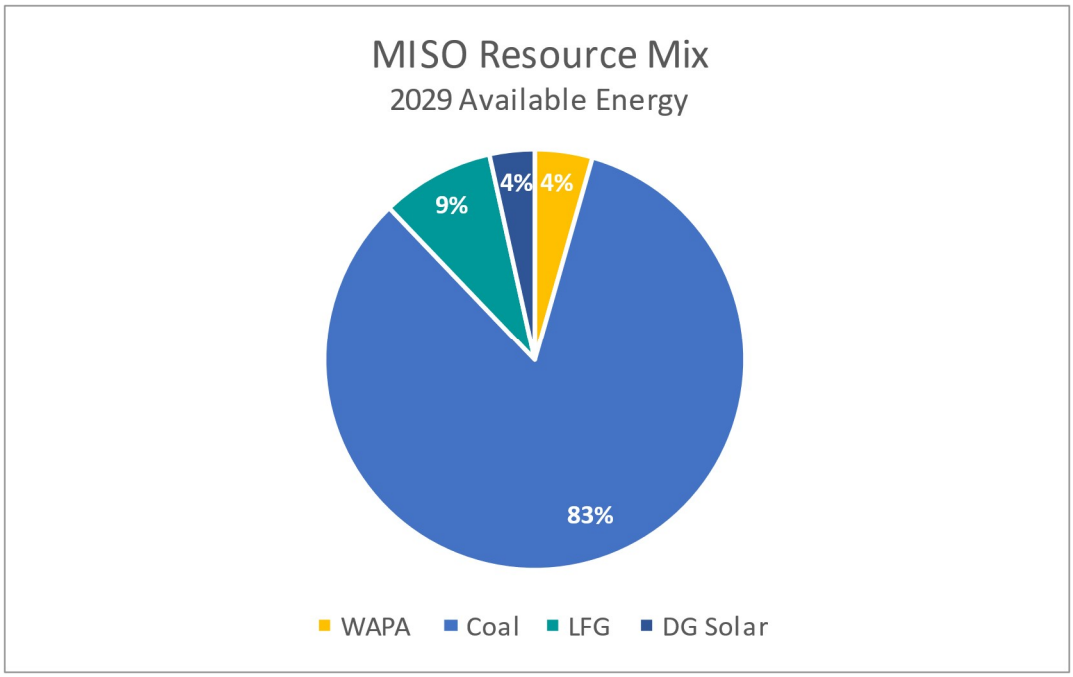


Figure VI-26

Finally, in 2038, MISO sees the expiration of the Landfill Gas PPA. There is no need for additional energy in MISO throughout the 15-year study period.

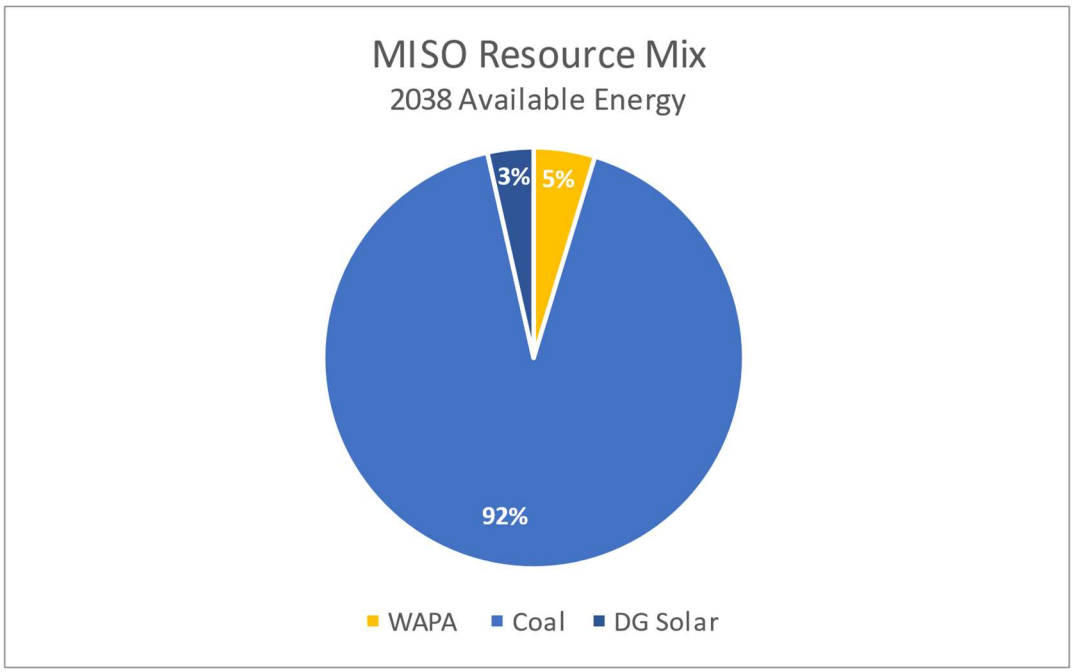


Figure VI-27

MEAN's resource mix in 2022 in terms of energy generation capability shows that the largest contribution comes from coal resources, at 54% of the total. Non-emitting resources make up the remaining 46%. 24% of the total energy is supplied by WAPA allocations and the WAPA Displacement agreement, 13% of MEAN's energy is renewable, and 8% is generated by a nuclear resource. MEAN entered into a short-term energy purchase to hedge against high market prices in 2022.

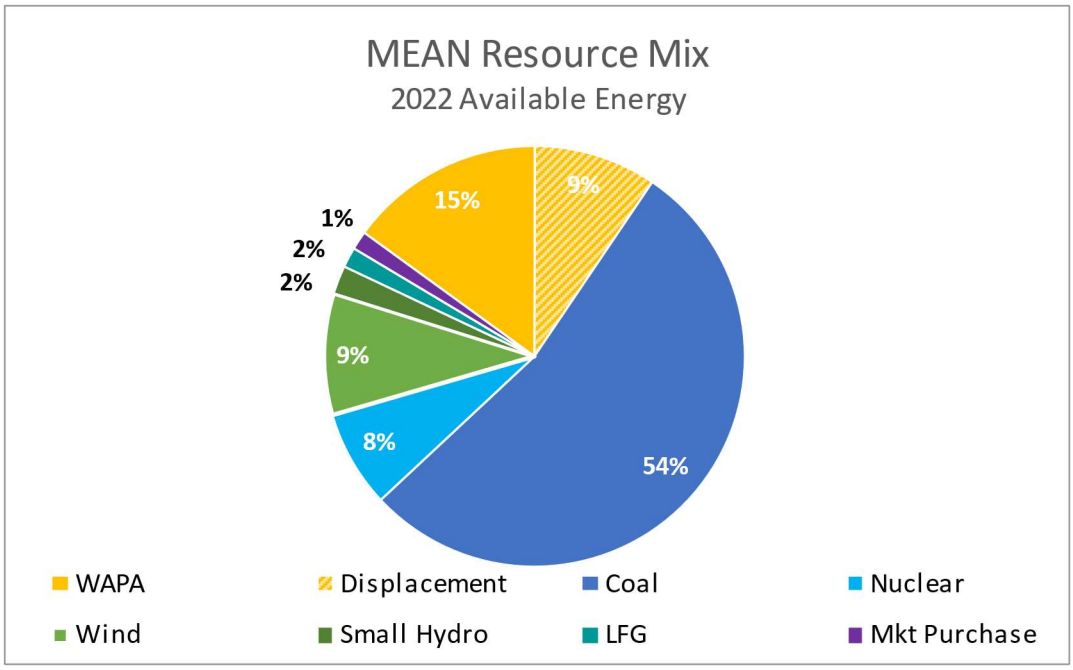


Figure VI-28

Into the future, the energy availability of coal resources decreases slightly to 49% of the total, the contribution of WAPA allocations decreases to 19%, and the renewable resource percentage increases to 16% with the installation of DG Solar. Only 16% of MEAN's total energy in 2029 must be generated by future resources.

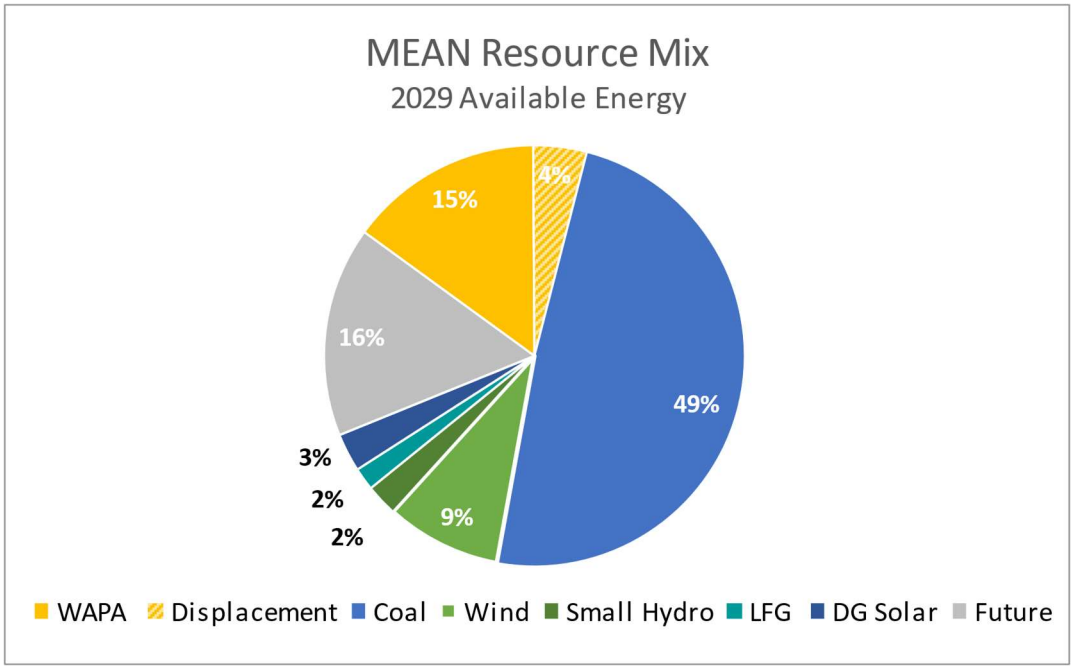


Figure VI-29

Out into 2038, MEAN's energy from coal is projected to remain constant at 50%. WAPA drops to 15% with the expiration of the WAPA Displacement Agreement. Renewables decrease to 8% as Wind PPAs, the Landfill Gas PPA, and the Shavano Falls Hydro PPA end. MEAN will require an estimated 27% of energy in 2038 from future resources.

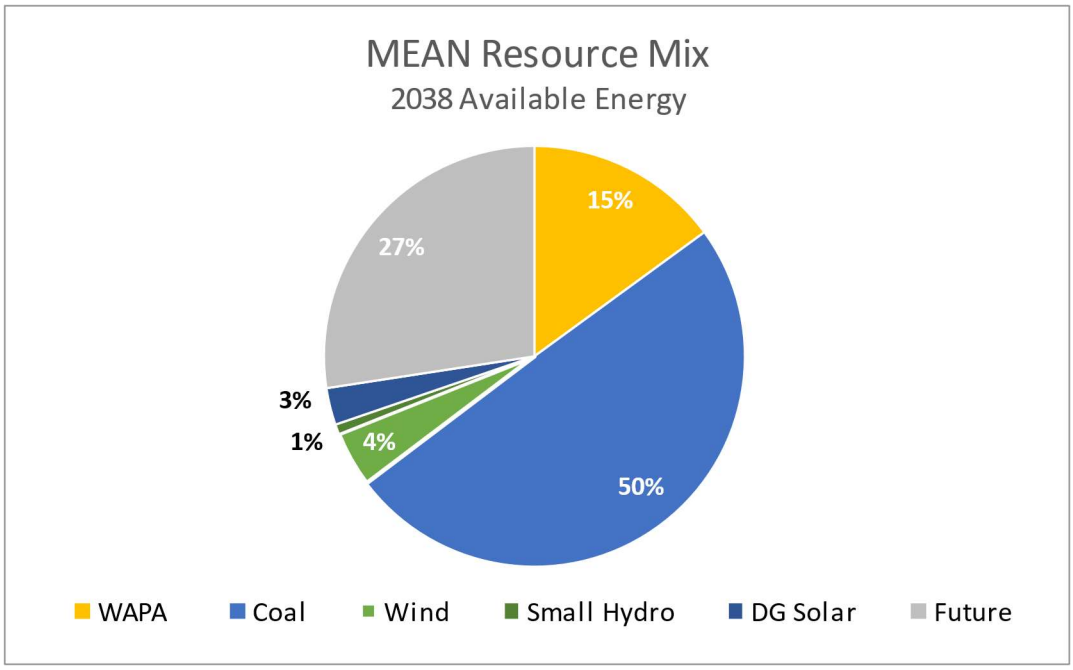


Figure VI-30

Again, the future energy mix is a projection based on not only the availability of resources, but the operation based on historical capacity factors and contract energy requirements. Changes in market dynamics and the introduction of an integrated market in the west could substantially alter the actual energy production and likely reduce energy produced by fossil fuel resources.

F. Resource Mix by Contract Type

MEAN's resource portfolio consists of assets obtained through various contract vehicles. The rights to the capacity and energy of a given unit as well as the way costs are incurred is dependent upon whether the contract is an ownership or a Power Purchase Agreement (*"PPA"*). In addition, WAPA provides allocations that are applied directly to load, separate from ownership or power purchase.

1. Capacity

In terms of nameplate capacity, 31.4% of MEAN's resource portfolio is controlled through an ownership interest, 20.4% of the total portfolio is assigned to MEAN as an allocation, 35.7% is contracted via a PPA, and 12.5% leased Member Generation. For purposes of this illustration, the WAPA Displacement Agreement is considered a Power Purchase Agreement.

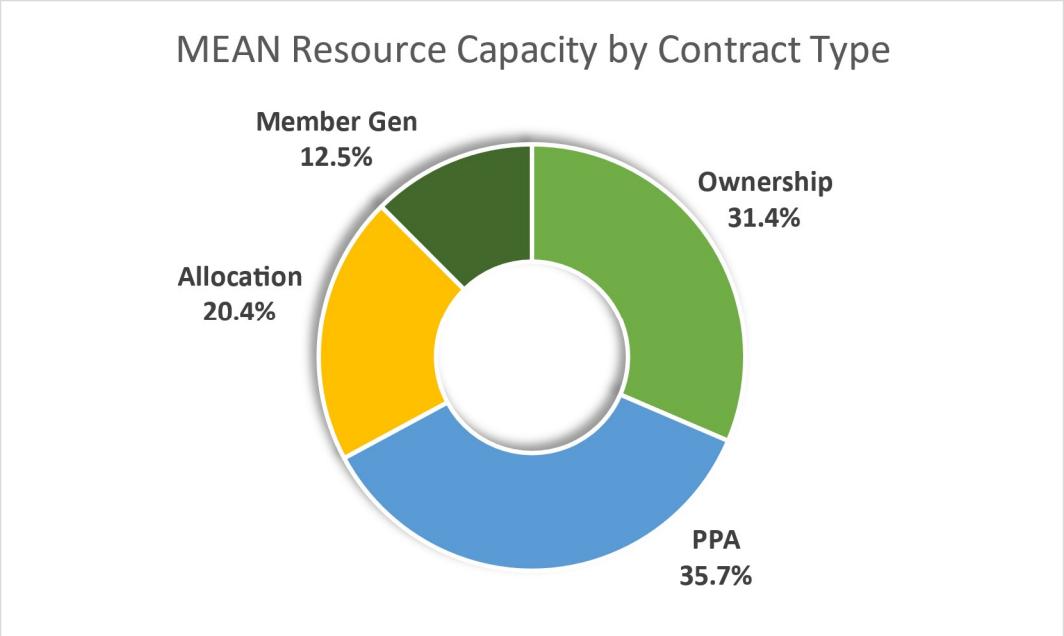


Figure VI-31

2. Energy

In total, 42.2% of the energy generated by MEAN's resource portfolio is controlled through an ownership interest, 15% of the total portfolio is assigned to MEAN as an allocation, and 42.7% is contracted via a PPA (including the WAPA Displacement Agreement.)

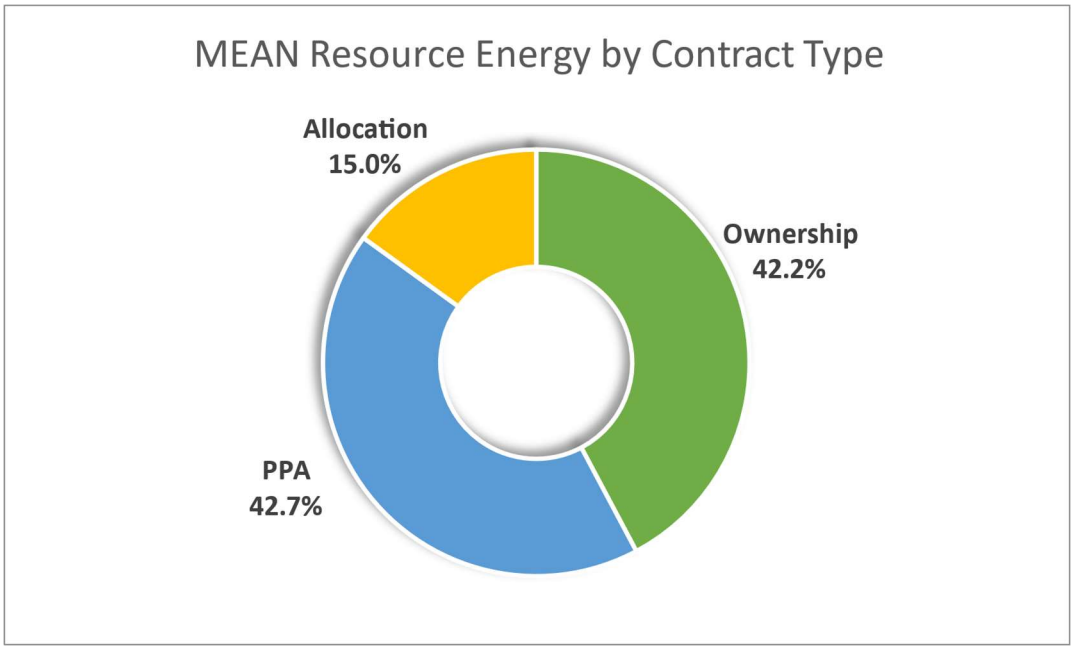


Figure VI-32

VII. Distributed Generation

A. Renewable Distributed Generation Policy

MEAN adopted a Renewable Distributed Generation Policy (the *"DG Policy"*) in 2016 that, in limited amounts and in certain circumstances, allows the Participants that have committed to purchase all of their electricity requirements from MEAN to (a) permit their retail customers to utilize output from qualifying renewable generation resources to supply all or a portion of their own loads, (b) purchase output from qualifying renewable generation resources owned by their retail customers, which shall be treated as a sale to MEAN if the resource has an estimated rated generating capacity of 25 kW or more, and (c) subject to a cap set forth in the DG Policy, own and operate qualifying renewable generation resources, to participate in qualifying community solar projects, or to enter into power purchase agreements under certain limited circumstances to purchase the output of qualifying renewable generation resources, to offset their total requirements purchases from MEAN.

In November of 2019, the MEAN Executive Committee, acting on behalf of the Board, approved an increase in the policy limits, allowing Participants to install one or more distributed renewable generating resources capable of generating up to 5% of the Participant's average annual energy needs served by MEAN, or the energy generated by 100 kW, whichever is greater. The type of resource determines the capacity factor, and therefore the allowable capacity of the installed resource.

B. Existing Distributed Generation

In 2016, MEAN conducted a Participant survey in preparation for the creation of the DG Policy to determine the installed DG in each community. This serves as a baseline of "grandfathered" distributed generation which will not be counted against the Participant's 5% cap if the asset is community-owned. This installed capacity is already reflected in the historical load values, and therefore is also included in future load forecasts.

The survey found that throughout the entire MEAN footprint, there was a total installed grandfathered DG capacity of 2,875 kW. Of this total, 71 kW were located in SPP, 739 kW were located in MISO, and 2,065 kW in the West.

Since the establishment of the grandfathered distributed generation, retail end users of MEAN communities have installed a total of 4,932 kW of distributed generation. Of this installed DG, 151 kW are located in SPP, 990 kW in MISO, and 3,791 kW in the West.

C. MEAN Community Solar Request for Proposals

In 2019, MEAN surveyed member communities regarding interest in installation of community-owned solar assets. In response to this survey, eight communities expressed initial interest. Further discussion increased this number to eleven interested communities. On behalf of these interested communities, MEAN released a Request for Proposals for community-owned solar facilities. The interested communities were required to supply a controlled site adequate for the project size and would contract directly with the solar developer. MEAN would administer and negotiate the contract and assist members in sizing and specifications of the installation. The aggregated Request for Proposals was pursued as the increased volume of solar installation required of the combined projects provided advantageous pricing compared to a standalone project in one community.

The RFP was released in July 2021 and bids received in September 2021. After evaluation of bids and consultation with members, MEAN awarded the bid for a total of 14.2 MW-DC of community-sited and -owned solar facilities. Since that time, additional communities have joined the project, and the total installed capacity has increased to 27.4 MW-DC. Project installation is scheduled to begin in Summer 2022 with all commercial operation dates by Spring 2023. Following is a list of MEAN communities participating in the project to date and the capacity of each planned installation. (This list may not be final and is pending the receipt of executed PPA contracts.)

Community	Annual Production (MWh)	Nameplate (kW-AC)	Nameplate (kW-DC)
Alliance NE	5,454,734	2,400	3,069
Ansley NE	209,268	120	119
Crete NE	3,360,018	1,600	1,950
Stuart NE	273,799	175	158
Waverly IA	6,673,710	3,400	4,020
Delta CO	2,056,087	875	1,017
Pender NE	290,685	175	166
Sergeant Bluff IA	1,134,240	600	691
Aspen CO	2,243,838	1,000	1,209
Gering NE	2,279,099	1,000	1,238
Indianola IA	6,545,027	3,400	4,090
Oxford NE	251,997	120	130
Sidney NE	3,697,157	1,600	2,036
Fort Morgan CO	9,816,612	4,200	5,040
Imperial NE	1,196,113	525	662
Denver IA	712,813	350	413
Wray CO	619,432	350	310
Carlisle IA	972,927	525	617
Paxton NE	262,906	120	147
Curtis NE	605,201	350	356
Total	48,655,662	22,885	27,438

Figure VII-1

MEAN encourages this type of development within communities in accordance with bond advisor recommended limits. We look for additional projects of this type in the future and anticipate participation approaching the full 5% of MEAN energy consumption. The following graph shows the impact if all MEAN communities installed their qualified level of distributed generation.

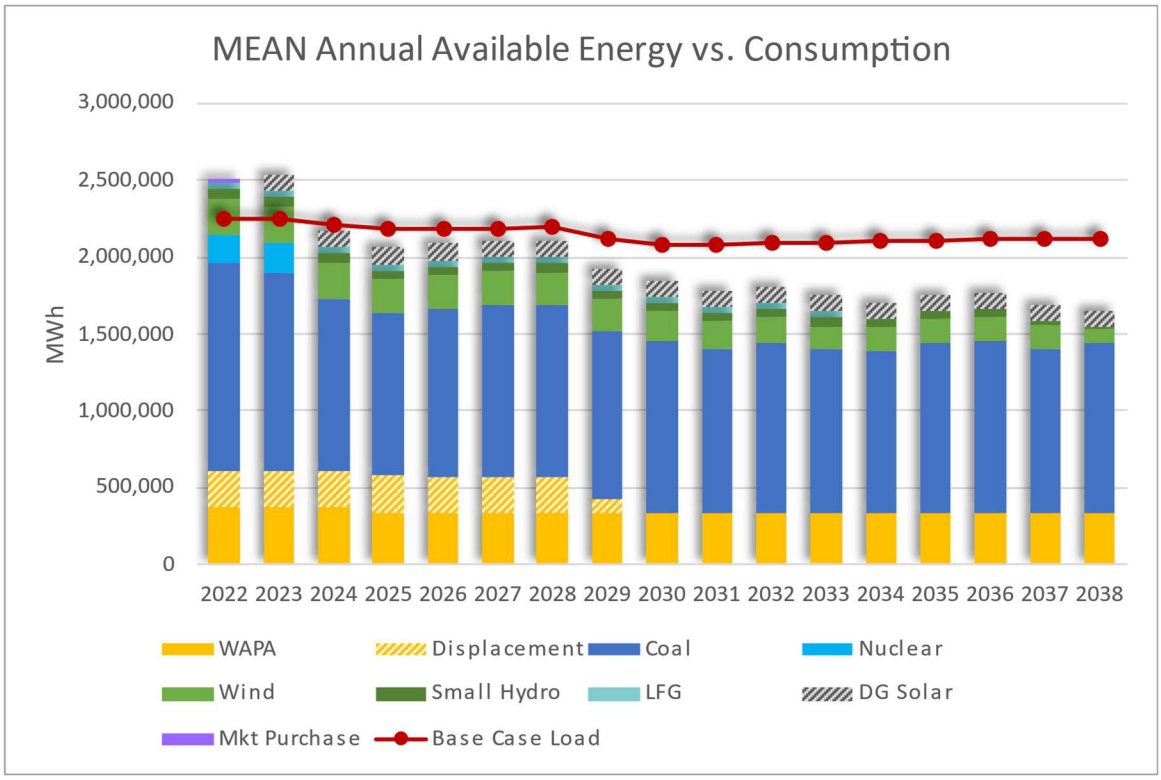


Figure VII-2

MEAN communities have also expressed interest in the installation of alternate distributed generation technologies, such as fuel cells, cogeneration facilities, and energy storage. Under evolving policy, projects may be incorporated into MEAN's load and resource balance into the future and would ultimately decrease the need for other resources.

D. MEAN-Contracted Distributed Generation

MEAN has identified the investigation of new MEAN-contracted generation opportunities located in Participant communities as a goal in MEAN's Strategic Plan and also as a portfolio preference in the IRP. MEAN initiated discussion on this concept with the Membership as it relates to potential solar facilities, and policy is being developed with the Power Supply Committee in 2022. As communities are participating in the current Community Solar RFP, or future RFPs, and installing generation under the Renewable Distributed Generation Policy, there is potential to concurrently install Distributed Generation directly owned or contracted to MEAN, provided participating communities have sufficient space available for lease to MEAN and the facilities are sized below the threshold that would require an interconnection study.

This concept has numerous benefits: renewable resources generating directly on member distribution systems, lower interconnection costs, incremental sizing for resource portfolio changes, potential savings on property leases, public appeal, and grid modernization with distributed generation and micro-grid systems. This policy is scheduled to be developed and presented to the Power Supply Committee and Board of Directors for recommendation and approval by the end of the calendar year.

E. Ultimate Impact of DG

Installed DG located behind the retail meter reduces the energy that Participant utilities supply to end users and consequently, the energy MEAN supplies to Participants. An increase in DG installations has the potential to reduce revenue for both the Participants and MEAN. There are a number of costs, on the other hand, that do not decrease proportionally with lower energy sales. There is a portion of costs that are avoided with a reduced energy supply, but many of MEAN's costs remain.

Fortunately, MEAN has designed the rate structure to directly bill for a portion of fixed costs on a basis that includes the capacity of DG. Because MEAN must maintain the Power Supply System to provide for the Participants' load even when the DG units are not generating, some fixed costs are allocated on this basis. This ensures that MEAN maintains a system capable of supplying firm power to our Participants under full load conditions. MEAN has performed deliberate calculations of its avoided costs throughout the footprint for application in distributed generation installations and continues to evaluate this calculation as conditions change.

As MEAN considers the acquisition of new resources to supply needs into the future, the installation of distributed generation reduces the needs in terms of energy and capacity. This solution also helps to progress MEAN toward the 2050 Vision of carbon neutrality and provides local benefit to MEAN communities. The pricing received for PPAs in the latest RFP also demonstrates that this type of resource can be economically competitive with other resources.

VIII. Existing Demand Side Management

A. Existing Demand Side Management – MEAN Programs

MEAN has conducted several Demand Side Management ("*DSM*") programs in the past, with varying degrees of adoption and impact. Currently MEAN provides a suite of five energy efficiency programs that offer cash incentives paid directly to customers to help cover the cost of energy efficient upgrades.

1. Commercial Programs

LED Lighting Program: This program provides cash incentives paid directly to commercial customers to help cover the cost of lighting upgrades and replacements to existing facilities. The program covers:

- Indoor high/low bay lighting
- Linear replacement or retrofit lighting
- LED Exit signs
- Fluorescent freezer/refrigerator case lighting
- Occupancy sensors (new for 2022)
- Customized requests

Converting to more efficient lighting can have a favorable impact on a business's bottom line. Interior lighting accounts for about 30 percent of a commercial business's total energy use. Lighting technologies, such as LEDs, can help cut lighting costs while improving output, visibility and reducing environmental impacts.

The MEAN Board of Directors approved the program for all long-term MEAN participants, with a maximum of $2,500 per customer/owner per year. The program is available to commercial businesses of MEAN long-term power participants. Incentives are allocated in the order that applications are received and approved and will be continued until the annual budget (currently $80,000) is exhausted.

The program year coincides with MEAN's fiscal year and runs April 1 through March 31. The program was initiated in FY16-17 and has been renewed thru FY22-23. Funding (updated as of April 1, 2022) is distributed according to the schedule below:

Lighting Efficiency Measure	New LED Wattage	Incentive
High Bay, Low Bay	9-65 watts	$8
	66-130 watts	$16
	131-240 watts	$24
LED Exit Signs	under 8 watts	$10
Uncensored Control	Occupancy sensor	$15
Linear Fluorescent	9-22 watt LED	$2
	23-45 watt LED	$4
	46-68 watt LED	$6
	69-90 watt LED	$8
Fluorescent Freezer/Refrigerator Case Lighting	5' or 6' strips	$20

Figure VIII-1

2. Residential Programs

MEAN offers four residential energy efficiency programs providing cash incentives to homeowners for making energy efficient upgrades. A budget of $25,000 for FY22-23 has been authorized by the Board to be distributed with staff discretion across the various incentive categories.

1) Smart Thermostat Program: Provides a cash incentive from $25 to $100 paid directly to residential customers to help cover the cost of installing a qualifying smart thermostat.
2) Attic Insulation Program: Provides cash incentives of $0.15/per square foot with a maximum incentive of $300 per existing residential dwelling for attic insulation.
3) Cooling System Tune-Up Program: Provides a $30 cash incentive to residential homeowners who have their cooling system tuned up by a HVAC contractor, regardless of what type or age of cooling system (air conditioner/air or water source heat pump).
4) High Efficiency Heat Pump Program: Provides cash incentives ranging from $400 to $3,000 to residential homeowners who are installing a new high efficiency heat pump system to their residential single-family dwelling.

B. Existing Demand Side Management – MEAN Community Programs

MEAN conducts an annual DSM survey to gather information from all member communities detailing the demand side programs they administer, including the magnitude of load under control for peak shaving and the energy and demand savings attained by participation in the programs. The high amount of load under control in SPP stems from the substantial irrigation load under control in central Nebraska. The responses from the 2021 survey, indicating 2020 data is shown in the table below:

Region	Communities	Programs	Program Type	Total Demand Under Control (kW)
MISO	5	9	• Energy Efficient Appliance Rebate Program (Residential, Commercial) • Recycling/Disposal Program (Residential) • Energy Efficient Light Bulb Program (Commercial) • Direct Control Load Management Program - AC/Thermostat Control • Refrigerator/Freezer Recycling Program (Residential) • Interruptible Load Program – (Commercial/ Industrial)	2,500
SPP	8	12	• AC Direct Control • Energy Efficient Light Bulb Program (Commercial) • Light Sensor Program - Street Lights • Pump/Motor & Fans • Audit and Building Envelope Program • Process Measures - Solar Water Heating	14,468

			• Interruptible Load Program • Recycling/Disposal Program (Residential) • Energy Efficient Appliance Rebate Program (Residential)	
West	4	12	• Audit and Building Envelope Measures - (Residential, Commercial, Industrial) • Energy Efficient Rebate Program (Residential) • Energy Efficient Light Bulb Program (Residential) • Recycling/Disposal Program (Residential) • Light Sensor Program (Commercial/Industrial) • Pump/Motor & Fans - Variable Speed Drives • Energy Savings Program • Energy Efficient Appliance Rebate Program (Residential)	0

Figure VIII-2

C. Historical Results - MEAN

1. Commercial Programs

LED Lighting Program: The current program was reinstated on April 1, 2016, for indoor commercial LED lighting conversions. The cumulative total budget of $405,000 from April 1, 2016, to March 31, 2021, has been widely utilized with 46 MEAN communities participating in the program to date. Of these participants, 7 were communities in Colorado, 7 in Iowa, 31 in Nebraska and 1 in Wyoming.

In the past 5 program years (FY17-18 thru FY21-22) the Commercial LED Lighting program has approved approximately 650 projects totaling roughly $420,000 in funding. In total, 54,912 fixtures were approved to be retrofitted during this time frame. The average annual energy savings achieved by the program over this 5-year span is approximately 1,247 MWh. The average annual peak demand savings over the same time period was 249 kW.

The 5-year average total cost of the LED Lighting Program per kW of savings is $338. This compares very favorably to even the most economical supply side option for additional resources, making DSM the lowest cost alternative to meet MEAN's future resource needs in terms of capacity.

After a slower program year during FY20-21 (due to the Pandemic labor and material shortages), participation numbers steadily increased again during FY21-22 with 70 LED lighting projects approved in 29 communities (approximately $68,000 in approved applications). Detailed results specific to program year FY21-22 are shown below:

Equipment Info (Conversion)	Fixtures Retrofitted	KW Savings	Hours ran (annual)	Coincidence	Annual KWh Savings	Peak KW Savings
High Bay: 9-65 watts LED	354	14.2	4,160	95%	55,960	13.5
High Bay: 66-130 watts LED	78	5.1	4,160	95%	20,037	4.8
High Bay: 131-240 watts LED	197	19.7	4,160	95%	77,854	18.7
Linear Replace/Retrofit: 9-22 watt LED	5,170	93.1	5,200	95%	459,716	88.4
Linear Replace/Retrofit: 23-45 watt LED	663	13.3	5,200	95%	65,504	12.6
Linear Replace/Retrofit: 46-68 watt LED	436	15.3	5,200	95%	75,384	14.5
Linear Replace/Retrofit: 69-90 watt LED	335	16.8	5,200	95%	82,745	15.9
LED Exit: under 8 watts	371	7.4	8,672	95%	61,129	7.0
LED Refrigerator	26	1.0	8,672	95%	8,568	1.0
Customized Application Fixtures (Linear)	697	19.5	5,200	95%	96,409	18.5
FY21-22 Totals	**8,327**	**205**			**1,003,307**	**195**

Figure VIII-3

Participation in the LED Lighting Program continues to be utilized by a wide variety of commercially metered customers in MEAN communities including municipal buildings, schools, churches, hospitals, grocery stores, industrial/agriculture as well as retail/service businesses. Below is a breakdown of projects by type for FY21-22 which saw 70 projects authorized:

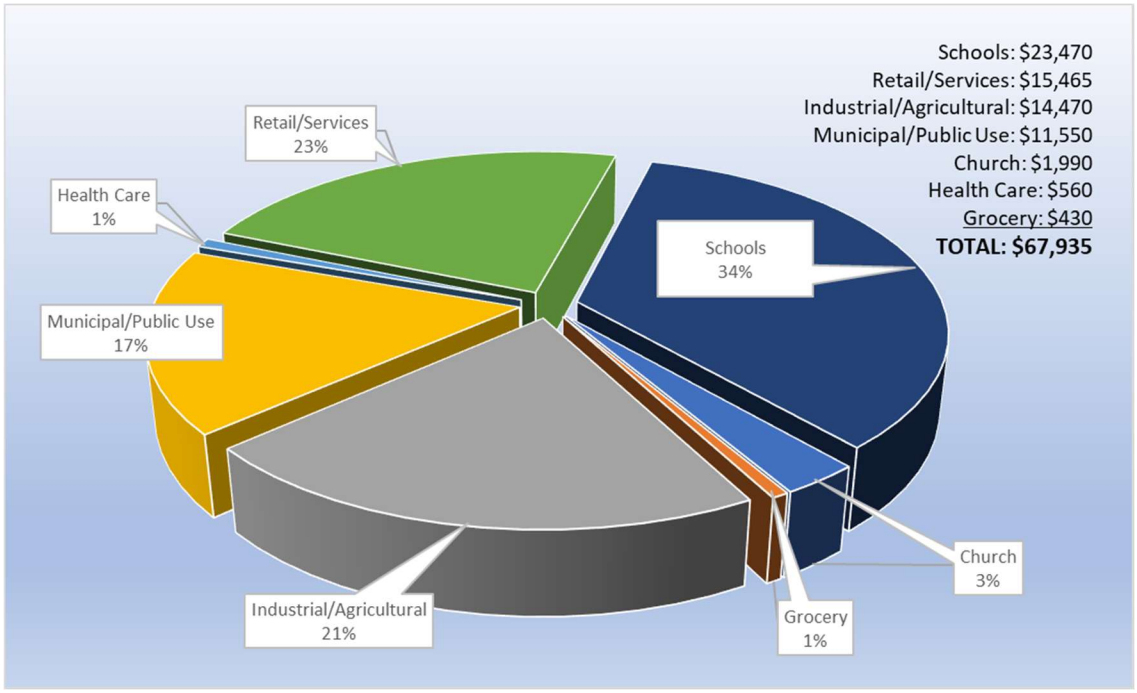


Figure VIII-4

2. Residential Programs

In FY21-22, eighteen MEAN communities participated in the residential energy efficiency programs and 48 projects totaling $9,270 were completed. This was up significantly from FY20-21 which saw 34 projects completed totaling $2,361 in incentives paid out. FY21-22 program category totals are illustrated below:

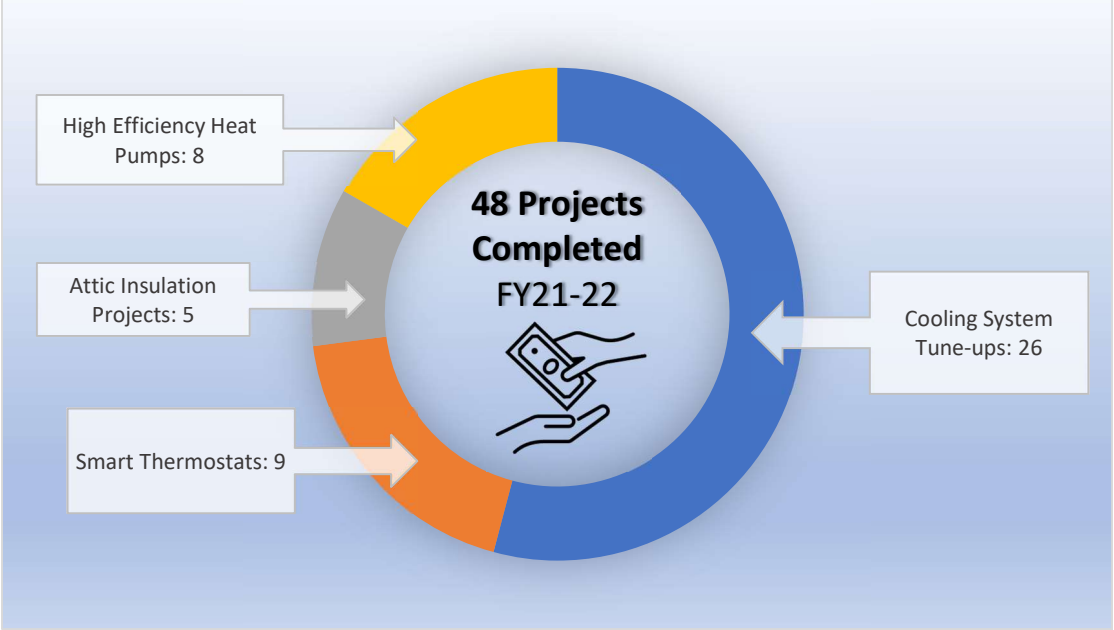


Figure VIII-5

D. Historical Results – MEAN Communities

The 2021 DSM survey asked participants to provide actual or estimated savings resulting from the DSM programs in their communities, both in terms of demand and energy. The results are shown in the table below:

Region	Communities	Programs	Total Demand Savings (kW)	Total Energy Savings (kWh)
MISO	5	9	415	218,116
SPP	8	12	2,136	2,386,085
West	4	12	1,477	31,052

Figure VIII-6

E. Continuing DSM Programs

1. MEAN Programs

The following established MEAN DSM programs will be continued as part of MEAN's overall resource portfolio:

- Commercial LED Lighting Program: The MEAN Board has approved the continuance of the LED Lighting program through FY22-23 with a budget of $80,000. With the decrease in the cost of LED lighting materials, incentive amounts by lighting efficiency measure and new wattage were decreased in accordance with industry standards. With the potential additional funds available in this program category, efforts are being made to develop additional programs for commercial customers of MEAN participant communities including for Cooling System Tune-Ups as well as Heat Pump Water Heaters.

- Residential Energy Efficiency Programs: Incentives available for Cooling System Tune-Ups, Attic Insulation, High Efficiency Heat Pumps and Smart Thermostat Installations will continue to be offered to MEAN participants. A budget of $25,000 for FY22-23 has been authorized by the Board to be distributed across the various project categories.
- Infrared Energy Audits: This service identifies abnormal heat in electrical and mechanical systems, helps predict equipment trouble and revenue loss. These valuable audits are beneficial to large account customers to lower their electricity costs and increase system reliability in order to maximize their bottom line.
- Energy Audits: Staff assists MEAN bulk power participants by performing an energy audit, recommending steps to improve energy efficiency for commercial/industrial customers (upon request).
- In addition to paying American Public Power Association (APPA dues), MEAN also pays 100% of the Demonstration of Energy & Efficiency Developments (DEED) dues for all MEAN Service Schedule M and K/K-1 Participants. Payment of dues on behalf of Participants by MEAN ensures each community receives access to the benefits of APPA membership.
- Member Exclusive Education Sessions: Workshops, retreats and forums are held throughout the year covering a variety of topics geared for member communities and their development. Sessions are hosted and planned by NMPP on a rotating basis and can be held in any participant community in accordance with interest and requests.
    - Past workshops topics include generation, load management, smart grid operations, net metering, energy efficiency, economic development, and employee retention and recruitment.
- NMPP Energy News Subscription: All members of NMPP receive the monthly NMPP Energy News newsletter. The newsletter covers news pertinent to the membership of NMPP with topics featured including energy efficiency, utility rates, legislative and regulatory updates and mutual aid. The newsletter also includes news about other members and updates on the NMPP Energy entities.

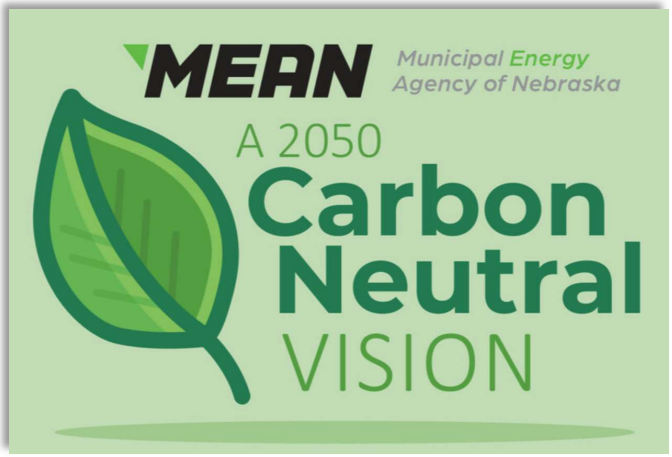
2. Community Programs

The participant DSM survey did not indicate any intentions to discontinue any existing DSM programs administered within MEAN communities. Therefore, it is assumed that all existing programs will continue into the future. The future rate of growth in demand and energy savings is unknown. Some of the programs are newly implemented and therefore do not have estimates of savings. Still others are not separately metered, and therefore do not have exact savings measured. As more data is collected and communities continue to invest in metering systems, it is expected that the actual savings attributable to these programs will be further quantified in future years.

IX. Renewable and Carbon-Free Energy Resources

A. MEAN's 2050 Vision

In 2020, the Board approved a resolution laying out a vision to work toward transitioning MEAN's wholesale power resource portfolio to achieve carbon neutrality by 2050 through the elimination of carbon emissions or balancing emissions with carbon removal through carbon offset mechanisms. The resolution authorizes MEAN's staff to work collaboratively with the MEAN Power Supply Committee to develop policies around resource planning, portfolio optimization and emissions reduction to support future actions to achieve the 2050 carbon neutral goal. The formation of the plan will be initiated in MEAN's 2022 Integrated Resource Plan. MEAN's current resource capacity portfolio consists of 49 percent non-carbon resources from projects around the region, including Total Requirements Participant allocations of federal hydropower from WAPA. MEAN's actual energy generation from carbon free resources in FY20-21 was over 50% of the total. MEAN will have opportunities in the coming years to transition toward higher levels of carbon neutrality as power purchase agreement contracts expire and capital debt is paid on its shared ownership of power resources with other utilities.



Achieving MEAN's 2050 vision will require industry advancements and technological innovations, particularly those that add stability to the grid and offset the intermittent production of renewable energy such as from wind and solar resources. Other needed advancements include the development of dispatchable renewable baseload energy resources, the increased availability of economical energy storage solutions and affordable deployment of carbon capture, utilization and storage technologies. Potential solutions are not yet viable on a utility scale or economically feasible, and emerging technologies must still be developed in order for MEAN to meet its carbon neutral goal.

B. Local Energy Goals

To determine how specific local energy goals correspond with MEAN's 2050 Vision, Participants were asked a number of related questions in the January 2021 online survey. Of the respondents, one third are interested in increasing their community's renewable portfolio. However, of those that indicated an interest in increasing their proportion of renewable energy, less than 25% are willing to pay a higher wholesale rate for lower emissions in their portfolio. When asked if the respondent's community would like to increase the carbon-neutral energy in their resource mix at an accelerated rate or concurrent with MEAN's progress toward the 2050 Vision of carbon neutrality, the overwhelming majority prefer to progress at the same rate as the overall organization.

The disparity in these results supports MEAN's establishment of the Wind Pool and the Landfill Gas Pool, allowing Participants to subscribe for certain amounts of power supply from wind and landfill gas resources to control the level of emissions in their power supply portfolio. On an annual basis,

MEAN sends a document to each Participant detailing the community's resource mix for the previous year in terms of energy generation to serve their load. This allows each Participant to make informed decisions about MEAN's total portfolio and their individual resource mix as well.

Survey results are shown in *Figures IX-1* through *IX-4*.

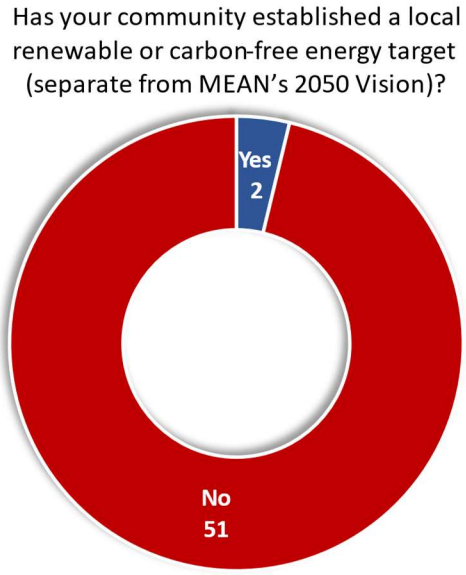


Figure IX-1

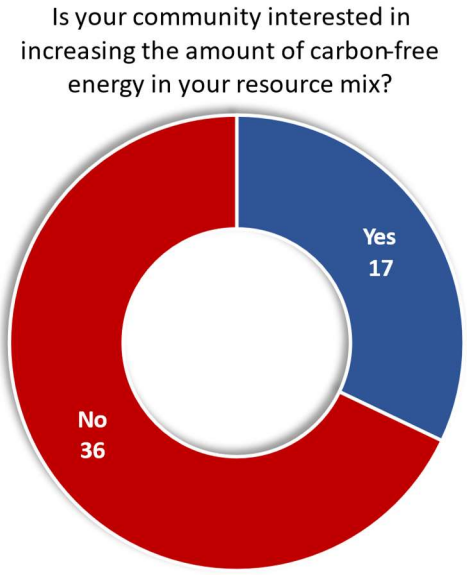


Figure IX-2

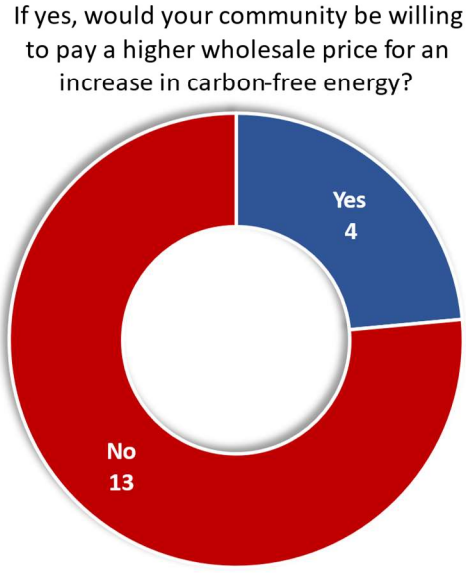


Figure IX-3

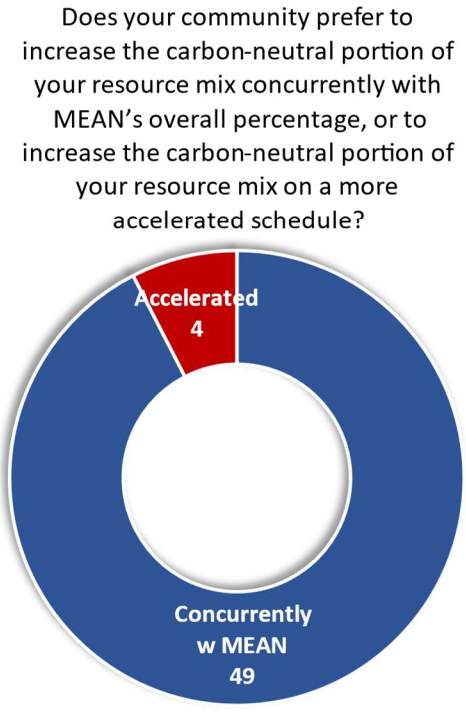


Figure IX-4

C. Interim Carbon Goal

The renewable survey also explored the schedule of progress toward the 2050 Vision of carbon neutrality. Given MEAN's portfolio and the extent of our long-term resource contracts combined with the unpredictable future of environmental compliance requirements and economic and environmental dispatch, the intervening years are to be determined based on resource acquisitions and the performance of new assets. As part of the January 2021 renewable survey, the members were asked whether MEAN should consider establishing an interim goal for a carbon-free percentage in our portfolio. Of the respondents, 65% answered in favor of an interim goal.

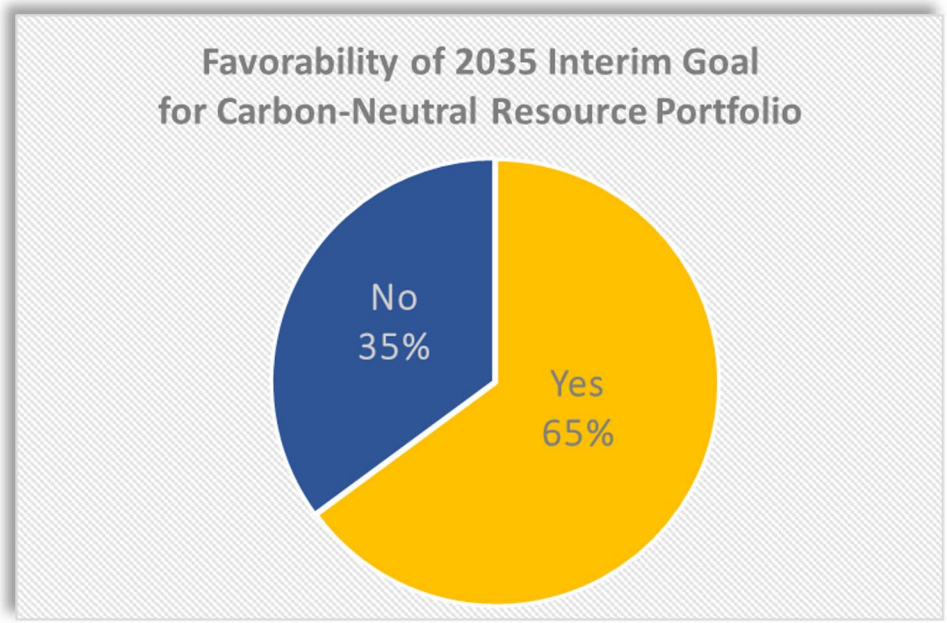


Figure IX-5

Of those in support of the interim goal, a follow up question asked for a suggested percentage to be achieved by 2035. The responses ranged from 25% to 100%, with an average of 61%.

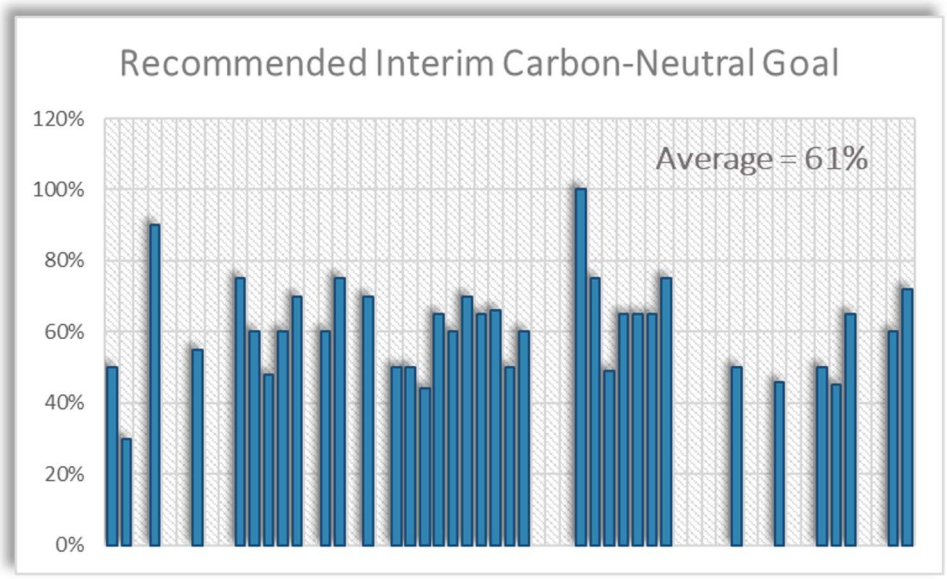


Figure IX-6

The Power Supply Committee and the Board will consider setting this interim goal in the near future. It is recommended and expected that this target will be set after the procurement of resources in 2023-24, which will give a more accurate projection of energy generation.

D. Existing Carbon-Free Resources

MEAN currently serves its total load obligation with the following carbon-free resources:

Resource	Nameplate Capacity
Kimball Wind Farm	30.0 MW
Shavano Falls Hydro	7.6 MW
Ridgway Hydro	4.0 MW
Reudi Hydro	4.5 MW
Ainsworth Wind	7.0 MW
Crofton Bluffs Wind	4.2 MW
Elkhorn Ridge Wind	8.0 MW
Laredo Ridge Wind	8.0 MW
Wessington Springs Wind	10.0 MW
WM Des Moines Landfill Gas	4.8 MW
Cooper Nuclear Station	26.0 MW
WAPA Allocations	124.7 MW
WAPA Displacement Agreement	61.9 MW

Figure IX-7

E. Carbon Free Resource Mix

As contract terms for these renewable assets expire, MEAN looks to replace the energy and capacity with carbon-free resources. As part of the 2050 Vision, MEAN aims to make resource acquisitions that only decrease the total carbon emissions of our portfolio.

The future resources considered for this resource planning analysis will be evaluated in part on their ability to decrease the carbon emissions in MEAN's current portfolio. Although environmental

impact ranked 9th in MEAN's member survey of the importance of resource evaluation criteria, the equivalent carbon emissions factor was an element of scoring in the Phase I supply side resource evaluation. Also factored into this evaluation was the sensitivity of resource options to a future carbon tax and future changes in environmental legislation, which largely correspond with emissions levels. Finally, the performance of each future resource is calculated in terms of the change in carbon intensity of the MEAN resource portfolio.

While attempting to formulate a future resource portfolio that reduces MEAN's carbon emissions, the goals of reliability and resource adequacy cannot be abandoned.

F. Renewable Resource Costs/Incentives

Certain investment or production incentive exist to subsidize the generation and investment in renewable energy resources. In December of 2015, Congress extended the Investment Tax Credit (*"ITC"*) for solar energy projects. This legislation allowed a federal tax credit of 30% of the capital invested in solar generation installed through 2019. The ITC decreased to 26% in 2020 and was scheduled to step down until 2022. In December 2020, Congress extended the ITC with a 26% credit for systems installed in 2020-2022 and 22% for systems installed in 2023. The ITC expires in 2024 unless extended again.

The Production Tax Credit (*"PTC"*) for wind projects provides a ten year $23/MWh credit for all wind generated energy for projects initiated in 2016. For projects that began construction in 2017, the PTC decreased to $19/MWh and continued to decline for each year through the end of 2021 at $15/MWh.

Recently, bills in Congress have proposed not only an extension for wind and solar tax credits, but also tax credits for carbon capture and energy storage.

As a tax-exempt entity, MEAN cannot claim tax credits for carbon-free energy generation. However, through power purchase agreements with developers, MEAN can obtain pricing that reflects these credits as calculated into the revenue requirements of the project. Credits are also being considered for energy storage, and state and local funding has recently been available for storage projects.

As a conservative approach, the Phase II analysis did not include any tax credits for energy resources. Due to the uncertainty of future policy that would extend or terminate existing credits for renewable resources and policy that may enact credits for other technologies, it would not be accurate to speculate on these values or their duration.

G. Resource Pools

To respond to the disparity in local goals for renewable or carbon-free energy, MEAN offers a Wind Pool and a Landfill Gas Pool where participants can elect to purchase specified amounts of those resources in terms of energy or the environmental attributes earned by those resources from MEAN's portfolio. This allows individual communities to control their own resource mix. MEAN communicates annually to participants to inform them of their actual energy mix for the prior year. The rates for these pools are established by the Board of Directors in accordance with policy.

Currently, the Wind Pool is fully subscribed with all MWh allocated to participants per contract. The Landfill Gas Pool was 34.2% subscribed in 2021, with approximately 25,760 MWh available for

contract. Per current MEAN policy, the rates for energy from the two renewable pools is based on actual costs paid for these resources.

As MEAN expands its portfolio in terms of carbon-free resources, the resource pools and the energy rates for these resources may evolve accordingly. The pools may need to expand to accommodate the acquisition of future carbon free resources and varying demand for carbon free energy from individual MEAN member communities. MEAN will continue to strive to offer increased levels of carbon-free energy to participants while also maintaining reliability and low rates.

H. Social Cost of Carbon vs. Carbon Tax

The concept of the social cost of carbon is an attempt to put a financial value on the current and future impact of systems and facilities that emit carbon. In addition, some formulations also calculate a monetary benefit from emissions reductions.

In lieu of a social cost of carbon, which has yet to be precisely or consistently quantified, the IRP model uses a carbon tax to allocate a cost to resources that emit carbon in a manner that is easily integrated with the chosen revenue requirement metric and takes into account the impacts on the market as a whole in addition to the impacts to individual resources.

In the market pricing projections used in the Phase II modeling of candidate portfolios, pricing scenarios 7, 8, and 9 include various forms of a carbon emissions tax. Scenarios 7 and 8 assume a CO_2 Limit in the future. These Scenarios then compare the calculated emissions of the projected resource mix for the region to the projected allowances under the carbon limit. This determines the carbon tax, which varies by year according to the actual carbon exceeding the projected allowance limit. Scenario 9, however, simply applies a linearly escalating carbon tax rate to all CO_2 emissions in all years of the model.

In these scenario calculations, MEAN applied this carbon tax to all carbon emissions from all resources, existing and future, in the portfolio. The carbon tax ranges from $3.00 to $105.00 per ton with a 2029 start in Scenario 7, $2.00 to $238.00 per ton with a delayed start in 2034 in Scenario 8, and $16.00 to $83.00 per ton for all years in Scenario 9.

X. Load and Resource Balance

A. Capacity/Demand Balance

Previous sections of this report have quantified the forecasted total load obligation that MEAN expects to serve in future years, in various future scenarios, as well as the capacity and energy available to MEAN for service of this load. To determine the timing and magnitude of MEAN's future resource needs, the annual peak demand must be compared to the resource capacity available during the peak and the total annual energy consumption must be compared against the expected and/or available generation of the portfolio's resources.

For the calculation of load and resource balance, resources will be quantified according to accredited capacity, or the maximum capacity that is expected to be available during the system peak load. For baseload and dispatchable resources, the accredited capacity is most typically equal to the nameplate capacity. However, intermittent or non-dispatchable resources cannot be depended on to supply nameplate capacity at any given hour but are subject to the availability of irregular occurrences such as wind and solar irradiance. SPP has provided an equation to determine the accredited capacity of such resources, which MEAN utilizes in this analysis. SPP and MISO continue to study this subject and offer annual updates to the accreditation process.

SPP currently uses the Effective Load Carrying Capability (ELCC) method for calculating accredited capacity of renewable resources. As SPP describes it: "Using ELCC practices, a facility's accreditation is a fractional probabilistic measure of the facility's nameplate rating that can be relied on to serve load. ELCC can express the value that generation contributes to a system as penetration of the specific resource type increases." This is a phenomenon particular to intermittent resources. As more of the resource type is installed, the less value each resource of that type contributes to the resource adequacy of the system, and therefore the lower the ELCC of all resources of that type.

The peak demand as shown in the load and resource balance is the total service obligation, which includes not only the forecasted peak load, but also the required reserve margin and the expected transmission losses. Resource capability in terms of capacity and energy is classified by fuel type. Behind-the-Meter-Generation ("BTMG") designates Participant Owned Generation.

1. MEAN System

The graph in *Figure X-1* shows the balance of peak demand and resource capacity for MEAN's entire footprint. Available capacity is sufficient to serve load until 2024. At that point, MEAN has a slowly growing resource need into the future.

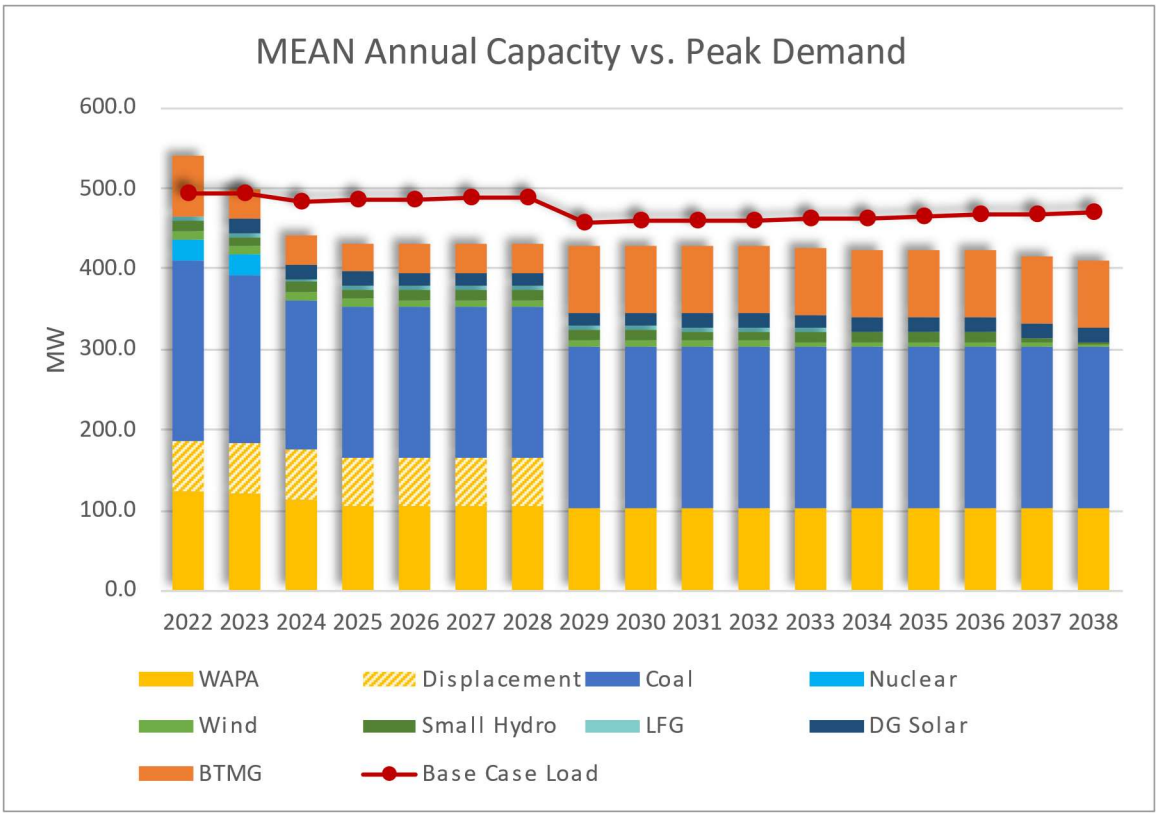


Figure X-1

However, since MEAN serves load and designates resources in each individual region, the load and resource balance must be divided by region to determine the course of future resource acquisition.

2. SPP Region

The graph in *Figure X-2* illustrates the peak demand and resource capacity balance for SPP. In 2022, capacity remains adequate to cover the service obligation. However, with the termination in 2023 of the Marketing Agent Arrangement with Indianola Municipal Utilities (*"IMU"*) and Waverly Utilities (*"WU"*) contracting excess member owned generation, SPP capacity is no longer sufficient to meet the load. The termination of the NPPD MUP in 2023 is evident in the further reduction of resource levels after that year. In 2029, the WAPA Displacement Agreement ends, allowing the capacity dedicated to that contract to be again applied to MEAN's load. Therefore, the SPP system has no further capacity needs after 2029.

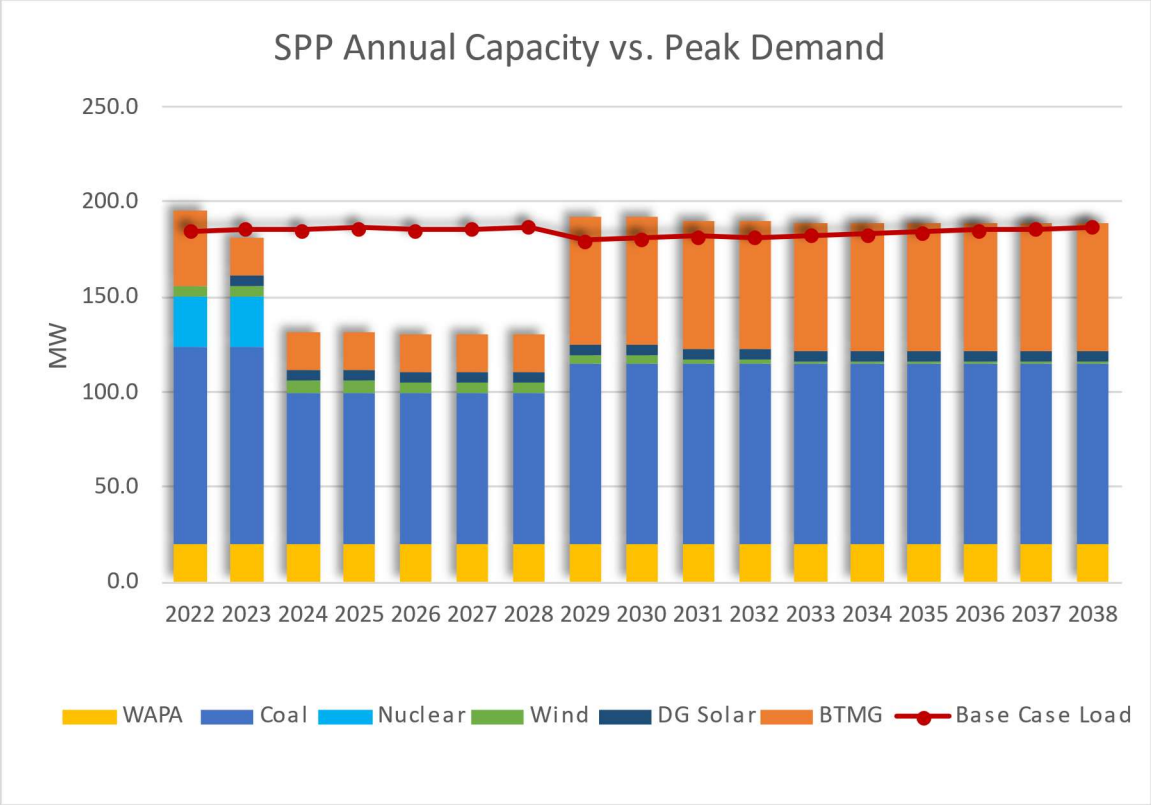


Figure X-2

3. West Region

The graph in *Figure X-3* shows the peak demand and resource capacity balance for the west region. The major changes on the load side occur in 2023 with the expiration of the limited term contracts with Wray and Holyoke and in 2029 with the expiration of the Glenwood Springs service contract.

On the resource side, the Black Hills PPA terminates in 2023, and the WAPA Displacement contract is set to expire in June of 2029. Then several wind PPAs expire late in the 15-year time period.

The west region is resource adequate until 2029. At that point, the region has a deficit of 21.9% of the load obligation. This continues through the remainder of the study period.

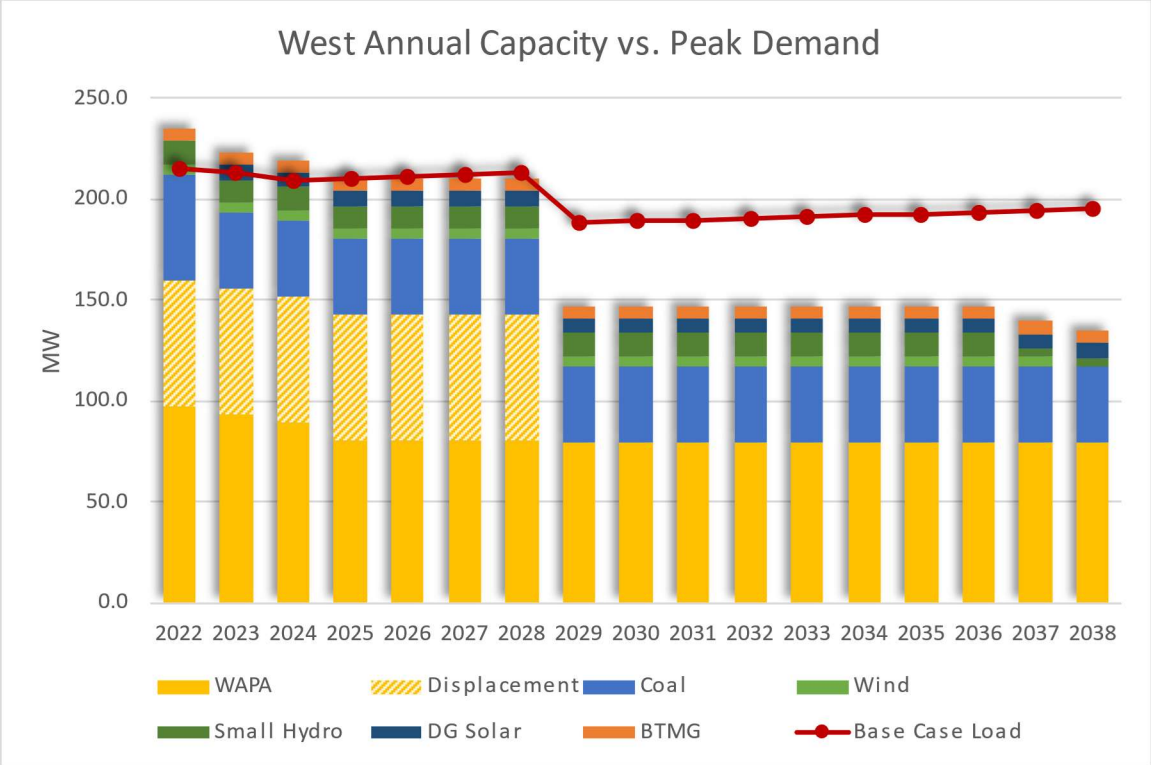


Figure X-3

4. MISO Region

Throughout the study period, MEAN has sufficient capacity in MISO, as shown in *Figure X-4*. There are very few changes in resources or load during this time. There is a slight decrease in load when the limited term contract with Lake View expires. Resource levels are constant, with the exception of the end of the Marketing Agent Arrangement with IMU and WU that ends following the peak season of 2023 and the end of the Landfill Gas PPA in 2034. There is a very minor resource deficiency in MISO beginning in 2034.

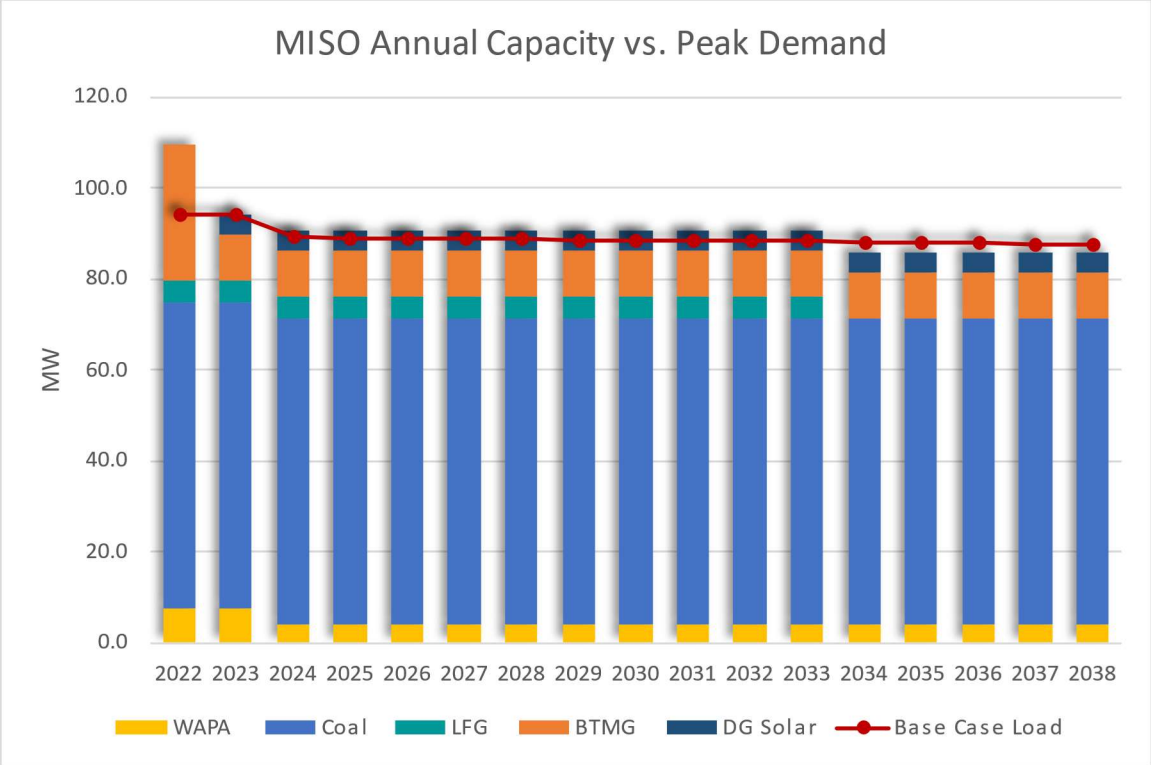


Figure X-4

B. Monthly Balance

The graphs in *Figures X-6* through *X-8* show the regional load and resource capability balance on a monthly basis to illustrate the periodic change in the balance. *Figure X-5* shows the monthly balance for the MEAN system as a whole.

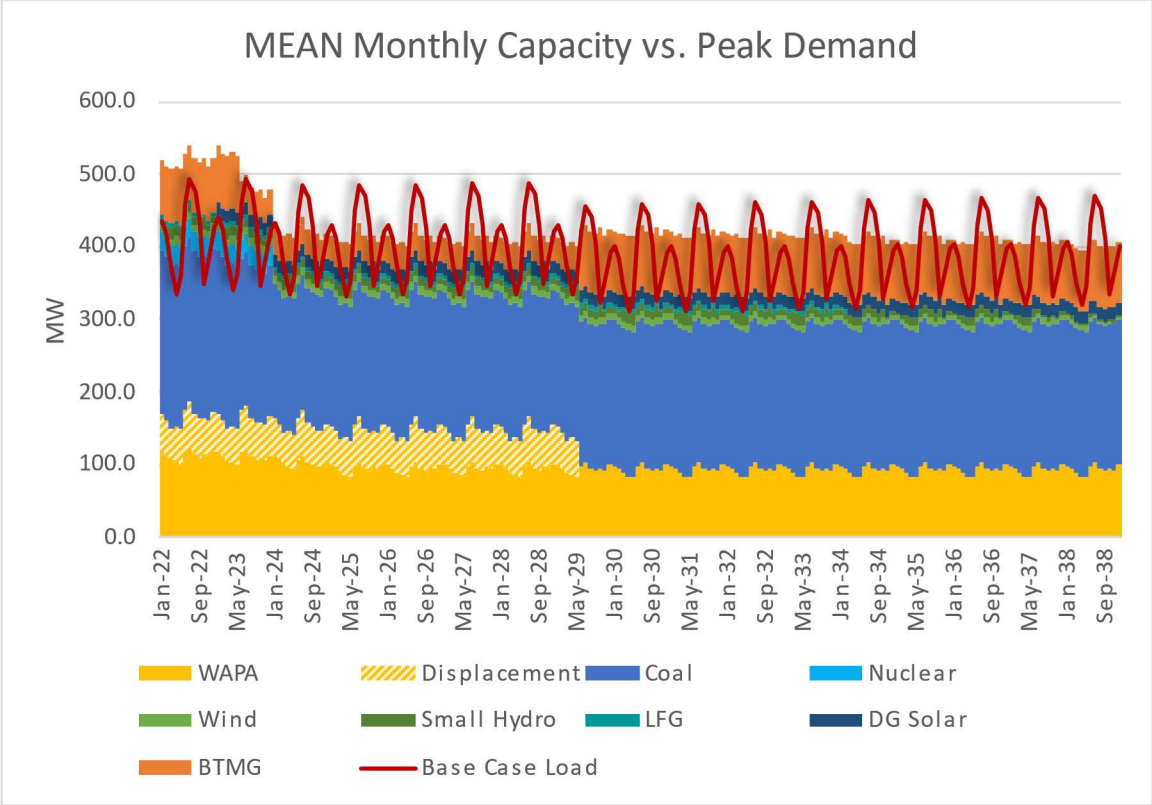


Figure X-5

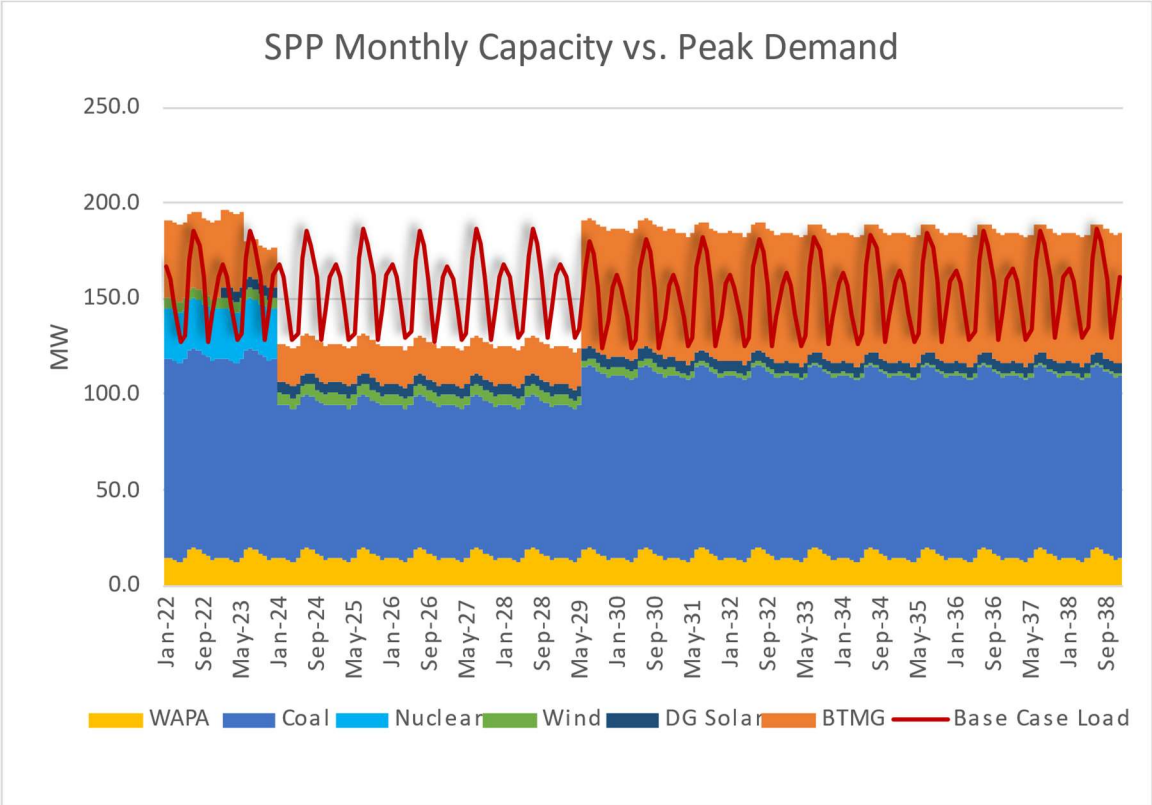


Figure X-6

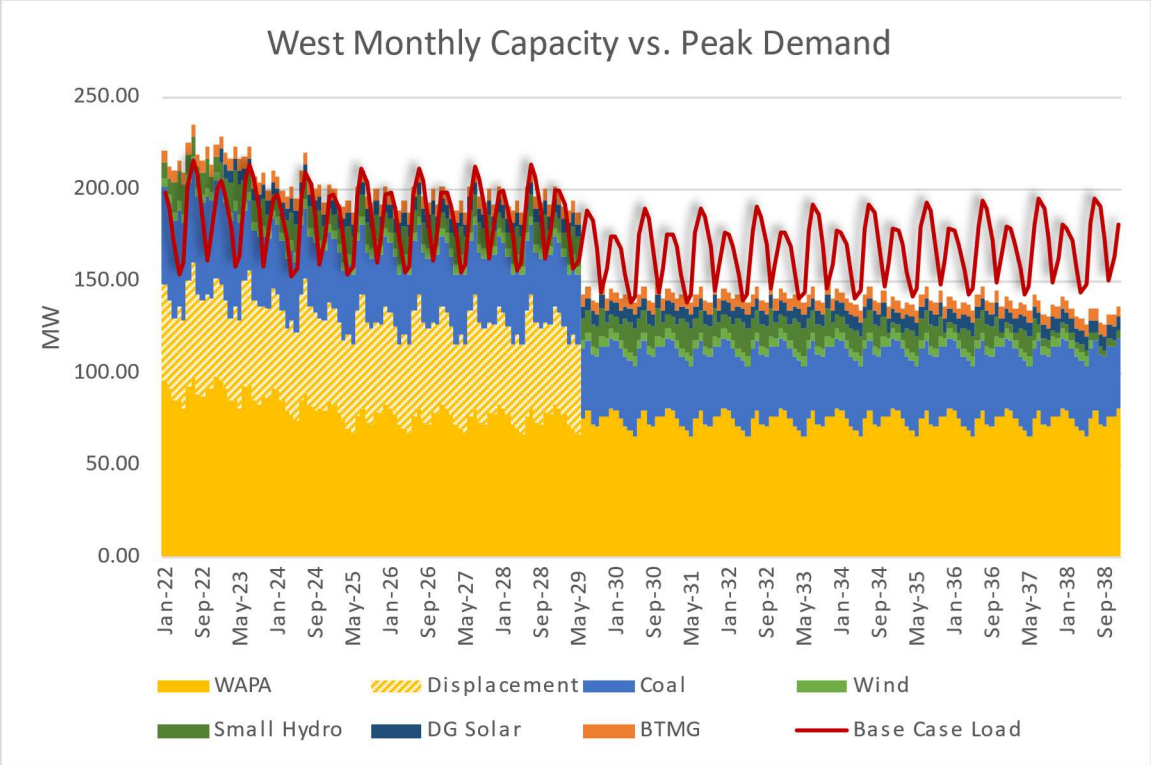


Figure X-7

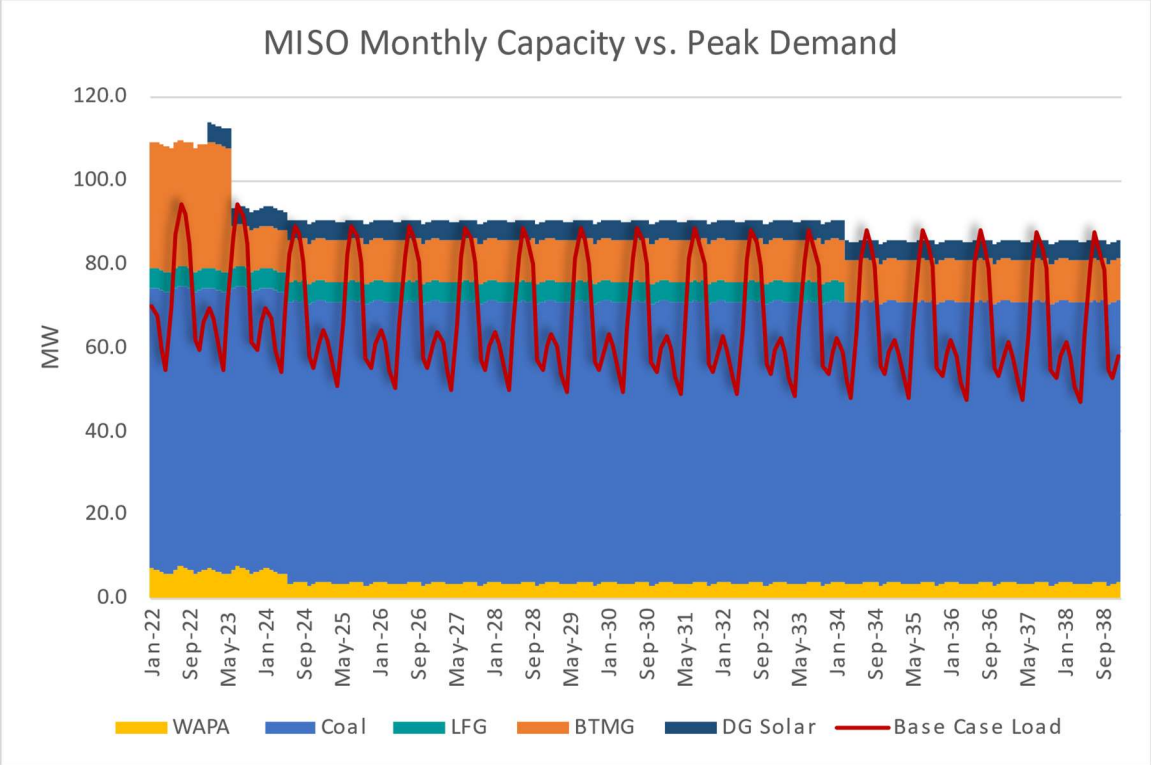


Figure X-8

C. Energy/Load Balance

When showing future energy output of MEAN resources for purposes of quantifying the balance of load and capability, expectations are based on total unit capability as well as historical operation and energy production. Depending on market conditions, real load, unit maintenance, and fuel pricing, actual production can vary from the predicted values.

1. MEAN System

The total picture of MEAN's total energy balance begins with an energy deficit in 2029 of approximately 16% of load, which grows to a 27% deficit in 2038.

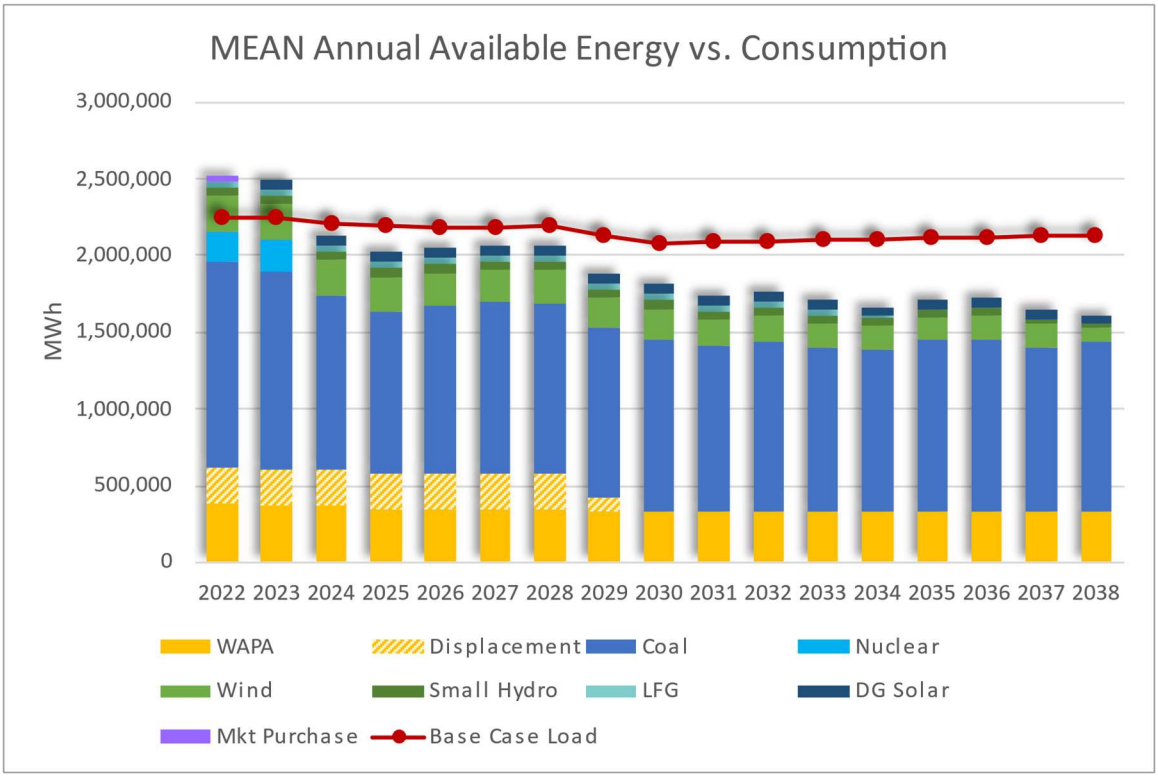


Figure X-9

However, as noted previously, MEAN serves load and designates resources per region, and therefore the level of energy generation in comparison to load must be analyzed for each region.

2. SPP Region

Resource generation in SPP is sufficient to cover load until the expiration of the NPPD MUP at the end of 2023. At that point, the region has a 23% energy deficit that grows to 30% in 2038. The end of the WAPA Displacement that returns the capacity of the behind-the-meter generation to MEAN's portfolio does not result in additional energy, so SPP continues to have an energy deficit even when capacity adequate. The long-term energy balance for SPP is shown in *Figure X-10*.

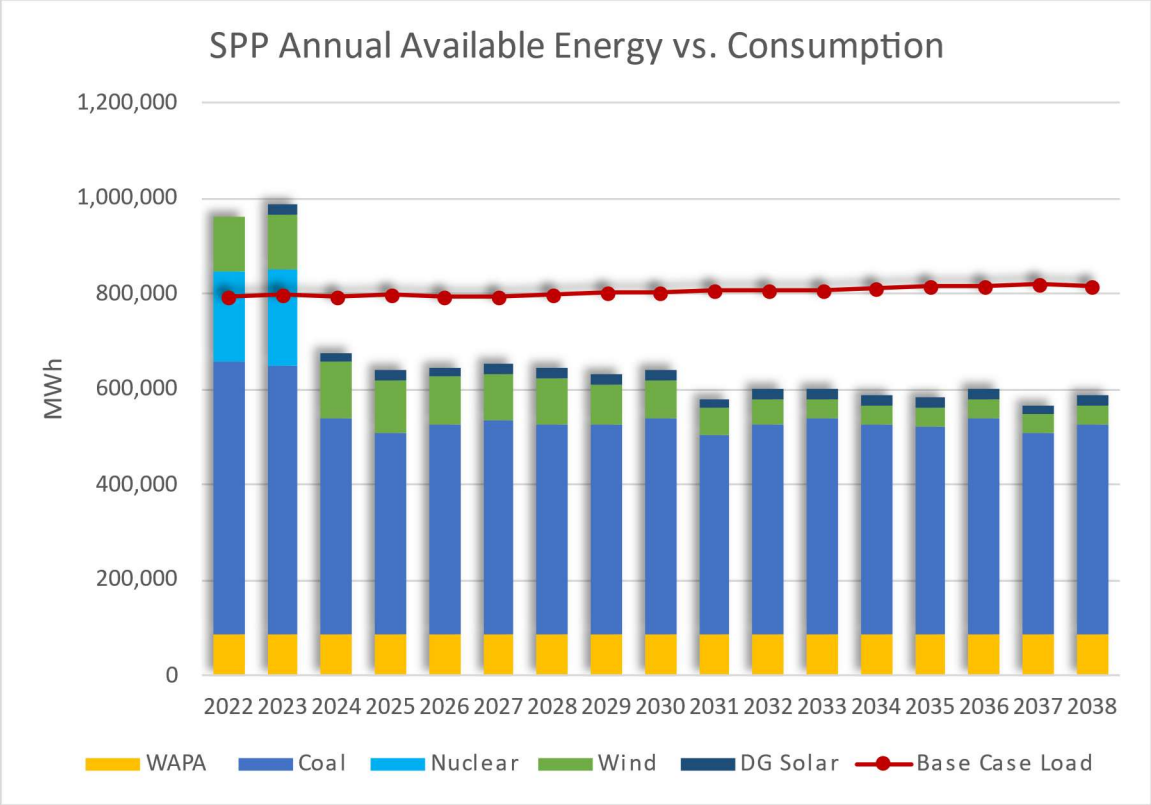


Figure X-10

3. West Region

In the west, an annual energy deficit of 18% begins immediately in 2023 with the expiration of the Black Hills PPA and grows larger to 37% in 2029 when the WAPA Displacement Agreement ends. *Figure X-11* shows the long-term balance.

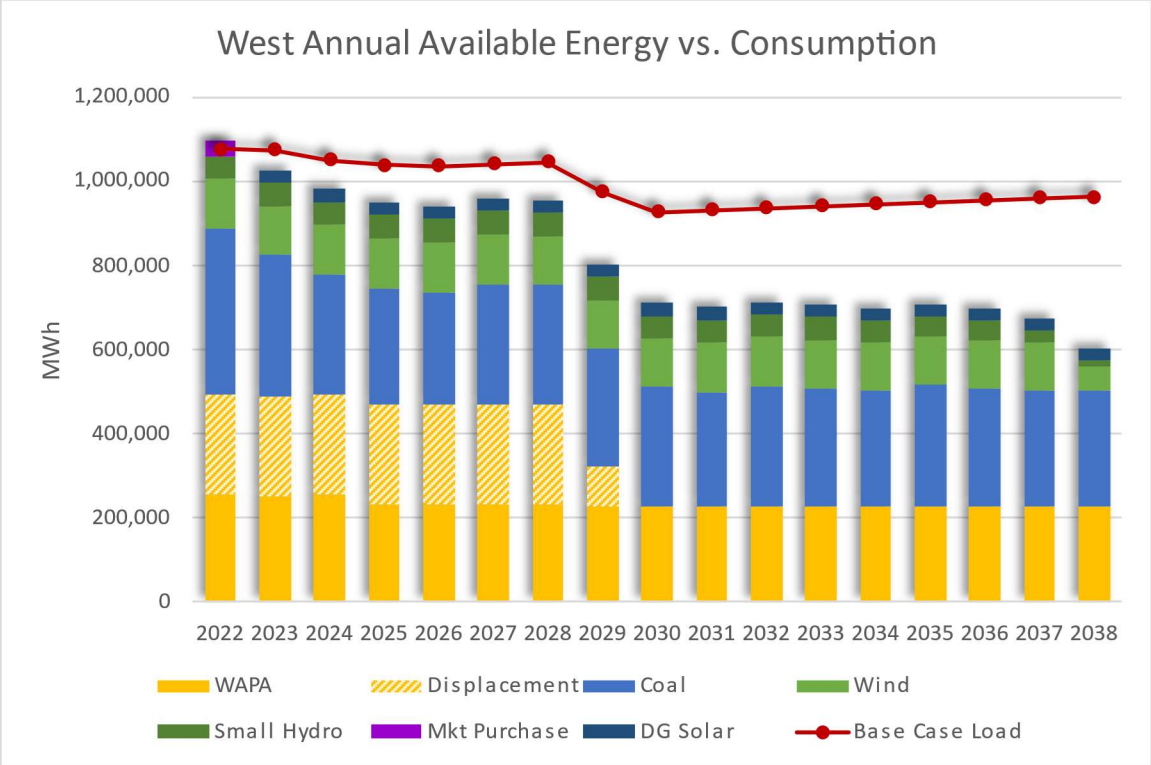


Figure X-11

4. MISO Region

Throughout the entirety of the study period, the MISO region is long on energy with no resource needs in terms of energy. As in the other regions, the coal resources in MISO have been historically operated at high capacity factors, while the average participant load factor in MISO is 48%. This balance is illustrated in *Figure X-12*.

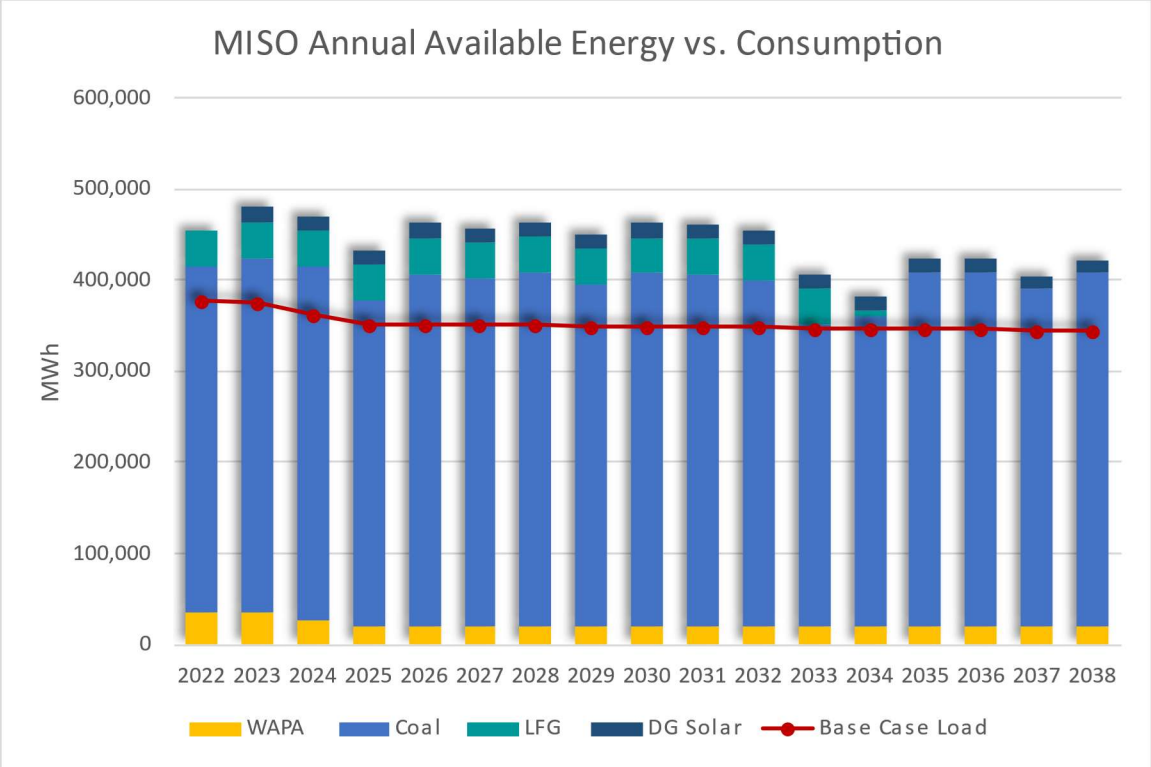


Figure X-12

D. Next Anticipated Resource Addition

It is important to clearly identify MEAN's future resource needs in terms of timing and scale in order to move forward with an evaluation to select the preferred resource portfolio. *Figure X-13* summarizes MEAN's total future capacity needs.

MEAN's need for additional capacity begins in 2024 with a capacity deficit that lasts the duration of the study period and increases throughout. In total, MEAN has a resource need of approximately 55 MW starting in 2024 which increases to a maximum resource need of 78 MW in 2028 before reducing to 43 MW the following year and then growing steadily to 65 MW in 2038.

Assigning the capacity needs into regional resource deficits, SPP has a need for approximately 55 MW of capacity from 2024 to 2028. The end of the WAPA Displacement Agreement eliminates the need for capacity in SPP in 2029. The West region first sees a capacity deficit of approximately 10 MW in 2024, which increases sharply to 45 MW in 2029 and increases throughout the remainder of the study period to 65 MW in 2038. MISO has a very minor capacity deficit of less than 5 MW from 2034 to 2038.

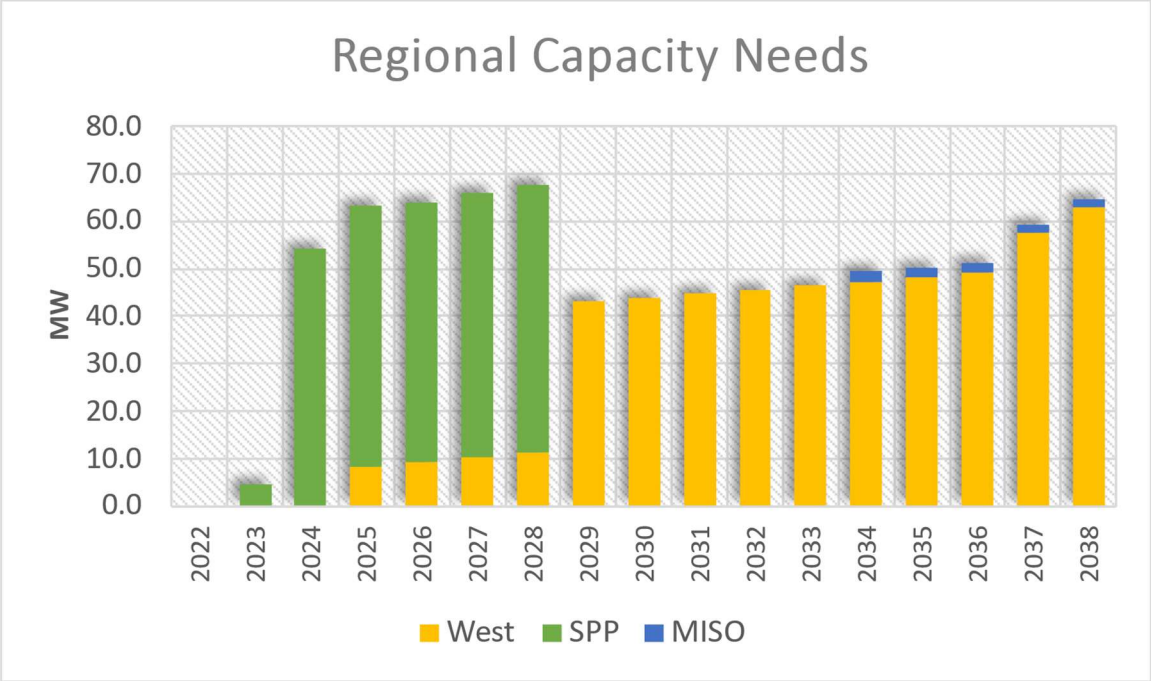


Figure X-13

The regional energy needs look very different. Both SPP and the West have an energy deficit from 2024 until 2038. SPP's energy need starts at 118,000 MWh in 2024 and increases to 250,000 MWh in 2038. In the West, resources are needed to supply 46,000 MWh in 2024 and grow to 358,000 MWh in 2038. MISO has no energy needs in the future.

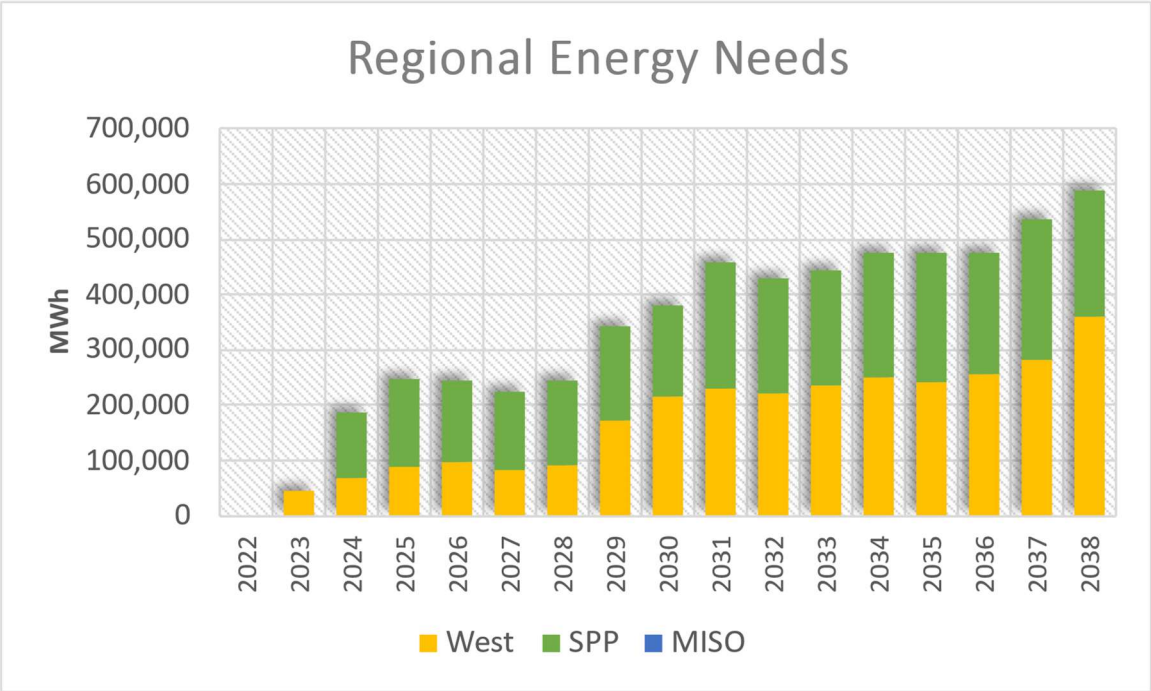


Figure X-14

XI. Transmission

MEAN is a transmission-dependent utility and receives transmission services provided by SPP, MISO and multiple transmission providers in the Western Interconnection. Transmission costs include network integration transmission service and point-to-point transmission service. Transmission costs also include the impact of auction revenue rights (*"ARR"*) and transmission congestion rights (*"TCR"*) in SPP and auction revenue rights and financial transmission rights (*"FTR"*) in MISO. These financial instruments were primarily designed to allow firm transmission customers the opportunity to offset price differences due to transmission congestion costs between resources and loads.

MEAN has also contracted to collect payments for transmission service purchased on behalf of certain Participants and remits these payments to the respective providers. Since MEAN is only acting as an agent, these amounts are not reflected as revenue or expense in MEAN's financial statements.

A. SPP and MISO

SPP and MISO each have integrated, regional electrical transmission systems and facilitate a regional wholesale marketplace. Network and point-to-point transmission service agreements provide MEAN with sufficient access to transmission facilities to deliver energy to the MEAN Participants, to participate in the SPP and MISO energy markets, and to sell excess generation and purchase replacement energy when generation is not available or it is economically beneficial. These MISO and SPP agreements are valid as long as MEAN continues to be the power supplier for the loads in the MISO or SPP market, as applicable. MEAN also purchased a 50 MW point-to-point transmission path from MISO to SPP, which is used to transfer 40 MW of participant owned generation capacity from Indianola Municipal Utilities and Waverly Utilities contracted under the Marketing Agent Agreement. This transmission agreement expires in 2033.

MEAN has experienced significant increases in transmission costs since it began participating in the SPP EIS market, which transitioned into SPP's IM in 2014. Such increased transmission costs are the result of transmission congestion caused by the increased dispatch of generation resources in newly integrated balancing areas, which raises the price to serve load, and increased transmission expansion in response to congestion. The increased costs are exacerbated by the fact that MEAN, as a transmission dependent utility, does not receive revenues from transmission expansion projects that transmission owners (*"TOs"*) receive to offset the higher costs.

B. Black Hills Common Use System

MEAN has several agreements with Black Hills Power which provide for firm point-to-point transmission service and non-firm point-to-point transmission service for use in making deliveries to Participant loads, resource deliveries to adjacent transmission networks, as well as energy sales to other regional utilities. The agreements have varying expiration dates and have rollover provisions to optimize future resource arrangements.

C. WAPA-RMR and WAPA-CRCM

WAPA-RMR and WAPA-CRCM provide network integration transmission service to MEAN Participants connected to these two transmission systems under Contract Numbers 18-RMR-2964 and 12-RMR-2321. WAPA provides this service to MEAN under a transmission tariff that is not subject to FERC jurisdiction. MEAN's point-to-point transmission service agreements with WAPA-RMR permit electricity produced from the resources of Black Hills, Laramie River Station, and Kimball Wind to be moved to the transmission networks of other providers. These agreements continue through November 20, 2024. Due to a non-contiguous transmission system, MEAN also purchases a long-term point-to-point transmission reservation from WAPA-CRCM to move Ridgway generation across to the Tri-State network.

D. Tri-State and PSCo

MEAN contracts for network transmission service with Tri-State and PSCo to deliver WAPA Displacement, Laramie River Station, Shavano Falls, and Ridgway Hydro to its member load within these transmission providers' service territories. MEAN has agreements with Tri-State and PSCo for short-term point-to-point transmission service and non-firm point-to-point transmission service to facilitate deliveries to Participant loads and resource deliveries to adjacent transmission networks.

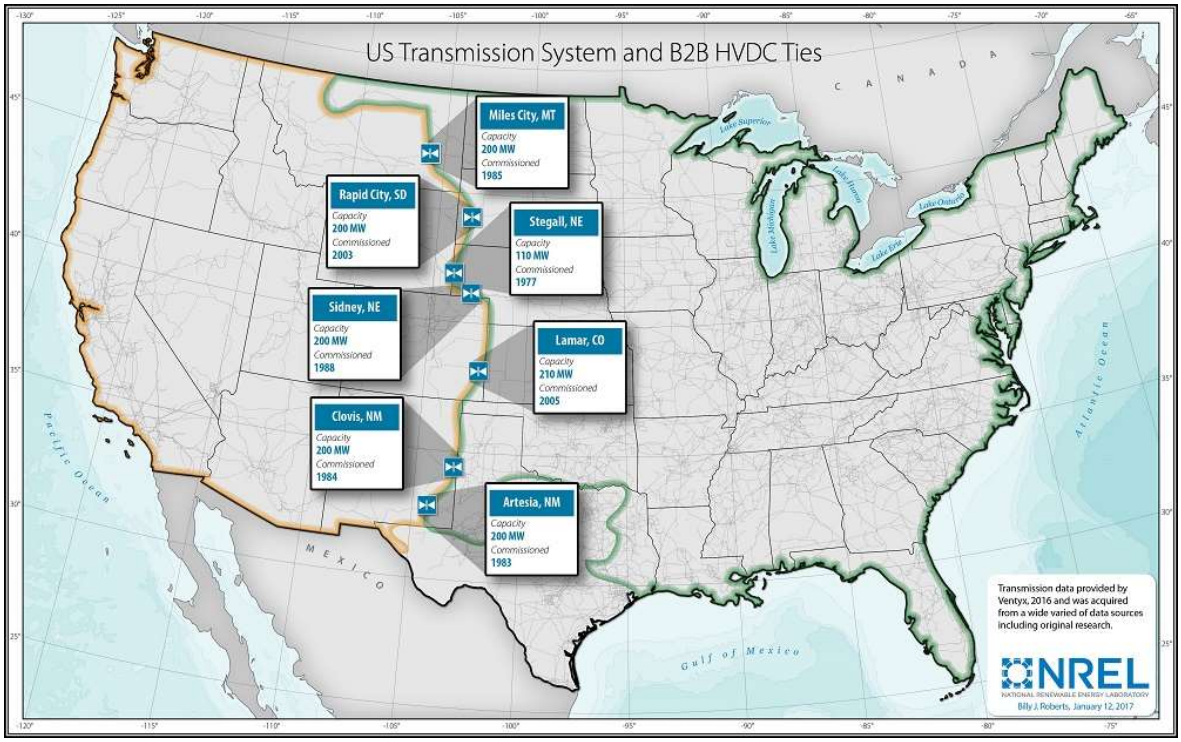
Recent transmission expansion planning by Tri-State and PSCO have indicated the potential for future transmission rate increases of its wholesale network transmission customers. Much of the planning has been designed to meet recently enacted Colorado legislature as well as anticipated renewable resource development along the Colorado front range.

E. Other

MEAN owns proportionate transmission rights in the transmission facilities associated with Laramie River Station and WSEC 4, pursuant to the Laramie River Station Agreements and WSEC 4 Agreements, respectively.

F. DC Tie Rights

MEAN's load and resources in SPP and the West are connected at the Direct Current Ties (*"DC Ties"*) that serve to integrate the eastern and western interconnects of the bulk electric system. Generators within each interconnect operate in the same phase and frequency. However, the frequencies do not match between the two interconnects, as the systems are too large and have too much inertia to be synchronous. The DC Ties allow a limited amount of power to flow back and forth between the systems, acting to absorb the variation in frequency. There are seven DC Ties in the US, three of which lie in MEAN's footprint.



MEAN has recently requested rights to transfer energy from east to west across the DC Tie at the Sidney Converter Station. MEAN's request under study would grant rights to transfer 34 MW beginning in 2024. A request has been submitted to obtain additional rights when they become available in future years. This allows MEAN to expand the application of resources to load with the ability to utilize SPP resources in the West. However, transmission across the DC Ties has associated costs, which have yet to be defined or quantified as the SPP West RTO is being developed. As such, MEAN cannot accurately model the costs of this optionality. The possibilities inherent in this transfer of power will be considered in the ultimate process of resource acquisition.

XII. Phase I Supply Side Resource Evaluation

A. Phase I Supply Side Evaluation Objectives

Phase I is a preliminary evaluation undertaken with the goal of examining a comprehensive list of supply side options and focusing this list down to fewer qualified options that prove to be feasible potential additions to the MEAN portfolio. The Phase I evaluation is in large part qualitative, directly reflective of Participant priorities, and based on simplified metrics. A more in-depth economic analysis is reserved for the qualified options in Phase II.

B. Phase I Supply Side Evaluation Process

Phase I begins with the identification of the full list of all supply side options to be considered. These include fossil-fueled resources, non-carbon resources, and storage resources.

A list of criteria on which these options will be evaluated is weighted by the MEAN participants as a way to determine the collective priorities. Each of the options is given a score for each criterion, and the score is weighted according to the ranking received from the participants.

The weighted scores are compared to arrive at the qualified options that will be the subject of the detailed economic analysis in Phase II.

C. Supply Side Options

Figure XII-1 displays the complete list followed by a simple description of the supply side options included in the Phase I evaluation for MEAN's future resource needs.

	Supply-Side Resource Options
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

*with and without CCS

Figure XII-1

1. Natural Gas Combustion Turbine

This option describes a simple cycle combustion turbine fueled by natural gas. NGCT plants are available as conventional or advanced technologies. For the purposes of this evaluation, the average value was used. Various configurations and turbine classes are available. The heat rate of CT units is assumed for this analysis at 10,000 Btu/kWh. NGCT plants can be operated as peaking units with capacity factors expected around the 5% range, or as intermediate units with capacity factors around 48-50%. This option could be contracted as an ownership portion or a power purchase. Natural gas resources are highly flexible resources, enabling them to respond to changes in supply from intermittent resources.

2. Natural Gas Combined Cycle

This option includes power generation from a natural gas fueled combined cycle unit where the combination of a gas turbine and a steam turbine can produce up to 50% more electricity than a simple cycle plant. The waste heat from the combustion turbine is used in a heat recovery steam generator to create steam which is fed into a steam turbine to produce a second energy stream. The average heat rate of a combined cycle unit is 6,609 Btu/kWh. As the combined cycle is the most economic natural gas plant configuration, it is typically operated as an intermediate or baseload resource. Capacity factors can run from 48 to 87%. The NGCC option was considered with and without a CCS system. Natural gas resources are highly flexible resources, enabling them to respond to changes in supply from intermittent resources.

3. Reciprocating Internal Combustion Engine

The Reciprocating Internal Combustion Engine (RICE) option would install one or more diesel-fired units, similar to MEAN's existing member-owned behind-the-meter generation. RICE units must be equipped with catalytic emission control devices for compliance with NESHAP regulations. RICE plants can be operated as peaking or emergency resources as they are equipped with very rapid ramping capabilities and can have stable turndown at 20% of full load. The average capacity factor of a RICE unit in 2021 was 16% per EIA. MEAN's RICE units average less than 1% capacity factor. Typical heat rate of a new unit is 8,295 Btu/kWh. This type of unit has become increasingly valuable with continued penetration of renewables to respond to the fluctuations in output from these intermittent resources.

4. Co-Fire (New or Retrofit)

This option contemplates a new or existing plant that co-fires on coal and biomass. Using biomass as a partial substitute for coal has little impact on boiler efficiency but has significant environmental advantages and offers opportunities for financial savings and local benefits, depending on location. Retrofitting an existing coal boiler to burn biomass typically has a lower capital cost than construction of a new dedicated biomass-fired plant. The average heat rate of a new co-fired plant burning 10-15% biomass is 9,880 Btu/kWh, and that of a retrofitted unit is 10,740 Btu/kWh. The average capacity factor is 52%.

5. Nuclear

The nuclear option used in this analysis includes a typical advanced nuclear fission-powered plant equipped with the requisite auxiliary systems. Nuclear plants generate electricity similar to other plants, except that the steam is created by the heat produced in the nuclear reaction. Average heat rate for a nuclear power plant is 10,480 Btu/kWh.

Nuclear plants operate as baseload resources, and for this analysis a capacity factor of 92% was used. This option offers certain benefits as a non-emitting resource. Also included as an option in the analysis is a system of small modular reactors. This design uses the same fission technology, but in combinations of smaller units, typically sized from tens of MWs to hundreds of MW. This modular concept has advantages over traditional nuclear plants in that the much smaller physical size allows off-site manufacture of the units, more options for siting, lower capital cost, and the ability to expand the plant in response to future needs.

6. Geothermal

The geothermal option presents two different technologies for generating renewable energy using heat extracted from below the earth's surface. Hydrothermal geothermal plants are a mature technology that injects fluid into naturally occurring reservoirs to create steam to power a turbine. Enhanced Geothermal Systems (*"EGS"*) artificially produce these conditions by fracturing hot rock below the surface for injection and extraction of fluid. For each of these plant types, two energy conversion processes are common: binary (using a heat exchanger to transfer geothermal energy to the steam turbine generator) and flash (creating steam directly from the geothermal fluid through a change in pressure). This analysis includes hydrothermal binary and near field EGS plant configurations. Both of these options operate at an average 80% capacity factor.

7. Biomass (100%)

Biomass plants are similar to coal plants with the exception of the feedstock. This option includes a dedicated plant burning 100% biomass. The cost and operation of a biomass plant are largely location dependent due to variations in fuel supply. The average capacity factor of a dedicated biomass plant is 52%. The typical heat rate is 13,500 Btu/kWh. Biomass plants have a lower emissions rate than coal plants and can also offer a local benefit if nearby feedstock supply is abundant.

8. Landfill Gas

Landfill gas (*"LFG"*) is a natural byproduct of the decomposition of organic materials in landfills. LFG is approximately 50% methane and 50% carbon dioxide, with a small amount of other organic compounds. LFG plants capture and convert this naturally occurring gas to be burned in internal combustion engines, turbines, microturbines, or fuel cells to generate electricity. Preventing the escape of methane into the atmosphere is a notable environmental benefit as methane is a more potent greenhouse gas than CO_2. Therefore, LFG facilities are considered to have zero or net negative emissions. LFG plants run at a high capacity factor, averaging 70.2%. The expected heat rate is 7,900 Btu/kWh.

9. Municipal Solid Waste

Municipal Solid Waste (*"MSW"*) contains biomass, non-biomass combustible materials, and noncombustible materials. The fuel can be utilized in two forms. Mass burn technology, the most common MSW-to-electricity technology, involves the combustion of unprocessed or minimally processed refuse. Refuse-derived fuel (*"RDF"*) typically consists of pelletized or fluff MSW produced by a resource recovery operation, which removes non-combustible materials. As the MSW is incinerated, heat from the combustion process is used to generate steam, which is then routed to a steam turbine-generator for power generation. MSW has relatively high carbon emissions factors but is

generally considered a renewable fuel. A typical MSW plant will run at capacity factors around 68-70%.

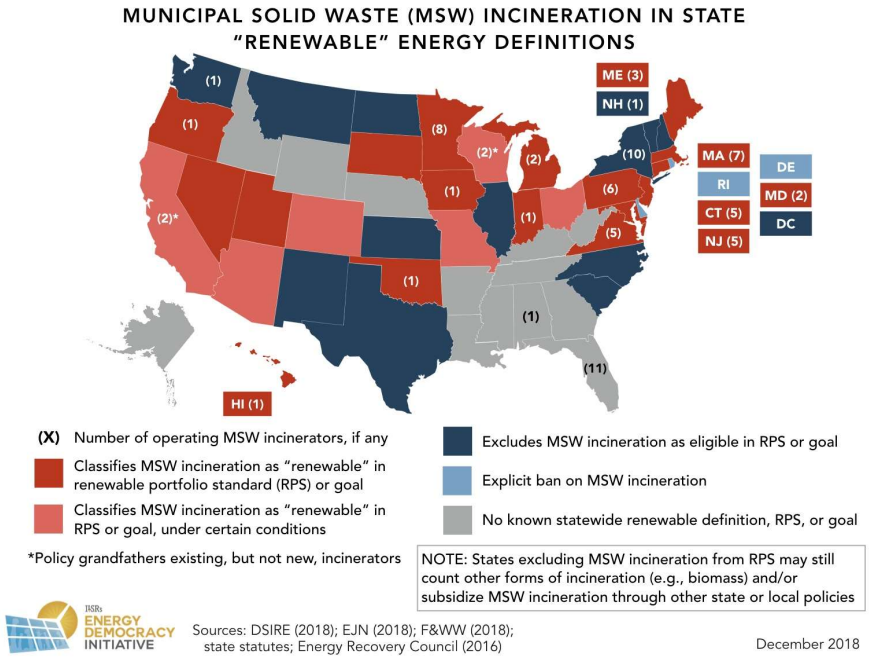


Figure XII-2

10. Hydropower

New hydropower resources can be originated either by powering non-powered dams (*"NPD"*) or by construction of a new dam via new stream-reach development (*"NSD"*). These plant types are further defined based on the head and capacity at the specific location. This analysis aimed to be conservative and used values for low head, low capacity units. For the NPD units, a capacity factor of 62% was input, and for the NSD units, a capacity factor of 66% was input. In reality, the capacity factor is a function of actual operation required to meet reservoir management needs using the plant's dispatch capability.

11. Wind

MEAN's service territory is a favorable area for wind resources. Recent years have seen an increase in development of large wind farms across Iowa, Nebraska, Colorado, and Wyoming. Wind resources constructed prior to the end of 2021 have a financial benefit in that they qualified for the Production Tax Credit (*"PTC"*), receiving a tax credit for each MWh produced for the first ten years of operation. For projects initiated in 2016, the credit is $23/MWh, which decreased by 20% each year and expired at the end of 2021. Legislation continues to be introduced to extend the tax credits. As experience with wind power and wind turbine installation grows, equipment pricing and installation costs continue to decrease. This is a favorable condition, as consideration of the PTC end dates starts to impact PPA pricing. In line with recent wind farm operation in the area, the analysis uses a 45% capacity factor. The ELCC method of accreditation calculation will reduce the accredited capacity with higher levels of penetration.

12. Utility or Community Solar

This option investigates a utility-scale photovoltaic solar installation owned by MEAN or a participant community. In fact, discussions among participants have even introduced the concept of several communities jointly owning such an asset. In total, 23.6 GW of solar was installed in the US in 2021. SPP added 20 MW of solar in 2020, with plans to add 100 MW in 2021. Similar to wind resources, as the rate of adoption increases, material and installation costs continue to fall to new lows. In addition to a decrease in capital costs, the Investment Tax Credit (*"ITC"*) offers a further savings benefit for systems constructed or substantially procured by the end of 2022. While not as ideal as the southwest regions, the solar irradiance in the MEAN footprint is at an acceptable level for solar installations. A capacity factor of 29% was used in the calculations for a solar resource. The representative resource is a single axis tracking solar system. The ELCC method of accreditation will reduce the accredited capacity with higher levels of penetration.

13. Green Hydrogen Storage

Electrolysis is a potential option for carbon-free hydrogen production using renewable and nuclear resources. Electrolysis is the process of using electricity to split water into hydrogen, oxygen, and free electrons. This reaction takes place in a unit called an electrolyzer. Electrolyzers can range in size from small, appliance-size equipment for small-scale distributed hydrogen production to large-scale, central production facilities that could be tied directly to renewable or other carbon-free forms of electricity generation. These systems have a target capacity factor of 97%, making them a rare baseload carbon free resource. Electrolyzers can be built in modular systems to facilitate turndown for efficiency, load following, and scalability.

14. Fuel Cell

A fuel cell is a device that runs hydrogen and oxygen through chemical reactions in a process that generates electricity and heat, which can then be used as energy sources. In this analysis, natural gas is used as the fuel from which to derive the hydrogen. Natural gas, primarily composed of methane (CH_4), must be separated into the carbon and hydrogen components to be used in the fuel cell. Separation is typically performed in a steam methane reformer that subjects the natural gas to steam at high temperature and pressure with a metal catalyst to facilitate a chemical reaction which produces hydrogen and small amounts of carbon dioxide and carbon monoxide. The hydrogen produced in this reaction is supplied to the fuel cell, while the other gases are vented. Water output from the fuel cell can be collected and returned to the reformer, recycling it to be heated into steam for the methane reformation process. Fuel cells are energy-efficient since they produce electricity chemically rather than through combustion. Fuel cells also result in lower emissions than other natural gas-fired energy resources, with a heat rate of approximately 6,400 Btu/kWh. Electrical output is available in a wide range to provide scalable options for a variety of applications.

15. Battery Storage

A battery storage system is integrated with a generation source to act as a sink for the electricity when it is not required for load and a source of that same electricity when load levels increase. In this way, battery storage can increase the value of an intermittent resource by dispatching energy to match the timing of the load, or alternately to optimize market pricing. There are various battery technologies available for this application,

including but not limited to: lead-acid, lithium-ion, sodium-sulfur, nickel-cadmium, sodium-nickel-chloride, and flow batteries. However, the most mature and commonly installed technology for utility-scale storage is the lithium-ion battery. Lithium-ion battery systems have high efficiency and are very flexible, with varying discharge times available. Although energy density and performance characteristics can vary widely among the different technologies, this analysis refers to lithium-ion batteries specific to a renewable integration application. Although lithium-ion batteries currently have a high capital cost, costs are expected to trend downward in the future due to an increase in manufacturing volume, design improvements, and chemistry improvements. For this analysis, both 2-hour and 4-hour batteries were considered.

16. Pumped Hydropower

The pumped hydropower energy storage (*"PHES"*) option represents a mature technology that is widely used throughout the US and the world. In fact, PHES power plants constitute over 90% of installed electrical storage capacity across the globe. Conventional pumped hydro storage systems use two water reservoirs at different elevations. The system is charged during off-peak hours by pumping water from the lower to the upper reservoir. When loads are sufficiently high, the energy is discharged by releasing water from the upper to the lower reservoir, powering a turbine and generator. There are different options for the upper and lower reservoirs, which can take advantage of local geography. Discharge times can be from hours to days. The efficiency of PHES plants is in the range of 70 % to 85%. Once constructed, PHES systems enjoy a very long service life. However, opportunities are dependent on location.

17. Thermal Storage

Thermal Energy Storage (*"TES"*) systems are yet another method by which energy demand is shifted from peak hours to off-peak hours. TES systems store thermal energy for peak demand dispatch by heating or cooling a storage medium for use in heating or cooling applications or power generation. Available technologies include sensible heat storage, latent heat storage, and thermo-chemical storage. Sensible heat storage stores energy through a temperature change of the storage medium and is applicable to domestic systems, district heating and cooling, and industrial needs. Since these applications are directed to end-use customers, MEAN is unable to administer such options. Latent heat storage stores energy through a phase change of the storage medium. Examples include molten salts in concentrated solar plants. Thermo-chemical storage uses chemical reactions to store and release thermal energy. Examples include adsorption processes and desiccant cooling. Most latent heat and thermo-chemical storage applications are in the development or demonstration phase and are high in cost and are therefore unlikely to be pursued by MEAN.

D. Criteria

The goal of Phase I was to narrow the complete list of supply side options to a list of qualified options that represent the most feasible supply side resources for MEAN. To select the qualified options, appropriate criteria had to be determined. To this end, MEAN conducted an online survey wherein the participants were asked to rank the following criteria in terms of importance in resource selection:

- Cost: This includes the total cost of energy. In an ownership scenario, this is inclusive of fuel costs, fixed O&M costs, variable O&M costs, and capital cost recovery. In a PPA

scenario, this includes the contracted price of energy. Transmission costs would also be added if applicable.

- Fuel Diversity: Fuel diversity of MEAN's resource mix is primarily determined using nameplate capacity, but the percentage of energy provided by each fuel will also be assessed. A higher level of fuel diversity reduces the impact of fuel price spikes, volatility, or supply availability.

- Flexibility/Dispatchability/Market Risk: This factor considers whether a resource is dispatchable (i.e., coal, natural gas, some hydropower, batteries) or intermittent (i.e., wind or solar) and whether the resource output can be reduced to a minimum level that allows response to market conditions. A resource's dispatchability is also a measure of its reliability.

- Emissions/Environmental Impact: Measures the resource emissions factors for NO_x, SO_2, CO_2, and Mercury. Water consumption will also be considered.

- Local Benefit: Locating a resource in or near a participant community to allow for economic development opportunities and/or localized environmental benefits.

- PPA vs. Ownership: Evaluates the impact on MEAN's long-term debt position and resource mix dependent upon whether a resource is acquired in an ownership stake as opposed to a power purchase.

- Environmental Policy Risk: Evaluates whether a resource is vulnerable to increased regulation (and possibly additional costs) as a result of future environmental policy.

- Progress Toward 2050 Vision: This criterion estimates a resource's contribution to the overall decrease of carbon emissions in MEAN's portfolio and the ability to sustain that reduction to 2050.

- Long Term Debt: Some resource contracts may require that MEAN contribute to payments on the facility's long-term debt, and in fact some contract lengths are tied to the term of existing debt. Resource contracts that require MEAN's obligation to pay long-term debt have impacts on the organization's financials and the length of Service Schedule M participants.

- Transmission Availability/Cost: Since MEAN is not a transmission owner, resources must obtain a transmission path from the source to the market or to the sink. Depending on the operation and location of the resource, this transmission service may come at an additional cost. Also, the availability of existing transmission means the resource will not be responsible for additional upgrade costs.

- Resource Adequacy/Capacity Accreditation: Resource capacity is accredited based on its type and its historical and predicted future performance. MEAN must have adequate accredited capacity to meet its projected peak demand. Therefore, the lower a resource's accreditation, the larger the nameplate capacity required. Baseload resources, such as coal and nuclear receive 100% accreditation, whereas wind and solar resources can be accredited as low as 10%. Resources with low accreditation sometimes require an additional capacity purchase to provide resource adequacy, thereby increasing the cost.

- Future Capital Cost/Decommissioning: Some types of resources have compliance measures that must be met to retire the resource at the end of its useful life. These measures typically come at a significant cost. Other types of resources may see high future capital cost to meet new future environmental compliance regulations.

The results of the survey indicated that the participants' most important criteria in resource selection is cost. With a score of 4.68 out of 5, Cost was the most highly rated criteria. This was followed by Long Term Debt with a score of 4.37, Transmission Availability/Cost with a score of 4.35, Local Benefit with a score of 4.26, Resource Adequacy/Capacity Accreditation with a score of 4.25, and Future Capital Cost/Decommissioning with a score of 4.21. The lowest priorities were Fuel Diversity, PPA vs. Ownership, and Environmental Policy Risk. The complete results are shown in *Figure XII-3*.

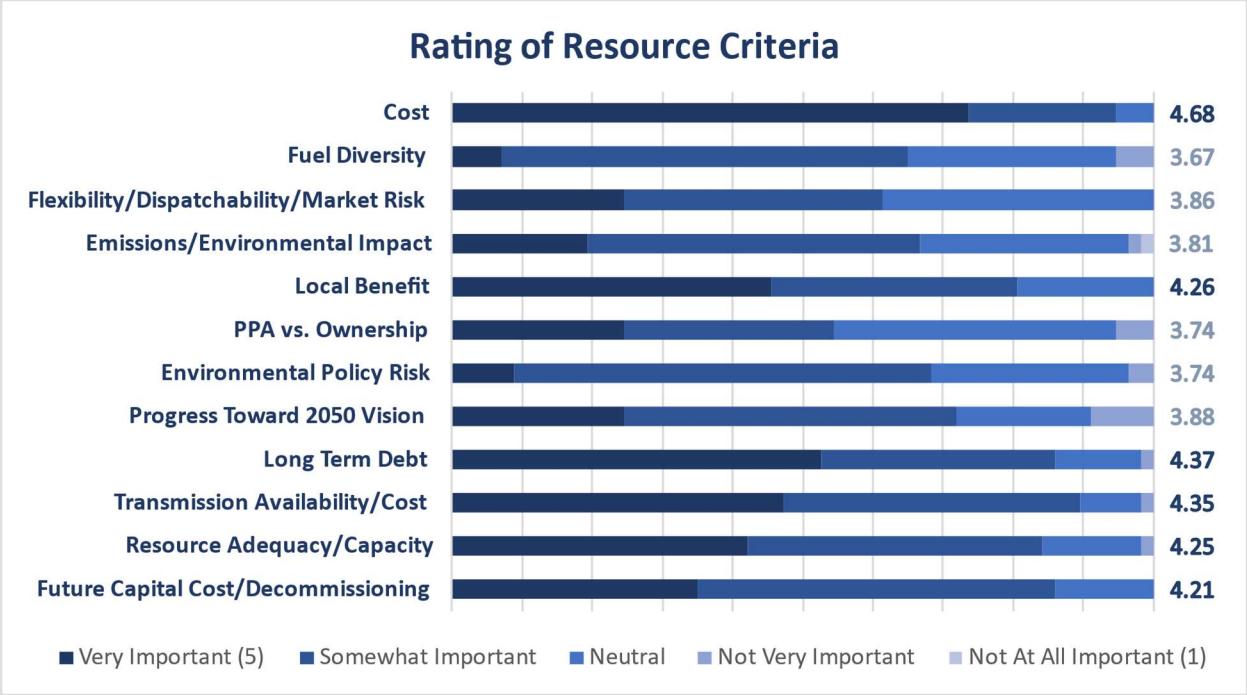


Figure XII-3

E. Input Data

Each of the supply side options was scored on each of the criteria using a variety of metrics obtained from the U.S. Energy Information Administration (*"EIA"*), the National Renewable Energy Laboratory (*"NREL"*), the Department of Energy (*"DOE"*), the Electric Power Research Institute (*"EPRI"*), and other publicly available studies. Specific data used as the scoring values for the Phase I evaluation is shown graphically in Appendix B.

F. Evaluation

The chart in *Figure XII-4* shows the total combined weighted score for each of the supply side options. The individual components of the score are color coded by criteria as described above.

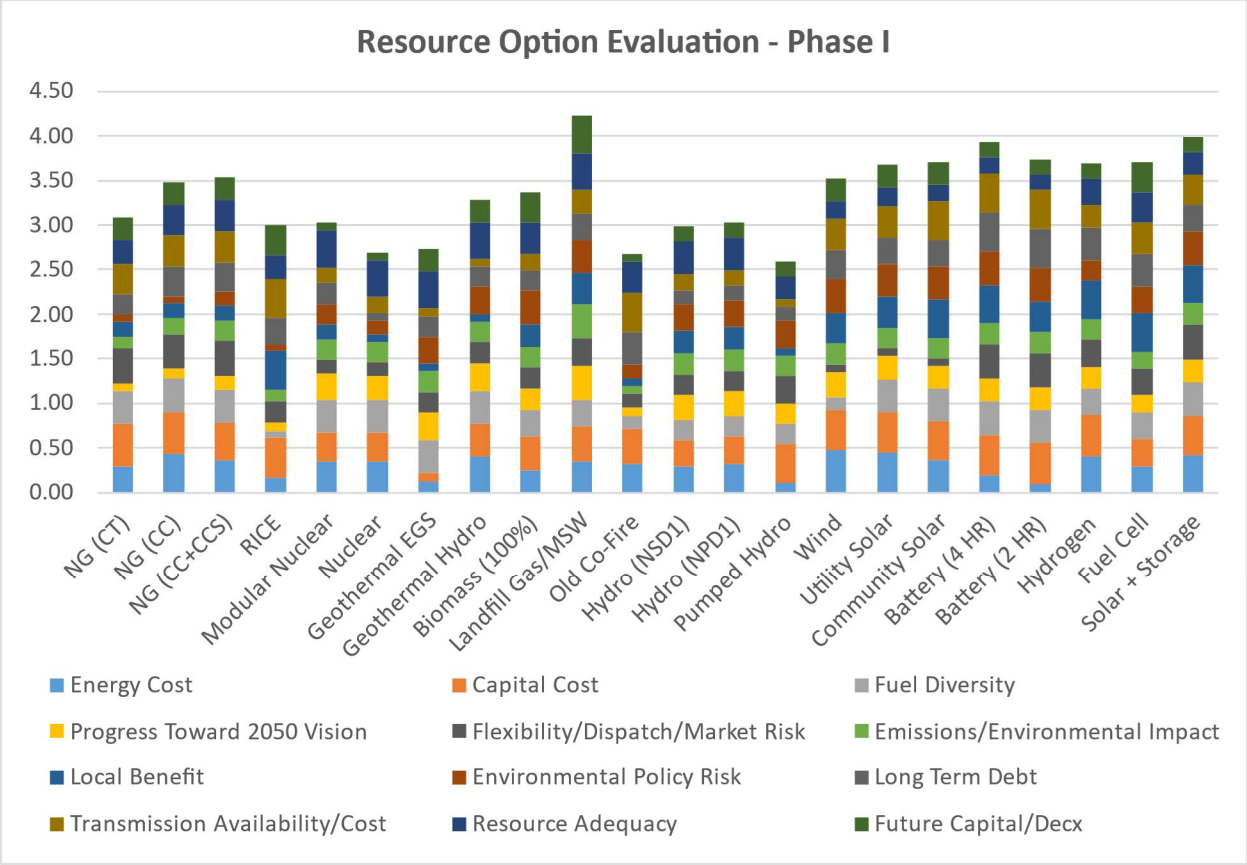


Figure XII-4

G. Qualified Options

1. Evaluation

The Phase I evaluation resulted in final combined weighted scores for each of the supply side options defined at the beginning of the process. Because the criteria were weighted according to the participants' survey, the scores reflect the options most likely to achieve the priorities of the participants. As highlighted in *Figure XII-5*, the top scoring options were:

- Landfill Gas/Municipal Solid Waste
- Solar+Storage
- Battery Storage
- Utility/Community Solar
- Fuel Cell
- Wind
- Hydrogen Storage
- Natural Gas Combined Cycle

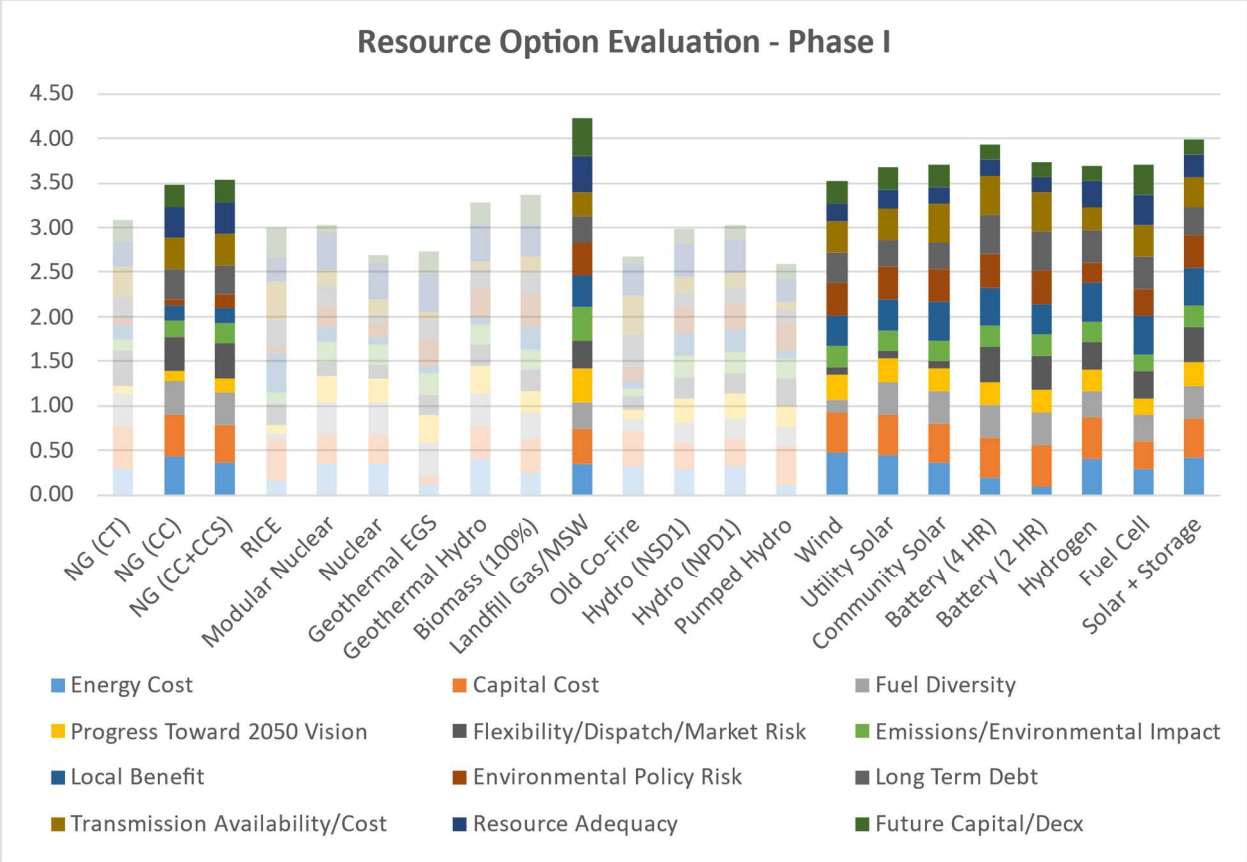


Figure XII-5

2. Public Participation

In discussions at the Power Supply Committee meetings and discussions with individual member representatives, participants suggested adding to the qualified options determined by the Phase I evaluation.

NextEra Solar: MEAN is in discussions with NextEra Energy regarding a proposed solar installation near the town of Sidney, Nebraska. This proposal has not yet been approved by the MEAN Board, and terms are not finalized. However, since solar resources were qualified for future evaluation based on the Phase I results, certain components of the NextEra project will be used to inform the inputs and assumptions for the solar facility model.

Local Hydropower: Although hydropower scored too low in the Phase I evaluation to qualify for Phase 2 modeling, MEAN has considered specific potential local hydropower projects for Power Purchase Agreement participation. The initial details of these opportunities warrant further investigation, and therefore a modeling option will be added with pricing and performance characteristics based on an average of these potential projects.

Participant Owned Generation: Several workshop attendees favorably discussed the option of allowing participants to install new behind-the-meter generation to their community fleet and add these units to MEAN's portfolio through the same contract by which MEAN leases existing generation. This is an option that would supply capacity and energy while at the same time provide a benefit to a participant community. MEAN would

intend to release a Request for Proposals to participants wherein the unit parameters are specified to allow MEAN to control the resource mix and enhance the performance of the participant owned generation fleet. Participant Owned Generation can also serve to fulfill capacity needs in portfolios that add intermittent generation with low capacity accreditation.

Extension of PPAs: MEAN is party to several Power Purchase Agreements that are scheduled to expire during the study period. Market dynamics may present an environment in which MEAN can negotiate an extension of these contracts favorable in terms of pricing and operating strategy. Contracts considered were the NPPD Multi-Unit Participation Agreement (GGS 1 and 2 and Cooper Nuclear Station), the Black Hills PPA (Wygen III and Neil Simpson 2), and the NPPD Wind PPAs. The Black Hills PPA was discounted for the lack of flexibility and dispatchability as well as the carbon emissions factor. The NPPD wind contracts were excluded as the assets are expected to be at or near the end of their useful service life when the contracts expire and would be an inferior option when compared to a new wind facility. An extension of a PPA for power from Cooper Nuclear Station was added as an option. This has not been offered or officially discussed with NPPD, and is only added as a studied option to determine its viability compared to other supply side resources.

Extension of Marketing Agent Arrangements: In January 2005, the MEAN Board placed a moratorium on participant owned generation, disallowing any generating unit additions to the committed facilities fleet. When Indianola Municipal Utilities and Waverly Utilities joined MEAN, they operated in their communities significant generating assets that they wished to lease to MEAN. The Board agreed to lift the moratorium to lease 15 MW from each participant under the existing ERPA contract. Under a separate contract, the Marketing Agent Agreement, MEAN leases certain capacity amounts termed Short-Term Leased Capacity and Excess Capacity at different payment terms for 2-3 year time periods. This agreement includes a total of approximately 49 MW. The current contract term extends through the MISO Planning year 2022-23. Of the total behind-the-meter generation of IMU and WU, a portion is exported from MISO to SPP. Extension of these contracts would provide SPP with additional capacity needed for resource adequacy to allow future renewable generation resources that carry low accredited capacity.

XIII. Demand Side Management Evaluation

A. Demand Side Management Evaluation Process

Just as new a supply side resource can be added to MEAN's portfolio to supply additional energy to meet the demands of the end-user, conversely end-user demand can be decreased to require less energy to be generated by supply side resources. Demand side management (*"DSM"*) programs can be utilized to reduce peak demand and thereby eliminate or delay the need for future capacity additions. Reducing peak demand also has the added benefit of decreasing resource adequacy (capacity) needs, allowing for the use of more resources that offer energy generation with little accredited capacity (i.e., intermittent renewable resources.) Alternately, DSM measures can be designed to lower energy consumption to decrease the energy generation required by existing and future resources. Since MEAN's load and resource balance shows a future deficit in terms of both capacity and energy, both types of DSM are viable solutions.

In an attempt to minimize the required supply side resources to meet MEAN's total obligation, a demand side resource evaluation was performed to determine the value of proposed DSM programs.

B. Demand Side Options

In addition to the established DSM programs that MEAN plans to continue as described in Section VII, a list of potential future programs was compiled for evaluation. The total list for the initial investigation included:

- Energy Efficiency Education
- Street Lighting Upgrades
- Commercial/Irrigation Interruptible Service
- Commercial/Industrial Direct Load Control
- Commercial High Efficiency HVAC Incentives
- Appliance Recycling Incentive
- Residential Direct Load Control (Air Conditioners, Water Heaters)
- Residential High Efficiency HVAC Incentives

C. Market Feasibility

The first step in the analysis was to determine the market feasibility of the potential programs. In other words, an estimation of the probability that each program would be accepted and applied by the end-user market. In January, MEAN conducted an online survey to ask each community's Board representative to rate the potential implementation of each of the prospective DSM programs. The results of the survey are shown in *Figure XIII-1*.

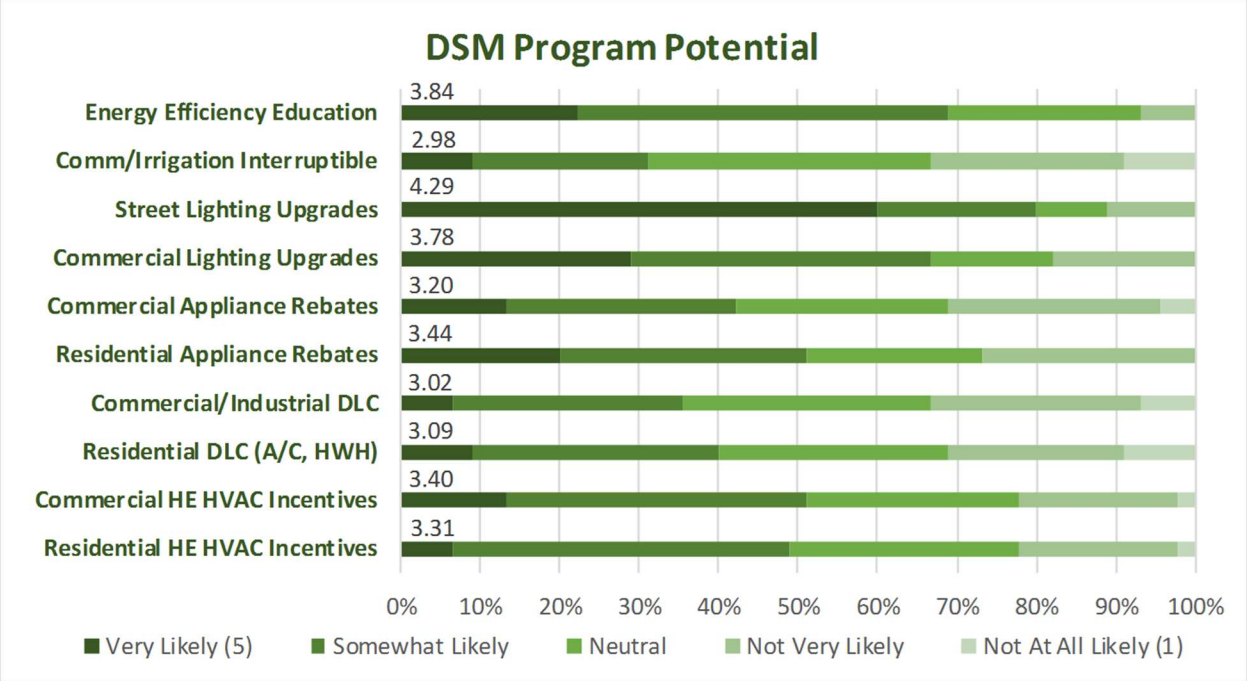


Figure XIII-1

The options with the highest scores for market feasibility were: Street Lighting Upgrades, Energy Efficiency Education, Commercial High Efficiency HVAC Upgrades, Residential High Efficiency HVAC Upgrades, and Appliance Recycling Incentives.

MEAN previously administered a program to incentivize street lighting upgrades. However, as one of the goals of the DSM program is to decrease system demand, the reduction of street lighting load, which occurs noncoincident with peak load, did not contribute to advancement of the program goal. The street lighting program has since been discontinued.

In addition, as part of the four new energy efficiency programs rolled out in 2021, MEAN recently implemented a High Efficiency Heat Pump incentive program for either converting an existing natural gas system or upgrading from a conventional electric system. The results of the survey indicate that MEAN should continue to fund and support these programs.

The lowest scoring options were: Residential Direct Load Control, Commercial/Industrial Direct Load Control, and Commercial/Irrigation Interruptible Rates. These programs were eliminated from further consideration.

D. Qualified Options

Based on the results of the Participant survey, the qualified options were broadly categorized as Residential and Commercial Appliance Rebates, Residential and Commercial High Efficiency HVAC Incentives, and Energy Efficiency Education. In order to perform a more accurate analysis, these categories were studied and more specific programs defined for the next step in the analysis.

To respond to customer interest as indicated by recent programs administered by other regional utilities and to create programs designed to be useful and effective for a minimum 10-year span, the following DSM programs were advanced to the final analysis:

Residential and Commercial Appliance Rebate Programs:

- Refrigerator Rebate
- Freezer Rebate

Residential and Commercial High Efficiency HVAC Incentives:

- Room Air Conditioner Upgrade Incentive
- Central Air Conditioner Upgrade Incentive
- Heat Pump Water Heater Rebate

E. Economic Feasibility

1. Benefit/Cost Ratio Tests

The costs and benefits of the proposed DSM programs will be compared using three different calculation methods, all of which are commonly used by utilities for this purpose. These three tests consider the costs and benefits of the DSM programs from different perspectives. A calculated ratio greater than 1 indicates benefits that exceed costs.

- The Utility Cost Test (*"UCT"*), also called the Program Administrator Cost Test. This test measures cost-effectiveness from the viewpoint of MEAN. If MEAN's avoided power supply costs exceed the costs incurred by MEAN in administering the program and paying the incentives or rebates to the end-use customer, the program is a net benefit to MEAN.

- Participant Cost Test (*"PCT"*). This test measures benefits and costs to the end-use customers participating in DSM programs. The test compares net bill savings, considering electric bills and gas bills, against incremental costs of the efficient HVAC equipment or appliance, which are calculated to include the incentive or rebate received from the utility. If the savings exceed the incremental costs, the program provides a positive financial impact to end-use customers.

- Total Resource Cost Test (*"TRC"*). This test examines each program from the viewpoint of the entire MEAN system. The TRC test compares the program benefits of avoided power supply costs against the administration costs to the utility and the customer costs of upgrading equipment. The payment of incentives or rebates is a net zero as it is a cost to the utility but a benefit to the end-use customer. Bill savings also net out, both between the retail customer and supplier and the wholesale customer and supplier. A passing score on the TRC indicates a decrease in total resource costs, benefitting MEAN and the customer.

The table in *Figure XIII-2* summarizes the benefits and costs included in the calculations of the ratio.

TEST	BENEFITS	COSTS
Utility Cost Test	Utility Avoided Costs	• Program Administration Costs • Incentives/Rebates Paid
Participant Cost Test	Net Bill Savings	• Incremental Cost of Investment (Net of Incentive/Rebate)
Total Resource Cost Test	Utility Avoided Costs	• Program Administration Costs • Incremental Cost of Investment

Figure XIII-2

2. Market Potential

The first step in quantifying the costs and benefits of the proposed DSM programs is to determine the potential market for each program. MEAN used the 2020 and 2015 Residential Energy Consumption Survey (*"RECS"*) conducted by the U.S. Energy Information Administration, which details the statistics of appliance and HVAC equipment ownership. Data is available on the number of owned systems by type, age, efficiency rating, and capacity.

MEAN first tabulated the total percentage of regional customers who owned the applicable system or appliance and applied this percentage to the total number of residential meters in the MEAN system. Next, the type and age were considered to determine the number of systems likely to be eligible for replacement. Lastly, an estimate of the expected rate of participation was applied to the number of eligible systems/meters.

The table in *Figure XIII-3* shows the results of the market potential calculations for each program. This total number was distributed evenly over the ten-year assumed span of the program.

DSM PROGRAM	TOTAL METERS	OWNED SYSTEMS	ELIGIBLE SYSTEMS	PARTICIPATION	TOTAL POTENTIAL
Room Air Conditioner Rebate	84,066	26.52%	20.00%	25%	1,115
Central Air Conditioner Incentive	84,066	70.45%	34.85%	30%	6,192
Refrigerator Rebate	84,066	99.24%	11.45%	30%	2,866
Freezer Rebate	84,066	38.64%	49.04%	25%	3,982
Heat Pump Water Heater Rebate	84,066	64.39%	36.36%	20%	3,937

Figure XIII-3

3. Energy Efficiency Assumptions

To estimate the impact of each DSM program in terms of energy savings, MEAN used Energy Star Life Cycle Cost Estimate calculation tools (U.S. Department of Energy) and the Federal Energy Management Program Energy Cost Calculator for Electric and Gas Water Heaters.

The Air Source Heat Pump program replaces a traditional natural gas forced-air furnace and electric air conditioner with an electric air source heat pump. A programmable thermostat is not included in the calculations. This replacement results in an overall increase in electric energy consumption, as the annual energy used by the heat pump system exceeds that saved by the elimination of the conventional air conditioner. This is accompanied by a decrease in natural gas consumption with the elimination of the furnace. Therefore, the impact to the retail customer is a net positive savings, and the impact to MEAN's system in terms of energy is a net negative savings.

The Room Air Conditioner program simply replaces a minimum efficiency conventional unit with an Energy Star rated unit with higher efficiency.

The Central Air Conditioner program replaces a minimum efficiency conventional unit with an Energy Star rated unit with higher efficiency.

The Refrigerator program replaces a minimum efficiency standard appliance with an Energy Star rated unit with higher efficiency.

The Freezer program replaces a minimum efficiency standard appliance with an Energy Star rated unit with higher efficiency.

Previously, MEAN looked at a Water Heater program to replace a natural gas-fired water heater with an electric water heater, which has the effect of an increase in electric energy consumption and a decrease in natural gas consumption. Therefore, the impact to MEAN's system in terms of energy is a net negative savings. The current analysis instead includes an upgrade of a standard electric water heater with an Energy Star rated heat pump water heater unit.

The calculations are included in Appendix C, and the results are tabulated in *Figure XIII-4*.

DSM PROGRAM	ENERGY SAVINGS (MWh/year/unit)	POTENTIAL UNITS	PROGRAM SAVINGS (MWh/year)
Room Air Conditioner Rebate	0.124	111	13.82
Central Air Conditioner Incentive	0.482	619	298.46
Refrigerator Rebate	0.061	287	17.48
Freezer Rebate	0.315	398	125.43
Heat Pump Water Heater Rebate	2.242	394	882.68

Figure XIII-4

4. Costs and Savings

MEAN will incur DSM program costs in two ways. First, MEAN will require staff time to administer the program. It was assumed in this analysis that one staff member could be devoted to administration of all six programs. However, a pro-rated percentage of the staff member's time and salary would be allocated to individual programs. MEAN will also pay the cost of the incentives or rebates received by the end-use customers. Incentive and rebate amounts were projected based on the average offers from regional utilities for similar programs.

From the customer's perspective, the cost incurred is the incremental cost paid for the higher efficiency equipment or appliance as compared to the purchase of a standard unit. This data was calculated in the Energy Star Life Cycle Cost calculation tools as shown in Appendix C as well as general market data. This incremental cost must be adjusted to include the incentive or rebate received from MEAN for participation.

The costs for each program are listed in *Figure XIII-5*:

DSM PROGRAM	ADMINISTRATION COST ($/year)	INCENTIVE/REBATE	INCREMENTAL CUSTOMER COST
Room Air Conditioner Rebate	$14,846	$45	$51
Central Air Conditioner Incentive	$14,846	$300	$856
Refrigerator Rebate	$14,846	$60	$200
Freezer Rebate	$14,846	$60	$100
Heat Pump Water Heater Rebate	$14,846	$400	$850

Figure XIII-5

MEAN's benefit is quantified by its avoided cost. Every MWh that is not consumed at the end-use customer level is a MWh that MEAN does not have to generate or purchase. While all of MEAN's costs are not directly attributable to energy production, and therefore not avoided with a decrease in energy consumption, there is a portion of MEAN's costs that is avoided when energy consumption decreases. This is termed MEAN's "avoided cost." MEAN's current calculated avoided cost rate is $0.4209, a value that is recalculated annually with changing system parameters. In the benefit/cost analysis, this cost is escalated at a rate of 3% per year.

The end-use customer's benefit is determined by the net energy bill savings. For the Air Source Heat Pump program, this is the total of the increase in electric billing costs and the decrease in natural gas billing costs. For this analysis, a seasonal and regional weighted average of $0.0944 per kWh with a 1% annual escalation was used for the electric billing rate, and $0.97 per therm with a 2% escalation was used for the gas billing rate.

5. Results

The costs and benefits as described above were applied to the potential market participants for each of the proposed DSM programs. The costs were escalated and summed for a ten-year period. Finally, a Net Present Value was calculated for the annual costs and benefits and this value used to determine the final benefit/cost ratio. The results of the three Benefit/Cost tests are shown in *Figure XIII-6*.

DSM PROGRAM	UTILITY COST TEST (Benefit/Cost)	PARTICIPANT COST TEST (Benefit/Cost)	TOTAL RESOURCE COST TEST (Benefit/Cost)
Room Air Conditioner Rebate	0.0310	1.2112	0.0365
Central Air Conditioner Incentive	0.0706	0.0931	0.0396
Refrigerator Rebate	0.0246	0.0468	0.0147
Freezer Rebate	0.1473	0.8461	0.1831
Heat Pump Water Heater Rebate	0.2425	0.5353	0.2179

Figure XIII-6

As stated initially, only a ratio greater than 1 would indicate that a program is likely to result in benefits that outweigh its costs and therefore provide a net positive impact to MEAN or the end-use customer, depending on the test.

In total, only one program had a favorable result, and in only one of the tests. Therefore, none of the potential programs would prove beneficial to MEAN and the end-use customer to a point that would compensate for the required costs.

Fortunately, MEAN has recently expanded DSM offerings to retail customers. See the "Existing Demand Side Management" section for details on the four new energy efficiency programs initiated in 2021. To date, these programs have been successful and have shown energy and demand savings. MEAN will evaluate the future level of funding based on participation and measured savings for all participants.

F. Energy Efficiency Education

The DSM survey indicated that future energy efficiency education would likely see a high degree of participation in MEAN member communities. Through work with the Nebraska Municipal Power Pool organization and other statewide utilities, MEAN continues to seek opportunities to assist communities with education efforts. Recent educational sessions have been made available for MEAN member communities on topics including Electric Vehicle Charging Stations and Specifications as well as Community Solar Projects. MEAN's Services Committee regularly evaluates the potential for future programs and continuing education opportunities that align with overall member interest and budget limitations. To this end, MEAN regularly provides communications materials for communities to share with retail and residential customers promoting the benefits of the new energy efficiency programs and specific instructions for application.

G. Electric Vehicle Charging Stations

Another prospective Demand Side project that MEAN and Pool will be exploring in the near future is an incentive for residential electric vehicle charging stations. Other regional utilities have recently introduced similar programs, and MEAN anticipates that several communities will have a high degree of interest to participate. The potential applications and developments of this project could prompt a high level of collaboration between MEAN staff and member community staff and intense study of community interest, use profiles, and retail rate structure. This project will be introduced for discussion and consideration at a future Services Committee meeting.

H. Advanced Metering Infrastructure

MEAN is working on a project to provide advanced metering infrastructure (AMI) services to member communities. In the fall of 2019, MEAN conducted a business case study and survey of member representatives seeking interest in installing and employing Advanced Metering Infrastructure (*"AMI"*). Initial positive response was received from 20 towns. With this information, MEAN conducted an RFP for pricing of an aggregate AMI procurement.

AMI has the ability to provide two-way communication with community retail electric meters. It allows for remote meter reading, remote disconnections, and remote monitoring of system conditions. Following implementation, participating communities could use this system to perform demand side management at the individual meter level. With the proliferation of residential distributed generation, electric vehicle charging, and residential energy storage, AMI offers significant opportunity for demand control for the enhancement of DSM technologies. The use of DSM allows communities to control their energy peak and by extension, potentially reduce the need for MEAN to procure additional resources in the future. MEAN would have access to the data collected by the participating communities. MEAN could use this data to enhance load monitoring and forecasting activities.

Fourteen (14) communities have signed letters of intent to participate in this project, representing a total of approximately 10,500 meters. These communities vary in size and location across MEAN's footprint. If approved, this project is slated to begin implementation in 2022.

XIV. Phase II Analysis and Results

A. Phase II Supply Side Analysis

The qualified options from the Phase I supply side evaluation are combined with MEAN's existing contracted resources to create a number of future resource portfolios for study. The date on which a resource is modeled to begin generation is aligned with the timing of the regional resource deficit as defined in Section X "Load and Resource Balance".

The Phase II analysis aims to investigate the simulated operation of each of the hypothetical MEAN portfolios to calculate the 15-year revenue requirement and thereby determine the least cost option. The revenue requirement of the portfolios will be calculated for a number of future scenarios in terms of market pricing and load. The variance between these scenarios will indicate the volatility or risk of each portfolio, which will be presented as an evaluation criterion. In addition, the portfolios will be assessed in terms of environmental impact and progression toward MEAN's 2050 Vision of carbon neutrality.

The preferred option(s) will be integrated with the demand side management measures showing a favorable cost/benefit relationship to arrive at recommended short-term and long-term plans.

B. Impact of DSM Qualified Options

After conducting a survey of Participants to identify the DSM measures most likely to be implemented in the Participant communities and performing a cost/benefit analysis of those qualified options, no new programs are recommended for initiation. The analysis determined that the proposed new programs would result in a net cost to both the end use customer and to MEAN. Should cost parameters change in the future, particularly natural gas prices or retail electric rates, these options should be studied again for consideration.

MEAN's existing programs and the programs administered by individual Participant communities are quite successful and will be maintained into the future. The effects of these programs in decreasing demand and energy consumption have been quantified where possible and have already been incorporated into the regional load forecasts. Particularly in regard to the four new energy efficiency programs initiated in 2021, energy and demand savings will be projected and incorporated into future load forecasts and will be refined as data is collected in the future.

C. Studied Portfolios

The Phase I evaluation and subsequent discussions with members determined the following qualified supply side resource options:

- Natural Gas Combined Cycle
- Natural Gas Combined Cycle with Carbon Capture and Sequestration
- Landfill Gas
- Municipal Solid Waste
- Wind
- Utility/Community Solar
- Natural Gas Fuel Cell
- Hydropower

- Wind + Storage
- Solar + Storage
- Extension of Cooper Nuclear Station PPA

As each of these options offers different operational capabilities in terms of capacity factor (the relation of energy generation and nameplate capacity), some can provide the full capacity and energy needs of a region, while others can provide only capacity and others primarily only energy. To maintain an equal basis for comparison, each supply side resource was sized to meet the energy needs of the region, calculated using the resource's capacity factor, and additional capacity needs for resource adequacy were modeled as a capacity purchase, using accredited capacity calculations. This capacity purchase would initially be facilitated through leases of member-owned locally sited resources. Any needs exceeding member units would be contracted with a third party.

The qualified options were applied to the resource deficits of each region to create portfolios that would offer varying solutions to the needs of each region. The portfolios are as follows:

1. SPP

Portfolio 1: Natural Gas Combined Cycle

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from a natural gas combined cycle plant sized to meet the energy needs in SPP. The NGCC plant would be operated in SPP's integrated marketplace, subject to economic dispatch. A capacity purchase is added from 2024-2029 for resource adequacy. This portfolio achieves the goal of diversifying MEAN's resource portfolio in terms of fuel source, reduces emissions as compared to coal facilities, and provides reliability and a high degree of operational flexibility.

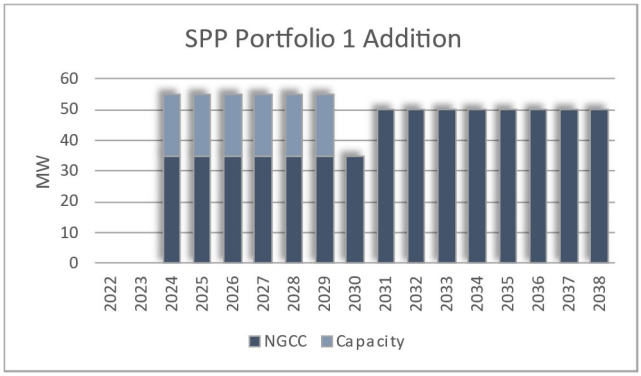


Figure XIV-1

Portfolio 1A: Natural Gas Combined Cycle with Carbon Capture

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from a natural gas combined cycle plant fitted with a carbon capture system sized to meet the energy needs in SPP. This plant is operated by economic dispatch in the SPP integrated marketplace and would provide both capacity and energy to MEAN's load. A capacity purchase is added from 2024-2029 for resource adequacy. This portfolio allows

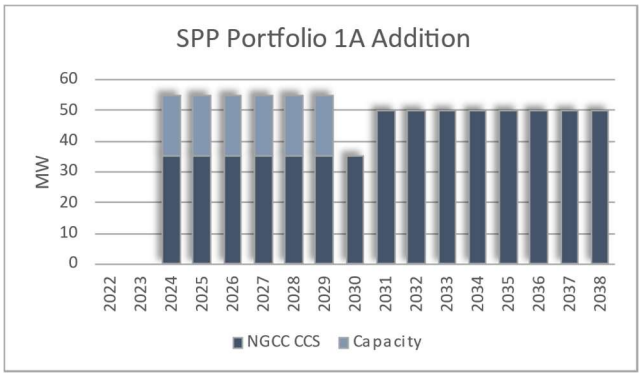


Figure XIV-2

MEAN to diversify the fuel sources of its resource portfolio, allows a reduction of emissions as compared to the coal units in the portfolio, and achieves the goals of resource flexibility and reliability.

Portfolio 2: Landfill Gas

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from one or more landfill gas plants sized to meet the energy needs in SPP. Landfill gas plants can be operated as must-run units or can be controlled with limited dispatch flexibility. The Phase II economic model considers the LFG plant dispatched according to marketplace economics to provide capacity and energy. A capacity purchase is added from 2024-2029 for resource adequacy. The LFG portfolio increases MEAN's percentage of renewables in SPP as well as the reliability and fuel diversity of MEAN's portfolio.

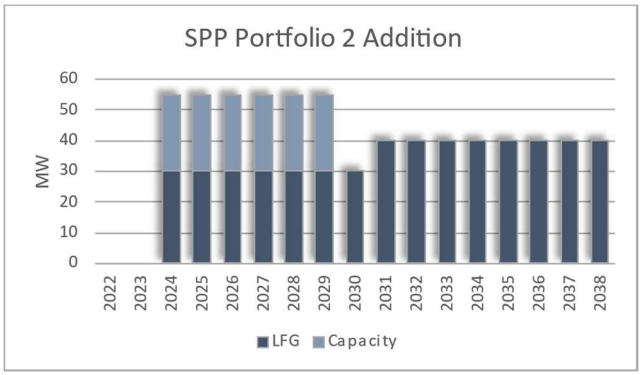


Figure XIV-3

Portfolio 3: Municipal Solid Waste

This portfolio would add capacity and energy from an MSW plant to MEAN's portfolio via a partial ownership contract or a power purchase agreement sized to meet the energy needs in SPP. The MSW plant would be operated via economic dispatch in SPP's integrated marketplace. A capacity purchase is added from 2024-2029 for resource adequacy. Although this option results in an increase in carbon emissions, MSW energy plants are considered renewable resources in many instances. This portfolio contributes to the renewable percentage in MEAN's SPP portfolio and creates a more diversified portfolio with regard to fuel source.

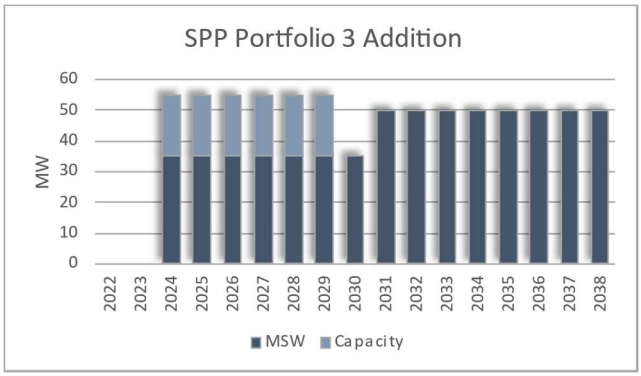


Figure XIV-4

Portfolio 4: Wind

MEAN would enter into a power purchase agreement for wind generation sized to meet the energy needs in SPP. As wind receives a low accreditation value per ELCC calculations, a larger capacity purchase is added from 2024-2029 for resource adequacy. Wind would be an intermittent resource in SPP. The wind portfolio adds a significant amount of renewable energy generation to MEAN's resource mix but does not contribute to reliability or flexibility.

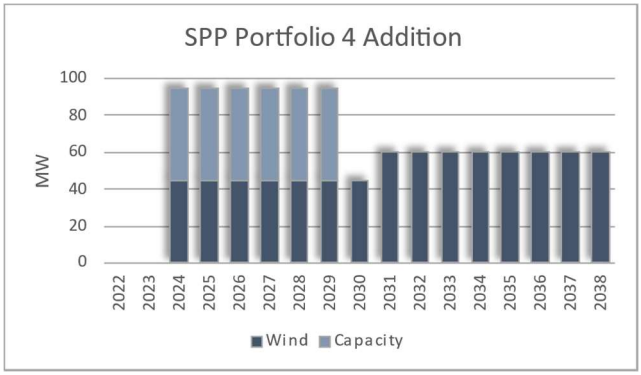


Figure XIV-5

Portfolio 5: Solar

In this portfolio, MEAN would enter into a power purchase agreement for utility owned solar generation to provide for energy needs in SPP. The solar nameplate capacity is quite large due to the low capacity factor of solar generation facilities. And because of the ELCC accreditation, a capacity purchase will be required from 2024-2029. This portfolio increases MEAN's renewable energy in SPP but reduces flexibility to respond to load fluctuations or market pricing changes.

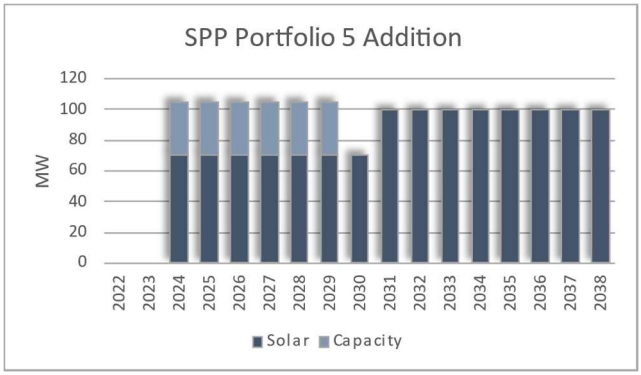


Figure XIV-6

Portfolio 6: Fuel Cell

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from one or more natural gas-fired fuel cell plants in an aggregate size to meet the energy needs in SPP. The fuel cell plant would be operated in SPP's integrated marketplace, subject to economic dispatch. A capacity purchase is added from 2024-2029 for resource adequacy. This portfolio achieves the goal of diversifying MEAN's resource portfolio in terms of fuel source, achieves a level of reduced emissions as compared to coal facilities, and provides reliability and operational flexibility.

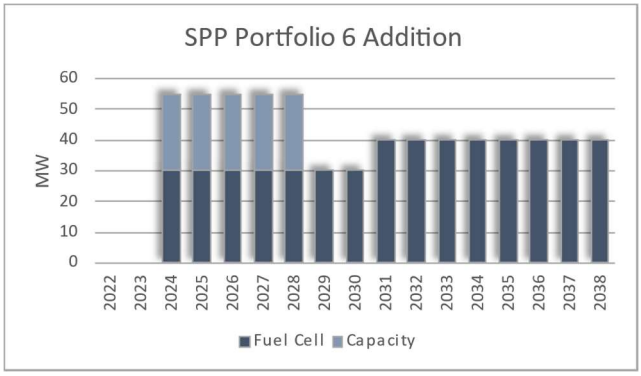


Figure XIV-7

Portfolio 7: Hydropower

Portfolio 7 adds a power purchase agreement for full or partial capacity and energy from a dispatchable hydropower plant. The agreement would be sized to meet energy needs in SPP. The hydropower plant would be operated at limited dispatch as restricted by other water use downstream and in response to market conditions. No additional capacity purchase is required with this resource option. The hydropower portfolio grants MEAN additional renewable energy in SPP while also maintaining a moderate degree of flexibility and reliability.

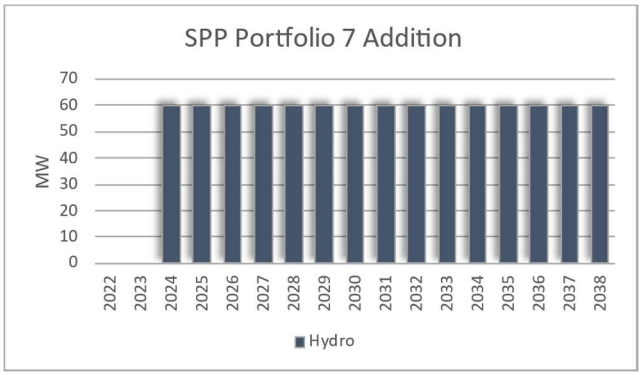


Figure XIV-8

Portfolio 8: Wind + Battery Storage

This portfolio begins with the same wind resource and capacity purchase modeled in Portfolio 4, but also adds a 4-hour battery to the system. The battery would be charged as available and discharged in response to market pricing. This portfolio allows MEAN to increase the renewable energy generation in SPP and realizes additional value in the limited dispatch of the battery storage.

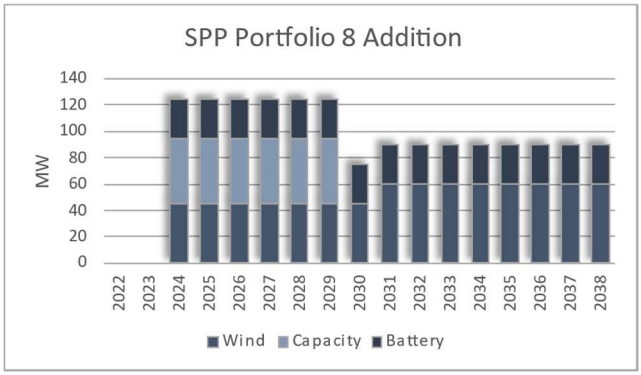


Figure XIV-9

Portfolio 9: Solar + Battery Storage

In the same manner, Portfolio 9 adds a 4-hour battery to the solar resource and capacity purchase modeled in Portfolio 5. The battery would be charged as available and discharged in response to market pricing. This solar plus storage portfolio gives MEAN an increased level of renewable energy generation in SPP, thereby reducing carbon emissions, and realizes additional value in the limited dispatch of the battery storage.

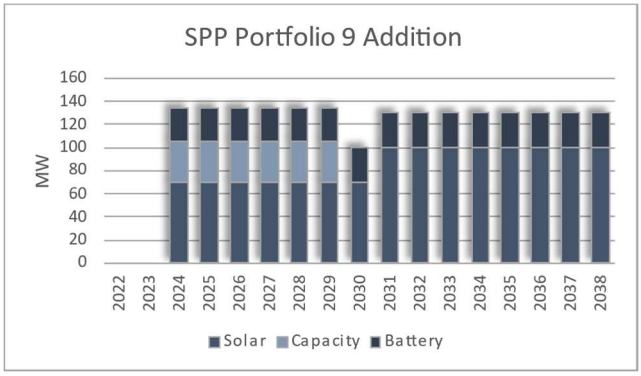


Figure XIV-10

Portfolio 10: Extend Power Purchase of Cooper Nuclear Station

Portfolio 10 retains in MEAN's portfolio a carbon free resource whose contract would otherwise end in 2024. The same capacity and energy from Cooper Nuclear Station would remain in MEAN's resource portfolio with an additional capacity purchase from 2024-2029 for resource adequacy. This resource provides MEAN with a carbon free resource that has a high capacity factor and full accreditation. Although this resource has proven reliable in the past, CNS is a must-run unit that does not allow for flexibility.

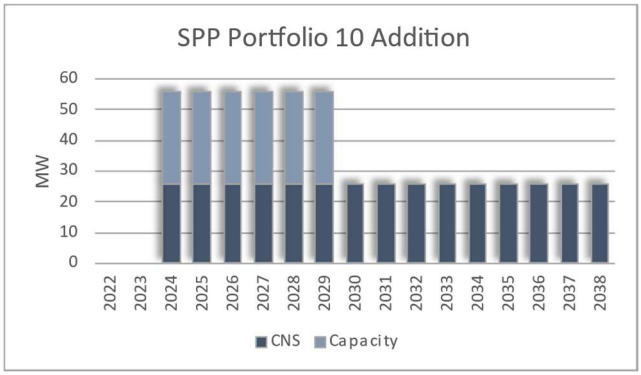


Figure XIV-11

2. West Region

Portfolio 1: Natural Gas Combined Cycle

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from a natural gas combined cycle plant sized to meet the energy needs in the West. The NGCC plant would be operated in response to load until such time that an RTO is adopted in the West. No additional capacity purchase is required for resource adequacy. This portfolio achieves the goal of diversifying MEAN's resource portfolio in terms of fuel source, reduces emissions as compared to coal facilities, and provides reliability and a high degree of operational flexibility.



Figure XIV-12

Portfolio 1A: Natural Gas Combined Cycle with Carbon Capture

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from a natural gas combined cycle plant fitted with a carbon capture system sized to meet the energy needs in the West. This plant is operated in response to load and unit operating parameters and would provide both capacity and energy to MEAN's load. No capacity



Figure XIV-13

purchase is required for resource adequacy. This portfolio allows MEAN to diversify the fuel sources of its resource portfolio, allows a reduction of emissions as compared to the coal units in the portfolio, and achieves the goals of resource flexibility and reliability.

Portfolio 2: Landfill Gas

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from one or more landfill gas plants sized to meet the energy needs in the West. Landfill gas plants can be operated as must-run units or can be controlled with limited dispatch flexibility. The Phase II economic model for the West considers the LFG plant dispatched according to load requirements to provide capacity and energy. No purchase of additional capacity is required for resource adequacy. The LFG portfolio increases MEAN's percentage of renewables in the West as well as the reliability and fuel diversity of MEAN's portfolio.

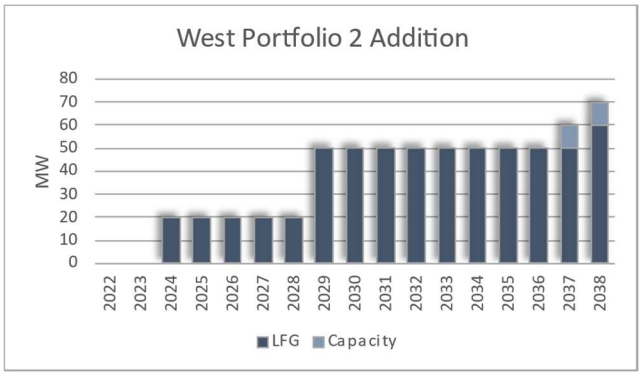


Figure XIV-14

Portfolio 3: Municipal Solid Waste

This portfolio would add capacity and energy from an MSW plant to MEAN's portfolio via a partial ownership contract or a power purchase agreement sized to meet the energy needs in the West. The MSW plant would be operated according to load levels, unit operating parameters, and feedstock processing rates. The fully accredited capacity of the MSW plant is sufficient for resource adequacy, and no additional purchase is required. Although this option results in an increase in carbon emissions, MSW energy plants are considered renewable resources in many instances. This portfolio contributes to the renewable percentage in MEAN's West portfolio and creates a more diversified portfolio with regard to fuel source.

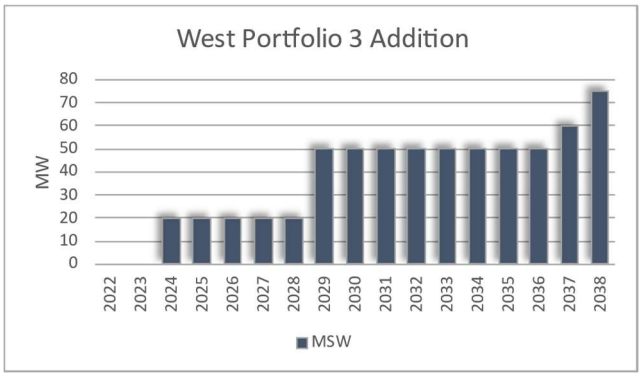


Figure XIV-15

Portfolio 4: Wind

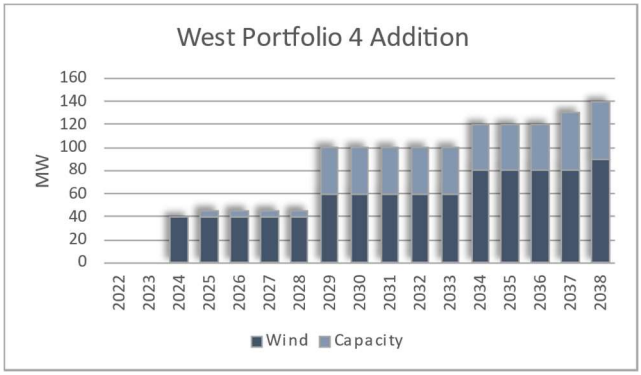


Figure XIV-16

MEAN would enter into a power purchase agreement for wind generation sized to meet the energy needs in the West. As wind receives a low accreditation value per ELCC calculations, an additional capacity purchase is added in 2025, with an increased amount from 2029 to 2038 for resource adequacy. Wind would be an intermittent resource in the West. The wind portfolio adds a significant amount of renewable energy generation to MEAN's resource mix but does not contribute to reliability or flexibility.

Portfolio 5: Solar

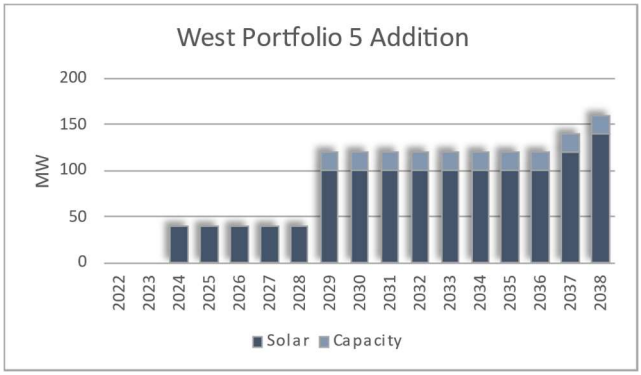


Figure XIV-17

In this portfolio, MEAN would enter into a power purchase agreement for utility owned solar generation to provide for energy needs in the West. The solar nameplate capacity is quite large due to the low capacity factor of solar generation facilities. And because of the ELCC accreditation method, a capacity purchase will be required from 2029 to 2038. This portfolio increases MEAN's renewable energy in the West but reduces flexibility to respond to load fluctuations or market pricing changes.

Portfolio 6: Fuel Cell

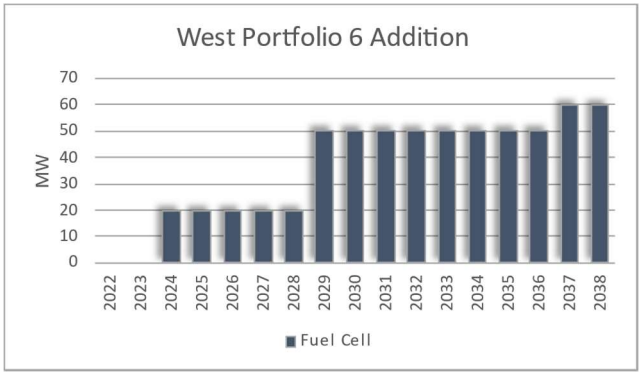


Figure XIV-18

MEAN would contract for a partial ownership or a power purchase agreement for capacity and energy from one or more natural gas-fired fuel cell plants in an aggregate size to meet the energy needs in the West. The fuel cell plant would be operated to match load requirements, until an RTO is implemented in the West. No additional capacity is required for resource adequacy. This portfolio achieves the goal of diversifying MEAN's resource portfolio in terms of fuel source, achieves a level of reduced emissions as compared to coal facilities, and provides reliability and operational flexibility.

Portfolio 7: Hydropower



Figure XIV-19

Portfolio 7 adds a power purchase agreement for full or partial capacity and energy from a dispatchable hydropower plant. The agreement would be sized to meet energy needs in the West. The hydropower plant would be operated at limited dispatch as restricted by other water use downstream and in response to West load. No additional capacity purchase is required with this resource option. The hydropower portfolio grants MEAN additional renewable energy in the West while also maintaining a moderate degree of flexibility and reliability.

Portfolio 8: Wind + Battery Storage

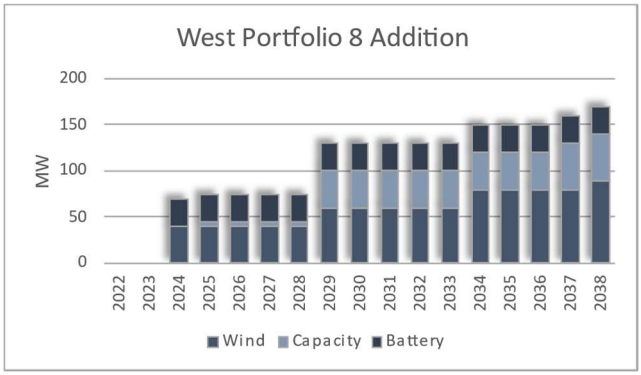


Figure XIV-20

This portfolio begins with the same wind resource and capacity purchase modeled in Portfolio 4, but also adds a 4-hour battery to the system. The battery would be charged as available and discharged in response to West load. An additional capacity purchase is required throughout the study period, starting small in 2025 and increasing in 2029. This portfolio allows MEAN to increase the renewable energy generation in the West and realizes additional value in the limited dispatch of the battery storage.

Portfolio 9: Solar + Battery Storage

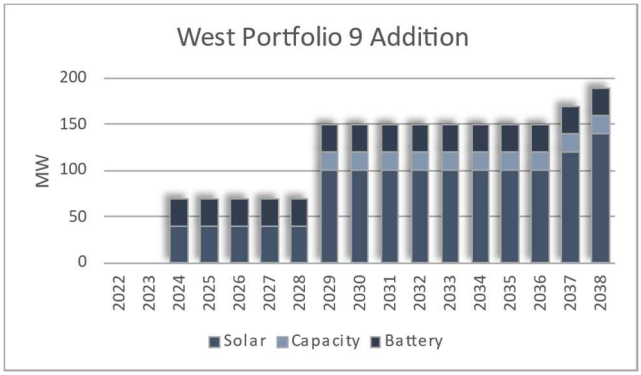


Figure XIV-21

In the same manner, Portfolio 9 adds a 4-hour battery to the solar resource and capacity purchase modeled in Portfolio 5. The battery would be charged as available and discharged in response to MEAN's West load. This solar plus storage portfolio gives MEAN an increased level of renewable energy generation in SPP, thereby reducing carbon emissions, and realizes additional value in the limited dispatch of the battery storage.

D. Hourly Resource Profile

To study each of the proposed portfolios, the model determines the generation of each resource in the portfolio on an hourly basis. This begins with the hourly resource profile, or hourly available capacity.

Available capacity is determined according to season of year, time of day, planned maintenance, forced outage rates, and variable fuel costs. Availability of existing resources is modeled on historical operating data, unit minimums, and planned outage schedules. For proposed new resources, availability is modeled after similar existing resources, known capacity factors, projected planned and forced outage rates, and for intermittent resources, hourly generation profiles of similar technologies in similar locations. Batteries' availability is dependent on charge level.

However, resource availability does not ensure dispatch. Actual generation of a resource depends on its operation type. Intermittent and must-run resources run solely on availability without control over operation. Some units have operating minimums that limit the turndown level of generation, which influences the hourly generation. For dispatchable resources, the model dispatches resources differently in SPP and the West. In the SPP model, it is assumed that any dispatchable resources will be operated in response to market pricing, within unit operating parameters. In the West, the dispatchable resources are modeled to operate according to load requirements, again within the unit's operating parameters. Battery systems are modeled to optimize the renewable resource output in terms of market price or system load.

E. Economic System Model

The Economic System Model used for the portfolio analysis is depicted in *Figure XIV-22*:

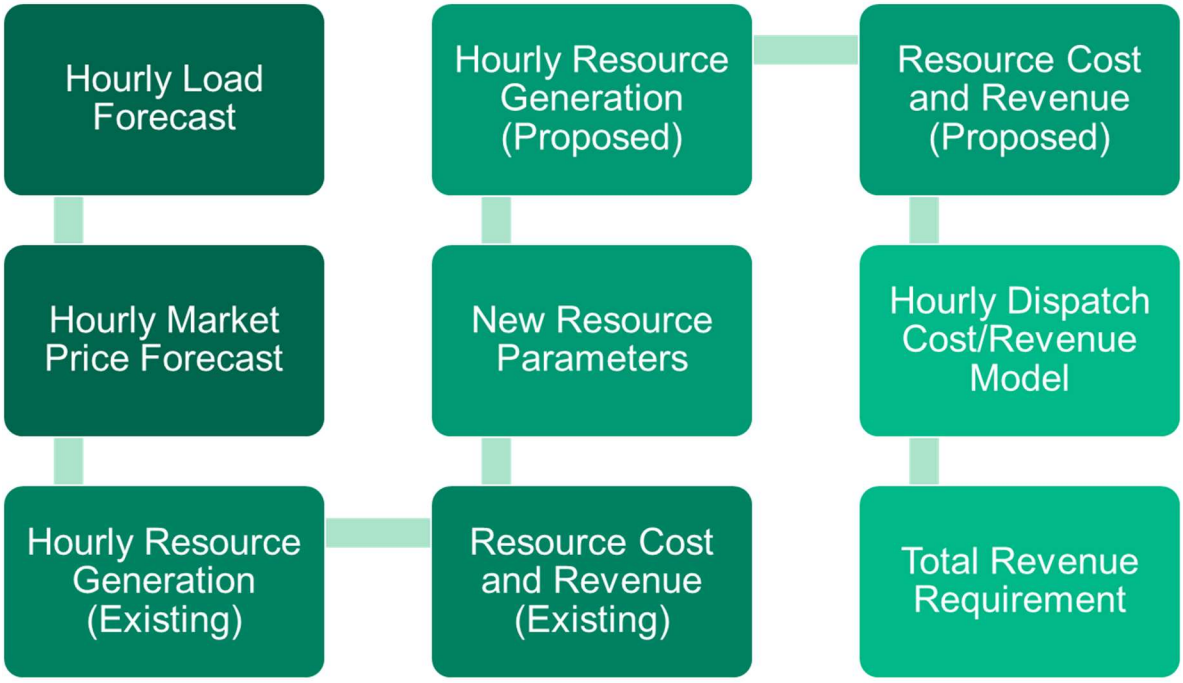


Figure XIV-22

The model calculates the deployment of available capacity, as determined by market and unit economics, to meet anticipated demand on a least-cost basis. Due to regional differences, separate models were created for SPP and the West.

Since market conditions and economics change on an hourly basis, each region's load was calculated hour by hour for the entire 15-year time range. This was accomplished by calculating each town's annual hourly load profile (including reserve margin and transmission loss) averaged over the last 10 years and applying the hourly profile to the forecasted monthly peak demand and energy consumption and finally summing each region's hourly load.

Hourly market pricing was provided by a third-party consultant. The pricing provided was specific to regional areas. Since economic dispatch in market constructs is determined in part by the locational marginal pricing, the model needed the individual nodal prices for each MEAN resource and proposed future resource as well as a load price. Comparing historical nodal pricing to a historical average regional price on an hourly basis created an hourly profile that related the nodal price to the regional price. This profile was then applied to the forward pricing projections for the larger areas. This calculated pricing per hour for the 15-year study period for each resource and the MEAN load node in SPP. In the west, the subregional hourly pricing was used per resource location.

For existing resources, current costs of generation were compiled, including fixed operation and maintenance costs, variable operation and maintenance costs, fuel costs, debt service, A&G costs, and anticipated capital investment. The escalation rates for future pricing were extracted from past billings, contract terms, and budgets supplied by unit owners. In addition, actual operating parameters were recorded, such as heat rates and emissions factors.

Similarly, operating parameters and costs were estimated for new resources. Operating metrics, such as capacity factor, emissions data, outage rates, minimum turndown, etc. were collected primarily from publicly available data from EIA, NREL, and other DOE sources as well as some published studies. From these same sources, the generating costs of the proposed resources were calculated using capital costs, fixed O&M, variable O&M, and fuel costs with a determination of the escalation rate of each cost.

For some of the studied resources, MEAN has obtained proposed contract terms and operating data for actual resources of the same type. In these cases, the actual data was utilized if possible and if in relative agreement with the publicly sourced data for representative resources.

The hourly resource profile as described above only determined when each resource was available to operate, and in the case of existing and intermittent resources, the typical expected generation for each hour. Resource availability, however, does not guarantee resource operation for dispatchable resources. To account for economic dispatch in the SPP market, the variable operating costs of a resource were compared against the nodal locational marginal price on an hourly basis.

Each resource was then categorized according to its operating mode – intermittent resources, must-run resources, WAPA allocations, resources with minimum operating levels, and dispatchable resources. All resources were dispatched into the model against the hourly load according to operating mode. This resulted in a tabulation of the hourly generation, the hourly cost of generation, the hourly revenue from market sales, the hourly cost of market purchases, and the hourly cost of load (in SPP).

Each portfolio was entered into its regional model, and the revenue requirements were calculated for each portfolio. All costs and revenues were summed on an hourly basis, then combined on an

annual basis, and finally summed for the entire 15-year study period to arrive at the total revenue requirement.

It should be noted that the revenue requirements calculated by the model include only resource-related costs of the components input into the model. These values are not intended to represent MEAN's total revenue requirements.

F. Sensitivity Scenario Analysis

The model was expanded to include the effects of a number of different scenarios. As external conditions change, generation costs and market costs change. This alters the economics of each portfolio in a different way. Three very significant factors that affect generation are system load, natural gas prices, and the potential of a carbon tax. The total system load will determine the resources called online in the generation stack and will therefore set the marginal price. Changes in natural gas pricing influence the generation level of natural gas resources, which are very often the marginal units, and as a result will affect the generation of other resources to compensate in response to load demand, which in turn affects the pricing of other fuels. In this way, fuel pricing impacts the overall regional resource mix as well as setting the market price. In the same way, the imposition of a carbon tax will increase the generating cost of some resources, which changes generating levels, fuel costs, and market costs.

In addition to changes in market pricing and carbon tax, the scenarios also include fuel adjustments resulting from the scenario conditions. These adjustments were applied to existing and proposed future resources.

The sensitivity analysis looked at nine possible scenarios that involve variations of these factors. The table in *Figure XIV-23* displays the scenarios under which the model was simulated. Each portfolio was entered into the model for each sensitivity.

Scenario	System Load	NG Pricing	CO_2 Tax
Scenario 1: Reference	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 2: High Load	High Load	Base Case NG	No CO_2 Tax
Scenario 3: Low Load	Low Load	Base Case NG	No CO_2 Tax
Scenario 4: High NG	Base Case Load	High NG	No CO_2 Tax
Scenario 5: Low NG	Base Case Load	Low NG	No CO_2 Tax
Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

*Zero Carbon Scenario assumes regulatory conditions that allow no future addition of carbon emitting resources.

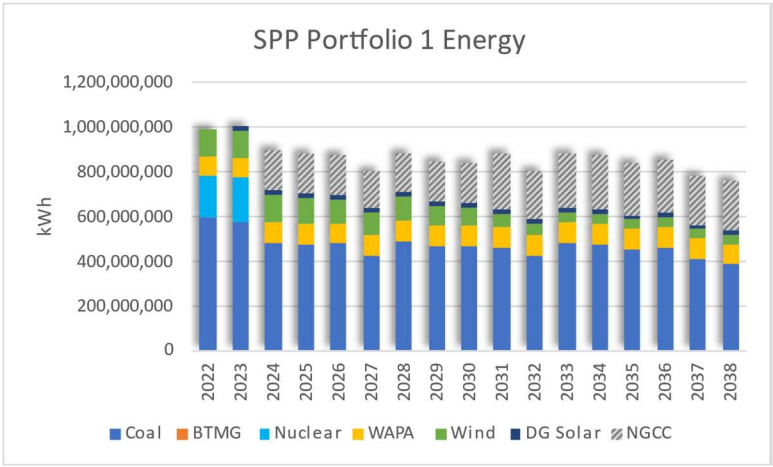
Figure XIV-23

G. Model Results

Each region's model was run with each portfolio and for each scenario. The results of the models are shown below in terms of energy, capacity, revenue requirement, and volatility.

1. SPP

Below are the graphs illustrating the energy and capacity generated by each type of resource in MEAN's SPP portfolio over the 15-year study period with the adoption of each studied resource:



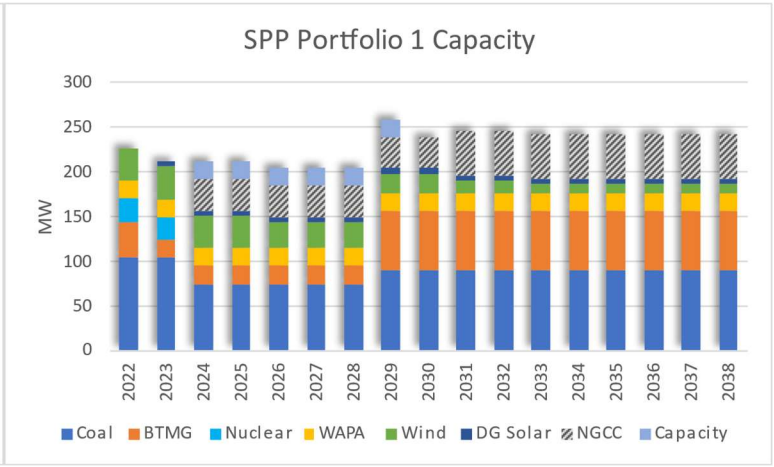
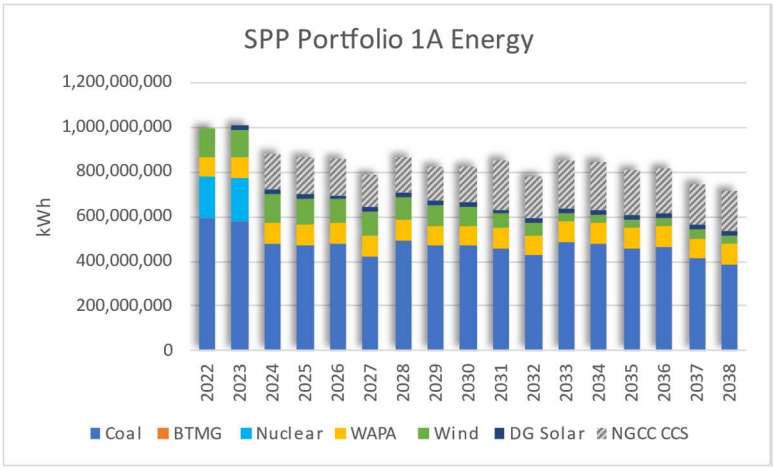


Figure XIV-24



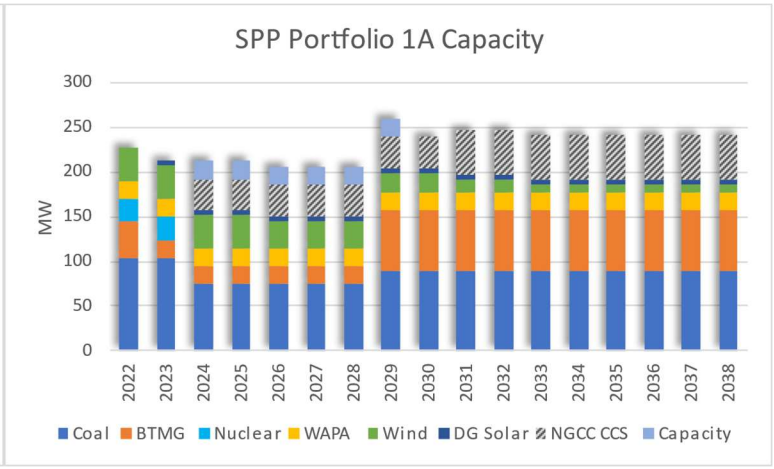
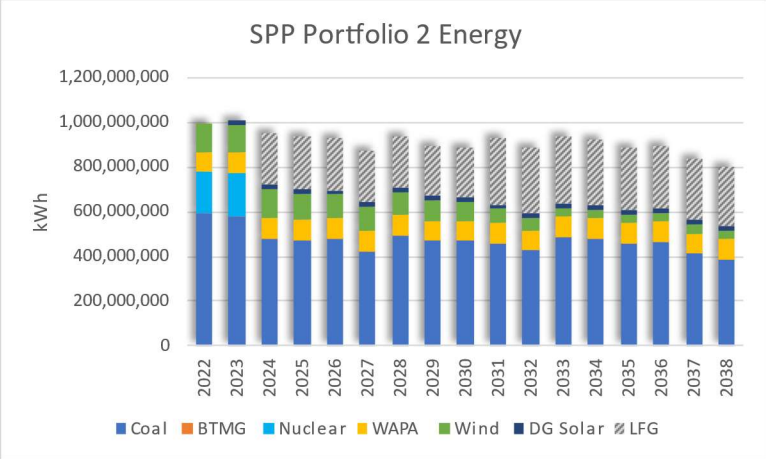


Figure XIV-25



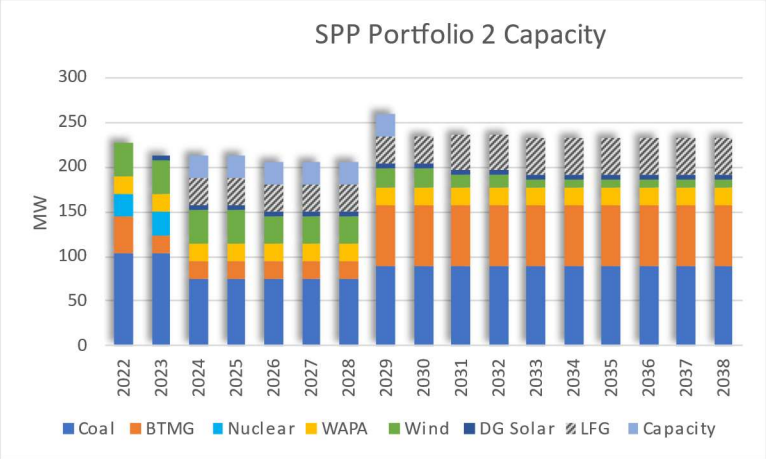
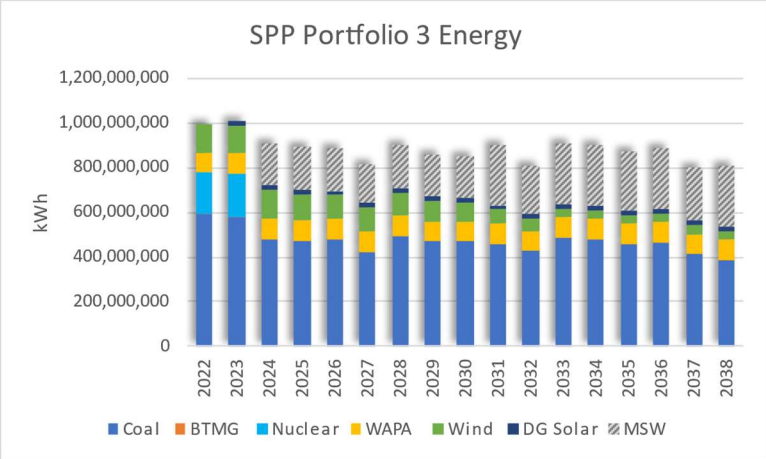


Figure XIV-26



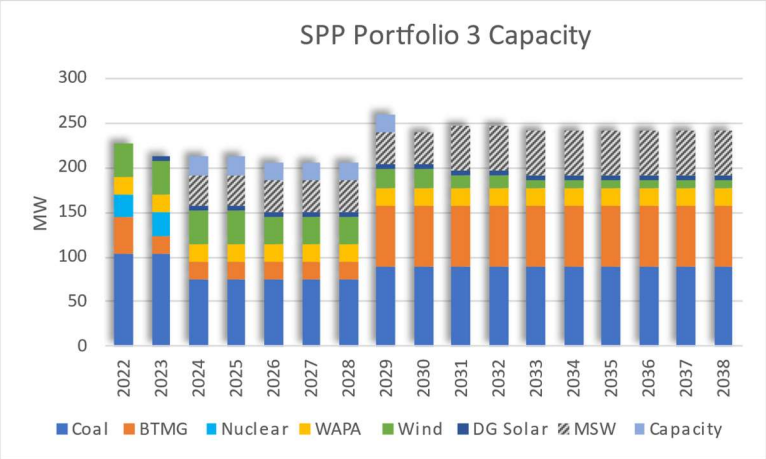
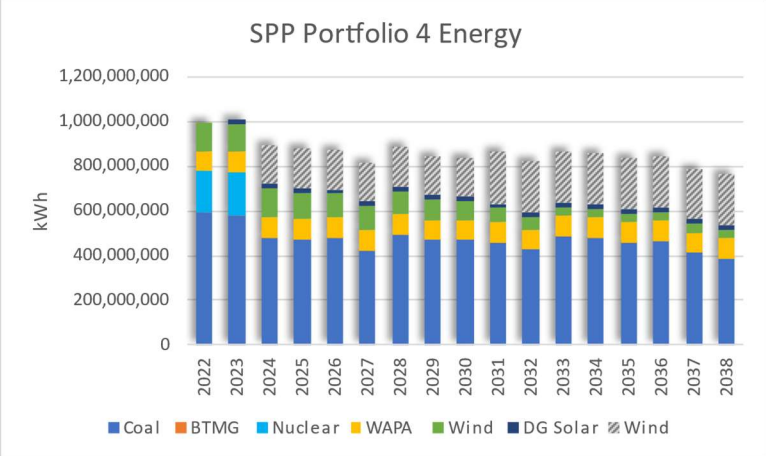


Figure XIV-27



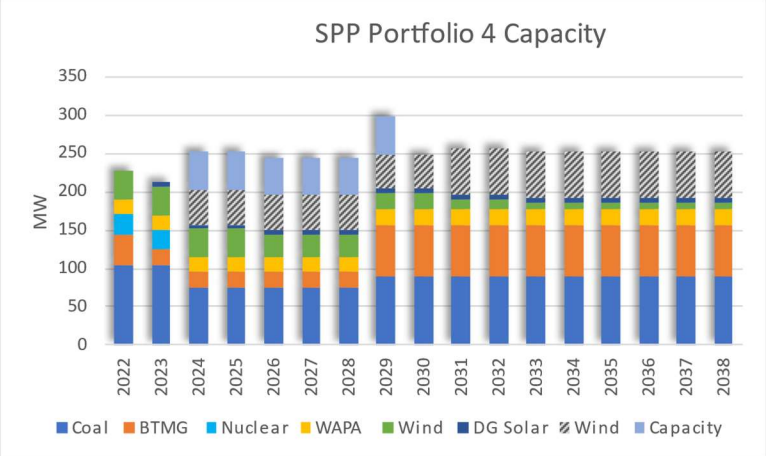
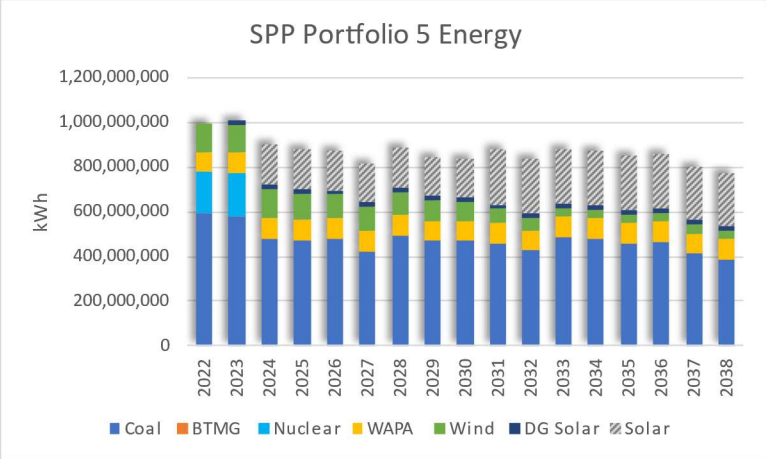


Figure XIV-28



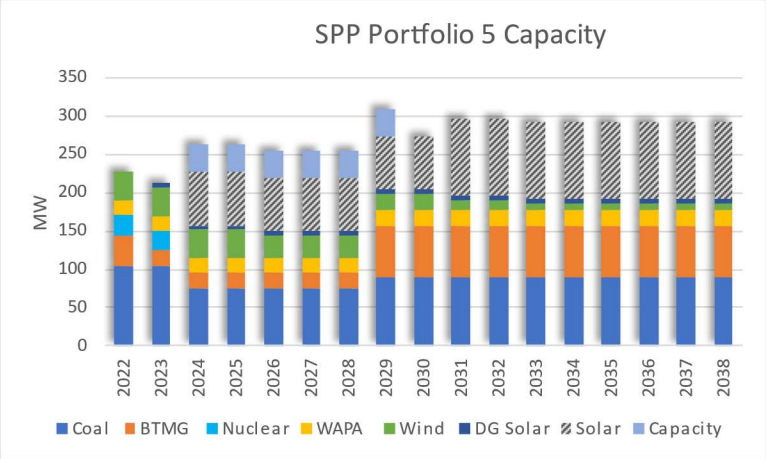
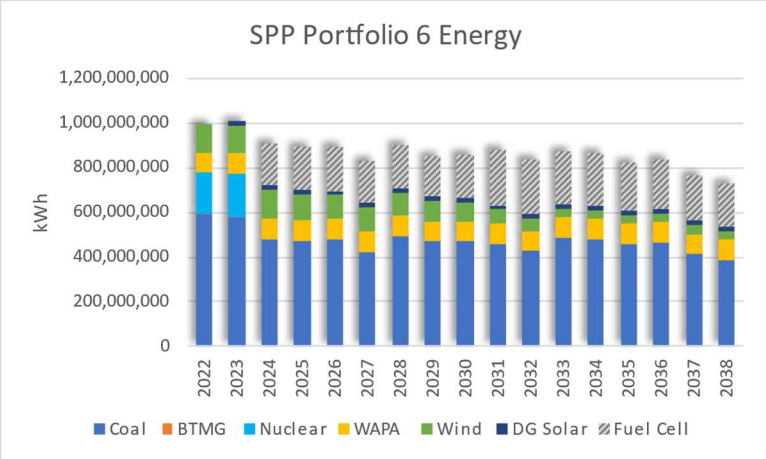


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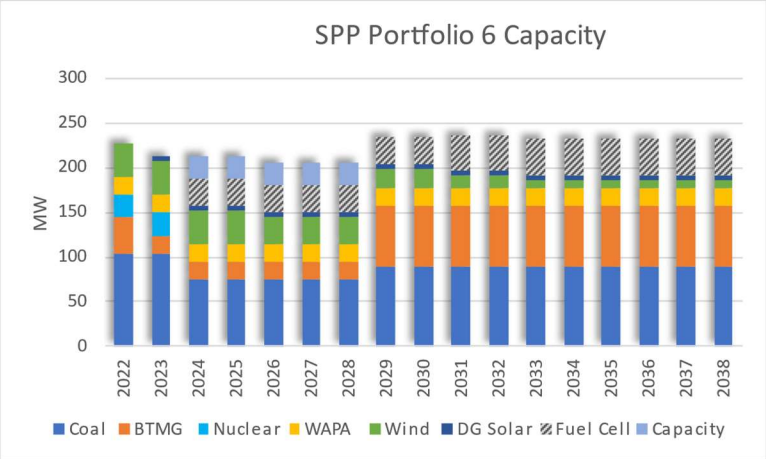
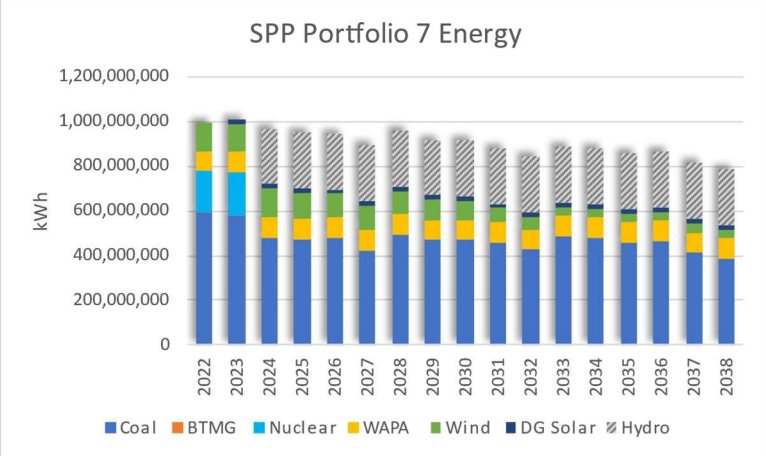


Figure XIV-30



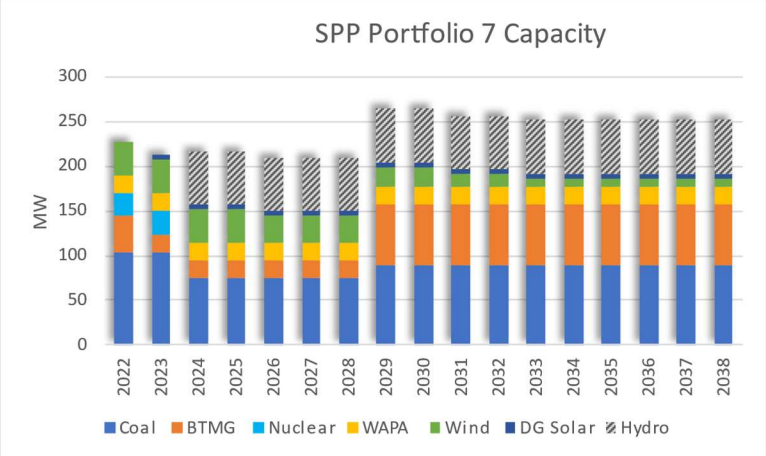
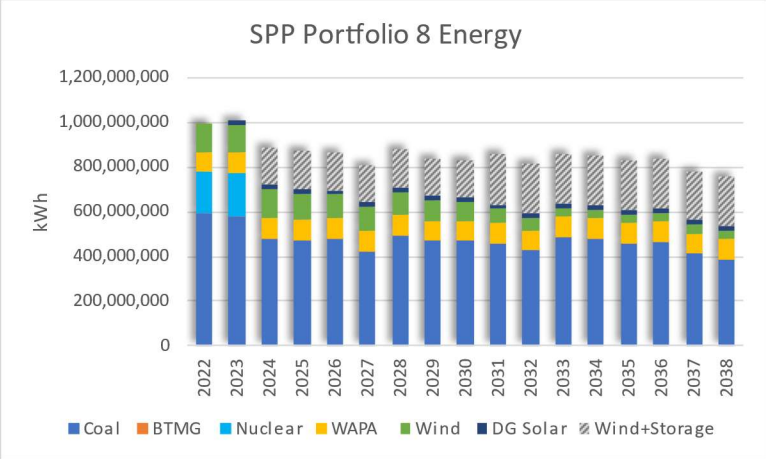


Figure XIV-31



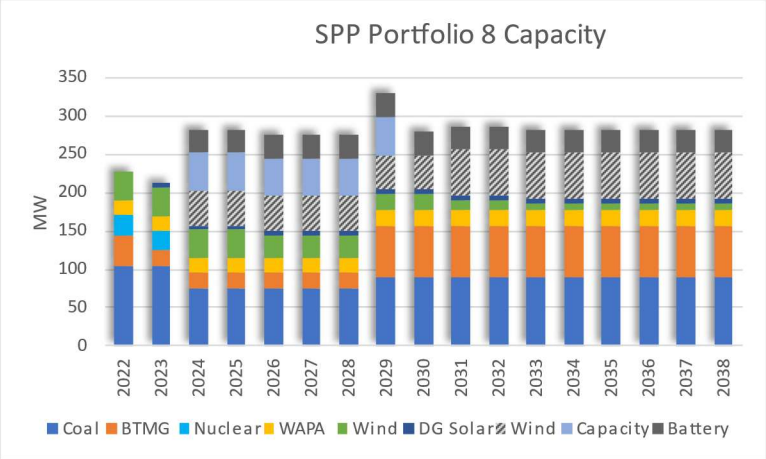
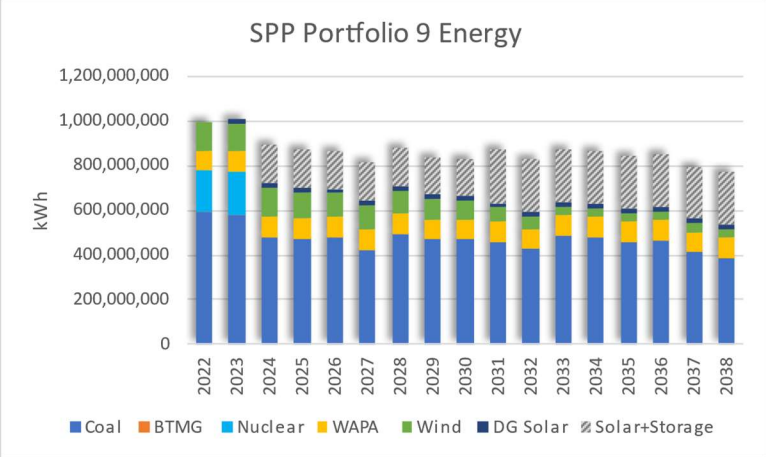


Figure XIV-32



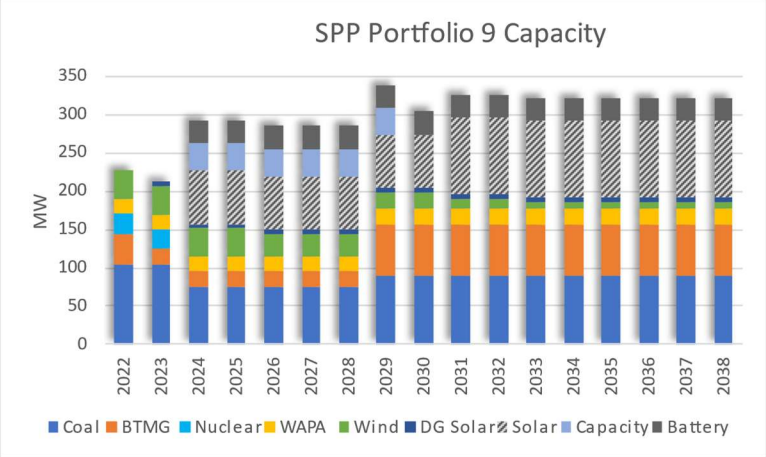
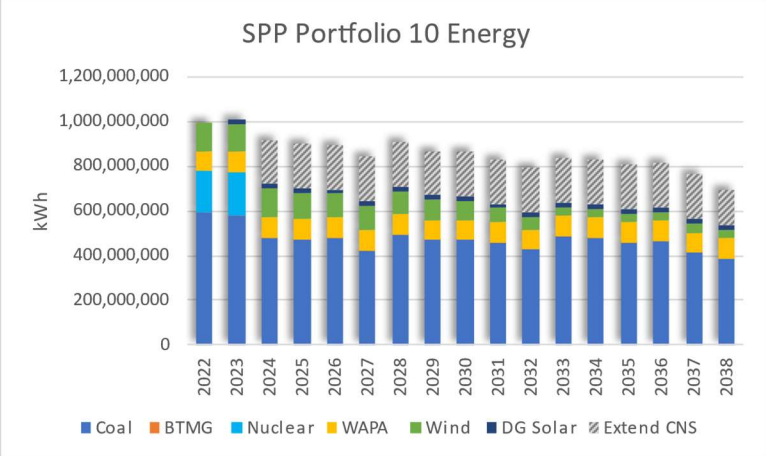


Figure XIV-33



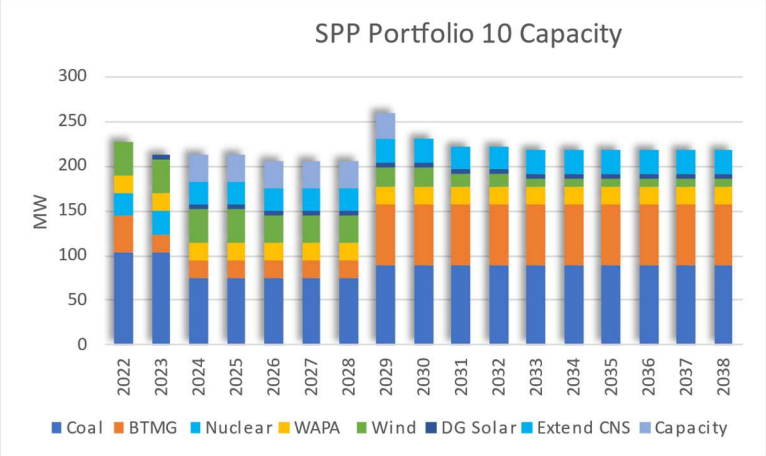


Figure XIV-34

The chart in *Figure XIV-35* shows the revenue requirement results of the SPP model for all ten portfolios described in Section XIV.C.1. and Section XIV.C.2. and all nine scenarios tabulated in *Figure XIV-23*. The dark blue bar represents the base case total 15-year revenue requirement for each portfolio. The light blue vertical line shows the positive and negative deviation from the base case, or the range from the maximum revenue

requirement of the sensitivity scenarios and the minimum revenue requirement of the sensitivity scenarios. This range is termed the "scenario variance".

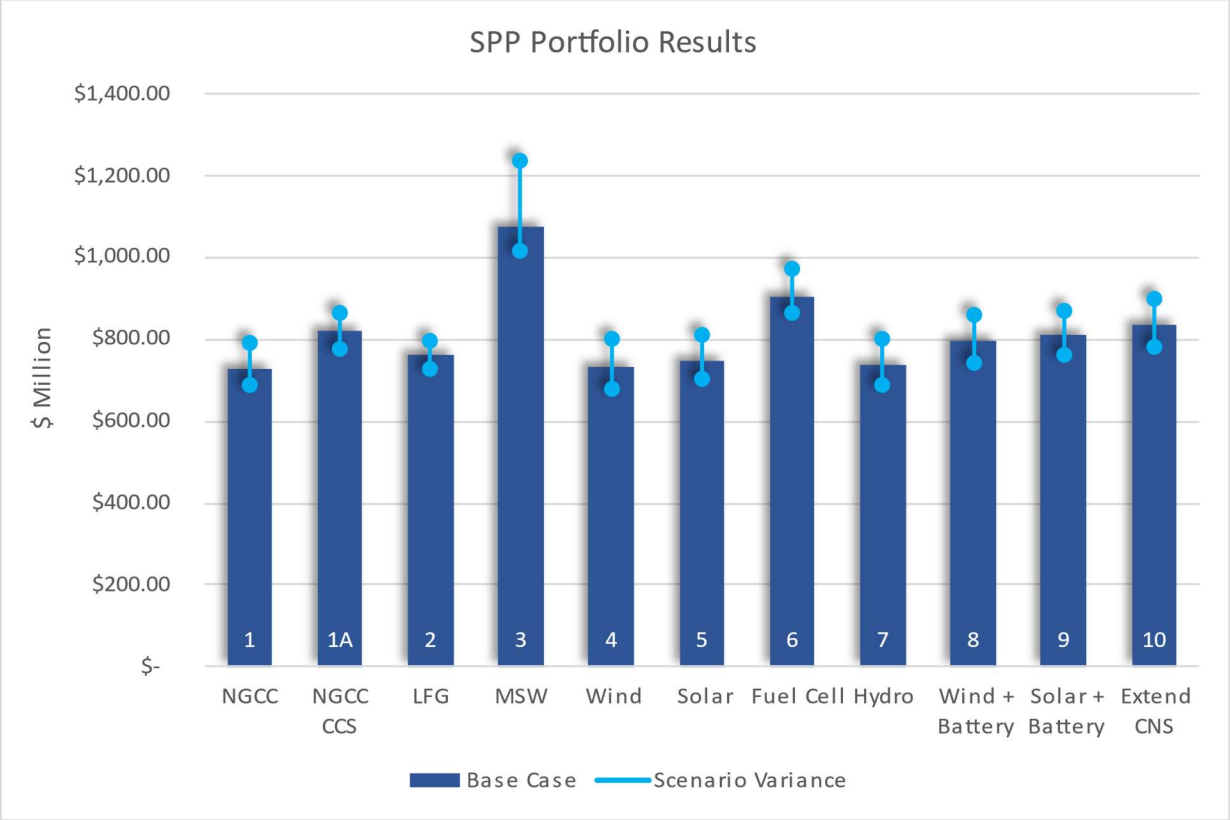


Figure XIV-35

The table in *Figure XIV-36* illustrates the same data with the values displayed and the addition of two metrics showing the incremental percentage above the lowest cost portfolio, termed "Cost Premium," and the positive variance above the reference scenario in terms of $/MWh.

Portfolio #	Description	Revenue Requirement (Reference Case)	Cost Premium	$/MWh Variance
Portfolio 1	NGCC	$ 726,236,996	0.00%	$ 4.53
Portfolio 1A	NGCC CCS	$ 819,371,754	12.82%	$ 3.23
Portfolio 2	LFG	$ 761,767,195	4.89%	$ 2.26
Portfolio 3	MSW	$ 1,073,853,337	47.87%	$ 10.80
Portfolio 4	Wind	$ 735,024,122	1.21%	$ 4.40
Portfolio 5	Solar	$ 749,466,854	3.20%	$ 4.05
Portfolio 6	Fuel Cell	$ 906,794,624	24.86%	$ 4.38
Portfolio 7	Hydro	$ 739,806,994	1.87%	$ 4.15
Portfolio 8	Wind + Battery	$ 797,677,434	9.84%	$ 4.39
Portfolio 9	Solar + Battery	$ 810,162,441	11.56%	$ 4.08
Portfolio 10	Extend CNS	$ 838,043,559	15.40%	$ 4.36

Figure XIV-36

The $/MWh Variance, or the differential between the maximum scenario and the base case scenario revenue requirement on a per MWh basis, quantifies the volatility or the risk inherent in each portfolio relative to possible changes in realized load, fuel pricing, and carbon tax levels. Plotting the base case revenue requirement against this variance allows a concurrent view of cost and risk for each of the SPP Portfolios. These metrics are displayed in *Figure XIV-37*.

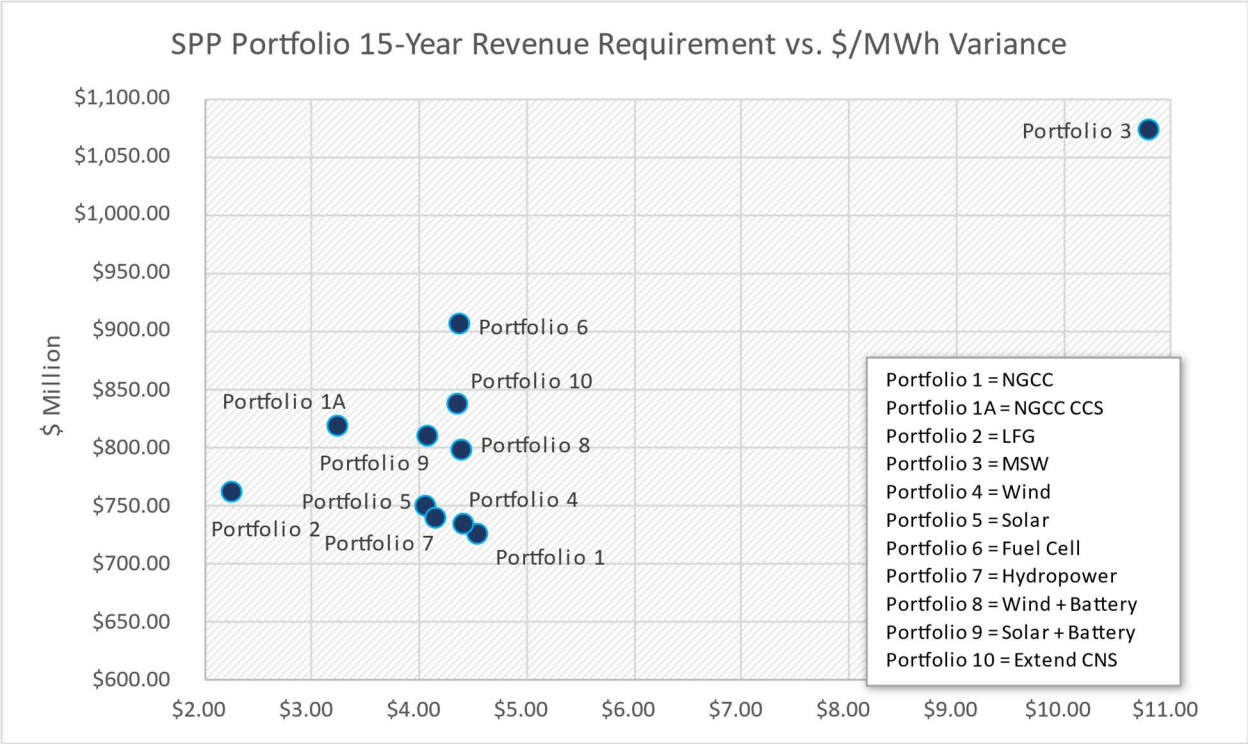


Figure XIV-37

To get a more distinct picture of the relative positions of the portfolios, Portfolio 3 is omitted from the graph in *Figure XIV-38*.

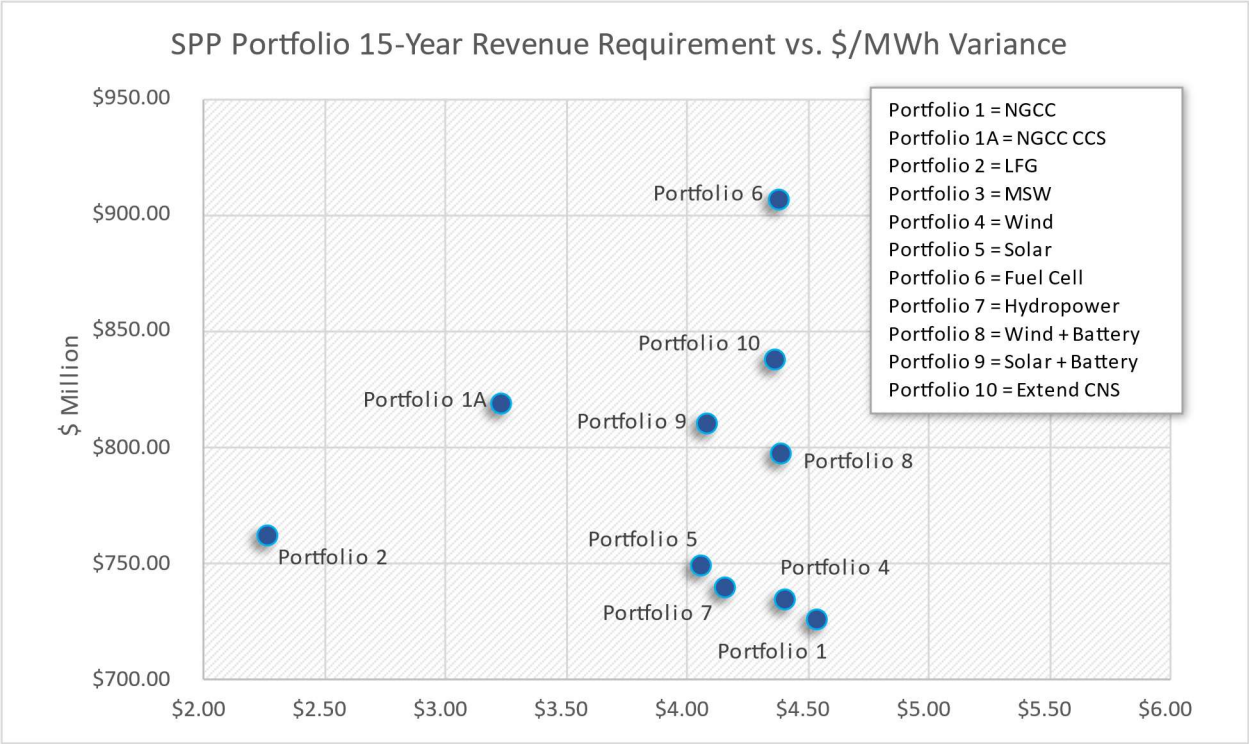


Figure XIV-38

The values and graphical results show that Portfolio 1, the natural gas combined cycle plant, has the lowest revenue requirement. However, Portfolio 4 (Wind), Portfolio 7 (Hydro), and Portfolio 5 (Solar) also have low revenue requirements and have variance levels that are as low or lower than Portfolio 1. Portfolio 2 (LFG) has a slightly higher revenue requirement and a much lower variance level.

2. West Region

Below are the graphs illustrating the energy and capacity generated by each type of resource in MEAN's West portfolio over the 15-year study period with the adoption of each studied resource:

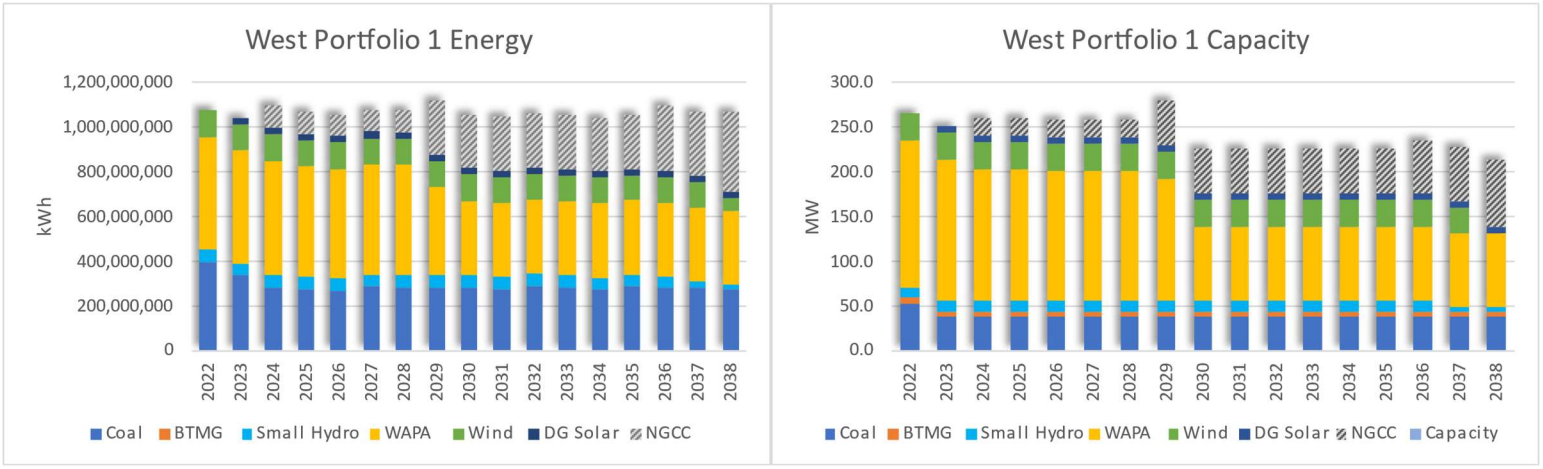
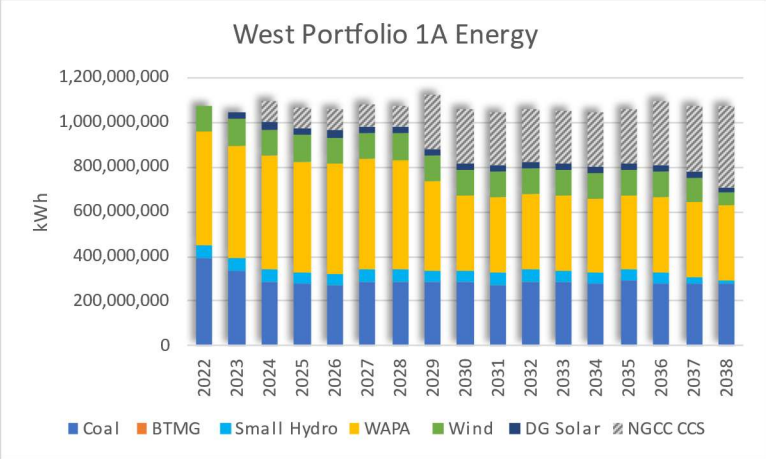


Figure XIV-39



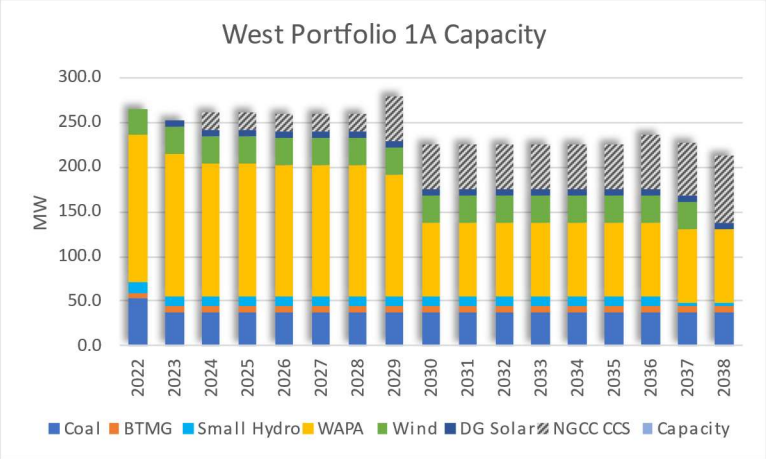
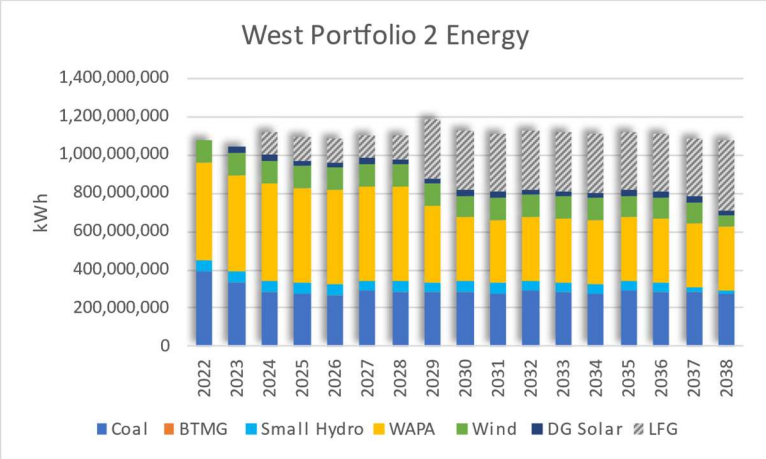


Figure XIV-40



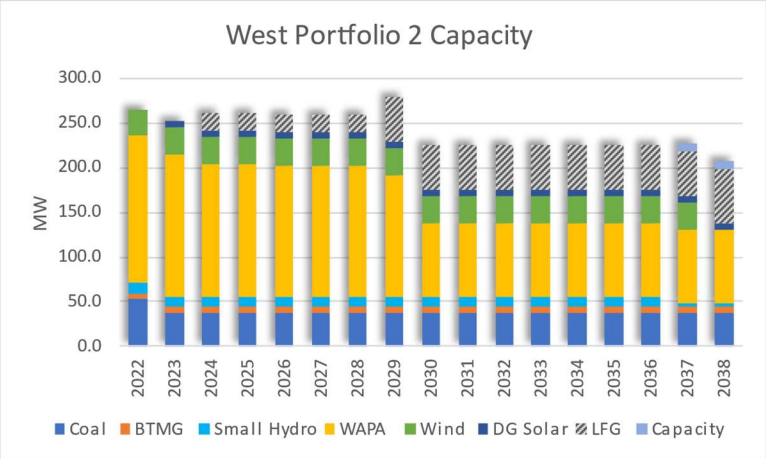
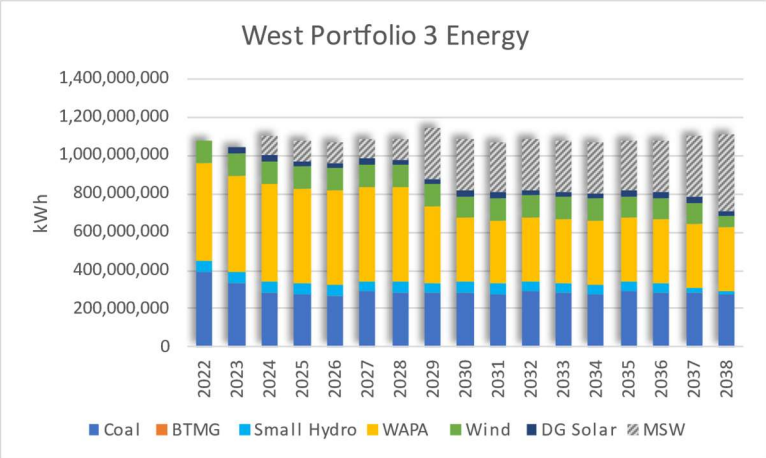


Figure XIV-41



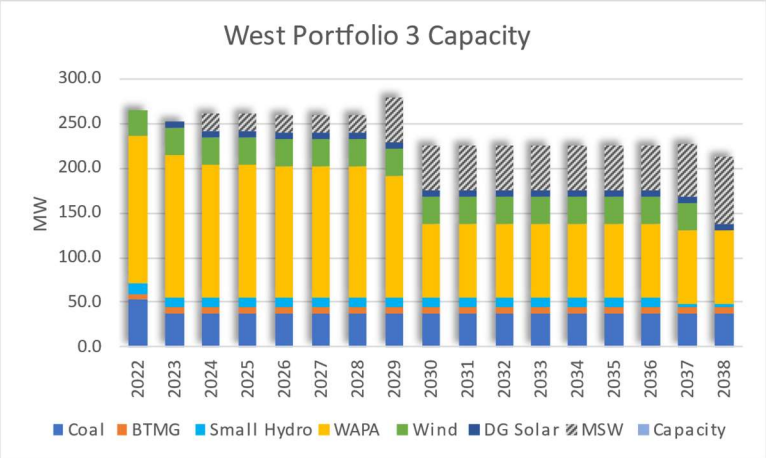
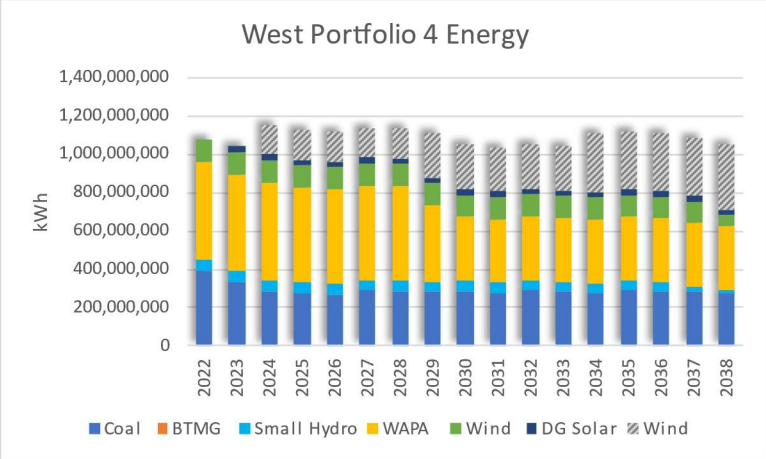


Figure XIV-42



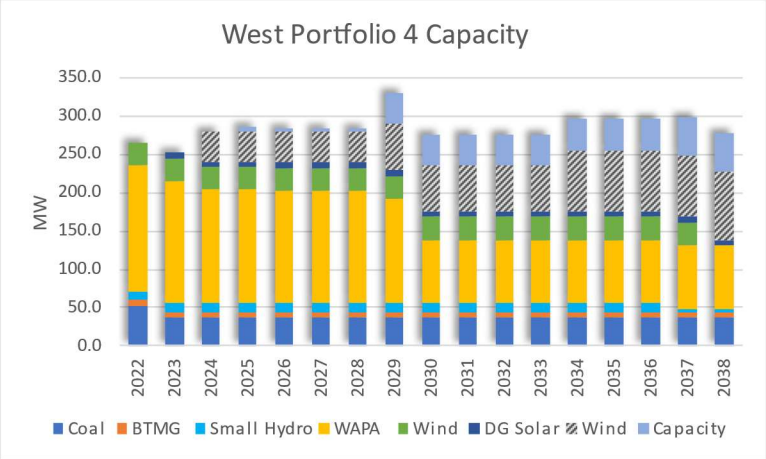
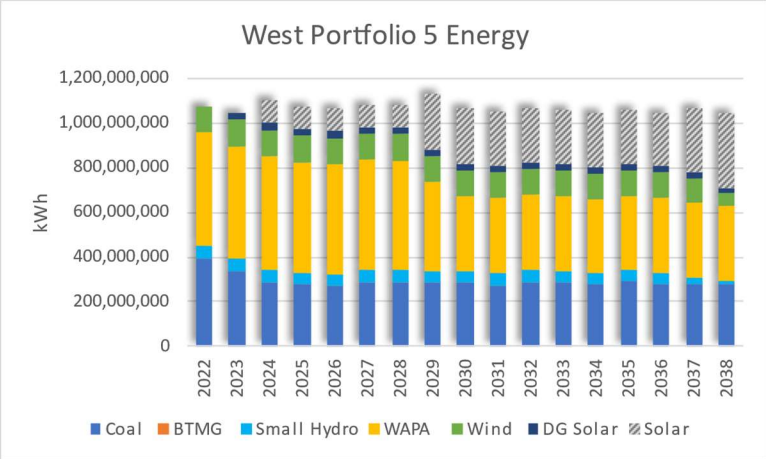


Figure XIV-43



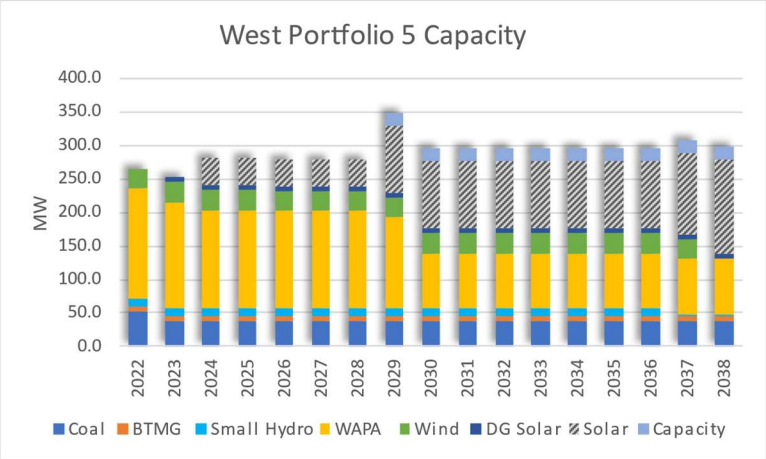
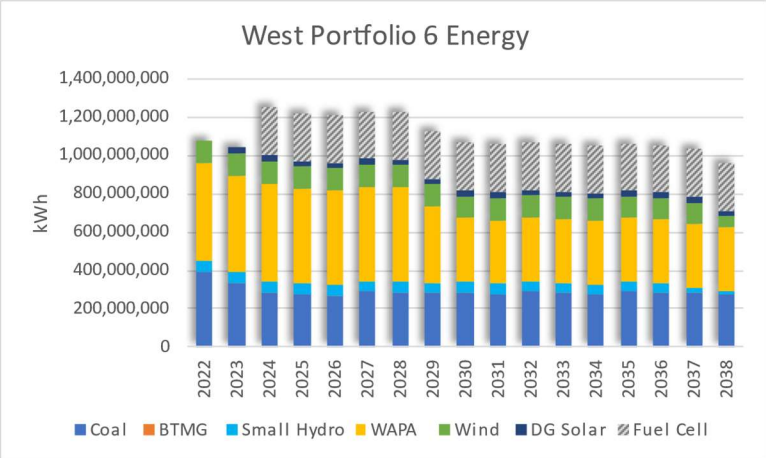


Figure XIV-44



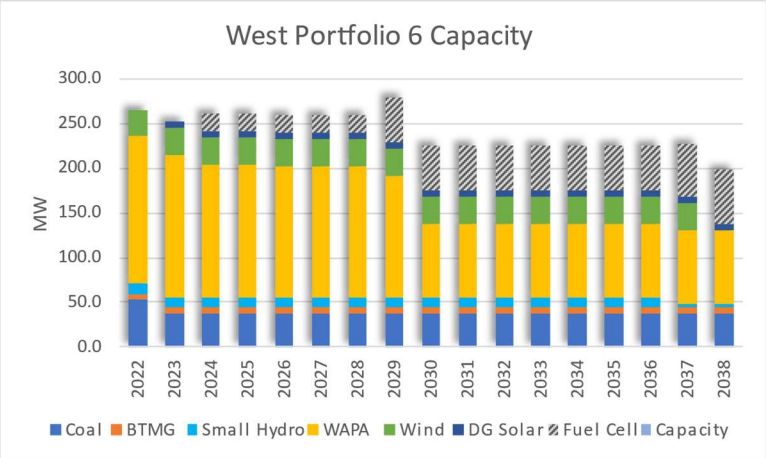
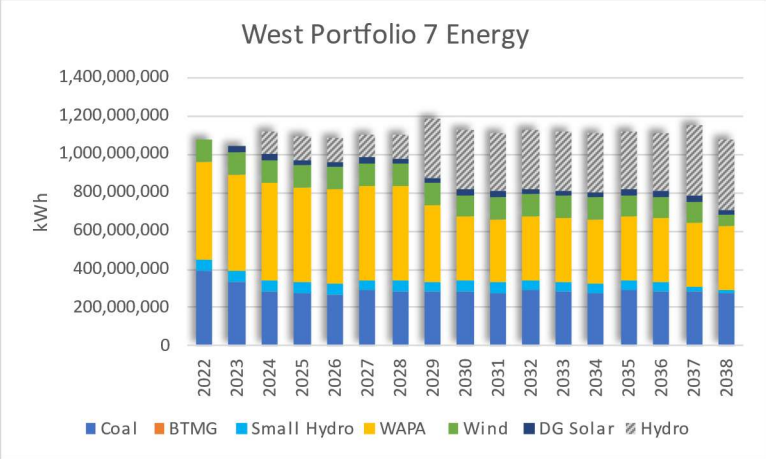


Figure XIV-45



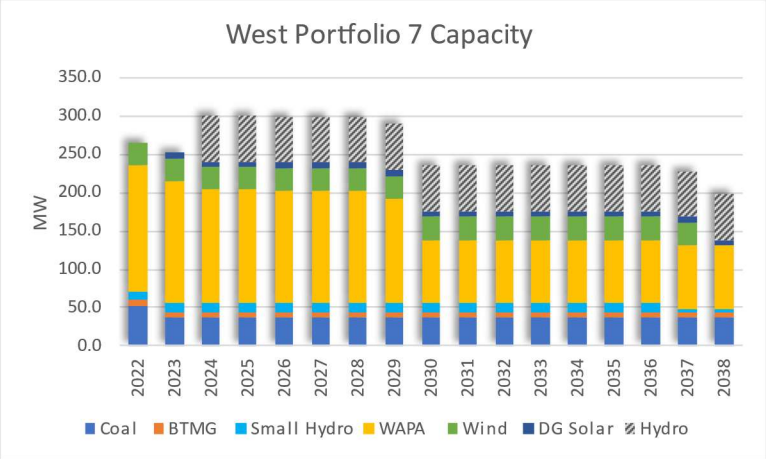
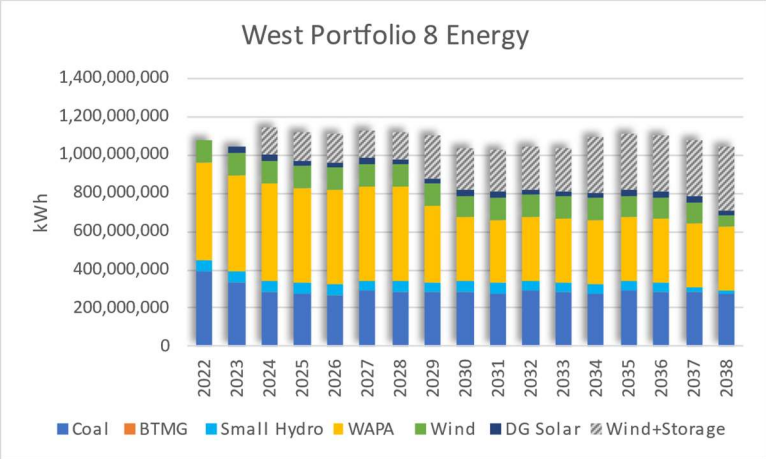


Figure XIV-46



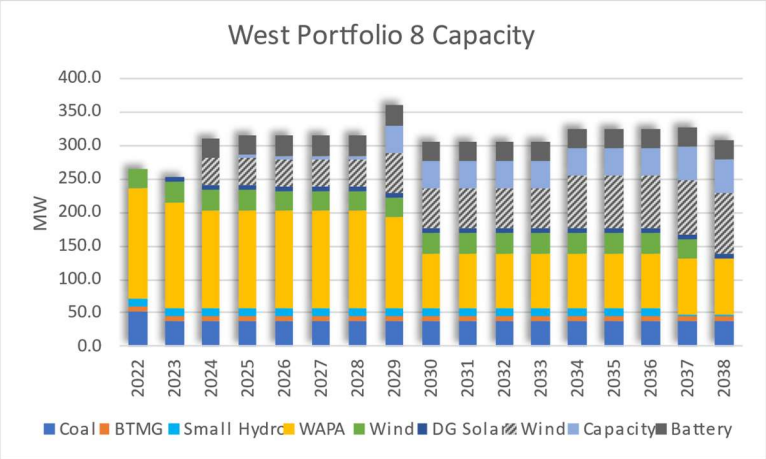
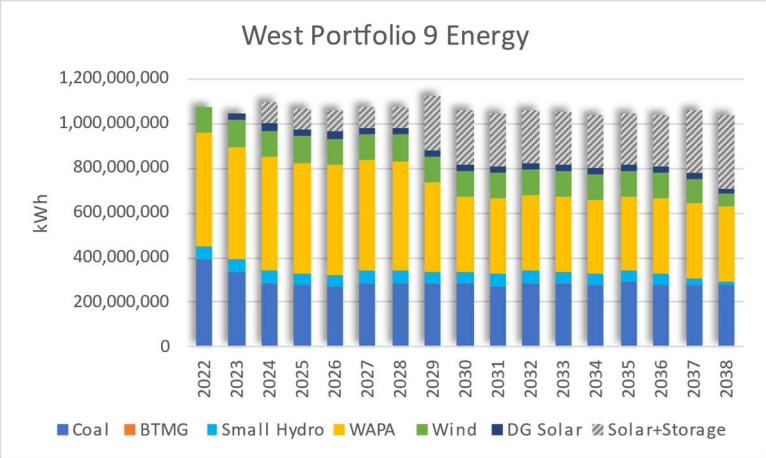


Figure XIV-47



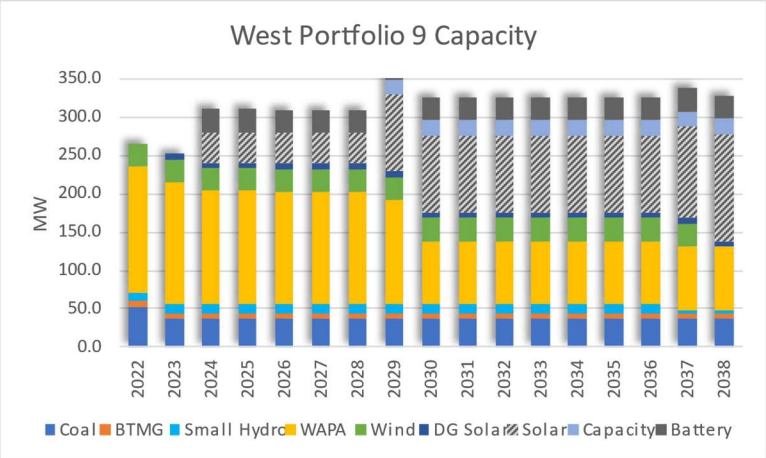


Figure XIV-48

The chart in *Figure XIV-49* shows the results of the west model for all nine portfolios and all nine scenarios. The dark green bar represents the base case total revenue requirement for each portfolio. The light green vertical line shows the positive and negative deviation from the base case, or the range from the maximum revenue requirement of the sensitivity scenarios and the minimum revenue requirement of the sensitivity scenarios. This range is termed the "scenario variance".

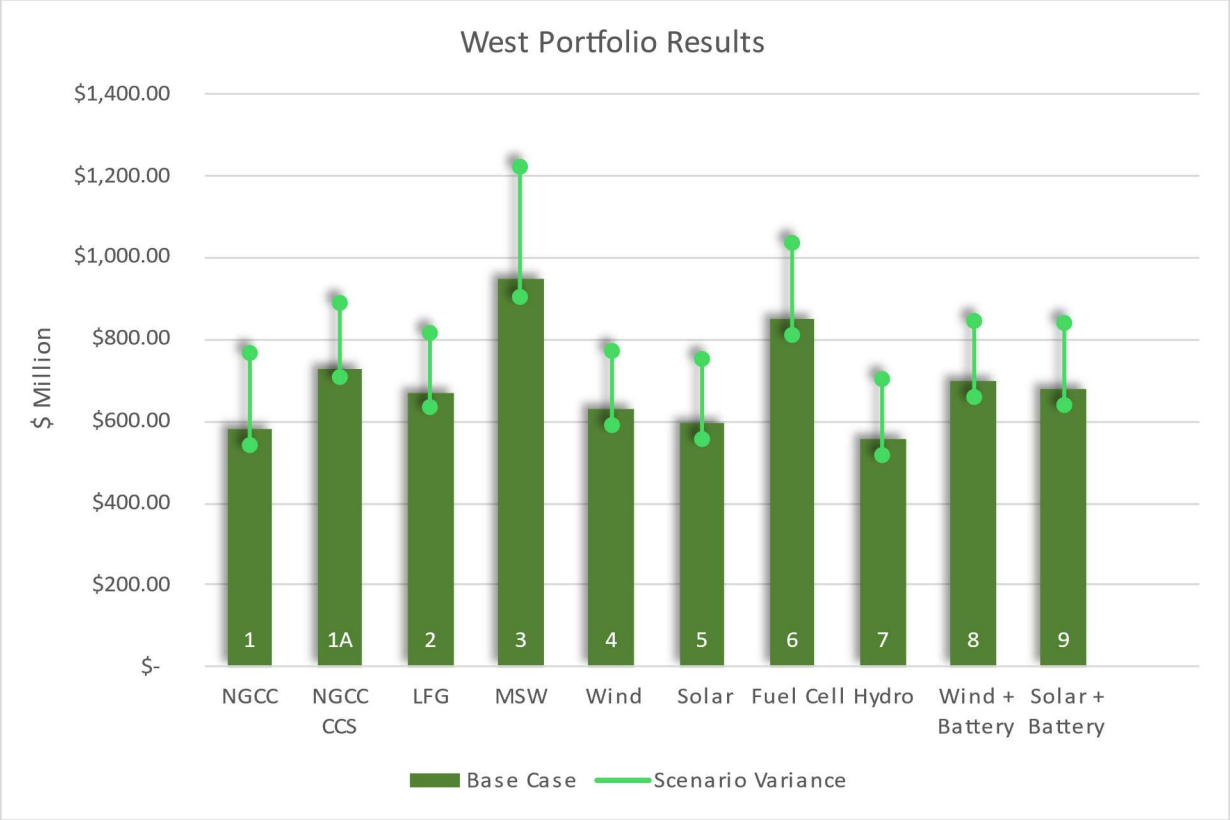


Figure XIV-49

The table in *Figure XIV-50* illustrates the same data with the values displayed and the addition of a metric showing the incremental percentage above the lowest cost portfolio, termed the "Cost Premium," and the positive variance of the highest cost scenario above the reference scenario in terms of $/MWh.

Portfolio #	Description	Revenue Requirement (Reference Case)	Cost Premium	$/MWh Variance
Portfolio 1	NGCC	$ 580,496,106	4.26%	$ 10.22
Portfolio 1A	NGCC CCS	$ 728,669,416	30.87%	$ 8.80
Portfolio 2	LFG	$ 672,001,680	20.69%	$ 7.73
Portfolio 3	MSW	$ 946,464,782	69.99%	$ 14.88
Portfolio 4	Wind	$ 629,945,559	13.14%	$ 7.77
Portfolio 5	Solar	$ 597,626,725	7.33%	$ 8.66
Portfolio 6	Fuel Cell	$ 850,591,267	52.77%	$ 9.93
Portfolio 7	Hydro	$ 556,790,179	0.00%	$ 7.69
Portfolio 8	Wind + Battery	$ 700,196,261	25.76%	$ 7.84
Portfolio 9	Solar + Battery	$ 681,653,840	22.43%	$ 8.83

Figure XIV-50

The positive variance, or the differential between the maximum scenario revenue requirement and the base case revenue requirement, quantifies the risk inherent in each portfolio relative to possible changes in fuel pricing and carbon tax levels. Plotting the base case revenue requirement against this variance allows a concurrent view of cost and risk for each of the West Portfolios. These metrics are displayed in *Figure XIV-51*.

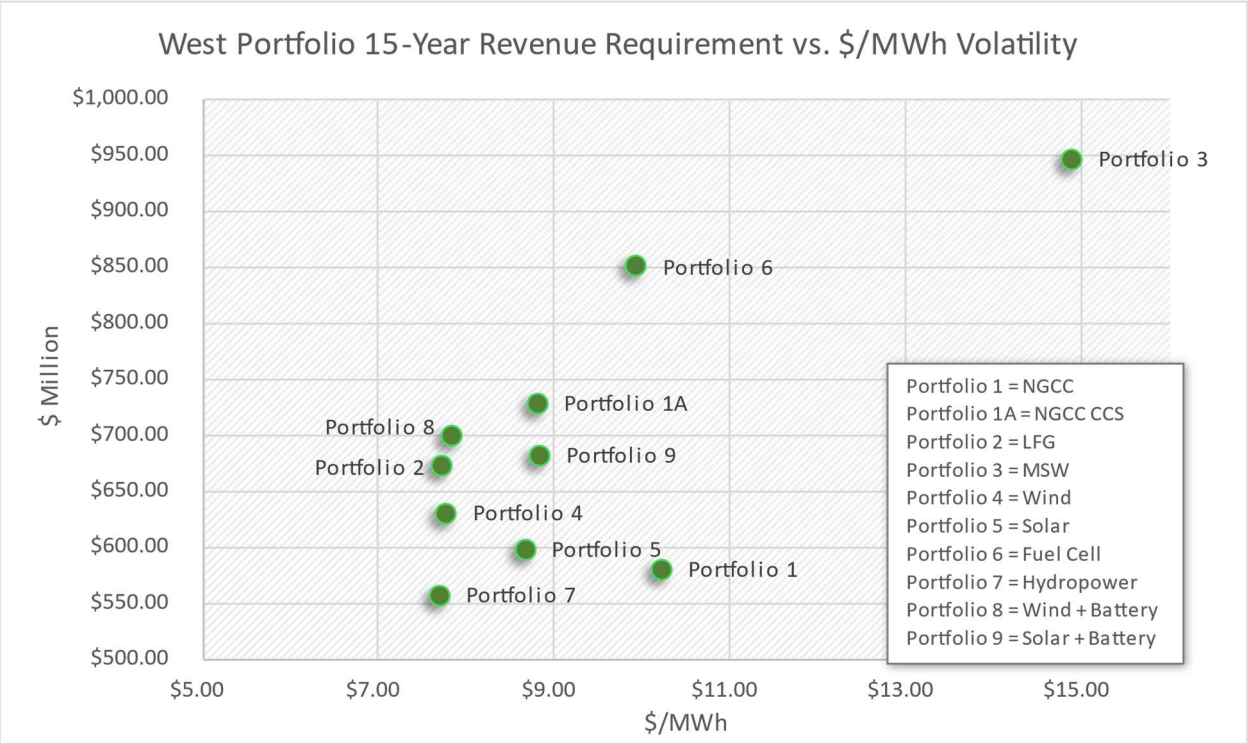


Figure XIV-51

To get a more distinct picture of the relative positions of the portfolios, Portfolio 3 is omitted from the graph in *Figure XIV-52*.

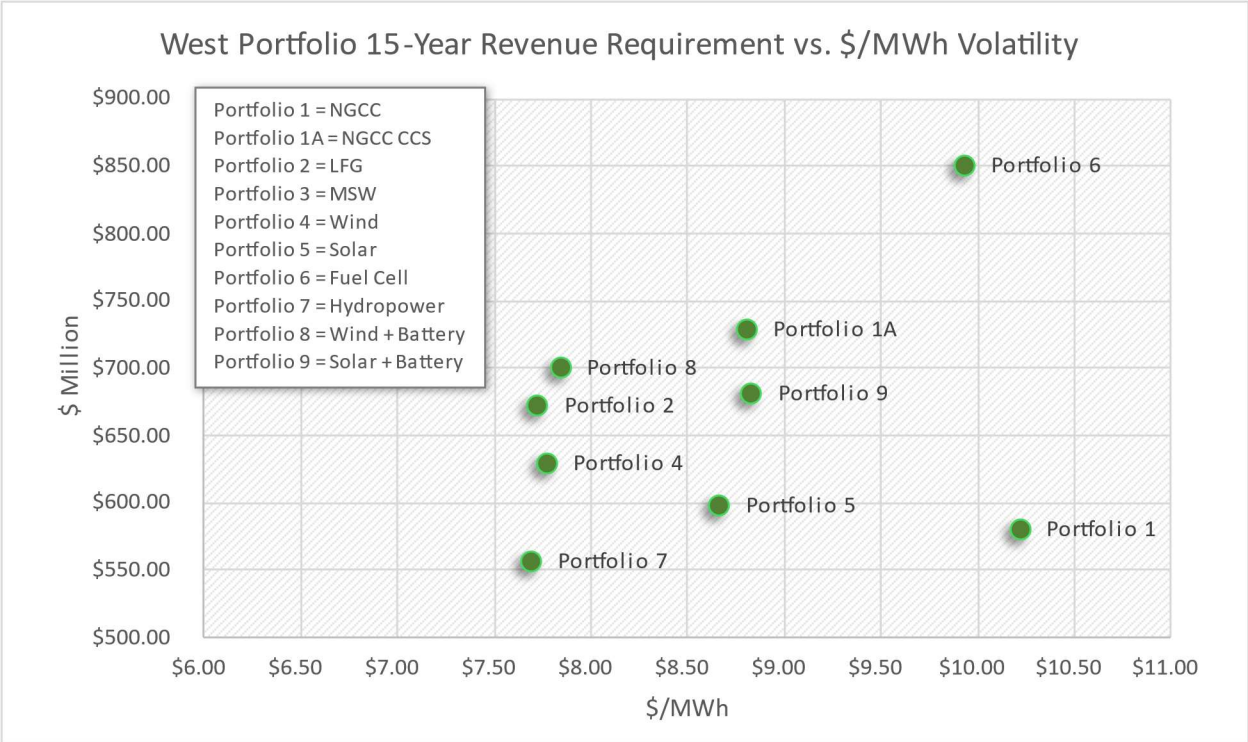


Figure XIV-52

The values and graphical results show that Portfolio 7, the hydropower plant, has the lowest revenue requirement, and the lowest variance level. However, Portfolio 5 (Solar) and Portfolio 4 (Wind) and revenue requirements and variance levels similar to that of Portfolio 7. Portfolio 1 (NGCC) resulted in a low revenue requirement, but a much higher level of variance. Portfolio 8 (Wind + Battery) and Portfolio 9 (Solar + Battery) align well with the corresponding Portfolios 4 and 5 but have the expected higher cost. Portfolio 2 (LFG) has a low variance level and a moderate revenue requirement.

XV. Environmental Impact

A. Existing Environmental Considerations

MEAN is subject to environmental and other regulations, in varying degrees, at federal, state and local levels. These regulations, as well as MEAN's compliance status, are detailed in Section IV.A.

As part of a long-term strategy, MEAN has invested in base load generating resources compliant with environmental regulations and expected to provide highly reliable base load generation for the Participants' present and future energy requirements. In addition to state-of-the-art coal facilities and WAPA allocations, MEAN has acquired renewable resources and carbon-free nuclear capacity and energy. MEAN has adopted the 2050 Vision which aims to create a carbon neutral resource portfolio by the year 2050. Future resource planning will follow the direction of the 2050 Vision, transitioning toward replacing certain carbon emitting resources with carbon free resources as existing contracts expire or resources reach the end of their operating life.

In the Phase I evaluation of supply side options, environmental impact was considered for all options as part of the scoring process. Three criteria reflected the consideration of a resource's current and future effects on the environment. Scoring categories included:

- Emissions/Environmental Impact, which calculated and compared the emissions levels for carbon, SO_2, NOx, and mercury.
- Environmental Policy Risk, which estimated the degree to which a resource could be affected by the imposition of future environmental regulations.
- Progress Toward the 2050 Vision, which considered whether a resource will contribute toward a decrease in carbon emissions.

In the participant survey, these categories ranked near the middle, and therefore had an average weighting in relation to other criteria. As a result, the initial round of supply side resource evaluation acted to eliminate resource options that resulted in a high level of environmental impact.

B. Supply Side Resource Options Environmental Impact

Using the resultant energy generation of each resource in the candidate portfolios, both existing resources and future proposed resources, and the known emissions factor and heat rate of each resource, the carbon intensity of the portfolio can be calculated on the basis of tons of carbon emissions per MWh of electricity generated.

1. SPP

The progression of MEAN's SPP regional resource mix carbon intensity achieved with each portfolio is shown in the figures below:

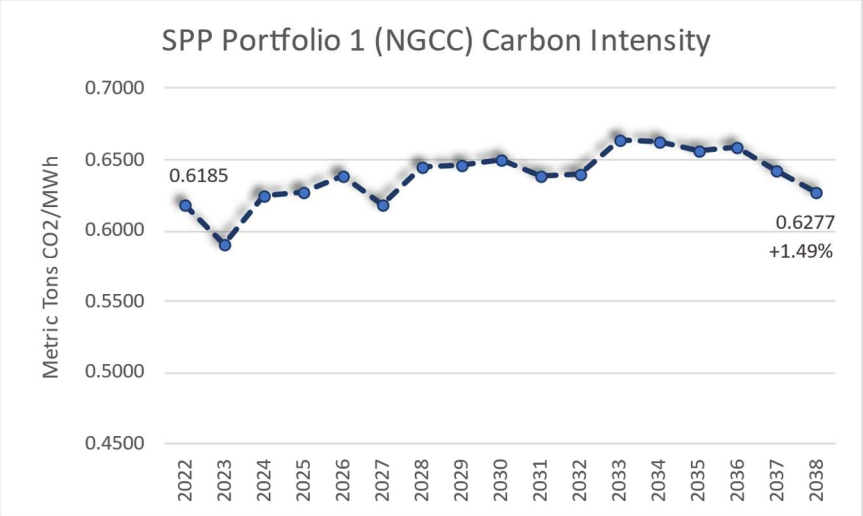


Figure XV-1

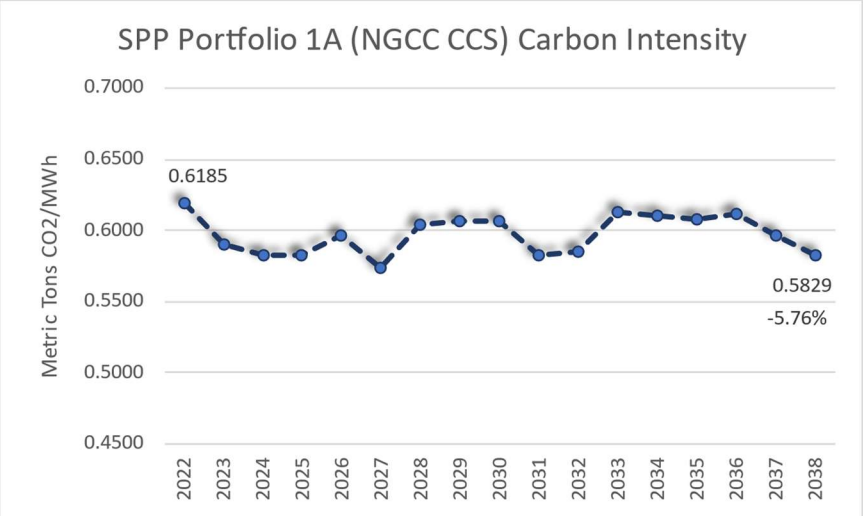


Figure XV-2

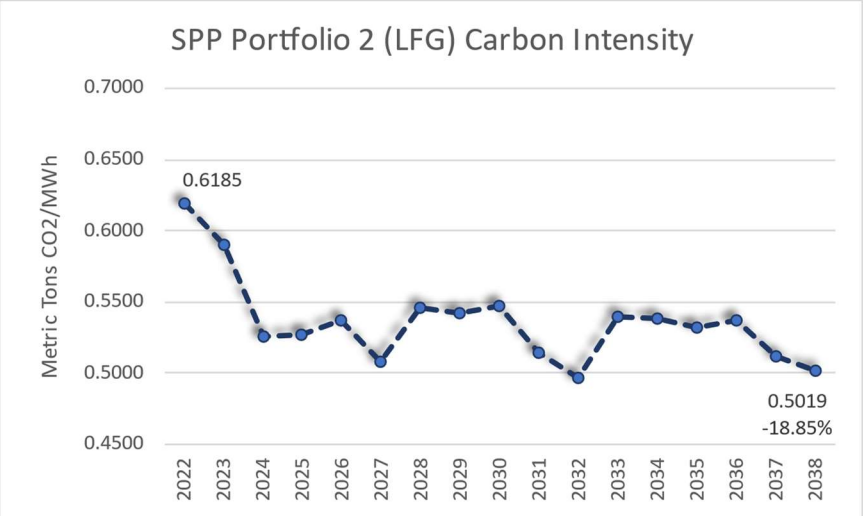


Figure XV-3

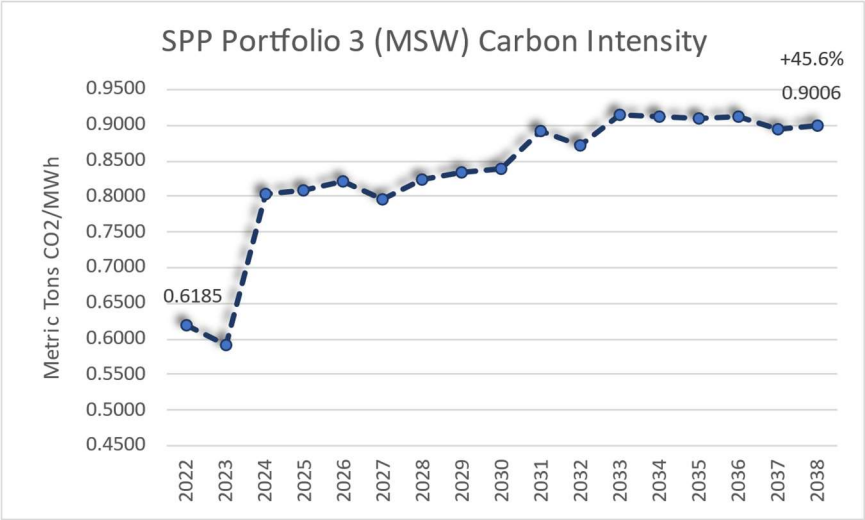


Figure XV-4

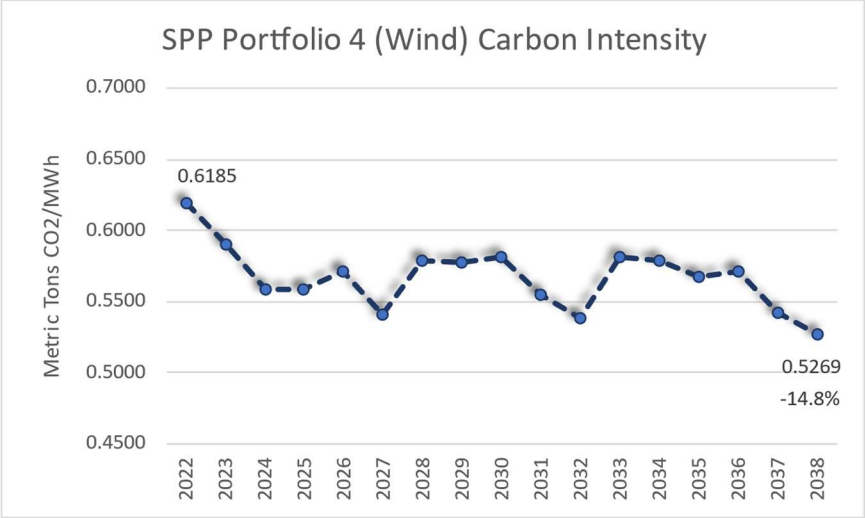


Figure XV-5

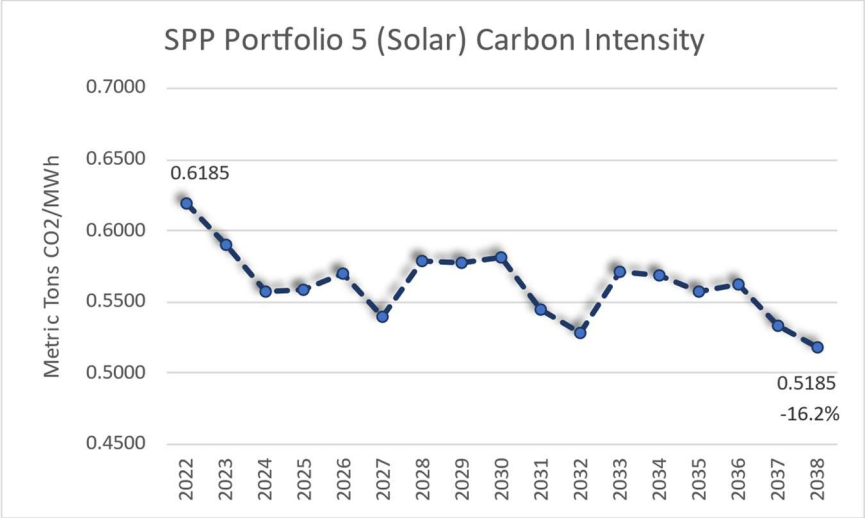


Figure XV-6

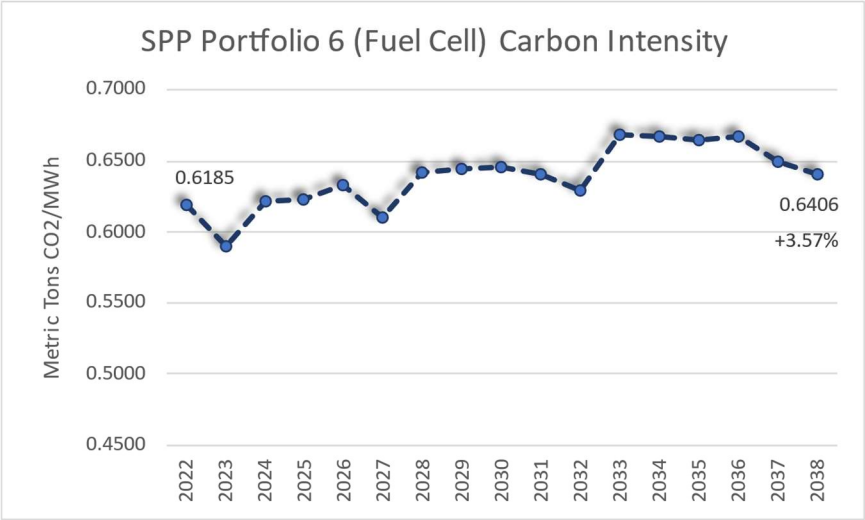


Figure XV-7

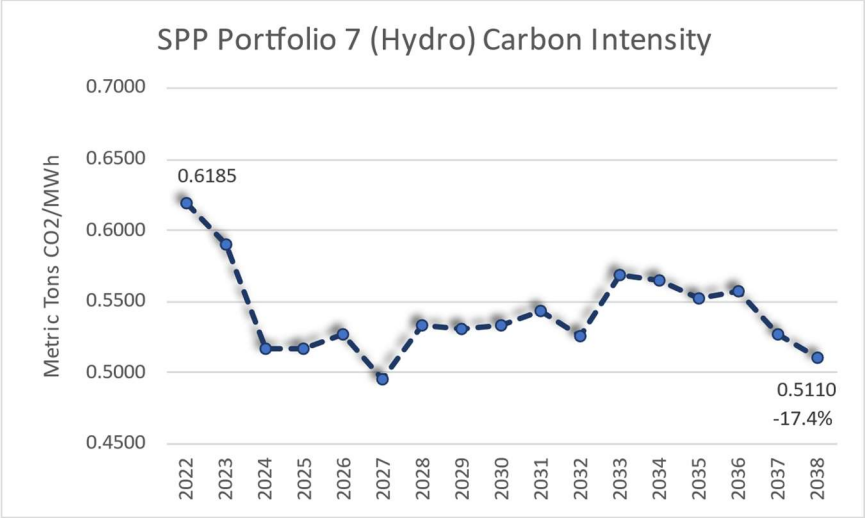


Figure XV-8

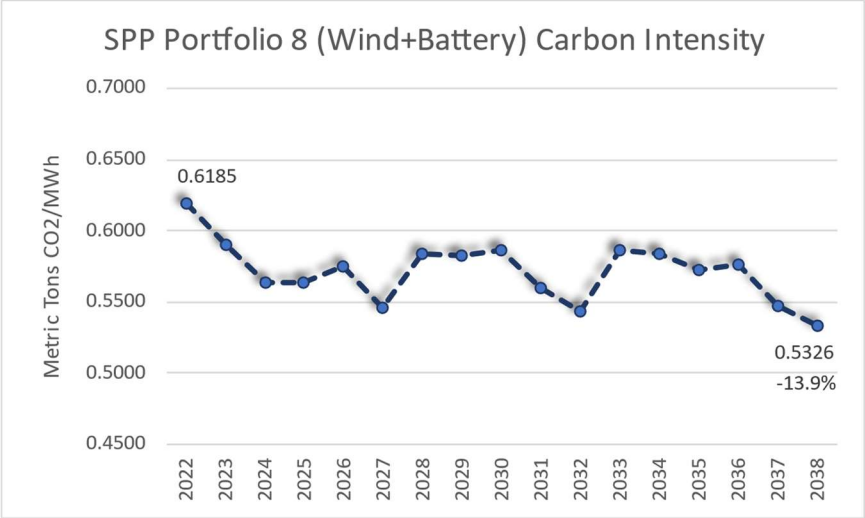


Figure XV-9

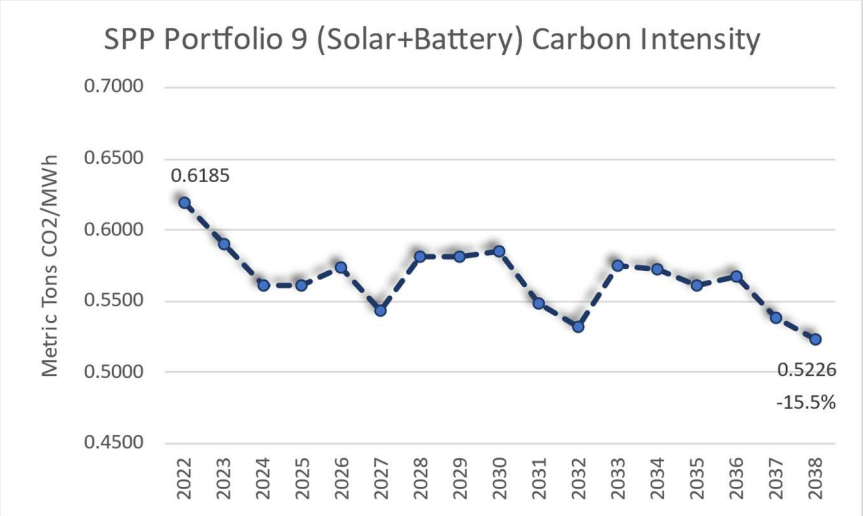


Figure XV-10

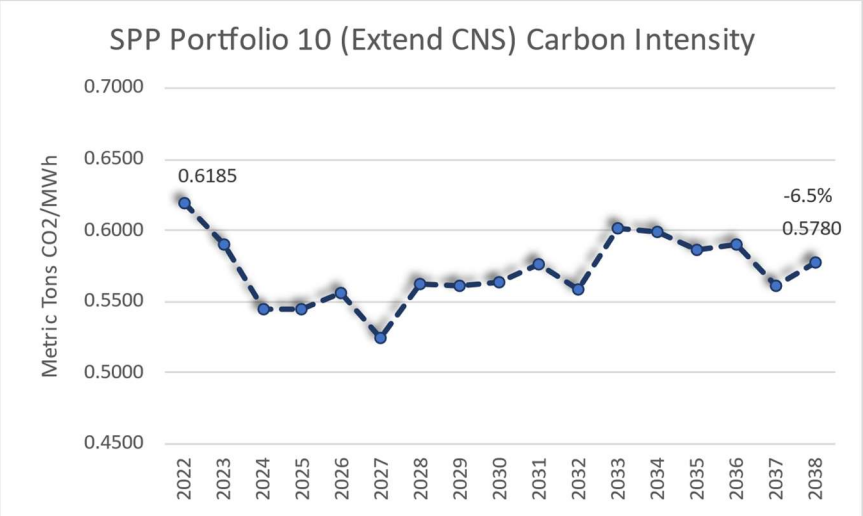


Figure XV-11

2. West Region

The progression of MEAN's West regional resource mix carbon intensity achieved with each portfolio is shown in the figures below:

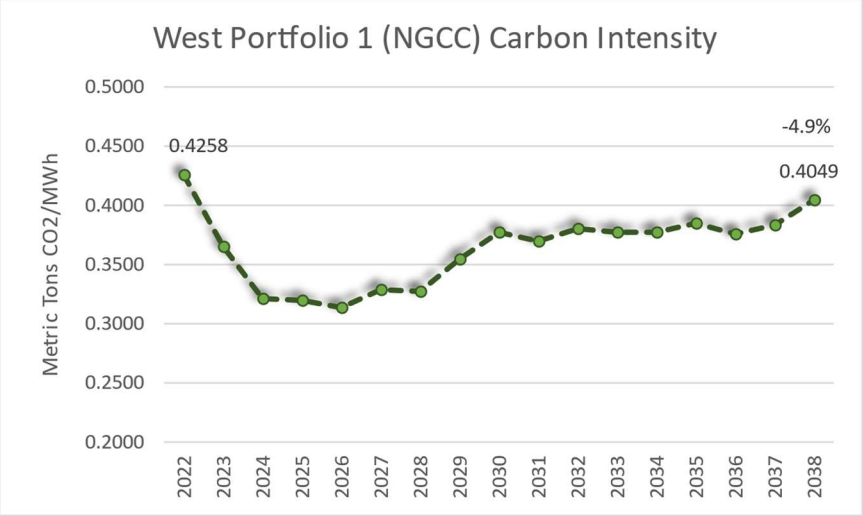


Figure XV-12

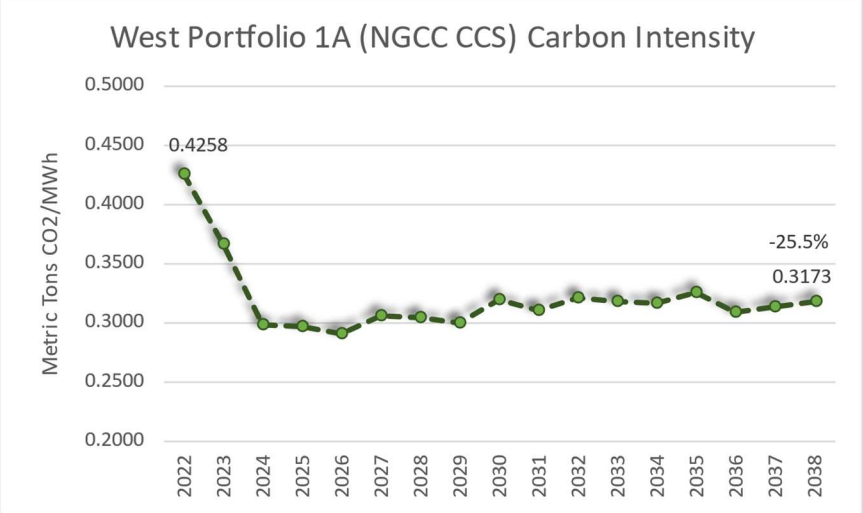


Figure XV-13

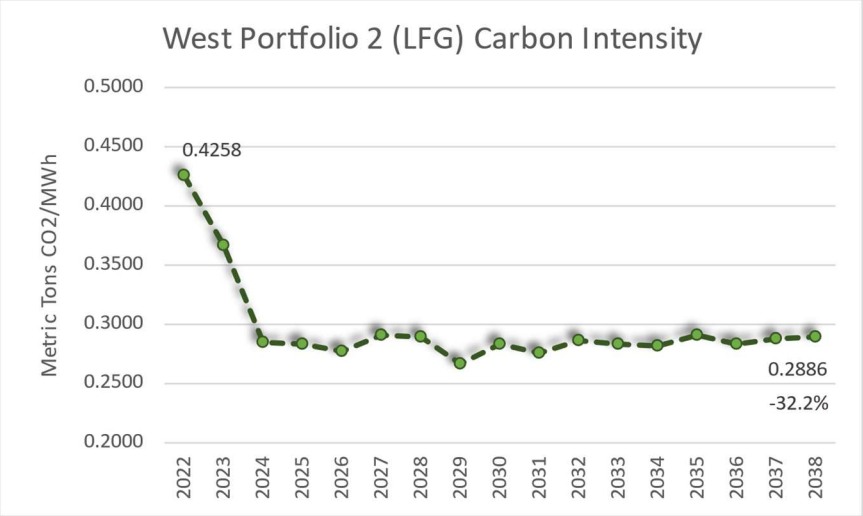


Figure XV-14

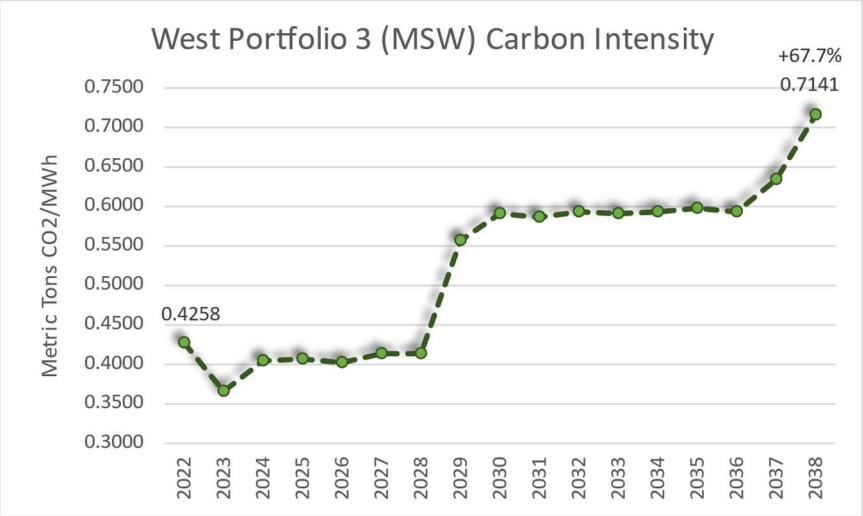


Figure XV-15

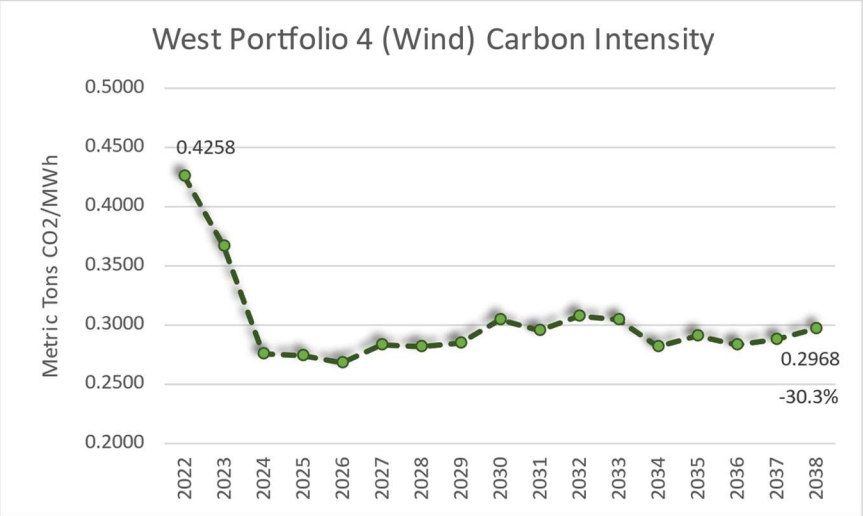


Figure XV-16

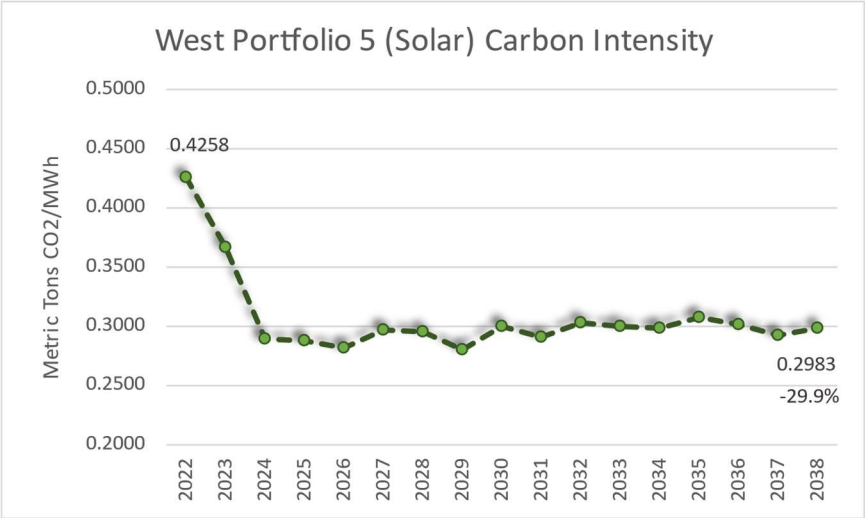


Figure XV-17

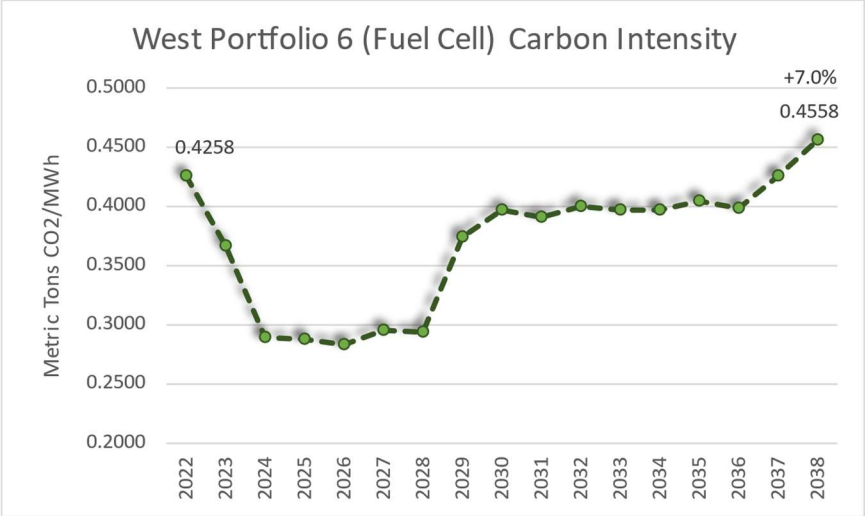


Figure XV-18

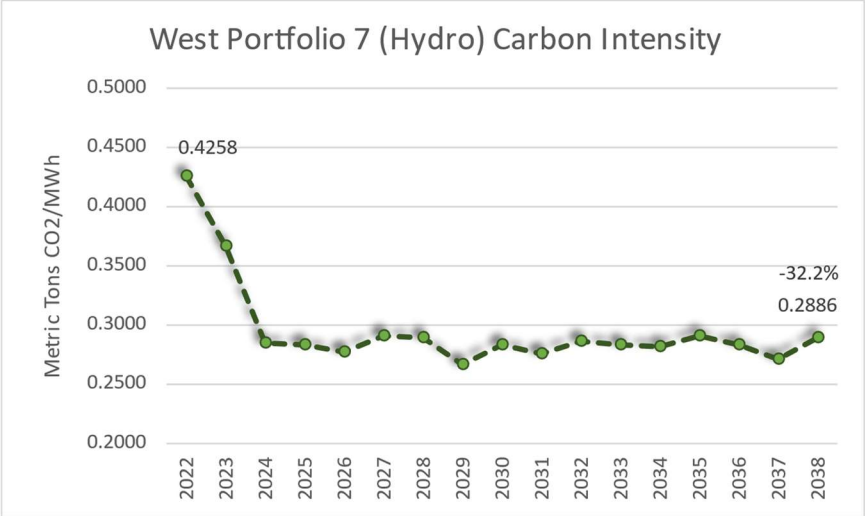


Figure XV-19

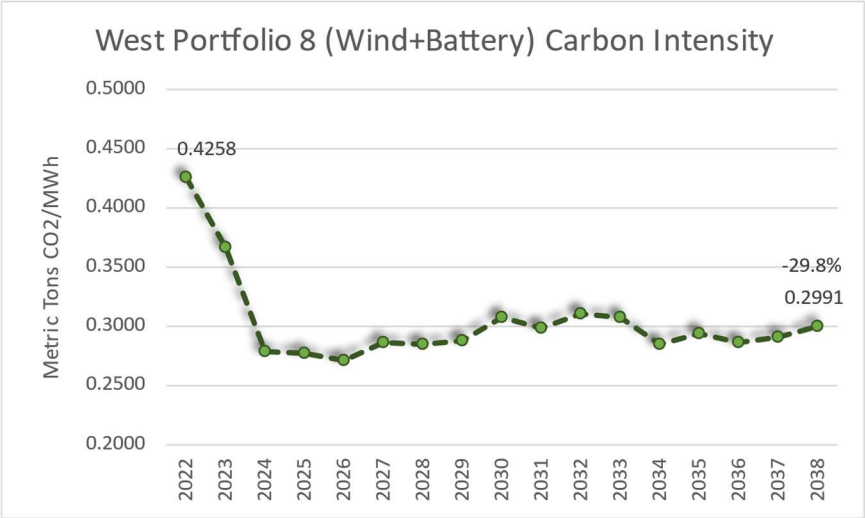


Figure XV-20

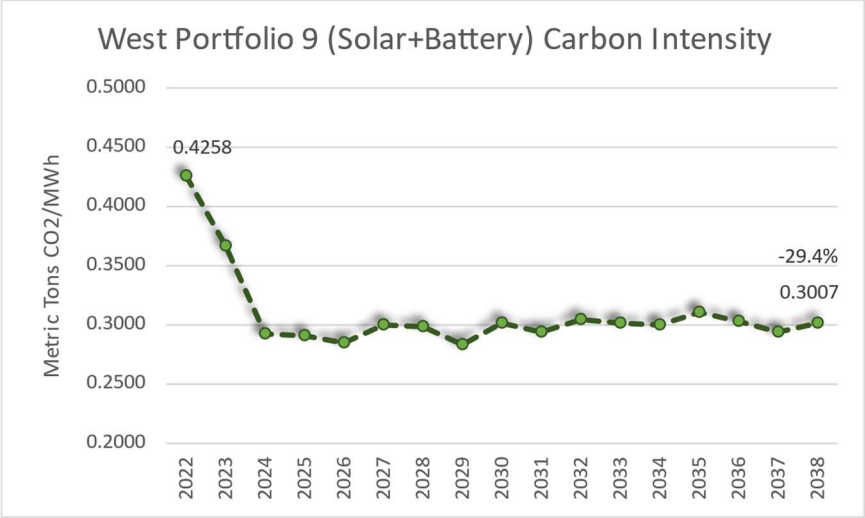


Figure XV-21

C. Carbon Cost Scenario Impact

The inclusion of the carbon tax sensitivity scenarios provides a method by which the impact of carbon emissions can be quantified for each portfolio as a whole. For each level of natural gas pricing, the results for the scenarios with no carbon tax can be compared against the results for the scenarios with a high carbon tax to show the consequence of high carbon emissions.

In the market pricing projections used in the Phase II modeling of candidate portfolios, pricing scenarios 7, 8, and 9 include various forms of a carbon emissions tax. These carbon tax scenarios are explained in Section IX.H. A comparison of Scenario 1 (base case load, base case NG price, and no CO_2 tax) to Scenario 9 (base case load, base case NG price, and CO_2 tax) provides a direct relation where the only variable that changes is the implementation of a carbon tax. Likewise, a comparison of Scenario 4 (base case load, high NG price, and no CO_2 tax) to Scenario 7 (base case load, high NG price, and CO_2 tax) shows the impact of a tax imposed as part of a carbon limit regulation. And a comparison of Scenario 5 (base case load, low NG price, and no CO_2 tax) to Scenario 8 (base case load, low NG price, and CO_2 tax) shows the impact of the same carbon limit tax on a different implementation schedule.

1. SPP

The average variance resulting from only the carbon tax (holding the natural gas pricing constant) in terms of $/MWh is shown in *Figures XV-22* for only Scenario 1 vs. 9 and *Figure XV-23* adds comparisons for Scenario 4 vs. 7 and Scenario 5 vs. 8.

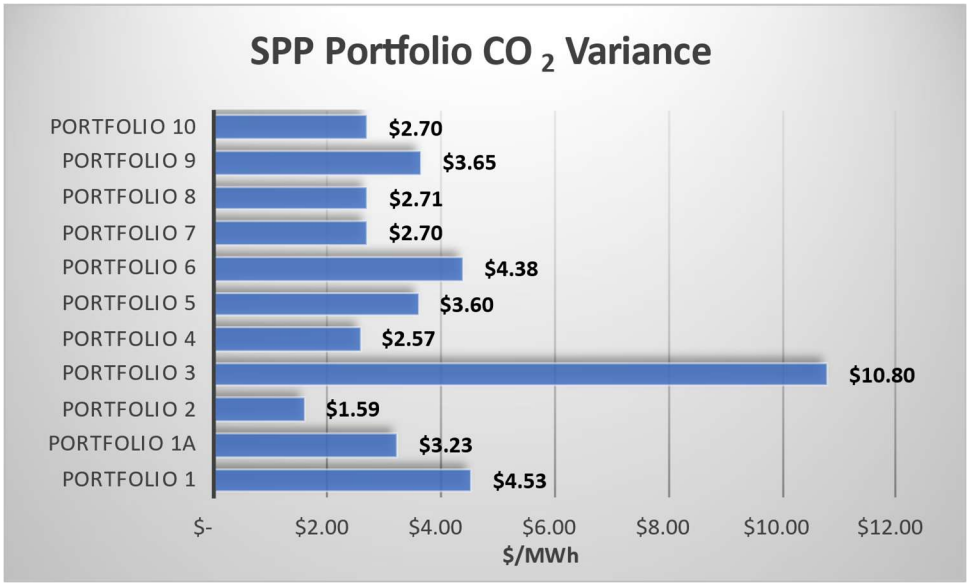


Figure XV-22

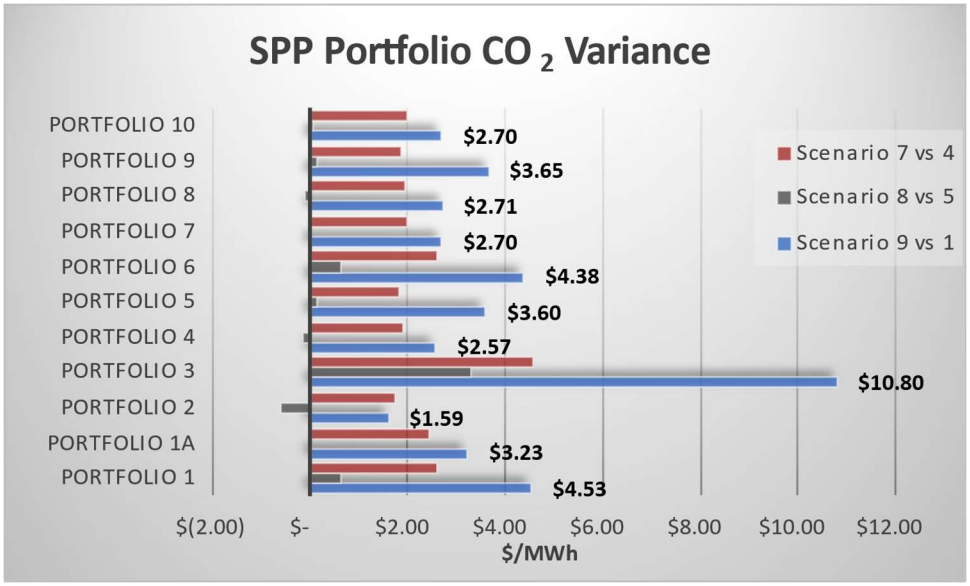


Figure XV-23

2. West Region

The average variance resulting from only the carbon tax (holding the natural gas pricing constant) in terms of $/MWh is shown in *Figures XV-24* for only Scenario 1 vs. 9 and *Figure XV-25* adds the comparisons of Scenario 4 vs. 7 and Scenario 5 vs. 8.

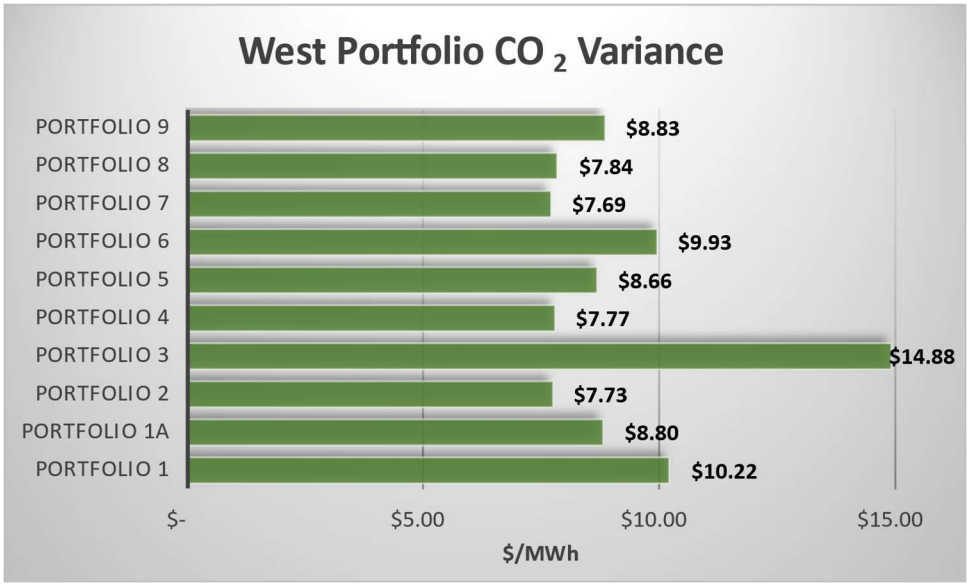


Figure XV-24

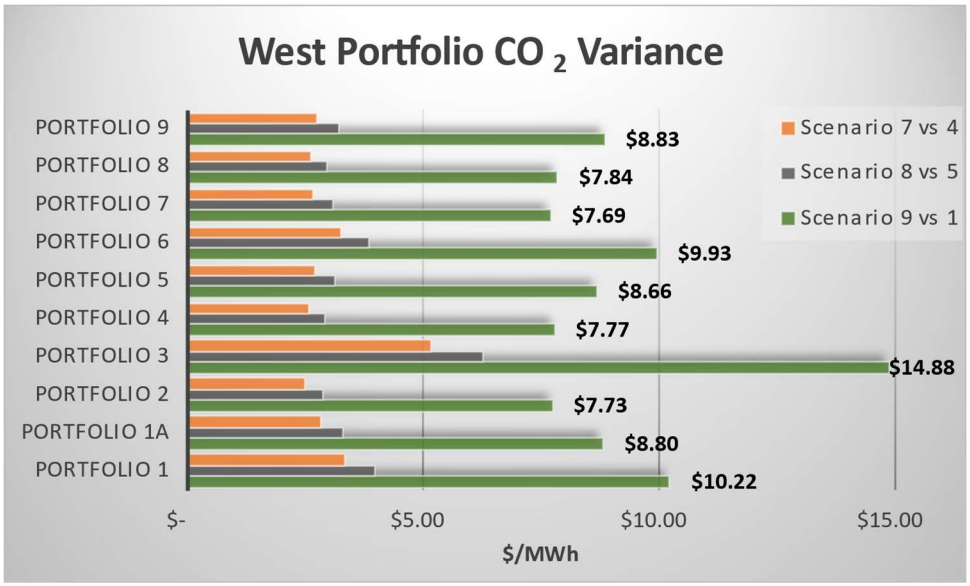


Figure XV-25

These results show an expected relation. Portfolios that include more fossil fueled capacity or more market energy purchases see a higher cost impact from a carbon tax. In this way, higher emitting resources are "penalized" in the model with a higher degree of variance. The effects of carbon emissions were included in the variance factor used in the analysis of the final portfolio results.

XVI. Conclusions and Recommended Action Plan

Based on the data and analysis in this IRP report, MEAN has developed conclusions relative to proposed demand side solutions and supply side solutions.

A. Conclusions

1. MEAN's Future Resource Needs

In the SPP service territory, MEAN has a need for capacity in the near term only. A capacity deficit of approximately 55-60 MW occurs from 2024-29 and is resolved when the WAPA Displacement Agreement ends. The energy deficit occurs throughout the study period, increasing with time.

In the West region, MEAN has capacity deficit of approximately 10 MW from 2025-28, which then increases to 45 MW when the WAPA Displacement Agreement ends and grows for the remainder of the study period to about 65 MW in 2038. The West region has a need for energy throughout the entire 15 years, which increases each year.

2. Demand Side Management – Conclusions

New DSM Programs: The costs and benefits of the five proposed new DSM programs were compared using three different calculation methods. These three tests consider the costs and benefits of the DSM programs from different perspectives. A calculated ratio of benefits to costs greater than 1 indicates that a program is likely to result in benefits that outweigh its costs and therefore provide a net positive impact to MEAN or the end-use customer, depending on the test. In total, only one of the proposed new programs had a favorable result, but in only one of the three tests. Therefore, none of the potential new programs studied would prove beneficial to MEAN and the end-use customer to a point that would compensate for the required costs. Demand Side Management programs often fail to demonstrate benefit in areas with very competitive electric rates.

MEAN's existing programs (identified below) continue to perform well and demonstrate their value, and therefore MEAN will maintain these programs. MEAN has plans to investigate future energy efficiency education opportunities and a program to offer incentives for residential EV chargers. Data will be presented to the MEAN Services Committee for approval in the coming months.

Commercial LED Lighting Upgrade Program: This program was initiated in FY 2016-17 and was successfully implemented throughout MEAN's system. The average annual energy savings achieved by the program are approximately 1,247 MWh, and the peak demand savings per year has been approximately 249 kW. These savings are reflected in the current load forecast. The NMPP Services Committee has approved the continuance of the LED Lighting Upgrade program through FY 22-23.

Residential Energy Efficiency Programs: After the successful introduction of these programs in FY21-22, incentives available for Cooling System Tune-Ups, Attic Insulation, High Efficiency Heat Pumps and Smart Thermostat Installations will continue to be offered to MEAN participants.

Advanced Metering Infrastructure: MEAN is working on a project to provide advanced metering infrastructure (AMI) services to member communities. In the fall of 2019, MEAN conducted a business case study and survey of member representatives seeking interest in installing and employing AMI. With this information, MEAN conducted an RFP for pricing of an aggregate AMI procurement. Fourteen (14) communities have signed letters of intent to participate in this project, representing a total of approximately 10,500 meters. If approved, this project is slated to begin implementation in 2022.

Other MEAN DSM programs to be continued include: Infrared Energy Audits, Energy Audits, American Public Power Association (APPA) dues, Demonstration of Energy & Efficiency Developments (DEED) dues, Member Exclusive Education Sessions, NMPP Energy News Subscription.

Participant DSM Programs: The 2021 Participant DSM survey revealed a total of 17 communities with 33 DSM programs in place. The non-coincident sum of the demand and energy savings from these DSM programs is 4.03 MW and 2,635 MWh, respectively. These community programs are expected to be maintained in future years. MEAN repeats the DSM survey on an annual basis to track these programs and the impact on MEAN's demand and load.

3. Supply Side Resources – Conclusions

Based on the January 2021 Participant survey, the preferred resource portfolio option should consider low cost as a requisite condition. To reflect this preference, the Phase I evaluation highly weighted the capital cost and energy cost of each option. To further investigate the life cycle cost of each proposed resource portfolio, the Phase II economic analysis calculated the total revenue requirement related to each portfolio's resources over the 15-year study period. The final results clearly indicate the portfolio options with the lowest cost.

In January 2020, the MEAN Board of Directors approved the 2050 Vision establishing a goal to achieve a carbon neutral resource portfolio by the year 2050. To progress toward this goal, MEAN will need to fulfill resource needs with future resources that contribute toward a decrease in the carbon intensity of MEAN's overall resource portfolio. The results of the portfolio model were formulated to calculate the carbon intensity of each portfolio over the study period and determine which portfolios align with the 2050 Vision.

In the course of multiple participant meetings and workshop sessions, MEAN received feedback from participants that signified an inclination toward resource solutions that provide a local benefit or allow for local participation. In fact, this criterion was also scored as the highest non-cost criterion in the participant survey conducted in January 2021. Participants discussed the leasing of additional participant owned generation and renewable distributed generation, such as community solar. In response, MEAN heavily weighted the Local Benefit score for each of the supply side options in the Phase I evaluation. In the Phase II portfolio modeling, resources were sized to provide for the energy needs of the region. To supplement the accredited capacity of the resource and meet the required resource adequacy for peak demand, additional capacity purchases were incorporated into the portfolio model. This additional capacity is to be leased member owned generation as available.

Internal feedback from MEAN Operations communicated an appeal for resources that allow for operational flexibility. Due to constantly changing market conditions, the ability to schedule the output of a resource in response to changes in load and market price is very valuable. The value of this flexibility often translates into financial value as well, which relates to the priority of cost-effectiveness. Also, since the economic model used in the Phase II analysis included both generating costs and market sale and purchase costs, dispatchable resources could operate in response to this differential and either realize financial benefit or avoid disadvantaged pricing, whereas non-dispatchable resources did not operate in this manner.

SPP Top Performing Portfolios:

- The proposed portfolio in SPP that best achieved the primary goal of low cost was Portfolio 1, the addition of capacity and energy from a natural gas combined cycle plant located in the SPP footprint. This option also provides for operational flexibility and fuel diversity, but not local benefit. Portfolio 1 does not result in a decrease in carbon intensity for MEAN's resource portfolio.

- Portfolio 4, a wind resource for energy generation accompanied by a capacity purchase sized as required for resource adequacy, has a 15-year revenue requirement only marginally higher than that of the lowest cost option, and resulted in a lower cost variance across the pricing scenarios. In addition, Portfolio 4 allows for a 14.8% reduction in SPP portfolio carbon intensity.

- Portfolio 7, the hydropower option, also resulted in a low revenue requirement, a low cost variance, and a 17.4% reduction in carbon intensity for SPP. In SPP there is not likely to be a hydropower resource that provides benefit to a MEAN community.

- The solar resource in Portfolio 5 had the lowest modeled cost variance and a 15-year revenue requirement that was similar to the lowest cost options. This option is also emissions free and therefore leads to a 16.2% reduction in the portfolio's carbon intensity over time. Additional required capacity would be provided by leased member generation as available.

- Portfolio 2, the landfill gas resource, has a lower than average revenue requirement and a much lower variance level. A landfill gas plant also has the potential to provide local benefit and lowers the carbon intensity of MEAN's SPP portfolio.

- Portfolios 8 and 9, the wind and solar with battery storage, may prove to be viable options in the future if the incremental cost of batteries decreases as expected in the future.

West Top Performing Portfolios:

- The proposed portfolio in the west that best achieved the primary goal of low cost was Portfolio 7, the hydropower resource. This portfolio also saw a very low level of cost variance, or cost risk. Being a carbon free resource, the addition of hydropower resulted in a 32.2% reduction in the carbon intensity of the West

portfolio. MEAN is aware of hydropower options that may allow for a benefit to a MEAN community.

- The next lowest cost option in the West was Portfolios 5, the solar resource, with additional leased capacity from member generation. This portfolio carried increased volatility as compared to the hydro option. Solar also offers a local benefit potential and a reduction in carbon intensity of 29.9% in the West.

- The wind resource, Portfolio 4, has many of the same benefits. This option is lower than average revenue requirement, low cost variance, and reduces the carbon intensity of the west portfolio by 30.3%. Additional capacity is acquired through the lease of member generation.

- Portfolio 1, the Natural Gas Combined Cycle plant, results in a very low 15-year revenue requirement, but unfortunately carries a high variance risk as this option is impacted by natural gas pricing and CO_2 tax in the West. This option also provides for operational flexibility and fuel diversity, but not local benefit. This resource only achieves a modest 4.9% reduction in carbon intensity.

- Portfolios 8 and 9, wind and solar with batteries, once again show the potential to be feasible options should the capital cost of battery storage decrease in the future.

B. Proposed Future Resource Portfolios

1. Committee Recommendation to the Board of Directors

Following the presentation of the Phase II Economic Modeling results and the relative revenue requirements, cost variance risk, and impact to carbon intensity resulting from each proposed portfolio, the Power Supply Committee considered and discussed the portfolios in light of the conclusions described above. These discussions took place at the public meetings in April 2022 and May 2022 (see Appendix A for minutes). The Committee voted unanimously in favor of a resolution recommending to the Board of Directors the following preferred portfolio(s) for each region:

SPP: Portfolio 1A (Natural Gas Combined Cycle with Carbon Capture)

Portfolio 2 (Landfill Gas)

Portfolio 7 Hydropower

Portfolio 8 (Wind with Battery Storage)

Portfolio 9 (Solar with Battery Storage)

West: Portfolio 1A (Natural Gas Combined Cycle with Carbon Capture)

Portfolio 2 (Landfill Gas)

Portfolio 7 (Hydropower)

Portfolio 8 (Wind with Battery Storage)

Portfolio 9 (Solar with Battery Storage)

The recommendation for Portfolios 8 and 9 acknowledges the fact that pricing for energy storage is not advantageous in the near term, but capital costs are anticipated to decrease over the next 2-3 years. The Committee recommended that the addition of storage capabilities be considered in consequence of reductions in pricing.

2. IRP Approval by the Board of Directors

The Board of Directors received and considered the same results and supporting information at their public meeting in May 2022, along with the recommendation of the Power Supply Committee. A resolution adopting the IRP in accordance with this recommendation was approved unanimously by the Board of Directors at that public meeting. Please see Appendix E for this resolution.

This resolution does not dictate that the preferred resource must be procured by MEAN as an addition to the portfolio. It provides direction to MEAN staff to research, evaluate, and pursue the preferred portfolio resources when making resource planning decisions and acquisitions to meet MEAN's demand and energy needs in the future.

C. Recommended Action Plans

Based on the above conclusions, Committee recommendation, and Board resolution, MEAN will determine short term and long-term action plans in relation to demand side management resources and supply side resources in response to future projected capacity and energy deficits throughout its service territory.

1. Short-Term Recommended Action Plan (0-5 Years)

MEAN will continue to administer all current DSM programs: LED Lighting Upgrades, Residential Energy Efficiency Programs (Smart Thermostats, Attic Insulation, Cooling System Tune-Up, and High Efficiency Heat Pumps), Energy Audits, Member Education Sessions, and NMPP Energy News subscriptions. MEAN will revisit the proposed new programs upon any significant change in the analysis inputs to reevaluate the benefit to cost ratio. MEAN will perform analysis to determine the participation and economic feasibility of a residential EV charger incentive program.

MEAN will continue to pursue the aggregated Advanced Metering Infrastructure project to assist member communities with the installation of hardware and software systems to facilitate smart metering and load control.

Participants will be encouraged to continue existing DSM programs and initiate any new measures welcomed by their communities. MEAN will continue to perform the DSM annual survey and include DSM demand and energy savings into the load forecast.

In SPP, MEAN will proceed toward the recommended portfolio options to address the impending need for capacity and energy. MEAN has initiated discussions with and has received proposed cost and performance data from developers and resource owners in SPP for projects that align with MEAN's needs. These communications are a continuous and necessary part of MEAN's resource planning, and the information obtained was used in the Phase II modeling for accuracy of inputs. MEAN staff will explore and pursue power supply contracts for resources that align with the preferred portfolios in the Board resolution: natural gas with carbon capture, landfill gas, hydropower, wind with battery

storage, or solar with battery storage. Locating future resources owned by or contracted to MEAN within or near member communities will be a priority for resource selection.

In the West, MEAN will pursue the recommended portfolios options to address the impending need for capacity and energy. MEAN has released an All-Source Request for Information to solicit offers for qualified resources in the West. This will provide cost and performance data on projects in development and available to fulfill MEAN's future resource needs. Utilizing the resource data and available opportunities indicated in the RFI response, MEAN staff will pursue power supply contracts for resources that align with the preferred portfolios in the Board resolution: natural gas with carbon capture, landfill gas, hydropower, wind with battery storage, or solar with battery storage. Locating future resources owned by or contracted to MEAN within or near member communities will be a priority for resource selection.

In the fall of 2022 installation is scheduled to begin on the community solar projects MEAN is facilitating for member communities. MEAN will guide communities through the construction period and monitor system performance as individual facilities come online in the fall of 2023. This information will be used by other members to evaluate installation of similar systems in the future. MEAN will continue efforts to assist members with analysis and procurement of distributed generation systems.

MEAN will continue the investigation of new MEAN-contracted renewable generation opportunities located in Participant communities as an option for future resources in accordance with the IRP conclusions and recommendation. MEAN initiated discussion on this concept with the Membership as it relates to potential solar facilities, and policy is being developed with the Power Supply Committee in 2022.

MEAN will continue to monitor actual load for all participant communities and compare against the load forecast and against existing capabilities. Any significant change will trigger a revised resource plan to determine required modifications and future actions. MEAN will continue to survey members annually to gather input and verification of load and load-impacting developments in member communities. In anticipation of future trends toward electrification, MEAN is planning a study to compare modified candidate portfolios in the case of high rates of electrification.

MEAN will continue to study the operation and performance of existing resources. In conjunction with changes to the SPP and MISO market constructs and renewable penetration within the markets, MEAN will determine the ongoing impact to capacity accreditation and unit dispatch and the resulting change to the long-term load and capability balance.

As discussions and development continues regarding plans to expand SPP to a West RTO, MEAN will remain engaged in the design of market structures and rules and will be prepared to optimize the current and future resource portfolio within the anticipated parameters of this new market. In the absence of an SPP West RTO, MEAN will closely monitor efforts in the Colorado legislature to enforce mandatory participation in an RTO.

In the short-term, MEAN will maintain communication with WAPA and review the hydrological forecasts pertaining to WAPA hydropower assets. If indications of future drought conditions persist, MEAN will prepare future load and capability scenarios to plan

for long-term reductions in available power from these resources and the acquisition of required replacement power.

Throughout MEAN's footprint, continual efforts will be made to acquire additional beneficial load. This development would allow further additions of carbon free resources to effect additional change to the portfolio's carbon intensity. Strategic load that can be shaped in the off-peak can also contribute to more efficient use of MEAN's energy generation.

2. Long -Term Recommended Action Plan (5-15 Years)

MEAN will regularly evaluate the impact and implementation of existing DSM programs. Based on the results of the evaluation, MEAN will continue to administer successful programs. MEAN will revisit the proposed new programs on a regular basis to recalculate the analysis inputs and reevaluate the cost-benefit ratio. Programs with a favorable ratio should be planned for a trial roll-out in interested communities to verify projected savings prior to widespread execution. Participants will be encouraged to continue existing DSM programs and initiate any new measures welcomed by their communities.

MEAN will explore opportunities to assist communities with optimizing AMI systems for load study and possible applications in load control and demand side management. Future expansion of the AMI system will be available to interested communities with local budget developments, scheduled meter replacements, changes in equipment costs, and investigation of future DSM programs.

In SPP, in accordance with the Board IRP resolution, MEAN will secure a long-term solution for an energy resource for future years. MEAN will need to supplement the resource acquired in the short-term plan to generate additional energy in the out years. With cost and performance data available from the new short-term resource contract, future costs of new resources, and future market changes MEAN will perform updated analysis to determine if the resource portfolio recommended in this report is still the optimal selection. Concurrently, MEAN will solicit its participants for opportunities to lease new or existing participant owned generation.

In the West, MEAN will explore options to acquire contracts for the recommended resources for capacity and energy as approved by the Board. The long-term balance in the West requires a resource or multiple resources to provide capacity and energy in addition to new resources in the short-term time frame. Concurrently, MEAN will solicit its participants for opportunities to lease new or existing participant owned generation. Again, resource planning will require updated data and analysis in response to changes in resource costs, fuel costs, regulatory and market conditions, and current generation projections for existing resources.

MEAN will continue to monitor actual load for all participant communities and compare against the load forecast and against existing capabilities. Any significant change will trigger a revised resource plan to determine required modifications and future actions. MEAN will pay particular attention to activities targeted to increase electrification in member communities and study the anticipated changes in load profile and load growth. MEAN will continue to survey members annually to gather input and verification of load and load-impacting developments in member communities.

MEAN will also continue to study the operation and performance of existing resources. In conjunction with changes to the SPP and MISO market constructs and the renewable penetration within these markets, MEAN will determine the ongoing impact to capacity accreditation and unit dispatch and the resulting change to the long-term load and capability balance.

MEAN will monitor federal, state, and local legislation to ensure that resources remain in compliance with all applicable regulations. Particular attention will be paid to regulations requiring investment in environmental controls and future resource transition plans. MEAN will also follow all portfolio standards and system emissions reduction requirements.

Throughout MEAN's footprint, continual efforts will be made to acquire additional load and extend terminating power supply contracts with member communities. Depending on the load profile in comparison to the rest of MEAN's system load and resource additions made in the short term, there may be opportunities to supply energy without additional capacity investment. Opportunities to add off-peak load or control specific loads may change the utilization and economics of some resources.

D. Tracking/Measurement Strategy

MEAN will employ the following Measurement Strategies to gauge the progress and impacts of the Recommended Action Plans described above.

METRIC	MEASUREMENT STRATEGY	MEASUREMENT BASELINE
Load vs. Forecast	MEAN will annually compare the actual peak demand and energy consumption against the forecast values. Data will be tracked by participant, region, and system. MEAN also conducts an annual load survey to aid in this measurement.	• Annual Load Forecast • 15-Year Load Forecast • Hourly/Monthly Participant Load Data • Participant Load Survey
Load vs. Capability	On a semi-annual basis, MEAN is required to calculate and present to the Board the upcoming peak season Load and Capability balance for planning purposes. MEAN typically presents a long-term outlook. In this way, changes in the timing of deficits can be foreseen to prepare via resource planning.	• Annual Load Forecast • 15-Year Load Forecast • Resource Contracts • Hourly Resource Generation Data • Outage Schedules • Current Season Load and Capability Report
DSM Savings/Impact	MEAN conducts an annual DSM survey to all participants to gather data on the programs offered and the expected demand and energy savings. Responses will be compared year-to-year to verify savings. This is valuable in the contemplation of future programs. MEAN also tracks data on its administered Lighting Upgrade Program for estimated power savings.	• Previous Year Hourly Participant Load Data – Peak and Energy Usage • DSM Survey Responses • Energy Star® Energy Efficiency Calculation Tools

Distributed Generation	MEAN will continue to support efforts by member communities to install qualified projects under the DG Policy. Discussions initiated to explore other distributed technologies, such as energy storage and fuel cells, will continue. MEAN will explore the installation of MEAN-owned systems located in member communities and collaborations available with this approach. Load and meter data will be collected to measure the performance of the DG systems as available. This will be compared to expected generation. MEAN will update load forecasts and anticipated capacity and energy needs.	• Member Meter Data – Load • Member Meter Data – Generation • DG System Performance • Evolving Costs of DG Installations
Existing Resource Performance	MEAN tracks the operation, performance, and cost of its contracted resources. This is measured against expected, budgeted, and contracted values and can be used to gauge the cost-effectiveness of existing and future resources. In the SPP and MISO markets, MEAN also tracks the locational marginal price to determine the actual total cost of the resource.	• Resource Contracts • Previous Year Hourly Resource Generation Data • Resource Invoices • LMP Data
New Resource Parameters	MEAN regularly tracks research on the costs and parameters of new resources. Understanding the performance of established and emerging technologies and the total generating cost in relation to market conditions will prepare MEAN for future resource acquisition. MEAN regularly discusses with developers their projects in the interconnection queue or under investigation.	• Resource Data Used for IRP (EIA, NREL, DOE) • Market Pricing • Developer Project Data
Market Construct Parameters	MEAN is actively involved with SPP, MISO, and WEIS Stakeholder Groups to engage in discussions regarding market constructs and rules. MEAN is also monitoring developments of a resource adequacy program in the West. In resource planning activities, MEAN will prepare a variety of future scenarios responsive to contemplated changes to quantify the impact to the MEAN system and inform future plans.	• Resource Adequacy Models • Resource Accreditation • SPP, MISO, and WEIS Tariffs • Current Market Constructs
Environmental Regulation	MEAN continually monitors environmental regulations, with particular attention to future legislation affecting the power industry. When changes are proposed or adopted, MEAN projects the impacts on existing or potential future resources. Currently, MEAN is watchful for changes in the status of state and federal environmental legislation and resource tax credits.	• Status Quo Regulations • MEAN's current compliance status

Figure XVI-1

Appendix A – Public Participation Materials

A. November 2019 Board and Committee Meetings

See meeting materials starting on Page A-2

B. January 2020 Board and Committee Meetings

See meeting materials starting on Page A-30

C. August 2020 Board and Committee Meetings

See meeting materials starting on Page A-65

D. November 2020 Board and Committee Meetings

See meeting materials starting on Page A-89

E. January 2021 Board and Committee Meetings

See meeting materials starting on Page A-115

F. May 2021 Board and Committee Meetings

See meeting materials starting on Page A-147

G. August 2021 Board and Committee Meetings

See meeting materials starting on Page A-181

H. November 2021 Board and Committee Meetings

See meeting materials starting on Page A-206

I. January 2022 Board and Committee Meetings

See meeting materials starting on Page A-234

J. April 2022 Power Supply Committee Workshop

See meeting materials starting on Page A-268

K. May 2022 Board and Committee Meetings

See meeting materials starting on Page A-297

L. January 2021 Member Survey

See survey results starting on Page A-348

M. September 2021 Member Survey

See survey results starting on Page A-358

N. MEAN Website Information

See website screenshots starting on Page A-366

NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the MEAN Power Supply Committee of the Municipal Energy Agency of Nebraska will be held Wednesday, November 20, 2019 at 1:30 p.m. (CT) at the Younes Conference Center, Kearney, NE.

A copy of the agenda is posted upon issuance, kept continually current, and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska. The meeting is open to the public. If you require assistance or special accommodations in order to attend the meeting, please contact Kim Schafers at (402) 474-4759.

Revised Agenda
Power Supply Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
November 20, 2019 – 1:30 p.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda
   A. Approval of minutes from the August 14, 2019 meeting
   B. Next meeting
   C. Consent Resolution

3. MEAN Resource Planning

4. CR Energy Update

5. Renewable Distributed Generation Policy Cap

6. Wessington Springs Wind Repower

7. Asset Management Policies and Procedures Modifications (Attachment E)

8. Participant Generation Update

9. Power Supply Committee Adjourn

Approved Minutes
Power Supply Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
November 20, 2019 – 1:30 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met Wednesday, November 20, 2019. Notice of the meeting was given to committee members by e-mail and was posted at nmppenergy.org. The public was advised by publication in the Lincoln *Journal-Star* newspaper. The notice and agenda were posted upon issuance at the NMPP Energy office in Lincoln, Nebraska, and kept continually current.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 2:07 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with nine of the eleven committee members present.

1. Pat Davison, Imperial
2. James DePue, Wray
3. Will Dowis, Gunnison
4. Bill Hinton, Kimball
5. Duane Hoffman, Oxford
6. Matt Langhorst, Glenwood Springs
7. Tom Ourada, Crete
8. Chris Rodman, Wall Lake
9. Jeremy Tarr, Broken Bow

Tom Goulette, Voting Ex-Officio

Absent: Adam Suppes, Delta; Randy Woldt, Wisner.

Others in attendance: Alliance – Jeff Sprock; Breda – Nancy Janssen; Callaway – Rod Brestel; Callaway – Joe Dickman; CR Energy – Eric Johnson; CR Energy – Joe Yavorski; Crete – Mike Kalkwarf; Crete – Kyle Manley; Crete – Brian Schmidt; Curtis – Doug Schultz; Fort Morgan – Brent Nation; Fort Morgan – Jeff Wells; Grant – Edward Dunn; Indianola – Chris DesPlanques; Kimball – Dan Dean; Mitchell – Perry Mader; Morrill – Nate James; Nebraska City – Jeff Kohrs; Nebraska City – Daniel Patton; Pender – Matt Torczen; Pierce – Chad Anderson; Pierce – Dave Hrabanek; Shickley – Barthold Brinkman; Sidney – Mike Palmer; Stuart – Bob Lockmon; Waverly – Darrel Wenzel; West Point – Bruce Schlecht; and Yuma – John Prettyman.

NMPP staff: Beth Ackland, Rich Andrysik, Carol Brehm, Tim Cerveny, Shannon Coleman, Chris Dibbern, Bruce Doll, Rich Eymann, Brad Hans, Mandy Hansen, Joe Hoebelman, Kara Hunt, Jamie Johnson, Sarah Jones, Jill Jones, Kyle Kaldahl, Michelle Lepin, Bob Poehling, Kim Schafers, Tim Sutherland, Candy Thomazin, and Andrew Ross.

Minutes

Minutes of the August 14, 2019 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the Power Supply Committee will be held on January 22, 2020 at the Younes Conference Center, Kearney, NE.

Consent Resolution

Motion: Jeremy Tarr moved to approve the consent resolution as presented. James DePue seconded the motion, which carried on a unanimous roll call vote.

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the August 14, 2019 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, January 22, 2020 at the Younes Conference Center in Kearney, Nebraska.*

MEAN RESOURCE PLANNING

Bob Poehling, Executive Director/CEO; Brad Hans, Deputy Director of Wholesale Electric Operations; and Shannon Coleman, Supervisor of Resource Planning and Analysis, provided information on MEAN's Resource Planning. Poehling discussed 2050 renewable energy and carbon neutral goals. He introduced Shannon Coleman who provided information on recent utility trends, external pressures, long-term future of MEAN's resource portfolio, and opportunities to achieve the stated goals.

Discussion was held.

CR ENERGY UPDATE

Brad Hans, Deputy Director of Wholesale Electric Operations, provided an overview of the Fort Morgan, Colorado, CR Energy Project, parameters, and, resource comparisons. Jeff Wells, Fort Morgan, Colorado, and CR Energy Representative Eric Johnson provided additional project information to the committee.

Discussion was held.

The MEAN Power Supply Committee recessed for break at 3:53 p.m. and resumed at 4:06 p.m.

The MEAN Power Supply Committee recommended the MEAN Board of Directors direct staff to negotiate a Power Purchase Agreement (PPA) with CR Energy for future Board approval.

Motion: *Jeremy Tarr moved to recommend that the MEAN Board of Directors direct staff to negotiate a Power Purchase Agreement (PPA) with CR Energy for future Board approval. Chris Rodman seconded the motion, which carried unanimously on a roll call vote.*

RENEWABLE DISTRIBUTED GENERATION POLICY CAP

Rich Andrysik, Distributed Resources & Generation Specialist, reviewed the following proposed change to the MEAN Renewable Distributed Generation Policy.

Proposal: Modify the DG Policy by striking two percent (2%) and inserting five percent (5%) in the definition of Cap as follows:

> *The Cap shall be the greater of (i) five percent (5%) ~~two percent (2%)~~ of the TRP's most recent three-year historical average annual kWh load (based on MEAN's fiscal year) served by MEAN (excluding any non-MEAN resources including without limitation firm electric service from Western Area Power Administration or electrical output from facilities owned or purchased by the TRP with approval of the MEAN Board of Directors) or (ii) the energy generated by 100 kW ("Cap").*

Discussion was held.

Motion: *James DePue moved to approve the resolution as presented. Will Dowis seconded the motion, which carried unanimously on a roll call vote.*

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, a proposed change to the Cap under the DG Policy for permitted offsets to the MEAN Energy Charge was previously distributed to the MEAN Power Supply Committee for review.

NOW THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors modify the DG Policy by striking two percent (2%) and inserting five percent (5%) in the definition of Cap as follows:

> *The Cap shall be the greater of (i) five percent (5%) ~~two percent (2%)~~ of the TRP's most recent three-year historical average annual kWh load (based on MEAN's fiscal year) served by MEAN (excluding any non-MEAN resources including without limitation firm electric service from Western Area Power Administration or electrical output from facilities owned or purchased by the TRP with approval of the MEAN Board of Directors) or (ii) the energy generated by 100 kW ("Cap").*

WESSINGTON SPRINGS WIND REPOWER

Shannon Coleman, Supervisor Resource Planning & Analysis, reviewed the following approval request of a 10-year extension, with pricing reduction, due to the repower of Wessington Springs windfarm. The windfarm is located in Jerauld County, South Dakota.

Motion: *James DePue moved to approve the resolution as presented. Chris Rodman seconded the motion, which carried unanimously on a roll call vote.*

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") and the Heartland Consumers Power District entered into an agreement in 2008 under which MEAN agreed to purchase a portion of the output generated by the Wessington Springs Wind Project ("Wind Agreement") through February 24, 2029; and,

WHEREAS, NextEra, the owner of the Wessington Springs Wind Project, is repowering the facility with new generators that will have the same nameplate capacity but will have increased efficiency and will be able to generate more energy; and,

WHEREAS, Heartland Consumers Power District is extending its agreement with the owner to receive a reduced energy purchase price and has offered to reduce the energy purchase price charged to MEAN under the Wind Agreement effective as of January 1, 2020, provided that MEAN must agree to extend the Wind Agreement for an additional ten (10) year term through February 24, 2039.

NOW THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve an extension for a term of ten (10) years to the Wind Agreement with Heartland Consumers Power District, with reduced pricing to take effect on or about January 1, 2020.

ASSET MANAGEMENT POLICIES AND PROCEDURES MODIFICATIONS

Tim Cerveny, Manager of Resources & Transmission, led the discussion on the proposed changes to the ERPA Policies and Procedures, proposed to be renamed to Asset Management Policies and Procedures (Attachment E previously distributed with the meeting packet).

Motion: *Duane Hoffman moved to approve the resolution as presented. Bill Hinton seconded the motion, which carried unanimously on a roll call vote.*

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, proposed revisions to the Electrical Resources Pooling Agreement Policies & Procedures, including a name change to the Asset Management Policies and Procedures, were previously sent to the MEAN Power Supply Committee.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Asset Management Policies and Procedures as presented.

PARTICIPANT GENERATION UPDATE

Tim Cerveny, Manager of Resources & Transmission, provided an update on the role of Participant Generation in system reliability and continued the capacity compensation dialog.

Discussion was held.

ADJOURNMENT

There being no further business, the meeting adjourned at 4:51 p.m. (CT).

Submitted by:

Tim Sutherland
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:

Kim Schafers
Municipal Energy Agency of Nebraska

MEAN Power Supply Committee
November 20, 2019
Younes Conference Center
Kearney, NE

nmpp ENERGY NMPP | MEAN | NPGA | ACE

1

MEAN Resource Planning

Shannon Coleman
Supervisor Resource Planning & Analysis

Brad Hans
Deputy Director of Wholesale Power Supply

2

2050 Portfolio Goal



3

Other Utility Goals

- MidAmerican Energy*
  - 100% Renewable Energy by 2020
- PRPA
  - 100% Carbon-Free by 2030
- Xcel
  - Carbon-Free by 2050
- Tri-State
  - "Responsible Energy Plan"
- Pacificorp
  - Shutting Down Coal
- OPPD
  - Long Term Goal of 100% Renewable
- NPPD
  - Carbon Capture Technology
- Advanced Technologies

MidAmerican Energy
Platte River Power Authority
Xcel Energy
TRI-STATE
PACIFICORP
OPPD Omaha Public Power District
Nebraska Public Power District

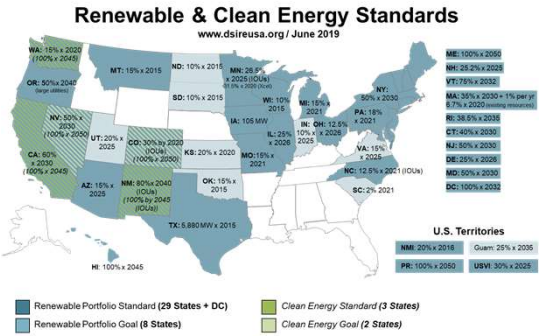
*MidAmerican Energy Company will generate renewable energy equal to 100 percent of its customers' usage on an annual basis.

4

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State Goals

- CA (2045), Washington DC (2032), HI (2045), NJ (2050), NM (2045), NV (2050), PR (2050), WA (2045)



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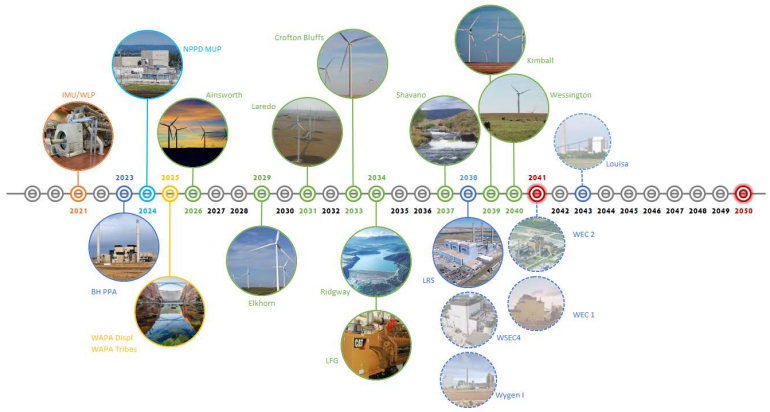
2050 Portfolio Goal

- 100% Carbon Neutral by 2050
  - "Carbon Neutral" = Net Zero Carbon Emissions
    - Eliminating Carbon Emissions or Balancing Emissions with Carbon Removal
  - How much carbon emission reduction can we achieve in MEAN's portfolio?
  - How can we offset our remaining carbon emissions?



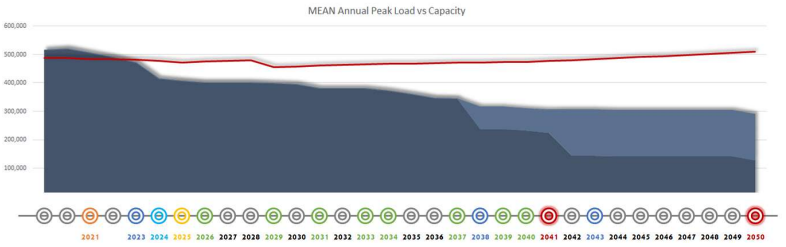
NMPP | MEAN | NPGA | ACE

Resource Timeline



NMPP | MEAN | NPGA | ACE

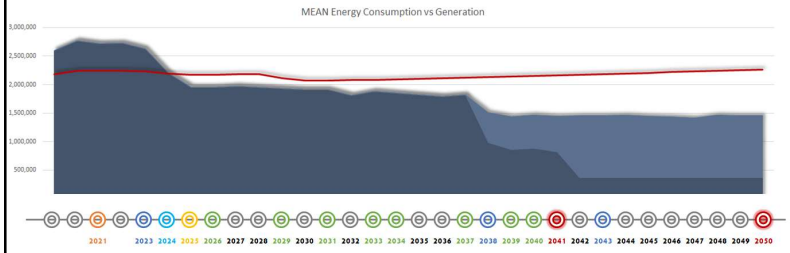
Capacity Timeline



Vision of the Future

NMPP | MEAN | NPGA | ACE

Energy Timeline



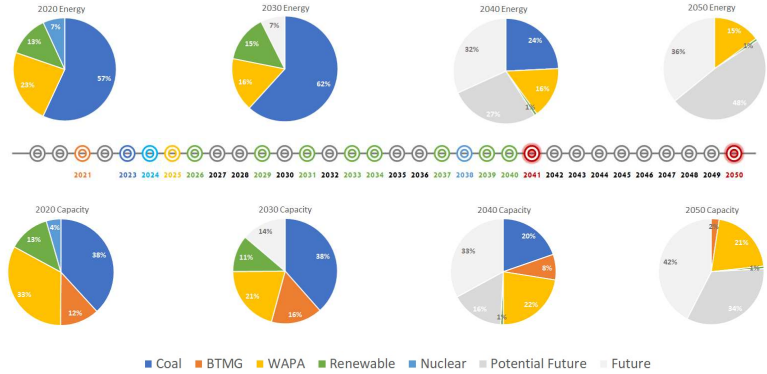
Vision of the Future

9

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Non-Carbon Portfolio Potential

- Current vs. Potential Future



10

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Direction of the 2017 IRP

B. Proposed Future Resource Portfolios

1. Committee Recommendation and Board Approval

Following the presentation of the Phase II Economic Modeling results and the relative revenue requirements and cost variance risk of each proposed portfolio, the Power Supply Committee discussed the portfolios in light of the conclusions described above. Consequently, the Committee recommended to the Board the adoption of the IRP with the incorporation of a plan to pursue the following future portfolios by region:

SPP:

- Portfolio 1D – Identified Natural Gas Combined Cycle Plant
- Portfolio 7 – Extension of Generation Agent Arrangement
- Portfolio 8 – Wind and Participant Owned Generation
- Portfolio 9 – Solar and Participant Owned Generation

West:

- Portfolio 1 – Natural Gas Combined Cycle Plant
- Portfolio 7 – Wind and Participant Owned Generation
- Portfolio 8 – Solar and Participant Owned Generation
- Portfolio 9 – CES and Participant Owned Generation

The Board unanimously voted to approve the resolution to accept this recommendation from the Power Supply Committee.

Direction of the 2022 IRP??

11

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Future Options

- Additional Wind Resources
  - SPP PPAs = $12-15/MWh (as low as 10 MW)
  - West PPAs = $21-32/MWh (~50 MW)
- New Solar Resource
  - Recent Pricing = $25-60/MWh
  - Purchase via Subcontract
- CR Energy Project
  - Renewable, Flexible (RNG)
- West Hydro Resources
- Community Solar





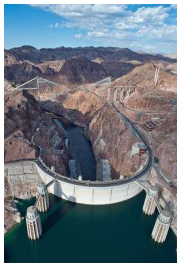


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WAPA Displacement

- Agreement currently expires in 2024
- Carbon free resource, 62 MW Capacity offset in east by Member gen
- Initiated discussions with WAPA for future considerations
- Opportunity to consolidate some arrangements with WAPA
- Dependent on future market construct in the west
- Value through pricing and flexibility



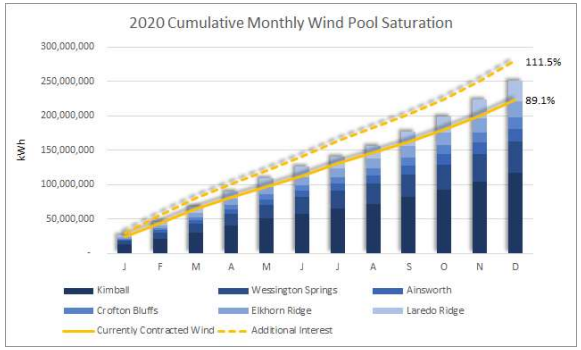
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MEAN Wind Pool

- Current Subscription = 89.1% of projected annual generation
- With Additional Interest = 112% of projected annual generation



*Generation includes additional energy production from Wessington Springs repower.

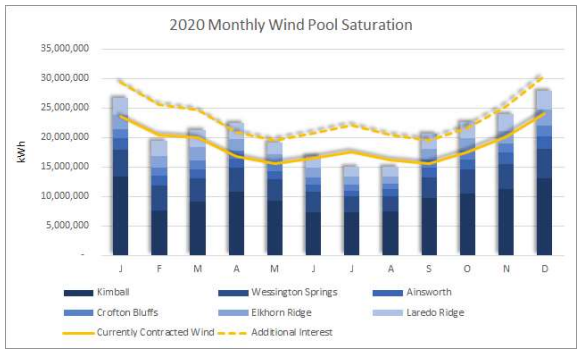
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MEAN Wind Pool

- Annual Shortage for Additional Interest ≈ 29,014 MWh
- At 40% CF = 8.3 MW
- At 45% CF = 7.4 MW
- Future decrease in wind rates may increase subscription interest

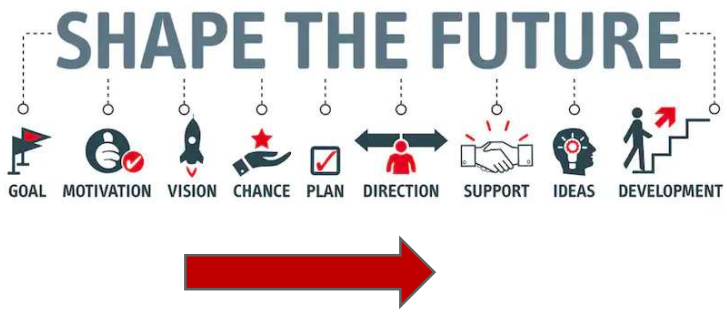


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2050 Portfolio Goal

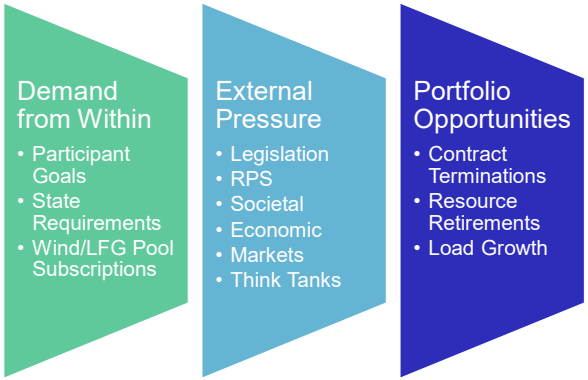


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Drivers of Change



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Building the Future

Principles and Pathways

- Maintain Contractual Relationships for those already in the Wind and LFG pools
- Consider moratorium of Wind and LFG pools
  - Consideration of active requests
  - 2023/24 portfolio opportunities
- Look at the transition to 2050 and balance Participant needs
  - Local demands
  - Sufficient with MEAN's plan
- Research an interim program for the Wind and LFG pools
  - JAA best practices
  - Participant needs and desires
- Follow the DG Policy model for development

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MEETING NOTICE

NOTICE IS HEREBY GIVEN that a meeting of the Board of Directors of the Municipal Energy Agency of Nebraska will be held Thursday, November 21, 2019 at 9:30 a.m. (CT), at the Younes Conference Center, Kearney, NE. NOTICE IS FURTHER HEREBY GIVEN that if a quorum of the Board of Directors is not present, a meeting of the Executive Committee of the Board of Directors of the Municipal Energy Agency of Nebraska will be called to order at 9:30 a.m. (CT) on Thursday, November 21, 2019 at the Younes Conference Center, Kearney, NE.

A copy of the agenda is posted upon issuance, kept continually current, and is also available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Dr., Lincoln, Nebraska. The meeting is open to the public. If you require assistance or special accommodations in order to attend the meeting, please contact Kim Schafers at (402) 474-4759.

Agenda
Board of Directors and
Executive Committee
Municipal Energy Agency of Nebraska
Younes Conference Center - Kearney, Nebraska
November 21, 2019 – 9:30 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act 84-1412 (8)
   B. Roll Call
      1) Board of Directors
      2) Executive Committee

2. Chairman's Remarks

3. Reports
   A. Executive Director
   B. Director of Wholesale Electric Operations

4. Consent Agenda
   A. Minutes of the August 15, 2019 meeting
   B. Fiscal Year 2019-2020 Year-to Date Financial Report
   C. Next meeting
   D. Consent Resolution

5. Committee Reports and Recommendations
   A. Power Supply Committee
      1) Power Supply Committee Meeting Summary of November 20, 2019
      2) CR Energy
      3) Asset Management Policies and Procedures Modifications (Attachment B)
      4) Renewable Distributed Generation Policy Cap
      5) Wessington Spring Repower
   B. Governance Review Committee
      1) Governance Review Committee Meeting Summary of November 20, 2019
   C. Finance Committee
      1) Finance Committee Meeting Summary of November 20, 2019
      2) Financial and Administrative Policies and Guidelines Modifications (Attachment F)
   D. Services Committee
      1) Services Committee Meeting Summary of November 20, 2019
   E. Risk Oversight Committee
      1) Risk Oversight Committee Meeting Summary of November 20, 2019

6. PPGA Board of Directors Representative

7. Consider and Approve City of Wood River Request to Withdraw Membership and Terminate Participation in the Electrical Resources Pooling Agreement

8. Consider and Approve Oak Creek

9. MEAN Board Meeting Location Comparison Costs

10. Federal Securities Law Requirements-Annual Board Training

11. Updates and Reports
    A. Western Energy Imbalance Service (WEIS) Update
    B. NMPP Energy Annual Conference Update
12. Contracts, Settlement Agreements, and General Counsel Report
    A. Contracts Report
    B. Legislative and Legal Updates
        1) State and Federal Activities

13. Closing Comments

14. Adjourn

Approved Minutes of Meeting
Executive Committee of the MEAN Board of Directors
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
Thursday, November 21, 2019

The MEAN Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) was scheduled to meet Thursday, November 21, 2019 at the Younes Conference Center, Kearney, NE. Notice of the Board of Directors and Executive Committee meeting was given to Directors and Alternate Directors by e-mail and/or mail and the public was advised by publication in the Lincoln *Journal-Star* newspaper. The notice and agenda were posted upon issuance at the NMPP Energy office in Lincoln, Nebraska, and kept continually current.

CALL TO ORDER

Chairman Tom Goulette called the MEAN Board of Directors meeting to order at 9:34 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public. Due to lack of quorum of the MEAN Board of Directors, the MEAN Executive Committee was called to order at 9:35 a.m. (CT).

EXECUTIVE COMMITTEE ROLL CALL

A quorum was declared with six of the seven Executive Committee Members in attendance.

1. Tom Goulette, West Point
2. Bill Hinton, Kimball
3. Tom Ourada, Crete
4. Doug Schultz, Curtis
5. Jeff Wells, Fort Morgan
6. Darrel Wenzel, Waverly

Executive Committee Member not in attendance: Adam Suppes, Delta

Others in attendance: Anderson, Chad; Brinkman, Barthold; Criss, Mike; Davison, Pat; Dean, Dan; DePue, James; DesPlanques, Chris; Dickman, Joe; Dowis, Will; Dunn, Edward; Goulette, Tom; Hinton, Bill: Hoffman, Duane; Hrabenek, Dave; James, Nathan; Janssen, Nancy; Johnson, Eric; Kalkwarf, Mike; Kohrs, Jeff; Langhorst, Matt; Lockmon, Bob; Manley, Kyle; McArthur, Jessy; McKain, Wendy; McNally, Joe; Moser, Bill; Nation, Brent; Ourada, Tom; Palmer, Mike; Patton, Dan; Prettyman, John; Rodman, Chris; Rundel, John; Schlecht, Bruce; Schultz, Doug; Sprock, Jeff; Tarr, Jeremy; Wells, Jeff; Wenzel, Darrel and Yavorski, Joe.

NMPP staff: Beth Ackland, Rich Andrysik, Carol Brehm, Tim Cerveny, Shannon Coleman, Chris Dibbern, Bruce Doll, Rich Eymann, Brad Hans, Joe Hoebelman, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle Kaldahl, Michelle Lepin, Bob Poehling, Kim Schafers, Tim Sutherland and Candy Thomazin.

CHAIRMAN'S REMARKS

Goulette noted that since there was not a quorum of the Board of Directors, the Executive Committee would be called to order.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, provided a report on the following items:

- The Joint Operating Committee (JOC) met November 6, 2019
- Adoption of Legislative 2020 Guidelines. The intent of the guidelines is to have a statement of legislative policy accepted by the NMPP Board of Directors on behalf of NMPP Membership. A copy of the Legislative 2020 Guidelines will be distributed with the meeting minutes.
- Successful transition with The Energy Authority (TEA) to outsource administrative services and settlement functions.
- Continued meetings with Nebraska State Senators regarding the value of public power
- Legislation work to simplify and modernize MEAN Governance
- Staff Community Visits-68 of 69 of MEAN Communities visited
- Nebraska City Utilities earned 1st place in the American Public Power Association's (APPA) Safety Award of Excellence for safe operating practices.
- Staff continue to work on opportunities to expand MEAN Services, Shared Resources, and Asset Management.
- Glenwood Springs, Colorado became the 7th U.S. City to reach its 100% renewable energy goal June 1, 2019. Two of the seven U.S. Cities to reach 100% renewable energy goals are MEAN Members. Aspen, Colorado became the 3rd City in the U.S. to reach 100% renewable in 2015.
- 2019 Capability Testing. Testing reliability achieved 95%.
- Continued focus on Western Energy Imbalance Service (WEIS)
- 2050 Portfolio Renewable and Carbon Neutral Goals

Director of Wholesale Electric Operations

Tim Sutherland, Director of Wholesale Electric Operations, provided the following report on the status of MEAN projects:

- Executed contracts between MEAN and the Town of Center, Colorado
- Value of Service Schedule J's
- Monitoring of Transmission Costs

CONSENT AGENDA

Minutes

Minutes of the August 15, 2019 Municipal Energy Agency of Nebraska (MEAN) Board of Directors and Management Committee were previously distributed. There were no changes to the minutes.

Fiscal Year 2019-2020 Year-to Date Financial Report

Jamie Johnson, Director of Finance & Accounting, summarized results for MEAN's Fiscal Year 2019-2020 Year-to-date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet; cash and investments; and fiscal year-to-date operating results. MEAN financials for July, August, and September 2019 were previously distributed.

Next Meeting

Chairman Goulette stated that the next meeting of the MEAN Board of Directors is scheduled Thursday, January 23, 2020 at the Younes Conference Center, Kearney, Nebraska.

Motion: *Jeff Wells moved to approve the following Consent Resolution. Tom Ourada seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the minutes of the Board and Management Committee of the August 15, 2019 meeting are hereby approved; and,*

2. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the financial statements for July, August, and September 2019 are hereby accepted; and,*

3. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the next meeting will be held on Thursday, January 23, 2020 at the Younes Conference Center, Kearney, Nebraska.*

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Governance Review, Finance, Power Supply, and Services Committees met on November 20, 2019.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of November 20, 2019

Brad Hans, Deputy Director of Wholesale Electric Operations, provided a recap of topics covered at the November 20, 2019 meetings. Hans summarized the following items:

- MEAN's 2050 Portfolio Discussion
- Future Power Supply Considerations
- Wind Pool Requests
- Building the Future

CR Energy

Brad Hans, Deputy Director of Wholesale Electric Operations, provided an overview of the Fort Morgan, Colorado, CR Energy Project, parameters, and, resource comparisons. Jeff Wells, Fort Morgan, Colorado, provided additional project information to the Board.

The MEAN Power Supply Committee recommended the MEAN Board of Directors direct staff to negotiate a Power Purchase Agreement (PPA) with CR Energy for future Board approval.

Motion: *Darrel Wenzel moved to recommend that the Executive Committee of the MEAN Board of Directors direct staff to negotiate a Power Purchase Agreement (PPA) with CR Energy for future Board approval. Doug Schultz seconded the motion, which carried unanimously on a roll call vote.*

Asset Management Policies and Procedures Modifications

Tim Cerveny, Manager of Resources & Transmission, led the discussion on the proposed changes to the ERPA Policies and Procedures, proposed to be renamed to Asset Management Policies and Procedures (Attachment E previously distributed with the meeting packet).

The MEAN Power Supply Committee recommended the MEAN Board of Directors approve the following Resolution.

Motion: *Doug Schultz moved to approve the resolution as presented. Tom Ourada seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, proposed revisions to the Electrical Resources Pooling Agreement Policies & Procedures, including a name change to the Asset Management Policies and Procedures, were previously sent to the MEAN Board of Directors.

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that the Asset Management Policies and Procedures are approved as presented.

Renewable Distributed Generation Policy Cap

Rich Andrysik, Distributed Resources & Generation Specialist, reviewed the following proposed change to the MEAN Renewable Distributed Generation Policy, for consideration by the MEAN Power Supply Committee and the MEAN Board of Directors. The change would revise the DG Cap for permitted offsets to the MEAN Energy Charge.

Proposal: Modify the DG Policy by striking two percent (2%) and inserting five percent (5%) in the definition of Cap as follows:

The Cap shall be the greater of (i) five percent (5%) ~~two percent (2%)~~ of the TRP's most recent three-year historical average annual kWh load (based on MEAN's fiscal year) served by MEAN (excluding any non-MEAN resources including without limitation firm electric service from Western Area Power Administration or electrical output from facilities owned or purchased by the TRP with approval of the MEAN Board of Directors) or (ii) the energy generated by 100 kW ("Cap").

Discussion was held.

The MEAN Power Supply Committee recommended the MEAN Board of Directors approved the resolution as presented.

Motion: *Tom Ourada moved to approve the resolution as presented. Darrel Wenzel seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, a proposed change to the Cap under the DG Policy for permitted offsets to the MEAN Energy Charge was previously distributed to the MEAN Board of Directors.

NOW THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that the DG Policy shall be modified by striking two percent (2%) and inserting five percent (5%) in the definition of Cap as follows:

The Cap shall be the greater of (i) five percent (5%) ~~two percent (2%)~~ of the TRP's most recent three-year historical average annual kWh load (based on MEAN's fiscal year) served by MEAN (excluding any non-MEAN resources including without limitation firm electric service from Western Area Power Administration or electrical output from facilities owned or purchased by the TRP with approval of the MEAN Board of Directors) or (ii) the energy generated by 100 kW ("Cap").

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that staff is authorized and directed to make the necessary changes to incorporate this revision throughout the DG Policy.

Wessington Springs Wind Repower

Shannon Coleman, Supervisor Resource Planning & Analysis, reviewed the following approval request of a 10-year extension, with pricing reduction, due to the repower of Wessington Springs windfarm. The windfarm is located in Jerauld County, South Dakota.

The MEAN Power Supply Committee recommended the MEAN Board of Directors approve the resolution as presented.

Motion: *Darrel Wenzel moved to approve the resolution as presented. Doug Schultz seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") and the Heartland Consumers Power District entered into an agreement in 2008 under which MEAN agreed to purchase a portion of the output generated by the Wessington Springs Wind Project ("Wind Agreement") through February 24, 2029; and,

WHEREAS, NextEra, the owner of the Wessington Springs Wind Project, is repowering the facility with new generators that will have the same nameplate capacity but will have increased efficiency and will be able to generate more energy; and,

WHEREAS, Heartland Consumers Power District is extending its agreement with the owner to receive a reduced energy purchase price and has offered to reduce the energy purchase price charged to MEAN under the Wind Agreement effective as of January 1, 2020, provided that MEAN must agree to extend the Wind Agreement for an additional ten (10) year term through February 24, 2039; and,

NOW THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors, that staff is hereby authorized to negotiate an extension for a term of ten (10) years to the Wind Agreement with Heartland Consumers Power District, with reduced pricing to take effect on or about January 1, 2020.

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors, that the Executive Director is hereby authorized to execute and deliver the extension agreement, subject to final legal and management review.

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors, that the Executive Director of MEAN is hereby authorized to do any and all things and to execute and deliver any and all documents which he deems necessary or advisable in order to consummate the execution and delivery of the Wind Agreement extension. Notwithstanding any provision of this Resolution authorizing the Executive Director to take any action or execute any document to the contrary, in the absence of the Executive Director or in lieu of the Executive Director, the person designated in writing by the Executive Director, may take such action or execute such document with like effect as fully as though named in this Resolution instead of the Executive Director.

MEAN GOVERNANCE REVIEW COMMITTEE

MEAN Governance Review Committee Meeting Summary of November 20, 2019

Chris Dibbern, General Counsel, provided a recap of topics covered at the November 20, 2019 Governance Review Committee meeting. Dibbern summarized the following items:

- Governance Documents
  - General Terms and Conditions of Service
  - Asset Management Policies and Procedures modifications
- Suggested Legislative Changes
- Membership Criteria
- Timeline of Service Schedule M and Exhibit D

FINANCE COMMITTEE

Finance Committee Meeting Summary of November 20, 2019

Jamie Johnson, Director of Finance and Accounting, provided a recap of topics covered at the November 20, 2019 meeting. Johnson summarized the debt strategy session discussion.

Financial and Administrative Policies and Guidelines Modifications

Jamie Johnson, Director of Finance and Accounting, conducted an annual review of the MEAN Financial and Administrative Policies and Guidelines. The document with redlined changes was previously distributed with the meeting packet as *Attachment F*. A revised version of the Financial and Administrative Policies and Guidelines was presented to the MEAN Finance Committee at its meeting on November 20, 2019. To allow additional time to review the revised version, no action was taken by the committee and was deferred to the MEAN Board of Directors for consideration and approval. Johnson noted one additional suggested change during the discussion.

Staff recommended the MEAN Board of Directors approve the resolution as presented.

Motion: *Doug Schultz moved to approve the resolution as presented. Darrel Wenzel seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted the MEAN Financial and Administrative Policies and Guidelines; and,

WHEREAS, proposed changes to the MEAN Financial and Administrative Policies were previously distributed to the MEAN Board of Directors for review.

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that the MEAN Financial and Administrative Policies and Guidelines shall be amended to include the changes as presented.

SERVICES COMMITTEE

Services Committee Meeting Summary of November 20, 2019

Jeremy Tarr, Services Committee Chair, provided a recap of topics covered at the November 20, 2019 Services Committee meeting. Tarr reported on new and existing MEAN Efficiency Program updates along with an O & M Specialist activities report.

RISK OVERSIGHT COMMITTEE

The November 20, 2019 Risk Oversight Committee meeting was cancelled. The next meeting will be held jointly with the Finance Committee on December 11, 2019 at NMPP Energy, Lincoln, Nebraska.

PPGA Board of Directors Representative

The Bylaws of the Public Power Generation Agency (PPGA) require that the appointment of its board members be approved by the governing body of each of the PPGA member organizations. As a result, MEAN must appoint a PPGA board representative.

Staff recommended that the MEAN Board of Directors approve the following resolution as presented.

Motion: *Jeff Wells moved to approve the resolution as presented. Doug Schultz seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska (the "Member") is a party to the Interlocal Agreement creating the Public Power Generation Agency (PPGA) and, pursuant to the terms of said Agreement, it is the responsibility of the governing body of the Member to designate a representative to the PPGA Board of Directors provided for under the terms of said Agreement;

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that pursuant to Section 3.02 of the PPGA Bylaws, the Executive Director of said Member is hereby directed to give written notice to PPGA of the appointment of Robert Poehling, Executive Director/CEO of MEAN, as the Member's representative to said PPGA Board of Directors.

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that Robert Poehling, Executive Director/CEO of said Member be, and hereby is, authorized by the Member to appoint an Alternate Director to PPGA on behalf of the Member according to the terms and provisions of Section 3.02 of the PPGA Bylaws ("Authorized Individual").

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the "Director Appointment Form For Public Power Generation Agency", attached hereto, is hereby approved, including without limitation the resolutions therein.

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the powers and authority granted by these resolutions shall continue in full force and effect until written notice is given to the Assistant Secretary Treasurer of PPGA of the cancellation or modification thereof. Pursuant to the bylaws of PPGA, these resolutions shall be effective upon delivery of the "Director Appointment Form For Public Power Generation Agency" to the Assistant Secretary Treasurer of PPGA.

The MEAN Board of Directors recessed for break at 10:52 a.m. and reconvened at 11:02 a.m.

MEAN Charter Amendments

Chris Dibbern, General Counsel, led the discussion on the proposed amendments to MEAN's Charter.

Town of Oak Creek, Colorado – Request to join as a participating Municipality in the MEAN Charter with representation on the MEAN Board of Directors. In October 2019, the Town of Oak Creek, Colorado approved joining as a participating municipality in MEAN's Charter and becoming a Board Member of MEAN. The Town has requested membership on the MEAN Board of Directors. Oak Creek is located in Routt County, Colorado.

City of Wood River, Nebraska – Request to Withdraw Membership and Terminate Participation in the Electrical Resources Pooling Agreement. The City has approved withdrawing as a participating Municipality on the MEAN Board of Directors and the ERPA Management Committee.

Article II, Section 2.03 of the ERPA states, in part:

"Any Participant may terminate its participation in this Agreement by two year's written notice to MEAN, which will then send written notice to all other Participants notifying them of the termination…"

Accordingly, this report serves as written notice to all MEAN Participants that the City of Wood River, Nebraska has provided to MEAN written notice of the City's termination of participation in the ERPA. Termination will be effective two years from the May 8, 2019 date of notice from the City unless the MEAN Board of Directors waives the two-year notice requirement.

Staff recommended the MEAN Board of Directors approve the following resolution as presented.

Motion: *Tom Ourada moved to approve the resolution as presented. Jeff Wells seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Town of Oak Creek, Colorado, has passed an ordinance to become a member of MEAN and serve on the MEAN Board of Directors; and,

WHEREAS, the City of Wood River, Nebraska, has provided MEAN with written notice to terminate the City's participation in the Electrical Resources Pooling Agreement (ERPA), and has passed an ordinance to withdraw as a member of MEAN and to relieve the City's director and alternate director from service on the MEAN Board of Directors; and,

WHEREAS, following approval by the Executive Committee of the MEAN Board of Directors and receipt of all necessary documents from the Town of Oak Creek and the City of Wood River, a petition to amend the Petition for Creation and MEAN's Charter to provide for the addition of the Town of Oak Creek, and to provide for the withdrawal of the City of Wood River, as a participating municipality, will be submitted to the Nebraska Power Review Board for final approval.

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that staff is authorized to do all things necessary to file a petition to amend the Petition for Creation and MEAN's Charter to add the Town of Oak Creek, Colorado, as a participating municipality, and to remove the City of Wood River, Nebraska, as a participating municipality, and submit the petition to the Nebraska Power Review Board.

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the Town of Oak Creek, Colorado, be accepted as a participating municipality of MEAN, pending receipt of all necessary documents and subject to approval by the Nebraska Power Review Board.

BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that, the two-year notice requirement for termination of participation in the ERPA is waived for the City of Wood River, Nebraska, with termination to be effective as of November 22, 2019.

MEAN Board Meeting Location Comparison Costs

Jamie Johnson, Director of Finance and Accounting, summarized meeting location costs for Kearney, Nebraska and Lincoln, Nebraska.

Discussion was held. No further action was taken.

Federal Securities Law Requirement-Annual Board Training

Jamie Johnson, Director of Finance and Accounting, presented on Federal Tax and Securities Law. Johnson stated that the annual Board training was being conducted in accordance with MEAN's Bond Compliance Policy. A training sign-in sheet was distributed.

UPDATES AND REPORTS

Staff provided updates and reported on the following:

Western Energy Imbalance Service (WEIS) Potential Participation

Michelle Lepin, Associate General Counsel, provided an update on the status of development of the Western Energy Imbalance Service (WEIS) Market. The Southwest Power Pool, Inc. will administer the WEIS. SPP issued the following news release on September 9, 2019.

Three regional utilities announce decision to join Southwest Power Pool market

Basin Electric Power Cooperative, Tri-State Generation and Transmission Association, and the Western Area Power Administration (WAPA) announced September 9 their decision to join Southwest Power Pool's (SPP) Western Energy Imbalance Service (WEIS) market.

When SPP launches the WEIS in February 2021, it will become the market administrator for these and potentially other utilities in the west. The market will centrally dispatch energy from these participants throughout the region every five minutes, enhancing both the reliability and affordability of electricity delivery from utilities to their customers.

MEAN is seeking to join the WEIS but first had a few questions about the agreement, costs, exit fees and voting structures. An energy imbalance market could be helpful to western players and could lead to a Regional transmission organization in the future which might be a real-time market.

"We are committed to seeking mutually beneficial partnerships consistent with sound business principles," said WAPA Administrator and CEO Mark A. Gabriel in a news release. "With the pace of change in the electric industry increasing, generation options evolving, and pressing needs regarding balancing area operations, we have a need to look at different market structures for WAPA's diverse customers and needs. Our goal is to keep our value at the highest level while adhering to our core value to do what is right."

WAPA's agreement includes the firm electric service loads and resources of Pick-Sloan Missouri Basin Program–Eastern Division, Loveland Area Projects and Salt Lake City Area Integrated Projects, in the Upper Great Plains Western Area Balancing Authority (WAUW) and Western Area Colorado Missouri Balancing Authority (WACM) footprints. For those reasons MEAN is very interested in the project.

As the market's administrator, SPP will maintain the reliability of the region's transmission system and meet demand with the most cost-effective generation available, reducing wholesale electricity costs for participants. Like SPP's previous markets, the WEIS will provide price transparency of wholesale energy, allow parties to trade bilaterally and hedge against costly transmission congestion. SPP is accepting commitments from additional customers to be included in the market's initial go-live through October 25, 2019. SPP is committed to the long-term success of the WEIS and plans to operate under a Western Joint Dispatch Agreement, which guarantees participants a say in the market's ongoing evolution. Utilities do not have to be a member of the SPP regional transmission organization (RTO) to participate.

An overview of the WEIS' design is available at www.spp.org/weis.

NMPP Energy Annual Conference Update

Carol Brehm, Member Relations Representative, provided an update on the 2020 NMPP Energy Annual Conference. The conference will be held March 24-26, 2020 at the Marriott Cornhusker Hotel, located in Lincoln, Nebraska. Additional information including registration will be made available at a later date.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports, State, and Federal News. Summaries of the following agreements were included in the previously distributed meeting packet:

- Western Area Power Administration Contract No. 19-RMR-3022 for WACM Subentity Reserve Sharing Agreement
- Western Area Power Administration Confirmation Agreement No. 19-RMR-3059 to Contract 87-LAO-193 regarding Interconnected Operation of Power Systems
- Black Hills Wyoming, LLC Amended and Restated Wygen I Ownership Agreement and Amended and Restated Wygen I Operating Agreement

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, provided closing comments. Poehling thanked attendees for their attendance. He noted the importance of having meeting quorum and stated that the next MEAN Committee and Board meetings are scheduled January 22-23, 2020 in Kearney, Nebraska.

ADJOURNMENT

There being no further business, the meeting adjourned at 11:39 a.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:

Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

MEAN Board of Directors Executive Committee

November 21, 2019

Municipal Energy Agency of Nebraska

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Power Supply Committee

Summary of November 20, 2019 Meeting

MEAN Staff

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Power Supply Committee Meeting Summary

- 2050 Portfolio Goal
- Future Power Supply Considerations
- Wind Pool Requests
- Building the Future
- PSC Considerations:
  - CR Energy
  - Asset Management Policies & Procedures
  - DG Policy Cap
  - Wessington Springs Repower











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MEETING NOTICE

NOTICE IS HEREBY GIVEN that a meeting of the MEAN Power Supply Committee of the Municipal Energy Agency of Nebraska will be held Wednesday, January 22, 2020 at 1:30 p.m. (CT) at the Younes Conference Center, Kearney, NE. A teleconference option will be available. Public Building addresses of meeting attendees are as follows:

COLORADO – 500 Doolittle Dr., Aspen, CO

NEBRASKA – 324 Laramie Avenue, Alliance, NE; 8377 Glynoaks Drive, Lincoln, NE; 416 W Talmadge Rd, Kearney, NE.

A copy of the agenda is posted upon issuance, kept continually current, and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska. The meeting is open to the public. If you require assistance or special accommodations in order to attend the meeting, please contact Kim Schafers at (402) 474-4759.

Agenda
Power Supply Committee
with Teleconference Option
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
January 22, 2020 – 1:30 p.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda
   A. Approval of minutes from the November 20, 2019 meeting
   B. Next meeting
   C. Consent Resolution

3. Firm Power Interchange Service Agreement Renewals for Lake View, IA and Snyder, NE

4. Gunnison, CO Renewable Energy Purchase

5. CR Energy Purchase Power Agreement Update

6. MEAN Leased Capacity Compensation

7. Integrated Resource Planning-2050 Vision

8. Power Supply Committee Adjourn

Approved Minutes
Power Supply Committee and Teleconference
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
January 22, 2020 – 12:30 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met Wednesday, January 22, 2020. Notice of the meeting was given to committee members by e-mail and/or mail and the public was advised by publication in the Lincoln *Journal-Star* newspaper. The notice and agenda were posted upon issuance at the NMPP Energy office in Lincoln, Nebraska, and kept continually current. A teleconference option was made available. Public Building addresses of meeting attendees were:

COLORADO – 500 Doolittle Dr., Aspen, CO

NEBRASKA – 324 Laramie Avenue, Alliance, NE; 8377 Glynoaks Drive, Lincoln, NE; 416 W Talmadge Rd, Kearney, NE

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 1:31 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with nine of the eleven committee members present.

1. Pat Davison, Imperial
2. James DePue, Wray
3. Will Dowis, Gunnison
4. Bill Hinton, Kimball
5. Duane Hoffman, Oxford
6. Matt Langhorst, Glenwood Springs
7. Adam Suppes, Delta
8. Tom Ourada, Crete
9. Jeremy Tarr, Broken Bow

Tom Goulette, Voting Ex-Officio

Absent: Chris Rodman, Wall Lake and Randy Woldt, Wisner.

**Attending and/or voting via teleconference*

Others in attendance: *Jeff Sprock – Alliance; Doug DeLaune – Arnold; Rick Rigel – ARPA; Tyler Christoff – Aspen;*Samantha Jackson – Bayard; Wayne Kautz – Bridgeport; Mitchell Lamm – Burwell;* Todd Kielkopf – Carlisle; Brenda Carnes – Crete; Mike Kalkwarf – Crete; Brian Schmidt – Crete; Doug Schultz – Curtis; Brent Nation – Fort Morgan; Edward Dunn – Grant; Chris DesPlanques – Indianola; Dan Dean – Kimball; Nate James – Morrill; Jim Knothe – Paxton; Jeff Kohrs – Nebraska City; Matt Torczon – Pender; Chad Anderson – Pierce; Bart Brinkman – Shickley; Mike Palmer – Sidney; Darrel Wenzel – Waverly; and John Prettyman – Yuma.

NMPP staff: Rich Andrysik, Carol Brehm, Tim Cerveny, Shannon Coleman, *Stephanie Daugherty, *Bruce Doll, Rich Eymann, Brad Hans, Mandy Hansen, Joe Hoebelman, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle Kaldahl, Michelle Lepin, *Gen Li, Brittany Millard, Bob Poehling, Andrew Ross, *Brandon Ryan, Kim Schafers, *Rich Small, Robin Spady, *Christine Stanley, Tim Sutherland, Candy Thomazin, and Kevin Wickham.

Minutes

Minutes of the November 20, 2019 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the Power Supply Committee will be held on May 20, 2020 at the Younes Conference Center, Kearney, NE.

Consent Resolution

Motion: *Jeremy Tarr moved to approve the consent resolution as presented. Pat Davison seconded the motion, which carried on a unanimous roll call vote.*

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the November 20, 2019 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, May 20, 2020 at the Younes Conference Center in Kearney, Nebraska.*

FIRM POWER INTERCHANGE SERVICE AGREEMENT RENEWALS FOR LAKE VIEW, IOWA AND SNYDER, NEBRASKA

Andrew Ross, Director of Retail Utility Services & Member Relations, discussed the service agreement renewal for Lake View, Iowa.

The City of Lake View, Iowa intends to or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a three-year term beginning June 1, 2021.

Motion: *Bill Hinton moved to approve the resolution as presented. Adam Suppes seconded the motion, which carried on a unanimous roll call vote.*

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the City of Lake View, Iowa, and MEAN expires May 31, 2021, and

WHEREAS, the City of Lake View, Iowa, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a three-year term beginning June 1, 2021, and

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the Village of Snyder, Nebraska, and MEAN expires May 31, 2021 ("Supplemental Agreement"), and

WHEREAS, the Village of Snyder, Nebraska, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a six-year term beginning June 1, 2020, which agreement will supersede and replace the existing Supplemental Agreement effective June 1, 2020.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Agreement for Firm Power Interchange Service between the City of Lake View, Iowa, and MEAN to be effective for a term of June 1, 2021 through May 31, 2024.

BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Agreement for Firm Power Interchange Service between the Village of Snyder, Nebraska, and MEAN to be effective for a term of June 1, 2020 through May 31, 2026.

After the vote, Power Supply Committee Chair, Tom Ourada, clarified that the resolution was intended to include both the City of Lake View, Iowa, and Snyder, Nebraska agenda items in one combined vote. Ross discussed the service agreement renewal for Snyder also. The Village of Snyder, Nebraska, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a six-year term beginning June 1, 2020, which agreement will supersede and replace the existing Supplemental Agreement effective June 1, 2020.

The Power Supply Committee chose to redo the motion and vote.

Motion: *Duane Hoffman moved to approve the resolution as presented. James DePue seconded the motion, which carried on a unanimous roll call vote.*

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the City of Lake View, Iowa, and MEAN expires May 31, 2021, and

WHEREAS, the City of Lake View, Iowa, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a three-year term beginning June 1, 2021, and

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the Village of Snyder, Nebraska, and MEAN expires May 31, 2021 ("Supplemental Agreement"), and

WHEREAS, the Village of Snyder, Nebraska, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a six-year term beginning June 1, 2020, which agreement will supersede and replace the existing Supplemental Agreement effective June 1, 2020.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Agreement for Firm Power Interchange Service between the City of Lake View, Iowa, and MEAN to be effective for a term of June 1, 2021 through May 31, 2024.

BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Agreement for Firm Power Interchange Service between the Village of Snyder, Nebraska, and MEAN to be effective for a term of June 1, 2020 through May 31, 2026.

GUNNISON, COLORADO RENEWABLE ENERGY PURCHASE

Brad Hans, Director of Wholesale Electric Operations, discussed the Gunnison, Colorado Renewable Energy Purchase. Hans reported that Gunnison made an official request in late October 2019 to get to 100% renewable via wind starting in 2020. This request was revised in early November 2019 based on remaining wind pool to get all available to bring them to 100% as additional wind becomes available. The agreement is designed to provide a variable product to Gunnison for wind power remaining in the pool after other wind contract commitments are provided.

Discussion was held.

Motion: *James DePue moved to approve the resolution as presented. Pat Davison seconded the motion, which carried on a unanimous roll call vote.*

MEAN POWER SUPPLY COMMITTEEE RESOLUTION

WHEREAS, the City of Gunnison, Colorado (City) desires to increase its purchase of renewable energy from the Municipal Energy Agency of Nebraska (MEAN) in an effort to become a "net-zero" utility; and,

WHEREAS, MEAN's Wind Resource Pool does not currently produce sufficient wind-generated electrical energy that would satisfy the City's remaining electrical energy requirements but at times may produce wind-generated electrical energy to serve a portion of City's remaining electrical energy requirements; and,

WHEREAS, representatives of the City have requested that MEAN notify the City representatives when additional wind-generated energy becomes available, to facilitate the City's purchase of additional power to meet its net-zero goal.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Fourth Supplemental Agreement for Wind-Generated Energy Purchase between MEAN and the City of Gunnison, Colorado.

BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve notifying the City's representatives when additional wind-generated energy becomes available, to facilitate the City's purchase of additional power to meet its net-zero goal.

CR ENERGY PURCHASE POWER AGREEMENT UPDATE

Tim Cerveny, Manager of Resources & Transmission, provided an update on the CR Energy project, which included an overview and next steps of the project.

MEAN LEASED CAPACITY COMPENSATION

Tim Cerveny, Manager of Resources & Transmission, led the discussion on MEAN Leased Capacity Compensation. The packet included a draft resolution to remove the distinction in capacity compensation Demand Rates for Service Schedule M Participants.

Discussion was held.

Motion: *Jeremy Tarr moved to recommend the MEAN Board of Directors increase the capacity compensation Demand Rate paid under Section 4. Capacity Commitment Compensation, Subsection 4.02, of the Schedule of Rates and Charges for Service Schedule M from $1.50/kW-month to $2.00/kW-month over a two-year period, as follows: $1.75/kW-month effective April 1, 2020 and $2.00/kW-month effective April 1, 2021. James DePue seconded the motion, which carried on a unanimous roll call vote.*

INTEGRATED RESOURCE PLANNING-2050 VISION

Bob Poehling, Executive Director/CEO, provided opening comments about MEAN's vision for carbon neutrality by 2050. Poehling turned the discussion over to Shannon Coleman, Supervisor, Resource Planning & Analysis. Coleman continued the discussion on MEAN's Integrated Resource Planning-2050 Vision and provided an overview of the proposed resolution for the Power Supply Committees consideration.

Discussion was held.

The Power Supply Committee recommended the MEAN Board of Directors approve the following resolution.

Motion: *James DePue moved to approve the resolution as presented. Pat Davison seconded the motion, which carried on a unanimous roll call vote.*

WHEREAS, MEAN is dedicated to its mission of providing reliable and affordable power supply to its Participant communities; and,

WHEREAS, MEAN is committed to assisting member communities in their desire and responsibility to balance environmental concerns with the duty to provide reliable, affordable power; and,

WHEREAS, MEAN's 2017 Integrated Resource Plan established a clear directive to pursue future resources that minimize economic and environmental impacts while maximizing local benefit and reliability of service; and,

WHEREAS, MEAN is committed to an ambitious vision of the future and recognizes the need for future integration and innovation with non-carbon resources;

NOW, THEREFORE, BE IT RESOLVED BY the Board of Directors that MEAN staff is authorized and directed to actively work toward the MEAN 2050 Vision of carbon neutrality by the year 2050 while holding paramount its mission to provide reliable and affordable power supply.

MEAN staff will work in collaboration with Participants to construct policies around resource planning, portfolio optimization, and emissions reduction that utilize our public principles and guidelines to support future actions to achieve the 2050 carbon neutral goal.

These policies in total will form the plan by which we will strive toward 2050. The final formation of the plan will culminate in MEAN's 2022 Integrated Resource Plan (IRP), which details MEAN's future resource needs and performs evaluations to determine the preferred resource plan. The actions pursuant to this plan will accumulate to achieve the final 2050 Goal of carbon neutrality.

MEAN's strategy to reach its net-zero carbon goal articulated in the 2050 Vision will include an "all-of-the-above" outlook. All viable resource options will be considered through MEAN's resource planning process using the same set of criteria and with the final goal of net zero carbon emissions. Any feasible options must maintain reliability and affordability of MEAN's power supply.
Progress toward the 2050 Vision will encounter the constraints of our existing resource portfolio and the limitations of current resource technology and grid infrastructure. The Board acknowledges that the following developments must be realized in advance of meeting the 2050 Vision:

- *Development of Dispatchable Renewable Baseload Energy Resources*
- *Increased Availability of Economical Energy Storage Solutions*
- *Affordable Deployment of Carbon Capture, Utilization, and Storage Technologies*
- *Market Structures to Effectively Accommodate Energy Storage*
- *Transmission Upgrades for Renewable and Distributed Generation Integration*
- *Introduction of an Organized Market in the West Region that Accommodates Carbon-Neutral Initiatives*
- *Widespread Installation of Advanced Metering for the Integration of Distributed Generation*
- *Economic Exit Strategies or Emissions Reduction Technologies at Existing Fossil-Fueled Resources*

ADJOURNMENT

There being no further business, the meeting adjourned at 3:33 p.m. (CT).

Submitted by:

Tim Sutherland
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:

Kim Schafers
Municipal Energy Agency of Nebraska

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MEAN Resource Planning

Shannon Coleman

Supervisor Resource Planning & Analysis

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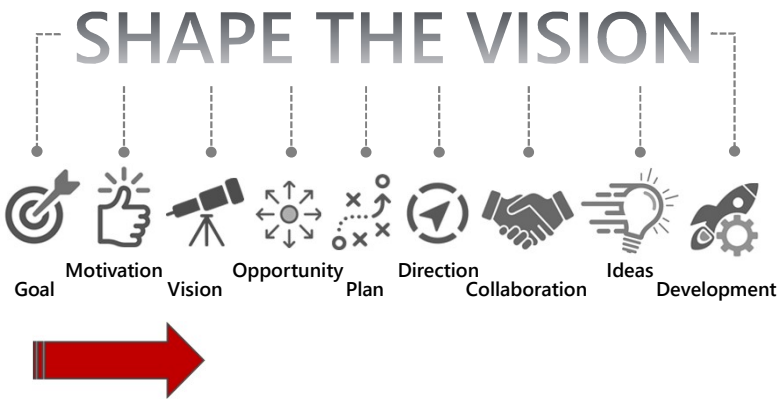
MEAN 2050 Vision

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2050 Vision



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2050 Portfolio Goal

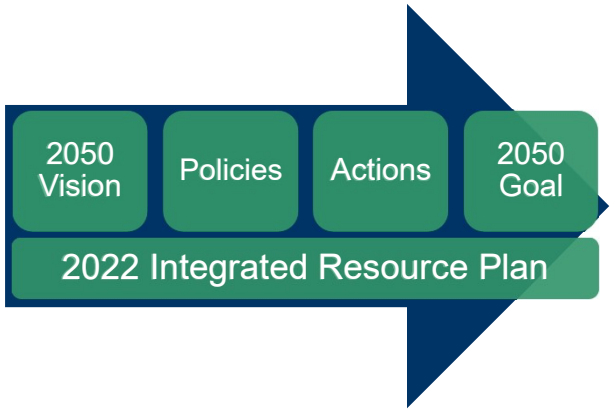
- 100% Carbon Neutral by 2050
  - "Carbon Neutral" = Net Zero Carbon Emissions
    - Eliminating Carbon Emissions or Balancing Emissions with Carbon Removal
  - How much carbon emission reduction can we achieve in MEAN's portfolio?
  - How can we offset our remaining carbon emissions?



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2050 Process



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Direction of the 2017 IRP

B. Proposed Future Resource Portfolios

1. Committee Recommendation and Board Approval

Following the presentation of the Phase II Economic Modeling results and the relative revenue requirements and cost variance risk of each proposed portfolio, the Power Supply Committee discussed the portfolios in light of the conclusions described above. Consequently, the Committee recommended to the Board the adoption of the IRP with the incorporation of a plan to pursue the following future portfolios by region:

SPP:

- Portfolio 1D – Identified Natural Gas Combined Cycle Plant
- Portfolio 7 – Extension of Generation Agent Arrangement
- Portfolio 8 – Wind and Participant Owned Generation
- Portfolio 9 – Solar and Participant Owned Generation

West:

- Portfolio 1 – Natural Gas Combined Cycle Plant
- Portfolio 7 – Wind and Participant Owned Generation
- Portfolio 8 – Solar and Participant Owned Generation
- Portfolio 9 – CES and Participant Owned Generation

The Board unanimously voted to approve the resolution to accept this recommendation from the Power Supply Committee.

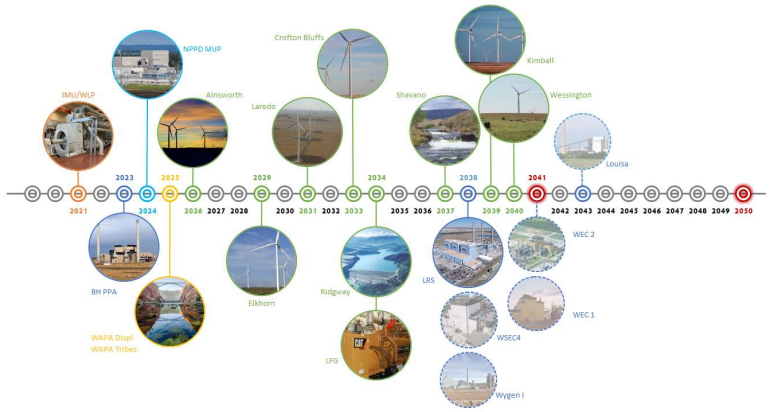
Direction of the 2022 IRP

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Resource Timeline

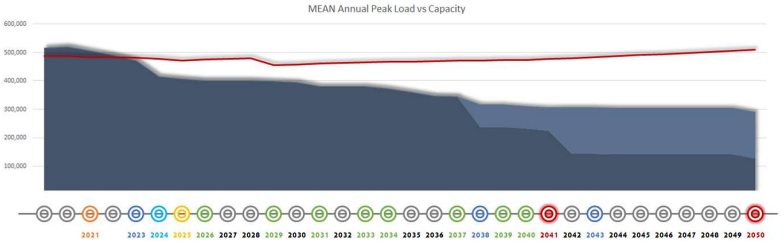


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Capacity Timeline



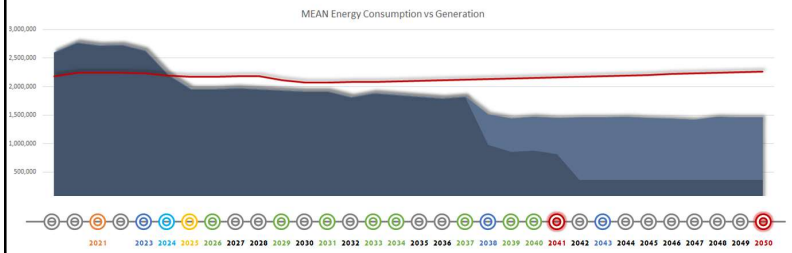
Vision of the Future

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Energy Timeline



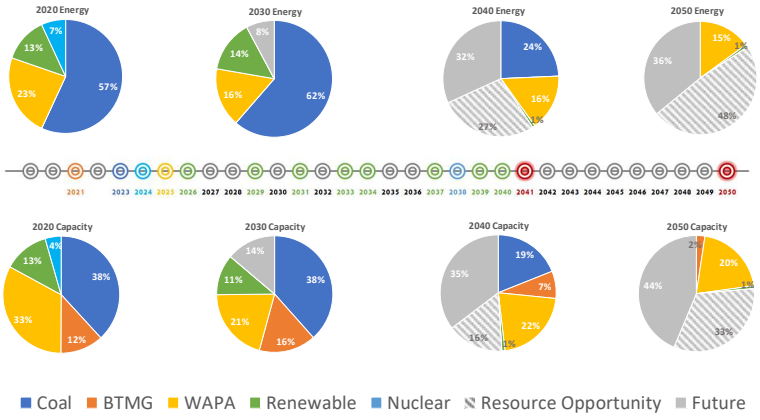
Vision of the Future

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Non-Carbon Portfolio Potential

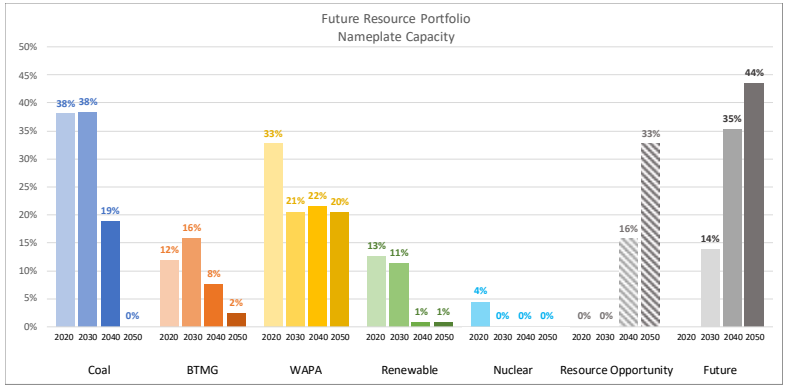


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Future Resource Portfolio - Capacity

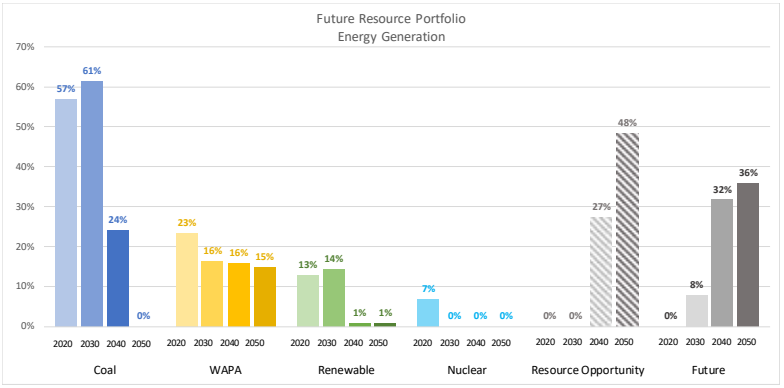


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Future Resource Portfolio - Energy



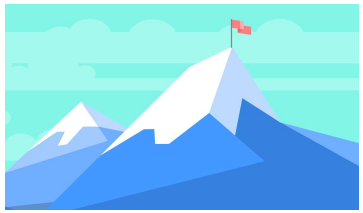
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MEAN's Mission

- Overarching Criteria for All Resource Decisions
  - Reliable Power Supply
  - Affordable Power Supply
  - Environmental Responsibility
  - Member Driven
- 2050 Vision Will Incorporate
- 2022 IRP Will Incorporate



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Identified Policies and Pathways

- 2022 IRP
- Western Energy Imbalance System
- CR Energy Pyrolysis Project
- Mt. Elbert Pumped Hydro Storage
- Load Growth
  - Marketing
  - Economic Development
  - Electrification
- DG Policy
- AMI
- Energy Efficiency and Demand Response



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Future Resource Options

- Additional Wind Resources
- New Solar Resources
  - Utility Scale via Subcontract
  - Community Solar
- CR Energy Project
  - Renewable, Flexible (RNG)
- West Hydro Resources
- Conversion of Fossil Fuel Plants
- Carbon Capture, Utilization, and Storage
- Future Technology







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Building the Future

Principles and Pathways

- Maintain Contractual Relationships for those already in the Wind and LFG pools
- Consider moratorium of Wind and LFG pools
  - Consideration of active requests
  - 2023/24 portfolio opportunities
- Look at the transition to 2050 and balance Participant needs
  - Local demands
  - Sufficient with MEAN's plan
- Research an interim program for the Wind and LFG pools
  - JAA best practices
  - Participant needs and desires
- Follow the DG Policy model for development

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Future Considerations

- Diversity
  - Fuel
  - Geography
  - Unit Size
- Risk
  - Fuel
  - Legislation/Regulation
  - Markets
  - Technology
- Marketing for Future Load
  - Growing Footprint
  - Electrification







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Limitations and Challenges

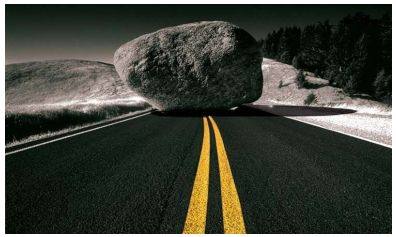
- Need for Baseload Resources/Capacity
- Economics of Non-Carbon Resources and Storage
- Existing Ownership
- Diversity of Participant Goals (Pool Structure)
- Intermittent Resource Integration
- Transmission Limitations
- Legislation – State and Federal
- Market Operations



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Necessary Future Developments

- Renewable Dispatchable Baseload
- Market Structure for Storage
- Economical Storage
- Emerging Technology
  - CCUS
  - Hydrogen
  - Modular Nuclear
- Transmission Investment
- Full Market in West?
- Exit Strategies for Ownerships



MEETING NOTICE

NOTICE IS HEREBY GIVEN that the annual meeting of the Board of Directors and meeting of the Executive Committee of the Municipal Energy Agency of Nebraska will be held Thursday, January 23, 2020 at 9:30 a.m. (CT), at the Younes Conference Center, Kearney, NE. A teleconference option will be available. Public Building addresses of meeting attendees are as follows:

COLORADO – 500 Doolittle Dr., Aspen, CO; 100 West 2nd St., Julesburg, CO;

NEBRASKA – 324 Laramie Avenue, Alliance, NE; 445 Main St., Bayard, NE; 157 E. Kimball St., Callaway, NE; 612 D St., Fairbury, NE; 8377 Glynoaks Dr., Lincoln, NE; 416 W Talmadge Rd, Kearney, NE; 400 Main St., Trenton, NE;

The agenda includes election of officers and review and approval of the fiscal year 2020-2021 budget. A copy of the agenda is posted upon issuance, kept continually current, and is also available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Dr., Lincoln, Nebraska. The meeting is open to the public. If you require assistance or special accommodations in order to attend the meeting, please contact Kim Schafers at (402) 474-4759.

REVISED Combined Agenda
Board of Directors and Executive Committee
with Teleconference Option
Municipal Energy Agency of Nebraska
Younes Conference Center - Kearney, Nebraska
January 23, 2020 – 9:30 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act
   B. Roll Call
      1) Board of Directors
      2) Executive Committee

2. Chairman's Remarks

3. Reports
   A. Executive Director
   B. Director of Wholesale Electric Operations

4. Consent Agenda (Executive Committee)
   A. Minutes of the February 27, 2019 and November 21, 2019 meeting
   B. Consent Resolution

5. Consent Agenda (Board of Directors)
   A. Minutes of the November 21 , 2019 meeting
   B. Fiscal Year 2019-2020 Year-to-Date Financial Report
   C. Acknowledge Receipt of the Unapproved Minutes of November 6, 2019 Joint Operating Committee Meeting
   D. Next meeting
   E. Consent Resolution

6. Committee Reports and Recommendations
   A. Governance Review Committee
      1) Governance Review Committee Meeting Summary of January 22, 2020
      2) General Terms and Conditions of Service and corresponding modifications to the Schedule of Rates and Charges for Service Schedules M and K/K-1
      3) Asset Management Policies and Procedures Modifications
      4) MEAN Associate Class By-Law Addition
   B. Power Supply Committee
      1) Power Supply Committee Meeting Summary of January 22, 2020
      2) Firm Power Interchange Service Agreement Renewals for Lake View, IA and Snyder, NE
      3) Gunnison, CO Renewable Energy Purchase
      4) CR Energy Purchase Power Agreement Update
      5) MEAN Leased Capacity Compensation
      6) Integrated Resource Planning-2050 Vision
   C. Finance Committee
      1) Finance Committee Meeting Summary of December 11, 2019 and January 22, 2020
      2) Preliminary Year-End Projections Fiscal Year 2019-2020

3) Budget and Rates and Charges Fiscal Year 2020-2021, Modifications to Schedule of Rates and Charges for Service Schedule M, Modifications to Schedule of Rates and Charges for Service Schedule K and K-1, and Modification of Wind Rate and Environmental Attribute Rate

D. Risk Oversight Committee
   1) Risk Oversight Committee Meeting Summary of January 22, 2020

7. Election of Officers
   A. Chair
   B. Vice Chair
   C. Secretary/Treasurer

8. Election of Executive Committee At-Large Members

9. Updates and Reports
   A. Report on Western Energy Imbalance Service (WEIS) Market
   B. NMPP Energy Annual Conference

10. Contracts, Settlement Agreements, and General Counsel Report
   A. Contracts Report
   B. Legislative and Legal Updates
      1) State and Federal Activities
      2) Legal Updates

11. Closing Comments

12. Adjourn

Approved Minutes of Annual Meeting and Teleconference
Board of Directors and Executive Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
Thursday, January 23, 2020

The MEAN Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) met in joint session with the MEAN Executive Committee on Thursday, January 23, 2020 at the Younes Conference Center located in Kearney, Nebraska. Notice of the annual meeting was given to Directors and Alternate Directors by e-mail and/or mail and the public was advised by publication in the Lincoln *Journal-Star* newspaper. The notice and agenda were posted upon issuance at the NMPP Energy office in Lincoln, Nebraska, and kept continually current. A teleconference option was made available . Public Building addresses of meeting attendees were:

COLORADO – 500 Doolittle Dr., Aspen, CO; 100 West 2nd St., Julesburg, CO;

NEBRASKA – 324 Laramie Avenue, Alliance, NE; 445 Main St., Bayard, NE; 157 E. Kimball St., Callaway, NE; 612 D St., Fairbury, NE; 8377 Glynoaks Dr., Lincoln, NE; 416 W Talmadge Rd, Kearney, NE; 400 Main St., Trenton, NE.

MEAN BOARD OF DIRECTORS

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:39 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with 34 of the 54 Directors in attendance.

1. Anderson, Chad – Pierce
2. *Brestel, Rod – Callaway
3. Brinkman, Bart– Shickley
4. Cooley, Tammy – Gering
5. *Coolidge, Dan – Bayard
6. Criss, Mike – Chappell
7. Christoff, Tyler – Aspen
8. Davison, Pat – Imperial
9. De Laune, Doug – Arnold
10. DePue, James – Wray
11. DesPlanques, Chris – Indianola
12. Dowis, Will – Gunnison
13. Dunn, Edward – Grant
14. Goulette, Tom – West Point
15. *Hartwell, Carrie – Julesburg
16. Hinton, Bill – Kimball
17. Hoffman, Duane – Oxford
18. James, Nate – Morrill
19. Kautz, Wayne – Bridgeport
20. Kohrs, Jeff – Nebraska City
21. Langhorst, Matt – Glenwood Springs
22. Lockmon, Bob – Stuart
23. McNally, Joe – Neligh
24. Moser, Bill – Ansley
25. Nation, Brent – Fort Morgan
26. Ourada, Tom – Crete
27. Palmer, Mike – Sidney
28. Prettyman, John – Yuma
29. Schultz, Doug – Curtis
30. *Sprock, Jeff – Alliance
31. Suppes, Adam – Delta
32. Torczon, Matt – Pender
33. Wenzel, Darrel – Waverly
34. Youtz, Dana – Torrington

**Attending and/or voting via teleconference*

Board Members not in attendance: Stacey Lesher – Basin; Grant Jorgensen – Beaver City; James Summers – Benkelman; Larry Edgar – Blue Hill; Nancy Janssen – Breda; Gene Chapin – Broken Bow; Mitch Lamm – Burwell; Ray Luhring – Falls City; Jim Morehead – Fairbury; Keith Beck – Fleming; Curtis Mitchell – Fountain; Ron Carpenter – Haxtun; Allan Thomas – Lyman; Victoria Simonsen – Lyons; Kim Blome – Mitchell, NE; Gene Horne – Red Cloud; Jon Winkel – Sergeant Bluff; Chris Rodman – Wall Lake; Randy Woldt – Wisner; and Holly Plejdrup – Wood River.

Others in attendance: Beyer, Mike; Carnes, Brenda; Dean, Dan; Kalkwarf, Mike; Knothe, Jim; *McKain, Wendy; *Rundel, John; Schmidt, Brian; and Tarr, Jeremy. Note: All communities listed on the public meeting notice were present on the phone. Those communities include: City Office – Alliance, NE., City Office – Aspen, CO., City Office – Bayard, NE., Village Office – Callaway, NE., City Office – Fairbury, NE.

NMPP staff: *Beth Ackland, Carol Brehm, *Stephanie Daughtery,*Bruce Doll, Tim Cerveny, Shannon Coleman, Chris Dibbern, Brad Hans, Mandy Hansen, *Scott Hartz, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, *Jeff Lindsay, Kyle Kaldahl, Michelle Lepin, Brittany Millard, Bob Poehling, *Joe Rivera, Andrew Ross, *Brandon Ryan, Kim Schafers, *Armin Sehic, *Rich Small, Robin Spady, Tim Sutherland, Candy Thomazin, and Kevin Wickham.

EXECUTIVE COMMITTEE

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:42 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with six of the seven committee members in attendance:

1. Tom Goulette, West Point
2. Bill Hinton, Kimball
3. Tom Ourada, Crete
4. Doug Schultz, Curtis
5. Adam Suppes, Delta
6. Darrel Wenzel, Waverly
7. Vacant

Others in attendance: Anderson, Chad; Beyer, Mike; Brinkman, Bart; Carnes, Brenda; Christoff, Tyler; Cooley, Tammy; *Coolidge, Dan; Criss, Mike; Davison, Pat; Dean, Dan; Delaune, Doug; DePue, James; DesPlanques, Chris; Dowis, Will; Dunn, Edward; Hoffman, Duane; James, Nate; Kalkwarf, Mike; Kautz, Wayne; Knothe, Jim; Kohrs, Jeff; Langhorst, Matt; Lockmon, Bob; *McKain, Wendy; McNally, Joe; Moser, Bill; Nation, Brent; Palmer, Mike; Prettyman, John; Schmidt, Brian; *Sprock, Jeff; Tarr, Jeremy; Torczon, Matt; *Trundel, John; and Youtz, Dana.

NMPP staff: *Beth Ackland, Rich Andrysik, Carol Brehm, Tim Cerveny, Shannon Coleman, *Stephanie Daughtery, Chris Dibbern, *Bruce Doll, Rich Eymann, Brad Hans, Mandy Hansen, Scott Hartz, Joe Hobelman, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle Kaldahl, Michelle Lepin, *Jeff Lindsay, Brittany Millard, Bob Poehling, *Joe Rivera, Andrew Ross, *Brandon Ryan, Kim Schafers, Armin Sehic, *Rich Small, Robin Spady, Tim Sutherland, Candy Thomazin, and Kevin Wickham.

CHAIRMAN'S REMARKS

Goulette reminded Directors to be mindful of remaining in the room and on the phone to ensure a quorum for the transaction of business.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, began his comments by recognizing staff at NMPP for their work and dedication to NMPP/MEAN and its Communities. He then congratulated Tim Sutherland, Director of Wholesale Electric Operations on his upcoming March retirement. Tim has been with the organization for over 28 years.

Director of Wholesale Electric Operations

Tim Sutherland, Director of Wholesale Electric Operations, thanked Bob Poehling, MEAN Participants, and the staff at NMPP. Sutherland stated that over the years, faces may have changed, but the goals remain, and that is, to make certain the organization is prepared to serve the future. Tim's final comment was a quote by E.E. Cummings; 'The most wasted of all days is one without laughter.' Tim then received a standing ovation from the room. Congratulations Tim, your leadership and sense of humor will be missed!

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, thanked Tim Sutherland for his guidance not only to staff but in understanding the perspective of MEAN Participants. Hans stated that Tim's work has created a strong foundation that will allow MEAN to move forward.

CONSENT AGENDA-MEAN EXECUTIVE COMMITTEE

Minutes

Minutes of the February 27, 2019 and November 21, 2019 meeting were previously distributed. There were no changes to the minutes.

Motion: *Darrel Wenzel moved to approve the following Consent Resolution. Adam Suppes seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE RESOLUTION

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Executive Committee that the minutes of the February 27, 2019 and November 21, 2019 meetings are hereby approved.

The MEAN Executive Committee recessed at 9:54 a.m.

CONSENT AGENDA-MEAN BOARD OF DIRECTORS

Minutes

Due to lack of quorum of the MEAN Board of Directors, November 21, 2019 meeting, there were no minutes. The meeting continued with the Fiscal Year 2019-2020 Year-to-Date Financial report.

Fiscal Year 2019-2020 Year-to Date Financial Report

Jamie Johnson, Director of Finance and Accounting, summarized MEAN's Fiscal Year 2019-2020 Year-to-Date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet as of November 2019; cash and investments; and fiscal year-to-date operating results through November 30, 2019. MEAN financials for November 2019 were previously distributed for review.

Acknowledge receipt of unapproved November 6, 2019 meeting minutes of the Joint Operating Committee (JOC)

Goulette noted that the unapproved minutes from the November 6, 2019 meeting of the NMPP Energy Joint Operating Committee (JOC) were received and included in the previously distributed meeting packet for review.

Next Meeting

The next scheduled meeting of the MEAN Board of Directors is Thursday, May 21, 2020 at the Younes Conference Center, Kearney, Nebraska.

Motion: *Tom Ourada moved to approve the following Consent Resolution. Darrel Wenzel seconded the motion, which carried unanimously on a roll call vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the financial statements for November 2019 are hereby accepted; and,*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the receipt of the minutes of the November 6, 2019 Joint Operating Committee meeting is hereby*

acknowledged; and,

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, May 21, 2020 at the Younes Conference Center, Kearney, Nebraska.*

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Finance, Governance Review, Power Supply, and Risk Oversight Committees met on January 22, 2020.

MEAN GOVERNANCE REVIEW COMMITTEE

MEAN Governance Review Committee Meeting Summary of January 22, 2020

Michelle Lepin, Associate General Counsel, provided a recap of topics covered at the January 22, 2020 Governance Review Committee meeting.

General Terms and Conditions of Service and Corresponding Modifications to the Schedule of Rates and Charges for Service Schedules M and K/K-1

Michelle Lepin, Associate General Counsel, reviewed the proposed General Terms and Conditions of Service and corresponding modifications to the Rate Schedules (Attachments K, B and C previously distributed with the meeting packet). The General Terms and Conditions of Service document contains modernized versions of certain provisions from the Electrical Resources Pooling Agreement (ERPA), which will terminate June 30, 2021, as well as new provisions addressing governing law, venue, breach cure period and limitations of remarketing WAPA power. The Governance Review Committee approved a recommendation to the Board of Directors at its meeting on January 22, 2020.

A proposed resolution for approval of the General Terms and Conditions of Service and corresponding modifications to the Rate Schedules was included with the Asset Management Policies and Procedures resolution below. A watermarked copy of the Electrical Resources Pooling Agreement (ERPA) was included in the packet for reference only (Attachment E previously distributed with the meeting packet).

Asset Management Policies and Procedures Modifications

Michelle Lepin, Associate General Counsel, reviewed the proposed modifications to the Asset Management Policies and Procedures (Attachment F). The Governance Review Committee approved a recommendation regarding this document at its meeting on January 22, 2020.

A summary of the changes includes:

- Metering/Reporting: New provisions added based on ERPA language (modernized)
- Change the term “member” to “participant”
- Remove references to the ERPA
- Add new operational terms regarding capacity and member generation
- Housekeeping changes

Motion: *Edward Dunn moved to approve the following resolution. Duane Hoffman seconded the motion, which carried unanimously on a roll call vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, as part of the Board-approved initiative to streamline and modernize the governing documents of MEAN, the MEAN Board of Directors desires to approve General Terms and Conditions of Service and modifications to the Schedule of Rates and Charges for Service Schedules M and K/K-1 to incorporate the General Terms and Conditions of Service, as well as modifications to the Asset Management Policies and Procedures; and

WHEREAS, copies of the proposed General Terms and Conditions of Service and modifications to the Asset Management Policies and Procedures and the Schedule of Rates and Charges for Service Schedules M and K/K-1 were previously distributed to the MEAN Board of Directors and the Governance Review Committee.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the Board approves the following as presented: General Terms and Conditions of Service and related modifications to be effective April 1, 2020 to the Schedule of Rates and Charges for Service Schedules M and K/K-1 to incorporate the General Terms and Conditions, as well as modifications to the Asset Management Policies and Procedures.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the modifications to the Schedule of Rates and Charges for Service Schedules M and K/K-1 to incorporate the General Terms and Conditions approved by this Resolution shall be combined with any and all other modifications to such Schedules of Rates and Charges approved at the January 23, 2020 meeting.

MEAN Associate Class By-Law Addition

No action was taken, the committee tabled the discussion of the MEAN Associate Class By-Law Addition and will bring it back for discussion at a future meeting.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of January 22, 2020

Brad Hans, Director of Wholesale Electric Operations, provided a recap of topics covered at the January 22, 2020 Power Supply Committee meeting.

Firm Power Interchange Service Agreement Renewals for Lake View, IA and Snyder NE

Andrew Ross, Director of Retail Utility Services & Member Relations, discussed the service agreement renewals for Lake View, Iowa and Snyder, Nebraska.

The City of Lake View, Iowa intends to or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a three-year term beginning June 1, 2021.

The Village of Snyder, Nebraska, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a six-year term beginning June 1, 2020, which agreement will supersede and replace the existing Supplemental Agreement effective June 1, 2020.

The MEAN Power Supply Committee recommended the MEAN Board of Directors approve the following resolution.

Motion: *Mike Palmer moved to approve the following resolution. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the City of Lake View, Iowa, and MEAN expires May 31, 2021, and

WHEREAS, the City of Lake View, Iowa, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a three-year term beginning June 1, 2021, and

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the Village of Snyder, Nebraska, and MEAN expires May 31, 2021 ("Supplemental Agreement"), and

WHEREAS, the Village of Snyder, Nebraska, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN to be effective for a six-year term beginning June 1, 2020, which agreement will supersede and replace the existing Supplemental Agreement effective June 1, 2020.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the Agreement for Firm Power Interchange Service between the City of Lake View, Iowa, and MEAN is hereby approved for a term of June 1, 2021 through May 31, 2024, subject to (i) final legal and management review and execution of the Agreement for Firm Power Interchange Service by and between MEAN and the City of Lake View, Iowa, and (ii) receipt of all necessary documents from the City of Lake View, Iowa.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Agreement for Firm Power Interchange Service between the Village of Snyder, Nebraska, and MEAN is hereby approved for a term of June 1, 2020 through May 31, 2026, subject to (i) final legal and management review and execution of the Agreement for Firm Power Interchange Service by and between MEAN and the Village of Snyder, Nebraska, and (ii) receipt of all necessary documents from the Village of Snyder, Nebraska.

Gunnison, CO Renewable Energy Purchase

Brad Hans, Director of Wholesale Electric Operations, led the discussion. Hans reported that Gunnison made an official request in late October 2019 to get to 100% renewable via wind starting in 2020. This request was revised in early November 2019 based on remaining wind pool to get all available and additional to bring them to 100% as additional wind becomes available. The agreement is designed to provide a variable product to Gunnison for wind power remaining in the pool after other wind contract commitments are provided.

Discussion was held.

The Power Supply Committee recommended the MEAN Board of Directors approve the agreement with Gunnison.

Motion: *Matt Langhorst moved to approve the following resolution. Edward Dunn seconded the motion, which carried 30-2-1 on a roll call vote. Note: Due to a computer error the noting for and against the agenda item was properly recorded and calculated, however, the individual record was not saved.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the City of Gunnison, Colorado (City) desires to increase its purchase of renewable energy from the Municipal Energy Agency of Nebraska (MEAN) in an effort to become a "net-zero" utility; and,

WHEREAS, MEAN's Wind Resource Pool does not currently produce sufficient wind-generated electrical energy that would satisfy the City's remaining electrical energy requirements but at times may produce wind-generated electrical energy to serve a portion of City's remaining electrical energy requirements; and,

WHEREAS, representatives of the City have requested that MEAN notify the City representatives when additional wind-generated energy becomes available, to facilitate the City's purchase of additional power to meet its net-zero goal.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that staff is hereby authorized and directed to negotiate a Fourth Supplemental Agreement for Wind-Generated Energy Purchase between MEAN and the City of Gunnison, Colorado.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Executive Director is hereby authorized and directed to execute a Fourth Supplemental Agreement for Wind-Generated Energy Purchase between MEAN and the City of Gunnison, Colorado, subject to final legal and management review.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that MEAN will notify the City's representatives when additional wind-generated energy becomes available, to facilitate the City's purchase of additional power to meet its net-zero goal.

CR Energy Purchase Power Update

Tim Cerveny, Manager of Resources & Transmission, provided an update on the CR Energy project, which included an overview and next steps of the project.

MEAN Leased Capacity Compensation

Tim Cerveny, Manager of Resources & Transmission, led the discussion on MEAN Leased Capacity Compensation. Cerveny provided information on the unit exercise fuel costs.

The Power Supply Committee at its January 22, 2020 meeting recommended the MEAN Board of Directors increase the capacity compensation Demand Rate paid under Section 4. Capacity Commitment Compensation, Subsection 4.02, of the Schedule of Rates and Charges for Service Schedule M from $1.50/kW-month to $2.00/kW-month over a two-year period, as follows: $1.75/kW-month effective April 1, 2020 and $2.00/kW-month effective April 1, 2021.

Discussion was held.

Tom Goulette sought a motion and a second to approve the resolution as presented.

Prior to the vote, a comment was received from Mike Palmer to continue future discussions and to monitor capacity.

Motion: *Tom Ourada moved to approve the resolution. Edward Dunn seconded the motion, which carried 28-1-0 on a roll call vote. Note: Due to a computer error the noting for and against the agenda item was properly recorded and calculated, however, the individual record was not saved.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") capacity compensation Demand Rate for generating units which are owned by MEAN participants and contractually committed to MEAN after April 1, 1997 ("Post 4/1/97 Participant Generation") currently differs from the rate paid to those contractually committed to MEAN on or before April 1, 1997; and

WHEREAS, the MEAN Board of Directors desires to remove the distinction in capacity compensation Demand Rates for Service Schedule M Participants by modifying the capacity compensation Demand Rate for Post 4/1/97 Participant Generation over a two-year period; and

WHEREAS, proposed modifications to Section 4. Capacity Commitment Compensation of the Schedule of Rates and Charges for Service Schedule M were previously distributed to the MEAN Board of Directors and the Power Supply Committee.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the Board approves the modifications as presented to Section 4. Capacity Commitment Compensation, Subsection 4.02, of the Schedule of Rates and Charges for Service Schedule M, with the following modifications for Service Schedule M Post 4/1/97 Participant Generation: revise the capacity compensation Demand Rate to $1.75/kW-month effective April 1, 2020 and to $2.00/kW-month effective April 1, 2021.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the modifications to Section 4 of the Schedule of Rates and Charges for Service Schedule M approved by this Resolution shall be combined with any and all other modifications to such Schedule of Rates and Charges approved at the January 23, 2020 meeting.

Integrated Resource Planning-2050 Vision

Shannon Coleman, Supervisor, Resource Planning & Analysis, led the discussion on Integrated Resource Planning-2050 Vision. The Power Supply Committee recommended the MEAN Board of Directors approve the 2050 Vision.

The MEAN Board of Directors recessed for break at 10:55 a.m. and resumed at 11:04 a.m.

Motion: *Tom Ourada moved to approve the following resolution. Edward Dunn seconded the motion, which carried 28-1-0 on a roll call vote. Note: Due to a computer error the noting for and against the agenda item was properly recorded and calculated, however, the individual record was not saved.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, MEAN is dedicated to its mission of providing reliable and affordable power supply to its Participant communities; and,

WHEREAS, MEAN is committed to assisting member communities in their desire and responsibility to balance environmental concerns with the duty to provide reliable, affordable power; and,

WHEREAS, MEAN's 2017 Integrated Resource Plan established a clear directive to pursue future resources that minimize economic and environmental impacts while maximizing local benefit and reliability of service; and,

WHEREAS, MEAN is committed to an ambitious vision of the future and recognizes the need for future integration and innovation with non-carbon resources;

NOW, THEREFORE, BE IT RESOLVED BY the Board of Directors that MEAN staff is authorized and directed to actively work toward the MEAN 2050 Vision of carbon neutrality by the year 2050 while holding paramount its mission to provide reliable and affordable power supply.

MEAN staff will work in collaboration with Participants to construct policies around resource planning, portfolio optimization, and emissions reduction that utilize our public principles and guidelines to support future actions to achieve the 2050 carbon neutral goal.

These policies in total will form the plan by which we will strive toward 2050. The final formation of the plan will culminate in MEAN's 2022 Integrated Resource Plan (IRP), which details MEAN's future resource needs and performs evaluations to determine the preferred resource plan. The actions pursuant to this plan will accumulate to achieve the final 2050 Goal of carbon neutrality.

MEAN's strategy to reach its net-zero carbon goal articulated in the 2050 Vision will include an "all-of-the-above" outlook. All viable resource options will be considered through MEAN's resource planning process using the same set of criteria and with the final goal of net zero carbon emissions. Any feasible options must maintain reliability and affordability of MEAN's power supply.

Progress toward the 2050 Vision will encounter the constraints of our existing resource portfolio and the limitations of current resource technology and grid infrastructure. The Board acknowledges that the following developments must be realized in advance of meeting the 2050 Vision:

- *Development of Dispatchable Renewable Baseload Energy Resources*
- *Increased Availability of Economical Energy Storage Solutions*
- *Affordable Deployment of Carbon Capture, Utilization, and Storage Technologies*
- *Market Structures to Effectively Accommodate Energy Storage*
- *Transmission Upgrades for Renewable and Distributed Generation Integration*
- *Introduction of an Organized Market in the West Region that Accommodates Carbon-Neutral Initiatives*
- *Widespread Installation of Advanced Metering for the Integration of Distributed Generation*

- *Economic Exit Strategies or Emissions Reduction Technologies at Existing Fossil-Fueled Resources*

FINANCE COMMITTEE

Finance Committee Meeting Summary of December 11, 2019 and January 22, 2020

Jamie Johnson, Director of Finance and Accounting, provided a recap of topics covered at the December 11, 2019 and January 22, 2020 meetings.

Preliminary Year-End Projections Fiscal Year 2019-2020

Jamie Johnson, Director of Finance and Accounting, reviewed the projected operating results (Attachment I), previously distributed in the meeting packet for MEAN, fiscal year ending March 31, 2020.

Budget and Rates and Charges Fiscal Year 2020-2021, Modifications to Schedule of Rates and Charges for Service Schedule M, Modifications to Schedule of Rates and Charges for Service Schedule K and K-1, and Modification of Wind Rate and Environmental Attribute Rate

Included for Board review and approval were the proposed budget (Attachment J) and Schedule of Rates and Charges for Service Schedule M (Attachment B) and Service Schedule K and K-1 (Attachment C) for fiscal year ending March 31, 2021. Jamie Johnson reviewed the proposed budget and rates.

The Finance Committee recommended the MEAN Board of Directors approve the proposed budget, charges, and rates for Fiscal Year ending March 31, 2021 as presented, with the following changes: Cap wages on A & G at 4% from projections Fiscal Year 2019-2020, no increase in energy charge rates for Service Schedule M (SSM) or Service Schedule K (SSK), set the wind rate for SSM at $43.00/MWh, and the wind rate for SSK at 5% above the M rate for wind.

Johnson asked if there were any questions.

Discussion ensued with multiple comments made by various representatives of the MEAN Board of Directors.

Darrel Wenzel made a motion that the MEAN Board of Directors consider the Finance Committee recommendation made at its January 22, 2020 meeting.

Additional discussion was held.

Mike Palmer seconded the motion with the caveat of how the wind rate is calculated moving forward.

Additional discussion was held.

The Chair of the Board of Directors, Tom Goulette asked if there were any other comments or questions.

Chris Dibbern, General Counsel, commented on the clarification of the second motion made by Mike Palmer; with the caveat of how the wind rate is moving forward; upon further discussion Mike Palmer was seconding the full motion made by Darrel Wenzel. Dibbern also clarified that the motion was for all Service Schedule Ks (SSK/SSK-1).

Goulette stated there was a motion and a second and called for the vote of the resolution as presented.

Motion: *Darrel Wenzel moved to approve the proposed budget, charges, and rates for Fiscal Year ending March 31, 2021 as presented, with the following changes: Cap wages on A & G at 4% from projections Fiscal Year 2019-2020, no increase in energy charge rates for Service Schedule M (SSM) or Service Schedule K (SSK), set the wind rate for SSM at $43.00/MWh, and the wind rate for SSK at 5% above the M rate for wind. Mike Palmer seconded the motion, which failed on a 9-20-3 roll call vote. Note: Due to a computer error the noting for and against the agenda item was properly recorded and calculated, however, the individual record was not saved.*

Following the vote, Goulette asked General Counsel Chris Dibbern if the original resolution as found in the meeting packet should be considered. Dibbern stated that a motion and a second would need to be made by a representative of the MEAN Board of Directors.

Jeff Sprock made a motion to approve the original resolution as found on pages 20-21 of the previously distributed meeting packet. Matt Langhorst seconded the motion.

Additional discussion was held. An explanation of MEAN's Bond Covenants was requested for future discussion.

Goulette asked if there were any questions or additional comments.

Discussion ensued.

Motion: *Jeff Sprock moved to approve the following resolution as presented. Matt Langhorst seconded the motion, which failed on a 11-17-4 on a roll call vote. Note: Due to a computer error the noting for and against the agenda item was properly recorded and calculated, however, the individual record was not saved.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Proposed Budget and Rates for Fiscal Year Ending March 31, 2021 were previously sent to the MEAN Board of Directors; and,

WHEREAS, the MEAN Board of Directors is authorized to set the Service Schedule M and Service Schedule K/K-1 rates; and,

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges applied to MEAN Participants for wind-generated energy purchased from the MEAN Wind Resource Pool; and,

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for the MEAN Landfill Gas Energy Environmental Attributes Pool; and,

WHEREAS, the MEAN Board of Directors, desires to approve the Budget for Fiscal Year 2020-2021, the Expenses and Fees for Service Schedule E, F, J, K and K-1 Participants to be effective April 1,

2020, the rates for Wind-Generated Energy and Landfill Gas Environmental Attributes, and revisions to the Service Schedule M and K/K-1 rates to be effective April 1, 2020 to allow for the required sixty (60) day advance notice.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that:

1. *The Budget for Fiscal Year 2020-2021, including amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a net fiscal year transfer amount of $800,000 into the Rate Stabilization Account, as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2021 as presented is hereby approved and shall be made a part of the official Minutes book.*

2. *The Expenses and Fees for Service Schedule E, F, J, K and K-1 Participants, as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2021 are hereby approved to become effective April 1, 2020 and made a part of the official Minutes book.*

3. *The Schedule of Rates and Charges, Exhibit B to Service Schedule M, as presented including the revised rates reflected therein to be effective April 1, 2020, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

4. *The Schedule of Rates and Charges for Bulk Power Participation, Service Schedule K and K-1, as presented including the revised rates reflected therein to be effective April 1, 2020, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

5. *The Wind Energy Output Charge charged to MEAN Participants for energy produced by any of the facilities within the MEAN Wind Resource Pool shall be decreased from $0.04600/kWh to $0.04100/kWh effective April 1, 2020. Furthermore, this rate shall remain in effect until duly modified. Staff is hereby authorized and directed to issue an updated Exhibit to each Participant's supplemental agreement for wind-generated energy purchase to reflect the modified rate.*

6. *The rate for Environmental Attributes associated with the MEAN Landfill Gas Energy Environmental Attributes Pool shall be increased from $19.22/Environmental Attribute to $19.72/Environmental Attribute (each Environmental Attribute shall be that associated with 1 MWh of energy) effective April 1, 2020. Furthermore, this rate shall remain in effect until duly modified. Staff is hereby authorized and directed to issue an updated Exhibit to each Participant's Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes to reflect the modified rate.*

Discussion was held.

Following discussion, Mike Palmer made a motion that the MEAN Board of Directors approve the proposed budget, charges, and rates for Fiscal Year ending March 31, 2021 as presented, with the following changes: Cap payroll and benefits on A & G at 4% from projections Fiscal Year 2019-2020, no increase in energy charge rates for Service Schedule M (SSM) or Service Schedule Ks (SSK/K-1), set the wind rate at $43.00/MWh with review next year. Edward Dunn seconded the motion.

Additional discussion was held. Baring no further discussion, the MEAN Board of Directors proceeded with the vote.

General Counsel Chris Dibbern asked Chairman Goulette to re-state the motion presented. Goulette re-stated the motion made by Mike Palmer which was seconded by Edward Dunn.

Motion: *Mike Palmer moved to approve the proposed budget, charges, and rates for Fiscal Year ending March 31, 2021 as presented, with the following changes: Cap payroll and benefits on A & G at 4% from projections Fiscal Year 2019-2020, no increase in energy charge rates for Service Schedule M (SSM) or Service Schedule Ks (SSK/K-1), set the wind rate at $43.00/MWh with review next year. Edward Dunn seconded the motion, which passed on a 17-12-3 roll call vote. Note: Due to a computer error the noting for and against the agenda item was properly recorded and calculated, however, the individual record was not saved.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Proposed Budget and Rates for Fiscal Year Ending March 31, 2021 were previously sent to the MEAN Board of Directors; and,

WHEREAS, the MEAN Board of Directors is authorized to set the Service Schedule M and Service Schedule K/K-1 rates; and,

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges applied to MEAN Participants for wind-generated energy purchased from the MEAN Wind Resource Pool; and,

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for the MEAN Landfill Gas Energy Environmental Attributes Pool; and,

WHEREAS, the MEAN Board of Directors, desires to approve the Budget for Fiscal Year 2020-2021, the Expenses and Fees for Service Schedule E, F, J, K and K-1 Participants to be effective April 1, 2020, the rates for Wind-Generated Energy and Landfill Gas Environmental Attributes, and revisions to the Service Schedule M and K/K-1 rates to be effective April 1, 2020 to allow for the required sixty (60) day advance notice.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that:

1. *The Budget for Fiscal Year 2020-2021, including amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a net fiscal year transfer amount of $800,000 into the Rate Stabilization Account, as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2021 as presented is hereby approved and shall be made a part of the official Minutes book.*

2. *The Expenses and Fees for Service Schedule E, F, J, K and K-1 Participants, as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2021 are hereby approved to become effective April 1, 2020 and made a part of the official Minutes book.*

3. *The Schedule of Rates and Charges, Exhibit B to Service Schedule M, as presented including the revised rates reflected therein to be effective April 1, 2020, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly*

modified.

4. *The Schedule of Rates and Charges for Bulk Power Participation, Service Schedule K and K-1, as presented including the revised rates reflected therein to be effective April 1, 2020, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

5. *The Wind Energy Output Charge charged to MEAN Participants for energy produced by any of the facilities within the MEAN Wind Resource Pool shall be decreased from $0.04600/kWh to $0.04300/kWh effective April 1, 2020. Furthermore, this rate shall remain in effect until duly modified. Staff is hereby authorized and directed to issue an updated Exhibit to each Participant's supplemental agreement for wind-generated energy purchase to reflect the modified rate.*
6. *The rate for Environmental Attributes associated with the MEAN Landfill Gas Energy Environmental Attributes Pool shall be increased from $19.22/Environmental Attribute to $19.72/Environmental Attribute (each Environmental Attribute shall be that associated with 1 MWh of energy) effective April 1, 2020. Furthermore, this rate shall remain in effect until duly modified. Staff is hereby authorized and directed to issue an updated Exhibit to each Participant's Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes to reflect the modified rate.*

RISK OVERSIGHT COMMITTEE

Risk Oversight Committee Meeting Summary of January 22, 2020

Robin Spady, Director of Risk & Compliance/Regulatory Counsel, provided the following summary of topics covered at the January 22, 2020 Risk Oversight Committee meeting:

- Review of risk program updates to market product parameters
- NERC compliance review
- The Risk Oversight Committee moved to closed session to discuss a report on risk program tracking

Prior to the election of officers, a roll call was taken to determine if there was meeting quorum; a quorum was confirmed with 29 Board of Directors representatives in attendance; the meeting continued with the election of officers.

ELECTION OF OFFICERS

Election of officers was conducted at the MEAN Board of Directors January 23, 2020 Annual Meeting. Chris Dibbern provided an overview of the election process. Dibbern noted that eligibility lists were made available along with the duties of the position at the meeting and was included with the previously distributed meeting packet. Terms of the officers are for fiscal year 2020-2021 (April 1 through March 31).

All nominations received by electronic mail for election of officers on the MEAN Board of Directors for fiscal year 2020-2021 were previously distributed for review. A current list of qualifying nominations received by electronic mail and self-nomination include: Chairman: Tom Goulette – West Point (incumbent); Vice – Chairman: Tom Ourada – Crete (incumbent); Secretary/Treasurer: Darrel Wenzel – Waverly (incumbent). There were no nominations received from the floor. A slate of

nominees for the Board of Directors Chairman; Vice – Chairman, and Secretary/Treasurer was presented. Dibbern provided the candidates with an opportunity to comment prior to the vote.

Motion: *Jeff Sprock moved that nominations cease for Chairman, Vice Chairman and Secretary/Treasurer of the Board, and to accept the slate as presented for the positions of Board of Directors Chairman, Vice-Chairman, and Secretary/Treasurer. Edward Dunn seconded the motion, and with no objections, carried unanimously on a voice acclamation vote.*

The following Directors were re-elected: Tom Goulette, West Point was re-elected Chairman of the MEAN Board of Directors; Tom Ourada, Crete was re-elected Vice-Chairman, and Darrel Wenzel, Waverly was re-elected as Secretary/Treasurer.

ELECTION OF EXECUTIVE COMMITTEE FOUR AT-LARGE MEMBERS

Election of the MEAN Executive Committee was conducted at the MEAN Board of Directors January 23, 2020 Annual Meeting. The MEAN Executive Committee consists of seven members. Individuals serving by virtue of positions held include the MEAN Board Chairman, the MEAN Board Vice-Chairman and the MEAN Board Secretary/Treasurer. There was one at-large vacancy. A nomination was received from the floor for Mike Palmer – Sidney, NE., who accepted the nomination. A slate of the at-large members was presented: Bill Hinton, Kimball; Mike Palmer, Sidney; Doug Schultz, Curtis; and, Adam Suppes, Delta. All were eligible for election/re-election.

Motion: *Edward Dunn moved that nominations cease for the Executive Committee at-large, and that the Board of Directors proceed to vote on the slate of the at-large members. Darrel Wenzel seconded the motion, and with no objections, carried unanimously on a voice acclamation vote.*

The following Directors were elected or re-elected to serve as the four at-large Executive Committee members: Doug Schultz, Curtis; Adam Suppes, Delta; Bill Hinton-Kimball; and Mike Palmer-Sidney.

UPDATES AND REPORTS

Report on Western Area Imbalance Service (WEIS) Market

Michelle Lepin, Associate General Counsel, provided an update on the status of development of the Western Energy Imbalance Service (WEIS) Market. MEAN recently executed the Western Joint Dispatch Agreement, which sets forth the terms and conditions for Southwest Power Pool's administration of the WEIS and MEAN's funding and participation as a voting member.

NMPP Energy Annual Conference

Carol Brehm, Member Relations Representative, provided an overview of the NMPP Energy Annual Conference including the NMPP Annual Members' Council & Board Meeting to be held March 24-26, 2020 at the Cornhusker Marriott, downtown Lincoln. Additional information and registration form can be found at: http://www.nmppenergy.org/annual/conference

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports. Summaries of the following agreements were included in the previously distributed meeting packet:

- Scribner, Nebraska Agreement Regarding SPP Market Assistance
- Public Service Company of Colorado Service Agreement for Network Integration Transmission Service and Network Operating Agreement
- Southwest Power Pool, Inc. Amended and Restated Western Joint Dispatch Agreement regarding Western Energy Imbalance Service (WEIS)
- Black Hills Wyoming, LLC and Liberty Mutual Insurance Company Reimbursement and Payment Bond (Renewal of Bond No. 6621399)
- The Energy Authority, Inc. Task Order 2 (Load Forecasting Services) to Resource Management Agreement

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, provided closing comments. He thanked attendees and noted upcoming meetings and events.

ADJOURNMENT

There being no further business, the meeting adjourned at 12:50 p.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:
Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

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Integrated Resource Planning 2050 Vision

Shannon Coleman

Supervisor Resource Planning & Analysis

MEAN 2050 Vision

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2050 Vision

SHAPE THE VISION

Goal Motivation Vision Opportunity Plan Direction Collaboration Ideas Development

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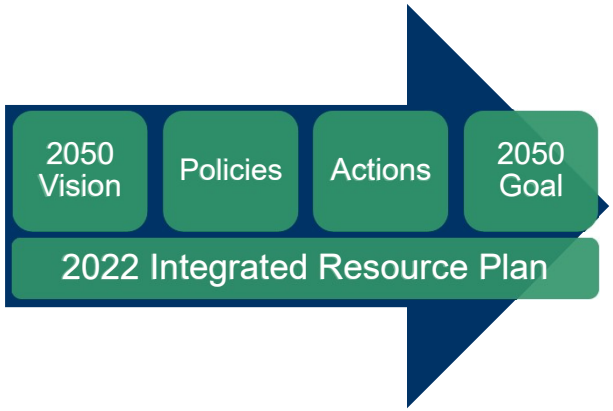
2050 Portfolio Goal

- 100% Carbon Neutral by 2050
  - "Carbon Neutral" = Net Zero Carbon Emissions
    - Eliminating Carbon Emissions or Balancing Emissions with Carbon Removal
  - How much carbon emission reduction can we achieve in MEAN's portfolio?
  - How can we offset our remaining carbon emissions?



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2050 Process

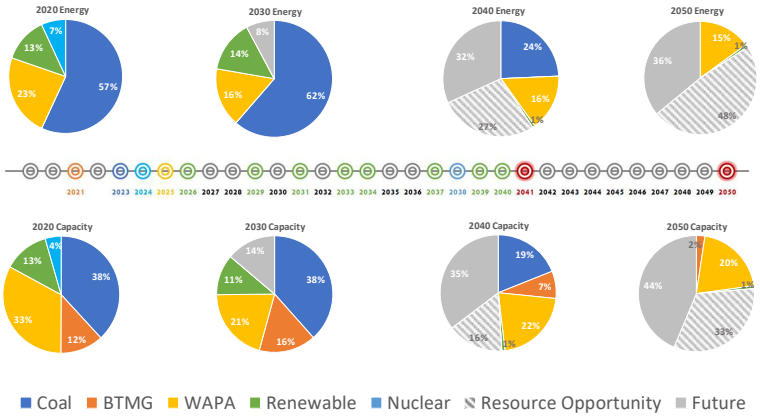


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Non-Carbon Portfolio Potential



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Limitations and Challenges

- Need for Baseload Resources/Capacity
- Economics of Non-Carbon Resources and Storage
- Existing Ownership
- Diversity of Participant Goals (Pool Structure)
- Intermittent Resource Integration
- Transmission Limitations
- Legislation – State and Federal
- Market Operations



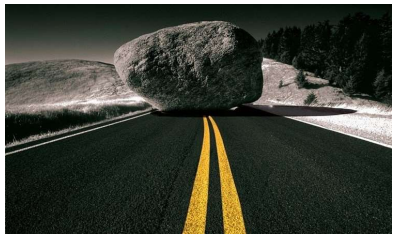
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Necessary Future Developments

- Renewable Dispatchable Baseload
- Market Structure for Storage
- Economical Storage
- Emerging Technology
  - CCUS
  - Hydrogen
  - Modular Nuclear
- Transmission Investment
- Full Market in West?
- Exit Strategies for Ownerships



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MEETING NOTICE

NOTICE IS HEREBY GIVEN that a telephone conference meeting of the MEAN Power Supply Committee of the Municipal Energy Agency of Nebraska will be held Wednesday, August 12, 2020 at 2:00 p.m. (CT). Since the meeting will be held electronically, and no quorum of the public body will be physically present together, there will be no public in-person attendance. Access to the meeting will be made available to members of the public and members of the media by telephone conference at +1 (646) 749-3129, access code 635-930-165.

Public Building addresses of meeting attendees are as follows:

COLORADO – 1133 Main Street, Delta CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 245 W 4th Street Wray, CO.

IOWA – 108 Boyer St. Wall Lake, IA.

NEBRASKA – 243 East 13th Street, Crete, NE; 740 Court St Imperial NE; 107 S. Burg St, Kimball NE; 8377 Glynoaks Drive, Lincoln, NE; 326 Ogden Avenue, Oxford, NE; 444 S. Main Street, West Point, NE; 519 10th Street, Wisner, NE.

An agenda is kept continually current and is available for public inspection by request, no later than 10:00 a.m. on the day before the meeting, if you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact.

Power Supply Committee
Teleconference Meeting
Municipal Energy Agency of Nebraska
August 12, 2020 – 2:00 p.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda
   A. Approval of minutes from the May 20, 2020 meeting
   B. Next meeting
   C. 2020 Winter Season Load and Capability Report and Operational Readiness
   D. Consent Resolution

3. Integrated Resource Planning-2050 Vision

4. Renewable Distributed Generation Policy

5. Capability Testing Update

6. CR Energy Update

7. Asset Management Policies and Procedures

8. Adjourn

Approved Minutes
Power Supply Committee Teleconference Meeting
Municipal Energy Agency of Nebraska
August 12, 2020 – 2:00 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met via teleconference, Wednesday, August 12, 2020. Notice of the meeting was given to committee members by e-mail. The public was advised by publication in the Lincoln *Journal-Star* newspaper. The notice and agenda were kept continually current, was available to members of the public and members of the media by telephone conference, and, was available for public inspection by request at NMPP Energy at http://www.nmppenergy.org/contact. Instruction to join the meeting via GoToMeeting or by telephone only was provided in the public notice and on the meeting agenda available on the Board's website.

Public Building addresses of meeting attendees are as follows:

COLORADO – 1133 Main Street, Delta CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 245 W 4th Street Wray, CO.

IOWA – 108 Boyer St. Wall Lake, IA.

NEBRASKA – 243 East 13th Street, Crete, NE; 740 Court St Imperial NE; 107 S. Burg St, Kimball NE; 8377 Glynoaks Drive, Lincoln, NE; 326 Ogden Avenue, Oxford, NE; 444 S. Main Street, West Point, NE; 519 10th Street, Wisner, NE.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 2:08 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with eight of the ten committee members present.

1. James DePue, Wray
2. Will Dowis, Gunnison
3. Bill Hinton, Kimball
4. Duane Hoffman, Oxford
5. Matt Langhorst, Glenwood Springs
6. Tom Ourada, Crete
7. Adam Suppes, Delta
8. Randy Woldt, Wisner

Tom Goulette, Voting Ex-Officio

Absent: Pat Davison, Imperial; Chris Rodman, Wall Lake

CONSENT AGENDA

Minutes

Minutes of the May 20, 2020 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee will be held on November 11, 2020, at the Younes Conference Center, Kearney, Nebraska, or virtual meeting if required. *Note: Due to Veteran's Day falling on November 11, 2020, the meeting has been moved to November 12, 2020 at the Younes Conference Center, Kearney, Nebraska or by virtual meeting if required.*

2020 Winter Season Load and Capability Report and Operational Readiness

Shannon Coleman, Supervisor of Resource Planning and Analysis, reported on the 2020 winter season load and capability report. The report establishes the contracted capacity of leased member generation.

Consent Resolution

Motion: James DePue moved to approve the consent resolution as presented. Adam Suppes seconded the motion, which carried on a unanimous roll call vote.

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the May 20, 2020 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, November 11, 2020 at the Younes Conference Center in Kearney, Nebraska or virtual if required*

3. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the 2020 Winter Season Load and Capability Report.*

INTEGRATED RESOURCE PLANNING-2050 VISION

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an update of resource options and factors impacting analysis for the Integrated Resource Plan in support of the 2050 Vision.

Discussion was held.

RENEWABLE DISTRIBUTED GENERATION POLICY

Rich Andrysik, Distributed Resources & Generation Specialist, led the discussion on kW limits in the Renewable Distributed Generation Policy. There has been confusion among retail customers and solar developers regarding the kW limits. Developers try to maximize solar PV output while also trying to stay within the limits for net metering and under the Policy limit to avoid sale of excess energy to MEAN. DC output is the common nameplate rating for inverter-based systems. Language is being offered to use 25 kW AC capacity as the limit for inverter-based generators as well as AC machines. There are also some updates to remove reference to the Management Committee and the Electrical Resource Pooling Agreement and to add reference to the Asset Management Policies and Procedures. A redlined copy of the proposed modifications to the Renewable Distributed Generation Policy was included with the meeting packet (Attachment B).

Motion: *Adam Suppes moved to approve the resolution as presented. Matt Langhorst seconded the motion, which carried on a unanimous roll call vote (James DePue did not vote).*

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the MEAN Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, proposed changes to the DG Policy were previously distributed to the MEAN Power Supply Committee for review; and

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors approve the proposed modifications to the DG Policy.

NOW THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee, that the Committee recommends the MEAN Board of Directors approve the DG Policy modifications as presented.

CAPABILITY TESTING INFORMATION

Tim Cerveny, Manager of Resources & Transmission, provided an update regarding current testing status and reliability data. Cerveny reported that as of August 11, 2020, 17 communities tested 48 units, with a passing rate of 100%.

CR ENERGY UPDATE

Tim Cerveny, Manager of Resources & Transmission, provided an update regarding current status of PPA negotiations.

ASSET MANAGEMENT POLICIES AND PROCEDURES

Tim Cerveny, Manager of Resources & Transmission, provided an overview of the process for abnormal system conditions and restoring service.

ADJOURNMENT

There being no further business, the meeting adjourned at 2:56 p.m.

Submitted by:

Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:

Kim Schafers
Municipal Energy Agency of Nebraska

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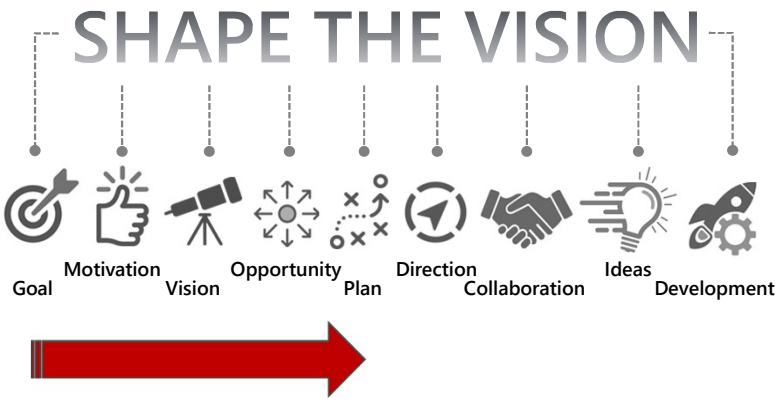
Integrated Resource Planning
2050 Vision Update

Shannon Coleman
Supervisor Resource Planning and Analysis

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2050 Vision



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Resource Exploration

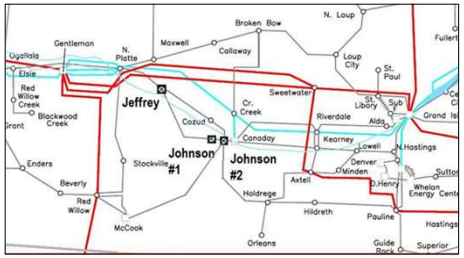
- Central Nebraska Public Power and Irrigation District
  - Total Capacity 63.5 MW
  - Average Capacity Factor 45% (Range 17-75%)
  - Built in 1940, Updates in 2001 and 2004
  - Production Limitations
    - Irrigation Season
    - Environmental
  - Currently Contracted to KCPL
  - Available January 2024
  - RECs Available with Power

CENTRAL
Nebraska Public Power and Irrigation District

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CNPPID Hydropower





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Resource Exploration

- Next Era Wind
  - Gage County Wind - 125 MW (as low as 10 MW Offtake)
  - 43% Capacity Factor
  - Signed SPP GIA, Permitting Now, Online December 2021
  - Low $20s – Flat Rate for 20 Years
- Geronimo Energy Solar
  - 3 Projects in NE – in SPP Queue since 2019
  - 50 MW Stove Creek, 100 MW Brock – Online 2023
  - CO Solar Opportunities

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Resource Exploration

- WAPA Displacement Agreement
  - 61.9 MW of Capacity and Energy (~44% Capacity Factor)
  - Monthly Max, Min, and Total Energy
  - MEAN Schedules within Parameters
  - WEIS Changes Value of Flexibility
  - Expires in September 2024
    - If Extended, Future Need in SPP
    - If Terminated, Future Need in West
  - Impacts Other Resource Decisions







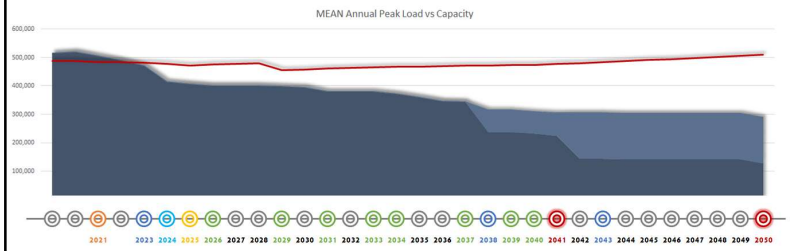
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Legislative Considerations

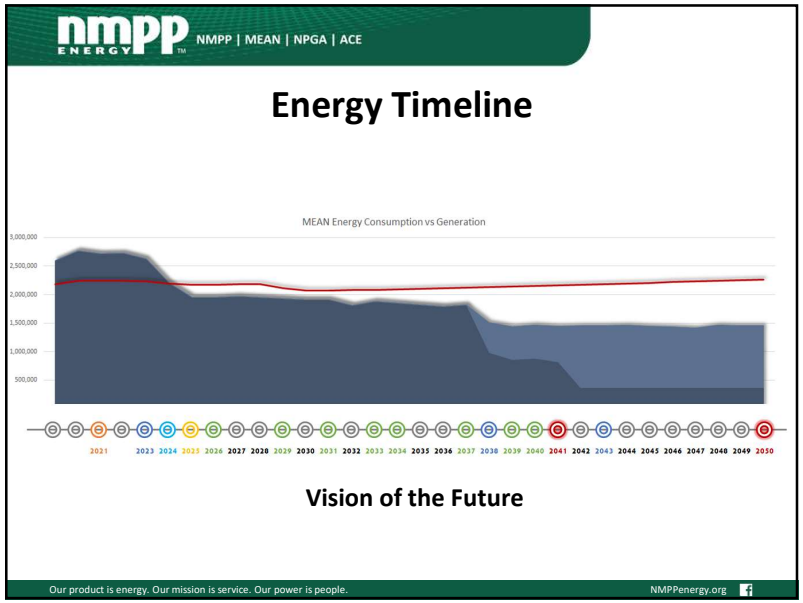
- Colorado
  - Legislation of 2019
  - Meetings - Clean Energy Plan Group, Colorado Energy Office
- Federal
  - Clean Energy Innovation & Deployment Act – Introduced 7/20
  - Biden Energy Plan
- EPA
  - CCR Developments
  - Affordable Clean Energy Rule

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Capacity Timeline



Vision of the Future


nmpp ENERGY
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Energy Timeline
MEAN Energy Consumption vs Generation
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
2021 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Vision of the Future
Our product is energy. Our mission is service. Our power is people.
NMPPenergy.org

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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a telephone conference meeting of the MEAN Board of Directors and MEAN Executive Committee of the Municipal Energy Agency of Nebraska will be held Wednesday, August 13, 2020 at 9:00 a.m. (CT). Since the meeting will be held electronically, and no quorum of the public body will be physically present together, there will be no public in-person attendance. Access to the meeting will be made available to members of the public and members of the media by telephone conference at +1 (646) 749-3129, access code 527-199-133.

Public Building addresses of meeting attendees are as follows:

COLORADO–294 S Worth Street, Center, CO; 500 Doolittle Dr, Aspen, CO; 1133 Main Street, Delta CO; 710 East Railroad Avenue, Fort Morgan CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 145 S Colorado Ave, Haxtun CO; 100 West Second Street, Julesburg CO; 245 W 4th Street Wray, CO; 320 South Main St, Yuma CO.

IOWA–108 N 2nd St., Breda IA; 195 N First Street, Carlisle, IA; 210 W 2nd Ave, Indianola, Iowa; 108 Boyer St. Wall Lake IA; 1002 Adams Pkwy, Waverly, IA;

NEBRASKA – 8377 Glynoaks Drive, Lincoln, NE; 324 Laramie Avenue, Alliance NE; 909 Division Street, Ansley, NE; 445 Main Street, Bayard, NE; 809 Main Street, Bridgeport, NE; 157 East Kimball, Callaway, NE; 243 East 13th Street, Crete NE; 201 Garlick Avenue Curtis NE; 612 D Street, Fairbury, NE; 1025 P Street, Gering NE; 346 Central Ave, Grant, NE; 740 Court Street, Imperial NE; 107 S. Burg Street, Kimball NE; 118 South Centre Avenue, Morrill, NE; 100 Central Avenue, Nebraska City NE; 202 Main Street, Neligh, NE; 326 Ogden Avenue, Oxford, NE; 110 N. Market Street, Shickley, NE; 528 10th Ave Sidney, NE; 111 West 2nd Street , Stuart NE; 402 Main Street, Trenton, NE; 444 S. Main Street, West Point, NE; 519 10th Street, Wisner, NE.

WYOMING – 436 East 22nd Avenue, Torrington, WY.

An agenda is kept continually current and is available for public inspection by request, no later than 10:00 a.m. on the day before the meeting, if you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact.

Board of Directors and Executive Committee
Teleconference Meeting
Combined Agenda
Municipal Energy Agency of Nebraska
August 13, 2020 – 9:00 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   - A. Nebraska Open Meetings Act-Section 84-1412(8)
   - B. Roll Call
     1) Board of Directors
     2) Executive Committee

2. Chairman's Remarks

3. Reports
   - A. Executive Director
   - B. Director of Wholesale Electric Operations

4. Consent Agenda (Executive Committee)
   - A. Minutes of the May 21, 2020 meeting
   - B. Consent Resolution

5. Consent Agenda Board
   - A. Minutes of the May 21, 2020 meeting
   - B. Fiscal Year 2019-2020 Audit Results
   - C. Fiscal Year 2020-2021 Year-to Date Financial Report
   - D. Annual Compliance Report RE: Bond Compliance Policy
   - E. Public Power Week, October 4-10, 2020
   - F. 2020 Winter Season Load and Capability Report and Operational Readiness
   - G. Next meeting
   - H. Consent Resolution

6. Committee Reports and Recommendations
   - A. Risk Oversight Committee
     1) Risk Oversight Committee Meeting Summary of August 12, 2020
     2) Risk Governance Policy
   - B. Governance Review Committee
     1) MEAN Bylaw Amendments
   - C. Power Supply Committee
     1) Power Supply Committee Meeting Summary of August 12, 2020
     2) Integrated Resource Planning-2050 Vision
     3) Renewable Distributed Generation Policy
     4) CR Energy Update
     5) Participant Capability Testing Update
   - D. Services Committee
     1) Services Committee Meeting Summary of August 12, 2020
     2) Development of Fiscal Year 2021-2022 Budget Including Estimated Costs for Recommended Services

7. Updates and Reports
   A. WACM Standardized BA Services Agreement

8. Contracts, Settlement Agreements, and General Counsel Report
   A. Contracts Report
   B. Legislative and Legal Updates

9. Closing Comments

10. Adjourn

Approved Minutes
Board of Directors and Executive Committee
Teleconference MeetingA
Municipal Energy Agency of Nebraska
Thursday, August 13, 2020

The Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) was scheduled to meet in a joint session with the MEAN Executive Committee via teleconference, Thursday, August 13, 2020. Notice of the meeting was given to committee members and their community city clerks by e-mail. The meeting was held electronically, no quorum of the public body was physically present together, and, no public in-person attendance. The public was advised by publication in the Lincoln *Journal-Star* newspaper. The notice and agenda were kept continually current, was available to members of the public and members of the media by telephone conference, and, was available for public inspection by request at NMPP Energy at http://www.nmppenergy.org/contact. Instruction to join the meeting via GoToMeeting or by telephone only, was provided in the public notice and on the Board's website.

Public Building addresses of meeting attendees are as follows:

COLORADO–294 S Worth Street, Center, CO; 500 Doolittle Dr, Aspen, CO; 1133 Main Street, Delta CO; 710 East Railroad Avenue, Fort Morgan CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 145 S Colorado Ave, Haxtun CO; 100 West Second Street, Julesburg CO; 245 W 4th Street Wray, CO; 320 South Main St, Yuma CO.

IOWA–108 N 2nd St., Breda IA; 195 N First Street, Carlisle, IA; 210 W 2nd Ave, Indianola, Iowa; 108 Boyer St. Wall Lake IA; 1002 Adams Pkwy, Waverly, IA;

NEBRASKA – 8377 Glynoaks Drive, Lincoln, NE; 324 Laramie Avenue, Alliance NE; 909 Division Street, Ansley, NE; 445 Main Street, Bayard, NE; 809 Main Street, Bridgeport, NE; 157 East Kimball, Callaway, NE; 243 East 13th Street, Crete NE; 201 Garlick Avenue Curtis NE; 612 D Street, Fairbury, NE; 1025 P Street, Gering NE; 346 Central Ave, Grant, NE; 740 Court Street, Imperial NE; 107 S. Burg Street, Kimball NE; 118 South Centre Avenue, Morrill, NE; 100 Central Avenue, Nebraska City NE; 202 Main Street, Neligh, NE; 326 Ogden Avenue, Oxford, NE; 110 N. Market Street, Shickley, NE; 528 10th Ave Sidney, NE; 111 West 2nd Street , Stuart NE; 402 Main Street, Trenton, NE; 444 S. Main Street, West Point, NE; 519 10th Street, Wisner, NE.

WYOMING – 436 East 22nd Avenue, Torrington, WY.

BOARD OF DIRECTORS

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:11 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public. Roll call was taken twice to determine if there was meeting quorum. Due to lack of quorum of the MEAN Board of Directors, the MEAN Executive Committee continued with the meeting.

EXECUTIVE COMMITTEE

CALL TO ORDER

Chairman Tom Goulette called the Executive Committee Meeting to order at 9:15 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with six of the seven Executive Committee Members in attendance:

1. Tom Goulette, West Point
2. Bill Hinton, Kimball
3. Tom Ourada, Crete
4. Mike Palmer, Sidney
5. Adam Suppes, Delta
6. Darrel Wenzel, Waverly

Not Present: Doug Schultz, Curtis

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, thanked meeting attendees for joining the second virtual Board/Executive Committee meeting during COVID-19. He reported that NMPP formed a Pandemic Response Team to develop a Return to Work plan and has revised the definition of "hotspots" that can be standardized regardless of population, is easily accessible to everyone, and hotspots are readily identifiable.

Poehling congratulated Randy Woldt and the City of Wisner, Nebraska, for the NMPP Project of the Year Award for its City Auditorium Renovation Project. The award is presented annually to honor a project or program in an NMPP Energy member community that creates a more cohesive community or one that makes it easier for city staff and employees to serve their residents. The award is typically presented at the NMPP Energy Annual Conference, but the event was canceled this year due to the COVID-19 pandemic.

Poehling continued his report by announcing that the legislative bill MEAN proposed (LB 858) passed 47-0-1-1 by the Nebraska State Legislature. The bill allows MEAN to modernize and simplify its governance structure. He noted that the Sustainable Development Strategies Group (SDSG) plans to release a third report, "The Toll Beyond Coal: Who Bears the Cost of Coal Plant Decommissioning and Coal Ash Disposal? A Case Study of the Municipal Energy Agency of Nebraska". Poehling ended his report by thanking MEAN's communities for their patience during the pandemic and noted that staff are available to assist.

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, provided a status update on the following MEAN projects:

- Analysis of COVID-19 Load Impacts/ Resource for Future References
- Potential Markets and Balancing Authority changes
- Western Energy Imbalance Service (WEIS)

- CAISO EIMs
- SPP Settlement System Upgrade
- MISO LMR Changes and Proposals
- Safety Programs
- Mutual Aid Response – Holyoke and Shickley
- Resource Evaluations
- Compliance Season
- AMI Project Evaluation and Business Case
- Distributed Generation
- PURPA Regulations

CONSENT AGENDA MEAN EXECUTIVE COMMITTEE

Minutes

Minutes of the May 21, 2020 meeting were previously distributed. There were no changes to the minutes.

Motion: *Darrel Wenzel moved to approve the following Consent Resolution. Tom Ourada seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE RESOLUTION

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Executive Committee that the minutes of the May 21, 2020 meeting are hereby approved.

CONSENT AGENDA MEAN BOARD OF DIRECTORS

Minutes

Minutes of the May 21, 2020 meeting were previously distributed. There were no changes to the minutes.

Fiscal Year 2019-2020 Audit Results

Jamie Johnson, Director of Finance and Accounting, noted that the audited financial statements for the fiscal year ended March 31, 2020 along with the 2019-2020 annual report could be found on the NMPP Energy website at http://www.nmppenergy.org/annual/reports. The Audit Communication Letter was previously distributed with the meeting packet (Attachment C).

Johnson introduced Chris Lindner of BKD, LLP. She noted that he also reported the previous day to the Finance Committee. Lindner reported on the MEAN Fiscal Year 2019-2020 audited financial statements and audit communication letter.

Fiscal Year 2020-2021 Year-to Date Financial Report

Johnson summarized MEAN's Fiscal Year 2020-2021 Year-to-Date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet; cash

and investments; and fiscal year-to-date operating results. MEAN financials for March, April, May, and June 2020 were previously distributed.

Annual Compliance Report RE: Bond Compliance Policy

Pursuant to responsibilities as set forth in MEAN's Bond Compliance Policy, Jamie Johnson, Director of Finance and Accounting, has conducted the annual review required by the Policy and has prepared a report to the Board. The report was previously distributed with the meeting packet.

Johnson summarized findings and overall compliance with the policy (records; tax compliance; continuing disclosure; other covenants and requirements; compliance with policy; training; effectiveness of the policy; and delivery of the report).

Public Power Week, October 4-10, 2020

Goulette stated that NMPP and MEAN member communities will celebrate Public Power Week, October 4-10, 2020 with more than 2,000 other electric utilities throughout the nation. Public Power Week is a national, annual event sponsored in conjunction with the American Public Power Association (APPA). He reported that if your utility needs assistance with public power materials such as a customizable news release, letter to the editor, newsletter article regarding public power, to contact Kevin Wickham in the NMPP communications department at kwickham@nmppenergy.org.

2020 Winter Season Load and Capability Report and Operational Readiness

Shannon Coleman, Supervisor of Resource Planning and Analysis, delivered the load and capability report for the upcoming 2020-21 winter season to the Power Supply Committee at its meeting on August 12, 2020. The report establishes the contracted capacity of leased member generation. A chart with detailed information was included in the previously distributed meeting packet.

Next Meeting

Chairman Goulette stated that the next meeting of the MEAN Board of Directors will be held on Thursday, November 12, 2020 at the Younes Conference Center, Kearney, Nebraska, or virtual if required.

Motion: *Tom Ourada moved to approve the following Consent Resolution. Mike Palmer seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the audited financial report for fiscal year ended March 31, 2020 is hereby accepted; and,*

2. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the financial statements for March, April, May, and June 2020 are hereby accepted; and,*

3. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the annual compliance report re: bond compliance and management policy dated July 29, 2020 is hereby accepted; and,*

4. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that October 4-10, 2020 is hereby recognized as Public Power Week and all MEAN participants are encouraged to observe and promote the benefits of public power to their citizens; and,*

5. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the 2020 Winter Season Load and Capability Report is hereby approved.*

6. *BE IT FURTHER RESOLVED BY the Executive Committee of the MEAN Board of Directors that the next meeting will be held on Thursday, November 12, 2020 at the Younes Conference Center, Kearney, Nebraska or by virtual if required.*

Note: Due to Veteran's Day falling on November 11, 2020, the MEAN Committee meetings have been moved to Thursday, November 12, 2020 and the MEAN Board of Directors meeting has been moved to Friday, November 13, 2020 at the Younes Conference Center, Kearney, Nebraska or by virtual meeting if required.

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Finance, Governance Review, Power Supply, Risk Oversight and Services Committees met on August 12, 2020.

RISK OVERSIGHT COMMITTEE

Risk Oversight Committee Meeting Summary of August 12, 2020

The Director of Risk and Compliance/Regulatory Counsel, Robin Spady, provided a recap of topics covered at the August 12, 2020 Risk Oversight Committee meeting.

Risk Governance Policy

Robin Spady, Director of Risk and Compliance/Regulatory Counsel, provided an overview on recent changes to the Risk Governance Policy. The following resolution was proposed to the Executive Committee of the MEAN Board of Directors.

Motion: *Tom Ourada moved to approve the following resolution as presented. Mike Palmer seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska (MEAN) Risk Oversight Committee recommended the MEAN Board of Directors approve a risk governance policy regarding short-term transaction risk including a definition of "Speculation"; and

WHEREAS, the Executive Committee of the MEAN Board of Directors desires to approve the Short-Term Transaction Risk Governance Policy, including a definition of "Speculation".

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that the Short-Term Transaction Risk Governance Policy, including the following definition of "Speculation", is approved as presented:

> "MEAN defines Speculation as the purchase or sale of a physical commodity or financial instrument for the purpose of profiting from market price fluctuations. Speculation is distinguishable from a transaction entered into to manage, hedge or mitigate the commercial risks that arise from MEAN's core business of supplying reliable electricity to MEAN's Participants and cost-effectively managing MEAN's Power Supply System, and will not be permitted at any time."

GOVERNANCE REVIEW COMMITTEE

Governance Review Committee Meeting Summary of August 12, 2020

Michelle Lepin, Associate General Counsel, provided a recap of topics covered at the August 12, 2020 Governance Review Committee meeting.

MEAN Bylaw Amendments

Michelle Lepin, Associate General Counsel, reviewed proposed amendments to the MEAN By-Laws to create classes of membership with allocated voting rights and an Associate class of participation in MEAN (Attachment A). The proposed amendments also add provisions addressing proprietary information and make housekeeping and modernization changes. The Governance Review Committee reviewed these amendments at its meeting on August 12, 2020 and recommended the Board approve the amendments. Due to lack of Board quorum, no action was taken and will be presented to the Board at its November meeting.

Discussion was held.

The MEAN Executive Committee recessed for break at 10:42 a.m. and reconvened at 10:52 a.m.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of August 12, 2020

Tim Cerveny, Manager of Resources & Transmission, provided a recap of topics covered at the August 12, 2020 meeting.

Integrated Resource Planning-2050 Vision

Shannon Coleman, Supervisor of Resource Planning and Analysis, presented an update of resource options and factors impacting analysis for the Integrated Resource Plan in support of the 2050 Vision.

Renewable Distributed Generation Policy

Rich Andrysik, Distributed Resources & Generation Specialist, led the discussion on kW limits in the Renewable Distributed Generation Policy. There has been confusion among retail customers and solar developers regarding the kW limits. Developers try to maximize solar PV output while also trying to stay within the limits for net metering and under the Policy limit to avoid sale of excess energy to MEAN. DC output is the common nameplate rating for inverter-based systems. Language is being offered to use 25 kW AC capacity as the limit for inverter-based generators as well as AC machines. There are also some updates to remove reference to the Management Committee and the Electrical Resource Pooling Agreement and to add reference to the Asset Management Policies and Procedures. A redlined copy of the proposed modifications to the Renewable Distributed Generation Policy was included with the meeting packet (Attachment B). At its meeting on August 12, 2020, the Power Supply Committee recommended the Board approve the proposed modifications.

The following resolution was proposed to the Executive Committee of the MEAN Board of Directors.

Motion: *Darrel Wenzel moved to approve the following resolution as presented. Adam Suppes seconded the motion, which carried unanimously on a roll call vote (Tom Ourada did not vote).*

EXECUTIVE COMMITTEE OF THE MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, proposed changes to the DG Policy were previously distributed to the MEAN Board of Directors for review.

NOW THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors that the DG Policy shall be amended as presented.

CR Energy Update

Tim Cerveny, Manager of Resources & Transmission, provided an update regarding current status of PPA negotiations.

Capability Testing Update

Tim Cerveny, Manager of Resources & Transmission, provided an update regarding current testing status and reliability data.

SERVICES COMMITTEE

Services Committee Meeting Summary of August 12, 2020

Staff provided a recap of topics covered at the August 12, 2020 meeting.

Development of Fiscal Year 2021-2022 Budget Including Estimated Costs for Recommended Services

The Services Committee met on August 12, 2020 to review utility-related services for the Fiscal Year 2021-2022 budget including estimated costs to provide the recommended services. At its August 12, 2020 meeting, the MEAN Services Committee recommended the Board direct staff to develop the Fiscal Year 2020-2021 budget including estimated costs to provide the recommended Services.

The following resolution was proposed to the Executive Committee of the MEAN Board of Directors.

Motion: *Mike Palmer moved to approve the following resolution as presented. Bill Hinton seconded the motion, which carried 5-1-0 on a roll call vote.*

Ayes: Tom Goulette, Bill Hinton, Tom Ourada, Mike Palmer, Adam Suppes

Nays: Darrel Wenzel

Abstain: None

EXECUTIVE COMMITTEE OF THE BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Services Committee of the MEAN Board of Directors reviewed the utility-related services offered by MEAN and recommended at the August 12, 2020 meeting that certain services be provided to qualifying MEAN participants by directing staff to include the estimated costs as part of the Fiscal Year 2021-2022 MEAN Budget; and,

WHEREAS, the Executive Committee of the MEAN Board of Directors desires to provide the recommended services to qualifying MEAN participants in Fiscal Year 2021-2022.

NOW, THEREFORE, BE IT RESOLVED BY the Executive Committee of the MEAN Board of Directors, that staff is hereby directed to include the estimated costs for the recommended services, as presented, as part of the Fiscal Year 2021-2022 MEAN Budget.

UPDATES AND REPORTS

WACM Standardized BA Services Agreement

Michelle Lepin, Associate General Counsel, provided an update on the status of the new WACM Standardized BA Services Agreement.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports. Summaries of the following agreements were included in the previously distributed meeting packet:

- MidAmerican Energy Company JOU Confirmation Letter to Market Services Agreement
- Western Area Power Administration Service Agreement for Network Integration Transmission Service (LAPT)
- Transmission Reassignment from MEAN to The Energy Authority, Inc. under MISO Tariff

- Western Area Power Administration Amendment No. 3 to Confirmation Agreement No. 19-RMR-3059 regarding spinning reserves to meet NWPP requirements to Contract 87-LAO-193 for Interconnected Operation of Power Systems
- Western States Power Corporation FY 2021 Participation in Loveland Area Projects Member Financing
- Western States Power Corporation FY 2021 Participation in Upper Great Plains Region Member Financing
- Contoural Statement of Work for NMPP Energy Entities, Project Number - NMPP Energy-02 to Professional Services Agreement
- Public Service Company of Colorado Service Agreement for Network Integration Transmission Service Version 0.1.0
- Black Hills Power, Inc. Agreement for Firm Point-to-Point Transmission Service
- WAPA Exhibit D, Rev. No. 3, Charges for Reserves, to Contract No. 87-LAO-193 for Interconnected Operation of Power Systems
- The Energy Authority, Inc. Task Order 3 to Resource Management Agreement (SPP WEIS Project Onboarding Services)
- BKD, LLP Engagement Letter for Audit 2020

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, provided closing comments. He thanked attendees and noted upcoming meetings and events.

ADJOURNMENT

There being no further business, the meeting adjourned at 11:34 a.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:
Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

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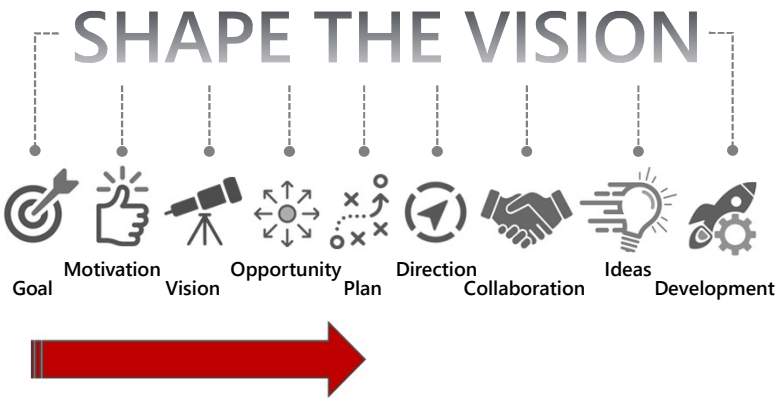
Integrated Resource Planning
2050 Vision Update

Shannon Coleman

Supervisor Resource Planning & Analysis

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2050 Vision



NMPP | MEAN | NPGA | ACE

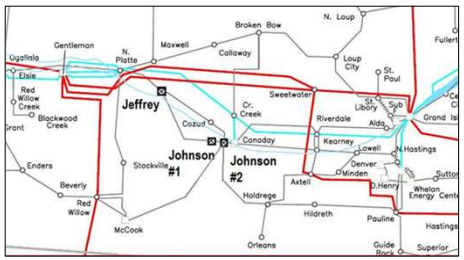
Resource Exploration

- Central Nebraska Public Power and Irrigation District
  - Total Capacity 63.5 MW
  - Average Capacity Factor 45% (Range 17-75%)
  - Built in 1940, Updates in 2001 and 2004
  - Production Limitations
    - Irrigation Season
    - Environmental
  - Currently Contracted to KCPL
  - Available January 2024
  - RECs Available with Power

CENTRAL
Nebraska Public Power and Irrigation District

NMPP | MEAN | NPGA | ACE

CNPPID Hydropower









NMPP | MEAN | NPGA | ACE

Resource Exploration

- Next Era Wind
  - Gage County Wind - 125 MW (as low as 10 MW Offtake)
  - 43% Capacity Factor
  - Signed SPP GIA, Permitting Now, Online December 2021
  - Low $20s – Flat Rate for 20 Years
- Geronimo Energy Solar
  - 3 Projects in NE – in SPP Queue since 2019
  - 50 MW Stove Creek, 100 MW Brock – Online 2023
  - CO Solar Opportunities

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Resource Exploration

- WAPA Displacement Agreement
  - 61.9 MW of Capacity and Energy (~44% Capacity Factor)
  - Monthly Max, Min, and Total Energy
  - MEAN Schedules within Parameters
  - WEIS Changes Value of Flexibility
  - Expires in September 2024
    - If Extended, Future Need in SPP
    - If Terminated, Future Need in West
  - Impacts Other Resource Decisions







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Legislative Considerations

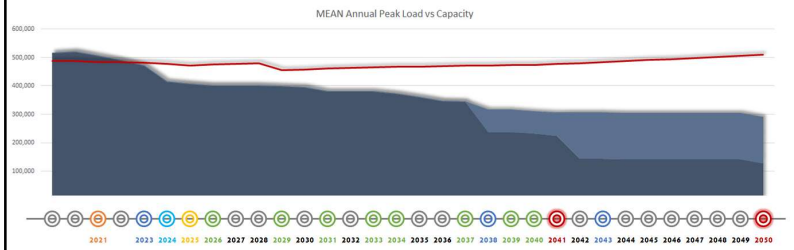
- Colorado
  - Legislation of 2019
  - Meetings - Clean Energy Plan Group, Colorado Energy Office
- Federal
  - Clean Energy Innovation & Deployment Act – Introduced 7/20
  - Biden Energy Plan
- EPA
  - CCR Developments
  - Affordable Clean Energy Rule

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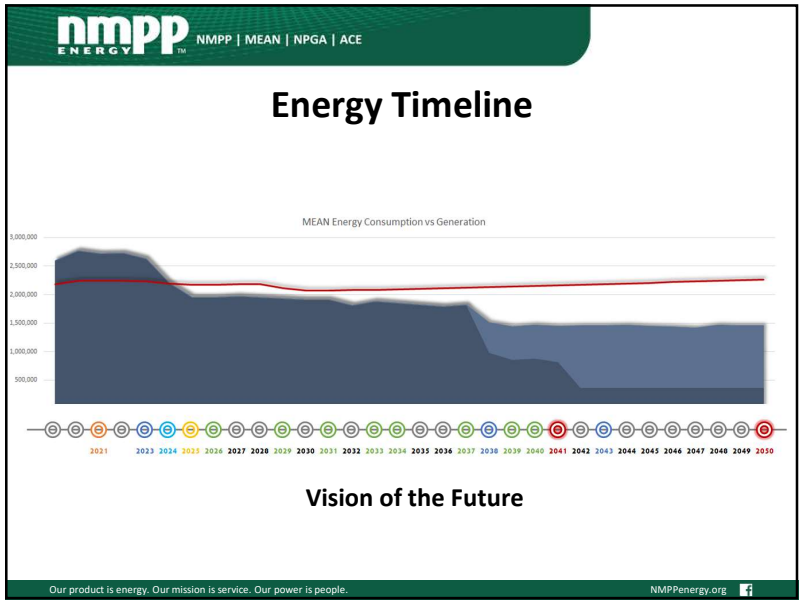
Capacity Timeline



Vision of the Future

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Energy Timeline
MEAN Energy Consumption vs Generation
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
2021 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Vision of the Future
Our product is energy. Our mission is service. Our power is people.
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MEETING NOTICE

NOTICE IS HEREBY GIVEN that a telephone conference meeting of the MEAN Power Supply Committee of the Municipal Energy Agency of Nebraska will be held Thursday, November 12, 2020 at 10:30 a.m. (CT). Since the meeting will be held electronically, and no quorum of the public body will be physically present together, there will be no public in-person attendance. Access to the meeting will be made available to members of the public and members of the media by telephone conference at +1 (571) 317-3129, access code 318-760-701.

Public Building addresses of meeting attendees are as follows:

COLORADO – 1133 Main Street, Delta CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 245 W 4th Street Wray, CO.

IOWA – 195 N 1st St, Carlisle, IA; 108 Boyer St. Wall Lake, IA.

NEBRASKA – 243 East 13th Street, Crete, NE; 740 Court St Imperial NE; 8377 Glynoaks Drive, Lincoln, NE; 326 Ogden Avenue, Oxford, NE; 444 S. Main Street, West Point, NE; 1111 Ave. E, Wisner, NE.

An agenda is kept continually current and is available for public inspection by request, no later than 10:00 a.m. on the day before the meeting, if you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact.

Power Supply Committee
Teleconference Meeting
Municipal Energy Agency of Nebraska
November 12, 2020 – 10:30 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda
   A. Approval of minutes from the August 12, 2020 meeting
   B. Next meeting
   C. Consent Resolution

3. Establish Exception to Moratorium and Lease Member Generation

4. Affordable Clean Energy (ACE) Presentation

5. Whelan Energy Center Unit 2 (WEC 2) Cost Reduction Efforts

6. Integrated Resource Planning Update with Discussion on Phase I Resource Criteria

7. Adjourn

Approved Minutes
Power Supply Committee Teleconference Meeting
Municipal Energy Agency of Nebraska
November 12, 2020 – 2:00 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met via teleconference, Thursday, November 12, 2020. The meeting was held electronically, no quorum of the public body was physically present together, and, no public in-person attendance. The public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were kept continually current, and was available to members of the public and members of the media by telephone conference, and, was available for public inspection by request at NMPP Energy at http://www.nmppenergy.org/contact. Instruction to join the meeting via GoToMeeting or by telephone only, was provided in the public notice and on the Board's website.

Public Building addresses of meeting attendees are as follows:

COLORADO – 1133 Main Street, Delta CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 245 W 4th Street Wray, CO.

IOWA – 108 Boyer St. Wall Lake, IA.

NEBRASKA – 243 East 13th Street, Crete, NE; 740 Court St Imperial NE; 107 S. Burg St, Kimball NE; 8377 Glynoaks Drive, Lincoln, NE; 326 Ogden Avenue, Oxford, NE; 444 S. Main Street, West Point, NE; 519 10th Street, Wisner, NE.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 10:32 a.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with eight of the ten committee members present.

1. Pat Davison, Imperial
2. James DePue, Wray
3. Will Dowis, Gunnison
4. Duane Hoffman, Oxford
5. Matt Langhorst, Glenwood Springs
6. Tom Ourada, Crete
7. Chris Rodman, Wall Lake
8. Adam Suppes, Delta (Arrived 10:39 a.m.)

Absent: Bill Hinton, Kimball and Randy Woldt, Wisner

Tom Goulette, Voting Ex-Officio

CONSENT AGENDA

Minutes

Minutes of the August 12, 2020 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee will be held on January 20, 2021, at the Younes Conference Center, Kearney, Nebraska, or virtual meeting if required.

Consent Resolution

Motion: *Matt Langhorst moved to approve the consent resolution as presented. Duane Hoffman seconded the motion, which carried on a unanimous roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the August 12, 2020 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, January 20, 2021 at the Younes Conference Center in Kearney, Nebraska or virtual if required.*

ESTABLISH EXCEPTION TO MORATORIUM AND LEASE MEMBER GENERATION

Tim Cerveny, Manager of Resources & Transmission, led the discussion of establishing an exception to the moratorium and lease additional Member generation from Wisner, Nebraska from 1.5 to 2 MW to offset reductions at other contracted facilities.

The Power Supply Committee recommended the MEAN Board of Directors approve the following resolution.

Motion: *Duane Hoffman moved to approve the following resolution. Matt Langhorst seconded the motion, which carried on a unanimous roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

MEAN POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the MEAN Board of Directors approved a moratorium effective January 20, 2005, on leasing any new or additional generation until such time peaking capacity generation is needed; and

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors establish an exception to the moratorium to allow MEAN to lease additional generating capacity from the City of Wisner, Nebraska, a participant, to satisfy capacity requirements under the Capacity and Energy Displacement Agreement, as amended, between MEAN and the Western Area Power Administration (the "WAPA Displacement Agreement"); and

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors approve a reduction in certain generating capacity required from other generation resources under the WAPA Displacement Agreement; and

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors approve an amendment to the WAPA Displacement Agreement to reflect the revised capacity amounts as set forth in this resolution.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors establish an exception to the moratorium placed into effect January 20, 2005, allowing MEAN to lease certain additional generating capacity from Wisner as described in this resolution.

BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors authorize the Director of Wholesale Electric Operations to do all things necessary to lease the following participant generation from Wisner and to notify Wisner of the lease amount, subject to all applicable rules and regulations including the requirement that the units and participants meet criteria set forth in the Asset Management Policies and Procedures:

Location	MW[1/]
Ansley	1.35
Benkelman	0.785
Broken Bow	6.90
Burwell	3.018
Callaway	0.752
Crete	6.151
Curtis	3.066
Oxford	3.45
Pender	3.30
Red Cloud	4.20
Stuart	1.543
West Point	4.145
Whelan Energy Center #2	16.00
Wisner	2.00
Total	**56.660**

BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve reducing certain generating capacity required from other generation resources under the WAPA Displacement Agreement.

BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve an amendment to the WAPA Displacement Agreement to reflect the revised capacity amounts.

AFFORDABLE CLEAN ENERGY (ACE) PRESENTATION

Tim Cerveny, Manager of Resources & Transmission, discussed the Affordable Clean Energy (ACE) rule and the impacts to our coal-fired facilities and steps required for implementation.

WHELAN ENERGY CENTER UNIT 2 (WEC2) COST REDUCTION EFFORTS

Tim Cerveny, Manager of Resources & Transmission, reported on operating mode changes, combined interest resources implementation and Public Power Generation Agency (PPGA) member collaboration.

INTEGRATED RESOURCE PLANNING UPDATE WITH DISCUSSION ON PHASE I RESOURCE CRITERIA

Shannon Coleman provided an update on Integrated Resource Planning and discussion of Phase I Resource Criteria.

ADJOURNMENT

There being no further business, the meeting adjourned at 11:12 a.m.

Submitted by:

Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:

Kim Schafers
Municipal Energy Agency of Nebraska

MEAN Power Supply Committee
November 12, 2020

nmpp ENERGY NMPP | MEAN | NPGA | ACE

1

nmpp ENERGY NMPP | MEAN | NPGA | ACE

Integrated Resource Planning
Phase I Resource Criteria

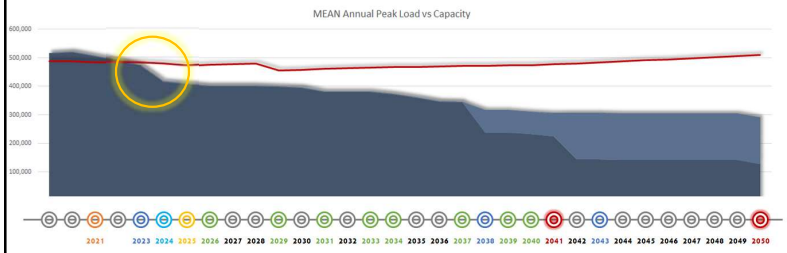
Shannon Coleman
Supervisor Resource Planning & Analysis

2

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2022 Integrated Resource Plan

- Upcoming Contract Terminations
- Resource Needs in West and/or SPP
- 2050 Vision



3

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2017 Resource Criteria Survey

1. In the context of planning for future resource needs to meet load, please rank the following criteria:

Criteria	5 Very Important	4 Somewhat Important	3 Neutral	2 Not Very Important	1 Not at All Important
Cost	☐	☐	☐	☐	☐
Fuel Diversity	☐	☐	☐	☐	☐
Reliability	☐	☐	☐	☐	☐
Flexibility (Dispatchability)	☐	☐	☐	☐	☐
Emissions/Environmental Impact	☐	☐	☐	☐	☐
Renewable Fuel	☐	☐	☐	☐	☐
Local Benefit	☐	☐	☐	☐	☐
PPA vs. Ownership	☐	☐	☐	☐	☐
Environmental Policy Risk	☐	☐	☐	☐	☐
Risk/Market Participation	☐	☐	☐	☐	☐

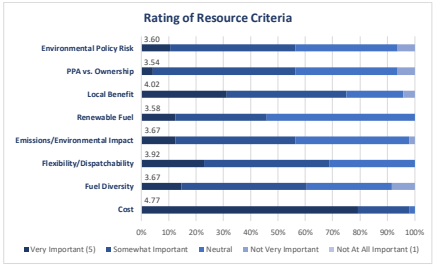
- Included Explanation of Each in Survey

4

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2017 Resource Criteria Survey Results

In the context of planning for future resource needs to meet load, please rank the following criteria:	Very Important (5)	Somewhat Important	Neutral	Not Very Important	Not At All Important (1)
Criteria	5	4	3	2	1
Cost	38	9	1	0	0
Fuel Diversity	7	22	15	4	0
Flexibility/Dispatchability	11	22	15	0	0
Emissions/Environmental Impact	6	21	20	1	0
Renewable Fuel	6	16	26	0	0
Local Benefit	15	21	10	2	0
PPA vs. Ownership	2	25	18	3	0
Environmental Policy Risk	5	22	18	3	0

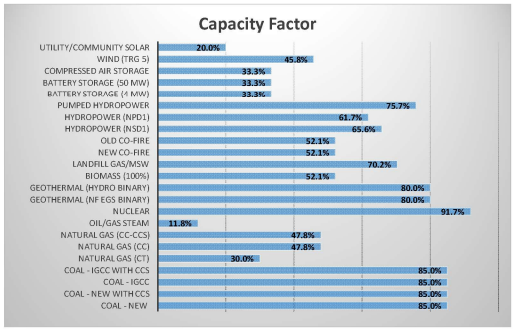


5

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Criteria Metrics

- (Max = 5, Min = 1, Each Option Received Calculated Proportional Score)
- Capacity Factor
- Capital Cost
- Energy Production
- Fixed O&M
- Variable O&M
- LCOE
- Fuel Cost
- Heat Rate
- Emissions
- Lead Time
- Outage Rates
  - (Forced and Planned)
- Turndown



6

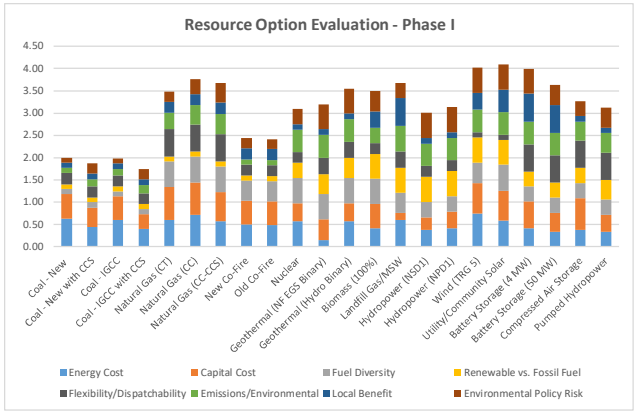
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Options	Score	4.77 Energy Cost	4.77 Capital Cost	3.67 Fuel Diversity	3.58 Renewable vs. Fossil Fuel	3.92 Flexibility/Dispatchability	3.67 Emissions/Environmental	4.02 Local Benefit	3.60 Environmental Policy Risk
Coal - New	2.00	0.63	0.55	0.11	0.11	0.24	0.11	0.13	0.11
Coal - New with CCS	1.86	0.45	0.43	0.11	0.11	0.24	0.16	0.13	0.23
Coal - IGCC	1.98	0.60	0.53	0.11	0.11	0.24	0.14	0.13	0.11
Coal - IGCC with CCS	1.74	0.41	0.32	0.11	0.11	0.24	0.19	0.13	0.23
Natural Gas (CT)	3.48	0.60	0.75	0.57	0.11	0.61	0.36	0.25	0.23
Natural Gas (CC)	3.76	0.71	0.73	0.57	0.11	0.61	0.43	0.25	0.34
Natural Gas (CC-CCS)	3.68	0.57	0.65	0.57	0.11	0.61	0.46	0.25	0.45
New Co-Fire	2.44	0.50	0.53	0.46	0.11	0.24	0.11	0.25	0.23
Old Co-Fire	2.42	0.48	0.53	0.46	0.11	0.24	0.11	0.25	0.23
Nuclear	3.09	0.57	0.40	0.57	0.34	0.24	0.51	0.13	0.34
Geothermal (NF EGS Binary)	3.20	0.15	0.46	0.57	0.45	0.37	0.51	0.13	0.56
Geothermal (Hydro Binary)	3.55	0.57	0.40	0.57	0.45	0.37	0.51	0.13	0.56
Biomass (100%)	3.49	0.41	0.54	0.57	0.56	0.24	0.33	0.38	0.45
Landfill Gas/MSW	3.68	0.60	0.15	0.46	0.56	0.37	0.57	0.63	0.34
Hydropower (NSD1)	3.00	0.37	0.29	0.34	0.56	0.24	0.51	0.13	0.56
Hydropower (NPD1)	3.13	0.42	0.37	0.34	0.56	0.24	0.51	0.13	0.56
Wind (TRG 5)	4.02	0.75	0.68	0.46	0.56	0.12	0.51	0.38	0.56
Utility/Community Solar	4.09	0.58	0.68	0.57	0.56	0.12	0.51	0.50	0.56
Battery Storage (4 MW)	4.00	0.41	0.60	0.34	0.34	0.61	0.51	0.63	0.56
Battery Storage (50 MW)	3.64	0.32	0.44	0.34	0.34	0.61	0.51	0.63	0.45
Compressed Air Storage	3.27	0.38	0.71	0.34	0.34	0.61	0.43	0.13	0.34
Pumped Hydropower	3.12	0.32	0.39	0.34	0.45	0.61	0.43	0.13	0.45

7

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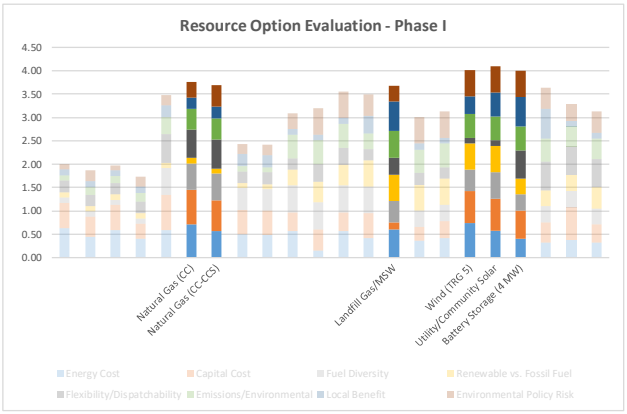
Phase I Resource Evaluation



8

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Phase II Resource Options



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2022 Resource Criteria

- Additional Criteria Ideas
  - 2050 Vision
  - Debt
  - Transmission
  - State Legislation
  - Curtailment Risk
  - Resource Adequacy/Capacity
  - Future Capital Cost/Decommissioning



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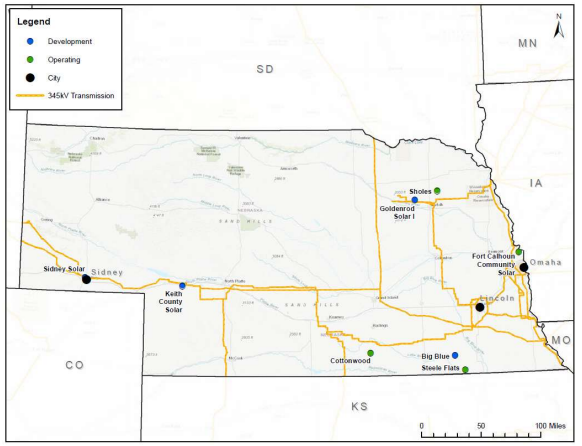
Resources Under Evaluation

- Central Nebraska Public Power and Irrigation District Hydro Facilities – NE
  - Up to 60 MW
  - January 2023
  - ***RFP Process in 2021***
  - Non-Carbon, Limited Dispatch, Mid-Range Capacity Factor, Fully Accredited Capacity

CENTRAL Nebraska Public Power and Irrigation District

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Other Renewable Projects



NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a telephone conference meeting of the MEAN Board of Directors and MEAN Executive Committee of the Municipal Energy Agency of Nebraska will be held Friday, November 13, 2020 at 9:00 a.m. (CT). Since the meeting will be held electronically, and no quorum of the public body will be physically present together, there will be no public in-person attendance. Access to the meeting will be made available to members of the public and members of the media by telephone conference at +1 (571) 317-3116, access code 936-631-269.

Public Building addresses of meeting attendees are as follows:

COLORADO–500 Doolittle Dr, Aspen, CO; 1133 Main Street, Delta CO; 110 Sherman Street, Fort Morgan CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 145 S Colorado Ave, Haxtun CO; 245 W 4th Street Wray, CO; 320 South Main St, Yuma CO.

IOWA–108 N 2nd St., Breda IA; 195 N First Street, Carlisle, IA; 210 W 2nd Ave, Indianola, IA; 108 Boyer St. Wall Lake IA; 1002 Adams Pkwy, Waverly, IA;

NEBRASKA – 8377 Glynoaks Drive, Lincoln, NE; 324 Laramie Avenue, Alliance, NE; 909 Division Street, Ansley, NE; 445 Main Street, Bayard, NE; 201 10th Street, Beaver City, NE; 508 1st Ave West, Benkelman, NE; 809 Main Street, Bridgeport, NE; 404 Grand Avenue, Burwell NE; 157 East Kimball Street, Callaway, NE; 243 East 13th Street, Crete NE; 201 Garlick Avenue Curtis NE; 612 D Street, Fairbury, NE; 1025 P Street, Gering NE; 342 Central Ave, Grant, NE; 740 Court Street, Imperial NE; 414 Jeffers Ave, Lyman, NE; 1280 Center Ave, Mitchell, NE; 118 South Centre Avenue, Morrill, NE; 100 Central Avenue, Nebraska City NE; 202 Main Street, Neligh, NE; 326 Ogden Avenue, Oxford, NE; 106 S. 1st St., Pierce, NE; 205 W Locust, Plainview NE; 528 10th Ave Sidney, NE; 111 West 2nd Street , Stuart NE; 402 Main Street, Trenton, NE; 444 S. Main Street, West Point, NE; 519 10th Street, Wisner, NE.

WYOMING – 153 E B St., Basin, WY

An agenda is kept continually current and is available for public inspection by request, no later than 10:00 a.m. on the day before the meeting, if you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact.

Board of Directors and Executive Committee
Teleconference Meeting
Combined Agenda
Municipal Energy Agency of Nebraska
November 13, 2020 – 9:00 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act 84-1412 (8)
   B. Roll Call
      1) Board of Directors
      2) Executive Committee

2. Chairman's Remarks

3. Reports
   A. Executive Director
   B. Director of Wholesale Electric Operations

4. Consent Agenda Executive Committee
   A. Minutes of the August 13, 2020 meeting
   B. Consent Resolution

5. Consent Agenda MEAN Board of Directors
   A. Fiscal Year 2020-2021 Year-to Date Financial Report
   B. Acknowledge Receipt of the Unapproved Minutes of the September 2, 2020 Joint Operating Committee Meeting
   C. Next meeting
   D. Consent Resolution

6. Federal Securities Law Requirements-Annual Board Training

7. Committee Reports and Recommendations
   A. Risk Oversight Committee
      1) Risk Oversight Committee Meeting Summary of November 12, 2020
   B. Services Committee
      1) Services Committee Meeting Summary of November 12, 2020
   C. Power Supply Committee
      1) Power Supply Committee Meeting Summary of November 12, 2020
      2) Establish Exception to Moratorium and Lease Member Generation
      3) Integrated Resource Planning Update with Discussion on Phase I Resource Criteria
   D. Finance Committee
      1) Finance Committee Meeting Summary of October 9, 2020 (Workshop), October 21, 2020 and November 12, 2020
   E. Governance Review Committee
      1) Governance Review Committee Meeting Summary of October 9, 2020 (Workshop), and November 12, 2020
      2) MEAN By-Law Amendments
      3) Joint Operating Committee Agreement

8. Updates and Reports
   A. Western Energy Imbalance Service (WEIS) Tariff
   B. Western Area Colorado Missouri Balancing Authority (WACM) Standardized Services Agreement
   C. Capability Testing Results
   D. Covid Impact to MEAN Load
   E. NMPP Energy Annual Conference Update

9. Contracts, Settlement Agreements, and General Counsel Report
   A. Contracts Report
   B. Legislative and Legal Updates
      1) State and Federal Activities

10. Closing Comments

11. Adjourn

Approved Minutes
Board of Directors and Executive Committee
Teleconference Meeting
Municipal Energy Agency of Nebraska
Friday, November 13, 2020

The Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) met in a joint session with the MEAN Executive Committee via teleconference, Friday, November 13, 2020. Notice of the meeting was given to committee members and their community city clerks by e-mail. The meeting was held electronically, no quorum of the public body was physically present together, and, no public in-person attendance. The public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were kept continually current, and was available to members of the public and members of the media by telephone conference, and, was available for public inspection by request at NMPP Energy at http://www.nmppenergy.org/contact. Instruction to join the meeting via GoToMeeting or by telephone only, was provided in the public notice and on the Board's website.

Public Building addresses of meeting attendees are as follows:

COLORADO–500 Doolittle Dr, Aspen, CO; 1133 Main Street, Delta CO; 110 Sherman Street, Fort Morgan CO; 101 West 8th Street, Glenwood Springs CO; 1100 West Virginia Ave, Gunnison CO; 145 S Colorado Ave, Haxtun CO; 245 W 4th Street Wray, CO; 320 South Main St, Yuma CO.

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WYOMING – 153 E B St., Basin, WY

BOARD OF DIRECTORS

CALL TO ORDER

Vice Chairman Tom Ourada called the meeting to order at 9:15 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public. Roll call was taken twice to determine if there was meeting quorum.

ROLL CALL

A quorum was declared with 33 of the 54 Directors in attendance.

1. Anderson, Chad – Pierce
2. Beyer, Michael – Bridgeport
3. Blome, Kim – Mitchell
4. Bridge, Kirby – Alliance
5. Carpenter, Ron – Haxtun
6. Christoff, Tyler – Aspen
7. Cooley, Tammy – Gering
8. Davison, Pat – Imperial
9. DePue, James – Wray
10. DesPlanques, Chris – Indianola
11. Dickman, Ghert – Callaway
12. Dowis, Will – Gunnison
13. Dunn, Edward – Grant
14. Goulette, Tom – West Point (Arrived 10:26 a.m.)
15. Hoffman, Duane – Oxford
16. James, Nate – Morrill
17. Janssen, Nancy – Breda
18. Jorgensen, Grant – Beaver City
19. Kohrs, Jeff – Nebraska City
20. Lamm, Mitchell – Burwell
21. Langhorst, Matt – Glenwood Springs
22. McNally, Joe – Neligh
23. Moser, Bill – Ansley
24. Nation, Brent – Fort Morgan
25. Ourada, Tom – Crete
26. Palmer, Mike – Sidney
27. Prettyman, John – Yuma
28. Renn, Mary – Fairbury
29. Rodman, Chris – Wall Lake
30. Schultz, Doug – Curtis
31. Summers, James – Benkelman
32. Suppes, Adam – Delta
33. Wenzel, Darrel – Waverly

Other Board Members in attendance: Tory Edwards – Arnold; Aaron Caplan – Lyons; and Carrie Hartwell – Julesburg. *Note: Arnold, Lyons and Julesburg attended via conference call, however, were not listed as a conference call site on the Public Meeting Notice and were not eligible to count towards quorum.*

Board Members not in attendance: Stacey Lesher – Basin; Shelly Bowlin – Bayard; Larry Edgar – Blue Hill; Gene Chapin – Broken Bow; Mike Criss – Chappell; Ray Luhring – Falls City; Keith Beck – Fleming; Carl Christian – Fountain; Bill Hinton – Kimball; Allan Thomas – Lyman; Bernard Gagne – Oak Creek; Chris Brader – Pender; Michael Clark – Red Cloud; Jon Winkel – Sergeant Bluff; Bart Brinkman – Shickley; Bob Lockmon – Stuart; Dana Youtz – Torrington; and Randy Woldt – Wisner.

EXECUTIVE COMMITTEE

CALL TO ORDER

Vice Chairman Tom Ourada called the Executive Committee Meeting to order at 9:19 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with five of the seven Executive Committee Members in attendance:

1. Tom Ourada, Crete
2. Mike Palmer, Sidney
3. Doug Schultz, Curtis
4. Adam Suppes, Delta
5. Darrel Wenzel, Waverly

Not Present: Bill Hinton, Kimball; and Tom Goulette, West Point.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, welcomed meeting attendees. He began his report by noting a follow up to a request received from the Joint Operating Committee (JOC), during the September 2, 2020 JOC meeting. Staff was asked to discuss the rising costs of health care and the impact it is having on our communities with our elected officials in Washington, DC. Poehling informed the MEAN Board of Directors and Executive Committee Members that a productive discussion took place with Senator Deb Fischer and her staff with the meeting lasting much longer than anticipated. He stated that Senator Fischer was empathetic and asked great questions. Poehling noted that staff has not yet met with Congressman Jeff Fortenberry but will continue working toward scheduling a meeting. He stated that NMPP Energy staff will continue to discuss this topic with elected officials at every possible opportunity.

Poehling discussed the upcoming rollout of the Enterprise Risk Management (ERM) Program being led by Robin Spady, Director of Risk and Compliance/Regulatory Counsel. He provided a brief overview of the ERM Program and noted that the program will roll out to each entity beginning with MEAN in the fall of 2021.

Poehling provided highlights of NMPP Energy's and MEAN's performance over the past five years noting there have been many positive trends and cost savings occurring during that time period.

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, thanked meeting attendees and began his report by stating that staff continue to serve MEAN Communities in many ways during the pandemic. He reported the delivery of hand sanitizer (over 300 gallons) to Member Communities, recent Mutual Aid requests received from David City, Nebraska Municipal Power Pool Member (NMPP), Pender, and West Point after an ice/snow storm moved across Nebraska. He noted that eight (NMPP/MEAN) Member Communities, Auburn, Cozad, Crete, Curtis, Holdrege, Pierce, Stuart and Wayne assisted with the mutual aid effort.

Hans continued his report noting the October 8-9, 2020 MEAN Finance and Governance Review Committee workshops and the results of the November meetings to build a strategic plan based on member requests and new concepts for potential services.

Hans provided an overview of the first two years of The Energy Authority (TEA) transition. He reported the optimization strategies have provided $850k YTD in value with a focus on compliance and risk management. Hans noted that TEA will provide a full report to the Board at its January 21, 2021 meeting.

Hans discussed Market developments in the West. He noted the announcement from Southwest Power Pool (SPP) that MEAN, along with several other utilities in the West, has signed a letter of intent to work with SPP and participate in discussions of the terms under which loads and resources in the West would be served and operated in the SPP Integrated Market that currently serves the majority of our Nebraska communities and one Iowa community. Commitments to join the market are anticipated to happen during the summer of 2021. A copy of the press release was distributed November 12, 2020 to MEAN Representatives and City Clerks.

Hans reported on the following cost saving measures for MEAN:

- Whelan Energy Center 2 (WEC2) Market Optimization $150k through July
- Change of supplier for operating reserves resulting in $400k per year savings
- WAPA billing credit of $175k for Northwest Power Pool (NWPP) Transition

Other MEAN Projects:

- Renewable Distributed Generation
  - Interconnection Policy reminder to MEAN communities to have policies in place and keep current
  - Emphasized MEAN communities put a rate structure in place to minimize the impacts of distributed generation
- Integrated Resource Planning

CONSENT AGENDA MEAN EXECUTIVE COMMITTEE

Minutes

Minutes of the August 13, 2020 MEAN Executive Committee meeting were previously distributed. There were no changes to the minutes.

Motion: *Darrel Wenzel moved to approve the following Consent Resolution. Mike Palmer seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

EXECUTIVE COMMITTEE RESOLUTION

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Executive Committee that the minutes of the August 13, 2020 meeting are hereby approved.

ADJOURNMENT EXECUTIVE COMMITTEE

There being no further business, the Executive Committee meeting adjourned at 9:51 a.m.

CONSENT AGENDA MEAN BOARD OF DIRECTORS

Minutes

Due to a lack of quorum of the MEAN Board of Directors on August 13, 2020, there were no meeting minutes for the Board to approve.

Fiscal Year 2020-2021 Year-to Date Financial Report

Johnson summarized MEAN's Fiscal Year 2020-2021 Year-to-Date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet; cash and investments; and fiscal year-to-date operating results. MEAN financials for July, August and September 2020 were previously distributed.

Acknowledge receipt of Approved September 2, 2020 meeting minutes of the Joint Operating Committee (JOC).

Ourada noted that the approved minutes from the September 2, 2020 meeting of the NMPP Energy Joint Operating Committee (JOC) were received and included in the previously distributed meeting packet for review.

Next Meeting

Vice Chairman Ourada stated that the next meeting of the MEAN Board of Directors will be held on Thursday, January 21, 2021 at the Younes Conference Center, Kearney, Nebraska, or virtual if required.

Motion: *Chris DesPlanques moved to approve the following Consent Resolution. Nancy Janssen seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the financial statements for July, August and September 2020 are hereby accepted; and,*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the receipt of the minutes of the September 2, 2020 Joint Operating Committee meeting is hereby acknowledged; and,*

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, January 21, 2021 at the Younes Conference Center, Kearney, Nebraska or virtual if required.*

Federal Securities Law Requirements-Annual Board Training

Jamie Johnson, Director of Finance and Accounting, presented the annual Board training regarding the requirements of federal securities laws in accordance with the Best Practices section of MEAN's Bond Compliance Policy. Board attendees acknowledged the training through one of the following options made available: online remote voting presence; on-line teleconference chat messaging; or by voice.

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Finance, Governance Review, Power Supply, Risk Oversight and Services Committees met on November 12, 2020.

RISK OVERSIGHT COMMITTEE

Risk Oversight Committee Meeting Summary of November 12, 2020

The Director of Risk and Compliance/Regulatory Counsel, Robin Spady provided a recap of topics covered at the November 12, 2020 meeting. Spady noted the review of compliance processes and NERC reliability. She stated that an external audit will be conducted in January 2021 by Steve McCoy with McCoy and Associates. The external review is conducted every 2-3 years and helps to keep MEAN audit ready. Spady will provide a report to the Board at its May 2021 meeting.

Spady provided an update on the OSHA Compliance Program; Congestion Rights; and development of the Enterprise Risk Management Program.

SERVICES COMMITTEE

Services Committee Meeting Summary of November 12, 2020

Andrew Ross, Director of Retail Utility Services & Member Relations, provided a recap of topics covered at the November 12, 2020 meeting. Ross provided a summary of the Advanced Metering Infrastructure project and membership interest; distribution projects; meter audits and potential new services. Chair Tom Goulette commented to the Board that West Point, Nebraska was able to determine where the outages were using AMI during the recent ice/snow storm in Nebraska. Goulette thanked all for their Mutual Aid assistance to help restore power to their community.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of November 12, 2020

Tim Cerveny, Manager of Resources & Transmission, provided a recap of topics covered at the November 12, 2020 meeting. The Power Supply Committee recommended the Board establish an exception to the moratorium and lease additional Member generation from Wisner, Nebraska from 1.5 to 2 MW to offset reductions at other contracted facilities. Cerveny summarized the Affordable Clean Energy (ACE) rule and the impacts to MEAN's coal-fired facilities and steps required for implementation. He provided an update on Whelan Energy Center 2 optimization. Cerveny noted Shannon Coleman, Supervisor Resource Planning and Analysis, provided updates on the Integrated Resource Planning and Phase I Resource Criteria.

Establish Exception to Moratorium and Lease Member Generation

Tim Cerveny, Manager of Resources and Transmission led the discussion of establishing an exception to the moratorium and lease additional Member generation from Wisner, Nebraska from 1.5 to 2 MW to offset reductions at other contracted facilities.

The Power Supply Committee recommended the MEAN Board of Directors approve this exception to the moratorium.

Motion: *Matt Langhorst moved to approve the following resolution. James DePue seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using*

the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the MEAN Board of Directors approved a moratorium effective January 20, 2005, on leasing any new or additional generation until such time peaking capacity generation is needed; and

WHEREAS, the MEAN Board of Directors desires to establish an exception to the moratorium to allow MEAN to lease additional generating capacity from the City of Wisner, Nebraska, a participant, to satisfy capacity requirements under the Capacity and Energy Displacement Agreement, as amended, between MEAN and the Western Area Power Administration (the "WAPA Displacement Agreement"); and

WHEREAS, the MEAN Board of Directors desires to approve a reduction in certain generating capacity required from other generation resources under the WAPA Displacement Agreement; and

WHEREAS, the MEAN Board of Directors desires to approve an amendment to the WAPA Displacement Agreement to reflect the revised capacity amounts as set forth in this resolution.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that an exception to the moratorium placed into effect January 20, 2005, shall hereby be established allowing MEAN to lease certain additional generating capacity from Wisner as described in this resolution.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Director of Wholesale Electric Operations is authorized and directed to do all things necessary to lease the following participant generation from Wisner and to notify Wisner of the lease amount, subject to all applicable rules and regulations including the requirement that the units and participants meet criteria set forth in the Asset Management Policies and Procedures:

Location	MW[1/]
Ansley	1.35
Benkelman	0.785
Broken Bow	6.90
Burwell	3.018
Callaway	0.752
Crete	6.151
Curtis	3.066
Oxford	3.45
Pender	3.30
Red Cloud	4.20
Stuart	1.543
West Point	4.145
Whelan Energy Center #2	16.00
Wisner	2.00
Total	**56.660**

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Board approves reducing certain generating capacity required from other generation resources under the WAPA Displacement Agreement.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the amendment to the WAPA Displacement Agreement to reflect the revised capacity amounts is hereby approved.

Integrated Resource Planning Update with Discussion on Phase I Resource Criteria

Shannon Coleman, Supervisor Resource Planning and Analysis, provided an update on Integrated Resource Planning and discussion of Phase I Resource Criteria.

FINANCE COMMITTEE

Finance Committee Meeting Summary of October 8, 2020 (Workshop), October 21, 2020 and November 12, 2020

Jamie Johnson, Director of Finance and Accounting, provided a recap of topics covered at the October 8, 2020 (Workshop), October 21, 2020 and November 12, 2020 meetings. Johnson reported the Finance Committee continued its discussion of MEAN's Rate Setting Philosophy, Rate Structure, Rates Impact of Resource Planning & 2050 Vision, Debt Strategy & Refunding considerations. Johnson noted the Finance Committee at its October 21, 2020 meeting reviewed preliminary shared costs, budgeted positions, and allocation of expenses/reimbursement for services rendered and resources utilized.

GOVERNANCE REVIEW COMMITTEE

Governance Review Committee Meeting Summary of October 9, 2020 (Workshop) and November 12, 2020

Michelle Lepin, Associate General Counsel, provided a recap of topics covered at the October 9, 2020 Workshop and the November 12, 2020 Governance Review Committee meeting. Lepin reported the committee's discussion of the draft By-Laws Phase 2 Amendments, Service Schedule M (SSM) Modernization Initiative, and Scope Documents. She noted Chris Dibbern, General Counsel, reported on potential amendments to the Nebraska Open Meetings Act and legislation solutions. Lepin stated the Governance Review Committee recommended the MEAN Board approve proposed minor revisions of the Joint Operating Committee Agreement.

MEAN By-Law Amendments

Michelle Lepin, Associate General Counsel, reviewed proposed amendments to modernize the MEAN By-Laws as permitted by LB 858. The amendments will create classes of membership in MEAN with allocated voting rights and an Associate class of participation (non-voting, non-member class) (Meeting Attachment E). The proposed amendments also add provisions addressing proprietary information and make housekeeping and modernization changes.

At its meeting on August 12, 2020, the Governance Review Committee recommended the Board approve amendments to the MEAN By-Laws to make such modernization changes. After the August 12, 2020 meeting, staff made the following updates to the proposed amendments:

- Effective date: Updated the effective date of the amendments from November 13, 2020 to November 14, 2020.
- Publication of notice of meetings: Revised description of the publication method (this change is necessary to match legislative changes under LB 148).

- Ex officio role on subcommittees: Added provision to reflect current practice in MEAN that the chairperson of the Board serves as an ex officio member of subcommittees.
- Inactive Members: Revised description that an Inactive Member's director shall not be counted in determining the number required for a quorum of the Board for conducting business at any meeting of the Board.

The proposed resolution for adoption by the Board also would grant blanket approval for any ERPA participant to become an Associate upon request and completion of the necessary paperwork. *Note: By-Law amendments require approval by two-thirds of votes cast.*

Motion: *Duane Hoffman moved to approve the following resolution. Tom Ourada seconded the motion, which carried on a 31-1-0 roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote (Chris DesPlanques did not vote).*

Ayes: Chad Anderson, Michael Beyer, Kim Blome, Kirby Bridge, Ron Carpenter, Tyler Christoff, Tammy Cooley, Pat Davison, James DePue, Gehrt Dickman, Will Dowis, Edward Dunn, Tom Goulette, Duane Hoffman, Nate James, Nancy Janssen, Grant Jorgensen, Jeff Kohrs, Mitch Lamm, Matt Langhorst, Joe McNally, Brent Nation, Tom Ourada, Mike Palmer, John Prettyman, Mary Renn, Chris Rodman, Doug Schultz, James Summers, Adam Suppes and Darrel Wenzel.

Nays: Bill Moser

Abstain: None

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) desires to amend the MEAN By-Laws to create classes of membership with allocated voting rights and an Associate class of participation in MEAN, to add provisions addressing proprietary information, and to make housekeeping and modernization changes; and

WHEREAS, a draft of the proposed amendments was previously sent to the MEAN Board of Directors.

NOW, THEREFORE, BE IT RESOLVED that the MEAN Board of Directors hereby approves the amendments to the MEAN By-Laws as presented.

BE IT FURTHER RESOLVED that the MEAN Board of Directors hereby extends an invitation and approves Associate participation under Article XI of the MEAN By-Laws for any participant of the Electrical Resources Pooling Agreement that submits a request to become an Associate, subject to receipt of all necessary documentation from the participant.

Joint Operating Committee Agreement

Chris Dibbern, General Counsel, reviewed the proposed minor revisions to the Joint Operating Committee Agreement. An updated redlined version of the JOC Agreement was included with the meeting packet (Attachment D).

The Governance Review Committee recommended the MEAN Board of Directors approve the revisions of the Joint Operating Committee Agreement.

Motion: *Matt Langhorst moved to approve the revisions of the Joint Operating Committee Agreement. Darrel Wenzel seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote (Chris DesPlanques, Jeff Kohrs and Joe McNally did not vote).*

UPDATES AND REPORTS

Western Energy Imbalance Service (WEIS) Tariff

Michelle Lepin, Associate General Counsel, provided an update on the development of the Western Energy Imbalance Service Market. Lepin noted this is the new imbalance market in the West that Southwest Power Pool (SPP) will administer, with a projected go live date of February 1, 2021. MEAN will participate with TEA serving as our Market Participant.

Western Area Colorado Missouri Balancing Authority (WACM) Standardized Services Agreement|

Michelle Lepin, Associate General Counsel, provided an update on the status of the new WACM Standardized BA Services Agreement. Lepin noted the Executive Committee approved the item at its May 21, 2020 meeting due to lack of quorum of the Board of Directors. The Western Area Power Administration (WAPA), in its role as the Western Area Colorado Missouri (WACM) Balancing Authority, is implementing a new standardized agreement for WACM Balancing Authority services. WAPA is requesting that all WACM Balancing Authority customers, including MEAN, execute the new standardized agreement to provide consistency and uniformity throughout the Balancing Authority Area and to help align the recent changes arising from SPP Reliability Coordinator Services and Northwest Power Pool Reserve Sharing Group as well as prepare for the upcoming changes needed for the Western Energy Imbalance Service (WEIS) Market implementation.

Capability Testing Results

Tim Cerveny, Manager of Resources and Transmission provided an update on Capability Testing Results. Cerveny reported as of September 30, 2020, seventeen communities tested (61 units) with a passing rate of 98.3%.

Covid 19- Impact to MEAN Load

Shannon Coleman, Supervisor Resource Planning and Analysis, provided a summary on Covid Impacts to Load. Coleman thanked Gen Li, Load Casting Specialist for preparing the report.

- For most months this year, the COVID impact on both load and energy was ≤ 5% in all three RTOs.
- The COVID impacts on both load and energy are trending downwards for all three RTOs since Summer.
- The average COVID impact on peak load for MEAN as a whole is around 4.3%.
- The average COVID impact on total energy for MEAN as a whole is around 4.5%.
- For both load and energy, the COVID impact is insignificant when comparing with the Weather impact.

NMPP Energy Annual Conference Update

Carol Brehm, Member Relations Representative, provided information on the March 23-25, 2021 NMPP Energy Annual Conference. Currently the conference will be held in person unless there are changes due to COVID-19. Brehm stated that staff will continue to monitor the situation and will provide updates accordingly.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports. Summaries of the following agreements were included in the previously distributed meeting packet:

- Heartland Consumers Power District Amendment (regarding Wessington Springs I wind facility) to Confirmation Letter under Mid-Continent Energy Marketers Association Capacity & Energy Tariff)
- Tri-State Generation and Transmission Cooperative, Inc. Confirmation Agreement TS-20-0177 (regarding Operating Reserves) under WSPP Agreement Schedule D
- Western Area Power Administration Service Agreement No. 20-SLC 1031 for Long Term Firm Point-to-Point Transmission Service
- The Energy Authority, Inc. Second Amended and Restated Task Order 1 (regarding Portfolio Management, RTO Market Management/Trading, and Bilateral Trading Services) to Resource Management Agreement
- MidAmerican Energy Company JOU Confirmation Letter to Market Services Agreement
- Western Area Power Administration Service Agreement for Network Integration Transmission Service (LAPT)
- Transmission Reassignment from MEAN to The Energy Authority, Inc. under MISO Tariff
- Western Area Power Administration Amendment No. 3 to Confirmation Agreement No. 19-RMR-3059 regarding spinning reserves to meet NWPP requirements to Contract 87-LAO-193 for Interconnected Operation of Power Systems
- Western States Power Corporation FY 2021 Participation in Loveland Area Projects Member Financing
- Western States Power Corporation FY 2021 Participation in Upper Great Plains Region Member Financing
- Contoural Statement of Work for NMPP Energy Entities, Project Number - NMPP Energy-02 to Professional Services Agreement
- Public Service Company of Colorado Service Agreement for Network Integration Transmission Service Version 0.1.0
- Black Hills Power, Inc. Agreement for Firm Point-to-Point Transmission Service
- WAPA Exhibit D, Rev. No. 3, Charges for Reserves, to Contract No. 87-LAO-193 for Interconnected Operation of Power Systems
- The Energy Authority, Inc. Task Order 3 to Resource Management Agreement (SPP WEIS Project Onboarding Services)

- BKD, LLP Engagement Letter for Audit 2020

Dibbern also discussed the Service on Outside Organization chart included in the packet that reflects staff members and the outside organizations they serve on on behalf of NMPP Energy entities.

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, provided closing comments. He thanked attendees and noted upcoming meetings and events.

ADJOURNMENT

There being no further business, the meeting adjourned at 11:47 a.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:
Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

MEAN Board of Directors Executive Committee

November 13, 2020

Municipal Energy Agency of Nebraska

NMPP | MEAN | NPGA | ACE

1

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Integrated Resource Planning Phase I Resource Criteria

Shannon Coleman

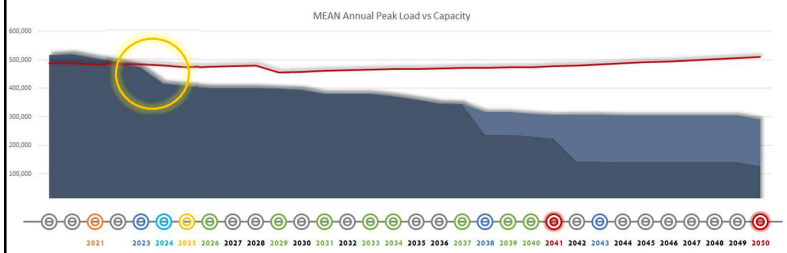
Supervisor Resource Planning & Analysis

2

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2022 Integrated Resource Plan

- Upcoming Contract Terminations
- Resource Needs in West and/or SPP
- 2050 Vision



3

NMPP | MEAN | NPGA | ACE

2017 Resource Criteria Survey

1. In the context of planning for future resource needs to meet load, please rank the following criteria:

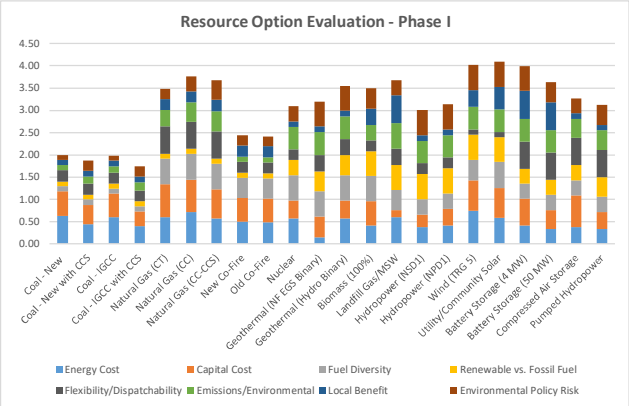
Criteria	5 Very Important	4 Somewhat Important	3 Neutral	2 Not Very Important	1 Not at All Important
Cost	☐	☐	☐	☐	☐
Fuel Diversity	☐	☐	☐	☐	☐
Reliability	☐	☐	☐	☐	☐
Flexibility (Dispatchability)	☐	☐	☐	☐	☐
Emissions/Environmental Impact	☐	☐	☐	☐	☐
Renewable Fuel	☐	☐	☐	☐	☐
Local Benefit	☐	☐	☐	☐	☐
PPA vs. Ownership	☐	☐	☐	☐	☐
Environmental Policy Risk	☐	☐	☐	☐	☐
Risk/Market Participation	☐	☐	☐	☐	☐

- Included Explanation of Each in Survey

4

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Phase I Resource Evaluation



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2022 Resource Criteria

- Additional Criteria Ideas
  - 2050 Vision
  - Debt
  - Transmission
  - State Legislation
  - Curtailment Risk
  - Resource Adequacy/Capacity
  - Future Capital Cost/Decommissioning



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Resources Under Evaluation

- Central Nebraska Public Power and Irrigation District Hydro Facilities – NE
  - Up to 60 MW
  - January 2023
  - ***RFP Process in 2021***
  - Non-Carbon, Limited Dispatch, Mid-Range Capacity Factor, Fully Accredited Capacity

CENTRAL Nebraska Public Power and Irrigation District

MEETING NOTICE

NOTICE IS HEREBY GIVEN that a telephone conference meeting of the MEAN Power Supply Committee of the Municipal Energy Agency of Nebraska will be held Wednesday, January 20, 2021 at 3:00 p.m. (CT). Since the meeting will be held electronically, and no quorum of the public body will be physically present together, there will be no public in-person attendance. Access to the meeting will be made available to members of the public and members of the media by telephone conference at +1 (571) 317-3116, access code 443-375-701.

An agenda is kept continually current and is available for public inspection by request, no later than 10:00 a.m. (CT) on the day before the meeting, if you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact.

Power Supply Committee
Teleconference Meeting
Municipal Energy Agency of Nebraska
November 12, 2020 – 10:30 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda
   A. Approval of minutes from the August 12, 2020 meeting
   B. Next meeting
   C. Consent Resolution

3. Establish Exception to Moratorium and Lease Member Generation

4. Affordable Clean Energy (ACE) Presentation

5. Whelan Energy Center Unit 2 (WEC 2) Cost Reduction Efforts

6. Integrated Resource Planning Update with Discussion on Phase I Resource Criteria

7. Adjourn

Approved Minutes
Power Supply Committee Teleconference Meeting
Municipal Energy Agency of Nebraska
January 20, 2021 – 3:00 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met via teleconference, Wednesday, January 20, 2021, under authority granted by Executive Order No. 20-36, Corona Virus–Public Meetings Requirement Limited Waiver, issued by the Governor of Nebraska on November 25, 2020. The meeting was held electronically, no quorum of the public body was physically present together, and, no public in-person attendance. The public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were kept continually current, and was available to members of the public and members of the media by telephone conference, and, was available for public inspection by request at NMPP Energy at http://www.nmppenergy.org/contact. Instruction to join the meeting via GoToMeeting or by telephone only, was provided in the public notice and on the Board's website.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 3:23 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with seven of the ten committee members present.

1. Pat Davison, Imperial
2. Will Dowis, Gunnison
3. Bill Hinton, Kimball
4. Matt Langhorst, Glenwood Springs
5. Tom Ourada, Crete
6. Chris Rodman, Wall Lake
7. Adam Suppes, Delta

Absent: James DePue, Wray; Duane Hoffman, Oxford; and Randy Woldt, Wisner

Tom Goulette, Voting Ex-Officio

CONSENT AGENDA

Minutes

Minutes of the November 12, 2020 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee will be held on May 19, 2021 at the Younes Conference Center, Kearney, Nebraska or virtual if required.

Consent Resolution

Motion: *Chris Rodman moved to approve the consent resolution as presented. Bill Hinton seconded the motion, which carried on a unanimous roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the November 12, 2020 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, May 19, 2021 at the Younes Conference Center in Kearney, Nebraska or virtual if required.*

TRENTON, NEBRASKA AGREEMENT FOR FIRM POWER INTERCHANGE SERVICE RENEWAL

Andrew Ross, Director of Retail Utility Services & Member Relations, led the discussion of Firm Power Interchange Service Renewal Agreement between MEAN and the Village of Trenton, Nebraska.

Motion: *Chris Rodman moved to approve the resolution as presented. Matthew Langhorst seconded the motion, which carried on a unanimous roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

MEAN POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the Village of Trenton, Nebraska, and MEAN expires December 31, 2021, and

WHEREAS, the Village of Trenton, Nebraska, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN for an eleven (11) year term beginning as of January 1, 2021.

BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve an Agreement for Firm Power Interchange Service between MEAN and the Village of Trenton, Nebraska, for the term of January 1, 2021 through December 31, 2031, subject to final legal and management review and receipt of all necessary documents from the Village of Trenton, Nebraska.

ESTABLISH EXCEPTION TO MORATORIUM AND MODIFICATION OF ASSET MANAGEMENT POLICIES AND PROCEDURES (AMPP)

Tim Cerveny, Manager of Resources & Transmission, led the discussion to Establish Exception to Moratorium and Modification of Asset Management Policies and Procedures (AMPP).

Proposed Modification to AMPP

V. CONTRACT CAPACITY (Approved on 1/23/20; modified on _____)

A. MEAN in its sole discretion will determine the amount of each Participant's Net Dependable Capacity, as defined in Article VI, Section C below, that will be compensated as leased generation under these Asset Management Policies and Procedures (Contract Capacity). The Contract Capacity amount may be changed by MEAN from time to time based on performance, testing and compliance with other provisions of these Asset Management Policies and Procedures.

B. From time to time, it is necessary for MEAN to adjust generating capacity levels in order to meet MEAN's resource needs. These adjustments are the result of fluctuations in unit capability testing results, changes to loads in MEAN's system, or for other reasons. In any instance where an adjustment is 2 MW or less, the following procedure may be used:

1. Staff will investigate possible options for capacity including existing and available resources of entities from which MEAN already receives generating capacity.

2. If MEAN Staff determines that increasing the Contract Capacity of any Participant from existing and available resources would be appropriate, MEAN Staff will contact the Participant to discuss modifications to the Contract Capacity. If the resource owner agrees, MEAN Staff will provide the information to the Executive Director of MEAN for approval.

3. Once approval has been received from the Executive Director of MEAN, MEAN Staff will update the necessary documentation for reporting and capacity compensation. The change in Contract Capacity will be reported to the Board at the next scheduled meeting.

Motion: *Adam Suppes moved to approve the resolution as presented. Chris Rodman seconded the motion, which carried on a unanimous roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the MEAN Board of Directors approved a moratorium effective January 20, 2005, on leasing any new or additional generation until such time peaking capacity generation is needed; and

WHEREAS, from time to time, it is necessary for MEAN to adjust generating capacity levels in order to meet MEAN's resource needs, which minor adjustments are the result of fluctuations in unit capability testing results, changes to loads in MEAN's system, satisfaction of capacity requirements under the Capacity and Energy Displacement Agreement, as amended, between MEAN and the Western Area Power Administration (the "WAPA Displacement Agreement"), or for other reasons; and

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors authorize staff to adjust the contracted capacity from existing and available participant-owned generation from time to time, such adjustments not to exceed 2 MW each, as an exception to the moratorium; and

WHEREAS, proposed revisions to the Asset Management Policies and Procedures were previously sent to the MEAN Power Supply Committee and the MEAN Board of Directors to accomplish the objective of this resolution.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the revisions to the Asset Management Policies and Procedures as presented.

COMMITTEE SCOPE DOCUMENT REVIEW

Staff reviewed the draft Scope document for the Power Supply Committee at the meeting. The Scope document will serve as a reference sheet laying out the responsibilities, composition, requirements for quorum, voting and other aspects of the subcommittee. Approval of the Scope document for the Committee will be sought in May 2021.

MUNICIPAL ENERGY AGENCY OF NEBRASKA
POWER SUPPLY COMMITTEE
SCOPE

A. Summary

The Power Supply Committee ("Committee"), a subcommittee of the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors (the "Board"), is responsible for the duties listed below.

B. Composition of the Committee

The Committee will be comprised as follows:

1. The Committee will consist of ten (10) committee members (each a "Committee Member") appointed by the Chair of the Board from among the list of Board representatives or alternate representatives. No proxies are allowed. The Chair of the Board shall serve as an ex officio member of the Committee, shall not be counted in determining the number required for a quorum of the Committee for conducting business, but may vote on matters.

2. Each Committee Member shall serve until the earliest of his or her (i) resignation, (ii) loss of status as a Board representative or alternate representative, or (iii) removal as a Committee Member by the Chair of the Board.

3. One Committee Member will be appointed by the Chair of the Board to serve as Chair of the Committee.

4. In the event of a vacancy on the Committee, the Chair of the Board will have the option to fill the vacancy by selecting a new Committee Member or may allow the vacancy to continue.

5. Personal characteristics to be considered when selecting Committee Members shall include but not be limited to the following:
    - Ability to listen, analyze, think clearly and creatively, work well with people individually and in a group.
    - Willing to prepare for and attend Committee meetings, ask questions, actively provide input, interact respectfully with staff and Committee Members, and contribute positively to group dynamics.
    - Maintain or develop skills necessary to read and understand financial statements, learn more about the energy and energy services business, understand role and responsibility as a Committee Member.
    - Possess honesty, sensitivity to and tolerance of differing views, a friendly, responsive, and patient approach, community-building skills, personal integrity, and concern for the organization's welfare.

C. Responsibilities

The Committee's responsibilities include the following:

1. Develop and maintain power supply-related planning, purchasing strategies, and reporting systems that help define power supply performance and reliability.

2. Monitor the condition of power supply resources, their competitive position and sustainability, the economies of scale achieved, their geographic concentration, and deviations of load and kWh from expectations.

3. Assess the effectiveness of existing power supply strategies, objectives, policies and procedures based on input from cross-functional sources; provide reports and recommendations as necessary.

4. Develop long range forecasts that identify future resource needs and economic viability; annually compare current resource portfolio to optimal portfolio to updated future resource plans.

5. Identify the power supply resources that are needed to serve Participant load and are reliable, cost-competitive, sustainable, diverse in nature, and environmentally sound.

6. Provide guidance to executive management's recommendations of ownership agreements, power supply and Participant contracts, and partnerships.

7. Develop criteria for, and report on, strategies impacting sustained operations and optimal growth.

8. Develop strategies, policies and procedures that maximize opportunities in the coordination center to minimize net energy and transmission costs and that optimize the use of power supply resources.

9. Other duties as assigned by the Board from time to time.

The Committee may perform other functions as may be necessary or appropriate for advising the Board.

D. Meetings

The Committee will meet as needed and may conduct the meetings by any lawful means. The presence of a majority of the Committee Members, as that term is defined above, will be necessary for the transaction of business by the Committee. Action may be taken upon a vote of a majority of the votes which the Committee Members present are entitled to cast.

E. Reporting

The Committee reports to the Board. The role and power of the Committee is advisory only. The Committee shall not have authority to act on behalf of the Board. No action or inaction by the Committee shall impair or affect the authority or power of the Board or other authorized parties acting on behalf of MEAN.

Revision History

Version	Effective Date	Adoption Date	Description of Revision
1.0	July 1, 2021	_____, 20__	Adoption of Scope

CENTRAL NEBRASKA PUBLIC POWER AND IRRIGATION DISTRICT

Shannon Coleman, Supervisor of Resource Planning and Analysis, summarized details of the Central Nebraska Public Power and Irrigation District's Request for Proposals for a Power Purchase Agreement for energy and capacity from three of its hydro power facilities.

WAVERLY AND INDIANOLA MARKETING AGENT AGREEMENT RENEWALS

Shannon Coleman, Supervisor of Resource Planning and Analysis, summarized the proposed renewal of the Marketing Agent Agreements with Waverly Utilities and Indianola Municipal Utilities under which MEAN will continue marketing the utilities' available capacity. The agreements also grant MEAN the right to purchase and pay for some or all of the marketable capacity. The presentation

included details of the contract terms and show how this contract enables MEAN to meet its load obligations.

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, Waverly Utilities and Indianola Municipal Utilities (the "Utilities") each own electric generation facilities that are not committed to MEAN long-term due to the Moratorium adopted by the MEAN Board of Directors and Management Committee on January 20, 2005; and

WHEREAS, the Utilities have entered into an agreement under which MEAN serves as the Utilities' agent through May 31, 2021 for marketing the capacity that is not already committed to MEAN under the Supplemental Agreement Regarding Capacity Purchase, as amended, between MEAN and each of the Utilities ("Marketable Capacity"); and

WHEREAS, the Utilities and MEAN are considering an extension of such marketing agent relationship through May 31, 2023; and

WHEREAS, as part of the marketing arrangement MEAN would retain the right to elect to purchase and pay for some or all of the Marketable Capacity for MEAN's purposes.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors authorize and direct staff to negotiate and execute a Marketing Agent Agreement between MEAN and each of the Utilities under which MEAN will market the Marketable Capacity for the Midcontinent Independent System Operator ("MISO") Planning Years 2021-2022 and 2022-2023, including the right for MEAN to elect to purchase and pay for some or all of the Marketable Capacity for MEAN's purposes.

INTEGRATED RESOURCE PLANNING UPDATE

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an overview of the risk analysis methodology used in the 2017 Integrated Resource Plan (IRP), and, solicited feedback for additional risk considerations or suggested changes to be incorporated into the 2022 IRP.

ADJOURNMENT

There being no further business, the meeting adjourned at 4:05 p.m. (CT).

Submitted by:

Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:

Kim Schafers
Municipal Energy Agency of Nebraska

Municipal Energy Agency of Nebraska

MEAN Power Supply Committee
January 20, 2021

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1

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Integrated Resource Planning Update

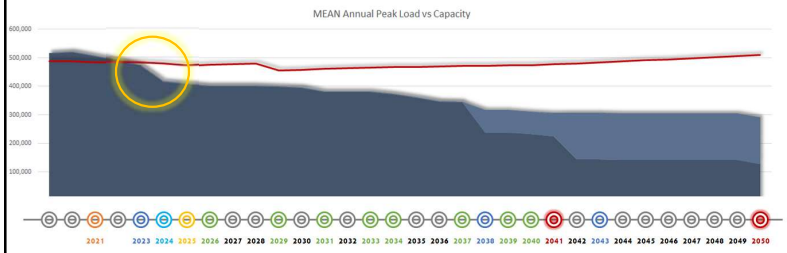
Shannon Coleman
Supervisor Resource Planning & Analysis

2

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2022 Integrated Resource Plan

- Upcoming Contract Terminations
- Resource Needs in West and/or SPP
- 2050 Vision



3

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2022 Integrated Resource Plan

- Internal Risk Discussions
  - Sensitivity vs. Stochastic
  - Variance and Severity
- 2017 IRP Quantified the Variance between Scenarios
  - Fuel Price Risk
  - Carbon Price Risk
- Other Measures of Risk
  - Load Growth?
  - Market Risk?
  - Regulatory/Legislative?



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2017 IRP Modeling Scenarios

Sensitivity Analysis Scenarios

CO_2 Tax	Natural Gas Price: Low	Base	High
No	1	4	7
Med	2	5	8
High	3	6	9

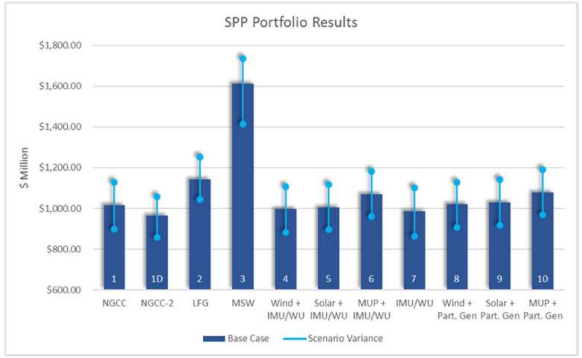
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2017 IRP Modeling Results

- Total Revenue Requirement



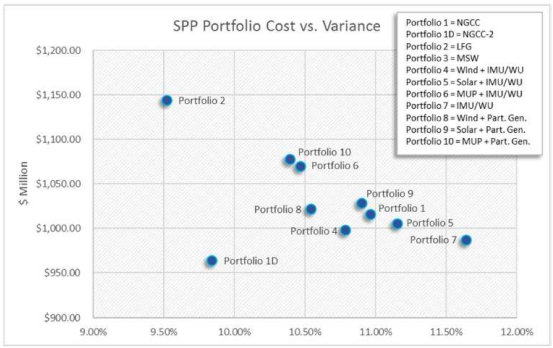
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2017 IRP Modeling Results

- Total Revenue Requirement vs. Variance



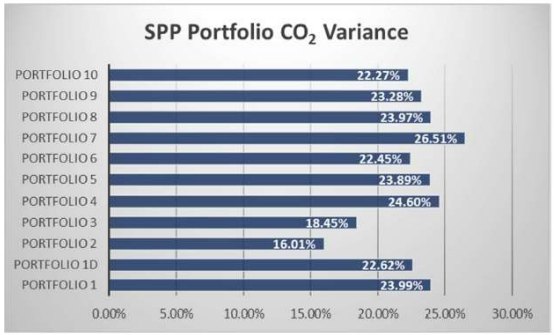
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2017 IRP Modeling Results

- Variance Between Scenarios



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2022 Resource Criteria Survey

1. In the context of planning for future resource needs to meet load, please rank the following criteria:

Criteria	5 Very Important	4 Somewhat Important	3 Neutral	2 Not Very Important	1 Not at All Important
Cost	☐	☐	☐	☐	☐
Fuel Diversity	☐	☐	☐	☐	☐
Flexibility/Dispatchability/Market Risk (Includes Curtailment Risk)	☐	☐	☐	☐	☐
Emissions/Environmental Impact	☐	☐	☐	☐	☐
Local Benefit	☐	☐	☐	☐	☐
PPA vs. Ownership	☐	☐	☐	☐	☐
Environmental Policy Risk	☐	☐	☐	☐	☐
Progress Toward 2050 Vision	☐	☐	☐	☐	☐
Long Term Debt	☐	☐	☐	☐	☐
Transmission Availability and Cost	☐	☐	☐	☐	☐
Resource Adequacy/Capacity	☐	☐	☐	☐	☐
Future Capital Cost/Decommissioning	☐	☐	☐	☐	☐

- Included Explanation of Each in Survey

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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that the Annual Meeting of the Board of Directors and MEAN Executive Committee of the Municipal Energy Agency of Nebraska will be held via teleconference, Thursday, January 21, 2021 at 9:00 a.m. (CT). Since the meeting will be held electronically, and no quorum of the public body will be physically present together, there will be no public in-person attendance. Access to the meeting will be made available to members of the public and members of the media by telephone conference at +1 (571) 317-3116, access code 896-787-645.

The agenda includes election of officers and review and approval of the fiscal year 2020-2021 budget. An agenda is kept continually current and is available for public inspection by request, no later than 10:00 a.m. on the day before the meeting, if you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact.

Combined Agenda
Annual Meeting
Board of Directors and Executive Committee
Teleconference Meeting
Municipal Energy Agency of Nebraska
January 21, 2021 – 9:00 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   - A. Nebraska Open Meetings Act
   - B. Roll Call
     - 1) Board of Directors
     - 2) Executive Committee

2. Chairman's Remarks

3. Reports
   - A. Executive Director
   - B. Director of Wholesale Electric Operations

4. Consent Agenda (Executive Committee)
   - A. Minutes of the November 13, 2020 meeting
   - B. Consent Resolution

5. Consent Agenda (Board of Directors)
   - A. Minutes of the November 13, 2020 meeting
   - B. Fiscal Year 2020-2021 Year-to-Date Financial Report
   - C. Acknowledge Receipt of the Unapproved Minutes of November 4, 2020 Joint Operating Committee Meeting
   - D. Next meeting
   - E. Consent Resolution

6. MEAN Charter Amendments
   - A. Carlisle, Iowa
   - B. Fountain, Colorado

7. Committee Reports and Recommendations
   - A. Governance Review Committee
     - 1) Governance Review Committee Meeting Summary of January 20, 2021
       - (a) Committee Scope Documents
       - (b) Bylaw Amendments
   - B. Services Committee
     - 1) Services Committee Meeting Summary of January 20, 2021
       - (a) MEAN Services Environmental Reporting
       - (b) Operations & Maintenance Project Update
       - (c) Potential Services
   - C. Finance Committee
     - 1) The Energy Authority (TEA) Update
     - 2) Finance Committee Meeting Summary of December 9, 2020 and January 20, 2021
       - (a) Debt Strategy and Refunding Considerations

3) Preliminary Year-End Projections Fiscal Year 2020-2021
4) Budget and Rates and Charges Fiscal Year 2021-2022, Modifications to Schedule of Rates and Charges for Service Schedule M, Modifications to Schedule of Rates and Charges for Service Schedule K and K-1, and Modification of Wind Rate and Environmental Attribute Rate

D. Power Supply Committee
1) Power Supply Committee Meeting Summary of January 20, 2021
(a) Central Nebraska Public Power and Irrigation District
(b) Integrated Resource Planning Update
2) Trenton, Nebraska Agreement for Firm Power Interchange Service Renewal
3) Establish Exception to Moratorium and Modification of Asset Management Policies and Procedures (AMPP).
4) Waverly and Indianola Marketing Agent Agreement Renewals

8. Election of Officers
A. Chair
B. Vice Chair
C. Secretary/Treasurer

9. Election of Executive Committee At-Large Members

10. Updates and Reports
A. Market Updates
B. Advanced Metering Infrastructure (AMI) and Solar RFP Updates
C. NERC Alert

11. Contracts, Settlement Agreements, and General Counsel Report
A. Contracts Report
B. Legislative and Legal Updates
1) State and Federal Activities
2) Legal Updates

12. Closing Comments

13. Adjourn

Approved Minutes of Annual Meeting and Teleconference
Board of Directors and Executive Committee
Teleconference Meeting
Thursday, January 21, 2021

The Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) under authority granted by Executive Order No. 20-36, Corona Virus–Public Meetings Requirement Limited Waiver, issued by the Governor of Nebraska on November 25, 2020 met in joint session with the MEAN Executive Committee on Thursday, January 21, 2021. Notice of the annual meeting was given to committee members and their community city clerks by e-mail. The meeting was held electronically, no quorum of the public body was physically present together, and, no public in-person attendance. The public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were kept continually current, and was available to members of the public and members of the media by telephone conference, and, was available for public inspection by request at NMPP Energy at http://www.nmppenergy.org/contact. Instruction to join the meeting via GoToMeeting or by telephone only, was provided in the public notice and on the Board's website.

MEAN BOARD OF DIRECTORS

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:06 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with 35 of the 54 Directors in attendance.

1. Beyer, Mike – Bridgeport
2. Blome, Kim – Mitchell
3. Brader, Chris – Pender
4. Brestel, Rod – Callaway
5. Bridge, Kirby – Alliance
6. Brinkman, Bart– Shickley
7. Christoff, Tyler – Aspen
8. Cooley, Tammy – Gering
9. Davison, Pat – Imperial
10. DesPlanques, Chris – Indianola
11. Dowis, Will – Gunnison
12. Dunn, Edward – Grant
13. Goulette, Tom – West Point
14. Hinton, Bill – Kimball
15. Hoffman, Duane – Oxford
16. Hrabanek, Dave – Pierce
17. James, Nate – Morrill
18. Janssen, Nancy – Breda
19. Kerr, Jim – Lyons
20. Kohrs, Jeff – Nebraska City
21. Lamm, Mitchell – Burwell
22. Langhorst, Matt – Glenwood Springs
23. Lockmon, Bob – Stuart
24. McNally, Joe – Neligh
25. Moser, Bill – Ansley
26. Nation, Brent – Fort Morgan
27. Ourada, Tom – Crete
28. Palmer, Mike – Sidney
29. Prettyman, John – Yuma
30. Rodman, Chris – Wall Lake
31. Schultz, Doug – Curtis
32. Suppes, Adam – Delta
33. Wenzel, Darrel – Waverly
34. Woldt, Randy – Wisner
35. Youtz, Dana – Torrington

Board Members not in attendance: Doug DeLaune – Arnold; Stacey Lesher – Basin; Dan Coolidge – Bayard; Grant Jorgensen – Beaver City; James Summers – Benkelman; Larry Edgar – Blue Hill; Gene Chapin – Broken Bow; Mike Criss – Chappell; Mary Renn – Fairbury; Ray Luhring – Falls City; Keith Beck – Fleming; Carl Christian – Fountain; Ron Carpenter – Haxtun; Carrie Hartwell – Julesburg; Allan Thomas – Lyman; Bernard Gagne –Oak Creek; Michael Clark – Red Cloud; Jon Winkel – Sergeant Bluff; and James DePue – Wray.

EXECUTIVE COMMITTEE

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:19 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with all seven committee members in attendance:

1. Tom Goulette, West Point
2. Bill Hinton, Kimball
3. Tom Ourada, Crete
4. Mike Palmer, Sidney
5. Doug Schultz, Curtis
6. Adam Suppes, Delta
7. Darrel Wenzel, Waverly

CHAIRMAN'S REMARKS

Goulette reminded Directors to be mindful of remaining on the phone to ensure a quorum for the transaction of business.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, provided a report on the roll out of the Enterprise Risk Management Program (ERM). He discussed the four phases of the ERM program: Risk Identification; Risk Assessment; Risk Mitigation/Implementation; and Risk Monitoring. The program will be led by Robin Spady, Director of Risk and Compliance/Regulatory Counsel. Poehling announced the 2021 NMPP Energy Annual Conference scheduled for March, has been postponed to September due to safety concerns related to the COVID-19 pandemic. He concluded his report by sharing the recent story of an act of vandalism regarding the Black Hills Natural Gas System that occurred in Aspen, Colorado, one of NMPP/MEAN's Member Communities. He noted that thousands of residents were without heat and hot water due to the vandalism. Poehling noted the importance of having adequate security around critical infrastructure. Contact NMPP/MEAN for information about available services.

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, provided a report on Markets in the West and noted the proposed aggressive changes that will impact MEAN's resource portfolio moving forward.

CONSENT AGENDA-MEAN EXECUTIVE COMMITTEE

Minutes

Minutes of the November 13, 2020 meeting were previously distributed. There were no changes to the minutes.

Motion: *Tom Ourada moved to approve the following Consent Resolution. Mike Palmer seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

EXECUTIVE COMMITTEE RESOLUTION

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Executive Committee that the minutes of the November 13, 2020 meeting are hereby approved.

The MEAN Executive Committee recessed at 9:51 a.m.

CONSENT AGENDA-MEAN BOARD OF DIRECTORS

Minutes

Minutes of the November 13, 2020 meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors were previously distributed.

Fiscal Year 2020-2021 Year-to Date Financial Report

Jamie Johnson, Director of Finance and Accounting, summarized MEAN's Fiscal Year 2020-2021 Year-to-Date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet as of November 2020; cash and investments; and fiscal year-to-date operating results through November 30, 2020. MEAN financials for November 2020 were previously distributed for review.

Acknowledge receipt of unapproved November 4, 2020 meeting minutes of the Joint Operating Committee (JOC)

Goulette noted that the unapproved minutes from the November 4, 2020 meeting of the NMPP Energy Joint Operating Committee (JOC) were received and included in the previously distributed meeting packet for review.

Next Meeting

The next scheduled meeting of the MEAN Board of Directors is Thursday, May 20, 2021 at the Younes Conference Center in Kearney, Nebraska or virtual if required.

Motion: *Darrel Wenzel moved to approve the following Consent Resolution. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote (Randy Woldt did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the financial statements for November 2020 are hereby accepted; and,*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the receipt of the minutes of the November 4, 2020 Joint Operating Committee meeting is hereby acknowledged; and,*

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, May 20, 2021 at the Younes Conference Center, Kearney, Nebraska or virtual if required.*

MEAN CHARTER AMENDMENTS

Charter Amendment Adding Participating Municipality on the MEAN Board of Directors

The City of Carlisle, Iowa, intends to pass or has passed an ordinance to become a member of MEAN and serve on the MEAN Board of Directors, pending approval by the Nebraska Power Review Board. Carlisle is located near Des Moines, Iowa.

Motion: *Darrel Wenzel moved to approve the following resolution. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote (Randy Woldt did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the City of Carlisle, Iowa, intends to pass or has passed an ordinance to become a member of MEAN and serve on the MEAN Board of Directors; and

WHEREAS, following approval by the MEAN Board of Directors and receipt of all necessary documents from the City of Carlisle, Iowa, a petition to amend the Petition for Creation and MEAN's Charter to provide for the addition of the City of Carlisle, Iowa, as a participating municipality, will be submitted to the Nebraska Power Review Board for final approval.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that staff is authorized to do all things necessary to file a petition to amend the Petition for Creation and MEAN's Charter to add the City of Carlisle, Iowa, as a participating municipality, and submit the petition to the Nebraska Power Review Board.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the City of Carlisle, Iowa, be accepted as a participating municipality of MEAN, pending receipt of all necessary documents and subject to approval by the Nebraska Power Review Board.

Charter Amendment Withdrawing Participating Municipality and Removing Director from the MEAN Board of Directors

The City of Fountain, Colorado intends to pass or has passed an ordinance to withdraw as a member of MEAN and to relieve the City's director and alternate director from service on the MEAN Board of Directors, pending approval by the Nebraska Power Review Board. Fountain is located southeast of Colorado Springs, Colorado.

Motion: *Darrel Wenzel moved to approve the following resolution. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote (Randy Woldt did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the City of Fountain, Colorado, intends to pass or has passed an ordinance to withdraw as a member of MEAN and to relieve the City's director and alternate director from service on the MEAN Board of Directors; and

WHEREAS, following approval by the MEAN Board of Directors and receipt of all necessary documents from the City of Fountain, Colorado, a petition to amend the Petition for Creation and MEAN's Charter to provide for the withdrawal of the City of Fountain, Colorado, as a participating municipality, will be submitted to the Nebraska Power Review Board for final approval.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that staff is authorized to do all things necessary to file a petition to amend the Petition for Creation and MEAN's Charter to remove the City of Fountain, Colorado, as a participating municipality, and submit the petition to the Nebraska Power Review Board.

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Finance, Governance Review, Power Supply, and Services Committees met on January 20, 2021.

MEAN GOVERNANCE REVIEW COMMITTEE

MEAN Governance Review Committee Meeting Summary of January 20, 2021

Michelle Lepin, Associate General Counsel, provided a recap of topics covered at the January 20, 2021 Governance Review Committee meeting. Lepin reported the Committee reviewed the draft Scope document at its January 20, 2021 meeting. The Scope document will serve as a reference sheet laying out the responsibilities, composition, requirements for quorum, voting and other aspects of the subcommittee. Approval of the Scope document for the Committee will be sought in May 2021. A copy of the Committee Scopes for Finance, Governance Review, Power Supply, Risk, and Services Committee was included in the Governance Review Committee meeting packet for the January 20, 2021 meeting. She noted that the Committee also reviewed an updated draft of the proposed Phase 2 MEAN By-Law amendments modernizing the governance of MEAN. Items for discussion included draft amendments addressing suspension and termination of participants, removal of directors, conflicts of interest, and a minor clarification to the Inactive Member calculation formula.

SERVICES COMMITTEE

MEAN Services Committee Meeting Summary of January 20, 2021

Andrew Ross, Director of Retail Utility Services & Member Relations, provided a recap of topics covered at the January 20, 2021 Services Committee meeting. Ross noted the Services committee reviewed the first draft of the Services Committee scope document with consideration of approval at its May 2021 meeting. He reported Tim Cerveny, Manager of Resources and Transmission highlighted MEAN Environmental reporting and service offerings that are available to MEAN Participants. Cerveny provided an update of Operations and Maintenance projects. Distribution training has been moved to fall of 2021 due to the COVID-19 pandemic. Ross noted Mandy Hansen, Supervisor of Member Services, discussed potential services and a proposed new Energy Efficiency Program – High Efficiency Heat Pump Incentive, to be added to the suite of energy effiency programs available to MEAN Participants. Additional information will be provided at the May meeting. Discussion was held on a potential Cybersecurity service. A Cybersecurity survey will be distributed to MEAN Participants for feedback. Contact NMPP Energy if your community has questions about available services.

FINANCE COMMITTEE

The Energy Authority (TEA) Update

Tyler Wolford, The Energy Authority (TEA) Client Services Manager, and Brad Hans, Director of Wholesale Electric Operations, provided a report to the MEAN Finance Committee and MEAN Board of Directors on the first full year of Optimization Activity.

Finance Committee Meeting Summary of December 9, 2020 and January 20, 2021

Jamie Johnson, Director of Finance and Accounting, provided a recap of topics covered at the December 9, 2020 and January 20, 2021 meetings. Johnson noted the Finance Committee continues its work and discussion of debt strategy and refunding considerations.

Preliminary Year-End Projections Fiscal Year 2020-2021

Jamie Johnson, Director of Finance and Accounting, reviewed the projected operating results (Attachment A), previously distributed in the meeting packet for MEAN, fiscal year ending March 31, 20201.

Budget and Rates and Charges Fiscal Year 2021-2022, Modifications to Schedule of Rates and Charges for Service Schedule M, Modifications to Schedule of Rates and Charges for Service Schedule K and K-1, and Modification of Wind Rate and Environmental Attribute Rate

Included for Board review and approval are the proposed budget (Attachment B) and schedules of rates and charges for Service Schedule M (Attachment C) and Service Schedule K and K-1 (Attachment D) for fiscal year ending March 31, 2022. Jamie Johnson reviewed the proposed budget and rates.

The Finance Committee recommended the MEAN Board of Directors approve the proposed budget, charges, and rates for Fiscal Year ending March 31, 2022 including modifications to the schedules of rates and charges for Service Schedule M and Service Schedule K and K-1, and modification of the Environmental Attribute Rate, at its meeting on January 20, 2021.

Discussion was held.

The following resolution was proposed to the MEAN Board of Directors.

Motion: *Tom Ourada moved to approve the following resolution. Chris Rodman seconded the motion, which carried 29-0-2 on a roll call vote (Michael Beyer, Duane Hoffman, Nate James, and Randy Woldt did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

Ayes: Kirby Bridge, Kim Blome, Chris Brader, Rod Brestel, Bart Brinkman, Tyler Christoff, Tammy Cooley, Pat Davison, Chris DesPlanques, Will Dowis, Edward Dunn, Tom Goulette, Bill Hinton, David Hrabanek, Nancy Janssen, Jim Kerr, Mitchell Lamm, Matthew Langhorst, Bob Lockmon, Bill Moser, Brent Nation, Tom Ourada, Mike Palmer, John Prettyman, Chris Rodman, Doug Schultz, Adam Suppes, Darrel Wenzel and Dana Youtz.

Nays: None

Abstain: Jeff Kohrs, Joe McNally

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Proposed Budget and Rates for Fiscal Year Ending March 31, 2022 were previously sent to the MEAN Board of Directors; and

WHEREAS, the MEAN Board of Directors is authorized to set the Service Schedule M and Service Schedule K/K-1 rates and charges; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for wind-generated energy purchased from the MEAN Wind Resource Pool; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for the MEAN Landfill Gas Energy Environmental Attributes Pool; and

WHEREAS, the MEAN Board of Directors, desires to approve the Budget for Fiscal Year 2021-2022 and the rates for Wind-Generated Energy, Landfill Gas Environmental Attributes, Service Schedule

M and Service Schedule K/K-1, all to be effective April 1, 2021 to allow for the required sixty (60) day advance notice.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that:

1. *The Budget for Fiscal Year 2021-2022, including amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a net fiscal year transfer amount of $0 into the Rate Stabilization Account, as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2022 as presented is hereby approved and shall be made a part of the official Minutes book.*

2. *The Schedule of Rates and Charges, Exhibit B to Service Schedule M, as presented including the rates reflected therein to be effective April 1, 2021, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

3. *The Schedule of Rates and Charges for Bulk Power Participation, Service Schedule K and K-1, as presented including the rates reflected therein to be effective April 1, 2021, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

4. *The Wind Energy Output Charge charged to MEAN Participants for energy produced by any of the facilities within the MEAN Wind Resource Pool shall remain at $0.04300/kWh effective April 1, 2021. Furthermore, this rate shall remain in effect until duly modified. Staff is hereby authorized and directed to issue an updated Exhibit to each Participant's supplemental agreement for wind-generated energy purchase to reflect the modified rate.*

5. *The rate for Environmental Attributes associated with the MEAN Landfill Gas Energy Environmental Attributes Pool shall be increased from $19.72/Environmental Attribute to $21.75/Environmental Attribute (each Environmental Attribute shall be that associated with 1 MWh of energy) effective April 1, 2021. Furthermore, this rate shall remain in effect until duly modified. Staff is hereby authorized and directed to issue an updated Exhibit to each Participant's Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes to reflect the modified rate.*

The MEAN Board of Directors recessed for break at 11:12 a.m. and resumed at 11:16 a.m.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of January 20, 2021

Tim Cerveny, Manager of Resources & Transmission, provided a recap of topics covered at the January 20, 2021 Power Supply Committee meeting.

Central Nebraska Public Power and Irrigation District

Shannon Coleman, Supervisor of Resource Planning and Analysis, summarized details of the Central Nebraska Public Power and Irrigation District's Request for Proposals for a Power Purchase Agreement for energy and capacity from three of its hydro power facilities.

Integrated Resource Planning Update

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an overview of the risk analysis methodology used in the 2017 Integrated Resource Plan (IRP) and solicited feedback for additional risk considerations or suggested changes to be incorporated into the 2022 IRP.

Trenton, Nebraska Agreement for Firm Power Interchange Service Renewal

Andrew Ross, Director of Retail Utility Services & Member Relations, led the discussion of Firm Power Interchange Service Renewal Agreement between MEAN and the Village of Trenton, Nebraska.

Motion: *Matthew Langhorst moved to approve the following Resolution. Darrel Wenzel seconded the motion, which carried unanimously on a roll call vote (Michael Beyer and Randy Woldt did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Supplemental Agreement for Firm Power Interchange Service between the Village of Trenton, Nebraska, and MEAN expires December 31, 2021, and

WHEREAS, the Village of Trenton, Nebraska, intends to pass or has passed an ordinance to approve a new Agreement for Firm Power Interchange Service with MEAN for an eleven (11) year term beginning as of January 1, 2021.

BE IT RESOLVED BY the MEAN Board of Directors that the Agreement for Firm Power Interchange Service between MEAN and the Village of Trenton, Nebraska, is hereby approved for the term of January 1, 2021 through December 31, 2031, subject to final legal and management review and receipt of all necessary documents from the Village of Trenton, Nebraska.

Establish Exception to Moratorium and Modification of Asset Management Policies and Procedures (AMPP).

Tim Cerveny, Manager of Resources & Transmission, led the discussion to Establish Exception to Moratorium and Modification of Asset Management Policies and Procedures (AMPP).

Proposed Modification to AMPP

V. CONTRACT CAPACITY (Approved on 1/23/20; modified on _____)

A. MEAN in its sole discretion will determine the amount of each Participant's Net Dependable Capacity, as defined in Article VI, Section C below, that will be compensated as leased generation under these Asset Management Policies and Procedures (Contract Capacity). The Contract Capacity amount may be changed by MEAN from time to time based on performance, testing and compliance with other provisions of these Asset Management Policies and Procedures.

B. From time to time, it is necessary for MEAN to adjust generating capacity levels in order to meet MEAN's resource needs. These adjustments are the result of fluctuations in unit capability testing results, changes to loads in MEAN's system, or for other reasons. In any instance where an adjustment is 2 MW or less, the following procedure may be used:

1. Staff will investigate possible options for capacity including existing and available resources of entities from which MEAN already receives generating capacity.

2. If MEAN Staff determines that increasing the Contract Capacity of any Participant from existing and available resources would be appropriate, MEAN Staff will contact the Participant to discuss modifications to the Contract Capacity. If the resource owner agrees, MEAN Staff will provide the information to the Executive Director of MEAN for approval.

3. Once approval has been received from the Executive Director of MEAN, MEAN Staff will update the necessary documentation for reporting and capacity compensation. The change in Contract Capacity will be reported to the Board at the next scheduled meeting.

Discussion was held.

Motion: *Tom Ourada moved to approve the following Resolution. Doug Schultz seconded the motion, which carried unanimously on a roll call vote (Mike Beyer, Nate James and Randy Woldt did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the MEAN Board of Directors approved a moratorium effective January 20, 2005, on leasing any new or additional generation until such time peaking capacity generation is needed; and

WHEREAS, from time to time, it is necessary for MEAN to adjust generating capacity levels in order to meet MEAN's resource needs, which minor adjustments are the result of fluctuations in unit capability testing results, changes to loads in MEAN's system, satisfaction of capacity requirements under the Capacity and Energy Displacement Agreement, as amended, between MEAN and the Western Area Power Administration (the "WAPA Displacement Agreement"), or for other reasons; and

WHEREAS, the MEAN Board of Directors desires to authorize staff to adjust the contracted capacity from existing and available participant-owned generation from time to time, such adjustments not to exceed 2 MW each, as an exception to the moratorium; and

WHEREAS, proposed revisions to the Asset Management Policies and Procedures were previously sent to the MEAN Board of Directors to accomplish the objective of this resolution.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the revisions to the Asset Management Policies and Procedures are approved as presented.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Executive Director is authorized to do any and all things and to execute and deliver any and all documents which he deems necessary or advisable in order to accomplish the objective of this resolution.

Waverly and Indianola Marketing Agent Agreement Renewals

The Power Supply Committee at its January 20, 2021 meeting approved a recommendation to the Board to enter into renewed Marketing Agent Agreements with Waverly Utilities and Indianola Municipal Utilities under which MEAN will continue marketing the utilities' available capacity. The agreements also grant MEAN the right to purchase and pay for some or all of the marketable capacity. Shannon Coleman, Supervisor of Resource Planning and Analysis, provided details of the contract terms and showed how these contracts enable MEAN to meet its load obligations.

Discussion was held.

Motion: *Mike Palmer moved to approve the following Resolution. Bill Hinton seconded the motion, which carried on a roll call vote (Chris Brader, Chris DesPlanques and Randy Woldt did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, Waverly Utilities and Indianola Municipal Utilities (the "Utilities") each own electric generation facilities that are not committed to MEAN long-term due to the Moratorium adopted by the MEAN Board of Directors and Management Committee on January 20, 2005; and

WHEREAS, the Utilities have entered into an agreement under which MEAN serves as the Utilities' agent through May 31, 2021 for marketing the capacity that is not already committed to MEAN under the Supplemental Agreement Regarding Capacity Purchase, as amended, between MEAN and each of the Utilities ("Marketable Capacity"); and

WHEREAS, the Utilities and MEAN desire to extend such marketing agent relationship through May 31, 2023; and

WHEREAS, as part of the marketing arrangement MEAN would retain the right to elect to purchase and pay for some or all of the Marketable Capacity for MEAN's purposes.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that staff is hereby authorized and directed to negotiate a Marketing Agent Agreement between MEAN and each of the Utilities under which MEAN will market the Marketable Capacity for the Midcontinent Independent System Operator ("MISO") Planning Years 2021-2022 and 2022-2023, including the right for MEAN to elect to purchase and pay for some or all of the Marketable Capacity for MEAN's purposes.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Marketing Agent Agreements with the Utilities are hereby approved, subject to final legal and management review, and the Executive Director of MEAN is hereby authorized and directed to execute such agreements on behalf of MEAN.

The Executive Committee resumed at 11:46 a.m.

ELECTION OF OFFICERS

Election of officers was conducted at the MEAN Board of Directors January 21, 2021 Annual Meeting. Chris Dibbern provided an overview of the election process. Dibbern noted that eligibility lists were made available along with the duties of the position at the meeting and was included with the previously distributed meeting packet. Terms of the officers are for fiscal year 2021-2022 (April 1 through March 31).

All nominations received by electronic mail for election of officers on the MEAN Board of Directors for fiscal year 2021-2022 were previously distributed for review. A current list of qualifying nominations received by electronic mail and self-nomination include: Chairman: Tom Goulette – West Point (incumbent); Chairman: Darrel Wenzel – Waverly; Vice – Chairman: Tom Ourada – Crete (incumbent); Secretary/Treasurer: Darrel Wenzel – Waverly (incumbent). There were no nominations received from the floor. Dibbern provided the candidates with an opportunity to comment prior to the vote. No comments were made prior to the vote.

Motion: *Mike Palmer moved that nominations cease for the position of Chairman of the Board. Matthew Langhorst seconded the motion, and with no objections, the Board moved directly to the vote.*

Tom Goulette, West Point was elected Chairman of the MEAN Board of Directors with 18 votes. Darrel Wenzel, Waverly received 12 votes.

Motion: *Doug Schultz moved that nominations cease for the position of Vice-Chairman of Board. Mike Palmer seconded the motion, and with no objections, the Board moved directly to the vote.*

Tom Ourada was re-elected Vice-Chairman of the MEAN Board of Directors with 24 votes.

Motion: *Nancy Breda moved that nominations cease for the position of Secretary/Treasurer of the Board. Mike Palmer seconded the motion, and with no objections, the Board moved directly to the vote.*

Darrel Wenzel, Waverly was re-elected Secretary/Treasurer of the MEAN Board of Directors.

ELECTION OF EXECUTIVE COMMITTEE FOUR AT-LARGE MEMBERS

Election of the MEAN Executive Committee was conducted at the MEAN Board of Directors January 21, 2021 Annual Meeting. The MEAN Executive Committee consists of seven members. Individuals serving by virtue of positions held include the MEAN Board Chairman, the MEAN Board Vice-Chairman and the MEAN Board Secretary/Treasurer. A slate of the at-large members was presented: Bill Hinton, Kimball; Mike Palmer, Sidney; Doug Schultz, Curtis; and Adam Suppes, Delta. All were eligible for election/re-election.

Doug Schultz declined the nomination.

Chris Dibbern, General Counsel sought additional nominations from the floor. Two nominations were received for Edward Dunn, Grant, NE., and Brent Nation, Fort Morgan CO. Following the nominations, the Board proceeded directly to the vote.

Motion: *Mike Palmer moved that nominations cease for the Executive Committee at-large, and that the Board of Directors proceed to vote on the slate of the at-large members. Darrel Wenzel seconded the motion. A second nomination was received for Brent Nation. Adam Suppes moved that nominations cease for the Executive Committee at-large, and the Board of Directors proceed to vote on the slate of the at-large members. Will Dowis seconded the motion. Baring no additional Executive Committee at-large nominees, The Board of Directors proceeded to vote on the slate of the at-large members, and, with no objections, the Board moved directly to the vote.*

The following Directors were elected or re-elected to serve as the four at-large Executive Committee members: Adam Suppes, Delta with 18 votes; Brent Nation-Fort Morgan with 16 votes; Mike Palmer-Sidney with 14 votes; and Bill Hinton-Kimball with 12 votes.

UPDATES AND REPORTS

Market Updates

Michelle Lepin, Associate General Counsel, provided an update on the status of development of the Western Energy Imbalance Service (WEIS) Market and SPP RTO West, and the status of the California ISO Energy Imbalance Market.

Advanced Metering Infrastructure (AMI) and Solar RFP Updates

Rich Andrysik, Distributed Resources & Generation Specialist, provided an update on the progress toward providing Advanced Metering Infrastructure (AMI) as a service. Additional members adding this AMI service helps to lower the cost for everyone. He discussed the drafting of a Request for Proposal to install solar PV in Participant Communities. By enlarging the project with multiple communities, economies of scale will help to bring costs down for everyone. Participants are invited to join.

Discussion was held.

NERC Alert

The Director of Risk and Compliance/Regulatory Counsel, Robin Spady provided a NERC alert update.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports. Summaries of the following agreements were included in the previously distributed meeting packet:

- Amendment No. 1 to Western Area Power Administration Consolidated Facility Arrangements Agreement No. 87-LAO-301
- Southwest Power Pool, Inc. Service Agreement #1906R14 for Network Integration Transmission Service
- Southwest Power Pool, Inc., Nebraska Public Power District, Corn Belt Power Cooperative, Inc. Network Operating Agreement
- PFM Financial Advisors, LLC Engagement Letter

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, provided closing comments. He thanked attendees and noted upcoming meetings and events.

ADJOURNMENT

There being no further business, the meeting adjourned at 12:43 p.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:
Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

MEAN Board of Directors
Executive Committee
January 21, 2021

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Integrated Resource Planning Update

Shannon Coleman

Supervisor Resource Planning & Analysis

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2022 Integrated Resource Plan

- Internal Risk Discussions
  - Sensitivity vs. Stochastic
  - Variance and Severity
- 2017 IRP Quantified the Variance between Scenarios
  - Fuel Price Risk
  - Carbon Price Risk
- Other Measures of Risk
  - Load Growth?
  - Market Risk?
  - Regulatory/Legislative?



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2017 IRP Modeling Scenarios

Sensitivity Analysis Scenarios

CO_2 Tax	Natural Gas Price: Low	Natural Gas Price: Base	Natural Gas Price: High
No	1	4	7
Med	2	5	8
High	3	6	9

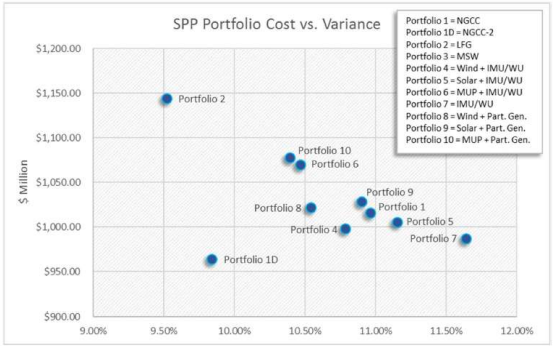
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2017 IRP Modeling Results

- Total Revenue Requirement vs. Variance



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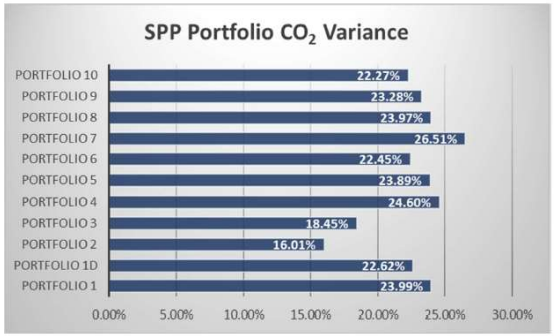
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2017 IRP Modeling Results

- Variance Between Scenarios



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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a virtual conference meeting of the MEAN Power Supply Committee of the Municipal Energy Agency of Nebraska will be held Wednesday, May 19, 2021 at 1:00 p.m. (CT). The meeting is open to the public and members of the media and is accessible via computer or smart device at: https://global.gotomeeting.com/join/119907389 or via telephone at +1 (571) 317-3116, access code: 119-907-389, or at NMPP Energy, the public designated meeting site, 8377 Glynoaks Drive, Lincoln, Nebraska. Members of the public will be required to wear a mask, maintain social distance, and observe posted signage in the building.

An agenda is kept continually current and is available for public inspection at NMPP Energy during normal business hours. Notice of this meeting, agenda and meeting materials along with a copy of the Nebraska Open Meetings Act will be posted prior to the meeting at: https://www.nmppenergy.org/public_meeting_information . If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact or (402) 474-4759.

Agenda
Power Supply Committee
Virtual Conference Meeting
Municipal Energy Agency of Nebraska
May 19, 2021 – 1:00 p.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda
   A. Approval of minutes from the January 20, 2021 meeting
   B. 2021 Summer Season Load and Capability Report and Operational Readiness
   C. Next meeting
   D. Consent Resolution

3. Committee Scope Document

4. Integrated Resource Planning Update

5. Central Nebraska Public Power and Irrigation District

6. Western Area Power Administration (WAPA) Displacement

7. Adjourn

Approved Minutes
Power Supply Committee
Virtual Conference Meeting
Municipal Energy Agency of Nebraska
May 19, 2021 – 1:00 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met via virtual conference, Wednesday, May 19, 2021. Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current, and, was available for public inspection at the NMPP Energy office, the designated public meeting site, 8377 Glynoaks Drive, Lincoln, Nebraska. Instruction to join the meeting via GoToMeeting or by virtual conference, along with a link to a copy of the Nebraska Open Meetings Act was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 1:00 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with nine of the ten committee members present.

1. Pat Davison, Imperial
2. James Depue, Wray
3. Will Dowis, Gunnison
4. Bill Hinton, Kimball
5. Duane Hoffman, Oxford
6. Tom Ourada, Crete
7. Chris Rodman, Wall Lake
8. Adam Suppes, Delta
9. Randy Woldt, Wisner

Absent: Matt Langhorst, Glenwood Springs

Tom Goulette, Voting Ex-Officio

Others Present: Justin Forman – Aspen; Nancy Janssen – Breda; Mike Beyer – Bridgeport; Dan Knoell – Broken Bow; Mitchell Lamm – Burwell; Rod Brestel – Callaway; Joe Dickman – Callaway; Todd Kielkopf – Carlisle; Tammy Cooley – Gering; Edward Dunn – Grant; Chris DesPlanques – Indianola; Jim Kerr – Lyons; Chris Brader – Pender; Jeremy Tarr – Plainview; Bart Brinkman – Shickley and Bob Lockmon – Stuart.

MEAN/NMPP staff: Carol Brehm, Bruce Doll, Tim Cerveny, Shannon Coleman, Chris Dibbern, Brad Hans, Mandy Hansen, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Jeff Lindsay, Kyle Kaldahl, Michelle Lepin, Brittany Millard, Bob Poehling, Matt Reed, David Russell, Andrew Ross, Kim Schafers, Robin Spady, Candy Thomazin, and Kevin Wickham.

CONSENT AGENDA

Minutes

Minutes of the January 20, 2021 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee will be held on August 18, 2021 at the Younes Conference Center located in Kearney, Nebraska or virtual conference if required.

Consent Resolution

Motion: *Duane Hoffman moved to approve the consent resolution as presented. Bill Hinton seconded the motion, which carried on a 7-0-1 roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

Ayes: Pat Davison, Will Dowis, Bill Hinton, Duane Hoffman, Tom Ourada, Chris Rodman, and Adam Suppes.

Nays: None

Abstain: James DePue

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the January 20, 2021 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, August 18, 2021 at the Younes Conference Center in Kearney, Nebraska, or virtual conference if required.*

3. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the 2021 Summer Season Load and Capability Report.*

COMMITTEE SCOPE DOCUMENT

Tim Cerveny, Manager of Resources & Transmission, led the discussion of the Committee Scope document, which contains minor changes from the prior draft reviewed by the Power Supply Committee at its January 20, 2021 meeting. The Scope document will serve as a reference sheet

laying out the responsibilities, composition, requirements for quorum, voting and other aspects of the subcommittee.

MUNICIPAL ENERGY AGENCY OF NEBRASKA
POWER SUPPLY COMMITTEE
SCOPE

A. Summary

The Power Supply Committee ("Committee"), a subcommittee of the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors (the "Board"), is responsible for the duties listed below.

B. Composition of the Committee

The Committee will be comprised as follows:

1. The Committee will consist of ten (10) committee members (each a "Committee Member") appointed by the Chair of the Board from among the list of Board representatives or alternate representatives. No proxies are allowed. The Chair of the Board shall serve as an ex officio member of the Committee, shall not be counted in determining the number required for a quorum of the Committee for conducting business, but may vote on matters.

2. Each Committee Member shall serve until the earliest of his or her (i) resignation, (ii) loss of status as a Board representative or alternate representative, or (iii) removal as a Committee Member by the Chair of the Board.

3. One Committee Member will be appointed by the Chair of the Board to serve as Chair of the Committee.

4. In the event of a vacancy on the Committee, the Chair of the Board will have the option to fill the vacancy by selecting a new Committee Member or may allow the vacancy to continue.

5. Personal characteristics to be considered when selecting Committee Members shall include but not be limited to the following:
    - Ability to listen, analyze, think clearly and creatively, work well with people individually and in a group.
    - Willing to prepare for and attend Committee meetings, ask questions, actively provide input, interact respectfully with staff and Committee Members, and contribute positively to group dynamics. A Committee Member who fails to attend three (3) consecutive meetings of the Committee may be asked to resign from the Committee.
    - Maintain or develop skills necessary to read and understand financial statements, learn more about the energy and energy services business, understand role and responsibility as a Committee Member.
    - Possess honesty, sensitivity to and tolerance of differing views, a friendly, responsive, and patient approach, community-building skills, personal integrity, and concern for the organization's welfare.

C. Responsibilities

The Committee's responsibilities, in collaboration with staff, include the following:

1. Develop and maintain power supply-related planning, purchasing strategies, and reporting systems that help define power supply performance and reliability.

2. Monitor the condition of power supply resources, their competitive position and sustainability, the economies of scale achieved, their geographic concentration, and deviations of load and kWh from expectations.

3. Assess the effectiveness of existing power supply strategies, objectives, policies and procedures based on input from cross-functional sources; provide reports and recommendations as necessary.

4. Develop long range forecasts that identify future resource needs and economic viability; annually compare current resource portfolio to optimal portfolio to updated future resource plans.

5. Identify the power supply resources that are needed to serve Participant load and are reliable, cost-competitive, sustainable, diverse in nature, and environmentally sound.

6. Provide guidance to executive management's recommendations of ownership agreements, power supply and Participant contracts, and partnerships.

7. Develop criteria for, and report on, strategies impacting sustained operations and optimal growth.

8. Develop strategies, policies and procedures that maximize opportunities in the coordination center to minimize net energy and transmission costs and that optimize the use of power supply resources.

9. Other duties as assigned by the Board from time to time.

The Committee may perform other functions as may be necessary or appropriate for advising the Board.

D. Meetings

The Committee will meet as needed and may conduct the meetings by any lawful means. The presence of a majority of the Committee Members, as that term is defined above, will be necessary for the transaction of business by the Committee. Action may be taken upon a vote of a majority of the votes which the Committee Members present are entitled to cast.

E. Reporting

The Committee reports to the Board. The role and power of the Committee is advisory only. The Committee shall not have authority to act on behalf of the Board. No action or inaction by the Committee shall impair or affect the authority or power of the Board or other authorized parties acting on behalf of MEAN.

Revision History

Version	Effective Date	Adoption Date	Description of Revision
1.0	July 1, 2021	_____, 20__	Adoption of Scope

Motion: *James DePue moved to approve the resolution as presented. Will Dowis seconded the motion, which carried unanimously on a roll call vote. Note: Votes were*

accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.

POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors document the composition, responsibilities, voting rights, quorum, and other aspects of the Power Supply Committee, to be effective July 1, 2021 after the scheduled termination of the Electrical Resources Pooling Agreement (ERPA) on June 30, 2021; and

WHEREAS, a proposed Scope document for the Power Supply Committee was previously sent to the Power Supply Committee.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Scope document as presented for the Power Supply Committee, to be effective July 1, 2021.

INTEGRATED RESOURCE PLANNING UPDATE

Shannon Coleman, Supervisor of Resource Planning and Analysis, reported on the progress of the 2022 Integrated Resource Plan, including the results of the Participant Resource Criteria survey, results of the Phase I Resource Evaluation, and current resource planning activities.

CENTRAL NEBRASKA PUBLIC POWER AND IRRIGATION DISTRICT

Tim Cerveny, Manager of Resources & Transmission, provided an update on the Central Nebraska Public Power and Irrigation District Request for Proposal timeline, term, capacity, and scheduling.

WESTERN AREA POWER ADMINISTRATION (WAPA) DISPLACEMENT

Tim Cerveny, Manager of Resources & Transmission, provided an update on the Western Area Power Administration (WAPA) Capacity and Energy Displacement Agreement. The agreement allows MEAN load to be served via WAPA Hydro Resources in the West. MEAN serves WAPA load in Nebraska and Kansas. MEAN and WAPA are exploring options for an extension of the displacment arrangement.

ADJOURNMENT

There being no further business, the meeting adjourned at 1:35 p.m. (CT).

Submitted by:
Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:
Kim Schafers
Municipal Energy Agency of Nebraska

Municipal Energy Agency of Nebraska

Prepared by:
Kim Schafers
Municipal Energy Agency of Nebraska

MEAN Power Supply Committee
Virtual Conference Meeting
May 19, 2021

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Integrated Resource Planning Update

Shannon Coleman
Supervisor of Resource Planning and Analysis

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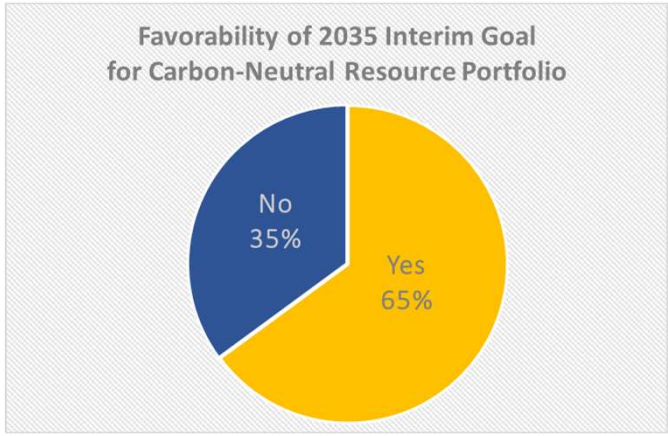
2022 IRP Phase I
Resource Option Evaluation

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Participant Survey

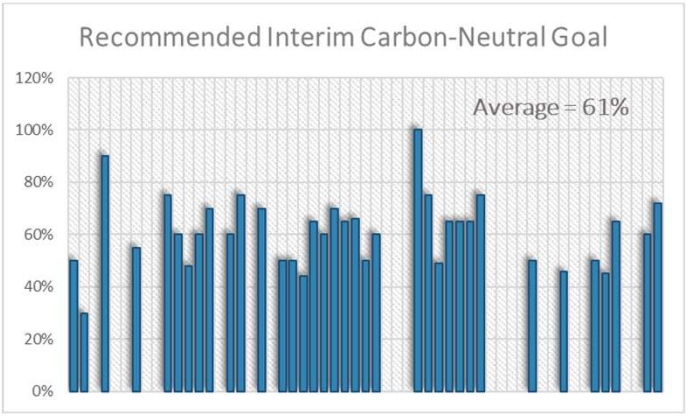


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Participant Survey

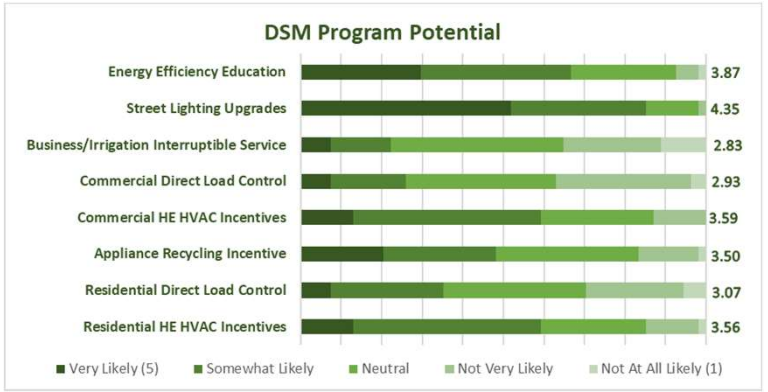


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Participant Survey

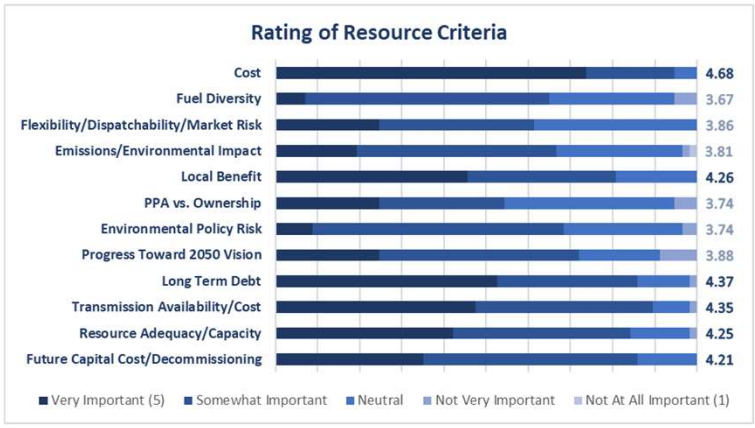


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Participant Survey



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Participant Survey

	Supply-Side Resource Options
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

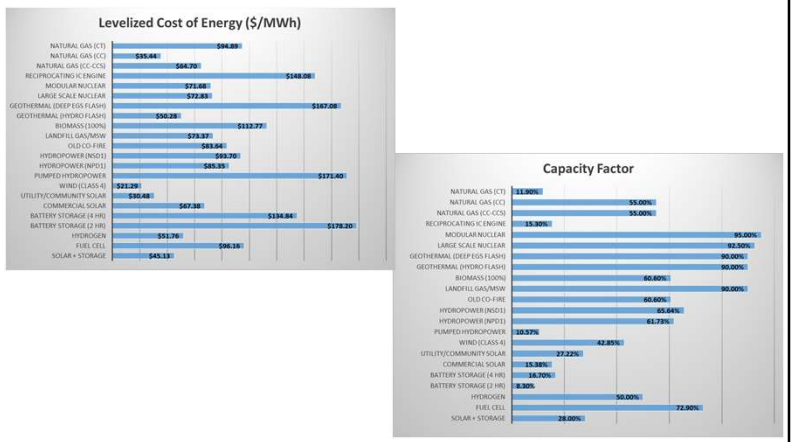
*with and without CCS

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Resource Evaluation

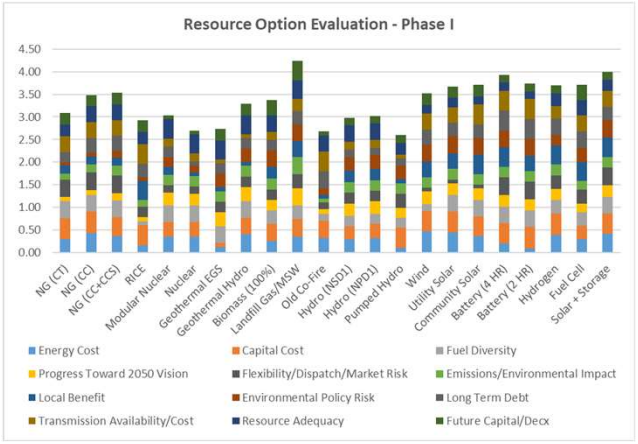


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Resource Evaluation

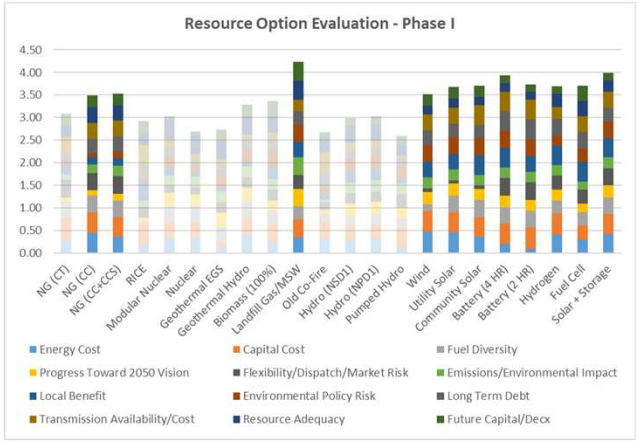


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Resource Evaluation



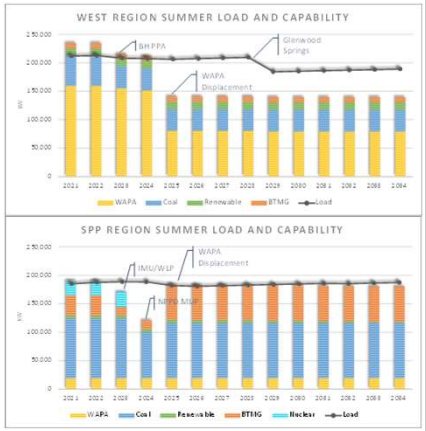
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Current Resource Planning

- Hydro Resource Option
  - WAPA Displacement Extension
  - In Negotiations Now
- Hydro Resource Option
  - CNPPID Hydropower RFP
  - Replacement for MUP
  - Preparing Proposal



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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a virtual conference meeting of the MEAN Board of Directors of the Municipal Energy Agency of Nebraska will be held Thursday, May 20, 2021 at 9:00 a.m. (CT). NOTICE IS FURTHER HEREBY GIVEN that if a quorum of the Board of Directors is not present, a meeting of the Executive Committee of the Board of Directors of the Municipal Energy Agency of Nebraska will be called to order at 9:00 a.m. (CT) on Thursday, May 20, 2021. The meeting is open to the public and members of the media and is accessible via computer or smart device at: https://global.gotomeeting.com/join/957253461

or via telephone at +1 (571) 317-3116, access code: 957-253-461, or at NMPP Energy, the public designated meeting site, 8377 Glynoaks Drive, Lincoln, Nebraska. Members of the public will be required to wear a mask, maintain social distance, and observe posted signage in the building.

An agenda is kept continually current and is available for public inspection at NMPP Energy during normal business hours. Notice of this meeting, agenda, and meeting materials along with a copy of the Nebraska Open Meetings Act will be posted prior to the meeting at: https://www.nmppenergy.org/public_meeting_information/mean. If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact or (402) 474-4759.

Revised Agenda
Board of Directors and Executive Committee
Virtual Conference Meeting
Municipal Energy Agency of Nebraska
May 20, 2021 – 9:00 a.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate.

1. Call to Order
   - A. Nebraska Open Meetings Act-Section 84-1412(8)
   - B. Roll Call
     1) Board of Directors
     2) Executive Committee

2. Chairman's Remarks

3. Public Comment

4. Reports
   - A. Executive Director
   - B. Director of Wholesale Electric Operations

5. Consent Agenda
   - A. Minutes of the January 21, 2021 meeting
   - B. Next meeting
   - C. 2021 Summer Season Load and Capability Report and Operational Readiness
   - D. Financial Report - Fiscal Year 2020-2021 Preliminary Year-End Review
   - E. Consent Resolution

6. MEAN Charter Amendment
   - A. Denver, Iowa
   - B. Plainview, Nebraska

7. Committee Reports and Recommendations
   - A. Governance Review Committee
     1) Governance Review Committee Summary of May 19, 2021
        (a) Modernization of Standard Agreements
     2) Committee Scope Documents
     3) Associate Participation Class Status
     4) By-Law Amendments
   - B. Risk Oversight Committee
     1) Risk Oversight Committee Meeting Summary of May 19, 2021
        (a) Enterprise Risk Management Program
        (b) NERC Compliance Update
     2) Risk Governance Policy
   - C. Power Supply Committee
     1) Power Supply Committee Meeting Summary of May 19, 2021
        (a) Integrated Resource Planning Update
        (b) Central Nebraska Public Power and Irrigation District
        (c) Western Area Power Administration (WAPA) Displacement
   - D. Services Committee

1) Services Committee Meeting Summary of May 19, 2021
   (a) Operations & Maintenance Project Update
   (b) Environmental Reporting
   (c) Discussion of Potential Services
2) MEAN Residential Heat Pump Efficiency Program

E. Finance Committee
1) Finance Committee Meeting Summary of May 13 and May 19, 2021
   (a) BKD Pre-Audit Communication Letter
   (b) Debt Strategy and Refunding Considerations
2) Financial Considerations related to Preliminary Fiscal Year 2020-2021 Net Revenue
   (a) Rate Stabilization Account Transfers
   (b) Allocation of a Portion of Fiscal Year 2020-2021 Net Revenue to Participants
3) Financial and Administrative Policies and Guidelines Modifications

8. Updates and Reports
A. Market Updates
B. NMPP Energy Annual Conference Update
C. Emergency Communication
D. Advanced Meter Infrastructure and Solar RFP Update
E. Capability Testing
F. Western Area Power Administration (WAPA) Rate Update

9. Contracts, Settlement Agreements, and General Counsel Report
A. Contracts Report
B. Legislative and Legal Updates

10. Closing Comments

11. Adjourn

Approved Minutes
Board of Directors
Virtual Conference Meeting
Municipal Energy Agency of Nebraska
Thursday, May 20, 2021

The Municipal Energy Agency of Nebraska (MEAN) Board of Directors met via virtual conference, Thursday, May 20, 2021. Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current, and, was available for public inspection at the NMPP Energy office, the designated public meeting site, 8377 Glynoaks Drive, Lincoln, Nebraska. Instruction to join the meeting via GoToMeeting or by virtual conference, along with a link to a copy of the Nebraska Open Meetings Act, was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

MEAN BOARD OF DIRECTORS

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:05 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with 36 of the 54 Directors in attendance.

1. Adams, Randy – Torrington
2. Atkins, Curt – Waverly
3. Beyer, Mike – Bridgeport
4. Brader, Chris – Pender
5. Brestel, Rod – Callaway
6. Bridge, Kirby – Alliance
7. Brinkman, Bart– Shickley
8. Cooley, Tammy – Gering
9. Davison, Pat – Imperial
10. DesPlanques, Chris – Indianola
11. DePue, James – Wray
12. Dowis, Will – Gunnison
13. Dunn, Edward – Grant
14. Forman, Justin – Aspen
15. Goulette, Tom – West Point
16. Hinton, Bill – Kimball
17. Hoffman, Duane – Oxford
18. Hrabanek, Dave – Pierce
19. James, Nate – Morrill
20. Janssen, Nancy – Breda
21. Kerr, Jim – Lyons
22. Knoell, Dan – Broken Bow
23. Kohrs, Jeff – Nebraska City
24. Lamm, Mitchell – Burwell
25. Langhorst, Matt – Glenwood Springs
26. Lockmon, Bob – Stuart
27. McCall, Tanner – Curtis
28. McNally, Joe – Neligh
29. Nation, Brent – Fort Morgan
30. Ourada, Tom – Crete
31. Palmer, Mike – Sidney
32. Renn, Mary – Fairbury
33. Rodman, Chris – Wall Lake
34. Suppes, Adam – Delta
35. Thomas, Eugene – Ansley
36. Woldt, Randy – Wisner

* *Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

Board Members not in attendance: Doug DeLaune – Arnold; Stacey Lesher – Basin; Dan Coolidge – Bayard; Grant Jorgensen – Beaver City; James Summers – Benkelman; Larry Edgar – Blue Hill; Mike Criss – Chappell; Ray Luhring – Falls City; Keith Beck – Fleming; Carl Christian – Fountain; Ron Carpenter – Haxtun; Carrie Hartwell – Julesburg; Kim Robb – Lyman; Kim Blome – Mitchell; Bernard Gagne – Oak Creek; Michael Clark – Red Cloud; Jon Winkel – Sergeant Bluff; and John Prettyman – Yuma.

Others Present: Joe Dickman – Callaway; Todd Kielkopf – Carlisle; Andrew Lee – Curtis; Jeremy Tarr – Plainview; Wade Walters – Shickley.

MEAN/NMPP staff: Carol Brehm, Bruce Doll, Tim Cerveny, Shannon Coleman, Chris Dibbern, Brad Hans, Mandy Hansen, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Jeff Lindsay, Kyle Kaldahl, Michelle Lepin, Brittany Millard, Bob Poehling, Matt Reed, David Russell, Andrew Ross, Kim Schafers, Robin Spady, Candy Thomazin, and Kevin Wickham.

CHAIRMAN'S REMARKS

Chairman Tom Goulette reminded Directors to be mindful of remaining on the phone to ensure a quorum for the transaction of business.

PUBLIC COMMENT

Goulette noted any individuals of the public body in attendance of the opportunity to make any agenda comments.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, began his report by noting that the mask mandate for Lincoln is set to expire on May 21, 2021 and is looking forward to meeting in person at the August meetings. He welcomed new employee Matt Reed, Distributed Resource and Generation Specialist. Matt replaces Rich Andrysik who retired March 31, 2021. Poehling continued with the following Fiscal year 2020-2021 report of MEAN projects:

- Due to the pandemic, staff worked remotely for most of Fiscal Year 2020-2021 and business travel was limited.
- New technology was rolled out and staff training was conducted in a short time frame
- Strategies were developed and implemented to maintain a sense of togetherness with staff and Member Communities.
- A Pandemic Response Team was developed that continue to meet weekly to proactively establish the best health guidelines for the organization.
- With the pandemic and a "one in 120-year" extreme weather event, MEAN continues to have a productive year. Poehling noted the following:
  - Staff analyzed operating reserves in the West. The result of this effort is an annual savings of roughly $400,000. In addition, staff contested the methodology used to calculate operating reserves resulting in a $175,000 credit for MEAN.

- With a shortage of hand sanitizer early in the pandemic, staff collaborated with Nebraska's ethanol industry, the University of Nebraska-Lincoln, and the State of Nebraska, to hand-deliver over 300 gallons of hand sanitizer to more than 70 NMPP Member Communities (43 of which were MEAN Communities).
    - Because of COVID-19 travel restrictions regarding crossing state borders, additional hand sanitizer was shipped to Members in Iowa and Colorado.
- Staff worked with Southwest Power Pool (SPP) and other participants to establish rules and protocols for the Western Energy Imbalance Service (WEIS) market. Market testing began in early December and went "live" at midnight on February 1, 2021.
- In November 2020, SPP announced it had signed a letter of intent to work with MEAN and five other utilities in the West to begin discussions on joining the SPP Regional Transmission Organization (RTO). The utilities include:
        - *Basin Electric Power Cooperative*
        - *Tri-state Generation and Transmission Association*
        - *Western Area Power Authority*
        - *Wyoming Municipal Power Agency*
        - *Deseret Electric Power Cooperative*
    - Poehling noted the recent SPP Announcement that Colorado Springs Utilities has joined the other five utilities in the SPP RTO.
    - Staff are working on the review of the SPP Membership Agreement which includes potential tariff modifications and negotiating terms of the potential market formation. The day ahead energy market will replace the WEIS and is expected to lower electricity costs, increase price transparency, and mitigate congestion on the transmission system for market participants. In addition, it will create efficiencies in scheduling for most of our west load as it will be consolidated into one SPP Market.
- Staff are looking into opportunities to expand service offerings through working with our Members, potential vendors and developing business cases.
- A business plan was developed for the Advanced Metering Infrastructure (AMI) project and has seen increased interest from participants.
- Staff have been analyzing the impact of COVID-19. The project provides valuable information for future load forecasting of communities impacted by the pandemic.
- A Distributed Generation (DG) Data Portal was developed for MEAN Participants. The project provides a simplified platform for MEAN Participants that are using their own metering system to send the DG data to MEAN. The goal of the project is to minimize the time it takes for the Participants to upload their monthly data.
- Staff spent time working with MEAN's Colorado Participants in response to a report issued by Strategic Development Strategies Group (SDSG).
- Staff responded to the following Mutual Aid events during the fiscal year:
    - May 2020 – Fairmont, NE
    - June 2020 – Haxtun, CO
    - July 2020 – Broken Bow, NE, Shickley, NE, Trenton, NE, and Wisner, NE
    - November 2020 – West Point, NE, David City, NE, and Pender, NE
    - February 2021 – Oxford, NE
    - March 2021 – Arnold, NE
- 2020 Summer Unit Capability Testing achieved 98.3%. This is measured by the ability of individual generators to produce projected output during their first test.
- Significant work has been performed on the simplification of MEAN's Governance and its enabling agreements.

  - MEAN proposed legislation to update various elements of the legislation that formed our organization. LB 858 passed on final reading July 31, 2020 and was signed into law by the Governor.
- In the days leading up to the February 2021 extreme weather event, and in the days that have followed, MEAN staff have worked tirelessly trying to protect the interests of our Members.

- Staff participated in multiple meetings, conferences, and training events:
  - Delta Montrose Electric Association Customer Meeting
  - Western States Power Corporation Board Meeting
  - Colorado River Energy Distributers Association (CREDA) Annual Meeting
  - Colorado Association of Municipal Utilities
  - Colorado Public Utilities Commission Meeting
  - Western Public Power Group Meeting
  - Western Area Power Administration Customer Meetings
  - American Public Power (APPA) Customer Connections Conference
  - APPA Joint Action Agency Conference
  - APPA Wholesale Markets Summit
  - APPA Western Public Power Group Conference
  - APPA MISO Participants Spring Meeting
  - MISO Informational Forum and Market Symposium Meetings
  - MISO Markets Committee Meeting and Resource Adequacy Meeting
  - MISO Load Serving Entity Coalition Meeting
  - OSHA Safety Training
  - Nebraska Safety Council First Aid/CPR/AED Training
  - FERC Technical Conference (Carbon Pricing in Organized Wholesale Electricity Markets)
  - SPP Annual Meeting of Members, Board of Directors & Member's Committee
  - Numerous SPP Customer and Working Group Meetings (Supply Adequacy Working Group, Regional Tariff Working Group, Market Working Group, Generating Testing Task Force, Market Operations Policy Committee, Transmission Working Group, Change Working Group)
  - The 2021 Energy Authority (TEA) Symposium
- Staff completed the transition of the Load Forecasting and Preschedule Activity over to The Energy Authority (TEA). This will allow staff to focus efforts on other value enhancing opportunities.

Poehling noted that this was not a comprehensive list but demonstrates the complex nature of topics MEAN addresses on a day-to-day basis. He concluded his report by noting staff development and education opportunities; NMPP Culture; and, results of the recent Employee Engagement Survey. The annual survey measures a wide range of research-validated workplace factors that impact employee engagement and satisfaction. A high score in the survey indicates a workplace where employees willingly go above and beyond in their work, advocate for the organization and intend to stay into the future. Scores range from 0-100, with 100 being the best possible score. The score from the last fiscal year was 89.85 % which is consistent from the previous years the survey was administered. Considering the challenges of this last fiscal year, maintaining a satisfaction rating was a significant accomplishment. Poehling asked the Board if they had any comments or questions, baring none, the meeting continued with a report from the Director of Wholesale Electric Operations.

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, provided a report on the status of MEAN Projects. Hans noted that he is looking forward to seeing everyone in person at the August meetings. His report included the following updates:

- Green Initiatives-Federal Grants and Renewable Survey
    - Staff continue to monitor energy grants available from the Government including electric vehicles. It is important for Communities to reach out to MEAN staff if your community is interested in participating in any of the initiatives. MEAN will be distributing a Renewable Survey soon. Your community response to the survey will help staff as it prepares information for the Integrated Resource Plan.
- Federal Energy Regulatory Commission (FERC) Order 2222. Hans provided the following update to all MEAN Communities:
    - FERC issued Order 2222 in September 2020 that allows for distributed energy resources (DER) aggregators to compete in regional organized wholesale electric markets.
    - This paves the way for DERs to directly participate, individually or in the aggregate, in Regional Transmission Organization (RTO) wholesale energy markets.
    - Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO) are working on the development and impacts of FERC Order 2222.
        - SPP as the wholesale market operator will be sending out information directly to distribution resources.
    - There are many questions, MEAN will continue to monitor the FERC Order 2222 and keep MEAN Communities informed.
- Hans provided the following Markets report. He noted Jeff Lindsay, Electric Operations Manager, would provide a detailed report to the Board later in the meeting.
    - Markets Role in Carbon Reduction
        - Resources-Access to the Market
        - Economic Operation-Reducing Costs and Carbon Footprint
- February Weather Event/March Workshop Follow-Up. Hans reported David Russell, Manager of Information Technology discussed the development of an Emergency Communication Alert System for MEAN Participants at the Services Committee meeting, May 19, 2021.

CONSENT AGENDA-MEAN BOARD OF DIRECTORS

Minutes

Minutes of the January 21, 2021 meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors were previously distributed.

2021 Summer Season Load and Capability Report and Operational Readiness

Detailed information was previously distributed in the meeting packet for the Board's review of the 2021 Summer Season Load and Capability Report and Operational Readiness. The report also

establishes the contracted capacity of leased member generation. Shannon Coleman, Supervisor, Resource Planning & Analysis, provided a review of the report.

Financial Report-Fiscal Year 2020-2021 Preliminary Year-End Review

MEAN financials for December 2020, January 2021 and February 2021 were previously distributed. Jamie Johnson, Director of Finance and Accounting, summarized results for MEAN's Fiscal Year 2020-2021 preliminary year-end results, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's preliminary balance sheet as of March 2021; cash and investments; and fiscal year-to-date preliminary operating results through March 31, 2021.

Next Meeting

The next scheduled meeting of the MEAN Board of Directors is Thursday, August 19, 2021 at the Younes Conference Center in Kearney, Nebraska or virtual if required.

Motion: *Tom Ourada moved to approve the following consent resolution. Edward Dunn seconded the motion, which carried unanimously on a roll call vote (Chris Brader, Kirby Bridge, Chris DesPlanques, Tanner McCall and Mary Renn did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

Consent Resolution

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the minutes of the January 21, 2021 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, August 19, 2021 at the Younes Conference Center, Kearney, Nebraska, or virtual conference if required.*

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the 2021 Summer Season Load and Capability Report is hereby approved.*

4. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that that the financial statements for December 2020, January 2021, and February 2021 are hereby accepted; and the preliminary year-end financial statements ending March 31, 2021 are hereby accepted.*

MEAN CHARTER AMENDMENTS

Michelle Lepin, Associate General Counsel, led the discussion on the proposed amendments to MEAN's Charter.

City of Denver, Iowa – The City of Denver, Iowa, has requested to join as a participating Municipality in the MEAN Charter with representation on the MEAN Board of Directors. Denver has been a total requirements participant of MEAN since 2007 (Service Schedule M since July 2010; Service Schedule K from 2007-2010). The City of Denver, Iowa, located in Northeast Iowa, requested membership on the MEAN Board of Directors.

Motion: *Edward Dunn moved to approve the following resolution. Duane Hoffman seconded the motion, which carried 30-0-1 on a roll call vote (Chris Brader, Chris DesPlanques, Will Dowis, Tanner McCall and Mary Renn did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

Ayes: Randy Adams, Curt Atkins, Michael Beyer, Kirby Bridge, Rod Brestel, Bart Brinkman, Tammy Cooley, Pat Davison, James DePue, Edward Dunn, Justin Forman, Tom Goulette, Bill Hinton, Duane Hoffman, David Hrabanek, Nate James, Nancy Janssen, Jim Kerr, Dan Knoell, Jeff Kohrs, Mitchell Lamm, Matthew Langhorst, Bob Lockmon, Joe McNally, Brent Nation, Tom Ourada, Mike Palmer, Chris Rodman, Adam Suppes, and Randy Woldt.

Nays: None

Abstain: Eugene Thomas

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the City of Denver, Iowa, has passed an ordinance to become a member of MEAN and serve on the MEAN Board of Directors; and,

WHEREAS, following approval by the MEAN Board of Directors and receipt of all necessary documents from the City of Denver, a petition to amend the Petition for Creation and MEAN's Charter to provide for the addition of the City of Denver will be submitted to the Nebraska Power Review Board for final approval.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that staff is authorized to do all things necessary to file a petition to amend the Petition for Creation and MEAN's Charter to add the City of Denver, Iowa, as a participating municipality and submit the petition to the Nebraska Power Review Board.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the City of Denver, Iowa, be accepted as a participating municipality of MEAN, pending receipt of all necessary documents and subject to approval by the Nebraska Power Review Board.

City of Plainview, Nebraska – The City of Plainview, Nebraska has requested to join as a participating Municipality in the MEAN Charter with representation on the MEAN Board of Directors. Plainview has been a total requirements participant of MEAN since 2004 (Service Schedule M since October 2011;

Service Schedule K 2004-2011). The City of Plainview, Nebraska, located in Northeast Nebraska, requested membership on the MEAN Board of Directors.

Motion: *Randy Woldt moved to approve the following resolution. Edward Dunn seconded the motion, which carried 32-0-1 on a roll call vote (Chris Brader, Chris DesPlanques and Tanner McCall did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

Ayes: Randy Adams, Curt Atkins, Michael Beyer, Kirby Bridge, Rod Brestel, Bart Brinkman, Tammy Cooley, Pat Davison, James DePue, Will Dowis, Edward Dunn, Justin Forman, Tom Goulette, Bill Hinton, Duane Hoffman, David Hrabanek, Nate James, Nancy Janssen, Jim Kerr, Jeff Kohrs, Mitchell Lamm, Matthew Langhorst, Bob Lockmon, Joe McNally, Brent Nation, Tom Ourada, Mike Palmer, Mary Renn, Chris Rodman, Adam Suppes, Eugene Thomas, and Randy Woldt.

Nays: None

Abstain: Daniel Knoell

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the City of Plainview, Nebraska, has passed an ordinance to become a member of MEAN and serve on the MEAN Board of Directors; and,

WHEREAS, following approval by the MEAN Board of Directors and receipt of all necessary documents from the City of Plainview, a petition to amend the Petition for Creation and MEAN's Charter to provide for the addition of the City of Plainview will be submitted to the Nebraska Power Review Board for final approval.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that staff is authorized to do all things necessary to file a petition to amend the Petition for Creation and MEAN's Charter to add the City of Plainview, Nebraska, as a participating municipality and submit the petition to the Nebraska Power Review Board.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the City of Plainview, Nebraska, be accepted as a participating municipality of MEAN, pending receipt of all necessary documents and subject to approval by the Nebraska Power Review Board.

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Governance Review, Power Supply, Risk Oversight and Services Committees met on May 19, 2021. The Finance Committee did not meet May 19, 2021 due to lack of meeting quorum, a report was provided to the Board.

MEAN GOVERNANCE REVIEW COMMITTEE

MEAN Governance Review Committee Meeting Summary of May 19, 2021

Michelle Lepin, Associate General Counsel, provided a summary of the discussions held at the Governance Review Committee meeting on May 19, 2021 meeting.

Modernization of Standard Agreements

Michelle Lepin, Associate General Counsel, provided an update on modernization of MEAN's standard agreements utilized with participants. A copy of the draft modernized version of the Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes was included in the meeting packet (Attachment A) for initial review by the Board.

Committee Scope Documents

Michelle Lepin, Associate General Counsel, led the discussion of Committee Scope documents for MEAN's subcommittees. Staff recommended Board approval of the Scope documents for the following subcommittees, to be effective July 1, 2021 after the scheduled termination of the Electrical Resources Pooling Agreement (ERPA) on June 30, 2021 (Meeting Attachments B - F): Finance Committee, Governance Review Committee, Power Supply Committee, Risk Oversight Committee, and Services Committee.

Included in the resolution is approval of the Scope documents for each subcommittee and approval of the conversion of the Power Supply Committee to a subcommittee of the MEAN Board of Directors effective June 30, 2021.

Motion: *Duane Hoffman moved to approve the following resolution. Mike Palmer seconded the motion, which carried unanimously on a roll call vote (Chris Brader, Chris DesPlanques, Duane Hoffman and Tanner McCall did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the MEAN Board of Directors desires to document the composition, responsibilities, voting rights, quorum, and other aspects of each of the following MEAN subcommittees: Finance Committee, Governance Review Committee, Power Supply Committee, Risk Oversight Committee, and Services Committee, to be effective July 1, 2021 after the scheduled termination of the Electrical Resources Pooling Agreement (ERPA) on June 30, 2021; and

WHEREAS, proposed Scope documents for each of the subcommittees were previously sent to the MEAN Board of Directors; and

WHEREAS, each of the subcommittees has recommended the MEAN Board of Directors approve the Scope for such subcommittee; and

WHEREAS, the MEAN Power Supply Committee was created under the ERPA as a subcommittee of the ERPA Management Committee; and

WHEREAS, the MEAN Board of Directors desires to convert the Power Supply Committee to a subcommittee of the MEAN Board of Directors effective July 1, 2021 due to the scheduled June 30, 2021 termination of the ERPA.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the Scope documents for the following subcommittees of MEAN are hereby approved as presented, to be effective July 1, 2021: Finance Committee, Governance Review Committee, Power Supply Committee, Risk Oversight Committee, and Services Committee.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Power Supply Committee shall be converted to a subcommittee of the MEAN Board of Directors effective June 30, 2021, with the composition, responsibilities, voting rights, quorum, and other aspects as documented in the Scope document for the Power Supply Committee.

Associate Participation Class Status

Michelle Lepin, Associate General Counsel, reported that the following five participants have joined the new Associate Participation Class: Arkansas River Power Authority, Grand Island, NE., Spencer, NE, Lake View, IA, and Rockford, IA.

By-Law Amendments

Michelle Lepin, Associate General Counsel, led the discussion of the By-Law Amendments Phase 2 of the Governance modernization initiative (Meeting Attachment G). Items discussed included draft amendments addressing suspension and termination of members, suspension and removal of directors, conflicts of interest, and a minor clarification to the Inactive Member calculation formula.

Discussion was held.

The MEAN Governance Review Committee recommended the MEAN Board of Directors approve the By-Law amendments as presented.

Motion: *Tom Ourada moved to approve the following resolution. Duane Hoffman seconded the motion, which carried 28-4-0 on a roll call vote (Chris Brader, Chris DesPlanques, Tanner McCall and Mary Renn did not vote). Note: By-Law amendments require approval by two-thirds of votes cast. Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

Ayes: Randy Adams, Curt Atkins, Michael Beyer, Kirby Bridge, Rod Brestel, Bart Brinkman, Tammy Cooley, Pat Davison, James DePue, Will Dowis, Edward Dunn, Justin Forman, Tom Goulette, Bill Hinton, Duane Hoffman, David Hrabanek, Nate James, Nancy Janssen, Jim Kerr, Daniel Knoell, Jeff Kohrs, Matthew Langhorst, Bob Lockmon, Brent Nation, Tom Ourada, Chris Rodman, Eugene Thomas, and Randy Woldt.

Nays: Mitchell Lamm, Joe McNally, Mike Palmer, and Adam Suppes

Abstain: None

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) desires to amend the MEAN By-Laws to add provisions addressing suspension, termination and withdrawal of members, suspension and removal of directors, conflicts of interest, and to clarify the Inactive Member calculation; and

WHEREAS, a draft of the proposed amendments was previously sent to the MEAN Board of Directors.

NOW, THEREFORE, BE IT RESOLVED that the MEAN Board of Directors hereby approves the amendments to the MEAN By-Laws as presented.

RISK OVERSIGHT COMMITTEE

Risk Oversight Committee Meeting Summary of May 19, 2021

Robin Spady, Director of Risk & Compliance/Regulatory Counsel, provided a summary of the discussions held at the Risk Oversight Committee (ROC) meeting on May 19, 2021, including an update of the Enterprise Risk Management Program and NERC Compliance Update.

Risk Governance Policy

Robin Spady, Director of Risk & Compliance/Regulatory Counsel, led the discussion of the Risk Governance Policy for the Board's consideration. Appendix A to the Risk Governance Policy, that was previously approved July 21, 2020, has an errata change to the heading document to align with the new naming convention of the Risk Governance Policy.

The Risk Oversight Committee recommended the MEAN Board of Directors approve the following resolution as presented.

Motion: *Edward Dunn moved to approve the following resolution. James DePue seconded the motion, which carried unanimously on a roll call vote (Michael Beyer, Chris Brader, Chris DesPlanques, Duane Hoffman, Tanner McCall and Mary Renn did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

BE IT RESOLVED BY the MEAN Board of Directors that the Risk Governance Policy Version 3.0 is hereby approved.

The MEAN Board of Directors recessed for break at 10:36 a.m. and reconvened at 10:43 a.m.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of May 19, 2021

Staff provided a summary of the discussions held at the Power Supply Committee meeting on May 19, 2021, including an update of the Central Nebraska Public Power and Irrigation District RFP, and Western Area Power Administration (WAPA) Capacity and Energy Displacement Agreement.

Integrated Resource Planning Update

Shannon Coleman, Supervisor of Resource Planning and Analysis, reported on the progress of the 2022 Integrated Resource Plan, including the results of the Participant Resource Criteria survey, results of the Phase I Resource Evaluation, and current resource planning activities.

SERVICES COMMITTEE

Services Committee Meeting Summary of May 19, 2021

Staff provided a summary of the discussions held at the Services Committee meeting on May 19, 2021, including an Operations & Maintenance Project update, Environmental Reporting, and

discussion of potential new information technology services.

MEAN Residential Heat Pump Efficiency Program

Mandy Hansen, Supervisor of Member Services, presented a proposed residential high efficiency heat pump program to be offered to customers of qualifying MEAN participants for work performed in Fiscal Year 2021-2022 on or after June 1, 2021. This action would expand the scope of services offered as part of the energy efficiency program to customers of qualifying MEAN participants without a budget increase (Attachments H - I).

The MEAN Services Committee recommended the MEAN Board of Directors approve the expanded scope of services as presented.

Motion: *Edward Dunn moved to approve the following resolution. James DePue seconded the motion, which carried unanimously on a roll call vote (Michael Beyer, Chris Brader, Chris DesPlanques, Duane Hoffman, Mitchell Lamm, Tanner McCall and Mary Renn did not vote). Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Services Committee of the MEAN Board of Directors reviewed the utility-related services offered by MEAN and recommended at the May 19, 2021 meeting that the scope of services offered as part of the energy efficiency program to customers of qualifying MEAN participants be expanded to include a residential high-efficiency heat pump incentive program for work performed in Fiscal Year 2021-2022 on or after June 1, 2021; and,

WHEREAS, the MEAN Board of Directors desires to provide the recommended service in Fiscal Year 2021-2022.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors, that the scope of services offered as part of the energy efficiency program to customers of qualifying MEAN participants is hereby expanded to include the residential high-efficiency heat pump incentive program as presented, for work performed in Fiscal Year 2021-2022 on or after June 1, 2021.

FINANCE COMMITTEE

Finance Committee Meeting Summary of May 13, 2021 and Summary of Reports

Jamie Johnson, Director of Finance and Accounting, provided a summary of the discussions held at the Finance Committee meeting on May 13, 2021 and the reports provided on May 19, 2021. Due to lack of quorum the Finance Committee did not take any action at its May 19, 2021 meeting.

a) BKD Pre-Audit Communication Letter. Jamie Johnson, Director of Finance and Accounting, will provide a review of the BKD Pre-Audit Communication Letter (Meeting Attachment J).
b) Debt Strategy and Refunding Considerations

Financial Considerations related to Preliminary Fiscal Year 2020 -2021 Net Revenue

Preliminary results for the fiscal year ended March 31, 2021 include net revenue of approximately $9.71 million. Jamie Johnson, Director of Finance & Accounting, discussed the results at the

meeting. To assist in the discussion, tables were previously included in the meeting packet that summarized the impact of various revenues and costs of MEAN and the resulting target and ratio coverage.

Discussion was held.

A. Rate Stabilization Account Transfers

Jamie Johnson discussed possible year end transactions related to rate stabilization activity. With the 2020-2021 Budget approval, a total of $800,000 of Rate Stabilization General funds were budgeted for transfer into the Rate Stabilization General account.

The Finance Committee met on May 13, 2021 and reviewed the preliminary results and recommended the Board of Directors credit $1,000,000 related to the Fixed Cost Recovery Charge to the MEAN Participants, transfer $1,600,000 into the Rate Stabilization Account for capital, transfer $800,000 into the Rate Stabilization Account for general consistent with the Approved Budget & Rates for the Fiscal Year Ended March 31, 2021, and an additional amount of $4,700,000 into the Rate Stabilization Account for general. The Finance Committee intends to revisit the amounts in August after additional market settlement amounts have been received related to the February extreme weather event.

The Board of Directors will consider the total fiscal year transfer amount into the Rate Stabilization account.

Discussion was held.

Discussion ensued and the following recommendation was put forth.

Motion: *Brent Nation moved to approve the following resolution to include the Board intends to revisit the amounts in August after the additional market settlement amounts have been received related to the February extreme weather event. Mike Palmer seconded the motion which carried on a 29-0-1 roll call vote (Michael Beyer, Chris Brader, Chris DesPlanques, Edward Dunn, Tanner McCall and Mary Renn did not vote).*

Ayes: Randy Adams, Curt Atkins, Kirby Bridge, Rod Brestel, Bart Brinkman, Tammy Cooley, Pat Davison, James DePue, Will Dowis, Justin Forman, Tom Goulette, Bill Hinton, Duane Hoffman, David Hrabanek, Nate James, Nancy Janssen, Jim Kerr, Daniel Knoell, Mitchell Lamm, Matthew Langhorst, Bob Lockmon, Joe McNally, Brent Nation, Tom Ourada, Mike Palmer, Chris Rodman, Adam Suppes, Eugene Thomas, and Randy Woldt.

Nays: None

Abstain: Jeff Kohrs

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, MEAN's 2003 Bond Resolution establishes a rate stabilization account within the General Reserve Fund; and,

WHEREAS, the MEAN Financial and Administrative Policies & Guidelines provide that MEAN will annually evaluate its preliminary Fiscal Year change in net position upon closing of MEAN's annual financial records including all year end accruals and Fiscal Year transactions, and that after evaluation of preliminary results, MEAN may transfer a portion of its preliminary Fiscal Year change in net position into the rate stabilization account or from the rate stabilization account in order to meet MEAN's rate stabilization account funding objective, while maintaining debt service coverage ratios established by bond covenants; and,

WHEREAS, an evaluation of the preliminary Fiscal Year 2020-2021 change in net position indicates an increase in the amount of approximately $9.71 million; and,

WHEREAS, the Budget for Fiscal Year 2020-2021 included amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a total fiscal year transfer amount of $800,000 into the Rate Stabilization Account, as set forth in the Approved Budget & Rates for Fiscal Year Ended March 31, 2021; and,

WHEREAS, the MEAN Board of Directors desires to modify the fiscal year transfer amount into the Rate Stabilization Account in order to meet MEAN's rate stabilization account funding objective, while maintaining debt service coverage ratios established by bond covenants.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors to transfer $800,000 into the Rate Stabilization Account for general consistent with the Approved Budget & Rates for Fiscal Year Ended March 31, 2021, an additional amount of $4,700,000 into the Rate Stabilization Account for general, and an additional amount of $1,600,000 into the Rate Stabilization Account for capital for a total fiscal year transfer amount into the Rate Stabilization Account of $7,100,000; and the Board will review these actions again in August once additional financial impact from the extreme weather event in February is known.

B. Allocation of a Portion of Fiscal Year 2020-2021 Net Revenue to Participants

Jamie Johnson discussed possible year end transactions related to credits to Participants.

The amount related to the Fixed Cost Recovery Charge would be allocated using the same allocation % that was used to allocate the total 2020-2021 Fixed Cost Recovery Charge to each Schedule M, K and K-1 Participant.

The amount related to the Energy Charge would be allocated to each Schedule M, K and K-1 Participant based on their proportionate share of the sum of total MEAN Energy (kWh) purchased including any Distributed Generation Excess Energy (kWh) purchased during Fiscal Year 2020-2021. Energy purchases are noted on each month's Statement of Power and Energy Delivered from MEAN provided to each Participant.

A lump sum payment of the credit allocated to Participants would be anticipated to be made in June or July 2021. Before payment would be made, the annual financial statement audit must be completed.

The MEAN Finance Committee met via virtual conference call on May 13, 2021 and reviewed the preliminary results and possible year end transactions and considered a recommendation to the Board of Directors.

Attachment 1, referred to in the following Board resolution, was previously distributed in the meeting packet. Meeting *Attachment K* summarized the allocation by Participant for the amounts included in the analysis.

Discussion ensued and the following recommendation was put forth.

Motion: *Brent Nation moved to approve the following resolution to include the Board intends to revisit the amounts in August after the additional market settlement amounts have been received related to the February extreme weather event. Tom Ourada seconded the motion which carried on a 28-0-1 roll call vote (Michael Beyer, Chris Brader, Chris DesPlanques, Edward Dunn, Bob Lockmon, Tanner McCall and Mary Renn did not vote).*

Ayes: Randy Adams, Curt Atkins, Kirby Bridge, Rod Brestel, Bart Brinkman, Tammy Cooley, Pat Davison, James DePue, Will Dowis, Justin Forman, Tom Goulette, Bill Hinton, Duane Hoffman, David Hrabanek, Nate James, Nancy Janssen, Jim Kerr, Daniel Knoell, Mitchell Lamm, Matthew Langhorst, Joe McNally, Brent Nation, Tom Ourada, Mike Palmer, Chris Rodman, Adam Suppes, Eugene Thomas, and Randy Woldt.

Nays: None

Abstain: Jeff Kohrs

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the preliminary Fiscal Year 2020-2021 net revenue for the Municipal Energy Agency of Nebraska ("MEAN") is approximately $9.71 million ("Fiscal Year Net Revenue"); and,

WHEREAS, rates and charges for Service Schedules M, K and K-1 are established each year at a level estimated to be sufficient to generate operating revenues which will be sufficient, together with other revenues of MEAN, to pay operating expenses, debt service and other expenses of MEAN payable from revenues and to maintain a level of liquidity sufficient to meet MEAN's ongoing working capital requirements; and,

WHEREAS, the MEAN Board of Directors desires to approve a credit of a portion of the Fiscal Year Net Revenue to the MEAN Participants that purchased from MEAN under Service Schedule M, K or K-1 during the MEAN Fiscal Year 2020-2021 (each an "Eligible Participant").

NOW, THEREFORE, BE IT RESOLVED by the MEAN Board of Directors that the Board hereby finds, determines and declares that:

1. *MEAN shall credit $1,000,000 to the Eligible Participants as set forth on Attachment 1 to this resolution consisting of the following:*

    a. *MEAN shall allocate $0 of the Fiscal Year Net Revenue to the Eligible Participants related to the Energy Charge. Each Eligible Participant's share shall be allocated to the Eligible Participants based on their proportionate share of the sum of total MEAN Energy (kWh) purchased, including amounts equivalent to Distributed Generation Excess*

Energy (kWh) purchased by Eligible Participants during Fiscal Year 2020-2021. Energy (kWh) purchased is noted on each month's Statement of Power and Energy Delivered From MEAN provided to each Participant. The allocation for each Eligible Participant shall be as set forth on Attachment 1 to this Resolution.

b. *MEAN shall allocate $1,000,000 to the Eligible Participants related to the Fixed Cost Recovery Charge. Each Eligible Participant's share of the Fixed Cost Recovery Charge credit shall be allocated based on their proportionate share of the total 2020-2021 Fixed Cost Recovery Charge paid by all Eligible Participants. The allocation for each Eligible Participant shall be as set forth on Attachment 1 to this Resolution.*

2. *The credit established by this Resolution shall be subject to final legal and management review; and the Board will review these actions again in August once additional financial impact from the extreme weather event in February is known.*

Financial Administrative Policies and Guidelines Modifications

In November 2019, Section 3: Committees of the Board was added to the Financial and Administrative Policies and Guidelines. Section 3 documented various items related to the Committees of the Board including duties and responsibilities. With the adoption of Scope documents for each Committee to be effective July 1, 2021, changes to Section 3 were presented as redlines in meeting Attachment L to remove duplicate information.

Motion: *Duane Hoffman moved to approve the resolution as presented. James DePue seconded the motion which carried unanimously on a roll call vote (Michael Beyer, Chris Brader, Chris DesPlanques, Edward Dunn, Duane Hoffman, Jeff Kohrs, Tanner McCall and Mary Renn did not vote).*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted the MEAN Financial and Administrative Policies and Guidelines; and

WHEREAS, proposed changes to the MEAN Financial and Administrative Policies were previously distributed to the MEAN Board of Directors for review, to remove provisions regarding the duties and responsibilities of subcommittees of MEAN since those duties are intended to be documented in the Scope documents of the subcommittees effective July 1, 2021.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the MEAN Financial and Administrative Policies and Guidelines shall be amended to include the changes as presented, effective July 1, 2021.

UPDATES AND REPORTS

Market Updates

Jeff Lindsay, Electric Operations Manager, provided an update on the status of the Western Energy Imbalance Service (WEIS) Market and Southwest Power Pool (SPP) RTO West, and the status of the California ISO Energy Imbalance Market.

NMPP Energy Annual Conference Update

Carol Brehm, Member Relations Representative, provided an update on the 2021 NMPP Energy Annual Conference. Brehm noted the conference, typically held in March each year, was postponed due to COVID-19. The September conference is being planned for in-person attendance and will be a slightly abbreviated version of the typical conference at reduced cost of $100 for participants. The conference will feature keynote speaker Kris Paranto, former U.S. Army Ranger and Private Security Contractor who was portrayed in the movie 13 hours about the rescue mission in Benghazi, Libya in 2012. The conference will also include a variety of energy industry-related topics that pertain to the NMPP Energy membership. More details will be available in the coming months. The dates for the 2022 NMPP Energy Annual Conference remain set for March 22-24 in Lincoln, Nebraska. If you have any questions, contact Carol Brehm (cbrehm@nmppenergy.org).

Emergency Communication

David Russell, Manager of Information Technology, discussed the development of an Emergency Communication Alert System for MEAN Participants.

Advanced Meter Infrastructure (AMI) and Solar Request for Proposal (RFP) Update

Tim Cerveny, Manager of Resources & Transmission, provided an update on the status of AMI and Solar RFP Projects.

Capability Testing

Tim Cerveny, Manager of Resources & Transmission, provided a report on the upcoming Capability testing schedule, site preparations and timeline.

Western Area Power Administration (WAPA) Rate Update

Carol Brehm, Member Relations Representative provided a WAPA rate update.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports. Summaries of the following agreements were included in the previously distributed meeting packet:

- Western Area Power Administration Agreement No. 20-RMR-3185 for Balancing Authority Services
- The Energy Authority, Inc. Meter Agent Services Agreement for WEIS Market
- Southwest Power Pool, Inc. Service Agreement #1906R15 for Network Integration Transmission Service
- Southwest Power Pool, Inc. Service Agreement for Firm Point-to-Point Transmission Service (8 MW WAPA-UGP for NCU)
- Southwest Power Pool, Inc. Service Agreement for Firm Point-to-Point Transmission Service (3 MW WAPA-UGP for FCU)

- Western Area Power Administration Service Agreement No. 21-SLC-1055 for Long Term Firm Point-to-Point Transmission Service
- Gunnison, Colo. Agreement for Purchase of As-Available Energy
- Glenwood Springs, Colo., Public Service Company of Colorado, and MEAN Transmission to Load Interconnection, Construction and Operating Agreement, and Glenwood Springs, Colo. Funding Agreement
- Joint Operating Committee Agreement among MEAN, NMPP, NPGA and ACE
- Black Hills Wyoming, LLC and Liberty Mutual Insurance Company Reimbursement and Payment Bond (Renewal of Bond No. 6621399)
- Power Costs, Inc. (PCI) Software License and General Services Agreement
- BKD, LLP Engagement Letter for Audit 2021

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, provided closing comments. He thanked attendees and noted upcoming meetings and events.

ADJOURNMENT

There being no further business, the meeting adjourned at 12:11 p.m.

Submitted by:
Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:
Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

MEAN Board of Directors
Executive Committee
Virtual Conference Meeting
May 20, 2021

NMPP | MEAN | NPGA | ACE

1

NMPP | MEAN | NPGA | ACE

2022 IRP Phase I
Resource Option Evaluation

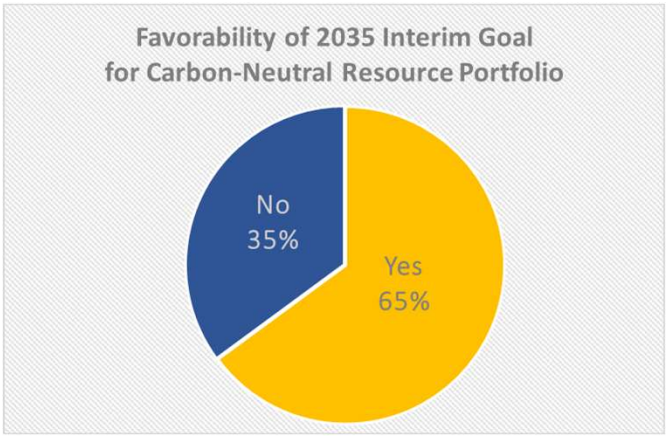
Shannon Coleman

Supervisor Resource Planning & Analysis

2

NMPP | MEAN | NPGA | ACE

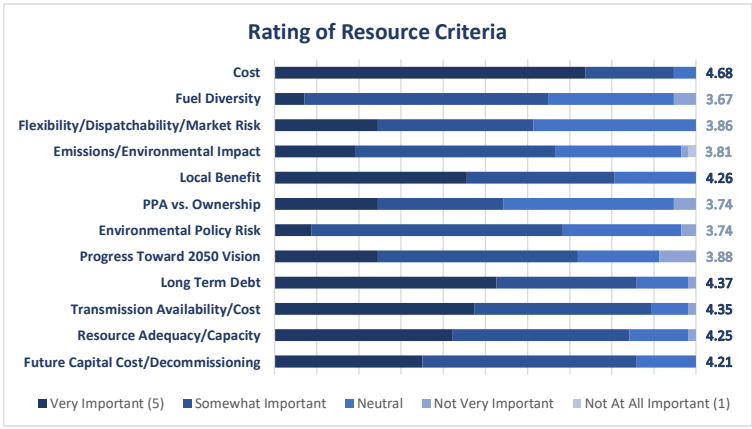
Participant Survey



3

NMPP | MEAN | NPGA | ACE

Participant Survey



4

NMPP | MEAN | NPGA | ACE

	Supply-Side Resource Options
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

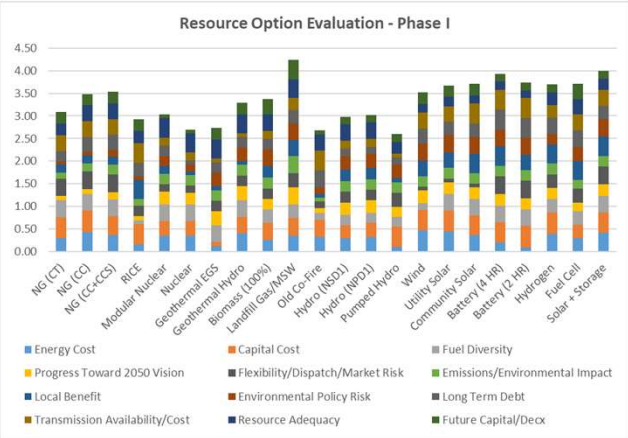
*with and without CCS

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Resource Evaluation

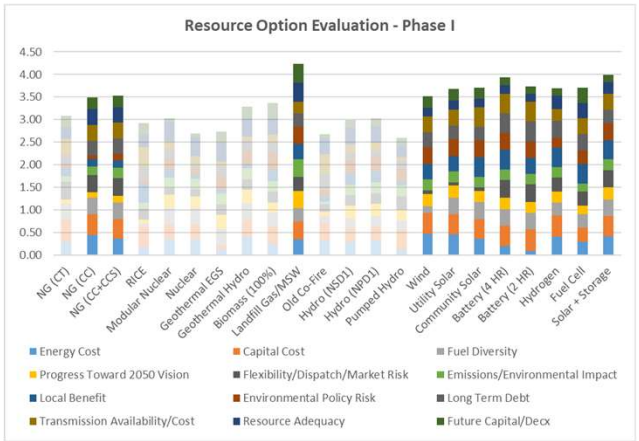


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Resource Evaluation



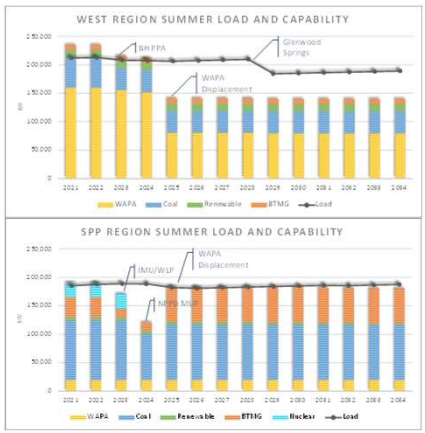
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Current Resource Planning

- Hydro Resource Option
  - WAPA Displacement Extension
  - In Negotiations Now
- Hydro Resource Option
  - CNPPID Hydropower RFP
  - Replacement for MUP
  - Preparing Proposal



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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee will be held Wednesday, August 18, 2021 at 1:00 p.m. (CT) at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/public_meeting_information/mean. If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact or (402) 474-4759.

Revised Agenda
Power Supply Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
August 18, 2021 – 1:00 p.m. (CT)

*All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk *.*

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda*
   A. Approval of minutes from May 19, 2021 meeting
   B. Next meeting
   C. Consent Resolution

3. Resource Portfolio
   A. 2021 Winter Season Load and Capability Report and Operational Readiness
   B. Western Area Power Administration (WAPA)
      1) WAPA-199 Potential Resource Needs
      2) WAPA Displacement Agreement
   C. Integrated Resource Planning Update
   D. Generation Update
      1) Base Load Generation
      2) Behind The Meter Generation

4. Total Requirements Participant Resource under MEAN Renewable Distributed Generation Policy – Town Of Oak creek, Colorado Solar Project

5. Adjourn

Approved Minutes
Power Supply Committee Meeting
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
August 18, 2021 – 1:00 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met Wednesday, August 18, 2021 at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the designated public meeting site. Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current and was available for public inspection at the NMPP Energy office. A link to a copy of the Nebraska Open Meetings Act was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 1:00 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with all ten committee members present.

13. Pat Davison, Imperial
14. James Depue, Wray
15. Will Dowis, Gunnison
16. Bill Hinton, Kimball
17. Duane Hoffman, Oxford
18. Matt Langhorst, Glenwood Springs
19. Tom Ourada, Crete
20. Chris Rodman, Wall Lake
21. Adam Suppes, Delta (Arrived at 1:03 p.m.)
22. Randy Woldt, Wisner

Ex-Officio: Tom Goulette, West Point

Others in attendance: Rick Rigel – ARPA; Tyler Christoff – Aspen; Justin Forman – Aspen; James Summers – Benkelman; Nancy Janssen – Breda; Todd Kielkopf – Carlisle; Mike Kalkwarf – Crete; Andrew Lee – Curtis; Robert Messbarger – Fairbury; Doug Linton – Fort Morgan; Brent Nation – Fort Morgan; Tammy Cooley – Gering; Edward Dunn – Grant; Chris DesPlanques – Indianola; Greg Nein – Julesburg; Perry Mader – Mitchell; Nathan James – Morrill; Chris Brader – Pender; Matt Torczon – Pender; Jeremy Tarr – Plainview; Bart Brinkman – Shickley (Arrived at 1:54 p.m.); Mike Palmer – Sidney; Beth Binder – Spencer; Randy Adams – Torrington; Darrel Wenzl – Waverly; Adam Woldt – Wisner; and John Prettyman – Yuma.

NMPP staff: Carol Brehm, Chris Dibbern, Tim Cerveny, Shannon Coleman, Chris Dibbern, Bruce Doll, Rich Eymann, Brad Hans, Joe Hoebelman, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle

Kaldahl, Michelle Lepin, Jeff Lindsay, Brittany Millard, Bob Poehling, Matt Reed, Andrew Ross, David Russell, Kim Schafers and Robin Spady.

CONSENT AGENDA

Minutes

Minutes of the May 19, 2021 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee will be held on November 17, 2021 at the Younes Conference Center located in Kearney, Nebraska or virtual conference if required.

Consent Resolution

Motion: *Randy Woldt moved to approve the consent resolution as presented. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote.*

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

4. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the May 19, 2021 meeting are hereby approved.*

5. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, November 17, 2021 at the Younes Conference Center in Kearney, Nebraska or virtual if required.*

RESOURCE PORTFOLIO

Tim Cerveny, Manager of Resources & Transmission, provided an overview on MEAN's Resources Portfolio.

2021 WINTER SEASON LOAD AND CAPABILITY REPORT AND OPERATIONAL READINESS

Shannon Coleman, Supervisor of Resource Planning and Analysis, delivered the load and capability report for the upcoming 2021-2022 winter season. The meeting packet included detailed information on the 2021-2022 Winter Season Load and Capability Report and Operational Readiness.

Discussion was held.

WESTERN AREA POWER ADMINISTRATION (WAPA)

Shannon Coleman, Supervisor of Resource Planning and Analysis, reviewed the proposed extension of the WAPA Displacement Agreement and how the proposed changes will impact capacity and energy needs in the future. Coleman provided detailed information on the newly announced changes to the SLCA CRSP allocations and the resulting short-term resource needs.

INTEGRATED RESOURCE PLANNING UPDATE

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an update on activities related to the current round of Integrated Resource Planning, including projected needs for capacity and energy and the scenarios (in terms of load forecasting and pricing) to be included in the IRP modeling. Coleman provided an overview of proposed and active federal and state legislation likely to impact resource planning.

GENERATION UPDATE

Tim Cerveny, Manager of Resources & Transmission, reviewed information regarding the performance of MEAN owned baseload generating facilities and behind the meter generation.

TOTAL REQUIREMENTS PARTICIPANT RESOURCE UNDER MEAN RENEWABLE DISTRIBUTED GENERATION POLICY – TOWN OF OAK CREEK, COLORADO SOLAR PROJECT

Matt Reed, Distributed Resources & Generation Specialist, led the discussion. The Town of Oak Creek, CO, has requested approval to install a 20.3-kW solar array. The array is well within the Renewable Distributed Generation Policy Cap. The Town of Oak Creek has received grant funding for the purchase and installation of the project to be installed on the roof of the Oak Creek town hall.

Note: The following paragraph included in the meeting packet inadvertenly listed the City of Gunnison, which was noted and verbally corrected to the Town of Oak Creek before the votes were cast. The resolution in the meeting packet correctly listed the Town of Oak Creek, Colorado.

Staff recommended the MEAN Power Supply Committee recommend the MEAN Board of Directors determine the ~~City of Gunnison~~ Town of Oak Creek solar project meets the criteria to be a Total Requirements Participant Resource under the MEAN Renewable Distributed Generation Policy.

Motion: *James DePue moved to approve the resolution as presented. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote.*

MEAN POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the MEAN Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, the DG Policy allows MEAN Total Requirements Participants to utilize the electrical output from certain qualifying behind the meter renewable generators to offset a specified portion of the Total Requirements Participant's energy purchases from MEAN; and

WHEREAS, such qualifying behind the meter renewable generators (each defined as a "TRP Resource" in the DG Policy) are subject to approval by the MEAN Board of Directors; and

WHEREAS, the following community desires to install, own and operate a solar array and utilize the electrical output from such array to offset a specified portion of the Total Requirements Participant's energy purchases from MEAN, which will require MEAN's approval of the TRP Resource: Town of Oak Creek, Colorado.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors determine the following project meets the criteria as a TRP Resource subject to the DG Policy, contingent upon the Total Requirements Participant providing the required Application and all other necessary documentation to MEAN for the project listed below:

- *Oak Creek, Colorado: solar array up to approximately 20.3 kW DC (via ownership)*

ADJOURNMENT

There being no further business, the meeting adjourned at 2:06 p.m. (CT).

Submitted by:
Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:
Kim Schafers
Municipal Energy Agency of Nebraska

MEAN Power Supply Committee
Municipal Energy Agency of Nebraska
Younes Conference Center
August 18, 2021

NMPP | MEAN | NPGA | ACE

1

NMPP | MEAN | NPGA | ACE

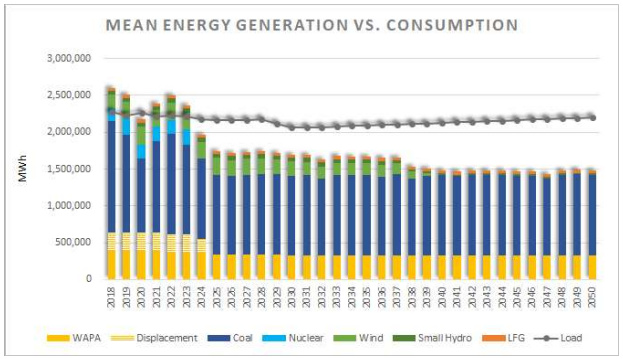
Integrated Resource Planning Update

Shannon Coleman
Supervisor of Resource Planning and Analysis

2

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Long Term Resource Portfolio



3

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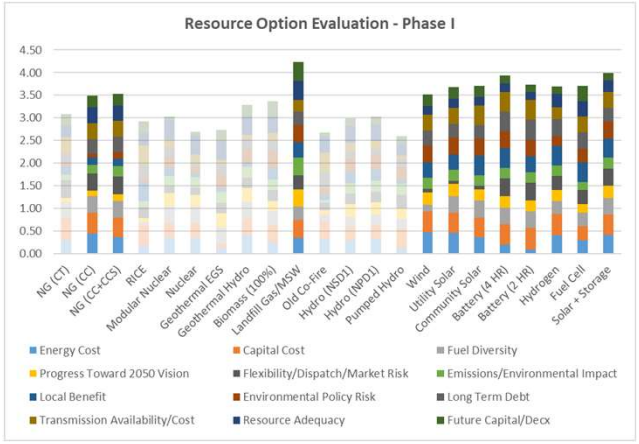
	Supply-Side Resource Options
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

*with and without CCS

4

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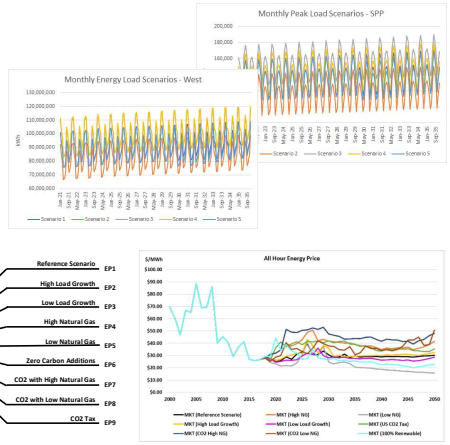
Resource Evaluation



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Integrated Resource Plan

- Load Scenarios
  - Scenario 1 = Base
  - Scenario 2 = 95% Low
  - Scenario 3 = 95% High
  - Scenario 4 = Electrification
  - Scenario 5 = Recession
- Market Pricing
  - Resource Mix
  - Energy Pricing
- Fuel Pricing
- Carbon Pricing



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The Legislative Picture

- Federal
  - Climate: CLEAN Future Act, Infrastructure Bill, Human Infrastructure Bill, Incentives, Electric Vehicles, Transmission
- Regional
  - SPP West RTO (3/1/24 Target)
- State
  - Colorado: GHG Inventory, Emissions Reduction (2025, 2030, 2050), Air Regulator Authority, Regulatory Pathway, Annual Tracking and Reporting, Climate Equity, Beneficial Electrification, CCUS Taskforce, Transmission Modernization, Colorado Energy Office Stimulus

NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors and the Executive Committee of the MEAN Board of Directors will be held Thursday, August 19, 2021 at 9:00 a.m. (CT) at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/public_meeting_information/mean. If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at http://www.nmppenergy.org/contact or (402) 474-4759.

Combined Agenda
Board of Directors and Executive Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
August 19, 2021 – 9:00 a.m. (CT)

*All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk *.*

1. Call to Order
   - A. Nebraska Open Meetings Act-Section 84-1412(8)
   - B. Roll Call
     - 1) Board of Directors
     - 2) Executive Committee

2. Chairman's Remarks

3. Reports
   - A. Executive Director
   - B. Director of Wholesale Electric Operations

4. Consent Agenda (Executive Committee) *
   - A. Minutes of August 11, 2021 meeting
   - B. Consent Resolution

5. Consent Agenda Board*
   - A. Minutes of the May 20, 2021 meeting
   - B. Fiscal Year 2020-2021 Audit Results
   - C. Fiscal Year 2021-2022 Year-to Date Financial Report
   - D. Annual Compliance Report RE: Bond Compliance Policy
   - E. Acknowledge Receipt of Unapproved June 2, 2021 Minutes of the Joint Operating Committee
   - F. Public Power Week, October 3-9, 2021
   - G. Next meeting
   - H. Consent Resolution

6. Committee Reports and Recommendations
   - A. Governance Review Committee
     - 1) Governance Review Committee Meeting Summary of August 18, 2021
     - 2) Modernization of Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes*
   - B. Power Supply Committee
     - 1) Power Supply Committee Meeting Summary of August 18, 2021
       - a) Resource Portfolio
         - (i) 2021 Winter Season Load and Capability Report and Operational Readiness
         - (ii) Western Area Power Administration (WAPA)
           1. WAPA Displacement Agreement
           2. WAPA-199 Potential Resource Needs
         - (iii) Integrated Resource Planning Update
         - (iv) Generation Update
           1. Base Load Generation

2. Behind the Meter Generation

2) Total Requirements Participant Resource under MEAN Renewable Distributed Generation Policy – Town of Oak Creek, Colorado Solar Project*

C. Services Committee
1) Services Committee Meeting Summary of August 18, 2021
a) Operations & Maintenance Updates
(i) Distribution Projects
(ii) USDA Energy Audits
(b) Discussion of Potential Services
(i) Services Survey Results
2) Proposed IT Services*
3) Development of Fiscal Year 2022-2023 Budget Including Estimated Costs for Recommended Services*

D. Finance Committee
1) Meeting Summary of August 18, 2021
a) Financial and Administrative Policies and Guidelines
b) Debt Strategy and Refunding Considerations
2) Financial Considerations related to Fiscal Year 2020-2021 Year End Transactions*
(a) Rate Stabilization Account Transfers
(b) Allocation of a Portion of Fiscal Year 2020-2021 Net Revenue to Participants

E. Risk Oversight Committee
1) Risk Oversight Committee Meeting Summary of August 18, 2021
a) Annual NERC Report
b) Changes to Approved Products List
c) Enterprise Risk Management Update
d) MISO Alternative Dispute Resolution

7. Updates and Reports
A. NMPP Energy Annual Conference
B. Capability Testing
C. Emergency Communications
D. Central Nebraska Public Power and Irrigation District
E. FERC Order 2222 Distributed Energy Resource Aggregation programs in RTOs
F. Advanced Meter Infrastructure and Solar RFP
G. Market Updates
H. Western Area Power Administration (WAPA)
1) WAPA-199 Rate Colorado River Storage Project (CRSP)/Salt Lake City Area Integrated Projects (SLCA)
2) WAPA Loveland Area Projects (LAP) 2025 Firm Electric Service (FES) Contracts
3) WAPA Upper Great Plains (UGP) 2022 Rate Process

8. Contracts, Settlement Agreements, and General Counsel Report
A. Contracts Report
B. Legislative and Legal Updates

9. Closing Comments

10. Adjourn

Approved Minutes
Board of Directors and Executive Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
August 19, 2021 – 9:00 a.m. (CT)

The Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) met in joint session with the MEAN Executive Committee Thursday, August 19, 2021 at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the designated public meeting site. Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current and was available for public inspection at the NMPP Energy office. A link to a copy of the Nebraska Open Meetings Act was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:00 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with 36 of the 57 Directors in attendance.

1. Adams, Randy – Torrington
2. Brader, Chris – Pender
3. Bridge, Kirby – Alliance
4. Brinkman, Barthold– Shickley
5. Christoff, Tyler – Aspen
6. Cooley, Tammy – Gering
7. Davison, Pat – Imperial
8. DePue, James – Wray
9. DesPlanques, Chris – Indianola
10. Dowis, Will – Gunnison
11. Dunn, Edward – Grant
12. Goulette, Tom – West Point
13. Hinton, Bill – Kimball
14. Hoffman, Duane – Oxford
15. James, Nate – Morrill
16. Janssen, Nancy – Breda
17. Kielkopf, Todd – Carlisle
18. Knoell, Dan – Broken Bow
19. Kohrs, Jeff – Nebraska City
20. Langhorst, Matt – Glenwood Springs
21. Lee, Andrew – Curtis
22. Lockmon, Bob – Stuart
23. Mader, Perry – Mitchell
24. McNally, Joe – Neligh
25. Messbarger, Robert – Fairbury
26. Nation, Brent – Fort Morgan
27. Nein, Greg – Julesburg
28. Ourada, Tom – Crete
29. Palmer, Mike – Sidney
30. Prettyman, John – Yuma
31. Rodman, Chris – Wall Lake
32. Summers, James – Benkelman
33. Suppes, Adam – Delta
34. Tarr, Jeremy – Plainview
35. Wenzel, Darrel – Waverly
36. Woldt, Randy – Wisner

Board Members not in attendance: Eugene Thomas – Ansley; Doug DeLaune – Arnold; Stacey Lesher – Basin; Dan Coolidge – Bayard; Grant Jorgensen – Beaver City; Larry Edgar – Blue Hill; Mike Beyer – Bridgeport; Mitchell Lamm – Burwell; Rod Brestel – Callaway; Mike Criss – Chappell; Larry Farley – Denver; Ray Luhring – Falls City; Keith Beck – Fleming; Carl Christian –

Fountain; Ron Carpenter – Haxtun; Kim Robb – Lyman; Aaron Caplan – Lyons; Bernard Gagne – Oak Creek; Dave Hrabanek – Pierce; Michael Clark – Red Cloud; and Jon Winkel – Sergeant Bluff.

Others in Attendance: Beth Binder, Justin Forman, Mike Kalkwarf, Chris Lindner, Doug Linton, Dan Patton, and Adam Woldt.

NMPP staff: Carol Brehm, Chris Dibbern, Tim Cerveny, Bruce Doll, Rich Eymann, Brad Hans, Joe Hoebelman, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle Kaldahl, Michelle Lepin, Jeff Lindsay, Brittany Millard, Bob Poehling, Matt Reed, Andrew Ross, David Russell, Kim Schafers and Robin Spady.

EXECUTIVE COMMITTEE

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:01 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with all seven committee members in attendance:

1. Tom Goulette, West Point
2. Bill Hinton, Kimball
3. Tom Ourada, Crete
4. Mike Palmer, Sidney
5. Doug Schultz, Curtis
6. Adam Suppes, Delta
7. Darrel Wenzel, Waverly

CHAIRMAN'S REMARKS

Goulette noted if there is not a quorum for Board, the MEAN Executive Committee will continue with the meeting and if there is not a quorum for the Executive Committee, the meeting can continue, however, no action will be taken. A quorum was declared for the Board of Directors and Executive Committee, the meeting continued with reports from Bob Poehling, Executive Director/CEO and Brad Hans, Director of Wholesale Electric Operations.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, welcomed and thanked MEAN Board Members for their attendance. Poehling began his report by congratulating MEAN on its 40th Anniversary. Poehling noted that due to the recent increases of COVID-19 cases and in the interest of safety, staff were required to wear masks during the meeting. He thanked the NMPP Digital Solutions Group along with staff for their work during the pandemic. Poehling provided an overview of the MEAN Committee meetings held August 18, 2021 and thanked Committee members for all their work. He welcomed Carlisle, Iowa; Denver Iowa; and Plainview, Nebraska as new Members to the MEAN Board of Directors.

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, congratulated MEAN on its 40th Anniversary and provided information on the status of the following MEAN Projects:

- PCI Business Systems Project
- Integrated Resource Plan and pending resource changes
- West Market/West RTO
- MEAN Alert System
- Staff Efficiencies and Budget Preparations FY 2022-2023
- Market Pricing and Wind Performance
- Industry Changes and Timelines

CONSENT AGENDA (MEAN Executive Committee)

Minutes

Minutes of the August 11, 2021 meeting of the Municipal Energy Agency of Nebraska (MEAN) Executive Committee were previously distributed. There were no changes to the minutes.

Motion: *Mike Palmer moved to approve the following Consent Resolution. Bill Hinton seconded the motion, which carried unanimously on a roll call vote.*

EXECUTIVE COMMITTEE RESOLUTION

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Executive Committee that the minutes of the August 11, 2021 meeting are hereby approved.

The MEAN Executive Committee adjourned at 9:38 a.m.

CONSENT AGENDA (MEAN Board of Directors)

Minutes

Minutes of the May 20, 2021 meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors were previously distributed. There were no changes to the minutes.

Fiscal Year 2020-2021 Audit Results

Jamie Johnson, Director of Finance and Accounting, discussed MEAN's fiscal year financial targets and ratio coverage. Johnson noted that the audited financial statements for the fiscal year ended March 31, 2021 along with the 2020-2021 annual report could be found on the NMPP Energy website at http://www.nmppenergy.org/annual/reports. The Audit Communication Letter was previously distributed with the meeting packet (Attachment C).

Johnson introduced Chris Lindner of BKD, LLP. She noted that he also reported the previous day to the MEAN Finance Committee. Lindner reported on the MEAN Fiscal Year 2020-2021 audited financial statements and audit communication letter.

Fiscal Year 2021-2022 Year-to Date Financial Report

Johnson summarized MEAN's Fiscal Year 2021-2022 Year-to-Date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet; cash and investments; and fiscal year-to-date operating results. MEAN financials for March, April, May, and June 2021 were previously distributed.

Annual Compliance Report RE: Bond Compliance Policy

Pursuant to responsibilities as set forth in MEAN's Bond Compliance Policy, Jamie Johnson, Director of Finance and Accounting, has conducted the annual review required by the Policy and has prepared a report to the Board. The report was previously distributed with the meeting packet.

Johnson summarized findings and overall compliance with the policy (records; tax compliance; continuing disclosure; other covenants and requirements; compliance with policy; training; effectiveness of the policy; and delivery of the report).

Acknowledge Receipt of Unapproved Minutes of the June 2, 2021 Joint Operating Committee Meeting

The unapproved minutes from the June 2, 2021 meeting of the NMPP Energy Joint Operating Committee (JOC) were received and included in the meeting packet for review.

Public Power Week, October 3-9, 2021

Goulette stated that NMPP and MEAN member communities will celebrate Public Power Week, October 3-9, 2021 with more than 2,000 other electric utilities throughout the nation. Public Power Week is a national, annual event sponsored in conjunction with the American Public Power Association (APPA). He reported that if your utility needs assistance with public power materials such as a customizable news release, letter to the editor, newsletter article regarding public power, to contact Kevin Wickham in the NMPP communications department for assistance. Communities are encouraged to submit their community's Public Power Event information and photos to: info@nmppenergy.org.

Next Meeting

The next meeting of the MEAN Board of Directors will be held on Thursday, November 18, 2021 at the Younes Conference Center, Kearney, Nebraska or by virtual if required.

Motion: *Edward Dunn moved to approve the following Consent Resolution. Adam Suppes seconded the motion, which carried unanimously on a roll call vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the minutes of the May 20, 2021 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the audited financial report for fiscal year ended March 31, 2021 is hereby accepted; and,*

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the financial statements for March, April, May, and June 2021 are hereby accepted; and,*

4. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the annual compliance report re: bond compliance and management policy dated July 28, 2021 is hereby accepted; and,*

5. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that October 3-9, 2021 is hereby recognized as Public Power Week and all MEAN participants are encouraged to observe and promote the benefits of public power to their citizens; and,*

6. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, November 18, 2021 at the Younes Conference Center, Kearney, Nebraska or by virtual conference if required.*

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Governance Review, Finance, Power Supply, Risk Oversight, and Services Committees met on August 18, 2021.

MEAN GOVERNANCE REVIEW COMMITTEE

MEAN Governance Review Committee Meeting Summary of August 18, 2021

Michelle Lepin, Associate General Counsel, provided a summary of the discussions held at the Governance Review Committee meeting on August 18, 2021.

MODERNIZATION OF SUPPLEMENTAL AGREEMENT FOR PURCHASE OF LANDFILL GAS ENERGY ENVIRONMENTAL ATTRIBUTES

Michelle Lepin, Associate General Counsel, reviewed proposed modifications to the standard form agreement used for sales of landfill gas energy environmental attributes to MEAN participants. A copy of the agreement with proposed modifications shown in redline form was included as Attachment A in the meeting packet. Current participants purchasing landfill gas energy environmental attributes will be requested to sign the new standard form agreement to ensure that they have the most current version of the Agreement.

The modifications proposed will remove references to the Electrical Resources Pooling Agreement (ERPA), incorporate the MEAN General Terms and Conditions of Service as part of the agreement, and make other modernization changes.

The MEAN Governance Review Committee recommended the MEAN Board of Directors approve the revised standard form of the Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes.

Motion: *Darrel Wenzel moved to approve the resolution as presented. Duane Hoffman seconded the motion, which carried 33-1-1 on a roll call vote (Bill Hinton did not vote).*

Ayes: Randy Adams, Chris Brader, Kirby Bridge, Bart Brinkman, Tyler Christoff, Tammy Cooley, Pat Davison, James DePue, Chris DesPlanques, Will Dowis, Edward Dunn, Tom Goulette, Duane Hoffman, Nate James, Nancy Janssen, Todd Kielkopf, Daniel Knoell, Jeff Kohrs, Matt Langhorst, Andrew Lee, Perry Mader, Robert Messbarger, Brent Nation, Greg Nein, Tom Ourada, Mike Palmer, John Prettyman, Chris Rodman, James Summers, Adam Suppes, Jeremy Tarr, Darrel Wenzel, and Randy Woldt.

Nays: Bob Lockmon

Abstain: Joe McNally

MEAN BOARD OF DIRECTORS RESOLUTION

BE IT RESOLVED BY the MEAN Board of Directors that the revised standard form of the following agreement is hereby approved as presented:

- *Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes*

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that staff is hereby authorized and directed to prepare the necessary documents for current participants purchasing landfill gas energy environmental attributes from MEAN to convert to the standard form agreement approved by this Resolution.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of August 18, 2021

Tim Cerveny, Manager of Resources & Transmission, provided a summary of the discussions held at the Power Supply Committee meeting on August 18, 2021 including an update on MEAN's Resource Portfolio; 2021 Winter Season Load and Capability Report and Operational Readiness; Integrated Resource Planning Update; Western Area Power Administration (WAPA) Displacement Agreement; WAPA-199 Potential Resource Needs; and Generation Update on Base Load and Behind the Meter Generation.

2021 Winter Season Load and Capability Report and Operational Readiness

Tim Cerveny, Manager of Resources & Transmission delivered the load and capability report for the upcoming 2021-2022 winter season. The meeting packet included detailed information on the 2021-2022 Winter Season Load and Capability Report and Operational Readiness.

Western Area Power Administration (WAPA)

Tim Cerveny, Manager of Resources & Transmission, reviewed the proposed extension of the WAPA Displacement Agreement and how the proposed changes will impact capacity and energy needs in the future. Similarly, the presentation detailed the newly announced changes to the SLCA CRSP allocations and the resulting short-term resource needs.

Discussion was held.

Integrated Resource Planning Update

Tim Cerveny, Manager of Resources & Transmission, provided an update on activities related to the current round of Integrated Resource Planning, including projected needs for capacity and energy and the scenarios (in terms of load forecasting and pricing) to be included in the IRP modeling. The presentation included an overview of proposed and active federal and state legislation likely to impact resource planning.

Generation Update

Tim Cerveny, Manager of Resources & Transmission, reviewed information regarding the performance of MEAN owned baseload generating facilities and behind the meter generation.

Total Requirements Participant Resource under MEAN Renewable Distributed Generation Policy – Town of Oak creek, Colorado Solar Project

Matt Reed, Distributed Resources & Generation Specialist, led the discussion. The Town of Oak Creek, CO, has requested approval to install a 20.3-kW solar array. The array is well within the Renewable Distributed Generation Policy Cap. The Town of Oak Creek has received grant funding for the purchase and installation of the project to be installed on the roof of the Oak Creek town hall.

The Power Supply Committee recommended the MEAN Board of Directors determine the project meets the criteria to be a Total Requirements Participant Resource under the MEAN Renewable Distributed Generation Policy.

Motion: *Darrel Wenzel moved to approve the resolution as presented. James DePue seconded the motion, which carried unanimously on a roll call vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the MEAN Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, the DG Policy allows MEAN Total Requirements Participants to utilize the electrical output from certain qualifying behind the meter renewable generators to offset a specified portion of the Total Requirements Participant's energy purchases from MEAN; and

WHEREAS, such qualifying behind the meter renewable generators (each defined as a "TRP Resource" in the DG Policy) are subject to approval by the MEAN Board of Directors; and

WHEREAS, the following community desires to install, own and operate a solar array and utilize the electrical output from such array to offset a specified portion of the Total Requirements Participant's energy purchases from MEAN, which will require MEAN's approval of the TRP Resource: Town of Oak

Creek, Colorado.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the following project meets the criteria as a TRP Resource subject to the DG Policy, contingent upon the Total Requirements Participant providing the required Application and all other necessary documentation to MEAN for the project listed below:

- *Oak Creek, Colorado: solar array up to approximately 20.3 kW DC (via ownership)*

SERVICES COMMITTEE

Services Committee Meeting Summary of August 18, 2021

Andrew Ross, Director of Retail Utility Services & Member Relations, provided a summary of the discussions held at the Services Committee meeting on August 18, 2021, including an Operations & Maintenance Project update on Distribution Projects, USDA Energy Audits, discussion of Potential Services, Services Survey results, and proposed IT Services.

David Russell, Manager of Digital Solutions Group, and Sarah Jones, Director of Enterprise Business Support, discussed a pilot cybersecurity project and potential budget impacts.

The Services Committee recommended the MEAN Board of Directors direct staff to proceed with the Cybersecurity Pilot Project this Fiscal Year and to include the estimated ongoing cost of the service as part of the Fiscal Year 2022-2023 Budget.

Motion: *Nancy Janssen moved to approve the recommendation as presented. Chris DesPlanques seconded the motion which carried unanimously on a roll call vote (Darrel Wenzel did not vote).*

Development of Fiscal Year 2022-2023 Budget Including Estimated Costs for Recommended Services

The Services Committee met on August 18, 2021 to review utility-related services for the Fiscal Year 2022-2023 budget including estimated costs to provide the recommended services. At its August 18, 2021 meeting the MEAN Services Committee recommended the Board direct staff to develop the Fiscal Year 2022-2023 budget including estimated costs to provide the recommended Services.

Motion: *Nancy Janssen moved to approve the resolution as presented. Chris DesPlanques seconded the motion which carried unanimously on a roll call vote (James Summers did not vote).*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Services Committee of the MEAN Board of Directors reviewed the utility-related services offered by MEAN and recommended at the August 18, 2021 meeting that certain services be provided to qualifying MEAN participants by directing staff to include the estimated costs as part of the Fiscal Year 2022-2023 MEAN Budget; and,

WHEREAS, the MEAN Board of Directors desires to provide the recommended services to qualifying MEAN participants in Fiscal Year 2022-2023.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors, that staff is hereby directed to include the estimated costs for the recommended services, as presented, as part of the Fiscal Year 2022-2023 MEAN Budget.

The MEAN Board of Directors recessed for break at 10:33 a.m. The meeting resumed at 10:43 a.m.

FINANCE COMMITTEE

Finance Committee Meeting Summary of August 18, 2021

Jamie Johnson, Director of Finance and Accounting, provided a summary of the discussions held at the Finance Committee meeting on August 18, 2021 including Financial and Administrative Policies and Guidelines, and Debt Strategy and Refunding Considerations.

Financial Considerations related to Fiscal Year 2020-2021 Year End Transactions

At the May 20, 2021 MEAN Board of Directors meeting, the MEAN Board completed the annual evaluation of MEAN's preliminary Fiscal Year change in net position in accordance with MEAN's Financial and Administrative Policies and Guidelines.

The MEAN Board of Directors approved the following:

Rate Stabilization Account

Transfer $800,000 into the Rate Stabilization Account for general consistent with the Approved Budget & Rates for Fiscal Year Ended March 31, 2021, an additional amount of $4,700,000 into the Rate Stabilization Account for general, and an additional amount of $1,600,000 into the Rate Stabilization Account for capital for a total fiscal year transfer amount into the Rate Stabilization Account of $7,100,000; and the Board will review these actions again in August once additional financial impact from the extreme weather event in February is known.

Allocation of a Portion of Net Revenue to Participants

Credit $1,000,000 to the Eligible Participants of which the full amount is allocated related to the Fixed Cost Recovery Charge; and the Board will review these actions again in August once additional financial impact from the extreme weather event in February is known.

Jamie Johnson, Director of Finance and Accounting provided additional information on the financial impact from the extreme weather event in February as well as other financial considerations.

To assist in the review of these actions, tables were included in the meeting packet to summarize MEAN's target and ratio coverage.

At its August 18, 2021 meeting, the Finance Committee recommended the MEAN Board of Directors direct staff to utilize $5,000,000 of Rate Stabilization Funds over the next five years, with $1,000,000 per year in the Fixed Cost Recovery Charge, beginning Fiscal Year 2022-2023.

Discussion was held.

Motion: *Chris DesPlanques moved approve the recommendation as presented. Tom Ourada seconded the motion which carried 32-2-2 on a roll call vote.*

Ayes: Randy Adams, Chris Brader, Kirby Bridge, Bart Brinkman, Tyler Christoff, Tammy Cooley, Pat Davison, James DePue, Chris DesPlanques, Will Dowis, Edward Dunn, Tom Goulette, Bill Hinton, Duane Hoffman, Nate James, Nancy Janssen, Todd Kielkopf, Daniel Knoell, Andrew Lee, Bob Lockmon, Perry Mader, Robert Messbarger, Brent Nation, Greg Nein, Tom Ourada, Mike Palmer, John Prettyman, Chris Rodman, James Summers, Adam Suppes, Darrel Wenzel, and Randy Woldt.

Nays: Matt Langhorst, Jeremy Tarr

Abstain: Jeff Kohrs, Joe McNally

RISK OVERSIGHT COMMITTEE

Risk Oversight Committee Meeting Summary of August 18, 2021

The Director of Risk and Compliance/Regulatory Counsel, Robin Spady provided a summary of topics covered at the August 18, 2021 meeting including Annual NERC Report; Changes to Approved Products List, Enterprise Risk Management Update, and MISO ADR Dispute.

UPDATES AND REPORTS

NMPP Energy Annual Conference

Carol Brehm, Member Relations Representative, provided an overview of the 2021 NMPP Energy Annual Conference to be held September 7-8 at the Cornhusker Marriott, downtown Lincoln. Brehm also provided an update on the 2022 NMPP Energy Annual Conference to be held March 22-24. *Update: Due to the surge of COVID-19 cases and speaker unavailability in person, we regret to announce that the NMPP Energy Annual Conference scheduled for September 7-8, 2021, at the Cornhusker Hotel* ***has been cancelled****. However, there will be an opportunity to join a virtual presentation to hear our keynote speaker, Kris Paronto, speak live on "Bottom Up Leadership" at 8 am CST on Wednesday, September 8, 2021 during the Pool Board Meeting.*

Capability Testing

Tim Cerveny, Manager of Resources & Transmission, provided an update regarding current testing status and reliability data.

Emergency Communications

Tim Cerveny, Manager of Resources & Transmission, discussed the communications application that participants can sign up for to receive balancing authority alerts via text and/or email.

Central Nebraska Public Power and Irrigation District

Tim Cerveny, Manager of Resources & Transmission, discussed the status of the response to the Central Nebraska Public Power and Irrigation District Request for Proposal.

FERC Order 2222 Distributed Energy Resource Aggregation programs in RTOs

Matt Reed, Distributed Resources & Generation Specialist, provided an update on Federal Energy Regulatory Commission (FERC) Order 2222. The update included a brief overview of FERC Order 2222 and how MEAN communities are affected by the new ruling and current MEAN recommendations.

Advanced Meter Infrastructure and Solar RFP

Matt Reed, Distributed Resources & Generation Specialist, provided an update in the Advanced Metering Infrastructure (AMI) community project. Information including the selected vendor, project milestones, and information on obtaining letters of intent from interested communities will be provided. Information on the MEAN Community Solar Request for Proposals and upcoming milestones for the review and awarding of contract to the winning bidder was provided.

Discussion was held.

Market Updates

Jeff Lindsay, Electric Operations Manager, provided a Market Update on the Western Energy Imbalance Service (WEIS); Southwest Power Pool (SPP) RTO West; and California Energy Imbalance Market (EIM) Project.

Western Area Power Administration (WAPA)

Carol Brehm, Member Relations Representative, provided an update on the WAPA-199 Rate Colorado River Storage Project (CRSP)/Salt Lake City Area Integrated Projects (SLCA); WAPA Loveland Area Projects (LAP) 2025 Firm Electric Service (FES) Contracts, and WAPA Upper Great Plains (UGP) 2022 Rate Process.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports. Information regarding the following agreements was included in the previously distributed meeting packet:

Other Party	Agreement Name
Indianola, IA. Municipal Utilities, Simpson College, Indianola, IA	Agreement for Purchase of As-Available Energy (QF)
Kimball	Reimbursement Agreement (regarding costs of High West Energy Distribution Service Agreement)
Gunnison, CO	Funding Agreement (regarding certain WAPA Application Fees & Study Costs for the North Gunnison Substation)

Glenwood Springs, CO	Funding Agreement (regarding interconnection facilities for Cardnell substation under Transmission to Load Interconnection, Construction and Operating Agreement with PSCo)
Public Service Company of CO (PSCo), Glenwood Springs, CO	Transmission to Load Interconnection, Construction and Operating Agreement (Cardnell Substation)
MidAmerican Energy Company	JOU Confirmation Letter to Market Services Agreement (Walter Scott Unit 4 and Louisa share)
Public Service Company of CO (PSCo)(Xcel as agent)	Service Agreement for Network Integration Transmission Service (#518, Version 0.2.0)
Southwest Power Pool, Inc. (SPP)	Service Agreement #1906R15 for Network Integration Transmission Service (main NITSA)
The Energy Authority, Inc. (TEA)	Transmission Reassignment from MEAN to The Energy Authority, Inc. under MISO Tariff
Western States Power Corporation	FY 2022 Participation in Loveland Area Projects (LAP) Member Financing 18-RMR-2962
Western States Power Corporation	FY 2022 Participation in Upper Great Plains Member Financing (for Corps of Engineers Contract Number 20-UGPR-18, Exhibit C and WAPA - UGPR Exhibit B)
Contoural, Inc., MEAN, ACE, NMPP, NPGA	Revised Appendix A, Change Order Request for Statement of Work for: NMPP Energy Entities, Project Number - NMPP Energy-02 to Professional Services Agreement
McGrath North Mullin & Kratz, PC LLO	Engagement Letter

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, provided closing comments.

ADJOURNMENT

There being no further business, the meeting adjourned at 12:14 p.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:
Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

MEAN Board of Directors
Executive Committee
Younes Conference Center
August 19, 2021

NMPP | MEAN | NPGA | ACE

1

NMPP | MEAN | NPGA | ACE

Integrated Resource Planning Update

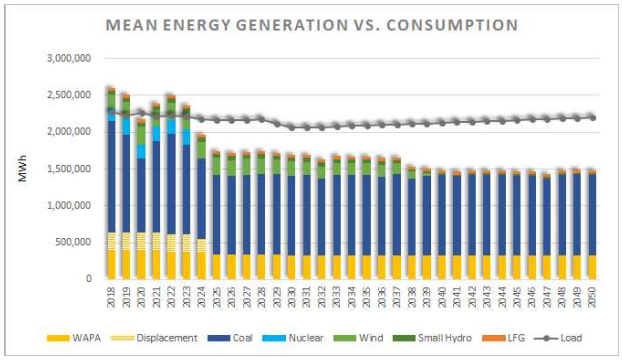
Tim Cerveny
Manager of Resources & Transmission

Shannon Coleman
Supervisor Resource Planning & Analysis

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Long Term Resource Portfolio

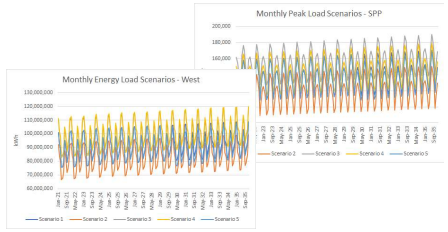


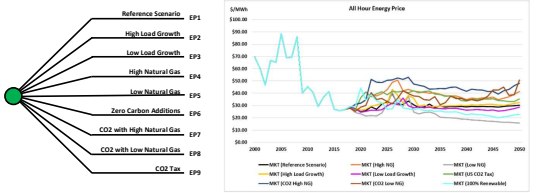
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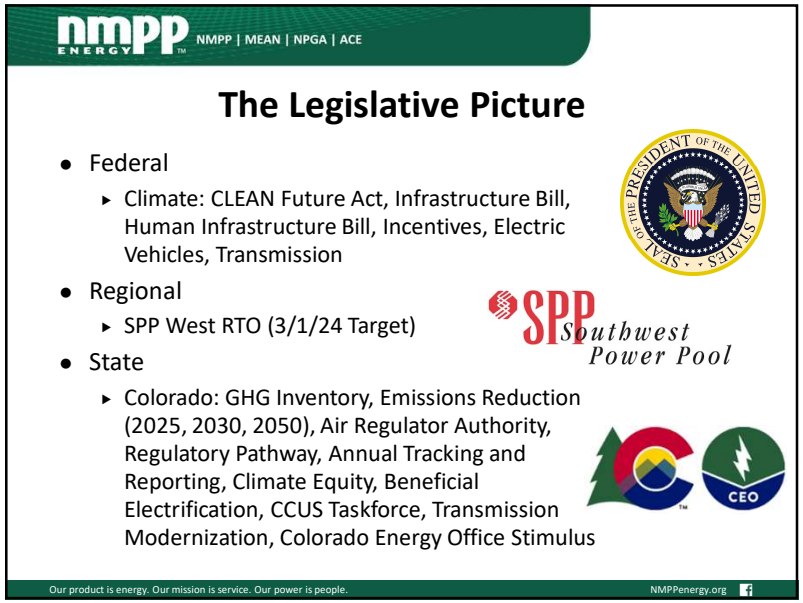
Integrated Resource Plan

- Load Scenarios
  - Scenario 1 = Base
  - Scenario 2 = 95% Low
  - Scenario 3 = 95% High
  - Scenario 4 = Electrification
  - Scenario 5 = Recession
- Market Pricing
  - Resource Mix
  - Energy Pricing
- Fuel Pricing
- Carbon Pricing





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The Legislative Picture
Federal
Climate: CLEAN Future Act, Infrastructure Bill, Human Infrastructure Bill, Incentives, Electric Vehicles, Transmission
Regional
SPP West RTO (3/1/24 Target)
State
Colorado: GHG Inventory, Emissions Reduction (2025, 2030, 2050), Air Regulator Authority, Regulatory Pathway, Annual Tracking and Reporting, Climate Equity, Beneficial Electrification, CCUS Taskforce, Transmission Modernization, Colorado Energy Office Stimulus
SPP Southwest Power Pool
CEO
Our product is energy. Our mission is service. Our power is people.
NMPPenergy.org

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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee will be held Wednesday, November 17, 2021 at 2:30 p.m. (CT) at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/about/board-meetings. If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at https://www.nmppenergy.org/contact-nmpp or (402) 474-4759.

Revised Agenda
Power Supply Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
November 17, 2021 – 2:30 p.m. (CT)

*All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk *.*

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda*
   A. Approval of minutes from August 18, 2021 meeting
   B. Next meeting
   C. Consent Resolution

3. Resource Portfolio
   A. Integrated Resource Planning
      1) Central Nebraska Public Power and Irrigation District
      2) Solar RFP
   B. Western Area Power Administration (WAPA)
      1) WAPA Capacity and Energy Displacement Agreement*
      2) WAPA-199/West Position Resource Needs
   C. Generation Update
      1) Base Load Generation
      2) Behind The Meter Generation
      3) Renewables
   D. ~~Markets~~ Operations
   E. Transmission

4. Adjourn

Approved Minutes
Power Supply Committee Meeting
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
November 17, 2021 – 2:30 p.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met November 17, 2021, at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the designated public meeting site. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current and was available for public inspection at the NMPP Energy office. A link to a copy of the Nebraska Open Meetings Act was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 3:10 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with nine of ten committee members present.

1. Pat Davison, Imperial
2. James Depue, Wray
3. Will Dowis, Gunnison
4. Duane Hoffman, Oxford
5. Matt Langhorst, Glenwood Springs
6. Tom Ourada, Crete
7. Chris Rodman, Wall Lake
8. Adam Suppes, Delta
9. Randy Woldt, Wisner

Absent: Bill Hinton, Kimball

Ex-Officio: Tom Goulette, West Point

CONSENT AGENDA

Minutes

Minutes of the August 18, 2021 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee will be held on January 19, 2022 at the Younes Conference Center located in Kearney, Nebraska or virtual conference if required.

Consent Resolution

Motion: *Chris Rodman moved to approve the consent resolution as presented. Adam Suppes seconded the motion, which carried unanimously on a roll call vote.*

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the August 18, 2021 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, January 19, 2022 at the Younes Conference Center in Kearney, Nebraska or virtual if required.*

Resource Portfolio

Staff provided information on MEAN's Resource Portfolio including Central Nebraska Public Power and Irrigation District; Solar RFP; WAPA Capacity and Energy Displacement Agreement; WAPA-199/West Position Resource Needs; Generation Update on Base Load Generation Facilities; Behind the Meter Generation; Renewables; Operations and Transmission.

Integrated Resource Planning Update

Shannon Coleman, Supervisor of Resource Planning and Analysis, shared an update on the progress of the 2022 Integrated Resource Plan, including the results of the Renewable Energy Survey, resource options under consideration, and upcoming additional opportunities for Board, Committee and public participation.

Central Nebraska Public Power and Irrigation District

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an update on the status of the proposal submitted for the Central Nebraska Public Power and Irrigation District's hydropower facility Request for Proposals.

Solar RFP

Matt Reed, Distributed Resources & Generation Specialist, provided an update on the MEAN Community Solar RFP including a summary of bids received, recommendation for bid award, and additional information on an opportunity for member communities to join the RFP post-award.

WAPA Capacity and Energy Displacement Agreement

Shannon Coleman, Supervisor of Resource Planning and Analysis, presented information on the WAPA Capacity and Energy Displacement Agreement, explained how this resource fits in MEAN's

portfolio, shared the results of a cost analysis, staff requested a recommendation for approval of an extension of this agreement.

Motion: *Chris Rodman moved to approve the resolution as presented. Adam Suppes seconded the motion, which carried unanimously on a roll call vote.*

MEAN POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Power Supply Committee desires to recommend that MEAN enter into a new Capacity and Energy Displacement Agreement effective December 1, 2021, with the Western Area Power Administration ("WAPA") to supersede, terminate and replace the existing agreement that was scheduled to terminate on September 30, 2024; and,

WHEREAS, the new Capacity and Energy Displacement Agreement will update the terms and conditions under which MEAN agrees to exchange and transmit power and energy generated or otherwise acquired by it in the states of Nebraska and Kansas for power and energy generated by WAPA's Loveland Area Projects ("LAP") to serve MEAN's customers in the western interconnection, and WAPA agrees to exchange and transmit power and energy generated by LAP resources in the western interconnection for power and energy generated or acquired by MEAN in the states of Kansas and Nebraska to serve WAPA's customers in the states of Kansas and Nebraska; and,

WHEREAS, MEAN and WAPA desire to incorporate the Kansas City Board of Public Utilities' ("KCBPU") LAP allocation into the new Capacity and Energy Displacement Agreement if and when KCBPU adjusts its transmission arrangements with Southwest Power Pool, Inc. ("SPP") accordingly.

NOW THEREFORE, BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors authorize the Executive Director to execute and deliver the new Capacity and Energy Displacement Agreement, subject to final legal and management review, with WAPA to be effective December 1, 2021.

BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors authorize the Executive Director to execute and deliver an amendment to the new Capacity and Energy Displacement Agreement, subject to final legal and management review, with WAPA to incorporate the KCBPU allocation into the agreement if and when KCBPU adjusts its transmission arrangements with SPP accordingly.

WAPA-199/West Position Resource Needs

Shannon Coleman, Supervisor of Resource Planning and Analysis, discussed the short-term energy purchase in the west region contracted to mitigate the projected short position resulting from the WAPA-199 allocation reduction as well as other west resource developments.

Generation Update

Tim Cerveny, Manager of Resources & Transmission, reviewed information regarding the performance of MEAN owned baseload generating facilities, behind the meter generation, and renewables.

Operations

Jeff Lindsay, Electric Operations Manager, provided a report on current elevated energy prices and Natural Gas price being a driving factor in day ahead and real time pricing.

Transmission

Brad Hans, Director of Wholesale Electric Operations, reported that staff is investigating an alternative method of managing transmission revenue recovery.

ADJOURNMENT

There being no further business, the meeting adjourned at 4:45 p.m. (CT).

Submitted by:
Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:
Kim Schafers
Municipal Energy Agency of Nebraska

MEAN Power Supply Committee

Municipal Energy Agency of Nebraska
Younes Conference Center
November 17, 2021

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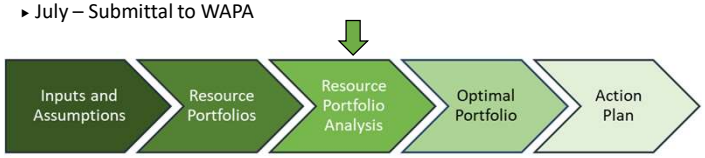
Integrated Resource Planning

Shannon Coleman
Supervisor of Resource Planning and Analysis

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Integrated Resource Plan Progress

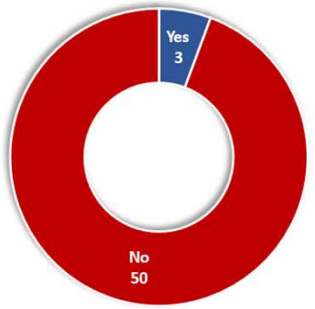
- Upcoming Action Items:
  - January Meeting – Presentation of Results
  - Workshop to Review Results and Prepare for Recommendation
  - May Meeting – PSC Recommendation and Board Approval
  - July – Submittal to WAPA



3

Renewable Energy Survey

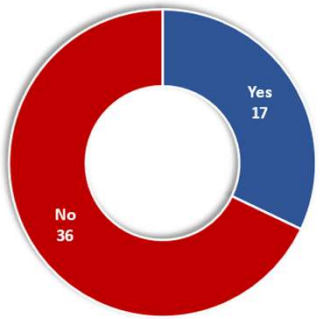
- Has your community established a local renewable or carbon-free energy target (separate from MEAN's 2050 Vision)?



4

Renewable Energy Survey

- Is your community interested in increasing the amount of carbon-free energy in your resource mix?

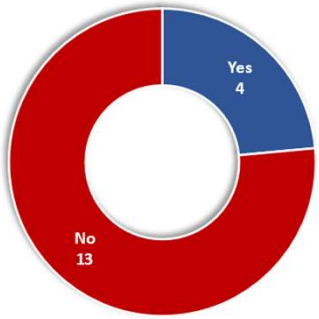


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5

Renewable Energy Survey

- If yes, would your community be willing to pay a higher wholesale price for an increase in carbon-free energy?



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Renewable Energy Survey

- Does your community prefer to increase the carbon-neutral portion of your resource mix concurrently with MEAN's overall percentage, or on a more accelerated schedule, knowing this could incur higher cost?

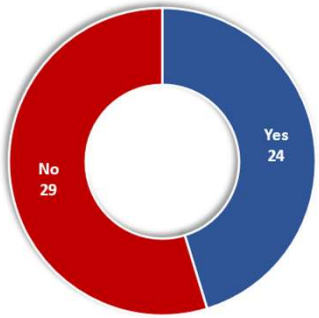


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Renewable Energy Survey

- Is your community interested in the installation of electric vehicle charging infrastructure?

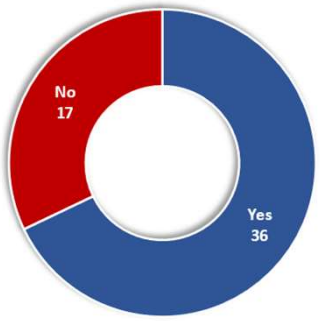


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Renewable Energy Survey

- Would your community be interested in funding opportunities for electric vehicle infrastructure if state or local funds were available for this purpose?

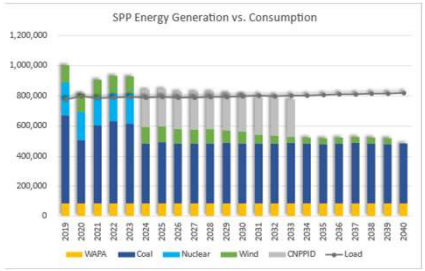


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9

Central NE Public Power & Irrigation District

- Request for Proposals
- 40-60 MW of Hydro in NE
- PPA Start Date January 2024
- MEAN's Proposal Under Consideration
- Negotiations Complete by End of 2021



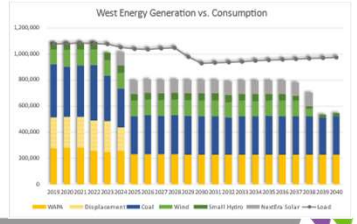
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10

NextEra Sidney Solar Project

- 40 MW
- 29.1% Capacity Factor
- Commercial Operation Date 2022 - 2024
- SPP Interconnect + DC Tie Rights
- Options for 15-Year and 25-Year PPA
- Flat Pricing $44-$52/MWh
- Escalating Pricing Starts at $36-$46/MWh
- Can serve SPP or West Load (Pending Tie Rights)
- **ENERGY + 2050 VISION**



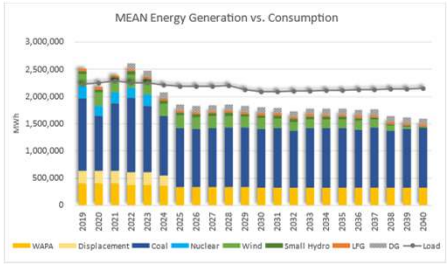


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DG in Portfolio

- Option in IRP – Demand Side Solution
- Reduction in Supply Side Resource Need
- Local Benefits
- Geographic Diversity
- Progress Toward 2050 Vision
- Various Technologies



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Western Area Power Administration(WAPA) Displacement

Shannon Coleman
Supervisor of Resource Planning and Analysis

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Background – WAPA Displacement

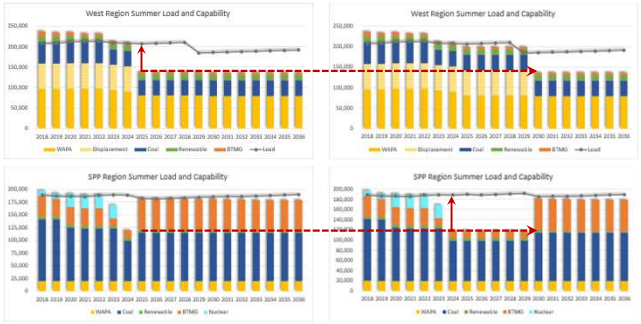
- Kansas Towns with WAPA Allocation
  - WAPA Cannot Serve the Load Across DC Ties
- MEAN Has Load and Resources in Both SPP and West
- MEAN Receives WAPA Power in West
  - Monthly Contract Rate of Delivery (Capacity)
  - Monthly Energy
- MEAN Serves WAPA's LAP Allocations in SPP
  - Plus Reserves
- MEAN Pays SPP Market Price
- Contract Expires 9/30/24





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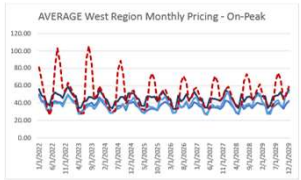
WAPA Displacement Impact

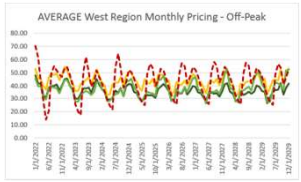


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West Region Picture

- Forward Pricing Curves
- SPP West RTO
- Resource Scarcity
  - WAPA
  - Coal Retirements

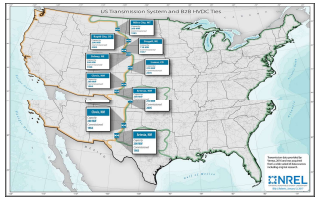




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Tie Rights?

- Regional L&C with Tie Rights
  - Option to Take SPP Capacity to West Load
  - CNPPID or BTMG
- Regional L&C without Tie Rights
  - Option to Move Resources
  - With New SPP Resource + Return of BTMG = Less Import from MISO + New West Resource
  - Sell Capacity in MISO (Capacity Market and MCR)





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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors will be held Thursday, November 18, 2021 at 9:00 a.m. (CT), at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. NOTICE IS FURTHER HEREBY GIVEN that if a quorum of the Board of Directors is not present, a meeting of the Executive Committee of the Board of Directors of the Municipal Energy Agency of Nebraska will be called to order at 9:00 a.m. (CT), at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/about/board-meetings. If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at https://www.nmppenergy.org/contact-nmpp or (402) 474-4759.

Revised Agenda
Board of Directors and Executive Committee Meeting
Municipal Energy Agency of Nebraska
Younes Conference Center - Kearney, Nebraska
November 18, 2021 – 9:00 a.m. (CT)

*All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk *.*

1. Call to Order
   A. Nebraska Open Meetings Act 84-1412 (8)
   B. Roll Call
      1) Board of Directors
      2) Executive Committee

2. Chairman's Remarks

3. Reports
   A. Executive Director
   B. Director of Wholesale Electric Operations

4. Consent Agenda*
   A. Minutes of the August 19, 2021 meeting
   B. Fiscal Year 2021-2022 Year-to Date Financial Report
   C. Acknowledge Receipt of Unapproved June 2, 2021, Minutes of the Joint Operating Committee
   D. Next meeting
   E. Consent Resolution

5. South Sioux City, Nebraska Southwest Power Pool (SPP) Market Assistance Agreement Renewal*

6. MEAN Charter Amendment
   A. City of Fountain, Colorado Request for Termination of Membership*

7. Federal Securities Law Requirements-Annual Board Training

8. Committee Reports and Recommendations
   A. Finance Committee
      1) Finance Committee Meeting Summary of October 20, 2021 and November 17, 2021
         (a) Preliminary Shared Administrative and General Budget for Fiscal Year 2022-2023 including Budgeted Positions and Allocation of Expenses/Reimbursement for Services Rendered and Resources Utilized
         (b) Rate Setting Philosophy
         (c) Rates and Charges
      2) Seventh Supplemental Bond Resolution for the issuance of Refunding Bonds in one or more Series to refund some or all of MEAN's outstanding 2012 Series A Bonds and 2013 Series A Bonds and a general resolution authorizing the contracts and documents for the refundings*
      3) Credit Agreement and Revolving Line of Credit Note with Wells Fargo*
      4) Financial and Administrative Policies and Guidelines*

B. Power Supply Committee
   1) Power Supply Committee Meeting Summary of November 17, 2021
      (a) Resource Portfolio
         (i) Integrated Resource Planning Update
            1. Central Nebraska Public Power and Irrigation District
            2. Solar RFP
         (ii) Western Area Power Administration (WAPA)
            1. WAPA-199 Potential Resource Needs
         (iii) Generation Update
            1. Base Load Generation
            2. Behind The Meter Generation
            3. Renewables
         ~~(iv) Markets~~ Operations
         (v) Transmission
   2) WAPA Capacity and Energy Displacement Agreement*

C. Services Committee
   1) Services Committee Meeting Summary of November 17, 2021
      (a) Operations & Maintenance Updates
         (i) Distribution Projects
      (b) Discussion of Potential Services
         (i) Energy Efficiency Programs Update
         (ii) Advanced Metering Infrastructure Project
         (iii) Cyber Security Update

D. Risk Oversight Committee
   1) Risk Oversight Committee Meeting Summary of November 17, 2021
      (a) NERC Update
      (b) MISO Hurricane Laura Alternative Dispute Resolution Update
      (c) Nebraska Unicameral Update
      (d) Enterprise Risk Management Update

9. Updates and Reports
   A. Member Updates
      ~~1) Colorado River Storage Project (CRSP)/Salt Lake City Area (SLCA) Western Area Power Administration (WAPA) WAPA-199 Rate Action Update~~
      2) Community Visits
      3) 2022 NMPP Energy Annual Conference Update
   ~~B. Resources & Transmission~~
   C. Operations
      1) Market Updates

10. Contracts, Settlement Agreements, and General Counsel Report
   A. Contracts Report
   B. Legislative and Legal Updates
      1) State and Federal Activities

11. Closing Comments

12. Adjourn

Approved Minutes
Board of Directors and Executive Committee Meeting
Municipal Energy Agency of Nebraska
Younes Conference Center - Kearney, Nebraska
November 18, 2021 – 9:00 a.m. (CT)

The Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) met Thursday, November 18, 2021 at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the designated public meeting site. Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current and was available for public inspection at the NMPP Energy office. A link to a copy of the Nebraska Open Meetings Act was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:00 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with 38 of the 57 Directors in attendance.

1. Adams, Randy – Torrington
2. Beyer, Mike – Bridgeport
3. Boeckman, Bob – Breda
4. Brestal, Rod – Callaway
5. Bridge, Kirby – Alliance
6. Brinkman, Barthold– Shickley
7. Carpenter, Ron – Haxtun
8. Cooley, Tammy – Gering
9. Davison, Pat – Imperial
10. DePue, James – Wray
11. DesPlanques, Chris – Indianola
12. Dowis, Will – Gunnison
13. Dunn, Edward – Grant
14. Forman, Justin – Aspen
15. Goulette, Tom – West Point
16. Hoffman, Duane – Oxford
17. Hrabanek, Dave – Pierce
18. James, Nate – Morrill
19. Kerr, Jim – Lyons
20. Kielkopf, Todd – Carlisle
21. Knoell, Dan – Broken Bow
22. Kohrs, Jeff – Nebraska City
23. Langhorst, Matt – Glenwood Springs
24. Lee, Andrew – Curtis (Arrived 9:12 a.m.)
25. Lockmon, Bob – Stuart
26. Mader, Perry – Mitchell
27. Messbarger, Robert – Fairbury
28. Nation, Brent – Fort Morgan
29. Ourada, Tom – Crete
30. Palmer, Mike – Sidney
31. Prettyman, John – Yuma
32. Rodman, Chris – Wall Lake
33. Summers, James – Benkelman
34. Suppes, Adam – Delta
35. Tarr, Jeremy – Plainview
36. Thomas, Dallas – Ansley
37. Wenzel, Darrel – Waverly
38. Woldt, Randy – Wisner

Board Members not in attendance: Doug DeLaune – Arnold; Stacey Lesher – Basin; Dan Coolidge – Bayard; Grant Jorgensen – Beaver City; Larry Edgar – Blue Hill; Cody Feeken – Burwell; Mike Criss – Chappell; Larry Farley – Denver; Ray Luhring – Falls City; Keith Beck – Fleming; Carl Christian – Fountain; Greg Nein – Julesburg; Bill Hinton – Kimball; Kim Robb – Lyman; Joe McNally –

Neligh; Bernard Gagne – Oak Creek; Chris Brader – Pender; Michael Clark – Red Cloud; and Jon Winkel – Sergeant Bluff.

Others in Attendance: Joe Dickman, Mike Kalkwarf, Wendy McKain and John Rundel.

CHAIRMAN'S REMARKS

Goulette noted that a public notice for a meeting of the MEAN Executive Committee was posted and listed on the agenda to ensure MEAN is in compliance with the Open Meetings Act when a quorum of the MEAN Board of Directors is not available, and action needs to be taken. A quorum was declared for the Board of Directors and the MEAN Executive Committee was not called to order.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, welcomed and thanked MEAN Board Members for their attendance. Poehling reported on the rebranding efforts of NMPP Energy coalition of organizations (ACE, MEAN, NPGA and Pool), including new digital tools, Status Alert Notification System and NMPP Operations Apps that will benefit Members; and a new website that features a members login portal. A short promotional video was shown to the Board of Directors. MEAN's new website is located at: https://mean.nmppenergy.org.

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, provided a status report of current MEAN activities, current elevated energy pricing and projects.

CONSENT AGENDA

Minutes

Minutes of the August 19, 2021 meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors were previously distributed. There were no changes to the minutes.

Fiscal Year 2021-2022 Year-to Date Financial Report

Johnson summarized MEAN's Fiscal Year 2021-2022 Year-to-Date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet; cash and investments; and fiscal year-to-date operating results. MEAN financials for July, August and September 2021 were previously distributed.

Discussion was held.

Acknowledge Receipt of Unapproved Minutes of the June 2, 2021 Joint Operating Committee Meeting

The unapproved minutes from the June 2, 2021 meeting of the NMPP Energy Joint Operating Committee (JOC) were received and included in the meeting packet for review.

Next Meeting

The next meeting of the MEAN Board of Directors will be held on Thursday, January 20, 2022 at the Younes Conference Center, Kearney, Nebraska or by virtual conference if required.

Motion: *Edward Dunn moved to approve the following Consent Resolution. Adam Suppes seconded the motion, which carried unanimously on a roll call vote (Bob Boeckman did not vote).*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the financial statements for July, August and September 2021 are hereby accepted; and,*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the receipt of the minutes of the June 2, 2021 Joint Operating Committee meeting is hereby acknowledged; and,*

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, January 20, 2022 at the Younes Conference Center, Kearney, Nebraska or virtual conference if required.*

SOUTH SIOUX CITY, NEBRASKA SOUTHWEST POWER POOL (SPP) MARKET ASSISTANCE AGREEMENT RENEWAL

Michelle Lepin, Associate General Counsel, provided an update on the proposed renewal of the SPP Market Assistance Agreement with the City of South Sioux City, Nebraska, under which MEAN provides certain market services in the Southwest Power Pool, Inc. (SPP) Integrated Marketplace for the City's share of the output of the Cottonwood Wind Energy Center. The current agreement is scheduled to expire March 31, 2022. Staff prepared a renewal agreement with modernized terms and conditions, and the City approved the renewal in November 2021.

Discussion was held.

Motion: *Duane Hoffman moved to approve the resolution as presented. Edward Dunn seconded the motion, which carried unanimously on a roll call vote (John Prettyman did not vote).*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the SPP Market Assistance Agreement between the Municipal Energy Agency of Nebraska (MEAN) and the City of South Sioux City, Nebraska, is scheduled to expire March 31, 2022, and

WHEREAS, MEAN staff prepared and delivered to the City of South Sioux City, Nebraska, a proposed SPP Market Assistance Agreement that would take effect April 1, 2022, for the City's consideration.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the SPP Market Assistance Agreement to be effective April 1, 2022 between MEAN and the City of South Sioux City, Nebraska, is hereby approved, subject to final legal and management review by MEAN and the delivery of all necessary documentation by the City of South Sioux City, Nebraska.

MEAN CHARTER AMENDMENT - CITY OF FOUNTAIN, COLORADO REQUEST FOR TERMINATION OF MEMBERSHIP

The City of Fountain, Colorado (City) submitted a formal request dated September 13, 2021 for MEAN to terminate the City's membership in MEAN and to utilize the procedure outlined in Article XIV, Section 1 of the MEAN By-Laws to effectuate termination of the City's participation in the MEAN Charter.

Michelle Lepin, Associate General Counsel, reviewed the next steps in the proposed termination of the City's membership. Termination will be subject to approval of the MEAN Board of Directors and the Nebraska Power Review Board.

Discussion was held.

Motion: *Mike Palmer moved to approve the resolution as presented. Andrew Lee seconded the motion, which carried unanimously on a roll call vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Charter of the Municipal Energy Agency of Nebraska (MEAN) includes the City of Fountain, Colorado (City), as a participating municipality; and

WHEREAS, the City submitted a formal request dated September 13, 2021 for MEAN to terminate the City's membership in MEAN and to utilize the procedure outlined in Article XIV, Section 1 of the Amended and Restated By-Laws of MEAN (MEAN By-Laws) to effectuate termination of the City's participation in the MEAN Charter; and

WHEREAS, the MEAN Board of Directors desires to accommodate City's request for MEAN to terminate City's membership in MEAN by terminating City's participation in the MEAN Charter.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that City's membership in MEAN via City's participation in the MEAN Charter shall be terminated effective upon approval by the Nebraska Power Review Board for the following reason: to accommodate the written request submitted by the City dated September 13, 2021.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that staff is authorized to do all things necessary to effectuate such termination, including without limitation to provide prior written notice of the termination to the City of Fountain, Colorado, and the reason therefor, to prepare a petition to amend the Petition for Creation and MEAN's Charter to remove the City of Fountain, Colorado, as a participating municipality, and to submit the petition to the Nebraska Power Review Board.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Executive Director of MEAN is authorized to decide that the proposed termination not take place if the City of Fountain, Colorado, objects to the termination as permitted by Article XIV, Section 1.B. of the MEAN By-Laws.

FEDERAL SECURITIES LAW REQUIREMENT-ANNUAL BOARD TRAINING

Jamie Johnson, Director of Finance and Accounting, presented the annual Board training regarding the requirements of federal securities laws in accordance with the Best Practices section of MEAN's Bond Compliance Policy. Following the training, 38 MEAN Board Representatives acknowledged their participation by attendance vote.

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Finance, Power Supply, Risk Oversight, and Services Committees met on November 17, 2021.

FINANCE COMMITTEE

Finance Committee Meeting Summary of October 20, 2021, and November 17, 2021

Jamie Johnson, Director of Finance and Accounting, provided a summary of topics covered at the October 20, 2021 and November 17, 2021 meetings including the following:

- Preliminary Shared Administrative and General Budget for Fiscal Year 2022-2023 including Budgeted Positions and Allocation of Expenses/Reimbursement for Services Rendered and Resources Utilized
- Rate Setting Philosophy
- Rates and Charges

SEVENTH SUPPLEMENTAL BOND RESOLUTION FOR THE ISSUANCE OF REFUNDING BONDS IN ONE OR MORE SERIES TO REFUND SOME OR ALL OF MEAN'S OUTSTANDING 2012 SERIES A AND 2013 SERIES A BONDS AND A GENERAL RESOLUTION AUTHORIZING THE CONTRACTS AND DOCUMENTS FOR THE REFUNDINGS

Jamie Johnson, Director of Finance and Accounting, provided a municipal bond market update and information on various refunding opportunities.

The Finance Committee has previously discussed the potential contribution of up to $5,000,000 of available operating cash of MEAN. Johnson discussed further at the meeting.

A general authorizing resolution of the MEAN Board of Directors for Power Supply System Refunding Revenue Bonds for consideration was included as *Attachment A* in the meeting packet. Johnson reviewed the resolution at the meeting.

The MEAN Board of Directors also considered the Seventh Supplemental Power Supply System Revenue Bond Resolution (the "*Seventh Supplemental Bond Resolution*") authorizing Power Supply System Refunding Revenue Bonds included as *Attachment B* in the meeting packet. Johnson reviewed the resolution and the related exhibits at the meeting.

All of MEAN's outstanding bonds have been issued and are secured under MEAN's Power Supply System Revenue Bond Resolution, adopted by the Board on August 21, 2003 (the "*Master Resolution*"), which includes general provisions for the issuance from time to time of Bonds by MEAN.

All of the bonds issued under the Master Resolution, including the proposed refunding bonds, are secured and paid on a parity (equal) basis from the revenues of MEAN.

Bonds are issued under the Master Resolution through the adoption of supplemental resolutions, such as the *Seventh Supplemental Bond Resolution*.

The *Seventh Supplemental Bond Resolution* authorizes the issuance of refunding bonds in one or more series (the "*Refunding Bonds*") to refund all or a portion of MEAN's outstanding 2012 Series A and 2013 Series A Bonds.

The *Seventh Supplemental Bond Resolution* is substantially similar to the Supplemental Bond Resolutions adopted by the Board for MEAN's previous refunding bonds.

The *Seventh Supplemental Bond Resolution* and the related authorizing resolution delegate authority to the Executive Director or any other Authorized Officer of MEAN (includes the Chairperson, Vice Chairperson, and Secretary-Treasurer) to approve the final terms of the Refunding Bonds for the purpose described above, provided that the terms of the Refunding Bonds must be within the following parameters which are included in Section 203 of the *Seventh Supplemental Bond Resolution*:

- Maximum principal amount: $65 million, providing the flexibility to sell the Refunding Bonds at a premium or a discount, whichever provides the most net present value savings;

- Final maturity: No extension of the term of the current bonds
    - The final maturity of the Series of Refunding Bonds issued to refund the 2012 Bonds shall be not later than April 1, 2032
    - The final maturity of the Series of Refunding Bonds issued to refund the 2013 Bonds shall be not later than April 1, 2036

- The refunding of the 2012 Bonds shall result in Net Present Value Savings of at least 10% and the refunding of the 2013 Bonds shall result in Net Present Value Savings of at least 10%.

The MEAN Finance Committee approved a recommendation at its meeting on November 17, 2021.

The general resolution for the Board of Directors consideration was included in the meeting packet as *Attachment A*.

Motion: *Chris DesPlanques moved to approve the resolution included in the meeting packet as Attachment A. Darrel Wenzel seconded the motion, which carried unanimously on a roll call vote.*

In addition, the *Seventh Supplemental Bond Resolution* for the Board of Directors consideration was included in the meeting packet as *Attachment B*.

Motion: *Mike Palmer moved to approve the Seventh Supplemental Bond Resolution included in the meeting packet as Attachment B. Edward Dunn seconded the motion, which carried unanimously on a roll call vote.*

Credit Agreement and Revolving Line of Credit Note with Wells Fargo

Jamie Johnson, Director of Finance and Accounting, provided an update on the results of the Request for Information (RFI) soliciting proposals from commercial banks for a $15 million line of credit. MEAN's Financial Advisor, PFM, administered the RFI process. MEAN's current facility expires in May of 2022.

As discussed with the Finance Committee at the virtual conference on October 20, 2021, based on the results of the RFI, staff recommended amending the current revolving line of credit with Wells Fargo Bank National Association.

The Credit Agreement dated May 29, 2020 will be amended (the First Amendment to the Credit Agreement) as follows:

- A three-year term to November 18, 2024 (current term ends May 27, 2022)
- Reducing the unused commitment fee from 0.35% per annum to 0.26% per annum
- Updating the notice address for Wells Fargo Bank

The current $15 million Revolving Line of Credit Note will be replaced with no change to the amount. The interest rate is being updated due to the replacement of the London Interbank Offered Rate (LIBOR). LIBOR is being replaced by SOFR which is a secured overnight financing rate as administered by the Federal Reserve Bank of New York. Any outstanding principal balance shall bear interest at a fluctuating rate of 0.90% above Daily Simple SOFR. To date, MEAN has not drawn funds from the line of credit.

Johnson discussed the amendment terms at the meeting. The MEAN Finance Committee approved a recommendation at its meeting on November 17, 2021. A resolution for the Board of Directors consideration was included in the meeting packet as *Attachment C.*

Motion: *Adam Lee moved to approve the resolution included in the meeting packet as Attachment C. Adam Suppes seconded the motion, which carried unanimously on a roll call vote.*

Financial and Administrative Policies and Guidelines

Jamie Johnson, Director of Finance and Accounting, conducted an annual review of the MEAN Financial and Administrative Policies and Guidelines at the August 18, 2021 Finance Committee meeting. The document with redline changes was included with the August 18, 2021 meeting materials.

Staff has completed further review of the document. A summary of the changes since the August 18, 2021 meeting are as follows:

- Added sentence in 7: Investments to tie in requirements of laws of the State of Nebraska. No other changes were suggested after review by MEAN's Bond Counsel.
- Added revisions to 16.1: Avoided Cost and Standard Rate to make references to markets more generic and added wording to allow for adjustments. Adjustment wording is similar to what has been identified by Southwest Power Pool for tariff revisions resulting from extreme price spikes resulting in unusually high calculations.
- Updated 17: Commercial Insurance updated for changes that had been identified when comparing to similar section of Nebraska Municipal Power Pool's policies and guidelines.
- Appendix A – Business Travel – fixed one more reference to employer-provided vehicle

The document with all redline changes was included in the packet as *Attachment D*.

The Finance Committee approved a recommendation to the Board of Directors at the November 17, 2021 meeting.

Motion: *Darrel Wenzel moved to approve the resolution as presented. Edward Dunn seconded the motion, which carried unanimously on a roll call vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted the MEAN Financial and Administrative Policies and Guidelines; and

WHEREAS, proposed changes to the MEAN Financial and Administrative Policies were previously distributed to the MEAN Board of Directors for review.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the MEAN Financial and Administrative Policies and Guidelines shall be amended to include the changes as presented.

The MEAN Board of Directors recessed for break at 10:48 a.m. The meeting resumed at 11:01 a.m.

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of November 17, 2021

Staff provided a summary of the discussion held at the Power Supply Committee meeting on November 17, 2021, including an update on MEAN's Resource Portfolio; Integrated Resource Planning Update; Central Nebraska Public Power and Irrigation District; Solar RFP; WAPA-199 Potential Resource Needs; Generation Update on Base Load Generation Facilities, Behind the Meter Generation; Renewables; Operations and Transmission.

Integrated Resource Planning Update

Shannon Coleman, Supervisor of Resource Planning and Analysis, shared an update on the progress of the 2022 Integrated Resource Plan, including the results of the Renewable Energy Survey, resource options under consideration, and upcoming additional opportunities for Board, Committee and public participation.

Western Area Power Administration (WAPA) Capacity and Energy Displacement Agreement

Tim Cerveny, Manager of Resources & Transmission, presented information on the WAPA Capacity and Energy Displacement Agreement and explained how this resource fits in MEAN's portfolio, the results of a cost analysis, and request a recommendation for approval of an extension of this agreement.

Motion: *Adam Suppes moved to approve the resolution as presented. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") desires to enter into a new Capacity and Energy Displacement Agreement effective December 1, 2021, with the Western Area Power Administration ("WAPA") to supersede, terminate and replace the existing agreement that was scheduled to terminate on September 30, 2024; and

WHEREAS, the new Capacity and Energy Displacement Agreement will update the terms and conditions under which MEAN agrees to exchange and transmit power and energy generated or otherwise acquired by it in the states of Nebraska and Kansas for power and energy generated by WAPA's Loveland Area Projects ("LAP") to serve MEAN's customers in the western interconnection, and WAPA agrees to exchange and transmit power and energy generated by LAP resources in the western interconnection for power and energy generated or acquired by MEAN in the states of Kansas and Nebraska to serve WAPA's customers in the states of Kansas and Nebraska; and

WHEREAS, MEAN and WAPA desire to incorporate the Kansas City Board of Public Utilities' ("KCBPU") LAP allocation into the new Capacity and Energy Displacement Agreement if and when KCBPU adjusts its transmission arrangements with Southwest Power Pool, Inc. ("SPP") accordingly.

NOW THEREFORE, BE IT FURTHER RESOLVED BY the MEAN Board of Directors, that the Executive Director is hereby authorized to execute and deliver the new Capacity and Energy Displacement Agreement, subject to final legal and management review, with WAPA to be effective December 1, 2021.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors, that the Executive Director is hereby authorized to execute and deliver an amendment to the new Capacity and Energy Displacement Agreement, subject to final legal and management review, with WAPA to incorporate the KCBPU allocation into the agreement if and when KCBPU adjusts its transmission arrangements with SPP accordingly.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors, that the Executive Director of MEAN is hereby authorized to do any and all things and to execute and deliver any and all documents which he deems necessary or advisable in order to consummate the execution and delivery of the new Capacity and Energy Displacement Agreement. Notwithstanding any provision of this Resolution authorizing the Executive Director to take any action or execute any document to the contrary, in the absence of the Executive Director or in lieu of the Executive Director, the person designated in writing by the Executive Director, may take such action or execute such document with like effect as fully as though named in this Resolution instead of the Executive Director.

SERVICES COMMITTEE

Services Committee Meeting Summary of November 17, 2021

Staff provided a summary of the discussions held at the Services Committee meeting on November 17, 2021, including an Operations & Maintenance Project update on Distribution Projects, discussion of Potential Services update on Energy Efficiency Programs, Advanced Metering Infrastructure Project and Cyber Security update.

RISK OVERSIGHT COMMITTEE

Risk Oversight Committee Meeting Summary of November 17, 2021

Robin Spady, Director of Risk & Compliance/Regulatory Counsel, provided a summary of the discussions held at the Risk Oversight Committee meeting on November 17, 2021, including updates on: NERC, MISO Hurricane Laura Alternative Dispute Resolution, Nebraska Unicameral and Enterprise Risk Management.

UPDATES AND REPORTS

Member and Community Updates

Carol Brehm, Member Relations Representative, provided updates on utility sharing, community and economic growth.

NMPP Energy Annual Conference Update

Carol Brehm, Member Relations Representative, reported the 2022 NMPP Energy Annual Conference will be held in person, March 22-24, 2022, at the Cornhusker Marriott located in Lincoln, Nebraska. The Keynote speaker will be Mark Nutsch, Green Beret Commander portrayed in the Movie 12 Strong and New York Times Best-Seller, *Horse Soldiers*.

Operations

Jeff Lindsay, Electric Operations Manager, provided an update on Western Energy Imbalance Service (WEIS) Market; Southwest Power Pool (SPP) RTO West; and California Independent System Operator (CAISO) Energy Imbalance Market.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, gave a summary of the legal, legislative, and regulatory reports. Information regarding the following agreements was included in the previously distributed meeting packet:

Other Party	Agreement Name
Arnold	Revised Exhibit A (Contract Wind Energy Amounts) to Amended and Restated Supplemental Agreement for Wind-Generated Energy Purchase

High West Energy	Distribution Service Agreement for Backup Service for the City of Kimball
Southwest Power Pool, Inc. (SPP)	Second Amended and Restated Western Joint Dispatch Agreement (adds Colorado Springs Utilities to the Western Energy Imbalance Service Market WJDA participant)
Tri-State G&T Association, Inc.	Confirmation Under WSPP Agreement for Purchase of Operating Reserves
Tri-State G&T Association, Inc.	Confirmation Under WSPP Agreement for Purchase of Operating Reserves
WAPA	Letter Agreement No. 21-SLC-1064 regarding City of Gunnison System Impact Study necessary to further evaluate the system upgrades to accommodate the load increase of 2 MW beginning in October 2021
WAPA, Iowa Tribe of Kansas and Nebraska	Exhibit B, Revision No. 5 (Sample Calculation of Tribal Benefits) to Benefit Crediting Contract No. 15-RMR-2729

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, thanked Participants for attending the meeting and noted the December 8, 2021 MEAN Finance & Risk Oversight Committee meeting and MEAN's Committee and Annual Board of Directors Meetings (Elections & Budget) to be held January 19-20, 2022.

ADJOURNMENT

There being no further business, the meeting adjourned at 12:02 p.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:
Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

MEAN Board of Directors

Municipal Energy Agency of Nebraska
Younes Conference Center, Kearney, NE
November 18, 2021

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Power Supply Committee Summary

November 17, 2021

- Integrated Resource Planning
- Solar RFP
- WAPA-199 Potential Resource Needs
- Base Load Generation
- Behind the Meter Generation
- Renewables
- Operations
- Transmission

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Integrated Resource Planning Update

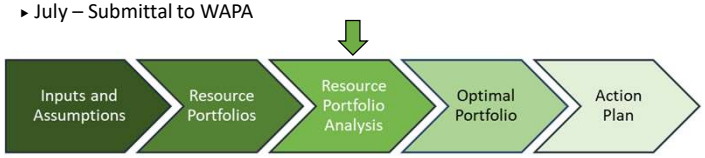
Shannon Coleman
Supervisor Resource Planning & Analysis

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Integrated Resource Plan Progress

- Upcoming Action Items:
  - January Meeting – Presentation of Results
  - Workshop to Review Results and Prepare for Recommendation
  - May Meeting – PSC Recommendation and Board Approval
  - July – Submittal to WAPA

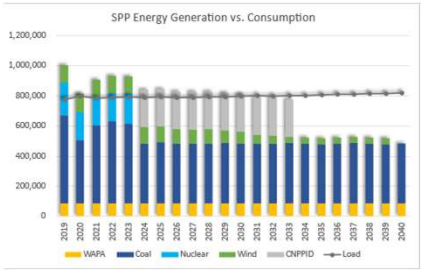


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4

Central NE Public Power & Irrigation District

- Request for Proposals
- 40-60 MW of Hydro in NE
- PPA Start Date January 2024
- MEAN's Proposal Under Consideration
- Negotiations Complete by End of 2021



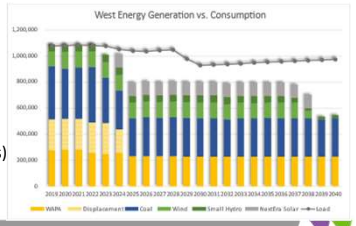
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NextEra Sidney Solar Project

- 40 MW
- 29.1% Capacity Factor
- Commercial Operation Date 2022 - 2024
- SPP Interconnect + DC Tie Rights
- Options for 15-Year and 25-Year PPA
- Flat Pricing $44-$52/MWh
- Escalating Pricing Starts at $36-$46/MWh
- Can serve SPP or West Load (Pending Tie Rights)
- **ENERGY + 2050 VISION**



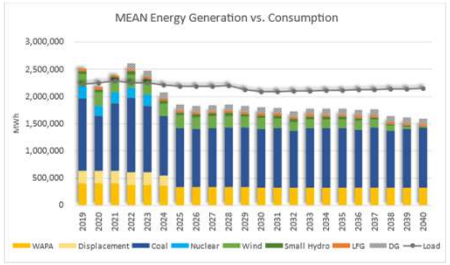


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DG in Portfolio

- Option in IRP – Demand Side Solution
- Reduction in Supply Side Resource Need
- Local Benefits
- Geographic Diversity
- Progress Toward 2050 Vision
- Various Technologies



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7

WAPA Capacity and Energy Displacement Agreement

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8

Background – WAPA Displacement

- Kansas Towns with 62 MW of WAPA Allocations
  - WAPA Cannot Serve the Load Across DC Ties
- MEAN Has Load and Resources in Both SPP and West
- MEAN Receives WAPA Power in West
  - Monthly Contract Rate of Delivery (Capacity)
  - Monthly Energy
- MEAN Serves WAPA's LAP Allocations in SPP
  - Plus Reserves
- MEAN Pays SPP Market Price
- Contract Expires 9/30/24



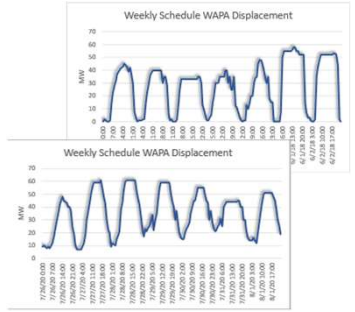


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Value of Displacement

- Operations
  - Ramping
  - Minimums
  - Location
- Flexibility
  - Load Following
  - Economic Advantage
- Potential Use as Reserve
- Cost Analysis Shows Benefit



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Summary of Contract Changes

- Term of New Agreement: Dec. 1, 2021 – May 31, 2029
- Early Termination Options apply
  - RTO Integration by WAPA-RMR
  - Environmental Requirements
- Adjustments to Capacity and Energy Amounts
  - 2025 Resource Adjustments subject to MEAN's acceptance
  - Additional allocations may be incorporated if parties agree
- Minimum hourly schedules apply
- High Hydrology Conditions
- Loss of Load provision

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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee will be held in person Wednesday, January 19, 2022 at 2:30 p.m. (CT) at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/about/board-meetings.

In the event of inclement weather or directed health measures surrounding the COVID-19 pandemic, MEAN may change the in-person only meeting scheduled January 19, 2022 at 2:30 p.m. (CT), at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, to a ***virtual only meeting to be held January 19, 2022 at 2:30 p.m. (CT).

Accordingly, **if inclement weather or directed health measures surrounding the COVID-19 pandemic arise,** in lieu of an in-person meeting, NOTICE IS HEREBY GIVEN that a virtual conference meeting of the Municipal Energy Agency of Nebraska (MEAN)Power Supply Committee will be held Wednesday, January 19, 2022, at 2:30 p.m. (CT). The meeting is open to the public and members of the media and is accessible via computer or smart device at https://global.gotomeeting.com/join/231000301 or via telephone at +1 (866) 899-4679, access code 231-000-301; or at NMPP Energy, the public designated meeting site, 8377 Glynoaks

Agenda
Power Supply Committee
Municipal Energy Agency of Nebraska
Younes Conference Center, Kearney, Nebraska
January 19, 2022 – 2:30 p.m. (CT)

All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk.*

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Consent Agenda*
   A. Approval of minutes from the November 17, 2021 meeting
   B. Next meeting
   C. Consent Resolution

3. Resource Portfolio
   A. Integrated Resource Planning
   B. Power Supply Options
      1) Central Nebraska Public Power and Irrigation District
      2) NextEra Solar Project
   C. Total Requirements Participant Resources under MEAN Renewable Distributed Generation Policy*
   D. Generation Update
      1) Base Load Generation
      2) Behind the Meter-Emergency Operations (Southwest Power Pool)
   E. Electric Operations Update
   F. Operating Reserves

4. Initial Concept Discussions
   A. Power Supply Resource Contract Length and Pricing
   B. Renewable Pools Transition
   C. MEAN Resources in Participating Communities
   D. Battery Storage

5. Adjourn

Approved Minutes
Power Supply Committee
Virtual Conference Meeting
Municipal Energy Agency of Nebraska
January 19, 2022 – 2:30 p.m. (CT)

Due to directed health concerns surrounding the COVID-19 pandemic, in lieu of an in-person meeting, a virtual conference meeting of the Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee was held January 19, 2022 at 2:30 p.m. (CT). Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current, and, was available for public inspection at the NMPP Energy office, the designated public meeting site, 8377 Glynoaks Drive, Lincoln, Nebraska. Instruction to join the meeting via GoToMeeting or by virtual conference, along with a link to a copy of the Nebraska Open Meetings Act was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chair Tom Ourada called the meeting to order at 3:50 p.m. (CT). Ourada announced that pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with nine of ten committee members present.

1. Pat Davison, Imperial
2. James Depue, Wray
3. Will Dowis, Gunnison
4. Bill Hinton, Kimball
5. Duane Hoffman, Oxford
6. Matt Langhorst, Glenwood Springs
7. Tom Ourada, Crete
8. Chris Rodman, Wall Lake
9. Adam Suppes, Delta

Absent: Randy Woldt, Wisner

Ex-Officio: Tom Goulette, West Point

CONSENT AGENDA

Minutes

Minutes of the November 17, 2021 meeting were previously distributed. There were no changes to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee will be held May 18, 2022 at the Younes Conference Center located in Kearney, Nebraska or virtual conference if required.

Consent Resolution

Motion: *Chris Rodman moved to approve the consent resolution as presented. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line teleconference messaging; or by voice vote.*

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the November 17, 2021 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, May 18, 2022 at the Younes Conference Center in Kearney, Nebraska or virtual conference if required.*

Resource Portfolio

Staff provided information on MEAN's Resource Portfolio including Integrated Resource Planning; Power Supply Options; Total Requirements Participant Resources under the MEAN Renewable Distributed Generation Policy; Generation Update; Electric Operations Update; Operating Reserves and Initial Concept Discussions.

Integrated Resource Planning Update

Shannon Coleman, Supervisor of Resource Planning and Analysis, shared an update on the progress of the 2022 Integrated Resource Plan, including the schedule and upcoming opportunities for Board and Committee participation, the Phase II modeling process, the candidate portfolios, and the identification of resource needs.

Power Supply Options-Central Nebraska Public Power and Irrigation District

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an update on the status of the proposal submitted for the Central Nebraska Public Power and Irrigation District's hydropower facility Request for Proposals, including how this resource would integrate into MEAN's portfolio.

NextERA Solar Project

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an update on the progress of the NextEra Solar project under development near Sidney, Nebraska. The presentation included a summary of the project, terms of the proposed PPA, and options for the project's configuration and delivery.

Total Requirements Participant Resource under MEAN Renewable Distributed Generation Policy– 2022 Solar RFP Participants

Matt Reed, Distributed Resources & Generation Specialist, led the discussion. Ten MEAN communities were involved in a competitive bidding process in 2021 to receive competitive bids on installing community solar for each community under the 5% cap outlined in the Renewable Distributed Generation Policy. The project has increased in scope to possibly include over 20 communities, each within their 5% cap. Solar RFP participants plan to have purchase power agreements signed in the first quarter of 2022 with a project completion of 1st quarter of 2023.

Prior to the vote, Reed noted a correction to the resolution and stated that Waverly, Nebraska should be listed as Waverly, Iowa.

Motion: *Bill Hinton moved to approve the resolution as presented. Chris Rodman seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line teleconference messaging; or by voice vote.*

MEAN POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the MEAN Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, the DG Policy allows MEAN Total Requirements Participants to utilize the electrical output from certain qualifying behind the meter renewable generators, which may include certain qualifying purchases under power purchase agreements, to offset a specified portion of the Total Requirements Participant's energy purchases from MEAN; and

WHEREAS, such qualifying behind the meter renewable generators and qualifying purchases under power purchase agreements (each defined as a "TRP Resource" in the DG Policy) are subject to approval by the MEAN Board of Directors; and

WHEREAS, certain MEAN total requirements participant communities either participated in a Request for Proposals process facilitated by MEAN on behalf of certain Total Requirements Participants for TRP Resources, or subsequently expressed interest in considering participation in such a TRP Resource, and may elect to proceed with the current proposal, which will require MEAN's approval of the TRP Resource; and

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors determine that each of the following projects meets the criteria as a TRP Resource subject to the DG Policy, each contingent upon the Total Requirements Participant accepting the current proposal and providing all necessary documentation to MEAN for the project listed below:

Photovoltaic Facility (via power purchase agreement) – sizes DC:

- *Alliance, Nebraska: 3,490 kW*
- *Ansley, Nebraska: 135 kW*
- *Aspen, Colorado: 1,424 kW*
- *Crete, Nebraska: 3,638 kW*
- *Delta, Colorado: 1,811 kW*
- *Denver, Iowa: 454 kW*
- *Fort Morgan, Colorado: 6,401 kW*
- *Gering, Nebraska: 1,448 kW*
- *Gunnison, Colorado: 800 kW*
- *Glenwood Springs, Colorado: 3,984 kW*
- *Imperial Public Power District: 760 kW*
- *Indianola, Iowa: 4,212 kW*
- *Lyons, Colorado: 364 kW*
- *Oxford, Nebraska: 161 kW*
- *Pender, Nebraska: 452 kW*
- *Sergeant Bluff, Iowa: 896 kW*
- *Shickley, Nebraska: 114 kW*
- *Sidney, Nebraska: 2,377 kW*
- *Stuart, Nebraska: 176 kW*
- *Trenton, Nebraska: 181 kW*
- *Waverly, ~~Nebraska:~~Iowa: 4,380 kW*
- *West Point, Nebraska: 1,598 kW*
- *Wisner, Nebraska: 172 kW*
- *Wray, Colorado: 396 kW*

Generation Update

Tim Cerveny, Manager of Resources & Transmission, reviewed information regarding the performance of MEAN owned baseload generating facilities, and behind the meter generation emergency operations and communication.

Electric Operations Update

Jeff Lindsay, Electric Operations Manager, provided a report on natural gas prices, current electric market pricing, driving factors in the pricing and an update on the winter energy purchase in the west.

Operating Reserves

Jeff Lindsay, Electric Operations Manager, provided a report on the status of MEAN's required Operating Reserves in the west, current pricing and options staff are evaluating for cost reduction.

Initial Concept Discussions

Brad Hans, Director of Wholesale Electric Operations, introduced initial concept discussions for upcoming initiatives that will involve the contract lengths necessary to get the most competitive resource pricing with our upcoming power agreements, a potential transition of the current renewable pools to a product that will balance the needs of Member Communities, upcoming resource changes and the 2050 Vision. In addition, he discussed distributed generation and potential development of a

policy to establish a means to place MEAN resources in Member Communities. Matt Reed, Distributed Resources & Generation Specialist, started the discussion on battery storage and how MEAN will need to address this as it becomes more economically feasible.

ADJOURNMENT

There being no further business, the meeting adjourned at 5:20 p.m. (CT).

Submitted by:
Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Prepared by:
Kim Schafers
Municipal Energy Agency of Nebraska

MEAN Power Supply Committee

Municipal Energy Agency of Nebraska
Virtual Conference Meeting
January 19, 2022

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1

Resource Portfolio

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2

Integrated Resource Planning

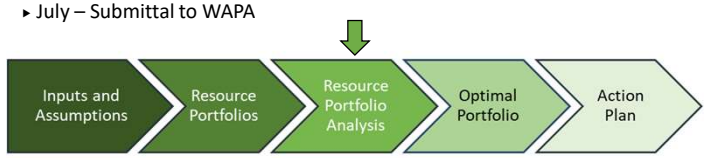
Shannon Coleman
Supervisor of Resource Planning and Analysis

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3

Integrated Resource Plan Progress

- Upcoming Action Items + Opportunities for Public Participation:
  - April – Draft IRP Report Sent to Communities for Review
  - **April – Workshop to Review Results and Prepare for Recommendation**
  - May Meeting – PSC Recommendation and Board Approval
  - July – Submittal to WAPA

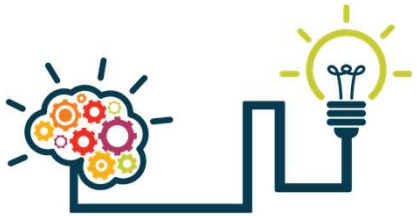


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April IRP Workshop

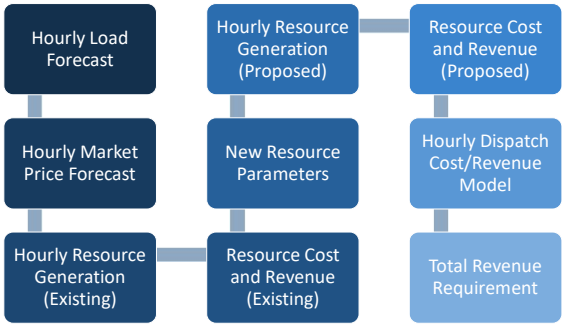
- REMINDER: IRP Workshop
  - April 21, 2022
  - In-Person and Virtual Attendance Options
  - Review the Results of the IRP
  - Discuss Power Supply Committee Recommendations
  - Discuss Draft IRP Report Document



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Integrated Resource Plan Modeling Process



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Assumptions

- Horizons Energy Future Pricing Projections
- 2050 Vision
- Distributed Generation Integration
- Actual Proposal Terms are Used for Supply Side Options
- Transfer Between SPP and West Limited by Available DC Tie Rights



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Sensitivity Analysis

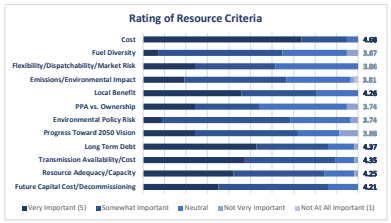
Load Scenario 1	• 50/50 Weather-Normalized Forecast
Load Scenario 2	• 95% Low Forecast
Load Scenario 3	• 95% High Forecast
Load Scenario 4	• High Electrification
Load Scenario 5	• Recession in Year 10

Pricing Scenario 1	• Reference Scenario • Energy Growth = 0.72% CAGR, Mid NG Pricing
Pricing Scenario 2	• High Load Growth • Energy Growth = 0.98% CAGR
Pricing Scenario 3	• Low Load Growth • Energy Growth = 0.49% CAGR
Pricing Scenario 4	• High Natural Gas
Pricing Scenario 5	• Low Natural Gas
Pricing Scenario 6	• 80% CO_2 Reduction by 2050 • High Natural Gas
Pricing Scenario 7	• 80% CO_2 Reduction by 2050 • Low Natural Gas
Pricing Scenario 8	• Implementation of $15/st Carbon Tax • 2.5% Annual Escalation
Pricing Scenario 9	• Reduced Renewable Capital Cost, No FF Additions • Energy Growth = -0.35% CAGR

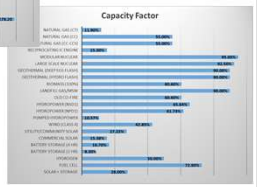
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Phase I Evaluation





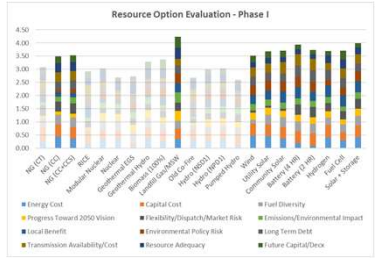


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Candidate Portfolios

- Natural Gas Combined Cycle
  - With Carbon Capture
- Landfill Gas/Municipal Solid Waste
- Wind
  - With Battery Storage
- Solar
  - With Battery Storage
- Hydrogen Fuel Cell

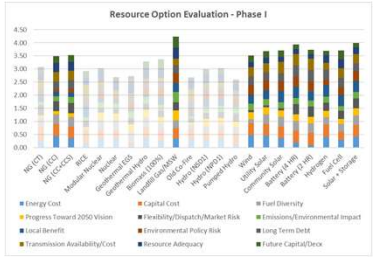


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Candidate Portfolios

- CNPPID Hydro
- NextEra Sidney Solar
- Community Distributed Generation
- MEAN-Owned DG
- Extension of Existing Contracts?
  - NPPD MUP
  - BH PPA

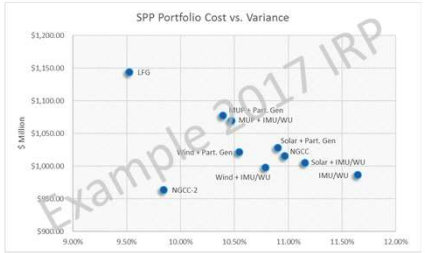


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Format of Results



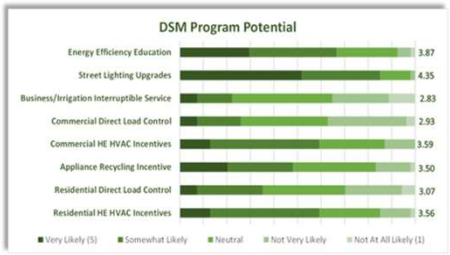


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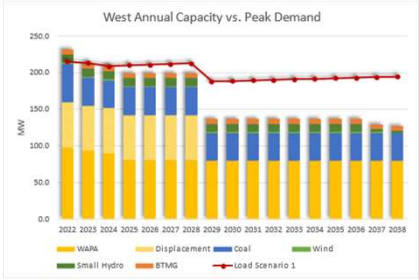
Demand Side Management

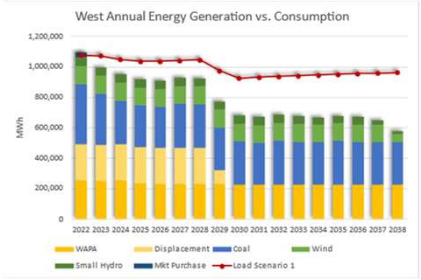
- Qualitative Screening
  - Cost, Customer Preference, Environmental Impact, Market Potential, Ease of Implementation, Availability
  - Scored from 0-3
- Economic Evaluation
  - Total Resource Cost – MEAN, Utility, Retail Customer
  - Avoided Demand and Energy Cost
  - Lost Retail Revenue
  - NPV Calculation



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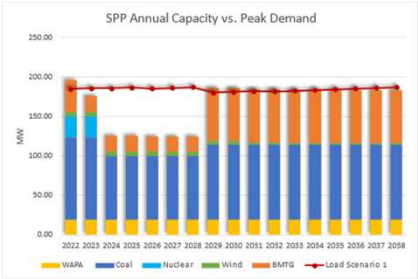
West Region Resource Needs

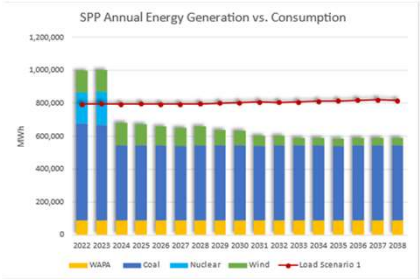




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SPP Resource Needs

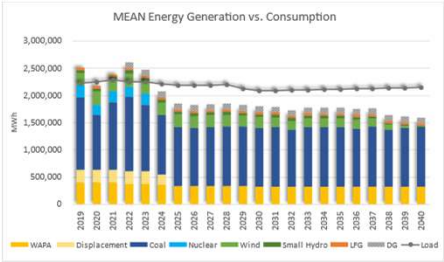




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DG in Portfolio

- Option in IRP – Demand Side Solution
- Reduction in Supply Side Resource Need
- Local Benefits
- Geographic Diversity
- Progress Toward 2050 Vision
- Various Technologies



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Power Supply Options

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Central Nebraska Public Power and Irrigation District

Shannon Coleman
Supervisor of Resource Planning and Analysis

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Central NE Public Power & Irrigation District

- 40-60 MW of Hydro in NE
- PPA Start Date January 2024
- MEAN's Proposal Under Consideration
- CNPPID to Submit Counteroffer by End of January
- Considering On-Peak/Off-Peak Pricing
- Pricing for Capacity and Energy

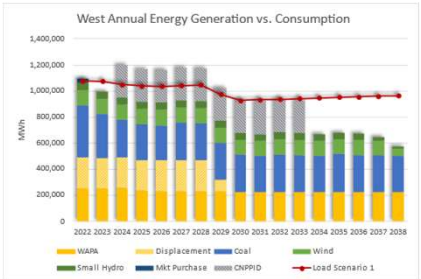
CENTRAL
Nebraska Public Power and Irrigation District

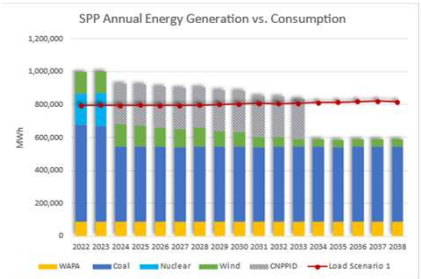


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Central NE Public Power & Irrigation District





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NextEra Solar Project

Shannon Coleman
Supervisor of Resource Planning and Analysis

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NextEra Solar Project

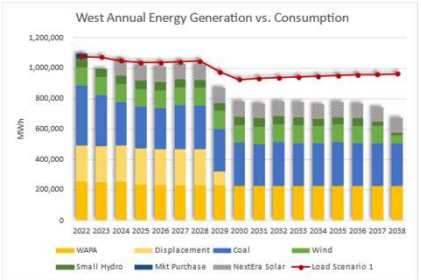
- 40 MW Located Near Sidney, NE
- Accredited Capacity = 85% (2020)
- 29.1% Capacity Factor
- Commercial Operation Date 2024
- SPP Interconnect + DC Tie Rights
- Options for 15-Year and 25-Year PPA
- Flat Pricing $44-$52/MWh
- Escalating Pricing Starts at $36-$46/MWh
- Option to Add Battery Storage
- **ENERGY + 2050 VISION**

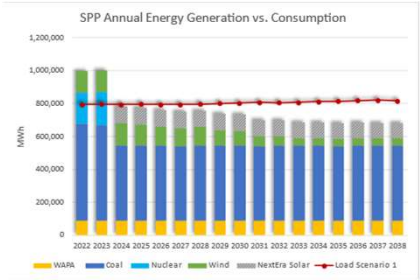


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NextEra Solar Project



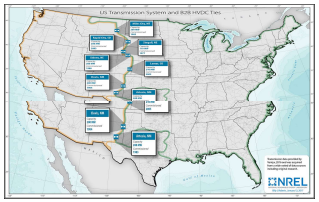


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DC Tie Rights

- 34 MW Across SCSE Starting 2024
- 75 MW Across SCSE Starting 2027
- Would Allow Use of CNPPID or NextEra Solar in West
- Request for Clarification to SPP to Identify Required Path and Cost Impact
- SPP West in 2024?



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NOTICE OF ANNUAL MEETING

NOTICE IS HEREBY GIVEN that the Annual Meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors and Executive Committee will be held in person Thursday, January 20, 2022, at 9:00 a.m. (CT), at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

The agenda includes election of officers and review and approval of the fiscal year 2022-2023 budget. An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/about/board-meetings.

In the event of inclement weather or directed health measures surrounding the COVID-19 pandemic, MEAN may change the in-person only meeting scheduled January 20, 2022 at 9:00 a.m. (CT), at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, to a ***virtual only meeting to be held January 20, 2022 at 9:00 a.m. (CT).

Accordingly, **if inclement weather or directed health measures surrounding the COVID-19 pandemic arise,** in lieu of an in-person meeting, NOTICE IS HEREBY GIVEN that a virtual conference meeting of the Annual Meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors and Executive Committee will be held Thursday, January 20, 2022, at 9:00 a.m. (CT). The meeting is open to the public and members of the media and is accessible via computer or smart device at https://global.gotomeeting.com/join/751921917 or via

Revised Combined Agenda
Annual Meeting
Board of Directors and Executive Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – Kearney, Nebraska
January 20, 2022 – 9:00 a.m. (CT)

*All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk *.*

1. Call to Order
   A. Nebraska Open Meetings Act
   B. Roll Call
      1) Board of Directors
      2) Executive Committee

2. Chairman's Remarks

3. Reports
   A. Executive Director
   B. Director of Wholesale Electric Operations

4. Consent Agenda (Executive Committee)
   A. Minutes of the November 3, 2021 meeting
   B. Consent Resolution

5. Consent Agenda (Board of Directors)
   A. Minutes of August 19, 2021 and November 18, 2021 meeting
   B. Fiscal Year 2021-2022 Year-to-Date Financial Report
   C. Acknowledge Receipt of the Unapproved Minutes of November 3, 2021 Joint Operating Committee Meeting
   D. Next meeting
   E. Consent Resolution

6. Amended Western Joint Dispatch Agreement regarding Western Energy Imbalance Service (WEIS) Market*

7. Committee Reports and Recommendations
   A. Finance Committee
      1) Finance Committee Meeting Summary of December 8, 2021 and January 19, 2022
         (a) Debt Strategy and Refunding Considerations
      2) Financial and Administrative Policies and Guidelines*
      3) Preliminary Year-End Projections Fiscal Year 2021-2022
      4) Budget, Rates, and Charges Fiscal Year 2022-2023, Modifications to Schedule of Rates and Charges for Service Schedule M, Modifications to Schedule of Rates and Charges for Service Schedule K and K-1, and Modification of Wind Rate and Environmental Attribute Rate*
   B. Power Supply Committee
      1) Power Supply Committee Meeting Summary of January 19, 2022
         (a) Integrated Resource Planning
         (b) NextEra Solar Project

(c) Generation Update
(i) Base Load Generation
(ii) Behind the Meter-Emergency Operations (Southwest Power Pool)
(d) Electric Operations Update
(e) Operating Reserves
(f) Initial Concept Discussions
(i) Power Supply Resource Contract Length and Pricing
(ii) Renewable Pools Transition
(iii) MEAN Resources in Participating Communities
(iv) Battery Storage

2) Total Requirements Participant Resources under MEAN Renewable Distributed Generation Policy*
3) Central Nebraska Public Power and Irrigation District

8. Election of Officers*
A. Chair
B. Vice Chair
C. Secretary/Treasurer

9. Election of Executive Committee At-Large Members*

10. Updates and Reports
A. Advanced Metering Infrastructure
B. 2022 NMPP Energy Annual Conference
C. Western Area Power Administration (WAPA) Hydro

11. Contracts, Settlement Agreements, and General Counsel Report
A. Contracts Report
B. Legislative and Legal Updates
1) State and Federal Activities
2) Legal Updates
C. Settlement Agreements with City of Neligh, Neb. and City of Scribner, Neb.

12. Closing Comments

13. Adjourn

Minutes
Board of Directors Annual Meeting via Virtual Conference
Municipal Energy Agency of Nebraska
January 20, 2022 – 9:00 a.m. (CT)

Due to directed health concerns surrounding the COVID-19 pandemic, in lieu of an in-person meeting, a virtual conference meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors and Executive Committee was held January 20, 2022 at 9:00 a.m. (CT). Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and on-line in the Lincoln *Journal-Star* newspaper and website. The notice and agenda were posted upon issuance in the NMPP Energy office and kept continually current, and, was available for public inspection at the NMPP Energy office, the designated public meeting site, 8377 Glynoaks Drive, Lincoln, Nebraska. Instruction to join the meeting via GoToMeeting or by virtual conference, along with a link to a copy of the Nebraska Open Meetings Act was provided in the public notice, and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

MEAN BOARD OF DIRECTORS

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:07 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with 37 of the 57 Directors in attendance.

1. Brader, Chris – Pender
2. Brestel, Rod – Callaway
3. Bridge, Kirby – Alliance
4. Brinkman, Bart – Shickley
5. Carpenter, Ron – Haxtun
6. Christoff, Tyler – Aspen
7. Davison, Pat – Imperial
8. DePue, James – Wray
9. DesPlanques, Chris – Indianola
10. Dowis, Will – Gunnison
11. Dunn, Edward – Grant
12. Farley, Larry – Denver
13. Goulette, Tom – West Point
14. Hartwell, Carrie – Julesburg
15. Hinton, Bill – Kimball
16. Hoffman, Duane – Oxford
17. James, Nathan – Morrill
18. Kerr, Jim – Lyons
19. Kielkopf, Todd – Carlisle
20. Kohrs, Jeff – Nebraska City
21. Langhorst, Matt – Glenwood Springs
22. Lee, Andrew – Curtis (Arrived 9:38 a.m.)
23. Lockmon, Bob – Stuart
24. Mader, Perry – Mitchell (Arrived 9:38 a.m.)
25. Messbarger, Robert – Fairbury
26. Nation, Brent – Fort Morgan
27. Ourada, Tom – Crete
28. Palmer, Mike – Sidney
29. Prettyman, John – Yuma
30. Rodman, Chris – Wall Lake
31. Rust, Todd – Chappell (Arrived 9:30 a.m.)
32. Suppes, Adam – Delta
33. Tarr, Jeremy – Plainview
34. Thomas, Eugene – Ansley
35. Waldow, Blake – Broken Bow (Arrived 9:38 a.m.)
36. Wenzel, Darrel – Waverly
37. Youtz, Dana – Torrington

Board Members not in attendance: Doug DeLaune – Arnold; Stacey Lesher – Basin; Dan Coolidge – Bayard; Grant Jorgensen – Beaver City; James Summers – Benkelman; Larry Edgar – Blue Hill; Bob Boeckman – Breda; Michael Beyer – Bridgeport; Cody Feeken – Burwell; Ray Luhring – Falls City; Keith Beck – Fleming; Carl Christian – Fountain; Pat Heath – Gering; Kim Robb – Lyman; Joe McNally – Neligh; Bernard Gagne –Oak Creek; Dave Hrabanek – Pierce; Michael Clark – Red Cloud; Jon Winkel – Sergeant Bluff; and Randy Woldt – Wisner.

EXECUTIVE COMMITTEE

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:11 a.m. (CT). Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with all seven committee members in attendance:

1. Tom Goulette, West Point
2. Bill Hinton, Kimball
3. Brent Nation, Fort Morgan
4. Tom Ourada, Crete
5. Mike Palmer, Sidney
6. Adam Suppes, Delta
7. Darrel Wenzel, Waverly

CHAIRMAN'S REMARKS

Goulette reminded Directors to be mindful of remaining on the phone to ensure a quorum for the transaction of business.

REPORTS

Executive Director

Bob Poehling, Executive Director/CEO, provided a report on MEAN's fiscal year performance and project updates. Poehling noted the reason for moving the meetings virtually was due to impacts of Covid-19 on staff and the high number of positive cases in Lincoln. He stated that staff are doing everything to ensure that it's not impacting the ability to serve MEAN Participant Communities.

Director of Wholesale Electric Operations

Brad Hans, Director of Wholesale Electric Operations, provided a report on the status of MEAN Projects including energy pricing; expansion of the West Market; Integrated Resource Planning; preparations for future power purchase agreements; renewable pools transition; modernization of rate structure, battery storage and future workshops.

CONSENT AGENDA-MEAN EXECUTIVE COMMITTEE

Minutes

Minutes of the November 3, 2021 meeting were previously distributed. There were no changes to the minutes.

Motion: *Adam Suppes moved to approve the following Consent Resolution. Tom Ourada seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

EXECUTIVE COMMITTEE RESOLUTION

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Executive Committee that the minutes of the November 3, 2021 meeting are hereby approved.

The MEAN Executive Committee recessed at 9:43 a.m. (CT).

CONSENT AGENDA-MEAN BOARD OF DIRECTORS

Minutes

Minutes of the August 19, 2021 and November 18, 2021 meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors were previously distributed.

Fiscal Year 2021-2022 Year-to Date Financial Report

Jamie Johnson, Director of Finance and Accounting, summarized MEAN's Fiscal Year 2021-2022 Year-to-Date Financial Report, which included results for MEAN and the NMPP Energy organizations; an analysis of MEAN's balance sheet as of November 2021; cash and investments; and fiscal year-to-date operating results through November 30, 2021. MEAN financials for November 2021 were previously distributed for review.

Acknowledge receipt of unapproved November 3, 2021 meeting minutes of the Joint Operating Committee (JOC)

Goulette noted that the unapproved minutes from the November 3, 2021 meeting of the NMPP Energy Joint Operating Committee (JOC) were received and included in the previously distributed meeting packet for review.

Next Meeting

The next scheduled meeting of the MEAN Board of Directors is Thursday, May 19, 2022 at the Younes Conference Center in Kearney, Nebraska or virtual conference if required.

Motion: *Darrel Wenzel moved to approve the following Consent Resolution. Edward Dunn seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the minutes of the August 19, 2021 and November 18, 2021 meetings are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the financial statements for October 2021 and November 2021 are hereby accepted; and,*

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the receipt of the minutes of the November 3, 2021 Joint Operating Committee meeting is hereby acknowledged; and,*

4. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, May 19, 2022 at the Younes Conference Center, Kearney, Nebraska or virtual if required.*

<u>Amended Western Joint Dispatch Agreement regarding Western Energy Imbalance Service (WEIS) Market</u>

Staff provided an update on the status of amendments to the Western Joint Dispatch Agreement (WJDA) regarding the Western Energy Imbalance Service (WEIS) Market. Public Service Company of Colorado (PSCo) has requested the amendments to facilitate the participation of the PSCo Balancing Authority in the WEIS. SPP will be seeking written agreement to the amended and restated version of the WJDA by all participants in the Second Amended and Restated WJDA, including MEAN. Staff recommended the Board of Directors approve the following resolution.

Motion: *Darrel Wenzel moved to approve the resolution as presented. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, MEAN is a party to the Second Amended and Restated Western Joint Dispatch Agreement ("WJDA") regarding the Western Energy Imbalance Service ("WEIS") Market,

WHEREAS, the Southwest Power Pool, Inc. ("SPP"), as administrator of the WEIS Market, has requested that all WJDA participants, including MEAN, execute an amended and restated version of the WJDA to facilitate the participation of the Public Service Company of Colorado ("PSCo") and the PSCo Balancing Authority Area in the WJDA, and

WHEREAS, MEAN has load and resources in the PSCo Balancing Authority Area and desires to execute the amended and restated WJDA.

NOW THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors, that the Executive Director is hereby authorized to execute and deliver an amended and restated WJDA, subject to final legal and management review.

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Executive Director and agents of MEAN are, and each of them hereby is, authorized to do any and all things and to execute and deliver any and all documents which they or any of them deem necessary or advisable in order to consummate the execution and delivery of the amended and restated WJDA or any related agreement or document which is a requirement for execution of the amended and restated WJDA, subject to final legal and management review, and to do any and all things and take any and all actions which may be necessary or advisable, in their discretion, to effectuate the actions which MEAN has approved in this Resolution.

COMMITTEE REPORTS AND RECOMMENDATIONS

The MEAN Finance and Power Supply Committees met January 19, 2022.

FINANCE COMMITTEE

Finance Committee Meeting Summary of December 8, 2021 and January 19, 2022

Jamie Johnson, Director of Finance and Accounting, provided a recap of topics covered at the December 8, 2021 and January 19, 2022 meetings.

a) Debt Strategy and Refunding Considerations

Johnson provided a report on the results of the refunding of MEAN's Power Supply System Refunding Revenue Bonds 2012 Series A.

Financial and Administrative Policies and Guidelines

MEAN's Financial and Administrative Policies and Guidelines include *Section 12: Contracts* which includes a description of delegations of authority made by MEAN's Executive Director. Per the policy, changes to these delegations will be incorporated into these Financial and Administrative Policies and Guidelines and reported to the Board at the next regularly scheduled meeting.

The document with the redline changes was included in the packet as Attachment A.

The Finance Committee recommended the Board of Directors approve the changes to MEAN's Financial and Administrative Policies and Guidelines as presented.

Motion: *Darrel Wenzel moved to approve the resolution as presented. Chris DesPlanques seconded the motion, which carried unanimously on a roll call vote. Note: Votes were accepted using the following available options: on-line remote voting; on-line teleconference chat messaging; or by voice vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted the MEAN Financial and Administrative Policies and Guidelines; and

WHEREAS, proposed changes to the MEAN Financial and Administrative Policies were previously distributed to the MEAN Board of Directors for review.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the MEAN Financial and Administrative Policies and Guidelines shall be amended to include the changes as presented.

Preliminary Year-End Projections Fiscal Year 2021-2022

Jamie Johnson, Director of Finance and Accounting, reviewed the projected operating results (Attachment B), previously distributed in the meeting packet for MEAN's fiscal year ending March 31, 2022.

Budget, Rates, and Charges Fiscal Year 2022-2023, Modifications to Schedule of Rates and Charges for Service Schedule M, Modifications to Schedule of Rates and Charges for Service Schedule K and K-1, and Modification of Wind Rate and Environmental Attribute Rate

Included for Board review and approval were the proposed budget (Attachment C) and Schedule of Rates and Charges for Service Schedule M (Attachment D) and Service Schedule K and K-1 (Attachment E) for fiscal year ending March 31, 2023. Jamie Johnson reviewed the proposed budget and rates.

Information on the Wind Rate and Environmental Attribute Rate were included in the budget materials for board consideration.

The Finance Committee at its January 19, 2022 meeting recommended the Board of Directors approve the Recommended (Green) Scenario as outlined on page 41 of the Proposed Budget, Rates, and Charges Fiscal Year 2022-2023 information (Attachment C).

Scenario: Recommended (Green)
The Recommend scenario is presented in the budget packet as the Proposed Budget. The recommended scenario includes a 6% increase to the Energy Charge which is a 3% overall increase to rates and charges for Fiscal Year 2022-2023. No further increases are anticipated until Fiscal Year 2025-2026.

An advantage of this scenario is it provides a rate increase and expected stable rates for the following two years giving MEAN an opportunity to work on rate structure and refine targets for unrestricted cash and investments.

Discussion ensued with multiple comments made by members of the MEAN Finance Committee and various Board representatives on the virtual conference.

Motion: *Tyler Christoff moved to approve the following resolution as presented. Pat Davison seconded the motion, which did not carry on a 17-17-01 voice roll call vote (Carrie Hartwell did not vote. One vote was received after polling closed and did not count). Votes were accepted using the following available options: chat messaging; or by voice vote.*

Ayes: Chris Brader, Bart Brinkman, Tyler Christoff, Pat Davison, James DePue, Will Dowis, Tom Goulette, Duane Hoffman, Jim Kerr, Matt Langhorst, Perry Mader, Robert Messbarger, Tom Ourada, John Prettyman, Chris Rodman and Adam Suppes.

Nays: Rod Brestel, Kirby Bridge, Ron Carpenter, Chris DesPlanques, Edward Dunn, Larry Farley, Bill Hinton, Nathan James, Todd Kielkopf, Andrew Lee, Bob Lockmon, Mike Palmer, Todd Rust, Jeremy Tarr, Eugene Thomas, Blake Waldow and Darrel Wenzel.

Abstain: Jeff Kohrs

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Proposed Budget and Rates for Fiscal Year Ending March 31, 2023 were previously sent to the MEAN Board of Directors; and

WHEREAS, the MEAN Board of Directors is authorized to set the Service Schedule M, Service Schedule K, and Service Schedule K-1 rates and charges; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for wind-generated energy purchased from the MEAN Wind Resource Pool; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for the MEAN Landfill Gas Energy Environmental Attributes Pool; and

WHEREAS, the MEAN Board of Directors, desires to approve the Budget for Fiscal Year 2022-2023 and the rates for Wind-Generated Energy, Landfill Gas Environmental Attributes, Service Schedule M, Service Schedule K, and Service Schedule K-1, all to be effective April 1, 2022 to allow for the sixty (60) day advance notice required for Service Schedule M.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that:

1. *The Budget for Fiscal Year 2022-2023, including amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a net fiscal year transfer amount from the Rate Stabilization Account to meet a budgeted debt service coverage of 1.20x, as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2023 as presented is hereby approved and shall be made a part of the official Minutes book.*

2. *The Schedule of Rates and Charges, Exhibit B to Service Schedule M, as presented including the revised rates reflected therein to be effective April 1, 2022, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

3. *The Schedule of Rates and Charges for Bulk Power Participation, Service Schedule K, and Service Schedule K-1, as presented including the revised rates reflected therein to be effective April 1, 2022, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

4. *The Wind Energy Output Charge charged to MEAN Participants for energy produced by any of the facilities within the MEAN Wind Resource Pool shall remain at $0.04300/kWh effective April 1, 2022. Furthermore, this rate shall remain in effect until duly modified. Upon a change to the Wind Energy Output Charge, staff is hereby authorized and directed to issue an*

updated Exhibit to each Participant's supplemental agreement for wind-generated energy purchase to reflect the modified rate.

5. *The rate for Environmental Attributes associated with the MEAN Landfill Gas Energy Environmental Attributes Pool shall remain at $21.75/Environmental Attribute (each Environmental Attribute shall be that associated with 1 MWh of energy) effective April 1, 2022. Furthermore, this rate shall remain in effect until duly modified. Upon a change to the Environmental Attributes rate staff is hereby authorized and directed to issue an updated Exhibit to each Participant's Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes to reflect the modified rate.*

Discussion ensued with multiple comments made by various Board representatives on the virtual conference.

Motion: *Darrel Wenzel moved to approve the following resolution which was included on page 19 of the meeting packet with changes to the Rate Stabilization transfers for debt service coverage, Schedule M and Schedule K and K-1 rates, Wind Energy Output Charge and Fixed Cost Recovery Charge as noted. Andrew Lee seconded the motion.*

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Proposed Budget and Rates for Fiscal Year Ending March 31, 2023 were previously sent to the MEAN Board of Directors; and

WHEREAS, the MEAN Board of Directors is authorized to set the Service Schedule M, Service Schedule K, and Service Schedule K-1 rates and charges; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for wind-generated energy purchased from the MEAN Wind Resource Pool; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for the MEAN Landfill Gas Energy Environmental Attributes Pool; and

WHEREAS, the MEAN Board of Directors, desires to approve the Budget for Fiscal Year 2022-2023 and the rates for Wind-Generated Energy, Landfill Gas Environmental Attributes, Service Schedule M, Service Schedule K, and Service Schedule K-1, all to be effective April 1, 2022 to allow for the sixty (60) day advance notice required for Service Schedule M.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that:

1. *The Budget for Fiscal Year 2022-2023, including amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a net fiscal year transfer amount from the Rate Stabilization Account to meet a budgeted debt service coverage of ~~1.20x~~, 1.00x as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2023 as presented is hereby approved and shall be made a part of the official Minutes book.*

2. *The Schedule of Rates and Charges, Exhibit B to Service Schedule M, as presented including the revised $0.03975 rate~~s~~ reflected therein to be effective April 1, 2022, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

3. *The Schedule of Rates and Charges for Bulk Power Participation, Service Schedule K, and Service Schedule K-1, as presented including the revised $0.04174 rate~~s~~ reflected therein to be effective April 1, 2022, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

4. *The Wind Energy Output Charge charged to MEAN Participants for energy produced by any of the facilities within the MEAN Wind Resource Pool ~~shall remain at $0.04300/kWh~~ shall increase to $0.04369/kWh effective April 1, 2022. Furthermore, this rate shall remain in effect until duly modified. Upon a change to the Wind Energy Output Charge, staff is hereby authorized and directed to issue an updated Exhibit to each Participant's supplemental agreement for wind-generated energy purchase to reflect the modified rate.*

5. *The rate for Environmental Attributes associated with the MEAN Landfill Gas Energy Environmental Attributes Pool shall remain at $21.75/Environmental Attribute (each Environmental Attribute shall be that associated with 1 MWh of energy) effective April 1, 2022. Furthermore, this rate shall remain in effect until duly modified. Upon a change to the Environmental Attributes rate staff is hereby authorized and directed to issue an updated Exhibit to each Participant's Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes to reflect the modified rate.*

6. *The Fixed Cost Recovery Charge for Fiscal Year 2022-2023 shall total $42,900,000.00.*

Discussion ensued with multiple comments made by various Board representatives on the virtual conference.

No vote was taken on the previous motion as Darrel Wenzel amended his motion as detailed below and discussion ensued.

Motion: *Darrel Wenzel moved to approve the following resolution which was included on page 19 of the meeting packet with changes to the Wind Energy Output Charge and Fixed Cost Recovery Charge as noted. Edward Dunn seconded the motion which carried on a 20-12-1 voice roll call vote (Ron Carpenter, Carrie Hartwell, Nathan James and Robert Messbarger did not vote). Note: Votes were accepted using the following available options: chat messaging; or by voice vote.*

Ayes: Chris Brader, Rod Brestel, Kirby Bridge, Chris DesPlanques, Edward Dunn, Tom Goulette, Bill Hinton, Duane Hoffman, Andrew Lee, Bob Lockmon, Perry Mader, Tom Ourada, Mike Palmer, John Prettyman, Chris Rodman, Todd Rust, Jeremy Tarr, Blake Waldow, Darrel Wenzel and Dana Youtz.

Nays: Bart Brinkman, Tyler Christoff, Pat Davison, James DePue, Will Dowis, Larry Farley, Jim Kerr, Matt Langhorst, Brent Nation, Adam Suppes and Eugene Thomas.

Abstain: Jeff Kohrs

BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Proposed Budget and Rates for Fiscal Year Ending March 31, 2023 were previously sent to the MEAN Board of Directors; and

WHEREAS, the MEAN Board of Directors is authorized to set the Service Schedule M, Service Schedule K, and Service Schedule K-1 rates and charges; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for wind-generated energy purchased from the MEAN Wind Resource Pool; and

WHEREAS, the MEAN Board of Directors is authorized to set the rates and charges for the MEAN Landfill Gas Energy Environmental Attributes Pool; and

WHEREAS, the MEAN Board of Directors, desires to approve the Budget for Fiscal Year 2022-2023 and the rates for Wind-Generated Energy, Landfill Gas Environmental Attributes, Service Schedule M, Service Schedule K, and Service Schedule K-1, all to be effective April 1, 2022 to allow for the sixty (60) day advance notice required for Service Schedule M.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that:

1. *The Budget for Fiscal Year 2022-2023, including amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a net fiscal year transfer amount from the Rate Stabilization Account to meet a budgeted debt service coverage of 1.20x as set forth in the Proposed Budget and Rates for Fiscal Year Ending March 31, 2023 as presented is hereby approved and shall be made a part of the official Minutes book.*

2. *The Schedule of Rates and Charges, Exhibit B to Service Schedule M, as presented including the revised rates reflected therein to be effective April 1, 2022, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

3. *The Schedule of Rates and Charges for Bulk Power Participation, Service Schedule K, and Service Schedule K-1, as presented including the revised rates reflected therein to be effective April 1, 2022, is hereby approved and made a part of the official Minutes book. Furthermore, these rates shall remain in effect until duly modified.*

4. *The Wind Energy Output Charge charged to MEAN Participants for energy produced by any of the facilities within the MEAN Wind Resource Pool ~~shall remain at $0.04300/kWh~~ shall increase to $0.04369/kWh effective April 1, 2022. Furthermore, this rate shall remain in effect until duly modified. Upon a change to the Wind Energy Output Charge, staff is hereby authorized and directed to issue an updated Exhibit to each Participant's supplemental agreement for wind-generated energy purchase to reflect the modified rate.*

5. *The rate for Environmental Attributes associated with the MEAN Landfill Gas Energy Environmental Attributes Pool shall remain at $21.75/Environmental Attribute (each Environmental Attribute shall be that associated with 1 MWh of energy) effective April 1, 2022. Furthermore, this rate shall remain in effect until duly modified. Upon a change to the Environmental Attributes rate staff is hereby authorized and directed to issue an updated Exhibit to each Participant's Supplemental Agreement for Purchase of Landfill Gas Energy Environmental Attributes to reflect the modified rate.*

6. *The Fixed Cost Recovery Charge for Fiscal Year 2022-2023 shall total $42,900,000.00.*

POWER SUPPLY COMMITTEE

Power Supply Committee Meeting Summary of January 19, 2022

Staff provided a recap of topics covered at the January 19, 2022 Power Supply Committee meeting including an update on MEAN's Integrated Resource Planning Update; NextEra Solar Project; Generation Update; Electric Operations Update; Operating Reserves and Initial Concept Discussions regarding power supply resource contract length and pricing, renewable pool transition, MEAN resources in participating communities, and battery storage.

Total Requirements Participant Resources under MEAN Renewable Distributed Generation Policy

Matt Reed, Distributed Resources & Generation Specialist, led the discussion. Ten MEAN communities were involved in a competitive bidding process in 2021 to receive competitive bids on installing community solar for each community under the 5% cap outlined in the Renewable Distributed Generation Policy. The project has increased in scope to possibly include over 20 communities, each within their 5% cap. Solar RFP participants plan to have purchase power agreements signed in the first quarter of 2022 with a project completion of 1st quarter of 2023.

The MEAN Power Supply Committee recommended the MEAN Board of Directors determine the power purchase agreements meet the criteria as a Total Requirements Participant Resource under the MEAN Renewable Distributed Generation Policy. Prior to the vote, Reed noted a correction to the resolution and stated that Waverly, Nebraska should be listed as Waverly, Iowa.

Motion: *Edward Dunn moved to approve the following resolution as presented. Tom Ourada seconded the motion, which carried unanimously on a voice acclamation vote.*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the MEAN Board of Directors adopted a Renewable Distributed Generation Policy (the "DG Policy"); and

WHEREAS, the DG Policy allows MEAN Total Requirements Participants to utilize the electrical output from certain qualifying behind the meter renewable generators, which may include certain qualifying purchases under power purchase agreements, to offset a specified portion of the Total Requirements Participant's energy purchases from MEAN; and

WHEREAS, such qualifying behind the meter renewable generators and qualifying purchases under power purchase agreements (each defined as a "TRP Resource" in the DG Policy) are subject to approval by the MEAN Board of Directors; and

WHEREAS, certain MEAN total requirements participant communities either participated in a Request for Proposals process facilitated by MEAN on behalf of certain Total Requirements Participants for TRP Resources, or subsequently expressed interest in considering participation in such a TRP Resource, and may elect to proceed with the current proposal, which will require MEAN's approval of the TRP Resource; and

WHEREAS, for the TRP Resources which are the subject of this Resolution, MEAN desires to waive the DG Policy requirement that the Total Requirements Participant submit an application for the TRP Resource since MEAN facilitated the Request for Proposals process.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that each of the following projects meets the criteria as a TRP Resource subject to the DG Policy, each contingent upon the Total Requirements Participant accepting the current proposal and providing all necessary documentation to MEAN for the project listed below:

Photovoltaic Facility (via power purchase agreement) – sizes DC:

- *Alliance, Nebraska: 3,490 kW*
- *Ansley, Nebraska: _135 kW*
- *Aspen, Colorado: 1,424 kW*
- *Crete, Nebraska: 3,638 kW*
- *Delta, Colorado: 1,811 kW*
- *Denver, Iowa: 454 kW*
- *Fort Morgan, Colorado: 6,401 kW*
- *Gering, Nebraska: 1,448 kW*
- *Gunnison, Colorado: 800 kW*
- *Glenwood Springs, Colorado: 3,984 kW*
- *Imperial Public Power District: 760 kW*
- *Indianola, Iowa: 4,212 kW*
- *Lyons, Colorado: 364 kW*
- *Oxford, Nebraska: 161 kW*
- *Pender, Nebraska: 452 kW*
- *Sergeant Bluff, Iowa: 896 kW*
- *Shickley, Nebraska: 114 kW*
- *Sidney, Nebraska: 2,377 kW*
- *Stuart, Nebraska: 176 kW*
- *Trenton, Nebraska: 181 kW*
- *Waverly, ~~Nebraska~~Iowa: 4,380 kW*
- *West Point, Nebraska: 1,598 kW*
- *Wisner, Nebraska: 172 kW*
- *Wray, Colorado: 396 kW*

BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the Board waives the DG Policy requirement that the Total Requirements Participant submit an application for the TRP Resources approved in this Resolution.

Central Nebraska Public Power and Irrigation District

Shannon Coleman, Supervisor of Resource Planning and Analysis, provided an update on the status of the proposal submitted for the Central Nebraska Public Power and Irrigation District's hydropower facility Request for Proposals, including how this resource would integrate into MEAN's portfolio.

The MEAN Executive Committee resumed meeting at 1:30 p.m. (CT).

ELECTION OF OFFICERS

Election of officers was conducted at the MEAN Board of Directors January 20, 2022 Annual Meeting. Chris Dibbern provided an overview of the election process. Election information was made available prior to the meeting at https://www.nmppenergy.org/about/board-meetings and is available on the MEAN Member website. Terms of the officers are for fiscal year 2021-2023 (April 1 through March 31).

All nominations received by electronic mail for election of officers on the MEAN Board of Directors for fiscal year 2022-2023 were previously distributed for review. A current list of qualifying nominations received by electronic mail and self-nomination include: Chairman: Tom Goulette – West Point (incumbent); Vice – Chairman: Tom Ourada – Crete (incumbent); Secretary/Treasurer: Darrel Wenzel – Waverly (incumbent). There were no nominations received from the floor. A slate of nominees for the Board of Directors Chairman; Vice – Chairman, and Secretary/Treasurer was presented. Dibbern provided the candidates with an opportunity to comment prior to the vote. No comments were made prior to the vote.

Motion: *Mike Palmer moved to elect the slate as presented and to cease nominations for the position of Chairperson of the Board, Vice-Chairperson of the Board, and Secretary-Treasurer. Bill Hinton seconded the motion, and with no objections, the Board moved directly to a voice acclamation vote.*

The following were re-elected; Tom Goulette, West Point-Chairman of the MEAN Board of Directors; Tom Ourada, Crete-Vice-Chair of the Board of Directors; Darrel Wenzel, Waverly-Secretary-Treasurer.

ELECTION OF EXECUTIVE COMMITTEE AT-LARGE MEMBERS

Election of the MEAN Executive Committee At-Large members was conducted at the MEAN Board of Directors January 20, 2022 Annual Meeting. Per the MEAN By-Laws, the Executive Committee of the MEAN Board of Directors shall be composed of the chairperson of the Board, vice-chairperson of the Board, secretary-treasurer of the Board, and four directors to be elected by the Board to serve on the Executive Committee, who shall serve for a term of one year or until their successors are elected and qualified, whichever is later.

A slate of the at-large members was presented: Bill Hinton, Kimball; Brent Nation, Fort Morgan; Mike Palmer, Sidney; and Adam Suppes, Delta. All were eligible for election/re-election.

Chris Dibbern, General Counsel, sought additional nominations from the floor. No nominations were received. The Board of Directors proceeded directly to the vote.

Motion: *Edward Dunn moved that nominations cease for the Executive Committee at-large, and that the Board of Directors proceed to vote on the slate of the at-large members. Chris Rodman seconded the motion, and with no objections, the Board moved directly to a voice acclamation vote.*

The following Directors were re-elected to serve as the four at-large Executive Committee members: Bill Hinton, Kimball; Brent Nation, Fort Morgan; Mike Palmer, Sidney; and Adam Suppes, Delta.

UPDATES AND REPORTS

Advanced Metering Infrastructure (AMI)

Kyle Kaldahl, Budget and Cost Analyst provided an Advanced Metering Infrastructure (AMI) project update related to contracts, pricing, and grant opportunities.

2022 NMPP Energy Annual Conference

Carol Brehm, Member Relations Representative, provided a summary of the upcoming annual conference. Brehm noted the conference will be held March 22-24, 2022, at the Cornhusker Marriott located in Lincoln, Nebraska. Registration opens February 1, 2022. The Keynote speaker will be Mark Nutsch, Green Beret Commander portrayed in the movie, 12 Strong and Best-Seller, Horse Soldiers.

Western Area Power Association (WAPA) Hydro

Carol Brehm provided an update on the status of the WAPA hydro regions and potential WAPA rate adjustments for 2023 in all WAPA MEAN regions.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT

General Counsel

Chris Dibbern, General Counsel, provided a summary of the legal, legislative, and regulatory reports. Information regarding the following agreements was included in the previously distributed meeting packet:

Other Party	Agreement Name
Black Hills Power, Inc.	Service Agreement for Firm Point-to-Point Transmission Service (20 MW path from Wyodak 230 kV bus to Stegall West 230 kV bus) (Wygen I)
Southwest Power Pool, Inc. (SPP)	Service Agreement #1906R16 for Network Integration Transmission Service (routine update to NITSA designated network resource list; removal of references to Sargent and expired creditable upgrades)
The Energy Authority, Inc. (TEA)	Confirmation Letter for West-side firm power purchase under Resource Management Agreement dated 03/01/2019 (Deal No. 789741)
The Energy Authority, Inc. (TEA)	Confirmation Letter for West-side firm power purchase under Resource Management Agreement dated 03/01/2019 (Deal No. 789746)
The Energy Authority, Inc. (TEA)	Confirmation Letter for West-side firm power purchase under Resource Management Agreement dated 03/01/2019 (Deal No. 786241)
The Energy Authority, Inc. (TEA)	Confirmation Letter for West-side firm power purchase under Resource Management Agreement dated 03/01/2019 (Deal No. 786259)
Tri-State G & T Association, Inc.	Confirmation Under WSPP Agreement for Purchase of Operating Reserves (Nov. - Dec.)
Tri-State G & T Association, Inc.	Confirmation Under WSPP Agreement for Purchase of Operating Reserves (Jan.)
WAPA	Attachment 1, Revision 4, to Exhibit A (Generation Resource List) to Capacity and Energy Displacement Agreement No. 04-RMR-1489
FMA REALTY INC., a Nebraska corporation, d/b/a NAI FMA REALTY	Agreement for Maintenance Services (for NMPP Energy Headquarters Building)

SETTLEMENT AGREEMENT S WITH CITY OF NELIGH, NEB. AND CITY OF SCRIBNER, NEB.

As required by Neb. Rev. Stat. §84-713, the agenda for the January 20, 2022 MEAN Board of Directors meeting included disclosure of settlement agreements reached by MEAN with each of the following parties: City of Neligh, Nebraska and City of Scribner, Nebraska. Michelle Lepin, Associate General Counsel, reported the execution of the settlement agreements.

MEAN Board of Directors Chairperson, Tom Goulette, sought a motion and a second from the MEAN Board of Directors to convene into closed session for the protection of public interest to discuss claim matters relating to settlements with the City of Neligh, Nebraska and the City of Scribner, Nebraska, including attorney-client privileged communications and trade secrets. NMPP staff, MEAN Board of Directors and alternate directors, could participate in the closed session, excluding representatives of the City of Neligh, Nebraska and the City of Scribner, Nebraska.

Motion: *Edward Dunn moved to convene into closed session for the protection of public interest to discuss claim matters relating to settlements with the City of Neligh, Nebraska and the City of Scribner, Nebraska, including attorney-client privileged communications and trade secrets. NMPP staff, MEAN Board of Directors and alternate directors, could participate in the closed session, excluding representatives of the City of Neligh, Nebraska and the City of Scribner, Nebraska. Duane Hoffman seconded the motion which carried unanimously on a voice acclamation vote.*

Chairperson Goulette restated the limitation of the subject matter of the closed session was to discuss claim matters related to the settlements with the City of Neligh, Nebraska and the City of Scribner, Nebraska, including attorney-client privileged communications and trade secrets.

At 1:57 p.m., the MEAN Board of Directors convened into closed session, with the exception of the City of Neligh, Nebraska and the City of Scribner, Nebraska.

No action was taken in the closed session. At 2:06 p.m., Chairperson Goulette announced that the MEAN Board of Directors would reconvene into open session.

CLOSING COMMENTS

Bob Poehling, Executive Director/CEO, thanked Participants for their participation in the meeting and for their efforts in helping to govern the organization. He noted NMPP's Annual Conference (March 22-24, 2022) and future dialogue about MEAN's cash reserve policy and power supply portfolio.

ADJOURNMENT

There being no further business, the meeting adjourned at 2:08 p.m.

Submitted by:
Darrel Wenzel
Secretary/Treasurer
MEAN Board of Directors

Prepared by:

Kim Schafers
Administrative Assistant
Municipal Energy Agency of Nebraska

MEAN Board of Directors and Executive Committee Annual Meeting

Municipal Energy Agency of Nebraska
Virtual Conference Meeting
January 20, 2022

NMPPEnergy.org

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Power Supply Committee Summary

January 19, 2022

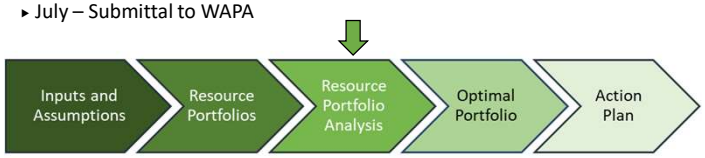
- Integrated Resource Planning
- NextEra Solar Project
- Generation Update
  - Base load Generation
  - Behind the Meter-Emergency Operations (Southwest Power Pool)
- Electric Operations Update
- Operating Reserves
- Initial Concept Discussions
  - Power Supply Resource Contract Length and Pricing
  - Renewable Pools Transmission
  - MEAN Resources in Participating Communities
  - Battery Storage

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2

Integrated Resource Plan Progress

- Upcoming Action Items + Opportunities for Public Participation:
  - April – Draft IRP Report Sent to Communities for Review
  - **April – Workshop to Review Results and Prepare for Recommendation**
  - May Meeting – PSC Recommendation and Board Approval
  - July – Submittal to WAPA

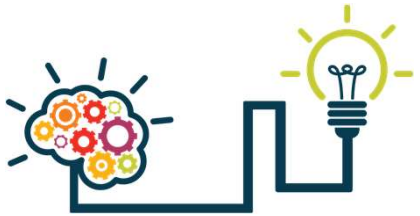


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3

April IRP Workshop

- REMINDER: IRP Workshop
  - April 21, 2022
  - In-Person and Virtual Attendance Options
  - Review the Results of the IRP
  - Discuss Power Supply Committee Recommendations
  - Discuss Draft IRP Report Document



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4

Central NE Public Power & Irrigation District

- 40-60 MW of Hydro in NE
- PPA Start Date January 2024
- MEAN's Proposal Under Consideration
- CNPPID to Submit Counteroffer by End of January
- Considering On-Peak/Off-Peak Pricing
- Pricing for Capacity and Energy

CENTRAL
Nebraska Public Power and Irrigation District



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NextEra Solar Project

- 40 MW Located Near Sidney, NE
- Accredited Capacity = 85% (2020)
- 29.1% Capacity Factor
- Commercial Operation Date 2024
- SPP Interconnect + DC Tie Rights
- Options for 15-Year and 25-Year PPA
- Flat Pricing $44-$52/MWh
- Escalating Pricing Starts at $36-$46/MWh
- Option to Add Battery Storage
- **ENERGY + 2050 VISION**

NEXTera ENERGY



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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee will be held Thursday, April 21, 2022, at 10:00 a.m. (CT) with a virtual conference option. The meeting is open to the public and members of the media and is accessible via computer or smart device at https://meet.goto.com/735821061 or via telephone at 1-877-309-2073, access code 735-821-061; or at NMPP Energy, the public designated meeting site, 8377 Glynoaks Drive, Lincoln, Nebraska. Members of the public will be required to adhere to posted safety signage.

The agenda includes a review of the proposed draft Integrated Resource Plan (IRP). The purpose of the meeting is to provide for public participation in the development of the IRP, which will be submitted to the Western Area Power Administration as part of the Energy Planning and Management Program. A copy of the proposed IRP will be available at the meeting and MEAN will consider comments it receives at the public meeting prior to submittal to the MEAN Board of Directors for approval at the May 19, 2022, meeting.

If you are unable to attend the meeting but would like to review the proposed draft IRP, a copy of the proposed draft IRP will be available on or about April 19, 2022, for public review at MEAN's business office located at 8377 Glynoaks Drive, Lincoln, NE 68516 or online at the MEAN IRP webpage at https://mean.nmppenergy.org/means-integrated-resource-plan. Member communities of MEAN are encouraged to make a copy of the draft IRP publicly available within their community and to invite public comment. Once the draft IRP is publicly available, comments may be submitted by mail to the Municipal Energy Agency of Nebraska, Attn. IRP, 8377 Glynoaks Drive, Lincoln, NE 68516 or by email to the address that will be posted on the MEAN IRP webpage.

Comments will be accepted if received during the 25 day comment period beginning on the date of posting of the draft IRP.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/about/board-meetings .

If you require assistance or special accommodation to participate in the meeting, contact NMPP Energy at https://www.nmppenergy.org/contact-nmpp or (402) 474-4759.

Power Supply Committee Meeting
Integrated Resource Plan Workshop
Municipal Energy Agency of Nebraska
NMPP Energy office – 8377 Glynoaks Dr. Lincoln, Nebraska 68516
With Virtual Conference Option
April 21, 2022 - 10:00 a.m. (CT)
Finance Committee Meeting
Risk Oversight Committee Meeting
1:00 p.m. (CT)

• AGENDA•

All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk.*

POWER SUPPLY COMMITTEE

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Public Comment Period
   (Public Comment Period Rules apply. See www.nmppenergy.org/about/board-meetings)

3. Consent Agenda*
   A. Approval of minutes from the March 31, 2022 meeting
   B. Next Meeting
   C. Consent Resolution

4. Integrated Resource Plan (IRP)
   A. Load Forecast Scenarios
   B. Existing Resource Portfolio
   C. Future Resource Needs
   D. Candidate Portfolios
   E. Market Price Scenarios
   F. Energy Efficiency/DSM Programs
   G. Renewable Distributed Generation
   H. 2050 Vision
   I. Modeling Results
      1) Total Revenue Requirement
      2) Future Resource Mix
      3) Carbon Emissions
      4) Risk

5. NextEra Solar Project

6. Central Nebraska Public Power and Irrigation District Hydropower Request for Proposals

7. Recess for lunch

RISK OVERSIGHT COMMITTEE / FINANCE COMMITTEE

8. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call
      1) Finance Committee
      2) Risk Oversight Committee

9. Public Comment Period
   (Public Comment Period Rules apply. See www.nmppenergy.org/about/board-meetings)

RISK OVERSIGHT COMMITTEE

10. Consent Agenda*
    A. Approval of minutes from the March 31, 2022 meeting
    B. Next Meeting
    C. Consent Resolution

FINANCE COMMITTEE

11. Consent Agenda*
    A. Approval of minutes from the March 31, 2022 meeting
    B. Next meeting
    C. Consent Resolution

POWER SUPPLY COMMITTEE / RISK OVERSIGHT COMMITTEE / FINANCE COMMITTEE

12. Financial and Administrative Policies and Guidelines*
    A. Cash Reserve
    B. Rate Stabilization Account Target
    C. MEAN Meeting Public Participation Policy

13. Rate Structure

14. Debt Strategy and Refunding Considerations

15. Adjourn

Minutes
Power Supply Committee Meeting
Integrated Resource Plan Workshop
Municipal Energy Agency of Nebraska
NMPP Energy office – 8377 Glynoaks Dr. Lincoln, Nebraska 68516
With Virtual Conference Option
April 21, 2022 - 10:00 a.m. (CT)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met Thursday, April 21, 2022, at 10:00 a.m. (CT), at the NMPP Energy office, 8377 Glynoaks Drive, Lincoln, Nebraska, the designated public meeting site. A virtual conference option was provided. Notice of the meeting was given to committee members by e-mail, and the public was advised by publication both print and online in the Lincoln Journal-Star newspaper and website on April 8, 2022. The notice and agenda were posted upon issuance in the NMPP Energy office, kept continuously current and available for public inspection at the NMPP Energy office. Instruction to join the meeting via virtual conference or telephone and links to an electronic copy of the agenda, all documents being considered at the meeting, and the current version of the Nebraska Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chairman Tom Ourada called the meeting to order at 10:00 a.m. (CT). Pursuant to Section 84-1412 (8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with eight of ten committee members in attendance.

Present:

1. James DePue — Wray
2. Will Dowis— Gunnison
3. Bill Hinton— Kimball
4. Duane Hoffman— Oxford
5. Matt Langhorst— Glenwood Springs
6. Tom Ourada— Crete
7. Chris Rodman— Wall Lake
8. Adam Suppes— Delta

Absent: Pat Davison— Imperial, Randy Woldt— Wisner

Others in attendance: Tyler Christoff, Luke Danielson (joined at 10:39), James DePue, Chris DesPlanques, KK DuVivier, Russ Forest, Leslie Glustrom, Nate James, Jim Kerr, Todd Kielkopf, Kate Clark, Kallie Klein, Jeff Kohrs, Ted Light, Brent Nation, Tess Peterson, Todd Rust, George Sibley, Dallas Thomas, and Darrel Wenzel.

NMPP Staff: Carol Brehm, Tim Cerveny, Shannon Coleman, Chris Dibbern, Brad Hans, Mandy Hansen, Scott Hartz, Stacy Hendricks, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle Kaldahl, Michelle

Lepin, Jennifer McCoy, Brittany Millard, Samantha Parker, Matt Reed, Andrew Ross, David Russell, Videl Sabio, Robin Spady, Candy Thomazin, and Kevin Wickham.

PUBLIC COMMENT PERIOD
Presenter: Michelle Lepin, Associate General Counsel

The Public Comment Period was announced, and a review of the rules applicable to the public comment process at MEAN public meetings was provided. It was stated that there had been sixteen previous public meetings that included opportunities for public participation. Continued opportunities for public comment, in addition to oral comments, were stated to include utilizing the chat function during the meeting, participating in the written comment period for the draft IRP, which began April 19, 2022, and ends May 14, 2022, at 5 pm CT, and in-person public comment opportunities at upcoming meetings.

Public Comment was given by:

Kallie Klein, Gunnison, CO, Sustainable Development Strategies Group (SDSG): requested an expanded public comment period.

Tess Peterson, Gunnison, CO, Sustainable Development Strategies Group (SDSG): requested an expanded public comment period and that MEAN hold workshops throughout its service area.

KK DuVivier, Denver, CO, Citizen: requested an expanded public comment period. Expressed concern that the IRP plan's timeframe to divest of coal is too slow and of its projection that MEAN's fossil fuel use will increase in 2029. Requested MEAN work harder at cutting back on coal.

Kate Clark, Gunnison, CO, Citizen: requested an expanded public comment period and expressed concern about MEAN's reliance on fossil fuel.

Committee member Mike Palmer stated he wanted to reiterate that all sixteen previous meetings were publicly noticed meetings that were open to members of the public and afforded the opportunity for anyone to participate in the process who wished to participate.

CONSENT AGENDA

Minutes

Minutes of the March 31, 2022, meeting of the Power Supply Committee were previously distributed. There were no corrections to the minutes.

Next Meeting

The next meeting of the Power Supply Committee is scheduled for Wednesday, May 18, 2022, at the Younes Conference Center in Kearney, Nebraska.

Consent Resolution

Motion: *Duane Hoffman moved to approve the resolution as presented. Matt Langhorst seconded the motion, which carried on a unanimous roll call vote.*

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll-call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the March 31, 2022 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, May 18, 2022, at the Younes Conference Center in Kearney, Nebraska*

INTEGRATED RESOURCE PLAN (IRP)
Presenter: Shannon Coleman, Supervisor of Resource Planning & Analysis

The purpose of the IRP workshop is to walk through the draft Integrated Resource Plan that was posted on April 19, in a guided presentation so that when reading the document, the intent and conclusion of each section will be clear. The information presented today will be a review of items covered at sixteen previous public meetings with input from the membership incorporated. The intent is for the Committee to have a meaningful discussion about the details in the analysis and what this means for MEAN's future portfolio. The further intent is for members to discuss and prepare to make a recommendation of the optimal portfolio to the MEAN Board of Directors. Once finalized, the IRP is due to be submitted to Western Area Power Administration (WAPA) in July of this year. MEAN values public participation, and as representatives of your communities MEAN encourages you to convey the thoughts of your communities in relation to resource planning, questions, concerns, goals, or anything that you or your communities would like to see included in our analysis.

There have been sixteen public meetings to date where the topic of the Integrated Resource Plan was presented and discussed. Meeting minutes and materials are included in the draft IRP document. The overall IRP process and upcoming action items were then presented.

Load Forecast Scenarios: Five load forecast scenarios were presented: a reference case, a high load case, a low load case, an electrification case, and a recession case. Forecasts were derived from the hourly load forecast per member and summed per market and for the entire MEAN system. MEAN annual peak demand forecasts and MEAN annual energy consumption forecasts through 2038 were presented, with regional and seasonal data included in the report.

Existing Resource Portfolio: MEAN's existing coal, nuclear, landfill gas, BTMG, hydro, and wind resources were reviewed and the 2022 capacity and available energy of MEAN, Southwest Power Pool (SPP), West, and Midcontinent Independent System Operator (MISO) were reviewed.

Future Resource Needs: MEAN, SPP, West, and MISO's Load and Capability, annual capacity vs. peak demand, and annual available energy vs. consumption were presented. Future capacity and energy needs were quantified according to time and magnitude.

Candidate Portfolios:
Phase I Evaluation: Supply-side resource options were identified for fossil fuel, carbon-neutral and storage resources, and scoring criteria were rated by the membership to be applied to quantitative data for each resource. Following the Phase 1 evaluation, the Candidate portfolios to be modeled in Phase 2 are as follows:

- Portfolio #1 NGCC
- Portfolio #1A NGCC – CCS
- Portfolio #2 LFG
- Portfolio #3 MSW
- Portfolio #4 Wind
- Portfolio #5 Solar
- Portfolio #6 NG Fuel Cell
- Portfolio #7 Hydropower
- Portfolio #8 Wind + Battery
- Portfolio #9 Solar + Battery
- Portfolio #10 Extend CNS

The process for sizing each resource in the candidate portfolios was explained.

Market Price Scenarios: The pricing sensitivity analysis considered independent and dependent variables combined to create nine future market price scenarios and allowed measurement of risk and volatility related to future conditions.

Energy Efficiency/DSM Programs: Utilizing the results of a survey sent to all members in January, MEAN compiled the top responses for program participation and conducted a three-part cost-to-benefit analysis. MEAN has identified future demand-side management to include the continuation of existing MEAN programs and community programs, energy efficiency education, residential electric vehicle chargers, advanced metering infrastructure, and battery storage.

Renewable Distributed Generation: Reviewed MEAN's current renewable Distributed Generation policy and the contribution of potential future energy generation under the updated policy. Provided an update of the planned installations under the Community Solar RFP. Also presented the concepts of installing other renewable technologies under the policy, the collaboration possible between communities, and MEAN-contracted resources to be located in member communities.

2050 Vision: The MEAN Board of Directors approved the 2050 Vision in January of 2020 which included the goal of creating a carbon-neutral resource portfolio by 2050. Future resources must be selected within this vision. Accordingly, the IRP values portfolios that reduce carbon emissions, and the portfolio modeling includes an accounting of carbon emissions to compare options. The results of the September 2021 renewable survey were reviewed, indicating existing local carbon-free goals and member positions on additional carbon-free energy within their portfolios.

IRP Modeling Process: MEAN wants its membership to not only understand the steps it is taking in the Phase II Economic Analysis, but to thoroughly examine it as well.

Each of the following steps in the Phase II modeling was explained:

- Hourly Load Forecast: The hourly load profile of every MEAN participant community was calculated using historical data. That hourly profile was applied to the monthly load forecast for the next 15 years to arrive at the projected load for each region for each hour of the next 15 years.
- Hourly Market Price Forecast: The hourly market pricing was provided by a third-party consultant and was provided by area. Because MEAN needed the individual prices for each MEAN resource as well as a load price per market, MEAN compared historical nodal pricing to

an average regional price and created an hourly ratio that was then applied to the pricing projections for the larger areas.

- Hourly Resource Generation (Existing): The output of each resource on an hourly basis was calculated using historical data and known outage schedules.
- Resource Cost and Revenue (Existing): For the existing resources, the current cost of generation is known, and future pricing can be escalated accordingly using fuel price projections, efficiencies, and capital project schedules.
- New Resource Parameters: MEAN then defined the operating parameters – capacity factor, emissions data, outage rates, etc. for all of the possible new resources.
- New Resource Hourly Generation: Similar to the existing resources, MEAN had to determine the available capacity of the new resources for each hour of the study period.
- New Resource Cost and Revenue: Next, MEAN found the generating costs of the proposed resources by tabulating the capital cost, fixed O&M, variable O&M, and fuel costs to determine the escalation rate of each cost. For the most part, these are generic resources, so publicly available data for costs we utilize from EIA, NREL, and other DOE sources, along with data from published studies. Exceptions were proposed projects that provided actual pricing and operating data.
- Hourly Dispatch Cost/Revenue Model: To determine how each of the resources would be dispatched each resource was categorized according to its operating mode – intermittent resources, must-run resources, WAPA allocations, resource minimums, and dispatchable resources. All resources were layered by operating mode. This gave the hourly output of each, hourly cost of generation, hourly revenue from market sale, and hourly load cost.
- Total Revenue Requirement: Those costs and revenues were summed on an hourly basis, then combined with all 15 years summed up to provide the total revenue requirement.

Modeling Results: Summary results were reviewed for SPP and the West. For each region, the 15-year revenue requirement (representing the portfolio cost), the scenario variance (representing risk), and the carbon intensity (representing the environmental impact) were shown graphically to compare portfolios. Lastly, summary heat maps were presented on those three bases.

Discussion ensued to include: MEAN requests Committee and Board representatives consider the recommendations. These recommendations give MEAN guidelines to follow and help define Board direction when MEAN procures resources. Cost is a significant consideration in these decisions, and the cost of each resource in the future needs to be considered. In accordance with MEAN's 2050 Vision, higher consideration should be given to resources that can decrease the portfolio's carbon intensity while maintaining cost-effectiveness and reliability. It is also essential to keep in mind the technology has to be developed and proven to support around-the-clock carbon-free generation.

Constituencies are very concerned with any cost increase. Cost and reliability are the two most important factors in many communities. It was suggested MEAN look at the availability of Production Tax Credits (PTC) for public power entities to reduce the cost of renewable installations and that MEAN should increase its advocacy for public power eligibility for PTCs.

Per the results, Committee members discussed an inclination to recommend wind, solar, hydropower, and landfill gas resources in the future MEAN portfolio. The hybrid renewable and storage options should be studied in the future as prices trend down.

The RTO market section regarding available energy vs dispatch energy shows MEAN's coal facilities have seen a decrease in capacity factor over the last few years, which is largely credited to the accessibility of renewables in the markets when running those units economically. MEAN expects to see this trend continue, which would reduce the fossil fuel energy in the portfolio in future years.

A discussion was held on the future installation of electric vehicle infrastructure and the power needs to support this build-out. It was suggested MEAN study the electrification scenario for the next IRP.

NEXTERA SOLAR PROJECT
Presenter: Tim Cerveny, Manager of Resources, Transmission and O & M Services

Due to several factors, material availability, etc., this project is on hold right now. It makes sense to hold off until there is less uncertainty which should also lower costs. This project would be in the SPP region but with the availability of DC Ties, MEAN may have the option to bring this West.

CENTRAL NEBRASKA PUBLIC POWER & IRRIGATION DISTRICT HYDROPOWER RFP
Presenter: Tim Cerveny, Manager of Resources, Transmission and O & M Services

MEAN submitted a proposal for 40 – 60 MW of hydropower located in central Nebraska. The proposal included capacity, energy, and renewable energy credits and the proposed contract would begin in January of 2024 when the Multi-Unit Participation Agreement with NPPD ends. These units are very well maintained and would be a great fit for MEAN's portfolio in terms of the capacity and energy that MEAN will need and in the time frame that it is needed. It would be a fully accredited renewable resource which is in line with MEAN's 2050 Vision.

12:03 p.m. Recessed for lunch

1:00 p.m. The MEAN Power Supply Committee reconvened and was joined by the Risk Oversight Committee and Finance Committee.

PUBLIC COMMENT PERIOD
Presenter: Michelle Lepin, Associate General Counsel

The Public Comment Period was announced and a review of the rules applicable to the public comment process at MEAN public meetings was provided. There were no requests to comment.

FINANCIAL AND ADMINISTRATIVE POLICIES AND GUIDELINES
Presenter: Jamie Johnson, Director of Finance & Accounting

Cash Reserves & Rate Stabilization Account Targets: MEAN will seek a recommendation for Board approval of the updated language to the cash reserve, liquidity, rate stabilization account, and rates and charges sections of the Financial and Administrative Policies and Guidelines as provided in the meeting packet, and as discussed at the March 31st meeting.

MEAN balances relative to the minimum cash reserve balances established by historical targets were presented. Those are minimums to be maintained. It is healthy and expected to have funds higher than the minimums. When looking at the operating fund, it is important to keep in mind that timing differences can significantly influence balances at a given point in time.

There is no proposal to change the formulas used to calculate minimum balances. The proposed language additions as shown in the meeting packet are only to provide clarification and add transparency to the policies that are already in place.

To date, MEAN's rate stabilization account has primarily been funded by external events. The reserve portion of these funds should be maintained except in very extreme circumstances. The goal would

continue to be to maintain funds at least equal to 15% of budgeted cash operating expenses, excluding purchased power capital; plus, the annual average of the preliminary 5-year capital budget, including purchased power capital. Targets can be changed through a Board resolution. As the target will fluctuate annually, it is important to fund the account at a level that will maintain the funds at the minimum for multiple years.

Discussion ensued to include: Do members want to have funding of the other component of the rate stabilization account built into the rates or would they prefer to allocate a certain amount of funds annually to fund the rate stabilization account? Costs will vary each year, but the later the Board starts funding the other component the more pressure there will be. Considering external events have added $28 million into this account to date, can't we assume that will continue to some degree? Under a previous resolution, $4 million is to be returned to members. Should there be an initiation fee for new members? New members will benefit from funds that they have never paid into. The fixed cost recovery charge per member has the potential to be lowered with new members resulting in the costs being spread over a larger group. When considering new J or K members, look not just at funding recovery of current costs paid in, but also the help on the backend. At some point, an analysis may be needed to show both the future load and energy benefits as well as decommissioning sharing expenses to determine if there is a need for a surcharge for new members.

In terms of distributing the $28.3 million in the rate stabilization fund, based on the 2022-2023 calculated target (MEAN's current policy), $20.1M should be allocated to the reserve account, leaving $8.2 M remaining prior to analyzing preliminary 2021-2022 results. $6.9M of that $8.2M has been allocated through the previous direction of the Board. As part of the 2022-2023 budget, $1.9M is needed to meet debt service coverage and $1M is needed to reduce the FCRC, and another $4M to reduce the FCRC in future years through the August 2021 resolution and the 2022-2023 budget process. Evaluations are always done at year-end and a determination is made on the use of funds based on the information at that point in time. In August 2021, the Board wanted to use $5M ($1M/year) to reduce the FCRC by $1M per year beginning 2022-2023. The Board can revisit that decision as needed. Additional discussions will take place at the meeting on May 12th, and on May 18th the Committee will be asked to make a recommendation to the Board on the allocation of the Rate Stabilization Fund balance to the various components.

Baseload Transmission Factors
Tim Cerveny, Manager of Resources, Transmission and O&M Services

Baseload Transmission Factors include economics, performance, operating strategy, regulatory environment, and MEAN's minority interest ownership in eight coal-fired facilities (200 MW). The economy drives the market, and integrated markets, subsidies for renewable resources, transmission congestion, and natural gas pricing factor into that. Performance factors are dependent on investment in facilities, and good management practices (e.g., not running a plant too hard) which are out of MEAN's control. Operating; cycling of units and heat rate impact, and the regulatory environment are all factors in baseload transmission.

Enterprise Risk Management Program
Robin Spady, Director of Risk & Compliance/Regulatory Counsel

An analysis of Enterprise Risk Management (ERM) is currently underway which will help identify areas of organizational risks both internally by MEAN staff, and by Committee representatives through one-on-one meetings. This will assist representatives in making recommendations to the MEAN Board of Directors on which risks to focus on. The ERM program timeline was presented and Baseload Facility Transition Planning from an ERM perspective was discussed.

MEAN Meeting Public Participation Policy
Presenter: Michelle Lepin, Associate General Counsel
MEAN staff presented a draft policy regarding public participation at MEAN public meetings. Under the Nebraska Open Meetings Act, public bodies can make and enforce reasonable rules and regulations regarding the conduct of members of the public at meetings. The MEAN staff has developed the proposed policy for consideration by the MEAN Committees and the Board. The policy would replace the current Public Comment Period Rules and would be incorporated into MEAN's Financial and Administrative Policies and Guidelines after the Committees and the Board have had sufficient time to review and comment on the proposed public participation policy language. Discussion ensued. No action was taken to approve the proposed policy language as MEAN staff will seek a recommendation from the MEAN Committees for Board approval at a future meeting.

MEAN staff recommends the Power Supply Committee consider a recommendation to the Board of Directors to approve the modifications to MEAN's Financial and Administrative Policies and Guidelines as presented.

Motion: *Matt Langhorst moved for the Power Supply Committee to recommend the Board of Directors approve the changes to MEAN's Financial and Administrative Policies and Guidelines as presented. Duane Hoffman seconded the motion, which carried on a unanimous roll call vote.*

The Finance Committee and Risk Oversight Committee also approved recommendations for the Board of Directors to approve the changes to MEAN's Financial and Administrative Policies and Guidelines as presented.

RATE STRUCTURE
Presenter: Jamie Johnson, Director of Finance & Accounting

In the future, MEAN wants to be sure its Fixed Cost Recovery Charge (FCRC) has components of all of the different ways MEAN procures energy. The energy charge has all the resource-related costs that are not included in the FCRC. Refer to the Financial and Administrative Policies and Guidelines for the full wind rate and landfill gas energy environmental attribute rate policies.

MEAN's renewable rate concept works with the potential change in underlying costs of the FCRC and ensures all participants pay for the capacity portion of all of MEAN's resources. It also eliminates the concerns regarding how market dynamics impact the cost of resources and continues to allow participants who want to be "more renewable" than MEAN is overall, to customize their resource mix.

MEAN is contemplating a new section in MEAN's Schedule of Rates and Charges to document the "E-rate". It will be similar to the current policy in that the "E-rate" won't be less than the Participant's contracted energy charge. It is a subscription based on a historical amount and is an add-on to participants' contracted energy charges. There must be agreement on the "E-Rate" to implement it.

Discussion ensued to include: Can someone who subscribes now, give up their portion later? What if due to political pressure a community needs to do something else? MEAN is in that position now and has received formal requests from communities but until MEAN has a resource change, it is not going to overextend itself. Those changes are coming, and most likely replacements will be renewables. The policy needs to be written to work with impending resource changes.

DEBT STRATEGY AND REFUNDING CONSIDERATION
Presenter: Jamie Johnson, Director of Finance & Accounting

A municipal bond market update and information on refunding opportunities were presented including the AAA MMD Rate Position from June 8, 1981, inception to April 13, 2022, yield curve movement since last year, and since January of 2022.

ADJOURNMENT

There being no further business, the meeting adjourned at 3:18 p.m. (CT)

Prepared by:
Stacy Hendricks
Municipal Energy Agency of Nebraska

Submitted by:
Brad Hans
Director of Wholesale Operations
Municipal Energy Agency of Nebraska

MEAN Municipal Energy Agency of Nebraska

Sign Up at the link below if you wish to make public comment at the Workshop

1. See link in GoToMeeting Chat box, or
2. https://www.nmppenergy.org/about/board-meetings
Under the MEAN Information tab: Public Comment Period Rules
(Click on "Sign Up Form" for April 21 IRP Workshop)

Meeting Information

MEAN Board Portal

Login at: https://www.nmppenergy.org

1

MEAN Power Supply Committee / Integrated Resource Planning Workshop

Municipal Energy Agency of Nebraska
Meeting with Virtual Conference Option
April 21, 2022

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2

Power Supply Committee-Call to Order

- Nebraska Open Meetings Act-Section 84-1412 (8)
- Roll Call

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Public Comment Period

Michelle Lepin
MEAN Associate General Counsel

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Public Comment Period – Opening Statement

- **Workshop Intent**
  - Detailed overview of draft IRP to open the comment period to gather input from members and public
    - Issuance is the culmination of a 2 year public process
- **Continued Opportunities for Public Comment**
  - Oral comment period
  - Meeting Chat function
  - Written Public Comment period on draft IRP
  - May 18, 2022 and May 19, 2022 public meetings
    - MEAN Power Supply Committee and Board, Younes Conference Center, Kearney, NE

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Public Comment Period – April 21, 2022 workshop

- This meeting is being recorded
- Reminder to mute when not speaking
- We will take comments via the following channels:
  - GoToMeeting Chat function
  - Oral comments
    - Unmute to speak during the Public Comment Period when called
    - Public comment period rules apply

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Public Comment Period

- Any member of the public may speak, subject to these rules
- Individuals must state the following:
  - **Name**
  - **Address** (unless the address requirement is waived to protect the security of the individual), and
  - **Name of any organization represented** by such person
- Public comment period will be a maximum of 30 minutes, on a first-come, first-served basis
- Comments are limited to 3 minutes per person
- Address comments to the Committee as a body and not to any individual member thereof
- Disruptive conduct is not allowed & individual may be asked to leave meeting

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Public Comment Period – Additional Opportunities

- Oral Public Comment Period during meeting – completed
  - Please mute for remainder of meeting
- Meeting Chat function
- Written Public Comment period on draft IRP
  - **Comments via mail or email will be accepted if received on or before 5:00 p.m. Central Time on May 14, 2022:**
    - **Mail:** Municipal Energy Agency of Nebraska, Attn. IRP, 8377 Glynoaks Drive, Lincoln, NE 68516
    - **E-Mail:** mean_irp@nmppenergy.org
- May 18, 2022 and May 19, 2022 public meetings
  - MEAN Power Supply Committee and Board, Younes Conference Center, Kearney, NE

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Power Supply Committee - Consent Agenda

- Approval of Minutes of the March 31, 2022 Meeting *(Attachment A)*
- Next Meeting is scheduled for May 18, 2022 at the Younes Conference Center, Kearney, Nebraska
- Consent Agenda as shown on page 4 of the meeting packet

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Integrated Resource Planning

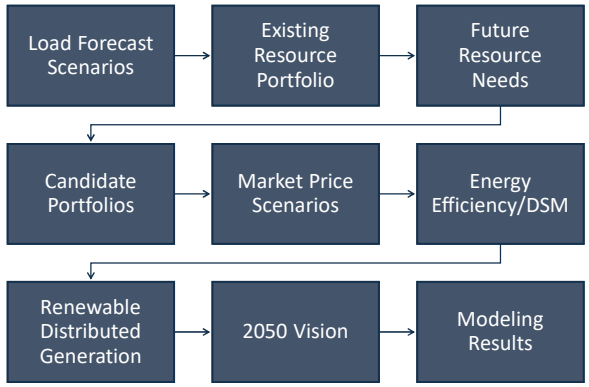
Shannon Coleman
Supervisor of Resource Planning and Analysis

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IRP Workshop

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Agenda



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Integrated Resource Plan Public Participation

November 2019
- Power Supply Committee + Board of Directors

January 2020
- Power Supply Committee + Board of Directors

August 2020
- Power Supply Committee + Board of Directors

November 2020
- Power Supply Committee + Board of Directors

January 2021
- Power Supply Committee + Board of Directors

May 2021
- Power Supply Committee + Board of Directors

August 2021
- Power Supply Committee + Board of Directors

November 2021
- Power Supply Committee + Board of Directors

January 2022
- Power Supply Committee + Board of Directors

January 2021 IRP Survey

September 2021 Renewable Energy Survey

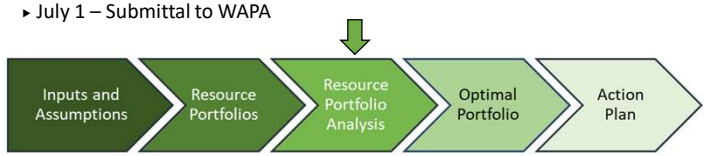


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Integrated Resource Plan Progress

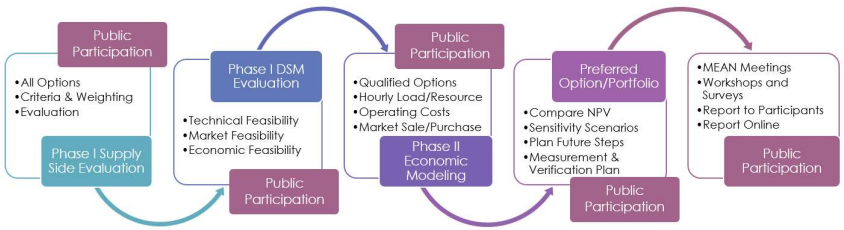
- Upcoming Action Items + Opportunities for Public Participation:
  - April – Draft IRP Report Sent to Communities for Review
  - **April – Workshop to Review Results and Prepare for Recommendation**
  - May Meeting – PSC Recommendation and Board Approval
  - July 1 – Submittal to WAPA



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IRP Process



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IRP Workshop

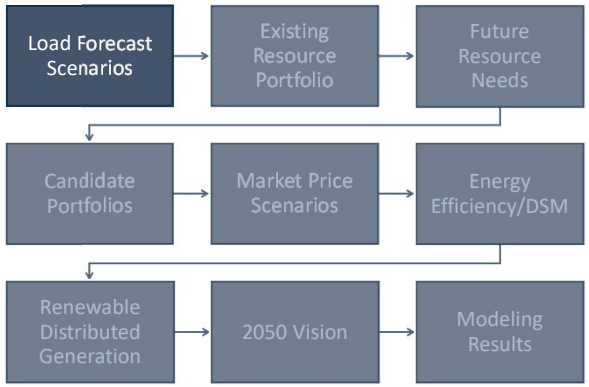
- Discuss Draft IRP Report Document
- Review the Results of the IRP
- **Prepare for Power Supply Committee Recommendations**



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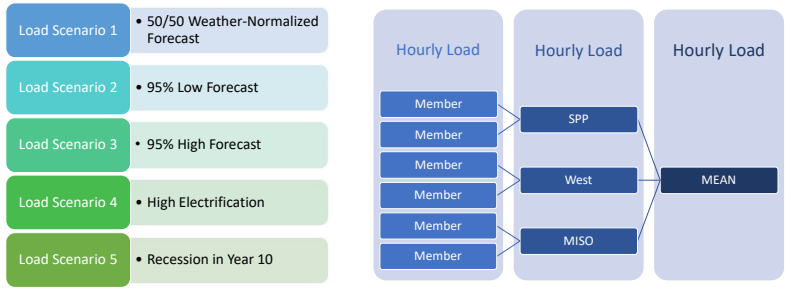
Agenda



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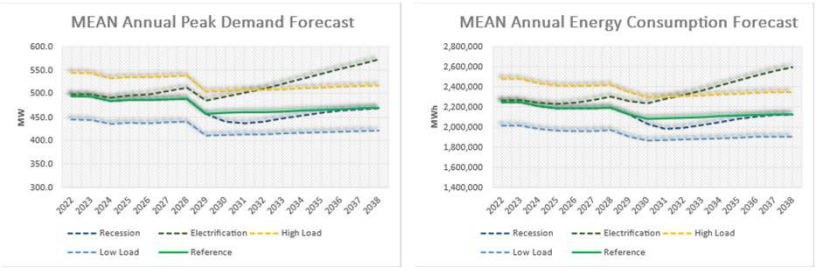
Load Forecast Scenarios



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Load Scenarios

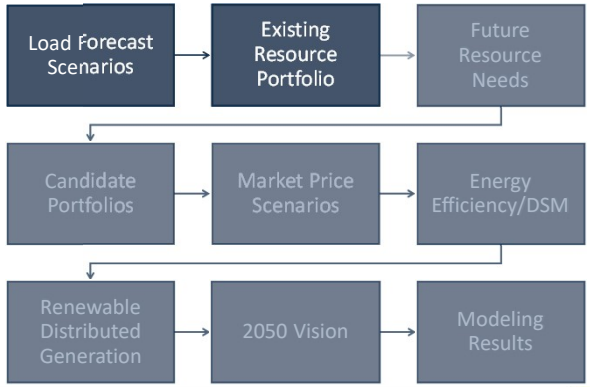


- All 5 Scenarios for Each Region – Demand and Energy

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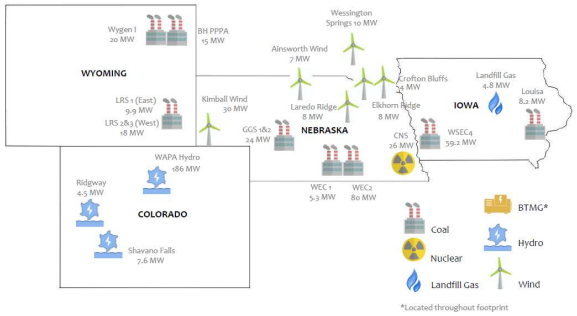
Agenda



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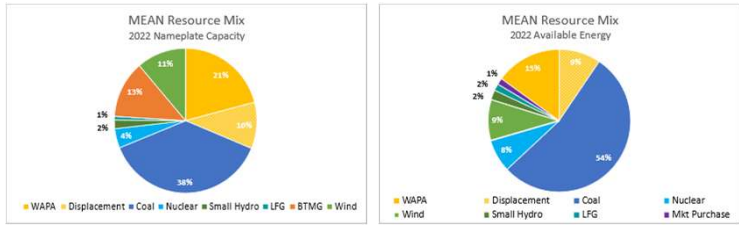
Existing Resources



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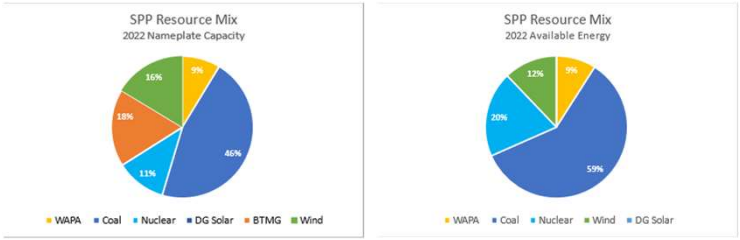
MEAN Capacity and Energy



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SPP Capacity and Energy



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West Capacity and Energy



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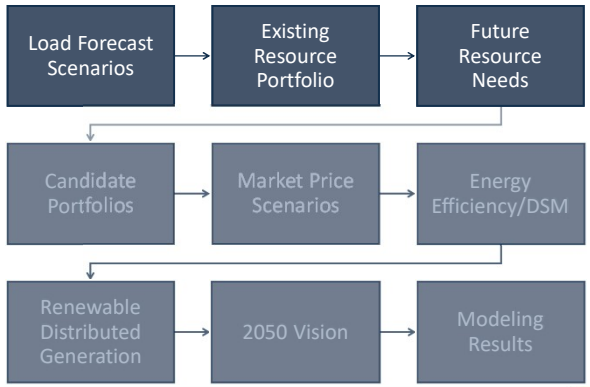
MISO Capacity and Energy



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Agenda



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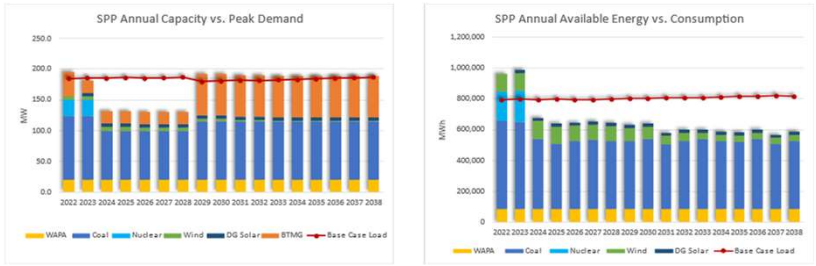
MEAN Load and Capability



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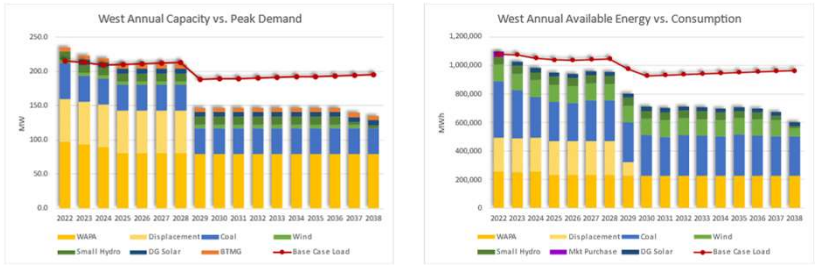
SPP Load and Capability



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West Load and Capability



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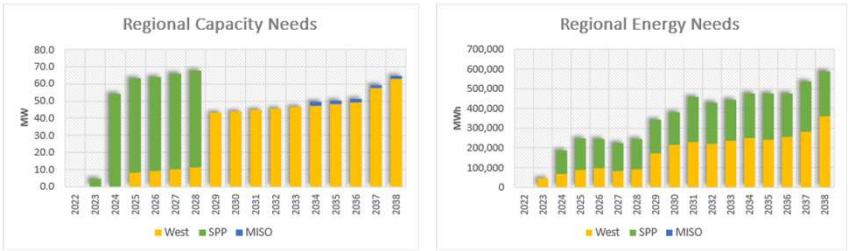
MISO Load and Capability



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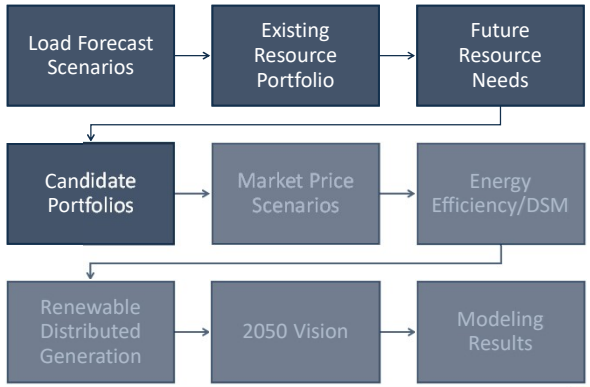
Resource Needs – Capacity and Energy



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Agenda



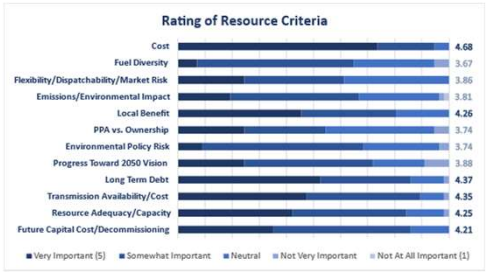
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Phase I Evaluation

	Supply-Side Resource Options
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

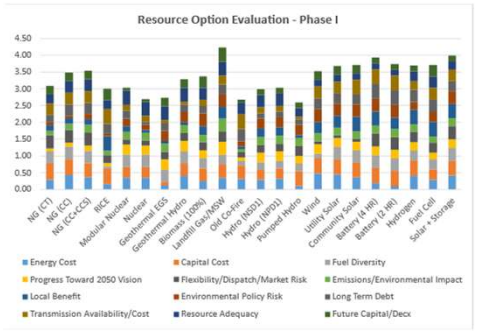
*with and without CCS



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Phase I Evaluation



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Candidate Portfolios

- Portfolio #1 NGCC
- Portfolio #1A NGCC – CCS
- Portfolio #2 LFG
- Portfolio #3 MSW
- Portfolio #4 Wind
- Portfolio #5 Solar
- Portfolio #6 NG Fuel Cell
- Portfolio #7 Hydropower
- Portfolio #8 Wind + Battery
- Portfolio #9 Solar + Battery
- Portfolio #10 Extend CNS

Size New Resource

Energy Need in Region by Year

Capacity Factor of New Resource

Size Additional Capacity

Capacity Need in Region by Year

Capacity Factor of New Resource

Member Gen or NGCC

Portfolio Model

New Resource

+

Additional Capacity

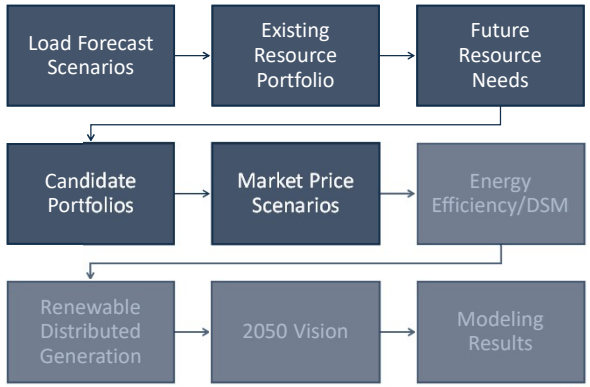
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Modeled Resource

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Pricing Scenarios - Sensitivity

- Independent Variables
  - System Load
  - NG Price
  - CO_2 Tax/Limit
- Dependent Variables
  - Market Price
  - Fuel Adjustment
  - Generation
- Allows Measurement of Risk/Volatility Related to Future Conditions

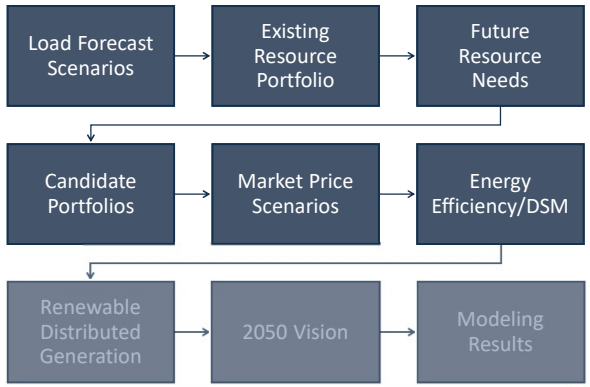
Scenario	System Load	NG Pricing	CO_2 Tax
Scenario 1: Reference	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 2: High Load	High Load	Base Case NG	No CO_2 Tax
Scenario 3: Low Load	Low Load	Base Case NG	No CO_2 Tax
Scenario 4: High NG	Base Case Load	High NG	No CO_2 Tax
Scenario 5: Low NG	Base Case Load	Low NG	No CO_2 Tax
Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

*Zero Carbon Scenario assumes regulatory conditions that allow no future addition of carbon emitting resources.

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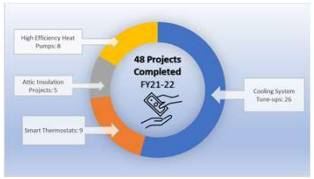


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Existing Demand Side Management

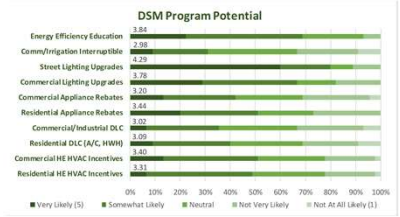
- Residential Smart Thermostats
- Residential Attic Insulation
- Residential Cooling System Tune-Up
- Residential High Efficiency Heat Pump
- Commercial LED Lighting Program
  - Annual Savings = 1,247 MWh energy + 249 kW demand
- MEAN Community Programs
  - 33 Programs in 17 Communities
  - Annual Savings = 2,635 MWh energy + 4.028 MW demand



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Demand Side Management Analysis



TEST	BENEFITS	COSTS
Utility Cost Test	Utility Avoided Costs	• Program Administration Costs • Incentives/Rebates Paid
Participant Cost Test	Net Bill Savings	• Incremental Cost of Investment (Net of Incentive/Rebate)
Total Resource Cost Test	Utility Avoided Costs	• Program Administration Costs • Incremental Cost of Investment

DSM PROGRAM	UTILITY COST TEST (Benefit/Cost)	PARTICIPANT COST TEST (Benefit/Cost)	TOTAL RESOURCE COST TEST (Benefit/Cost)
Room Air Conditioner Rebate	0.0310	1.2112	0.0365
Central Air Conditioner Incentive	0.0706	0.0931	0.0396
Refrigerator Rebate	0.0246	0.0468	0.0147
Freezer Rebate	0.1473	0.8461	0.1831
Heat Pump Water Heater Rebate	0.2425	0.5353	0.2179

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Future Demand Side Management

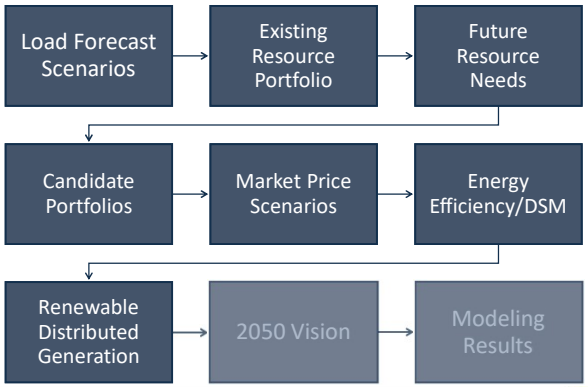
- Continuation of MEAN Programs
- Continuation of Community Programs
- Energy Efficiency Education
- Residential EV Chargers
- Advanced Metering Infrastructure
- Battery Storage



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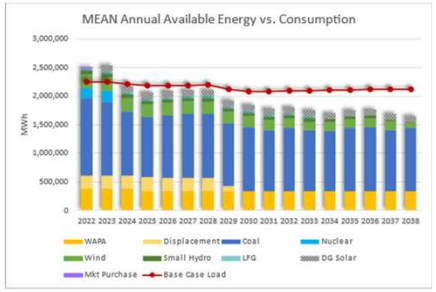


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Distributed Generation

- Renewable Distributed Generation Policy
- Potential to Decrease Future Energy Need
  - Offset Other Supply Side Resources
  - Local Benefit
  - 2050 Vision
  - Geographic Diversity



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Distributed Generation

- Community Solar RFP
  - 23.8 MW
  - Competitive Pricing with Aggregation
- Other Technologies in Future?
- Collaboration between Communities

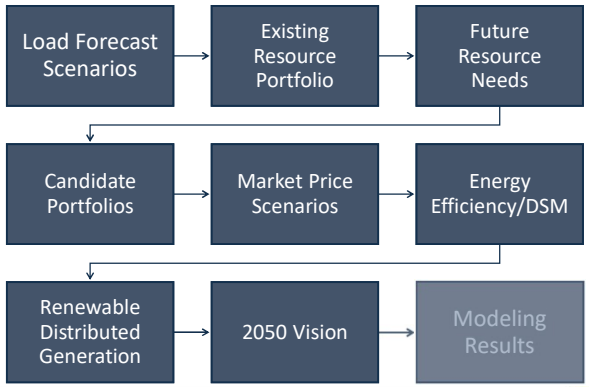
Community	Nameplate (kW-AC)	Nameplate (kW-DC)	Yr-1 Production (MWh)
Alliance NE	2,350	2,819	5499
Ansley NE	92	110	210.1
Crete NE	2,539	3,047	5735
Shickley NE	78	94	177.9
Stuart NE	124	149	275.8
Waverly IA	3,324	3,988	6903
West Point NE	1,142	1,370	2518
Delta CO	830	996	2102
Pender NE	324	389	709
Sergeant Bluff IA	858	1,030	1827
Aspen CO	919	1,103	2241
Gering NE	976	1,171	2280
Indianola IA	3,083	3,700	6639
Lyons CO	252	303	572.2
Oxford NE	106	127	252.2
Sidney NE	1,550	1,860	3744
Fort Morgan CO	4,156	4,987	10090
Imperial NE	499	598	1196
Denver IA	348	418	712
Wray CO	254	304	620.1
Total	23,803	28,564	54,303

Pending receipt of executed PPA contracts.

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Agenda



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2050 Vision

- Carbon Neutral Resource Portfolio by 2050
- Portfolios that Reduce Carbon Emissions
- Portfolio Model Must Include Accounting of Carbon Emissions to Compare Options
  - Scenario 1 vs Scenario 9
  - Scenario 4 vs Scenario 7
  - Scenario 5 vs Scenario 8
  - Metric of Carbon Intensity

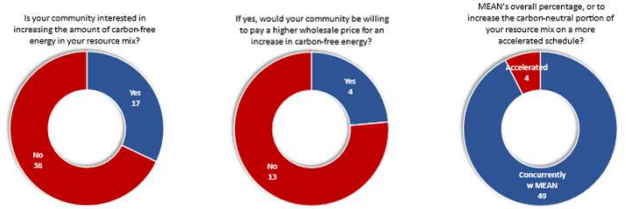
Scenario	System Load	NG Pricing	CO_2 Tax
Scenario 1: Reference	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 2: High Load	High Load	Base Case NG	No CO_2 Tax
Scenario 3: Low Load	Low Load	Base Case NG	No CO_2 Tax
Scenario 4: High NG	Base Case Load	High NG	No CO_2 Tax
Scenario 5: Low NG	Base Case Load	Low NG	No CO_2 Tax
Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

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2050 Vision

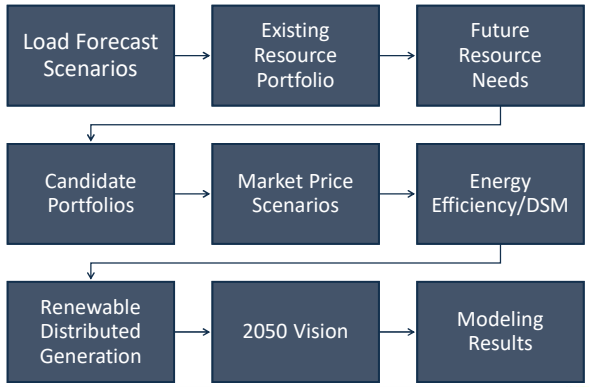
- September 2021 Renewable Survey



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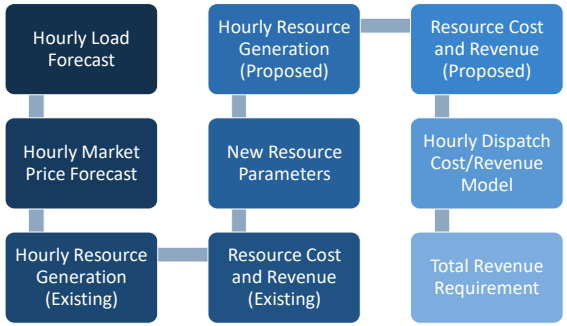
Agenda



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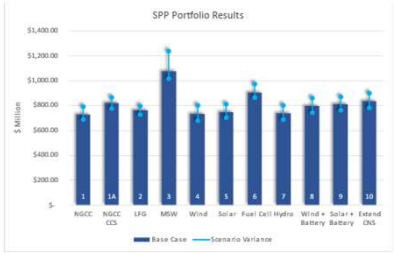
Integrated Resource Plan Modeling Process



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SPP Portfolio Results





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West Portfolio Results

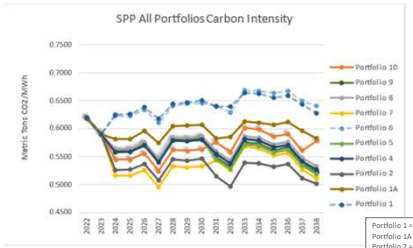




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SPP Environmental Impact

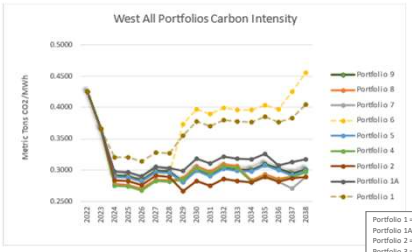




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West Environmental Impact





Portfolio 1 = NGCC
Portfolio 1A = NGCC CCS
Portfolio 2 = LFG
Portfolio 3 = MSW
Portfolio 4 = Wind
Portfolio 5 = Solar
Portfolio 6 = Fuel Cell
Portfolio 7 = Hydropower
Portfolio 8 = Wind + Battery
Portfolio 9 = Solar + Battery

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SPP Summary Results

SPP Summary Modeling Results				
Portfolio #	Resource	15-Year Revenue Requirement ($ Millions)	Price Variance ($/MWh)	Carbon Intensity (tons/MWh)
Portfolio 1	NGCC	$ 726.24	$ 4.53	1.49%
Portfolio 1A	NGCC CCS	$ 819.37	$ 3.23	-5.76%
Portfolio 2	LFG	$ 761.77	$ 2.26	-18.85%
Portfolio 3	MSW	$ 1,073.85	$ 10.80	45.60%
Portfolio 4	Wind	$ 735.02	$ 4.40	-14.80%
Portfolio 5	Solar	$ 749.47	$ 4.05	-16.20%
Portfolio 6	Fuel Cell	$ 906.79	$ 4.38	3.57%
Portfolio 7	Hydro	$ 739.81	$ 4.15	-17.40%
Portfolio 8	Wind + Battery	$ 797.68	$ 4.39	-13.90%
Portfolio 9	Solar + Battery	$ 810.16	$ 4.08	-15.50%
Portfolio 10	Extend CNS	$ 838.04	$ 4.36	-6.50%

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West Summary Results

West Summary Modeling Results				
Portfolio #	Resource	15-Year Revenue Requirement ($ Millions)	Price Variance ($/MWh)	Carbon Intensity (tons/MWh)
Portfolio 1	NGCC	$ 580.50	$ 10.22	-4.90%
Portfolio 1A	NGCC CCS	$ 728.67	$ 8.80	-25.50%
Portfolio 2	LFG	$ 672.00	$ 7.73	-32.20%
Portfolio 3	MSW	$ 946.46	$ 14.88	67.70%
Portfolio 4	Wind	$ 629.95	$ 7.77	-30.30%
Portfolio 5	Solar	$ 597.63	$ 8.66	-29.90%
Portfolio 6	Fuel Cell	$ 850.59	$ 9.93	7.00%
Portfolio 7	Hydro	$ 556.79	$ 7.69	-32.20%
Portfolio 8	Wind + Battery	$ 700.20	$ 7.84	-29.80%
Portfolio 9	Solar + Battery	$ 681.65	$ 8.83	-29.40%

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NextEra Solar Project

Tim Cerveny
Manager of Resources and Transmission

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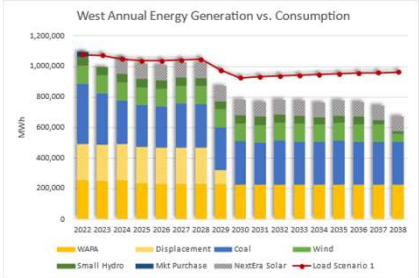
NextEra Solar Project

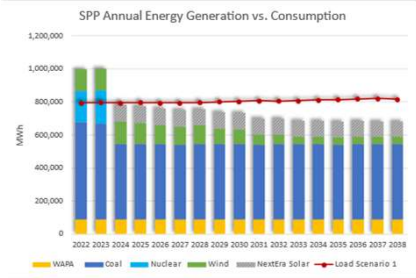
- 40 MW Located Near Sidney, NE
- Accredited Capacity = 85% (2020)
- 29.1% Capacity Factor
- Commercial Operation Date 2024
- SPP Interconnect + DC Tie Rights
- Options for 15-Year and 25-Year PPA
- Flat Pricing $44-$52/MWh
- Escalating Pricing Starts at $36-$46/MWh
- Option to Add Battery Storage
- Material Prices Impact
- **ENERGY + 2050 VISION**



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NextEra Solar Project





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Central Nebraska Public Power and Irrigation District Hydropower request for proposal

Tim Cerveny

Manager of Resources and Transmission

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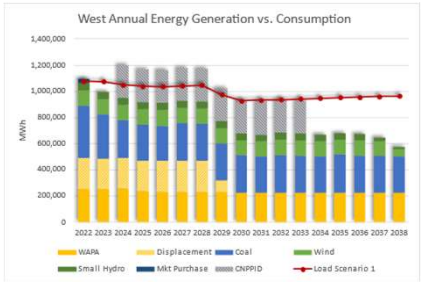
Central NE Public Power & Irrigation District

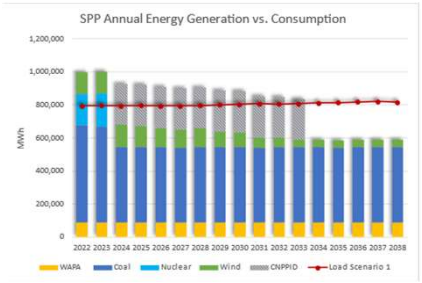
- 40-60 MW of Hydro in NE
- PPA Start Date January 2024
- MEAN's Proposal Under Consideration
- Considering On-Peak/Off-Peak Pricing
- Pricing for Capacity and Energy
- Continue to discuss



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Central NE Public Power & Irrigation District





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This concludes IRP Workshop

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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee will be held in person Wednesday, May 18, 2022 at 1:00 p.m. (CT) at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/about/board-meetings. Public comments will be accepted at this meeting on a first-come, first-served basis during the Public Comment Period designated on the agenda, subject to the Public Comment Period Rules posted under MEAN's board information section on NMPP Energy's website at https://www.nmppenergy.org/about/board-meetings.

If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at https://www.nmppenergy.org/contact-nmpp or (402) 474-4759.

Combined Agenda
Power Supply Committee Meeting
Municipal Energy Agency of Nebraska
Younes Conference Center – 416 Talmadge Rd, Kearney, NE 688452
May 18, 2022 - 1:00 p.m. (CT)
Finance Committee Meeting
Risk Oversight Committee Meeting
3:00 p.m. (CT)

*All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk**

POWER SUPPLY COMMITTEE

1. Call to Order
   A. Nebraska Open Meetings Act – Section 84-1412(8)
   B. Roll Call

2. Public Comment Period
   (Public Comment Period Rules apply. See www.nmppenergy.org/about/board-meetings)

3. Consent Agenda*
   A. Minutes of April 21, 2022 meeting
   B. Next meeting
   C. 2022 Summer Season Load and Capability Report and Operational Readiness
   D. Consent Resolution

4. Integrated Resource Plan Review & Recommendation*
   A. Load Forecast Scenarios
   B. Existing Resource Portfolio
   C. Future Resource Needs
   D. Candidate Portfolios
   E. Market Price Scenarios
   F. Energy Efficiency/DSM Programs
   G. Renewable Distributed Generation
   H. 2050 Vision
   I. Modeling Results
   J. Committee Recommendation

5. Updates
   A. Central Nebraska Public Power and Irrigation District Hydropower Request for Proposal
   B. NextEra Solar Project
   C. Western Area Power Administration (WAPA) Capacity and Energy Displacement Agreement

6. Recission of MEAN Resolution Regarding Power Purchase Agreements for Sergeant Bluff Solar*

7. Establish Exception to Moratorium and Lease Member Generation from City of Sidney, Nebraska*

8. Future Development Discussions
   A. MEAN Contracted Distributed Generation
   B. Battery Storage
   C. Behind The Meter Generation Modernization

9. Operations Update

Recess for Break

RISK OVERSIGHT COMMITTEE | FINANCE COMMITTEE

10. Call to Order
    A. Nebraska Open Meetings Act – Section 84-1412(8)
    B. Roll Call
        1) Finance Committee
        2) Risk Oversight Committee

RISK OVERSIGHT COMMITTEE | FINANCE COMMITTEE | POWER SUPPLY COMMITTEE

11. Public Comment Period
    (Public Comment Period Rules apply. See www.nmppenergy.org/about/board-meetings)

RISK OVERSIGHT COMMITTEE

12. Consent Agenda*
    A. Minutes of April 21, 2022 meeting
    B. Next meeting
    C. Consent Resolution

FINANCE COMMITTEE

13. Consent Agenda*
    A. Minutes of May 12, 2022 meeting
    B. Next meeting
    C. Consent Resolution

14. BKD Pre-Audit Communication Letter

15. Financial Report – Fiscal Year 2021-2022 Preliminary Year-End Review

FINANCE COMMITTEE | RISK OVERSIGHT COMMITTEE | POWER SUPPLY COMMITTEE

16. Rate Stabilization Account Target*

FINANCE COMMITTEE

17. Considerations related to Preliminary Fiscal Year 2021-2022 Financial Results*
    A. Rate Stabilization Account Transfers
    B. Allocation of a Portion of Fiscal Year 2021-2022 Net Revenue to Participants

18. Debt Strategy and Refunding Considerations

FINANCE COMMITTEE | RISK OVERSIGHT COMMITTEE | POWER SUPPLY COMMITTEE

19. Rate Structure

20. Adjourn

Unapproved Minutes
Power Supply Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – 416 Talmadge Rd, Kearney, NE 68845
May 18, 2022 – 1:00 p.m. (C.T)

The Municipal Energy Agency of Nebraska (MEAN) Power Supply Committee met on Wednesday, May 18, 2022, at the Younes Conference Center located at 416 Talmadge Road in Kearney, Nebraska, the designated meeting site. Notice of the meeting was given to committee members by e-mail and the public was advised by publication both print and online in the Lincoln Journal-Star newspaper and website on May 6, 2022. The notice and agenda were posted upon issuance at the NMPP Energy office at 8377 Glynoaks Drive, Lincoln, Nebraska, and kept continually current and available for public inspection. All documents being considered at the meeting, and the current version of the Nebraska Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chairman Tom Ourada called the meeting to order at 1:00 p.m. (CT). Pursuant to Section 84-1412 (8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with nine of ten committee members in attendance.

Present:

1. Davison, Pat – Imperial
2. DePue, James – Wray
3. Dowis, Will – Gunnison
4. Hinton, Bill – Kimball
5. Hoffman, Duane – Oxford (arrived at 1:05)
6. Langhorst, Matt – Glenwood Springs
7. Ourada, Tom – Crete
8. Rodman, Chris – Wall Lake
9. Woldt, Randy – Wisner

Absent: Suppes, Adam – Delta

Others in attendance: Rod Brestel, Annette Brower, Tyler Christoff, Chris DesPlanques, Joe Dickman, Tom Goulette, Doug Hazzard, Jim Kerr, Mike Kalkwarf, Todd Kielkopf, Andrew Lee, Doug Linton, Bob Lockmon, Rhonda Martin, Robert Messbarger, Brent Nation, Mike Palmer, Doug Parker, John Prettyman, Todd Rust, Janine Schmidt, Jeremy Tarr, and Darrel Wenzel

NMPP Staff: Carol Brehm, Tim Cerveny, Shannon Coleman, Chris Dibbern, Bruce Doll, Richard Eymann, Mandy Hansen, Stacy Hendricks, Joe Hobelman, Brenda Hudacek, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle Kaldahl, Michelle Lepin, Jeff Lindsay, Brittany Millard, Bob Poehling, Matt Reed, Andrew Ross, David Russell, Robin Spady, and Kevin Wickham

PUBLIC COMMENT PERIOD
Presenter: Michelle Lepin, Associate General Counsel

The Public Comment Period was announced and a review of the rules applicable to the public comment process at MEAN public meetings was provided. There were no public comments.

CONSENT AGENDA

Minutes

Minutes of the April 21, 2022, meeting of the Power Supply Committee were previously distributed to Committee Members and were included in the meeting packet. There were no corrections to the minutes.

Next Meeting

The next meeting of the MEAN Power Supply Committee is scheduled to be held on Wednesday, August 17, 2022, at the Younes Conference Center, located at 416 Talmadge Rd in Kearney, Nebraska.

2022 Summer Season Load and Capability Report and Operational Readiness

Detailed information on the 2022 Summer Season Load and Capability Report was included in the meeting packet.

Consent Resolution

Motion: Matt Langhorst moved to approve the following Consent Resolution. Chris Rodman seconded the motion, which carried unanimously on a roll call vote. (Duane Hoffman did not vote)

WHEREAS, certain business of the Power Supply Committee of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time.

NOW, THEREFORE, BE IT RESOLVED BY THE MEAN Power Supply Committee that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll-call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the minutes of the April 21, 2022 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the next meeting will be held on Wednesday, August 17, 2022, at the Younes Conference Center, 416 Talmadge Rd in Kearney, Nebraska*

3. *BE IT FURTHER RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the 2022 Summer Season Load and Capability Report.*

INTEGRATED RESOURCE PLAN
Presenter: Shannon Coleman, Supervisor of Resource Planning & Analysis

An overview of the MEAN IRP report was presented. Most of these items were covered at previous committee meetings and Board meetings over the last two years, and input from the membership has been incorporated. For every process within the IRP and for every input and decision point, MEAN presented information, had discussions with the committee and Board members, and asked for feedback. Staff does not make resource acquisition decisions. MEAN completes the analysis and delivers it to the Committees and the Board for their use in decision making. Portions of the overview addressed the following items:

Load Forecast Scenarios

The five load forecast scenarios that MEAN ran were presented for review and comparison. The load forecast was shown in terms of annual peak demand and annual energy load.

Existing Resource Portfolio

Graphs of MEAN's capacity and energy were presented. The energy shown on the graphs was based on historical generation and the expectation of each resource's availability, outage schedules, and status quo market conditions. As more renewables are integrated into the SPP and MISO markets it is expected that fossil fuel units will be dispatched less, which would change the percentages shown. Both capacity and energy are expected to be just over 50% fossil-fueled, with just under 50% supplied by non-carbon resources which compare closely with the actuals for the last available fiscal year. MEAN has several long-term resource contracts that spell out the terms of various ownership or power purchase arrangements which limits MEAN's resource portfolio. MEAN has minority ownership in all of the fossil fuel plants in its portfolio resulting in MEAN having minimal control of those units. The most economical resource option is for MEAN to take the energy that it is already paying for.

Future Resource Needs

Load and resources were combined to determine future resource needs. MEAN, SPP, West, and MISO load and capability reports were reviewed.

Candidate Portfolios

A review of the Phase I Evaluation was presented. Coal options that were included in the 2017 IRP have been removed due to a need for fuel diversity and in light of the 2050 Vision which set a goal of a carbon-neutral portfolio by 2050. Based on member feedback, the cost was the most important criteria, followed by long-term debt, transmission availability, and local benefit. Ten candidate portfolios were reviewed.

Market Price Scenarios

The nine pricing scenarios that were used in the model for sensitivity analysis were reviewed. The sensitivity scenarios allow for measuring risk within each of the portfolios.

Energy Efficiency/DSM Programs

MEAN had previously conducted an analysis to determine which Demand Side Management programs to administer and are already operating the DSM programs that resulted in the best benefit to cost ratio for both end-users and MEAN. Member surveys were recently conducted to identify the expected level of participation in future DSM programs. A three-part cost-benefit analysis was conducted on the top-scoring

options from the perspective of MEAN, the retail end-user, and the entire system. Due to the results from the cost-benefit analysis and the status of future projects, no new DSM measures were calculated in the modeling. All existing DSM programs are already incorporated into MEAN's load forecasting.

Renewable Distributed Generation

In late 2019, MEAN completed a business case for the creation of an aggregated solar request for proposals, combining several MEAN communities to collectively purchase solar resources. The resources would be installed in their own towns at a lower price than the communities could acquire with single, individual projects. This RFP was rather successful and resulted in proposed PPAs for over 27 MW of community solar energy. The future installation of distributed generation has the potential to reduce the need for MEAN-owned resources.

2050 Vision

Eight scenarios were reviewed and compared to ensure decisions are made in a way that would progress MEAN toward the 2050 Vision

Modeling Results

Modeling results were reviewed for the SPP and for the West. The results were similar, but not the same due to several differences between the two regions.

Staff requested the Power Supply Committee identify preferred portfolios to recommend to the Board. It was reiterated that identifying a preferred portfolio, or multiple portfolios does not mean those are the resources MEAN has to procure in the future. It just provides direction to MEAN staff when they are looking to acquire resources. Before actually contracting for a new resource, further analysis will be done and presented to the Power Supply Committee and the Board for approval.

Significant discussion ensued including: Communities expect reliability and it was suggested MEAN have continued diversity and dispatchable resources. Will there be enough resources to meet needs? Solar is a big question mark but more should be known in August. Battery prices are changing and prices are expected to drop with advancing technology. The capacity factor increases with battery power. Natural gas should be considered as it is a bridge to get from point A to point B.

There was a member consensus that wind and solar power should be included along with batteries and natural gas. The final recommendation of preferred portfolios to be included in the resolution for both SPP and the West is as follows (in numerical order):

1A Natural Gas Combined Cycle with Carbon Capture and Sequestration
2 Landfill Gas
7 Hydropower
8 Wind & Battery Energy Storage
9 Solar & Battery Energy Storage

Motion: Matt Langhorst moved to approve the following Resolution. Chris Rodman seconded the motion, which carried unanimously on a roll call vote.

POWER SUPPLY COMMITTEE
RESOLUTION

WHEREAS, Western Area Power Administration ("WAPA") requires its customers to prepare and submit an Integrated Resource Plan ("IRP") every five years, and

WHEREAS, MEAN has prepared an IRP for submission to WAPA in 2022 to comply with the requirements of the WAPA Energy Planning and Management Program for MEAN and its total requirements participants.

NOW, THEREFORE, BE IT RESOLVED by the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors approve the Integrated Resource Plan as presented, with additional updates to be incorporated in response to public comments and to include the following future portfolios in the recommended action plan:

- *SPP: Portfolio(s)* 1A, 2, 7, 8, & 9
- *West: Portfolio(s)* 1A, 2, 7, 8, & 9

BE IT FURTHER RESOLVED by the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors reserve the right to modify the 2022 IRP to take into account changed circumstances and operational and economic considerations.

UPDATES
Presenter: Tim Cerveny, Manager of Resources, Transmission and O&M Services

Central Nebraska Public Power and Irrigation District Hydropower Request for Proposal

MEAN is still in the running for this bid. Negotiations should continue this summer. It is still an ideal resource, and the location is optimal, it is right in MEAN's member backyards and there isn't a lot of hydro in Nebraska. As a reminder MEAN is picking up 34MW of DC Tie rights so this resource can be taken West if needed.

NextEra Solar Project

This project was on hold due to the uncertainty of possible imposed solar tariffs. The Federal government is having issues with how the panels are sourced and they are investigating to determine if they want to pursue tariffs. That could have a 200 – 250% impact on panel pricing. This will not impact the Sandhills Solar project since that involves domestically sourced products.

Western Area Power Administration Capacity and Energy Displacement Agreement
Presenter: Michelle Lepin, Associate General Counsel

The current agreement is scheduled to expire on September 30, 2024. Both parties feel it's best to keep this arrangement in place and extend it through May of 2029, with modernization updates. Those negotiations are close to being completed.

RECISSION OF MEAN RESOLUTION REGARDING POWER PURCHASE AGREEMENTS FOR SERGEANT BLUFF SOLAR
Presenter: Michelle Lepin, Associate General Counsel

Background information regarding the need for rescinding the 2016 MEAN resolution was included in the meeting packet. The power purchase agreements approved in 2016 were never executed and Sergeant Bluff has expressed an intention to utilize the MEAN Renewable Distributed Generation Policy (DG Policy) to enter into a new power purchase agreement with SE Municipal Solar, LLC. The City's purchase under the power purchase agreement was determined by the MEAN Board of Directors in January 2022 to meet the requirements of the DG Policy.

Motion: Duane Hoffman moved to approve the following Resolution. Matt Langhorst seconded the motion, which carried unanimously on a roll call vote. (Will Dowis did not vote)

MEAN POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, on March 10, 2016, MEAN adopted a resolution approving a power purchase agreement with Ideal Energy or equivalent solar group to purchase all electrical output of the approximately 1-1.5 MW solar photovoltaic generating facility to be owned and operated by Ideal Energy or equivalent solar group and located in the City of Sergeant Bluff, Iowa ("Ideal Energy or Equivalent Solar Group Project") and approving a supplemental agreement with the City of Sergeant Bluff, Iowa under which MEAN would sell the output of the facility to the City of Sergeant Bluff, Iowa;

WHEREAS, the Ideal Energy or Equivalent Solar Group Project has not been constructed and the agreements approved in 2016 have not been executed;

WHEREAS, the City of Sergeant Bluff, Iowa has expressed an intention to enter into a new power purchase agreement with SE Municipal Solar, LLC as part of the Solar RFP process recently conducted by MEAN; and

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors rescind the March 10, 2016 resolution.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the MEAN Board of Directors rescind the following resolution adopted March 10, 2016:

- *Resolution approving Power Purchase Agreement for solar resource and related sale of solar-generated power to Sergeant Bluff with associated Sergeant Bluff-specific SSM Exhibit D Modification*

ESTABLISH EXCEPTION TO MORATORIUM AND LEASE MEMBER GENERATION FROM CITY OF SIDNEY, NEBRASKA
Presenter Tim Cerveny, Manager of Resources, Transmission and O&M Services

Sidney, Nebraska is pursuing the installation of three units and is seeking a commitment from MEAN for capacity compensation or compensation for providing operating reserves. They are looking at between 6 and 7.5 MW. These would be limited use units, running less than 100 hours per year, and would have minimal impact on MEAN's carbon footprint. MEAN has a need for operating reserves in the West. MEAN is required to carry 4 - 5 MW of operating reserves and is currently contracting with a third party which is very expensive. This would be cost-effective for MEAN and would provide revenue to a MEAN community versus a third party. This could be a great opportunity. If Sidney pursues this they would have to have the capability to be online within 10 minutes.

Discussion ensued and included: Sidney is very early in this process. It should be mutually beneficial. For Sidney it's a resource to cover emergencies, for MEAN it's a resource for capacity. The actual energy output will be very low. There will be a separate contract for operating reserves and pricing will have to be negotiated with the City of Sidney.

Motion: Bill Hinton moved to approve the following Resolution. James DePue seconded the motion, which carried unanimously on a roll call vote.

MEAN POWER SUPPLY COMMITTEE RESOLUTION

WHEREAS, the City of Sidney, Nebraska, a MEAN Service Schedule M participant, intends to pursue the purchase and installation of 6 to 7.5 MW of behind the meter reciprocating internal combustion engine generation in their community and desires to commit to MEAN all of the generating accredited capacity for pooling by MEAN or utilize the generating facility for MEAN's operating reserves; and

WHEREAS, the MEAN Board of Directors approved a moratorium effective January 20, 2005, on leasing any new or additional generation until such time peaking capacity generation is needed; and

WHEREAS, the MEAN Power Supply Committee desires to recommend the MEAN Board of Directors establish an exception to the moratorium to allow MEAN to lease generating capacity from the City of Sidney, Nebraska or utilize the generating facility for operating reserves.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Power Supply Committee that the Committee recommends the Board of Directors approve an exception to the moratorium placed into effect January 20, 2005, to allow MEAN to lease approximately 6 to 7.5 MW of generating capacity from the City of Sidney, Nebraska or to enter into an agreement for MEAN to utilize the generating facility for operating reserves at a cost to be negotiated at a later date.

FUTURE DEVELOPMENT DISCUSSIONS
Presenter: Tim Cerveny, Manager of Resources, Transmission and O&M Services

MEAN Contracted Distributed Generation

Part of the solar RFP has been working to get those sites located in interested communities. There may be opportunities for MEAN to co-locate some facilities in those same areas using interconnection agreements. This would be consistent with the IRP.

Battery Storage

MEAN is starting to look at battery resources where it may be economically feasible and Staff is investigating available options and evaluating how the FCRC allocation can be used.

Behind The Meter Generation Modernization

MEAN is looking at options for remote start and remote monitoring and trying to modernize some of the existing facilities. If a community is looking at infrastructure upgrades or changes to a facility MEAN would like to work with them to identify improvements that will optimize efficiency and resource use. The metering of those generators is something MEAN would still like to pursue, working with communities that have digital meters that MEAN can connect to remotely would be great.

OPERATIONS UPDATE
Presenter: Jeff Lindsay, Electric Operations Manager

Provided a review of Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO) prices for April. Since the Russia/Ukraine war started gas prices have increased almost 50%. In the Southern and Central regions of the United States, it has been hotter than expected impacting natural gas prices. The Forward Curve of Natural Gas and WECC-MidC pricing was reviewed and compared to the same time last year. Prices per BTU are $1 to $2 higher than this time last year.

The MEAN Power Supply Committee recessed for a break at 2:47 p.m (C.T).

At 3:00 p.m. (C.T) the MEAN Power Supply Committee reconvened and was joined by the Risk Oversight Committee and Finance Committee.

PUBLIC COMMENT PERIOD
Presenter: Michelle Lepin, Associate General Counsel

The Public Comment Period was announced and a review of the rules applicable to the public comment process at MEAN public meetings was provided. There were no public comments.

RATE STABILIZATION ACCOUNT TARGET
Presenter: Jamie Johnson, Director of Finance & Accounting

The purpose of establishing a target goal for the Rate Stabilization Account is to plan for future expenses; some anticipated and some unknown. Establishing a goal doesn't mean it has to be funded. Funding would be up to the Board on an annual basis during the budget process. Establishing a target goal provides guidance and will help the Board understand the potential costs that are out there. If unanticipated costs occur, and funds have not been saved, it will have a much quicker and more severe impact on rates.

Discussion ensued and included a review of the different cash reserve components, minimal funding targets, potential unexpected costs, and the analysis used to determine the target goal being recommended. The current suggestion is based on current analysis but will need to be dynamic; updated based on future analysis.

Motion: Matt Langhorst moved to approve a recommendation that the Board of Directors establish a Rate Stabilization Account Target goal of $1.5 million annually for thirty years beginning fiscal year ended March 31, 2022. James DePue seconded the motion, which carried unanimously on a roll call vote.

RATE STRUCTURE
Presenter: Jamie Johnson, Director of Finance & Accounting

An overview of the flow of funds into and out of the Operating fund was presented, specifically how funds flow between the Operating fund and the Rate Stabilization Account. The Renewable Rate Concept is that the FCRC (MEAN A&G, Capital, and Debt Service) acts as the base for MEAN's revenue collection. Those are costs that are incurred regardless of what the actual load served is. Energy charges cover the remaining fixed costs and the variable costs. The "E" Rate is expected to be an "Energy Charge plus" amount, like the concept that the K Rate is the M Rate + 5%.

Discussion ensued and included: There is always angst about the funds going in and out of the Rate Stabilization Account. The rate structure discussion likely means more to those where MEAN serves the entire

load as opposed to those communities that receive large WAPA allocations. The Board must look at the flow of funds independently but also as a whole.

ADJOURNMENT

There being no further business, the meeting was adjourned at 4:15 p.m. (C.T)

Prepared by:
Stacy Hendricks
Municipal Energy Agency of Nebraska

Submitted by:
Brad Hans
Director of Wholesale Operations
Municipal Energy Agency of Nebraska

Integrated Resource Plan Review & Recommendation

Shannon Coleman
Supervisor Resource Planning & Analyst

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Agenda

- Load Forecast Scenarios
- Existing Resource Portfolio
- Future Resource Needs
- Candidate Portfolios
- Market Price Scenarios
- Energy Efficiency/DSM
- Renewable Distributed Generation
- 2050 Vision
- Modeling Results

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Integrated Resource Plan Public Participation

November 2019
- Power Supply Committee + Board of Directors

January 2020
- Power Supply Committee + Board of Directors

August 2020
- Power Supply Committee + Board of Directors

November 2020
- Power Supply Committee + Board of Directors

January 2021
- Power Supply Committee + Board of Directors

May 2021
- Power Supply Committee + Board of Directors

August 2021
- Power Supply Committee + Board of Directors

November 2021
- Power Supply Committee + Board of Directors

January 2022
- Power Supply Committee + Board of Directors

April 2022 Workshop

January 2021 IRP Survey

September 2021 Renewable Energy Survey



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Integrated Resource Plan Progress

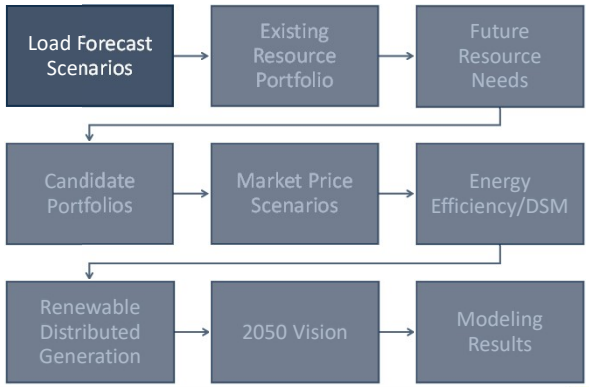
- Upcoming Action Items + Opportunities for Public Participation:
  - April – Draft IRP Report Sent to Communities for Review
  - April – Workshop to Review Results and Prepare for Recommendation
  - **May Meeting – PSC Recommendation and Board Approval**
  - July 1 – Submittal to WAPA

Inputs and Assumptions → Resource Portfolios → Resource Portfolio Analysis → Optimal Portfolio → Action Plan

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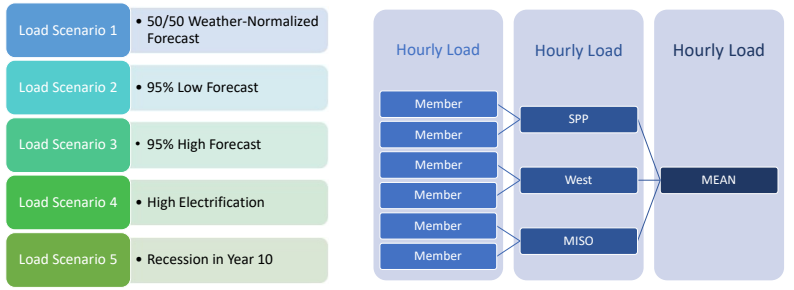
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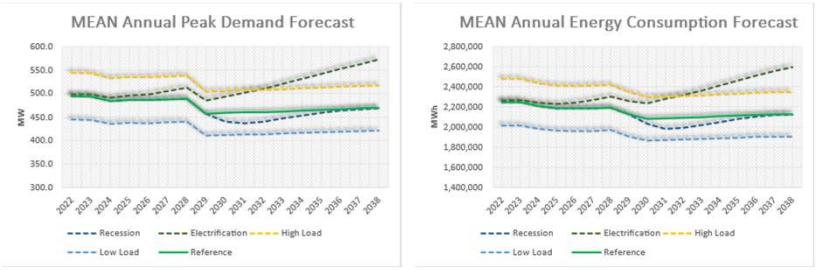
Load Forecast Scenarios



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Load Scenarios

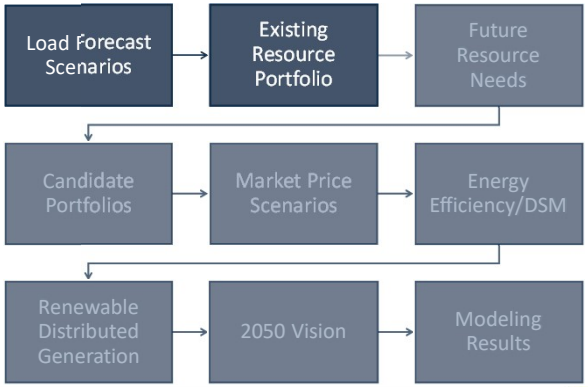


- All 5 Scenarios for Each Region – Demand and Energy

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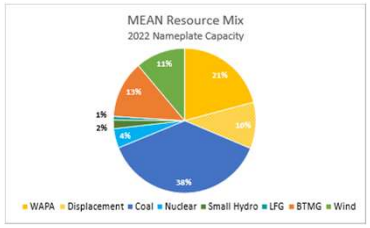
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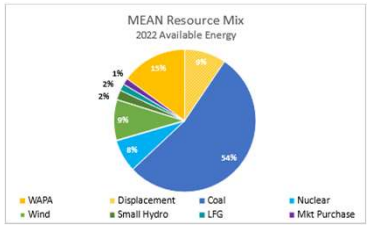


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MEAN Capacity and Energy

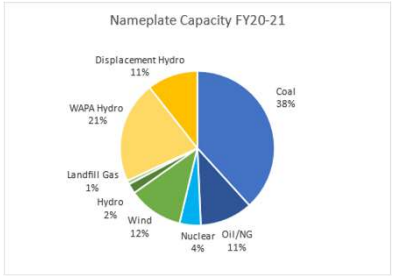


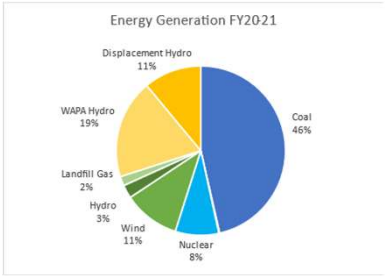


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Actuals FY20-21



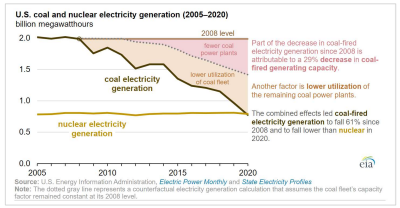


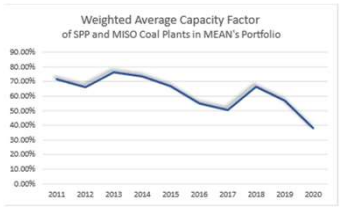
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Available Energy vs. Dispatched Energy

- Renewable Integration Results in Lower Dispatch of Fossil Fuel Units





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Limitations

- MEAN Resource Contracts
- MEAN is Minority Owner in Fossil Fuel Plants
- MEAN Has Little Control Over Resource Life or Retirement
- Must Pay Costs of Resource for Life of Contract
- Most Economical Option is to Take Energy
- Other Option is to Add Resources, Add Cost
- Added Penalties for Contract Non-Compliance
- All Resource Projections Show ACTUAL CONTRACT Amounts



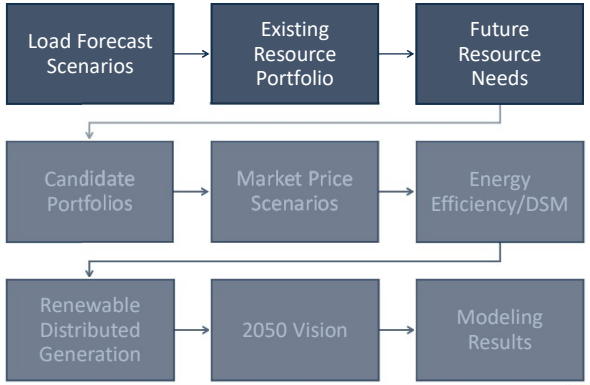




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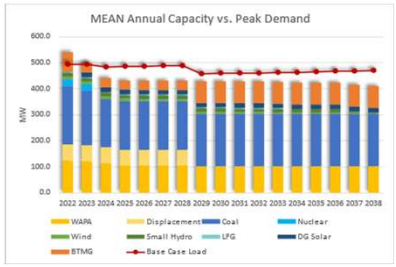
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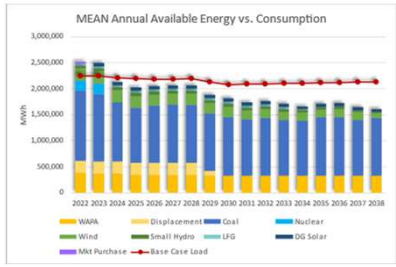


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MEAN Load and Capability

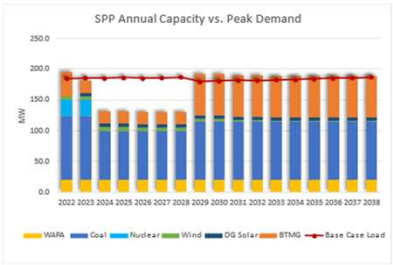


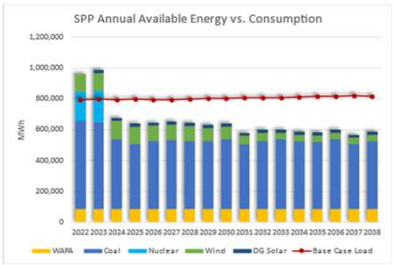


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SPP Load and Capability

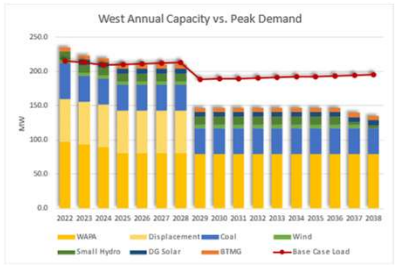


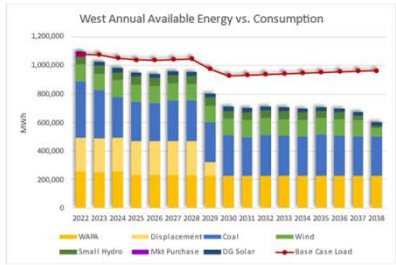


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West Load and Capability

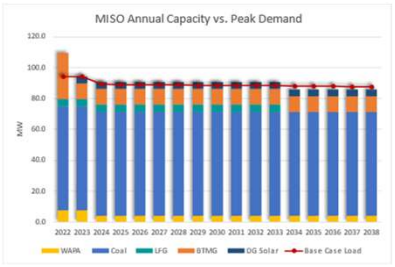


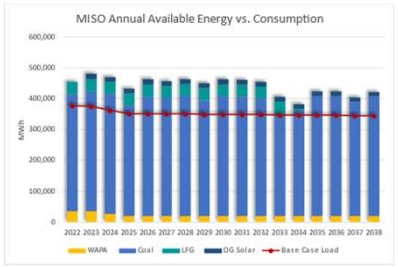


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MISO Load and Capability



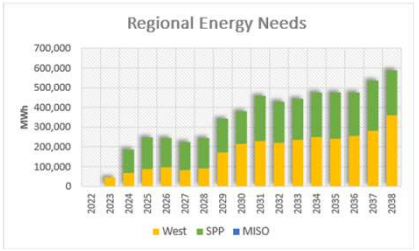


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Resource Needs – Capacity and Energy





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Agenda

- Load Forecast Scenarios
- Existing Resource Portfolio
- Future Resource Needs
- Candidate Portfolios
- Market Price Scenarios
- Energy Efficiency/DSM
- Renewable Distributed Generation
- 2050 Vision
- Modeling Results

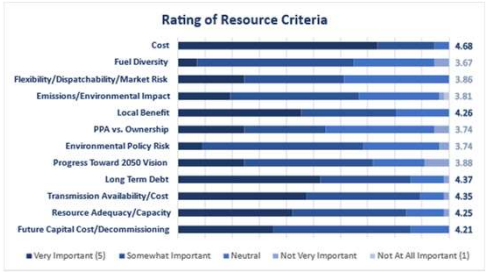
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Phase I Evaluation

Supply-Side Resource Options	
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

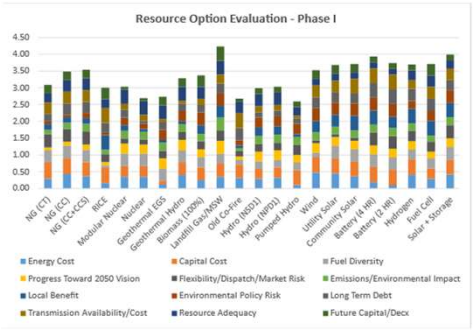
*with and without CCS



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Phase I Evaluation



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Candidate Portfolios

- Portfolio #1 NGCC
- Portfolio #1A NGCC – CCS
- Portfolio #2 LFG
- Portfolio #3 MSW
- Portfolio #4 Wind
- Portfolio #5 Solar
- Portfolio #6 NG Fuel Cell
- Portfolio #7 Hydropower
- Portfolio #8 Wind + Battery
- Portfolio #9 Solar + Battery
- Portfolio #10 Extend CNS

Size New Resource

Energy Need in Region by Year

Capacity Factor of New Resource

Size Additional Capacity

Capacity Need in Region by Year

Capacity Factor of New Resource

Member Gen or NGCC

Portfolio Model

New Resource

+

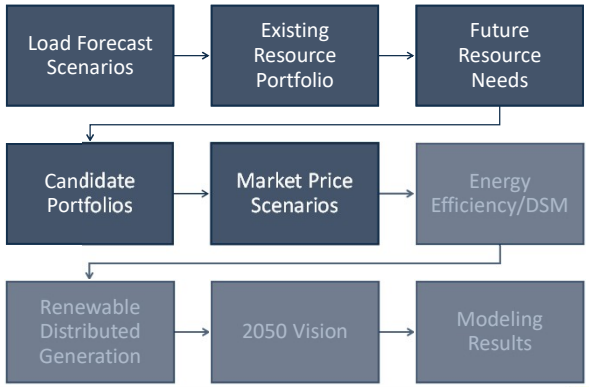
Additional Capacity

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Modeled Resource

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Pricing Scenarios - Sensitivity

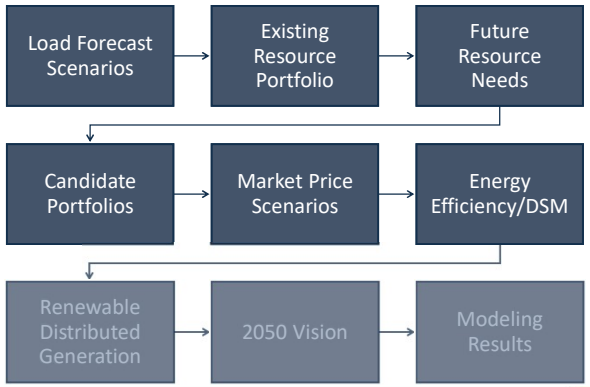
- Independent Variables
  - System Load
  - NG Price
  - CO_2 Tax/Limit
- Dependent Variables
  - Market Price
  - Fuel Adjustment
  - Generation
- Allows Measurement of Risk/Volatility Related to Future Conditions

Scenario	System Load	NG Pricing	CO_2 Tax
Scenario 1: Reference	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 2: High Load	High Load	Base Case NG	No CO_2 Tax
Scenario 3: Low Load	Low Load	Base Case NG	No CO_2 Tax
Scenario 4: High NG	Base Case Load	High NG	No CO_2 Tax
Scenario 5: Low NG	Base Case Load	Low NG	No CO_2 Tax
Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

*Zero Carbon Scenario assumes regulatory conditions that allow no future addition of carbon emitting resources.

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Agenda

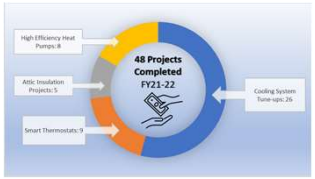


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Existing Demand Side Management

- Residential Smart Thermostats
- Residential Attic Insulation
- Residential Cooling System Tune-Up
- Residential High Efficiency Heat Pump
- Commercial LED Lighting Program
  - Annual Savings = 1,247 MWh energy + 249 kW demand
- MEAN Community Programs
  - 33 Programs in 17 Communities
  - Annual Savings = 2,635 MWh energy + 4.028 MW demand



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Demand Side Management Analysis



TEST	BENEFITS	COSTS
Utility Cost Test	Utility Avoided Costs	• Program Administration Costs • Incentives/Rebates Paid
Participant Cost Test	Net Bill Savings	• Incremental Cost of Investment (Net of Incentive/Rebate)
Total Resource Cost Test	Utility Avoided Costs	• Program Administration Costs • Incremental Cost of Investment

DSM PROGRAM	UTILITY COST TEST (Benefit/Cost)	PARTICIPANT COST TEST (Benefit/Cost)	TOTAL RESOURCE COST TEST (Benefit/Cost)
Room Air Conditioner Rebate	0.0310	1.2112	0.0365
Central Air Conditioner Incentive	0.0706	0.0931	0.0396
Refrigerator Rebate	0.0246	0.0468	0.0147
Freezer Rebate	0.1473	0.8461	0.1831
Heat Pump Water Heater Rebate	0.2425	0.5353	0.2179

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Future Demand Side Management

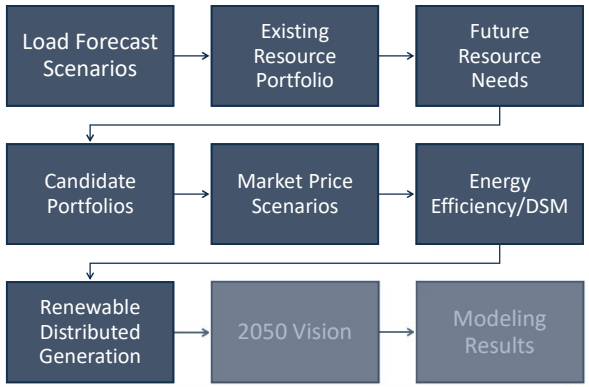
- Continuation of MEAN Programs
- Continuation of Community Programs
- Energy Efficiency Education
- Residential EV Chargers
- Advanced Metering Infrastructure
- Battery Storage



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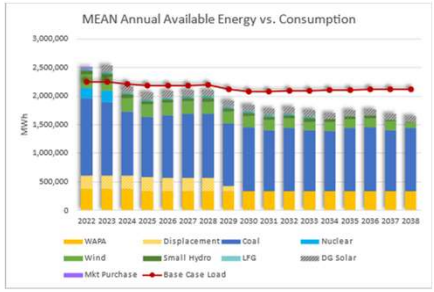


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Distributed Generation

- Renewable Distributed Generation Policy
- Potential to Decrease Future Energy Need
  - Offset Other Supply Side Resources
  - Local Benefit
  - 2050 Vision
  - Geographic Diversity



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Distributed Generation

- Community Solar RFP
  - 27.4 MW
  - Competitive Pricing with Aggregation
- Other Technologies in Future?
- Collaboration between Communities
- MEAN-Contracted Resources Located at Member Sites

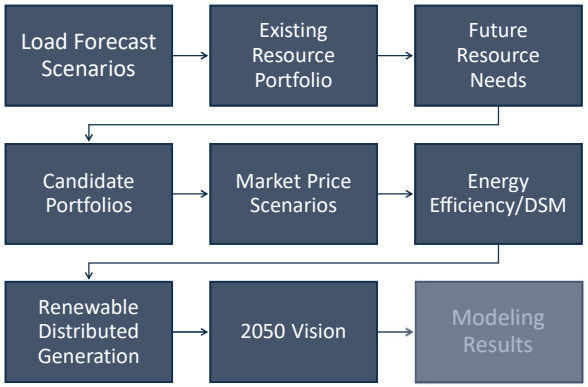
Community	Annual Production (MWh)	Nameplate (kW-AC)	Nameplate (kW-DC)
Alliance NE	5,454,734	2,400	3,069
Ansley NE	209,268	120	119
Crete NE	3,360,018	1,600	1,950
Stuart NE	273,799	175	158
Waverly IA	6,673,710	3,400	4,020
Delta CO	2,056,087	875	1,017
Pender NE	290,685	175	166
Sergeant Bluff IA	1,134,240	600	691
Aspen CO	2,243,838	1,000	1,209
Gering NE	2,279,099	1,000	1,238
Indianola IA	6,545,027	3,400	4,090
Oxford NE	251,997	120	130
Sidney NE	3,697,157	1,600	2,036
Fort Morgan CO	9,816,612	4,200	5,040
Imperial NE	1,196,113	525	662
Denver IA	712,813	350	413
Wray CO	619,432	350	310
Carlisle IA	972,927	525	617
Paxton NE	262,906	120	147
Curtis NE	605,201	350	356
Total	48,655,662	22,885	27,438

Pending receipt of executed PPA contracts.

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Agenda



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2050 Vision

- Carbon Neutral Resource Portfolio by 2050
- Portfolios that Reduce Carbon Emissions
- Portfolio Model Must Include Accounting of Carbon Emissions to Compare Options
  - Scenario 1 vs Scenario 9
  - Scenario 4 vs Scenario 7
  - Scenario 5 vs Scenario 8
  - Metric of Carbon Intensity

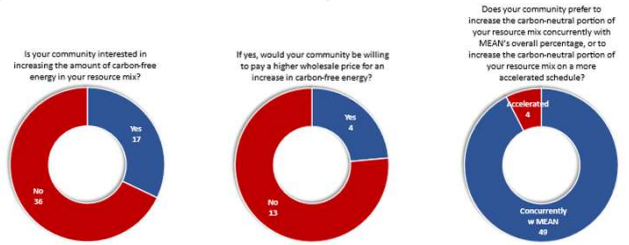
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Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

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2050 Vision

- September 2021 Renewable Survey

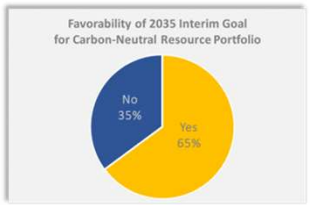


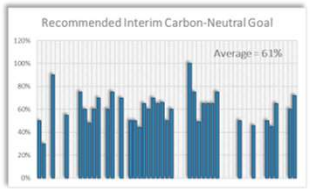
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2050 Vision

- 2035 Interim Goal
  - Following Contract for Resources in 2023-24
  - Updated Projection of Non-Carbon Energy Portfolio
  - Analysis of Cost Impact
  - Power Supply Committee to Study and Make Recommendation

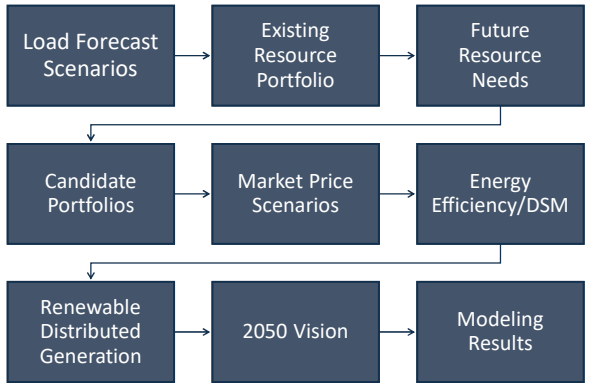




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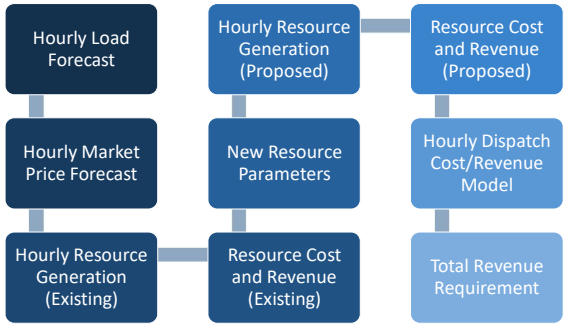
Agenda



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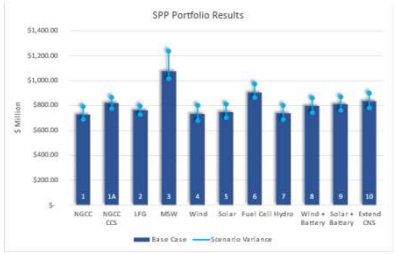
Integrated Resource Plan Modeling Process



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SPP Portfolio Results





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West Portfolio Results

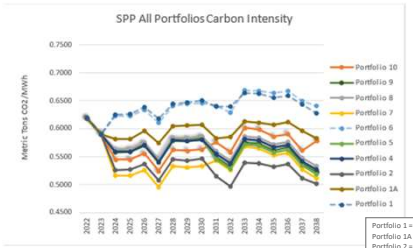




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SPP Environmental Impact

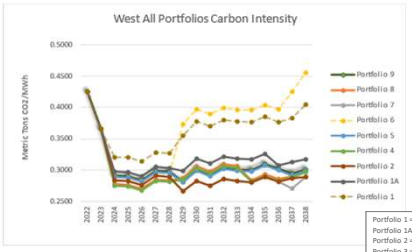




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West Environmental Impact





Portfolio 1 = NGCC
Portfolio 1A = NGCC CCS
Portfolio 2 = LFG
Portfolio 3 = MSW
Portfolio 4 = Wind
Portfolio 5 = Solar
Portfolio 6 = Fuel Cell
Portfolio 7 = Hydropower
Portfolio 8 = Wind + Battery
Portfolio 9 = Solar + Battery

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Summary Results

SPP Summary Modeling Results

Portfolio #	Resource	15-Year Revenue Requirement ($ Millions)	Price Variance ($/MWh)	Carbon Intensity (tons/MWh)
Portfolio 1	NGCC	$ 726.24	$ 4.53	1.49%
Portfolio 1A	NGCC CCS	$ 819.37	$ 3.23	-5.76%
Portfolio 2	LFG	$ 761.77	$ 2.26	-18.85%
Portfolio 3	MSW	$ 1,073.85	$ 10.80	45.60%
Portfolio 4	Wind	$ 735.02	$ 4.40	-14.80%
Portfolio 5	Solar	$ 749.47	$ 4.05	-16.20%
Portfolio 6	Fuel Cell	$ 906.79	$ 4.38	3.57%
Portfolio 7	Hydro	$ 739.81	$ 4.15	-17.40%
Portfolio 8	Wind + Battery	$ 797.68	$ 4.39	-13.90%
Portfolio 9	Solar + Battery	$ 810.16	$ 4.08	-15.50%
Portfolio 10	Extend CNS	$ 838.04	$ 4.36	-6.50%

West Summary Modeling Results

Portfolio #	Resource	15-Year Revenue Requirement ($ Millions)	Price Variance ($/MWh)	Carbon Intensity (tons/MWh)
Portfolio 1	NGCC	$ 580.50	$ 10.22	-4.90%
Portfolio 1A	NGCC CCS	$ 728.67	$ 8.80	-25.50%
Portfolio 2	LFG	$ 672.00	$ 7.73	-32.20%
Portfolio 3	MSW	$ 946.46	$ 14.88	67.70%
Portfolio 4	Wind	$ 629.95	$ 7.77	-30.30%
Portfolio 5	Solar	$ 597.63	$ 8.66	-29.90%
Portfolio 6	Fuel Cell	$ 850.59	$ 9.93	7.00%
Portfolio 7	Hydro	$ 556.79	$ 7.69	-32.20%
Portfolio 8	Wind + Battery	$ 700.20	$ 7.84	-29.80%
Portfolio 9	Solar + Battery	$ 681.65	$ 8.83	-29.40%

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NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that a meeting of the Municipal Energy Agency of Nebraska (MEAN) Board of Directors and Executive Committee will be held in person Thursday, May 19, 2022, at 9:00 a.m. (CT), at the Younes Conference Center, 416 W Talmadge Rd, Kearney, Nebraska, the public designated meeting site. The meeting is open to the public and members of the media.

An agenda is kept continually current and is available for public inspection at the NMPP Energy office, located at 8377 Glynoaks Drive, Lincoln, Nebraska, during normal business hours. Notice of this meeting, agenda, and documents to be considered at the meeting, along with a copy of the Nebraska Open Meetings Act, will be posted prior to the meeting at: https://www.nmppenergy.org/about/board-meetings Public comments will be accepted at this meeting on a first-come, first-served basis during the Public Comment Period designated on the agenda, subject to the Public Comment Rules posted under MEAN's board information section on NMPP Energy's website at https://www.nmppenergy.org/about/board-meetings.

If you require assistance or special accommodations in order to participate in the meeting, contact NMPP Energy at https://www.nmppenergy.org/contact-nmpp or (402) 474-4759.

Agenda
Board of Directors and Executive Committee
Municipal Energy Agency of Nebraska
Younes Conference Center – 416 Talmadge Rd, Kearney, NE 68845
May 19, 2022 – 9:00 a.m. (C.T)

All agenda items are for discussion and action will be taken as deemed appropriate. Potential action items may include but not be limited to items indicated with an asterisk.*

1. Call to Order
    A. Nebraska Open Meetings Act
    B. Roll Call
        1. Board of Directors
        2. Executive Committee

2. Public Comment Period
(Public Comment Period Rules apply. See www.nmppenergy.org/about/board-meetings)

3. Chairman's Remarks

4. Reports
    A. Executive Director
    B. Director of Wholesale Electric Operations

5. Consent Agenda*
    A. Minutes of January 20, 2022 meeting
    B. Next meeting
    C. 2022 Summer Season Load and Capability Report and Operational Readiness
    D. Financial Report – Fiscal Year 2021-2022 Preliminary Year-End Review
    E. Consent Resolution

6. Integrated Resource Plan*
    A. Load Forecast Scenarios
    B. Existing Resource Portfolio
    C. Future Resource Needs
    D. Candidate Portfolios
    E. Market Price Scenarios
    F. Energy Efficiency/DSM Programs
    G. Renewable Distributed Generation
    H. 2050 Vision
    I. Modeling Results
    J. Committee Recommendation

7. Committee Reports and Recommendations
    A. Power Supply Committee
        1. Meeting summary of March 31, April 21, and May 18, 2022
            a. Central Nebraska Public Power and Irrigation District Hydropower Request for Proposal
            b. NextEra Solar Project
            c. Future Development Discussions
            d. Western Area Power Administration (WAPA) Capacity and Energy Displacement Agreement

2. Recission of MEAN Resolution Regarding Power Purchase Agreements for Sergeant Bluff Solar*
3. Establish Exception to Moratorium and Lease Member Generation from City of Sidney, Nebraska*

B. Risk Oversight Committee
   1. Meeting summary of March 31, April 21, May 12, and May 18, 2022

C. Finance Committee
   1. Meeting summary of March 31, April 21, May 12, and May 18, 2022
      a. MEAN Meeting Public Participation Policy
      b. BKD Pre-Audit Communication Letter
      c. Rate Setting Philosophy
      d. Rates Impact of Resource Planning and 2050 Vision
      e. Rate Structure
      f. Debt Strategy and Refunding Considerations
   2. Financial and Administrative Policies and Guidelines*
   3. Rate Stabilization Account Target*
   4. Considerations related to Preliminary Fiscal Year 2021-2022 Financial Results*
      a. Rate Stabilization Account Transfers
      b. Allocation of a Portion of Fiscal Year 2021-2022 Net Revenue to Participants

8. Updates and Reports
   A. Advanced Metering Infrastructure Update
   B. Western Area Power Administration (WAPA) Updates
   C. Market & Operations Update
   ~~D. The Energy Authority (TEA) Update~~

9. Contracts, Settlement Agreements, and General Counsel Report
   A. Contracts Report
   B. Legislative and Legal Updates
      1. State and Federal Activities
      2. Legal Updates

10. Closing Comments

11. Adjourn

Unapproved Minutes
Board of Directors
Municipal Energy Agency of Nebraska
Younes Conference Center – 416 Talmadge Rd, Kearney, NE 68845
May 19, 2022 – 9:00 a.m. (CT)

The Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) met on Thursday, May 19, 2022, at the Younes Conference Center located at 416 Talmadge Road in Kearney, Nebraska, the designated meeting site. Notice of the meeting was given to Directors and Alternate Directors by e-mail and the public was advised by publication both print and online in the Lincoln Journal-Star newspaper and website on May 6, 2022. The notice and agenda were posted upon issuance at the NMPP Energy office at 8377 Glynoaks Drive, Lincoln, Nebraska, and kept continually current and available for public inspection. All documents being considered at the meeting, and the current version of the Nebraska Open Meetings Act were made available on NMPP Energy's Public Meeting Information website.

CALL TO ORDER

Chairman Tom Goulette called the meeting to order at 9:01 a.m. (CT). Pursuant to Section 84-1412 (8) of the Nebraska Open Meetings Act, a current copy of the Open Meetings Act was posted in the meeting room and made available to the public.

ROLL CALL

A quorum was declared with 36 of 56 Directors in attendance.

1. Brestel, Rod – Callaway
2. Bridge, Kirby – Alliance
3. Brinkman, Bart – Shickley
4. Christoff, Tyler – Aspen
5. Davison, Pat – Imperial
6. De Laune, Doug – Arnold
7. DePue, James – Wray
8. DesPlanques, Chris – Indianola
9. Dowis, Will – Gunnison
10. Dunn, Edward – Grant
11. Goulette, Tom – West Point
12. Hinton, Bill – Kimball (arrived at 9:12 a.m.)
13. Hoffman, Duane – Oxford
14. Hrabanek, Dave – Pierce (arrived at 9:15 a.m.)
15. Kerr, Jim – Lyons
16. Kielkopf, Todd – Carlisle
17. Kohrs, Jeff – Nebraska City
18. Langhorst, Matt – Glenwood Springs
19. Lee, Andrew – Curtis
20. Lockmon, Bob – Stuart
21. Messbarger, Robert – Fairbury
22. Nation, Brent – Fort Morgan
23. Ourada, Tom – Crete
24. Palmer, Mike – Sidney
25. Parker, Doug – Gering
26. Prettyman, John – Yuma
27. Rodman, Chris – Wall Lake
28. Rust, Todd – Chappell
29. Schmidt, Janine – Morrill
30. Summers, James – Benkelman
31. Suppes, Adam – Delta
32. Tarr, Jeremy – Plainview
33. Wenzel, Darrel – Waverly
34. Wickard, Mark – Bridgeport
35. Woldt, Randy – Wisner
36. Youtz, Dana – Torrington

Board Members not in attendance: Dallas Thomas – Ansley; CJ Duncan – Basin; Dan Coolidge –Bayard; Grant Jorgensen – Beaver City; Larry Edgar – Blue Hill; Bob Boeckman – Breda; Daniel Knoell – Broken Bow; Cody Feeken – Burwell; Larry Farley – Denver; Ray Luhring – Falls City; Keith Beck – Fleming; Ron Carpenter – Haxtun; Greg Nein – Julesburg; Kim Robb – Lyman, Perry Mader – Mitchell; Joe McNally – Neligh; Bernard Gagne – Oak Creek; Chris Brader – Pender; Michael Clark – Red Cloud; and John Winkel – Sergeant Bluff

Others in attendance: Annette Brower, Joe Dickman, Doug Hazzard, Doug Linton, Rhonda Martin, Wendy McKain, and Pete Rizzo.

NMPP Staff: Carol Brehm, Tim Cerveny, Shannon Coleman, Chris Dibbern, Bruce Doll, Richard Eymann, Brad Hans, Mandy Hansen, Stacy Hendricks, Joe Hobelman, Brenda Hudacek, Kara Hunt, Jamie Johnson, Jill Jones, Sarah Jones, Kyle Kaldahl, Michelle Lepin, Brittany Millard, Bob Poehling, Matt Reed, Andrew Ross, David Russell, and Kevin Wickham.

PUBLIC COMMENT PERIOD
Presenter: Michelle Lepin, Associate General Counsel

The Public Comment Period was announced and a review of the rules applicable to the public comment process at MEAN public meetings was provided. There were no public comments.

CHAIRMAN'S REMARKS
Presenter Tom Goulette, MEAN Board Chair

Board members were welcomed and it was noted that because there is a quorum of the Board of Directors, the Executive Committee would not be called to order.

REPORTS

Bob Poehling, Executive Director/CEO

A summary of the Integrated Resource Plan (IRP) process was provided. 86 written comments were received during the twenty-five day written public comment period. The interest and input was appreciated, and a summary of those comments will be included in MEAN's IRP submission to Western Area Power Administration (WAPA).

A potential new service option from Nebraska Municipal Power Pool (NMPP) was announced to provide physical security audits of member facilities to identify security vulnerabilities and protection measures that could be implemented. Staff is expected to complete an analysis of this potential service option in late summer or early fall.

Members were encouraged to review an article of interest published in the Wall Street Journal on Friday, May 13, 2022, on the rising risk of electricity shortages throughout the United States. The article states that demand is expected to exceed supply and electric-grid operators are warning of rolling blackouts during heat waves or other peak periods as soon as this year.

It was announced that MEAN plans to begin its next Strategic Planning session this fall.

Brad Hans, Director of Wholesale Electric Operations

The status of MEAN projects was presented including energy pricing and changes in the industry over the past twenty years. Fuel pricing and scarcity was discussed, as well as the role of Production Tax Credits (PTCs) and Investment Tax Credits (ITCs) in making renewable energy facilities economically feasible, and the importance of diversity in the resource mix. An update was provided on what energy pricing is currently doing in the markets and the future work on resource and portfolio changes and new policies to address MEAN contracted distributed generation, battery storage, and renewable pools was reported.

CONSENT AGENDA

Minutes

Minutes of the January 20, 2022 meeting of the MEAN Board of Directors were previously distributed and included as Attachment A in the meeting packet. There were no changes to the minutes.

Next Meeting

The next scheduled meeting of the MEAN Board of Directors will be held on Thursday, August 18, 2022, at the Younes Conference Center, 416 Talmadge Rd, in Kearney, Nebraska.

2022 Summer Season Load and Capability Report and Operational Readiness

Detailed information was previously distributed in the meeting packet for the Board's review of the 2022 Summer Season Load and Capability Report and Operational Readiness.

Financial Report - Fiscal Year 2021-2022 Preliminary Year-End Review

MEAN financials for December 2021, January 2022, and February 2022 were previously distributed. Summaries of preliminary fiscal year-end results for the NMPP Energy orgnizations and MEAN were included in the meeting packet. Jamie Johnson, Director of Finance and Accounting, discussed the preliminary results for the fiscal year ended March 2022.

Motion: Edward Dunn moved to approve the following Consent Resolution. Andrew Lee seconded the motion, which carried unanimously on a roll call vote. (Jeremy Tarr did not vote)

BOARD OF DIRECTORS RESOLUTION

WHEREAS, certain business of the Board of Directors of the Municipal Energy Agency of Nebraska (MEAN) transpires on a regular and routine basis or is not of a controversial nature; and,

WHEREAS, roll call votes on each individual issue greatly extended the meeting time;

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that in the interest of economizing time, yet complying with the Open Meetings Act of the State of Nebraska, which requires roll-call voting, the following issues are hereby consolidated in this Consent Resolution:

1. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the minutes of the January 20, 2022 meeting are hereby approved.*

2. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the next meeting will be held on Thursday, August 18, 2022, at the Younes Conference Center, 416 Talmadge Rd. in Kearney, Nebraska.*

3. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the 2022 Summer Season Load and Capability Report is hereby approved.*

4. *BE IT FURTHER RESOLVED BY the MEAN Board of Directors that the financial statements for December 2021, January 2022, and February 2022 are hereby accepted; and the preliminary year-end financial statements ending March 31, 2022, are hereby accepted.*

INTEGRATED RESOURCE PLAN
Presenter: Shannon Coleman, Supervisor of Resource Planning & Analysis

An overview of the MEAN IRP was presented. Portions of the overview addressed the following items:

- Load Forecast Scenarios
- Existing Resource Portfolio.
- Future Resource Needs
- Candidate Portfolios
- Market Price Scenarios
- Energy Efficiency/DSM Programs
- Renewable Distributed Generation
- 2050 Vision
- Modeling Results

Public participation was encouraged during this two-year process and responses to the public comments were included in the IRP. Several public comments were presented with a summary of MEAN's responses.

Summary of Public Comment: Over-reliance on coal and lack of meaningful progress in meeting its carbon-neutral goal.

Summary of Response: MEAN has several long-term resource contracts that spell out the terms of various ownership or power purchase arrangements. The contracts state that MEAN must take delivery of the power proportional to its contract and pay the associated costs. Even if MEAN is not taking delivery of energy it is contracted to pay a portion of the costs and could face penalties for breach of contract. MEAN has minor ownership in all of the fossil fuel plants in its portfolio and control of those units is proportional to ownership percentage resulting in MEAN having little control over decisions relating to the operating life or the retirement of any coal unit. If MEAN were to continue paying for these resources but add cleaner generation to replace them, MEAN members would see some notable increases in power costs, and MEAN would essentially be paying double for some energy generation. The most economical resource option is for MEAN to take the energy that it is already paying for.

Summary of Public Comment: Shouldn't be dismissive of renewable energy.

Summary of Response: Future portfolios are overwhelmingly centered on renewable resources. All recent resource decisions have been for extension or negotiations of non-carbon resources. MEAN's long-term resource contracts place significant limitations on resource portfolio selections.

Summary of Public Comment: Need clarity on future resource(s).

Summary of Response: The entire Phase II modeling is a cost and reliability comparison that includes carbon-reduction information. Reviewing cost and performance data is crucial to resource modeling and planning. The purpose of the IRP is to offer analysis for the selection of future resources. MEAN cannot dictate only one option as future circumstances change quickly. An example of that is solar tariffs. The Power Supply Committee recommends several portfolios for future efforts.

Summary of Public Comment: Expand energy efficiency programs.

Summary of Response: Section VIII of the IRP covers existing Demand Side Management (DSM). Section XIII includes DSM evaluation, and appendix C contains cost-benefit analysis calculations. MEAN

already deploys five very successful DSM programs that were selected because they offer the highest potential energy and peak demand savings and is exploring future programs to enhance DSM for its member communities. These energy efficiency programs are all listed on MEAN's website and the actual savings are shown in the report.

Summary of Public Comment: There has been insufficient time for public review and comment.

Summary of Response: This has been a two-year public process that did not start with the draft release of the IRP. Feedback on the inputs, assumptions, and processes was solicited. Public meeting notices and agendas were posted for 17 meetings, several with a remote attendance option and several with an alternate attendance location. All public commenters who participated spoke for less than three minutes each. The thirty-minute limit hasn't resulted in anyone being denied an opportunity to speak as there have never been ten commenters requesting to speak.

At its May 18, 2022 meeting, the Power Supply Committee recommended that the MEAN Board of Directors approve the IRP as presented, to include the following future portfolios for both Southwest Power Pool (SPP) and West in the recommended action plan (in numerical order):

1A Natural Gas Combined Cycle with Carbon Capture and Sequestration
2 Landfill Gas
7 Hydropower
8 Wind & Battery Energy Storage
9 Solar & Battery Energy Storage

Staff recommended the MEAN Board of Directors approve the resolution as presented and Board Chair Goulette opened the item for discussion. Discussion ensued including a review of the portfolio recommendations, public participation opportunities, and the Power Supply Committee's work selecting the portfolios.

Motion: Darrel Wenzel moved to approve the following Resolution. Tom Ourada seconded the motion, which carried unanimously on a roll call vote. (Chris DesPlanques and Jeremy Tarr did not vote)

RESOLUTION

WHEREAS, Western Area Power Administration ("WAPA") requires its customers to prepare and submit an Integrated Resource Plan ("IRP") every five years, and

WHEREAS, MEAN has prepared an IRP for submission to WAPA in 2022 to comply with the requirements of the WAPA Energy Planning and Management Program for MEAN and its total requirements participants.

NOW, THEREFORE, BE IT RESOLVED by the MEAN Board of Directors that the Integrated Resource Plan is determined to meet the requirements and is approved as presented, with additional updates to be incorporated in response to public comments and to include the following future portfolios in the recommended action plan:

- *SPP: Portfolio(s)* 1A, 2, 7, 8, & 9
- *West: Portfolio(s)* 1A, 2, 7, 8, & 9

BE IT FURTHER RESOLVED by the MEAN Board of Directors that staff is hereby authorized and directed to submit the IRP to WAPA in 2022 on behalf of MEAN and its total requirements participants.

BE IT FURTHER RESOLVED by the MEAN Board of Directors that the Board of Directors reserves the right to modify the 2022 IRP to take into account changed circumstances and operational and economic considerations.

The MEAN Board of Directors recessed for a break at 10:40 a.m. and reconvened at 10:57 a.m.

COMMITTEE REPORTS AND RECOMMENDATIONS

Power Supply Committee

Meetings Summary
Presenter: Tim Cerveny, Manager of Resources, Transmission and O & M Services

A recap of topics covered at the April 21, 2022 Workshop and May 18, 2022, Power Supply Committee meeting were provided including an update on Central Nebraska Public Power and Irrigation District Hydropower Request for Proposal; NextEra Solar Project; Future Developments Discussion; and the Western Area Power Administration (WAPA) Capacity and Energy Displacement Agreement.

Central Nebraska Public Power and Irrigation District Hydropower Request for Proposal: Negotiations should begin this summer and it is possible there could be an update to provide in August. There is not a lot of hydro in Nebraska so this is a great opportunity, and it is in a great location.

NextEra Solar Project: This was on hold due to the solar tariff uncertainty. The Federal government is looking at this and will decide if they are going to enforce those tariffs.

Future Development Discussions: Discussed MEAN contracted distributed generation, battery storage, and Behind the Meter Generation Modernization.

Western Area Power Administration Capacity and Energy Displacement Agreement: Very close to completing this renewal. Major changes were originally anticipated but due to some uncertainty in the West, those were scaled back so this renewal should be wrapped up soon.

Recission of MEAN Resolution Regarding Power Purchase Agreements for Sergeant Bluff Solar
Presenter: Michelle Lepin, Associate General Counsel

Background information regarding the need for rescinding the 2016 MEAN resolution was included in the meeting packet. The power purchase agreements approved in 2016 were never executed and Sergeant Bluff has expressed an intention to utilize the MEAN Renewable Distributed Generation Policy (DG Policy) to enter into a new power purchase agreement with SE Municipal Solar, LLC. The City's purchase under the power purchase agreement was determined by the MEAN Board of Directors in January 2022 to meet the requirements of the DG Policy.

At its May 18, 2022 meeting the Power Supply Committee recommended the MEAN Board of Directors approve the rescinding the 2016 resolution which had approved the Ideal Energy or equivalent solar group arrangement.

Motion: Edward Dunn moved to approve the following Resolution. Mike Palmer seconded the motion, which carried 33-0-1 on a roll call vote. (Dana Youts and Todd Rust did not vote)

Ayes: Rod Brestel, Kirby Bridge, Bart Brinkman, Tyler Christoff, Pat Davison, Doug De Laune, James DePue, Chris DesPlanques, Will Dowis, Edward Dunn, Tom Goulette, Bill Hinton, Duane Hoffman, Dave

Hrabanek, Jim Kerr, Todd Kielkopf, Matt Langhorst, Andrew Lee, Bob Lockmon, Robert Messbarger, Brent Nation, Tom Ourada, Mike Palmer, Doug Parker, John Prettyman, Chris Rodman, Todd Rust, Janine Schmidt, James Summers, Adam Suppes, Jeremy Tarr, Darrel Wenzel, Mark Wickard, Randy Woldt, Dana Youtz

Nayes: None

Abstain: Jeff Kohrs

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, on March 10, 2016, MEAN adopted a resolution approving a power purchase agreement with Ideal Energy or equivalent solar group to purchase all electrical output of the approximately 1-1.5 MW solar photovoltaic generating facility to be owned and operated by Ideal Energy or equivalent solar group and located in the City of Sergeant Bluff, Iowa ("Ideal Energy or Equivalent Solar Group Project") and approving a supplemental agreement with the City of Sergeant Bluff, Iowa under which MEAN would sell the output of the facility to the City of Sergeant Bluff, Iowa;

WHEREAS, the Ideal Energy or Equivalent Solar Group Project has not been constructed and the agreements approved in 2016 have not been executed;

WHEREAS, the City of Sergeant Bluff, Iowa has expressed an intention to enter into a new power purchase agreement with SE Municipal Solar, LLC as part of the Solar RFP process recently conducted by MEAN; and

WHEREAS, MEAN desires to rescind the March 10, 2016 resolution.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the following resolution adopted on March 10, 2016, is hereby rescinded:

- *Resolution approving Power Purchase Agreement for solar resource and related sale of solar-generated power to Sergeant Bluff with associated Sergeant Bluff-specific SSM Exhibit D Modification*

Establish Exception to Moratorium and Lease Member Generation
Presenter Tim Cerveny, Manager of Resources, Transmission and O&M Services

Sidney, Nebraska is pursuing the installation of three units and is seeking a commitment from MEAN for capacity compensation or compensation for providing operating reserves. They are looking at between 6 and 7.5 MW. These would be limited use units and would have minimal impact on MEAN's carbon footprint. MEAN has a need for operating reserves in the West. MEAN is required to carry 4 - 5 MW of operating reserves and is currently contracting with a third party which is very expensive. This would be cost-effective for MEAN and would provide revenue to a MEAN community versus a third party. This could be a great opportunity. If Sidney pursues this they would have to have the capability to be online within 10 minutes.

At its May 18, 2022 meeting the Power Supply Committee recommended the MEAN Board of Directors approve the following resolution to establish an exception to the moratorium placed into effect on January 20, 2005.

Motion: Jeremy Tarr moved to approve the following Resolution. Matthew Langhorst seconded the motion, which carried 33-0-1 on a roll call vote. (Dana Youtz and Tom Goulette did not vote)

Ayes: Rod Brestel, Kirby Bridge, Bart Brinkman, Tyler Christoff, Pat Davison, Doug De Laune, James DePue, Chris DesPlanques, Will Dowis, Edward Dunn, Bill Hinton, Duane Hoffman, Dave Hrabanek, Jim Kerr, Todd Kielkopf, Jeff Kohrs, Matt Langhorst, Andrew Lee, Bob Lockmon, Robert Messbarger, Brent Nation, Tom Ourada, Doug Parker, John Prettyman, Chris Rodman, Todd Rust, Janine Schmidt, James Summers, Adam Suppes, Jeremy Tarr, Darrel Wenzel, Mark Wickard, Randy Woldt

Nayes: None

Abstain: Mike Palmer

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the City of Sidney, Nebraska, a MEAN Service Schedule M participant, intends to pursue the purchase and installation of 6 to 7.5 MW of behind the meter reciprocating internal combustion engine generation in their community and desires to commit to MEAN all of the generating accredited capacity for pooling by MEAN or utilize the generating facility for MEAN's operating reserves; and

WHEREAS, the MEAN Board of Directors approved a moratorium effective January 20, 2005, on leasing any new or additional generation until such time peaking capacity generation is needed; and

WHEREAS, the MEAN Board of Directors desires to establish an exception to the moratorium to allow MEAN to lease approximately 6 to 7.5 MW of generating capacity from the City of Sidney, Nebraska; and

WHEREAS, the MEAN Board of Directors desires to allow for the option of utilizing the proposed new generating resource for MEAN operating reserves.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that an exception to the moratorium placed into effect on January 20, 2005, shall hereby be established allowing MEAN to lease approximately 6 to 7.5 MW of generating capacity from the City of Sidney, Nebraska or to enter into an agreement for MEAN to utilize the generating facility for operating reserves at a cost to be negotiated at a later date.

Risk Oversight Committee
Presenter: Bob Poehling, Executive Director/CEO

MEAN expects a self-certification request to come later, in the third or fourth quarter, of the year. A self-certification is like a mini audit and MEAN will need to produce evidence in support of our modeling submissions.

The Risk Oversight Committee has worked on billing disputes with both Midcontinent Independent System Operator (MISO) and SPP and is in the process of implementing annual risk training. The risk governance policy will be ready for annual review in August, and an in-depth enterprise risk analysis report is expected to be completed as well.

Brittany Millard has done a great job developing an enterprise risk management training program for MEAN employees, and if anyone here is interested in doing something similar please get in touch with her.

Finance Committee
Presenter: Jamie Johnson, Director of Finance and Accounting

Meeting Summary: The Board was presented a summary of Finance Committee activities since the last Board meeting and thanked all of the participating members for their contributions. Topics covered during those meetings included:

MEAN Public Participation Policy: Michelle Lepin, Associate General Counsel, referred Board members to the draft policy located in the meeting packet. The Policy contains reasonable rules and regulations regarding the conduct of members of the public participating in MEAN's public meetings. It was stated this is an initial review for the Board but it is anticipated to be recommended for approval at the August meeting once Board members have had more time to review it. A review of the Nebraska Open Meetings Act requirements was provided. Board members were asked to review the draft policy and contact her if there were any questions or suggestions.

BKD Communication Letter: The letter included as Attachment C in the meeting packet notified MEAN of the planning, scope, and timing of its annual audit. BKD is going through a merger with a firm on the East Coast where they will be able to expand their footprint however this should have little impact on MEAN. MEAN still has the same team and they were able to conduct their audit on site this year for the first time since the pandemic began. The auditors are currently on-site and expect to wrap things up by the end of the month.

Rate Setting Philosophy: The underlying priorities in rate-setting really provide a firm foundation to help guide how you want to implement rate changes when needed. The Finance Committee discussed policy language that would reinforce this premise.

Rates Impact of Resource Planning and 2050 Vision, and Rate Structure: The Finance Committee has been discussing how rate structures need to evolve as more renewables come on and contract structures continue to change. Costs look a bit different when you are an owner versus a purchase power agreement. The Finance Committee will continue to work on some potential changes to the rate structure, and how costs are allocated and this may be completed by the 2022-2023 Fiscal Year.

Debt Strategy and Refunding Considerations: It doesn't look like refunding of the 2013 transactions will happen when the bonds are callable in early 2023. It doesn't appear to be economical based on the current interest rate environment but staff and MEAN's financial advisor will continue to monitor.

Financial and Administrative Policies and Guidelines: Staff is recommending adding a section on Cash Reserves to the MEAN Financial and Administrative Policies and Guidelines. MEAN has had elements of cash reserve throughout its current policies. This would capture all of those elements into one section. The new language communicates why MEAN has cash reserves, how cash reserves are evaluated, and how they are handled. The policy, purpose, and goal of each cash reserve component was reviewed along with the proposed language modifications. The modifications have been reviewed and recommended by the Finance Committee, Risk Oversight Committee, and Power Supply Committee at previous committee meetings.

Motion: *Duane Hoffman moved to approve the following Resolution. James Summers seconded the motion, which carried a unanimous roll call vote. (Dana Youts did not vote)*

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Municipal Energy Agency of Nebraska ("MEAN") Board of Directors adopted the MEAN Financial and Administrative Policies and Guidelines; and

WHEREAS, proposed changes to the MEAN Financial and Administrative Policies were previously distributed to the MEAN Board of Directors for review.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that the MEAN Financial and Administrative Policies and Guidelines shall be amended to include the changes as presented.

Rate Stabilization Account Target: The Board is being asked to establish a target goal for the Rate Stabilization Account – "other" component. If the Board decides to approve this resolution the target goal will likely be dynamic. The current suggestion is based on current analysis but will need to be updated based on future analysis.

There are many unknowns and none of the facilities MEAN has an interest in have given a closure date, it is certain that costs are coming. Those costs may not be for closure, but for capital improvements required for the plant to perform when it's being cycled more, or for costs related to environmental regulation. The longer MEAN waits to begin setting aside funds for those unknown costs, the higher the annual commitment will need to be.

The Power Supply Committee, Finance Committee and Risk Oversight Committee each recommended the Board approve the presented target at the Committee meetings on May 18, 2022.

Motion: Edward Dunn moved to approve the following Resolution. Chris Rodman seconded the motion, which carried 34-0-1 on a roll call vote. (Dana Youts did not vote)

Ayes: Rod Brestel, Kirby Bridge, Bart Brinkman, Tyler Christoff, Pat Davison, Doug De Laune, James DePue, Chris DesPlanques, Will Dowis, Edward Dunn, Tom Goulette, Bill Hinton, Duane Hoffman, Dave Hrabanek, Jim Kerr, Todd Kielkopf, Matt Langhorst, Andrew Lee, Bob Lockmon, Robert Messbarger, Brent Nation, Tom Ourada, Mike Palmer, Doug Parker, John Prettyman, Chris Rodman, Todd Rust, Janine Schmidt, James Summers, Adam Suppes, Jeremy Tarr, Darrel Wenzel, Mark Wickard, Randy Woldt

Nayes: None

Abstain: Jeff Kohrs

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, MEAN's 2003 Bond Resolution establishes a rate stabilization account within the General Reserve Fund; and,

WHEREAS, the MEAN Financial and Administrative Policies and Guidelines establish various components of the rate stabilization account to facilitate tracking of the accumulation of and intended use of funds; and,

WHEREAS, the MEAN Board of Directors desires to establish a goal for accumulating funds within the rate stabilization account – other component.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors that a goal is hereby established for MEAN to accumulate funds within the rate stabilization account – other component of $1.5 million annually for 30 years beginning with the Fiscal Year ended March 31, 2022.

Considerations related to Preliminary Fiscal Year 2021-2022 Financial Results: Contracted purchases plus production costs have had a net negative impact. The primary driver of the increased costs have been significantly higher costs for market purchases for load and other market-based energy. MEAN's generation did not provide relief from these high costs as the volatility in the market pricing resulted in lower economic dispatch than anticipated. An evaluation of the preliminary Fiscal Year 2021-2022 showed a net loss of - $2.1 million.

Rate Stablization Account Transfers: As presented, and documented in the meeting packet, because debt service coverage is met and total unrestricted cash and investments exceed the minimum balance targets, staff does not recommend any rate stabilization account transfer.

Based on current Board direction in the 2022-2023 budget and in accordance with the modifications to the Rate Stabilization Account section of MEAN's Financial and Administrative Policies and Guidelines, staff recommends allocating the rate stabilization account balance as follows: $20,100,000 to the Reserve component, $1,900,000 to the Energy component, $5,000,000 to the Fixed Costs component, and $1,313,381 the Other component. The Board has discretion at any time to change what component the funds are in. These allocations can and should be reviewed as part of the budget process and at year-end. The Finance Committee recommended the Board approve the allocation as presented at the Finance Committee meeting on May 18, 2022.

Motion: James DePue moved to approve the following Resolution. Tom Ourada seconded the motion, which carried 33-0-1 on a roll call vote. (Doug Delaune and Dana Youts did not vote)

Ayes: Rod Brestel, Kirby Bridge, Bart Brinkman, Tyler Christoff, Pat Davison, James DePue, Chris DesPlanques, Will Dowis, Edward Dunn, Tom Goulette, Bill Hinton, Duane Hoffman, Dave Hrabanek, Jim Kerr, Todd Kielkopf, Matt Langhorst, Andrew Lee, Bob Lockmon, Robert Messbarger, Brent Nation, Tom Ourada, Mike Palmer, Doug Parker, John Prettyman, Chris Rodman, Todd Rust, Janine Schmidt, James Summers, Adam Suppes, Jeremy Tarr, Darrel Wenzel, Mark Wickard, Randy Woldt

Nayes: None

Abstain: Jeff Kohrs

MEAN BOARD OF DIRECTORS RESOLUTION

WHEREAS, MEAN's 2003 Bond Resolution establishes a rate stabilization account within the General Reserve Fund; and,

WHEREAS, the MEAN Financial and Administrative Policies & Guidelines provide that MEAN will annually evaluate its preliminary Fiscal Year change in net position upon closing of MEAN's annual financial records including all year-end accruals and Fiscal Year transactions and that after evaluation of preliminary results, MEAN may transfer a portion of its preliminary Fiscal Year change in net position into the rate stabilization account or from the rate stabilization account in order to meet MEAN's rate stabilization account funding objective, while maintaining debt service coverage ratios established by bond covenants; and,

WHEREAS, an evaluation of the preliminary Fiscal Year 2021-2022 change in net position indicates a decrease in the amount of approximately $2.1 million; and,

WHEREAS, the Budget for Fiscal Year 2021-2022 included amounts budgeted for transfer monthly into and from the Rate Stabilization Account equal to a total fiscal year transfer amount of $0 for the Rate Stabilization Account, as set forth in the Approved Budget & Rates for Fiscal Year Ended March 31, 2022; and,

WHEREAS, the MEAN Board of Directors does not desire to modify the fiscal year transfer amount into the Rate Stabilization Account as MEAN has met MEAN's rate stabilization account funding objective while maintaining debt service coverage ratios established by bond covenants; and,

WHEREAS, the MEAN Financial and Administrative Policies and Guidelines establish various components of the rate stabilization account to facilitate tracking of the accumulation of and intended use of funds; and,

WHEREAS, the MEAN Board of Directors desires to allocate the rate stabilization account balance as of March 31, 2022, into the various components.

NOW, THEREFORE, BE IT RESOLVED BY the MEAN Board of Directors to allocate the $28,313,381 balance in the Rate Stabilization Account as of March 31, 2022, into the following components: $20,100,000 to the Reserve component, $1,900,000 to the Energy component, $5,000,000 to the Fixed Costs component, with the remaining balance of $1,313,381 to the Other component.

Allocation of a Portion of Fiscal Year 2021 – 2022 Net Revenue to Participants: As presented, and documented in the meeting packet, because debt service coverage is met and total unrestricted cash and investments exceed the minimum balance targets, staff does not recommend any additional charge or a credit to participants.

UPDATES AND REPORTS

Advanced Metering Infrastructure Update
Presenter: Kyle Kaldahl, Budget and Project Manager

Negotiations have been ongoing with the Advanced Metering Infrastructure (AMI) vendor (Itron) and through these negotiations, clarity of NMPP's responsibilities, duties, and service obligations have come into focus. Itron has made it clear that NMPP is the customer of Itron; NMPP members that call Itron will not be recognized as a customer. This brings greater customer service responsibilities to NMPP, which is a challenge but also provides an outstanding opportunity. NMPP has been notified of hardware (meters, routers, etc) cost increases of 20 – 30% as well as an anticipated increase on the software side. Updated price estimates will be brought forward to communities who have signed a letter of intent as soon as updated pricing information is available. Additional updates and detail will be provided to the NMPP Board in June, with NMPP Board approval being requested in September.

Western Area Power Administration (WAPA) Updates
Presenter: Carol Brehm Member Relations Representative

At the border of Utah and Arizona is Lake Powell; Lake Mead is on the Nevada state line. The entire system provides water to 40 million people in multiple states including Nebraska and Colorado. The water level has dropped dramatically from last June to the first of May. Modeling forecasts suggest there is roughly a 1 in 4 chance that they will not be able to produce hydroelectric power by the year 2024.

Nevada, Utah, Arizona, New Mexico, Colorado, and Nebraska rely on hydropower from Glen Canyon Dam at Lake Powell.

CONTRACTS, SETTLEMENT AGREEMENTS, AND GENERAL COUNSEL REPORT
Presenter: Chris Dibbern, General Counsel

Contract Reports: Board members were referred to the meeting packet for a report on the executed contracts listed below, and Appendix E for Bills of Interest.

Other Party	Agreement Name
Public Service Company of CO (PSCo) (Xcel as agent)	Service Agreement for Network Integration Transmission Service (#518, Amendment 3, Update to Network Resource List)
WAPA	Service Agreement for Long Term Firm Point-to-Point Transmission Service (22-SLC-1094) (2 MW South Canal to Montrose 115kV) (CRCM)
Tri-State G & T Association, Inc.	Confirmations Under WSPP Agreement for Purchases of Operating Reserves (February 2022 through June 2022)
ACT Commodities Inc.	Agreement for Purchase and Sale of Renewable Energy Certificates
STX Commodities, LLC	General Agreement (Master Agreement) and Confirmation of Sale and Purchase of Renewable Energy Certificates
WAPA	Metering Agreement (Contract No. 21-RMR-3219)
Neligh	Amendment No. 1 to Agreement Regarding SPP Market Assistance
The Energy Authority, Inc. (TEA)	Third Amended and Restated Task Order 1 to Resource Management Agreement (renewal of Portfolio Management, Regional Transmission Organization (RTO) Market Management and Trading, and Bilateral Trading Services)
MidAmerican Energy Company	JOU Confirmation Letter to Market Services Agreement (Walter Scott Unit 4 and Louisa share)
Western States Power Corporation	FY-2022 Participation in Upper Great Plains Member Financing (Supplemental Funding, Corps of Engineers, Non-Routine Project Funding)
BKD, LLP	Engagement Letter for Audit 2022
Liberty Mutual Insurance Company, Black Hills Wyoming, LLC	Wygen I Reimbursement and Payment Bond (renewal of bond #6621399; credit assurance by Black Hills Wyoming, LLC)

Legislative and Legal Updates:

Federal News: Each state has already received an allocation under the American Rescue Recovery Plan Act which was the economic stimulus plan related to Covid. Additional funds under that Act will continue to be distributed over the next five years however, another item that has already passed is the Infrastructure Investment and Jobs Act. The Infrastructure Investment and Jobs Act has four times the funding provided under the American Rescue Recovery Plan Act. There are a lot of pieces in the Infrastructure Investment and Jobs Act that deal with electricity and members were encouraged to keep their eyes open for opportunities for funding there.

The Supreme Court is expected to make a decision on the role of the EPA's authority this summer. The EPA's role has gone back and forth over the past few administrations. This ruling will decide the extent of the EPA's authority to regulate greenhouse gas emissions.

State News & Updates: In Nebraska MEAN has worked to assist in getting two large water projects approved that would utilize some of the American Rescue Recovery Plan Act funding and would benefit member communities. Colorado has completed the first fast-charging stations for electric vehicles over 6 corridors in their state. Comanche III Power Plant is being closed earlier than planned which relates to earlier discussions today about planning and funding for future expenses. In Iowa, MEAN helped get a bill passed that would prohibit the removal of utility board trustees without cause. Wyoming is a great resource for wind and solar but they are needing transmission so they are looking at big transmission projects in the future.

UPDATES AND REPORTS *(Continued)*
Presenter: Tim Cerveny, Manager of Resources, Transmission and O&M Services

Market & Operations Update Gas prices are having a huge impact in all markets but certainly in SPP and prices are up about $5 from 2021 and investments in gas and infrastructure aren't keeping up with demand. We've had a record wind penetration this year. Availability of resources is having a huge impact.

MEAN has been talking to some of its base-load generators about their ability to hold back operating reserves on our behalf. In the meantime, we are looking at other options.

CLOSING COMMENTS
Bob Poehling, Executive Director/CEO

Bob closed out the meeting by thanking everyone for attending and noting the meeting schedule for the remainder of the year.

The 2022 Meeting schedule is as follows:

August 17, 2022 MEAN Committee Meetings, Kearney, Nebraska
August 18, 2022 MEAN Board of Directors Meeting, Kearney, Nebraska
October 19, 2022 MEAN Finance Committee Virtual Conference
November 16, 2022 MEAN Committee Meetings, Kearney, Nebraska
November 17, 2022 MEAN Board of Directors Meeting, Kearney, Nebraska

ADJOURNMENT

There being no further business, the meeting adjourned at 12:00 p.m.

Prepared by:
Stacy Hendricks
Municipal Energy Agency of Nebraska

Submitted by:
Brad Hans
Director of Wholesale Electric Operations
Municipal Energy Agency of Nebraska

Integrated Resource Plan Review & Recommendation

Shannon Coleman

Supervisor of Resource Planning & Analysis

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Agenda

- Load Forecast Scenarios
- Existing Resource Portfolio
- Future Resource Needs
- Candidate Portfolios
- Market Price Scenarios
- Energy Efficiency/DSM
- Renewable Distributed Generation
- 2050 Vision
- Modeling Results

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Integrated Resource Plan Public Participation

November 2019
- Power Supply Committee + Board of Directors

January 2020
- Power Supply Committee + Board of Directors

August 2020
- Power Supply Committee + Board of Directors

November 2020
- Power Supply Committee + Board of Directors

January 2021
- Power Supply Committee + Board of Directors

May 2021
- Power Supply Committee + Board of Directors

August 2021
- Power Supply Committee + Board of Directors

November 2021
- Power Supply Committee + Board of Directors

January 2022
- Power Supply Committee + Board of Directors

April 2022 Workshop

January 2021 IRP Survey

September 2021 Renewable Energy Survey



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Integrated Resource Plan Progress

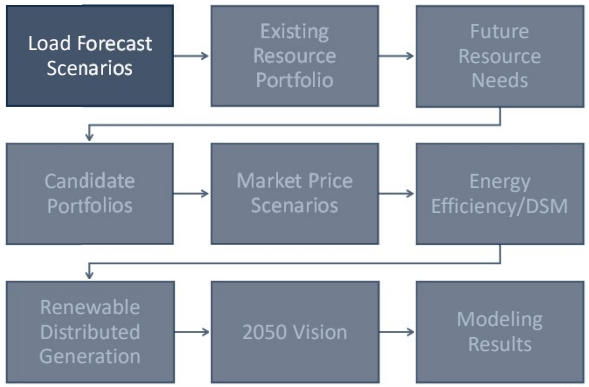
- Upcoming Action Items + Opportunities for Public Participation:
  - April – Draft IRP Report Sent to Communities for Review
  - April – Workshop to Review Results and Prepare for Recommendation
  - **May Meeting – PSC Recommendation and Board Approval**
  - July 1 – Submittal to WAPA

Inputs and Assumptions → Resource Portfolios → Resource Portfolio Analysis → Optimal Portfolio → Action Plan

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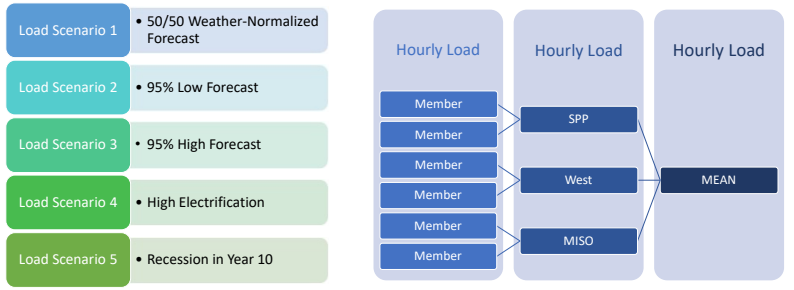
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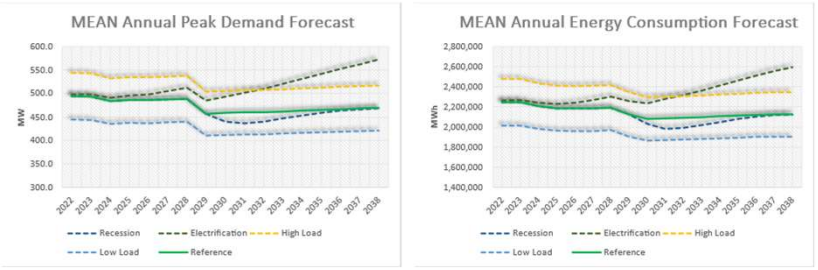
Load Forecast Scenarios



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Load Scenarios

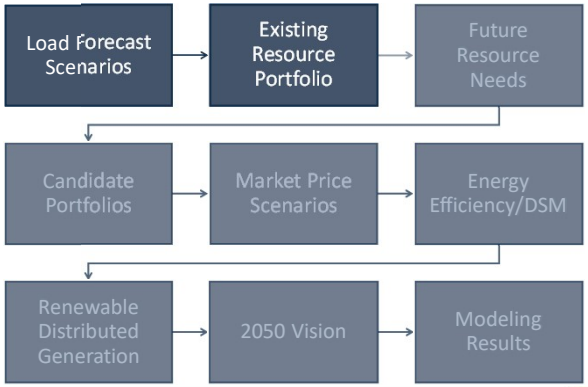


- All 5 Scenarios for Each Region – Demand and Energy

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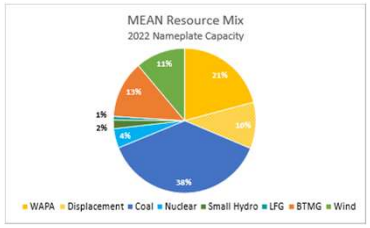
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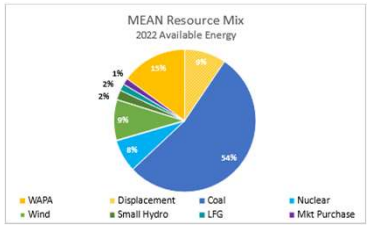


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MEAN Capacity and Energy

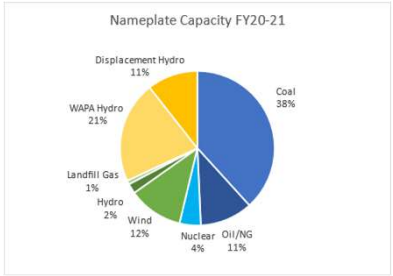


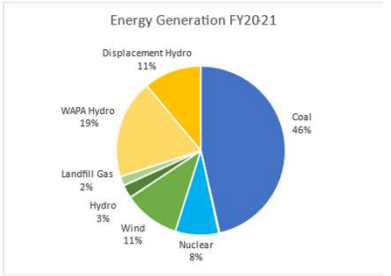


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Actuals FY20-21



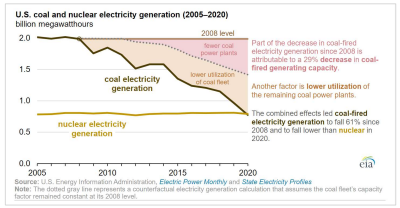


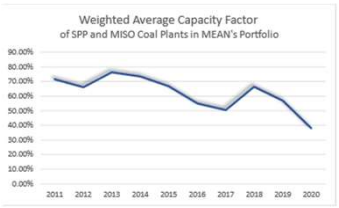
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Available Energy vs. Dispatched Energy

- Renewable Integration Results in Lower Dispatch of Fossil Fuel Units

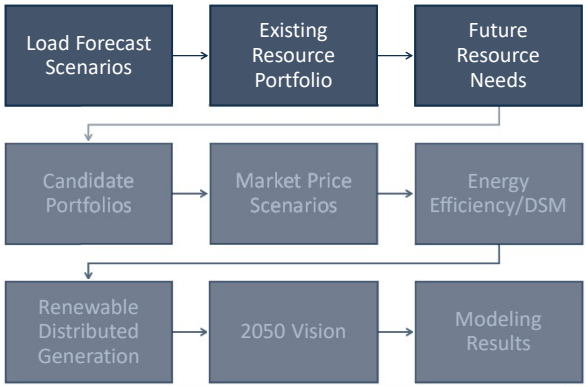




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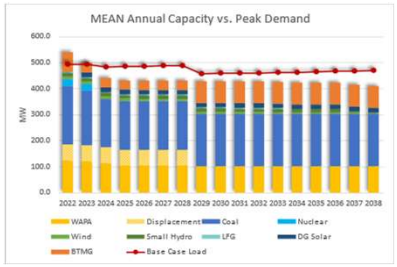
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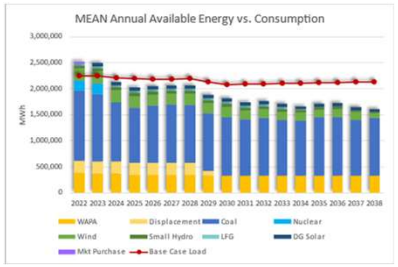


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MEAN Load and Capability

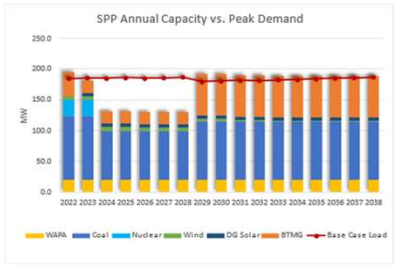


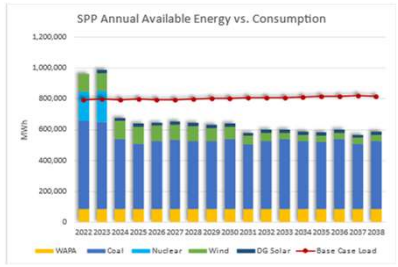


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SPP Load and Capability

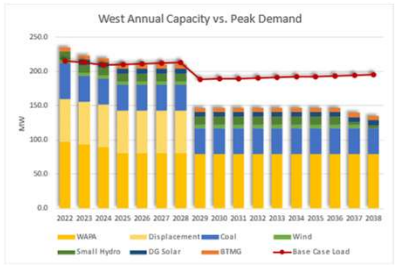


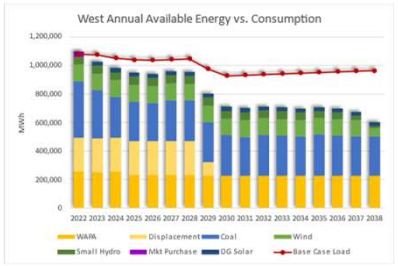


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West Load and Capability

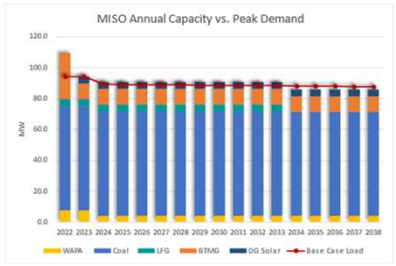


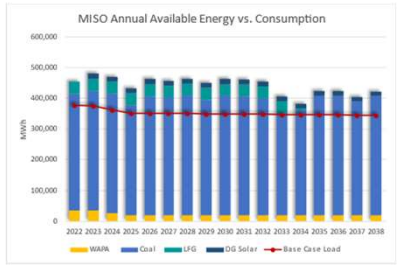


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MISO Load and Capability

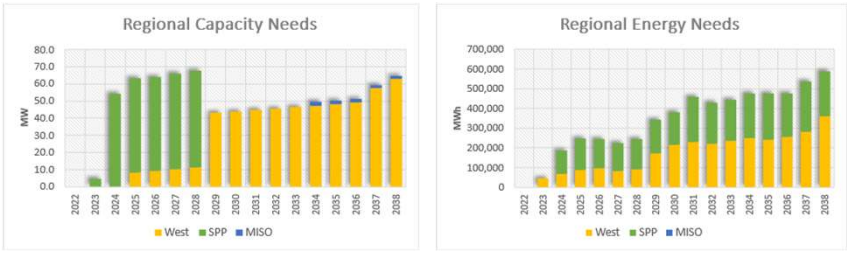




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Resource Needs – Capacity and Energy



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Agenda

- Load Forecast Scenarios
- Existing Resource Portfolio
- Future Resource Needs
- Candidate Portfolios
- Market Price Scenarios
- Energy Efficiency/DSM
- Renewable Distributed Generation
- 2050 Vision
- Modeling Results

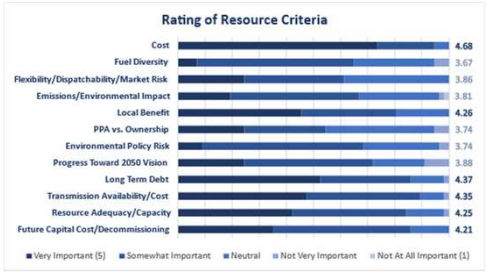
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Phase I Evaluation

	Supply-Side Resource Options
Fossil Fuel	Natural Gas Combustion Turbine
	Natural Gas Combined Cycle*
	Reciprocating IC Engine
	Co-Fire (retrofit existing)
Carbon Neutral	Small Modular Nuclear
	Nuclear Large Scale
	Geothermal
	Biomass (100%)
	Landfill Gas/ MSW
	Hydropower
	Wind
	Utility Solar
	Community Solar
	Green Hydrogen
	Fuel Cell
Storage	Battery Storage
	Solar + Storage
	Pumped Hydropower

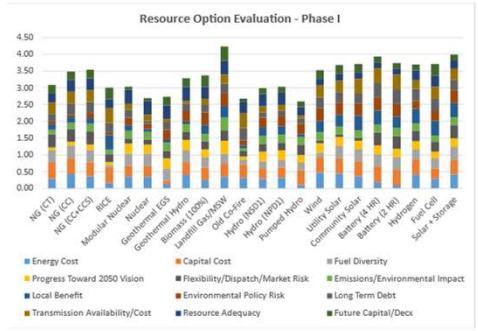
* with and without CCS



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Phase I Evaluation



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Candidate Portfolios

- Portfolio #1 NGCC
- Portfolio #1A NGCC – CCS
- Portfolio #2 LFG
- Portfolio #3 MSW
- Portfolio #4 Wind
- Portfolio #5 Solar
- Portfolio #6 NG Fuel Cell
- Portfolio #7 Hydropower
- Portfolio #8 Wind + Battery
- Portfolio #9 Solar + Battery
- Portfolio #10 Extend CNS

Size New Resource

- Energy Need in Region by Year
- Capacity Factor of New Resource

Size Additional Capacity

- Capacity Need in Region by Year
- Capacity Factor of New Resource
- Member Gen or NGCC

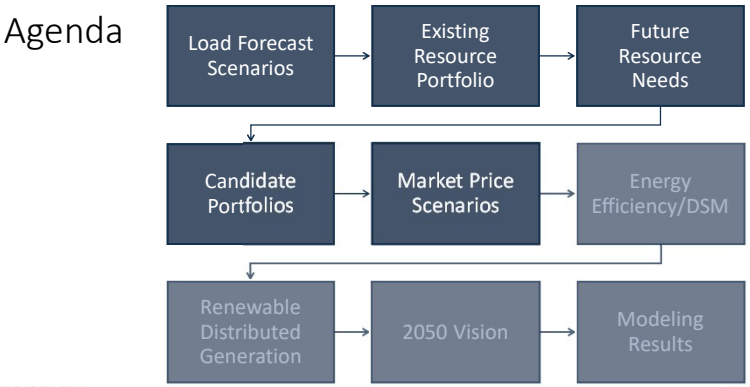
Portfolio Model

- New Resource
- \+
- Additional Capacity
- =
- Modeled Resource

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Agenda



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Pricing Scenarios - Sensitivity

- Independent Variables
  - System Load
  - NG Price
  - CO_2 Tax/Limit
- Dependent Variables
  - Market Price
  - Fuel Adjustment
  - Generation
- Allows Measurement of Risk/Volatility Related to Future Conditions

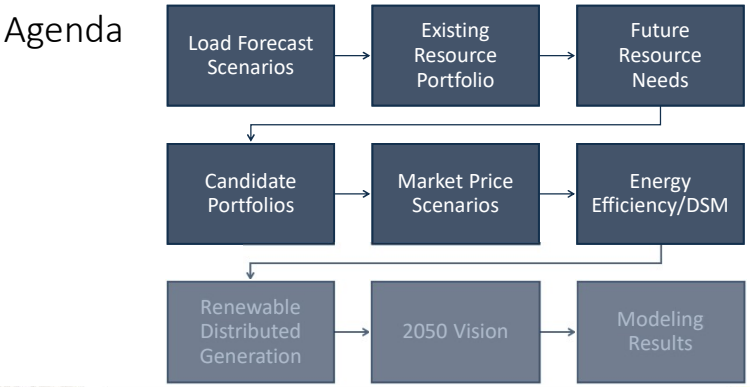
Scenario	System Load	NG Pricing	CO_2 Tax
Scenario 1: Reference	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 2: High Load	High Load	Base Case NG	No CO_2 Tax
Scenario 3: Low Load	Low Load	Base Case NG	No CO_2 Tax
Scenario 4: High NG	Base Case Load	High NG	No CO_2 Tax
Scenario 5: Low NG	Base Case Load	Low NG	No CO_2 Tax
Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

*Zero Carbon Scenario assumes regulatory conditions that allow no future addition of carbon emitting resources.

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Agenda

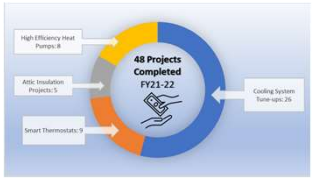


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Existing Demand Side Management

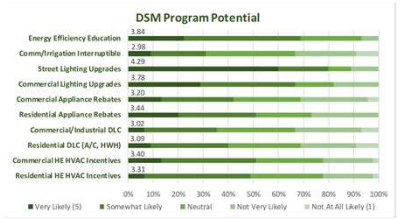
- Residential Smart Thermostats
- Residential Attic Insulation
- Residential Cooling System Tune-Up
- Residential High Efficiency Heat Pump
- Commercial LED Lighting Program
  - Annual Savings = 1,247 MWh energy + 249 kW demand
- MEAN Community Programs
  - 33 Programs in 17 Communities
  - Annual Savings = 2,635 MWh energy + 4.028 MW demand



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Demand Side Management Analysis



TEST	BENEFITS	COSTS
Utility Cost Test	Utility Avoided Costs	• Program Administration Costs • Incentives/Rebates Paid
Participant Cost Test	Net Bill Savings	• Incremental Cost of Investment (Net of Incentive/Rebate)
Total Resource Cost Test	Utility Avoided Costs	• Program Administration Costs • Incremental Cost of Investment

DSM PROGRAM	UTILITY COST TEST (Benefit/Cost)	PARTICIPANT COST TEST (Benefit/Cost)	TOTAL RESOURCE COST TEST (Benefit/Cost)
Room Air Conditioner Rebate	0.0310	1.2112	0.0365
Central Air Conditioner Incentive	0.0706	0.0931	0.0396
Refrigerator Rebate	0.0246	0.0468	0.0147
Freezer Rebate	0.1473	0.8461	0.1831
Heat Pump Water Heater Rebate	0.2425	0.5353	0.2179

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Future Demand Side Management

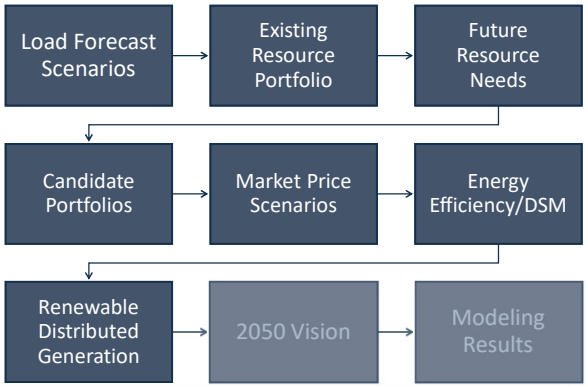
- Continuation of MEAN Programs
- Continuation of Community Programs
- Energy Efficiency Education
- Residential EV Chargers
- Advanced Metering Infrastructure
- Battery Storage



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Agenda

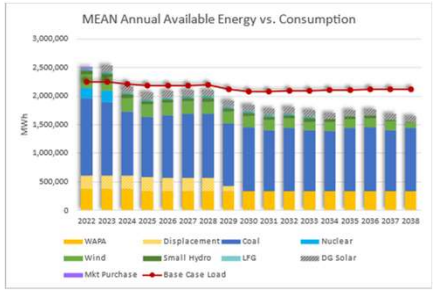


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Distributed Generation

- Renewable Distributed Generation Policy
- Potential to Decrease Future Energy Need
  - Offset Other Supply Side Resources
  - Local Benefit
  - 2050 Vision
  - Geographic Diversity



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Distributed Generation

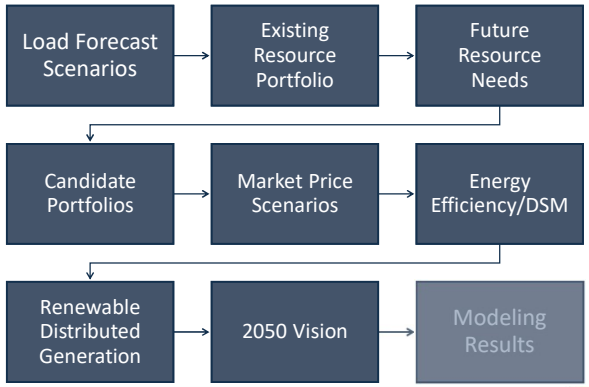
- Community Solar RFP
  - 27.4 MW
  - Competitive Pricing with Aggregation
- Other Technologies in Future?
- Collaboration between Communities
- MEAN-Contracted Resources Located at Member Sites

Community	Annual Production (MWh)	Nameplate (kW-AC)	Nameplate (kW-DC)
Alliance NE	5,454,734	2,400	3,069
Ansley NE	209,268	120	119
Crete NE	3,360,018	1,600	1,950
Stuart NE	273,799	175	158
Waverly IA	6,673,710	3,400	4,020
Delta CO	2,056,087	875	1,017
Pender NE	290,685	175	166
Sergeant Bluff IA	1,134,240	600	691
Aspen CO	2,243,838	1,000	1,209
Gering NE	2,279,099	1,000	1,238
Indianola IA	6,545,027	3,400	4,090
Oxford NE	251,997	120	130
Sidney NE	3,697,157	1,600	2,036
Fort Morgan CO	9,816,612	4,200	5,040
Imperial NE	1,196,113	525	662
Denver IA	712,813	350	413
Wray CO	619,432	350	310
Carlisle IA	972,927	525	617
Paxton NE	262,906	120	147
Curtis NE	605,201	350	356
Total	48,655,662	22,885	27,438

Pending receipt of executed PPA contracts.

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Agenda



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2050 Vision

- Carbon Neutral Resource Portfolio by 2050
- Portfolios that Reduce Carbon Emissions
- Portfolio Model Must Include Accounting of Carbon Emissions to Compare Options
  - Scenario 1 vs Scenario 9
  - Scenario 4 vs Scenario 7
  - Scenario 5 vs Scenario 8
  - Metric of Carbon Intensity

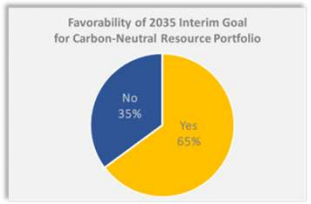


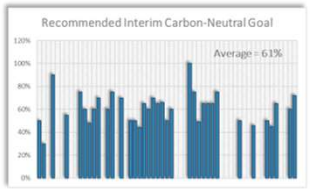
Scenario	System Load	NG Pricing	CO_2 Tax
Scenario 1: Reference	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 2: High Load	High Load	Base Case NG	No CO_2 Tax
Scenario 3: Low Load	Low Load	Base Case NG	No CO_2 Tax
Scenario 4: High NG	Base Case Load	High NG	No CO_2 Tax
Scenario 5: Low NG	Base Case Load	Low NG	No CO_2 Tax
Scenario 6: Zero Carbon*	Base Case Load	Base Case NG	No CO_2 Tax
Scenario 7: High NG CO_2	Base Case Load	High NG	CO_2 Tax
Scenario 8: Low NG CO_2	Base Case Load	Low NG	CO_2 Tax
Scenario 9: Carbon Tax	Base Case Load	Base Case NG	CO_2 Tax

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2050 Vision

- 2035 Interim Goal
  - Following Contract for Resources in 2023-24
  - Updated Projection of Non-Carbon Energy Portfolio
  - Analysis of Cost Impact
  - Power Supply Committee to Study and Make Recommendation





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Agenda

- Load Forecast Scenarios
- Existing Resource Portfolio
- Future Resource Needs
- Candidate Portfolios
- Market Price Scenarios
- Energy Efficiency/DSM
- Renewable Distributed Generation
- 2050 Vision
- Modeling Results

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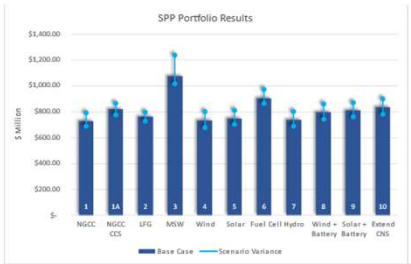
Integrated Resource Plan Modeling Process

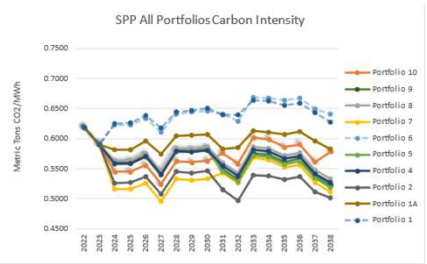
- Hourly Load Forecast
- Hourly Resource Generation (Proposed)
- Resource Cost and Revenue (Proposed)
- Hourly Market Price Forecast
- New Resource Parameters
- Hourly Dispatch Cost/Revenue Model
- Hourly Resource Generation (Existing)
- Resource Cost and Revenue (Existing)
- Total Revenue Requirement

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SPP Portfolio Results



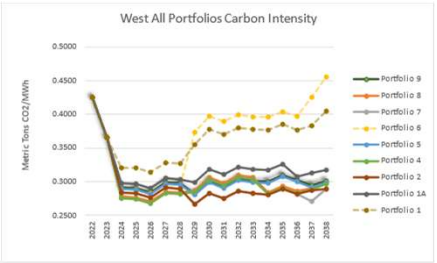


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West Portfolio Results





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Summary Results

SPP Summary Modeling Results

Portfolio #	Resource	15-Year Revenue Requirement ($ Millions)	Price Variance ($/MWh)	Carbon Intensity (tons/MWh)
Portfolio 1	NGCC	$ 726.24	$ 4.53	1.49%
Portfolio 1A	NGCC CCS	$ 819.37	$ 3.23	-5.76%
Portfolio 2	LFG	$ 761.77	$ 2.26	-18.85%
Portfolio 3	MSW	$ 1,073.85	$ 10.80	45.60%
Portfolio 4	Wind	$ 735.02	$ 4.40	-14.80%
Portfolio 5	Solar	$ 749.47	$ 4.05	-16.20%
Portfolio 6	Fuel Cell	$ 906.79	$ 4.38	3.57%
Portfolio 7	Hydro	$ 739.81	$ 4.15	-17.40%
Portfolio 8	Wind + Battery	$ 797.68	$ 4.39	-13.90%
Portfolio 9	Solar + Battery	$ 810.16	$ 4.08	-15.50%
Portfolio 10	Extend CNS	$ 838.04	$ 4.36	-6.50%

West Summary Modeling Results

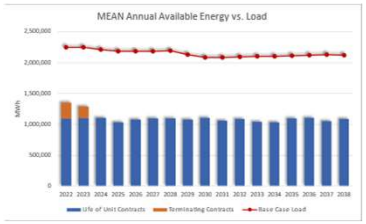
Portfolio #	Resource	15-Year Revenue Requirement ($ Millions)	Price Variance ($/MWh)	Carbon Intensity (tons/MWh)
Portfolio 1	NGCC	$ 580.50	$ 10.22	-4.90%
Portfolio 1A	NGCC CCS	$ 728.67	$ 8.80	-25.50%
Portfolio 2	LFG	$ 672.00	$ 7.73	-32.20%
Portfolio 3	MSW	$ 946.46	$ 14.88	67.70%
Portfolio 4	Wind	$ 629.95	$ 7.77	-30.30%
Portfolio 5	Solar	$ 597.63	$ 8.66	-29.90%
Portfolio 6	Fuel Cell	$ 850.59	$ 9.93	7.00%
Portfolio 7	Hydro	$ 556.79	$ 7.69	-32.20%
Portfolio 8	Wind + Battery	$ 700.20	$ 7.84	-29.80%
Portfolio 9	Solar + Battery	$ 681.65	$ 8.83	-29.40%

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Public Comment Response

- Reliance on Coal
  - Contracts Initiated Decades Ago
  - Minority Owner, Little Control
  - Life of Unit Contracts
  - Contract Payment
  - Breach of Contract
  - No Retirement Announcements
- RTO = Lower Dispatch
- Grid Operators Delaying Closures
- Fuel Switching







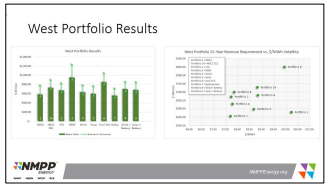


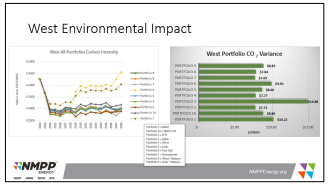
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Public Comment Response

- Dismissive of Renewable Energy
  - Portfolio #1 NGCC
  - Portfolio #1A NGCC – CCS
  - Portfolio #2 LFG
  - Portfolio #3 MSW
  - Portfolio #4 Wind
  - Portfolio #5 Solar
  - Portfolio #6 NG Fuel Cell
  - Portfolio #7 Hydropower
  - Portfolio #8 Wind + Battery
  - Portfolio #9 Solar + Battery
  - Portfolio #10 Extend CNS
  - Kimball Wind
  - CR Energy
  - Wessington Wind Repower
  - NextEra Solar
  - CNPPID Hydropower
  - WAPA Displacement



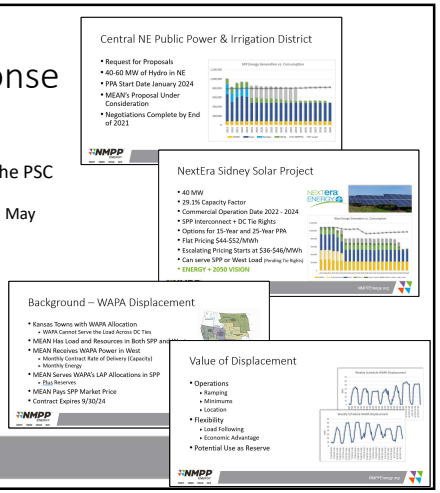


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Public Comment Response

- Lack of Transparency on Resources
  - All Resource Exploration Presented to the PSC and Board
    - Nov 2019, Jan 2020, Aug 2020, Jan 2021, May 2021, Nov 2021, Jan 2022, April 2022
  - WAPA Displacement
    - Board Approval of Extension
  - CNPPID Hydro
    - Board Approval of Proposal
  - NextEra Solar
- "Phantom Plant"
  - Entire IRP is Future Resource Analysis
  - No Discussions with NG Plant Owners



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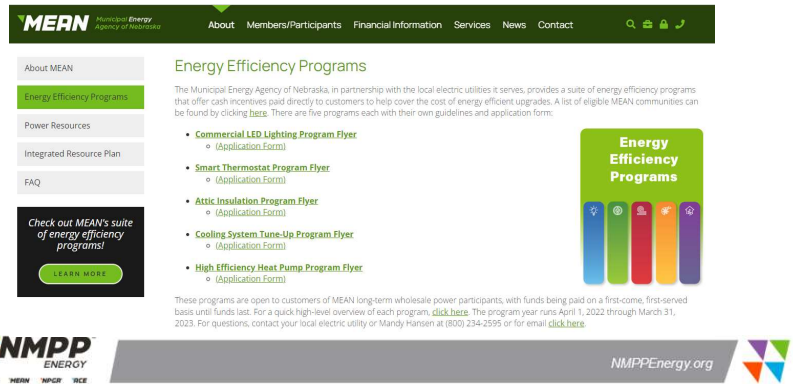
Public Comment Response

- Energy Efficiency and Demand Side Management
  - *"…there is no information on what efficiency programs were assessed and no cost-benefit calculations included in the IRP."*
  - Section XIII Demand Side Management Evaluation: Pages 170-177
  - Results of Cost-Benefit Calculations Displayed in Figure XIII-2 through Figure XIII-6
  - Details of Cost-Benefit Analysis Included in Appendix C
  - MEAN Conducts Several Very Successful DSM Programs
    - Previous Analysis Determined Programs Resulting in Highest Savings
    - Actual Annual Savings Shown in Section VIII Existing Demand Side Management
  - EE/DSM Cannot Supply All MEAN's Power Needs

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Public Comment Response



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Public Comment Response

- Public Review Opportunity
  - 2 Year Process
  - 17 Past Public Meetings
    - Each Publicly Noticed
    - Each Listed IRP on Agenda
    - Several with Remote Attendance Option
    - Several with Alternate Attendance Location
  - Workshop Allowed 10 Commenters, 4 Attended
  - Workshop Allowed 3 Minute Comment Time, All Commenters <3 Minutes
  - Most Information in the Report Previously Presented and Discussed



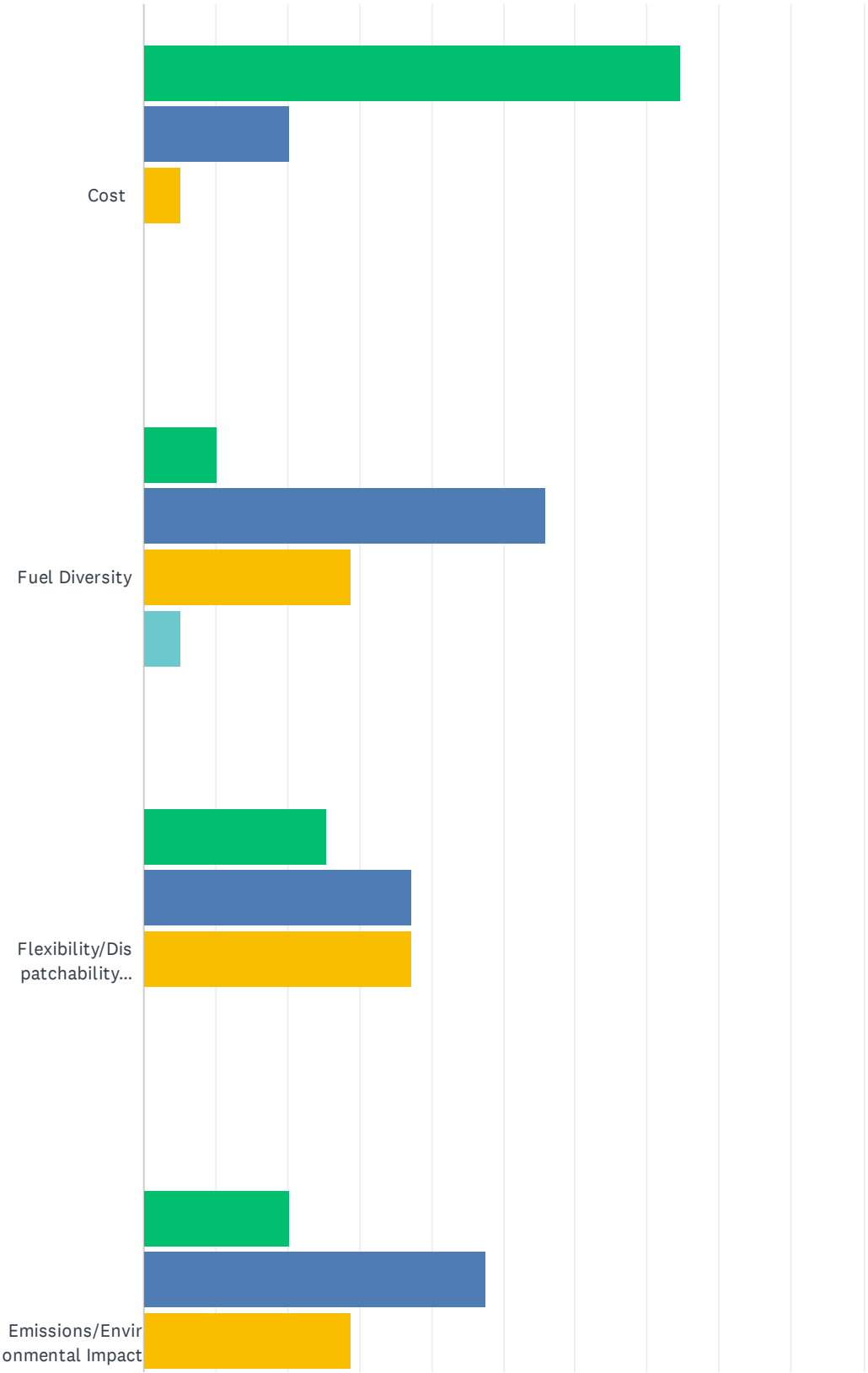


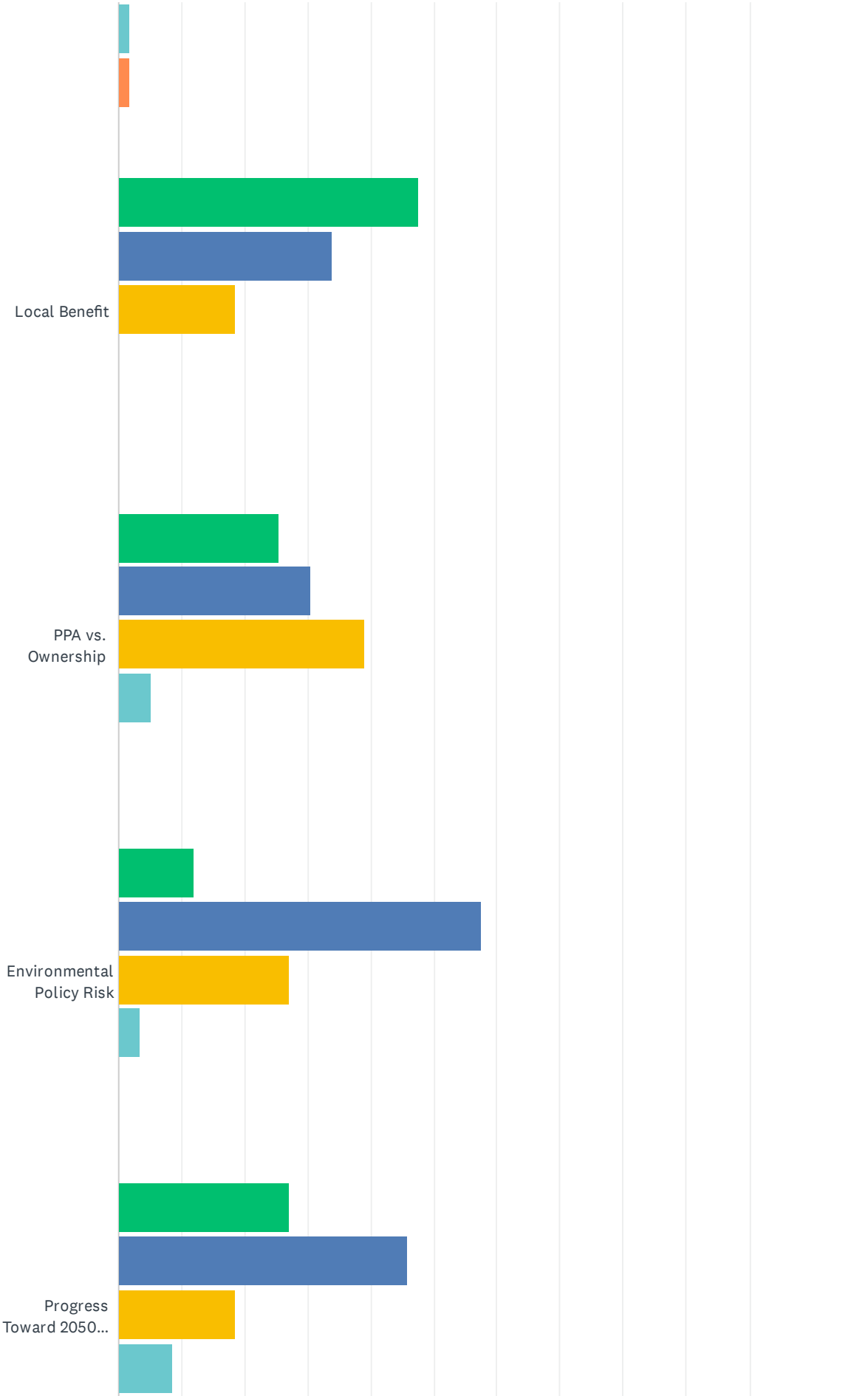
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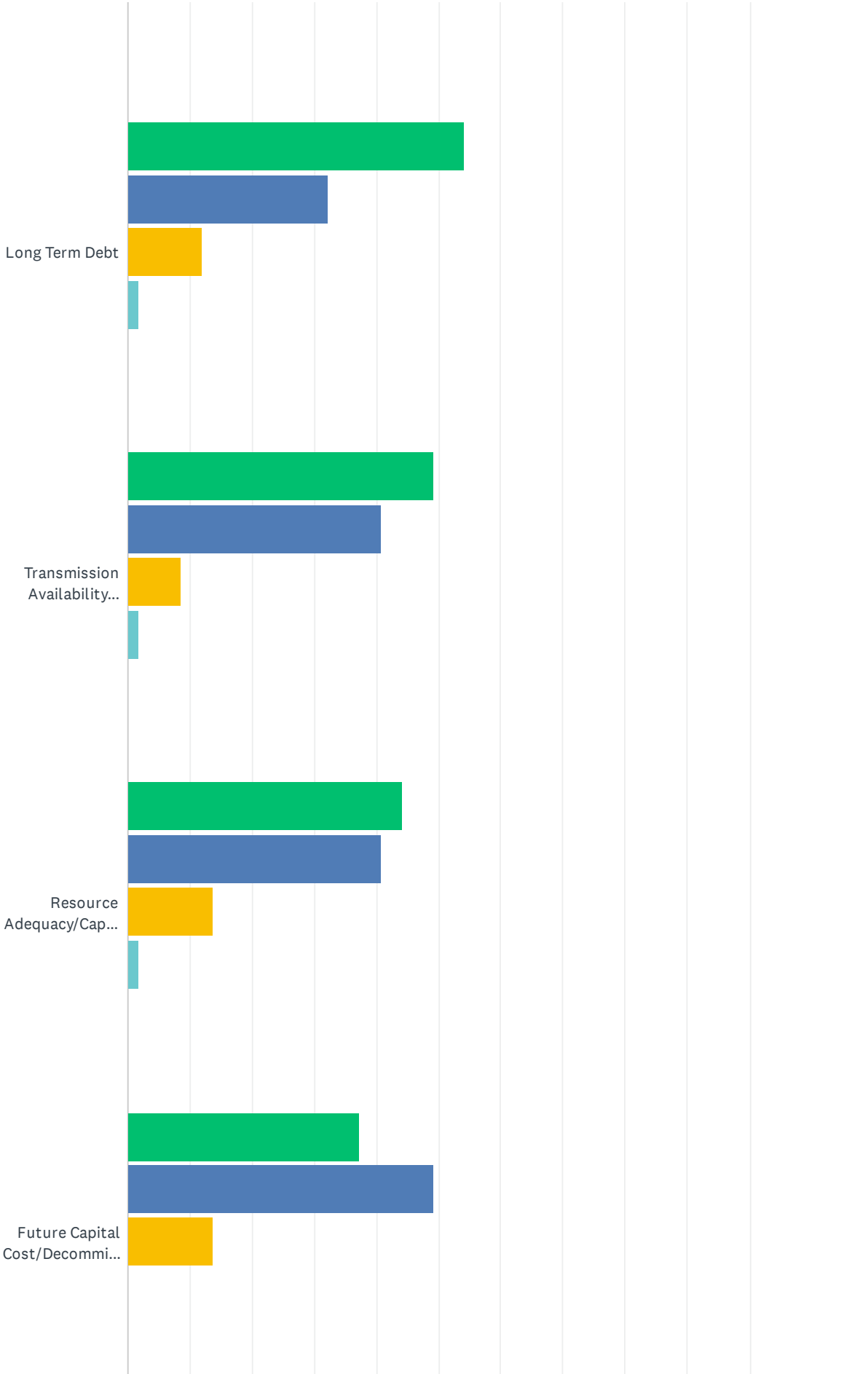
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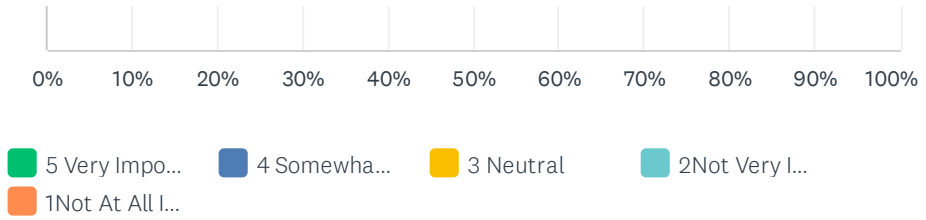
Q2 In the context of planning for future resource needs to meet load, please rank the following criteria:

Answered: 59 Skipped: 0




Local Benefit
PPA vs. Ownership
Environmental Policy Risk
Progress Toward 2050...

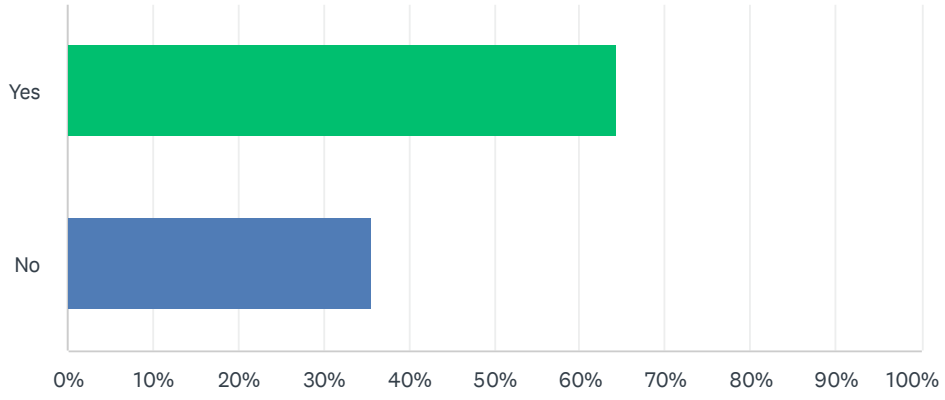

Long Term Debt
Transmission Availability...
Resource Adequacy/Cap...
Future Capital Cost/Decommi...



	5 VERY IMPORTANT	4 SOMEWHAT IMPORTANT	3 NEUTRAL	2NOT VERY IMPORTANT	1NOT AT ALL IMPORTANT	TOTAL
Cost	74.58% 44	20.34% 12	5.08% 3	0.00% 0	0.00% 0	59
Fuel Diversity	10.17% 6	55.93% 33	28.81% 17	5.08% 3	0.00% 0	59
Flexibility/Dispatchability/Market Risk(Includes Curtailment Risk)	25.42% 15	37.29% 22	37.29% 22	0.00% 0	0.00% 0	59
Emissions/Environmental Impact	20.34% 12	47.46% 28	28.81% 17	1.69% 1	1.69% 1	59
Local Benefit	47.46% 28	33.90% 20	18.64% 11	0.00% 0	0.00% 0	59
PPA vs. Ownership	25.42% 15	30.51% 18	38.98% 23	5.08% 3	0.00% 0	59
Environmental Policy Risk	11.86% 7	57.63% 34	27.12% 16	3.39% 2	0.00% 0	59
Progress Toward 2050 Vision	27.12% 16	45.76% 27	18.64% 11	8.47% 5	0.00% 0	59
Long Term Debt	54.24% 32	32.20% 19	11.86% 7	1.69% 1	0.00% 0	59
Transmission Availability and Cost	49.15% 29	40.68% 24	8.47% 5	1.69% 1	0.00% 0	59
Resource Adequacy/Capacity	44.07% 26	40.68% 24	13.56% 8	1.69% 1	0.00% 0	59
Future Capital Cost/Decommissioning	37.29% 22	49.15% 29	13.56% 8	0.00% 0	0.00% 0	59

Q3 Should MEAN establish interim goals in the progress toward the 2050 Vision?

Answered: 59 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	64.41%	38
No	35.59%	21
TOTAL		59

Q4 If "Yes," what would you recommend for an interim 2035 goal (as carbon-free percentage of portfolio)? MEAN's resource portfolio is currently 44% carbon free in terms of annual energy generation as of FY19-20.

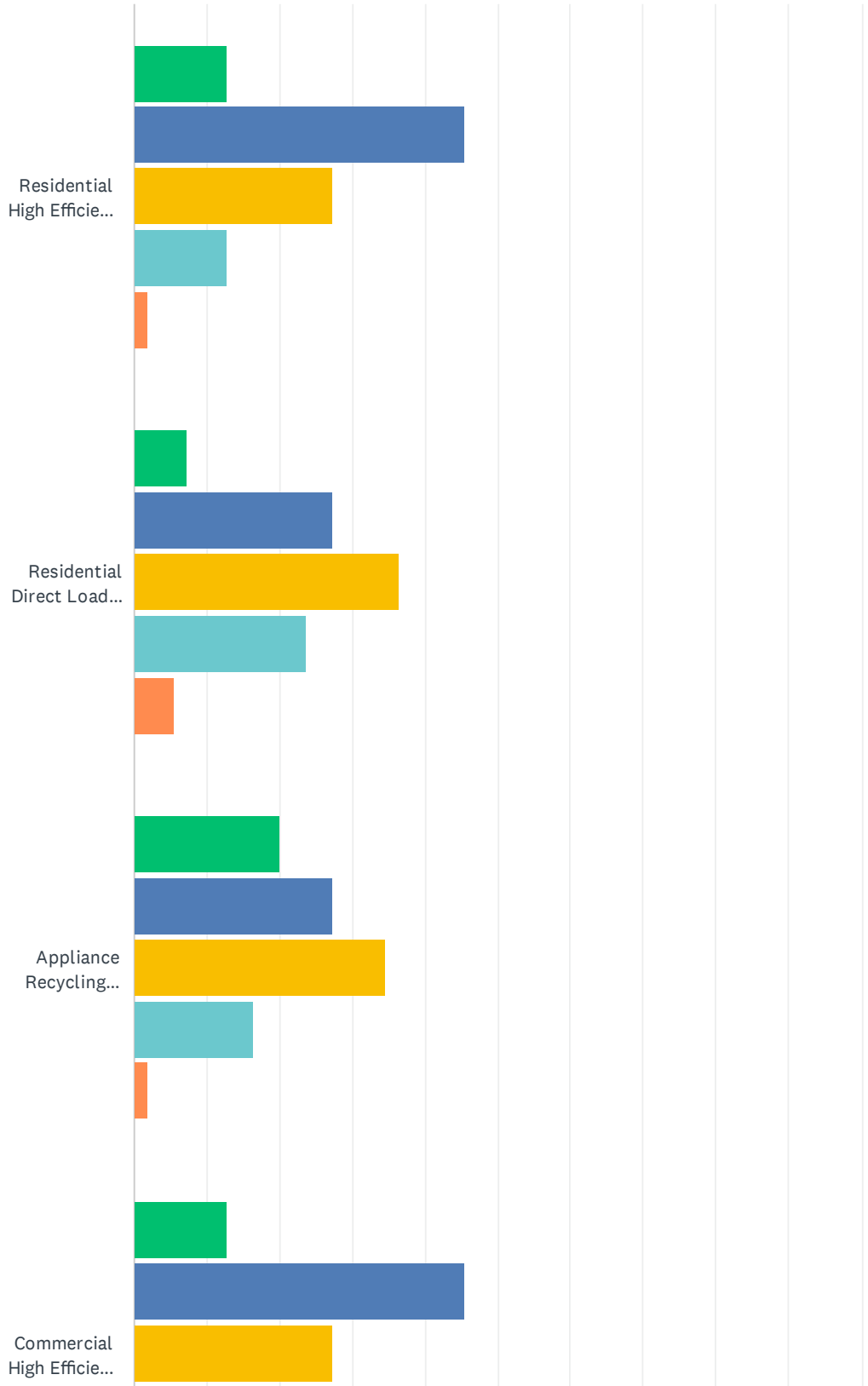
Answered: 39 Skipped: 20

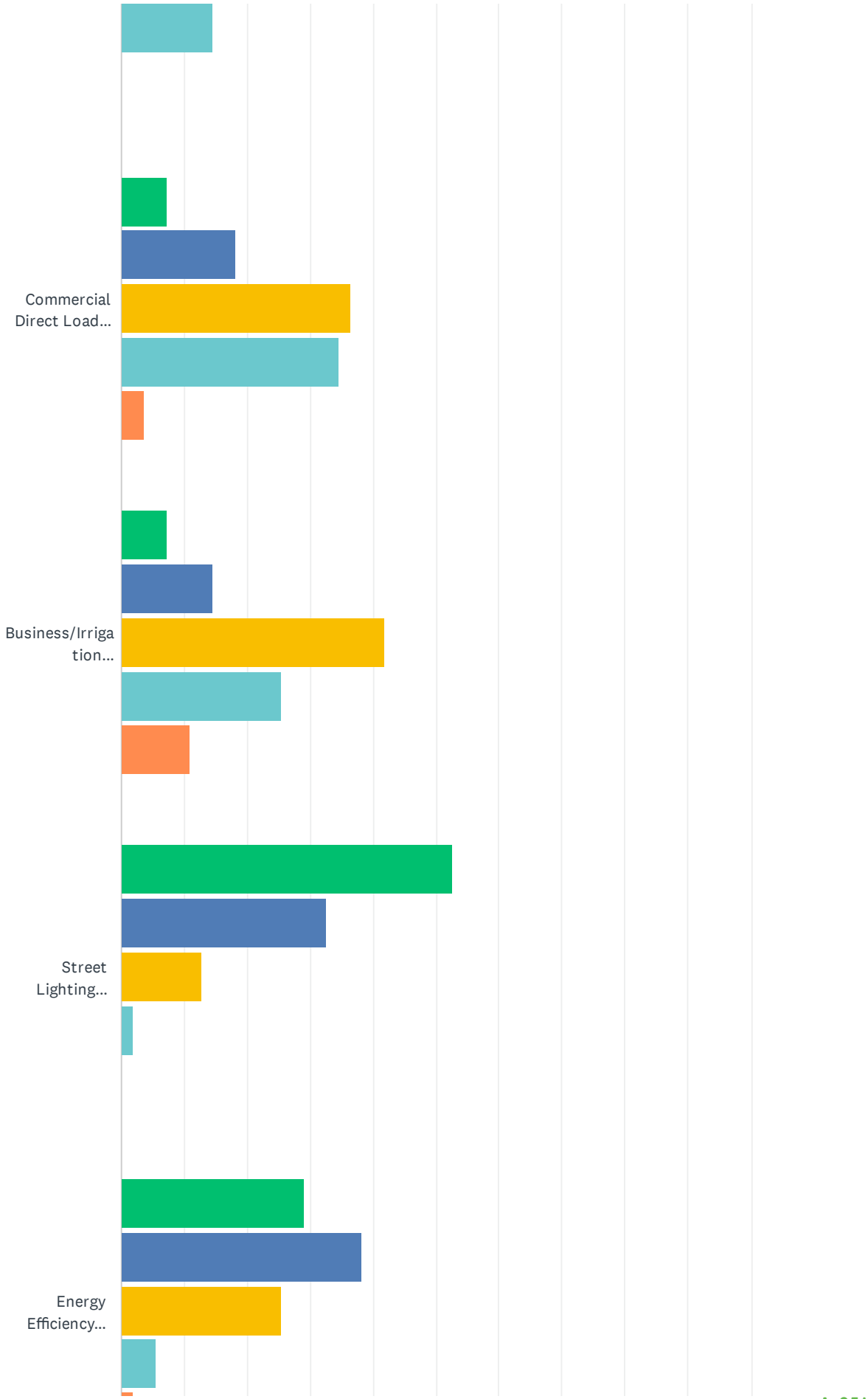
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1	50%	3/5/2021 8:44 AM
2	49	3/2/2021 9:20 AM
3	70%	2/23/2021 3:59 PM
4	70	2/19/2021 3:18 PM
5	?	2/15/2021 8:11 AM
6	60%	2/12/2021 9:44 AM
7	75	2/11/2021 8:24 PM
8	50	2/11/2021 12:07 PM
9	60%	2/11/2021 8:45 AM
10	60%	2/10/2021 4:43 PM
11	60%	2/10/2021 4:10 PM
12	55%	2/10/2021 3:58 PM
13	60	2/10/2021 3:46 PM
14	100	2/10/2021 3:00 PM
15	44%	2/10/2021 2:46 PM
16	46%	2/10/2021 2:17 PM
17	50	2/10/2021 2:02 PM
18	50%	2/10/2021 2:01 PM
19	70	2/10/2021 2:01 PM
20	i	2/10/2021 2:00 PM
21	90%	2/10/2021 1:55 PM
22	65%	2/9/2021 9:36 AM
23	65%	2/5/2021 8:47 AM
24	65%	2/4/2021 9:10 PM
25	75%	1/29/2021 10:14 AM
26	48%	1/29/2021 9:57 AM
27	72	1/28/2021 4:08 PM
28	60%	1/28/2021 3:08 PM
29	60%	1/27/2021 3:10 PM

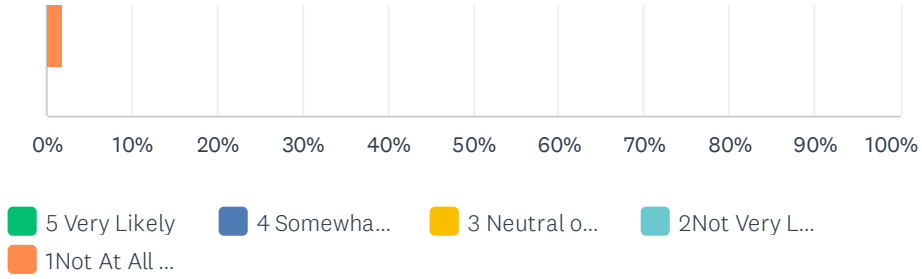
30	30%	1/27/2021 1:21 PM
31	66%	1/27/2021 9:34 AM
32	65%	1/27/2021 9:11 AM
33	50	1/26/2021 5:45 PM
34	50%	1/26/2021 2:46 PM
35	65	1/26/2021 1:40 PM
36	75%	1/26/2021 1:26 PM
37	45	1/26/2021 12:38 PM
38	65%	1/26/2021 12:24 PM
39	75%	1/26/2021 12:18 PM

Q5 Please grade the following Demand Side Management programs on the likelihood of implementation in your community:

Answered: 55 Skipped: 4



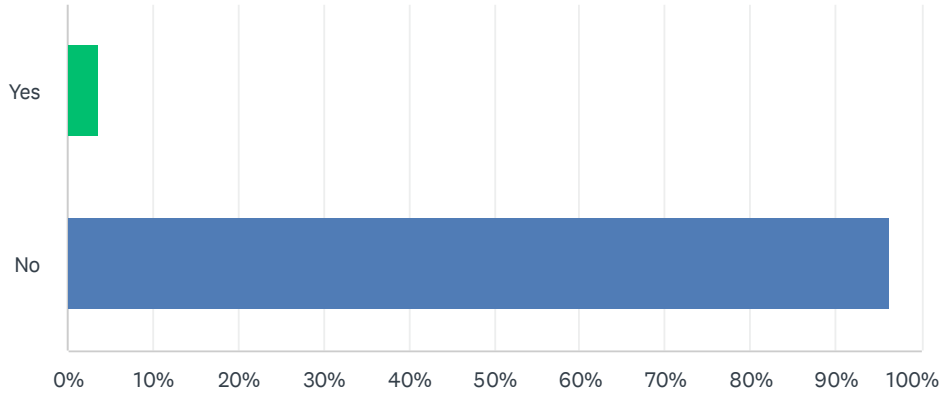

Commercial Direct Load...
Business/Irrigation...
Street Lighting...
Energy Efficiency...



	5 VERY LIKELY	4 SOMEWHAT LIKELY	3 NEUTRAL OR N/A	2NOT VERY LIKELY	1NOT AT ALL LIKELY	TOTAL
Residential High Efficiency HVAC Incentives	12.73% 7	45.45% 25	27.27% 15	12.73% 7	1.82% 1	55
Residential Direct Load Control (A/C, Water Heaters)	7.27% 4	27.27% 15	36.36% 20	23.64% 13	5.45% 3	55
Appliance Recycling Incentive	20.00% 11	27.27% 15	34.55% 19	16.36% 9	1.82% 1	55
Commercial High Efficiency HVAC Incentives	12.73% 7	45.45% 25	27.27% 15	14.55% 8	0.00% 0	55
Commercial Direct Load Control	7.27% 4	18.18% 10	36.36% 20	34.55% 19	3.64% 2	55
Business/Irrigation Interruptible Service	7.27% 4	14.55% 8	41.82% 23	25.45% 14	10.91% 6	55
Street Lighting Upgrades	52.73% 29	32.73% 18	12.73% 7	1.82% 1	0.00% 0	55
Energy Efficiency Education	29.09% 16	38.18% 21	25.45% 14	5.45% 3	1.82% 1	55

Q2 Has your community established a local renewable or carbon-free energy target (separate from MEAN's 2050 Vision)?

Answered: 54 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	3.70%	2
No	96.30%	52
TOTAL		54

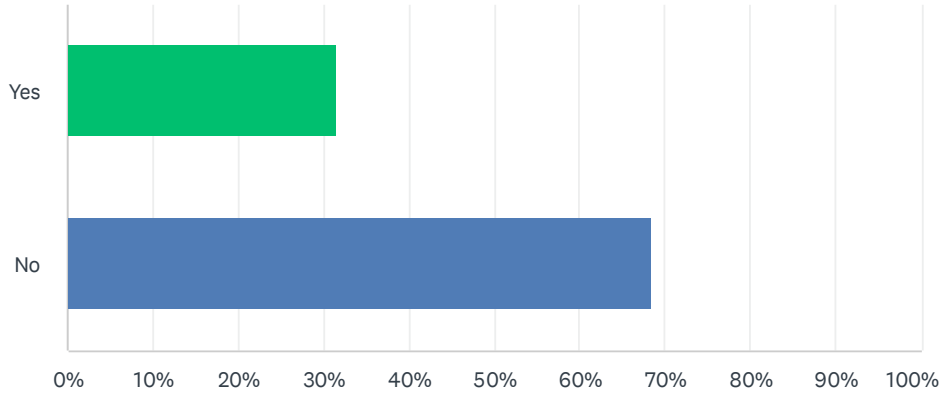
Q3 If yes, please state the year and percentage of carbon-free energy stated in your target:

Answered: 2 Skipped: 52

#	RESPONSES	DATE
1	100% by 2023	9/1/2021 2:27 PM
2	2015, 100%	8/31/2021 2:28 PM

Q4 Is your community interested in increasing the amount of carbon-free energy in your resource mix?

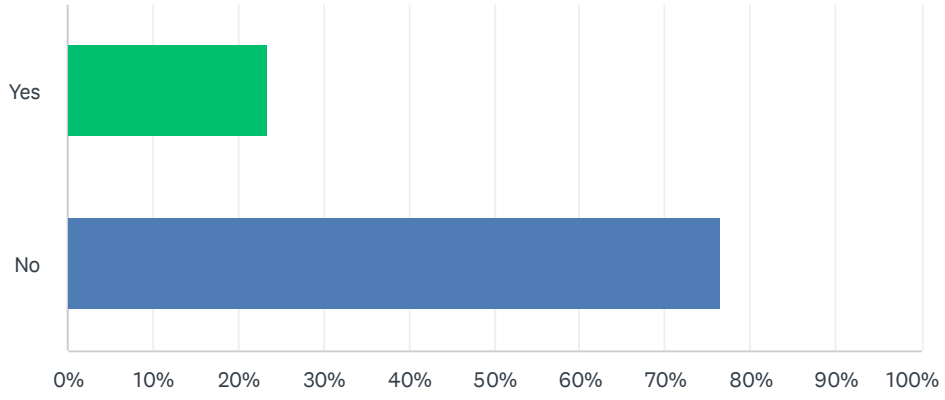
Answered: 54 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	31.48%	17
No	68.52%	37
TOTAL		54

Q5 If yes, would your community be willing to pay a higher wholesale price for an increase in carbon-free energy?

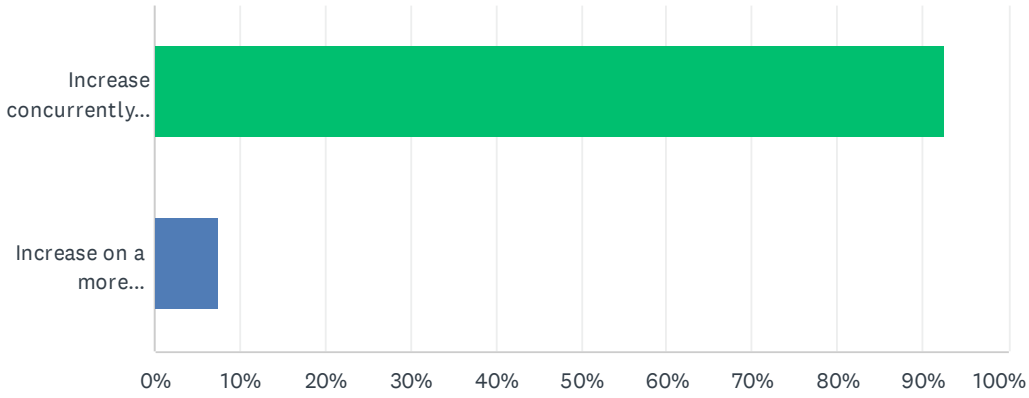
Answered: 17 Skipped: 37



ANSWER CHOICES	RESPONSES	
Yes	23.53%	4
No	76.47%	13
TOTAL		17

Q6 Does your community prefer to increase the carbon-neutral portion of your resource mix concurrently with MEAN's overall percentage, OR does your community prefer to increase the carbon-neutral portion of your resource mix on a more accelerated schedule, knowing this could incur higher cost?

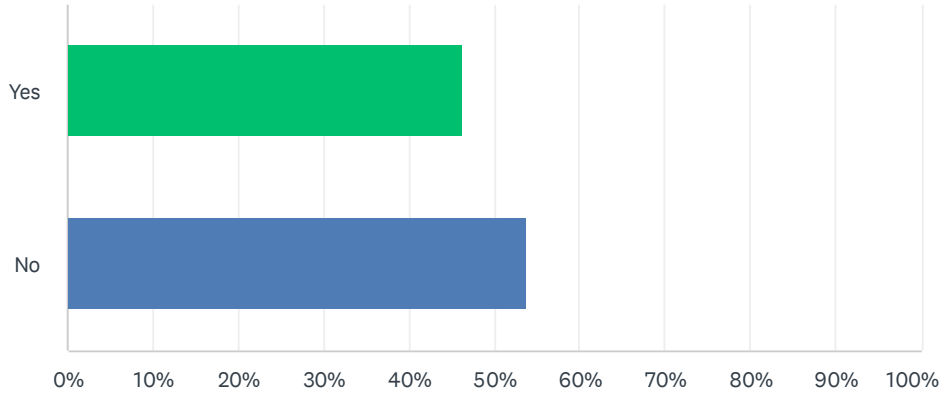
Answered: 54 Skipped: 0



ANSWER CHOICES	RESPONSES	
Increase concurrently with MEAN's overall percentage	92.59%	50
Increase on a more accelerated schedule	7.41%	4
TOTAL		54

Q7 Is your community interested in the installation of electric vehicle charging infrastructure?

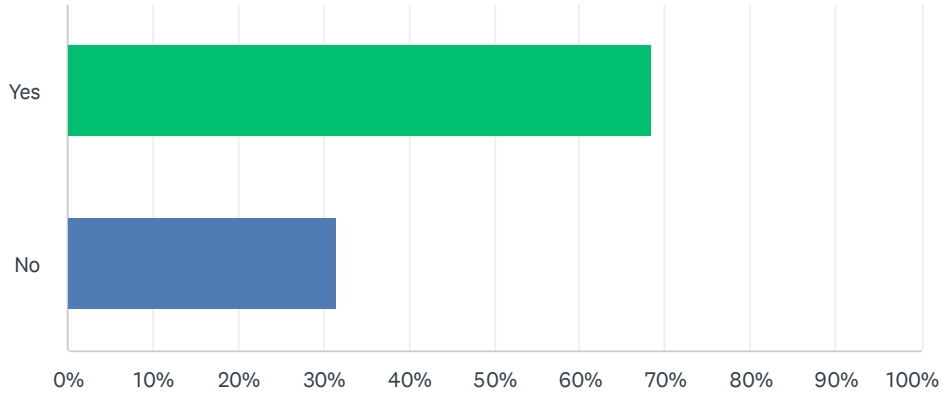
Answered: 54 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	46.30%	25
No	53.70%	29
TOTAL		54

Q8 Would your community be interested in funding opportunities for electric vehicle infrastructure if state or local funds were available for this purpose?

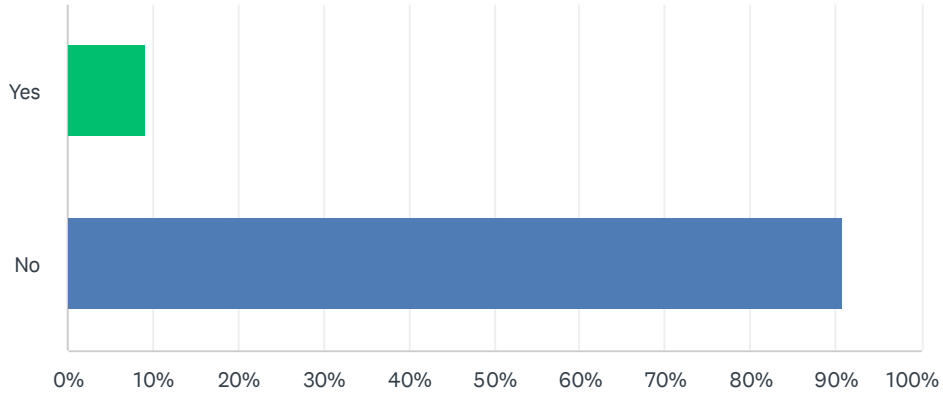
Answered: 54 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	68.52%	37
No	31.48%	17
TOTAL		54

Q9 Attached to the email, which included the link to this survey, was a copy of your current resource mix. Would you like someone to contact you regarding making potential changes to your current renewable resource mix?

Answered: 54 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	9.26%	5
No	90.74%	49
TOTAL		54

MEAN Municipal Energy Agency of Nebraska

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MEAN TO HOLD POWER SUPPLY PLANNING MEETING AND INTEGRATED RESOURCE PLAN REVIEW APRIL 21

The Municipal Energy Agency of Nebraska (MEAN) will hold a Power Supply Committee/Integrated Resource Plan Meeting that will review its 2022 Integrated Resource Plan (IRP) April 21 in Lincoln, Neb., at 10 a.m. A virtual option to participate...



MEAN PRESENTS SERVICE AWARD TO THE CITY OF CURTIS' TANNER MCCALL

The Municipal Energy Agency of Nebraska (MEAN) presented Tanner McCall, utility superintendent for the City of Curtis, Neb., with its Rudy Hultgren Dedicated Service Award March 23 at the NMPP Energy Annual Conference. The award is presented...

MEAN Municipal Energy Agency of Nebraska

About Members/Participants Financial Information Services News Contact

Check out MEAN's suite of energy efficiency programs!

LEARN MORE

MEAN to hold Power Supply Planning Meeting and Integrated Resource Plan Review April 21

APRIL 4, 2022



The Municipal Energy Agency of Nebraska (MEAN) will hold a Power Supply Committee/Integrated Resource Plan Meeting that will review its 2022 Integrated Resource Plan (IRP) April 21 in Lincoln, Neb., at 10 a.m. A virtual option to participate will be available. The meeting is open to the public.

MEAN's Integrated Resource Plan is filed every five years as required by the Western Area Power Administration (WAPA).

Integrated resource planning is a process for future new energy resources that evaluates the full range of alternatives, including new generating capacity, power purchases, energy conservation and efficiency, cogeneration and heating and cooling applications, and renewable energy resources to provide adequate and reliable service to a utility's electric customers.

MEAN welcomes member and public input to its IRP. A draft IRP plan will be available on or about April 19, 2022 on MEAN's IRP page. Once the draft IRP is publicly available, comments may be submitted by mail to the Municipal Energy Agency of Nebraska, Attn. IRP, 8377 Glynoaks Drive, Lincoln, NE 68516 or by email to the address that will be posted on the MEAN IRP webpage. Comments will be accepted if received during the 25 day comment period beginning on the date of posting of the draft IRP.

Action to adopt the 2022 IRP will be taken at MEAN's Board of Directors meeting on May 19, which is also open to the public.

Power Supply Committee/Integrated Resource Plan virtual meeting link: https://meet.goto.com/735821061 or telephone at 1-877-309-2073, access code 735-821-061.





MEAN's Integrated Resource Plan

The Municipal Energy Agency of Nebraska (MEAN) is in the process of preparing its 2022 Integrated Resource Plan (IRP) as required by the Western Area Power Administration (WAPA). MEAN files an IRP with WAPA every 5 years.

Integrated resource planning is a planning process for new energy resources that evaluates the full range of alternatives, including new generating capacity, power purchases, energy conservation and efficiency, cogeneration and district heating and cooling applications, and renewable energy resources, to provide adequate and reliable service to a utility's electric consumers. An IRP supports utility-developed goals and schedules. The plan must take into account necessary features for system operation, such as diversity, reliability, dispatchability, and other risk factors; must take into account the ability to verify energy savings achieved through energy efficiency and the projected durability of such savings measured over time; and must treat demand and supply resources on a consistent and integrated basis. The IRP must adhere to several criteria, which are listed on the WAPA website: https://www.wapa.gov/PowerMarketing/IRP/Pages/guidelines.aspx

MEAN welcomes member and public input to its IRP. Members and the public are provided numerous opportunities to comment on the IRP during MEAN's quarterly committee and Board meetings that are open to the public, with the agendas, including any discussion of the Integrated Resource Plan, published under MEAN's board information section on NMPP Energy's website at https://www.nmppenergy.org/about/board-meetings. In addition, as described below, MEAN will publish a draft copy of the IRP for public comment and will hold a public workshop as described below to review the draft IRP plan.

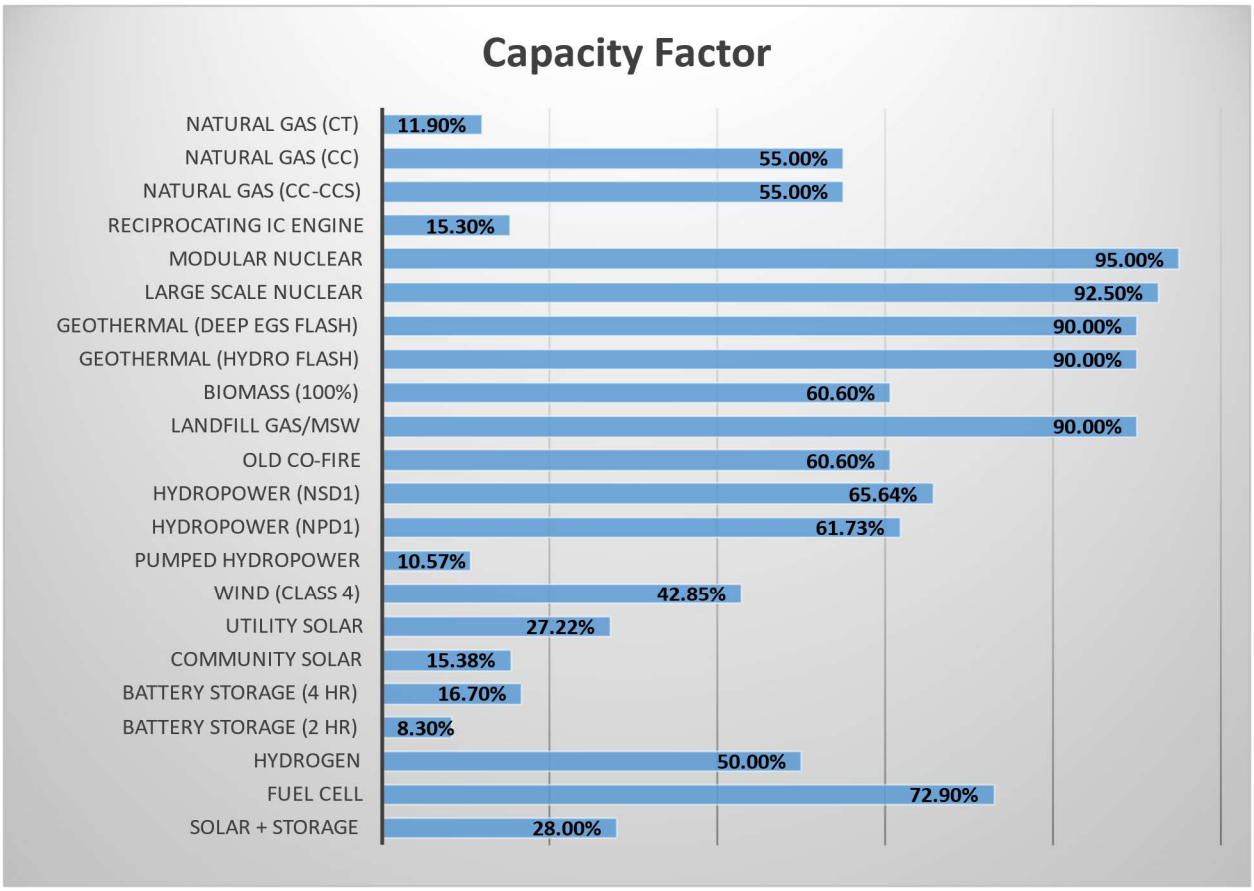
MEAN's draft IRP plan will be available on or about April 19, 2022 on this web page. Once the draft IRP is publicly available, comments may be submitted by mail to the Municipal Energy Agency of Nebraska, Attn. IRP, 8377 Glynoaks Drive, Lincoln, NE 68516 or by email to the address that will be posted on the MEAN IRP webpage. Comments will be accepted if received during the 25 day comment period beginning on the date of posting of the draft IRP.

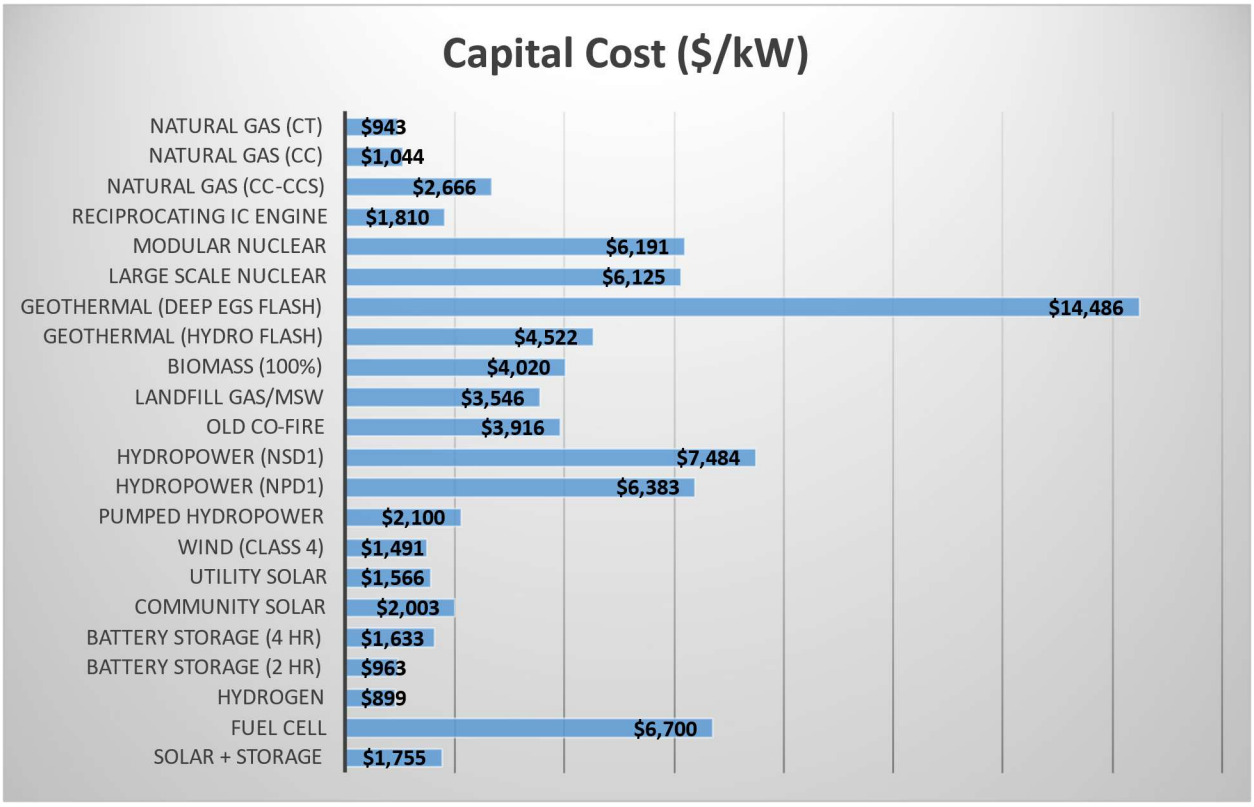
A public workshop to review the draft IRP will be held on April 21, 2022 in Lincoln, Neb., at 10 a.m. (virtual option for participation will be available.) Action to adopt the 2022 IRP will be taken at MEAN's Board of Directors meeting on May 19, 2022. Public comments will be accepted at the workshop and Board meeting, subject to the Public Comment Period Rules available under MEAN's board information section on NMPP Energy's website, available by clicking here. Comment periods will be available on a first-come, first-served basis. **Individuals interested in making public comments at the April 21, 2022 workshop may** sign up here.

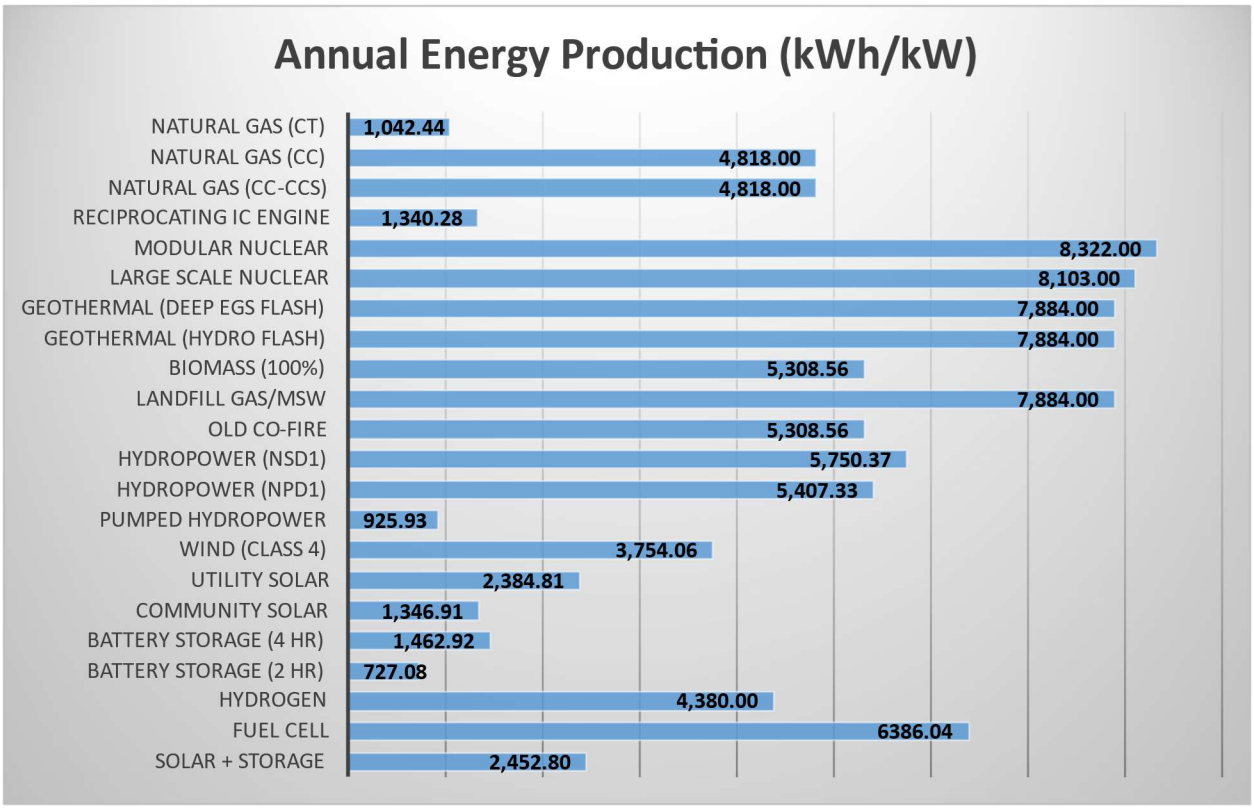
MEAN's 2017 IRP can be found here.

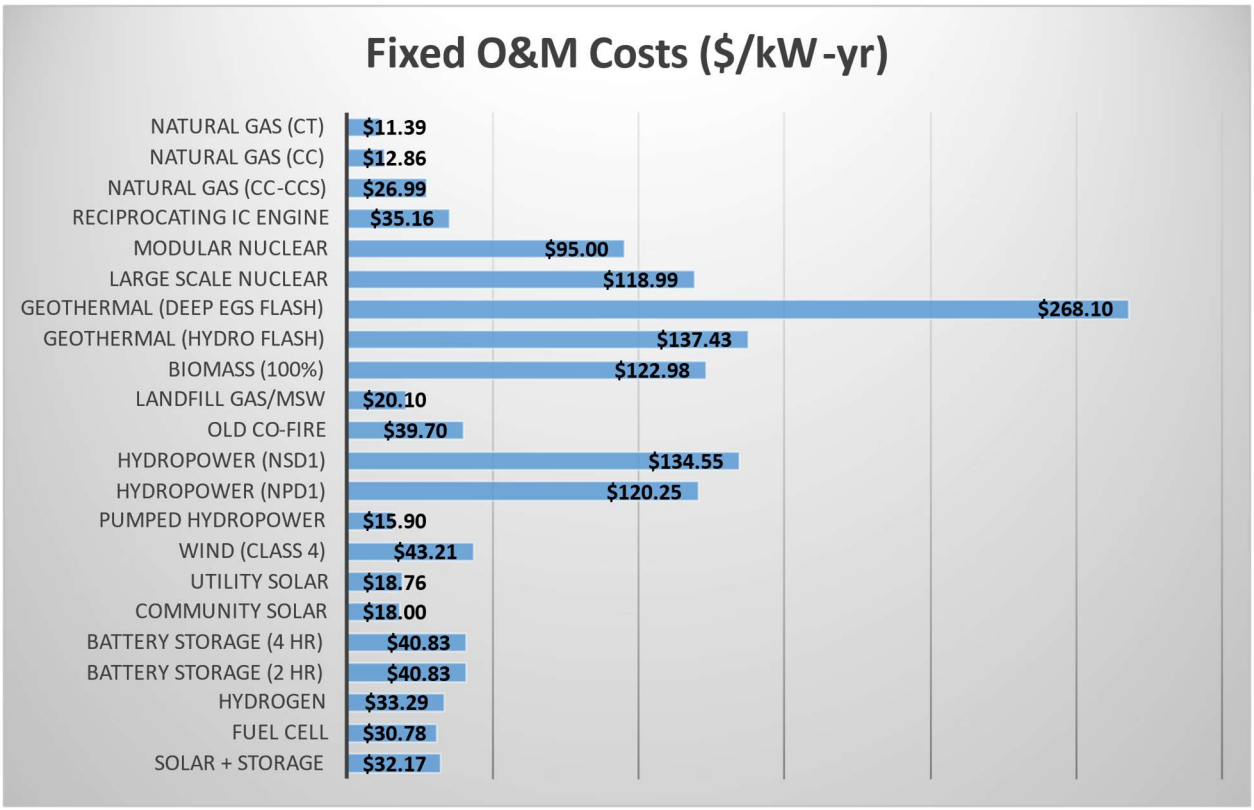
Power Supply Committee/Integrated Resource Plan virtual meeting link: https://meet.goto.com/735821061 or telephone at 1-877-309-2073, access code 735-821-061.

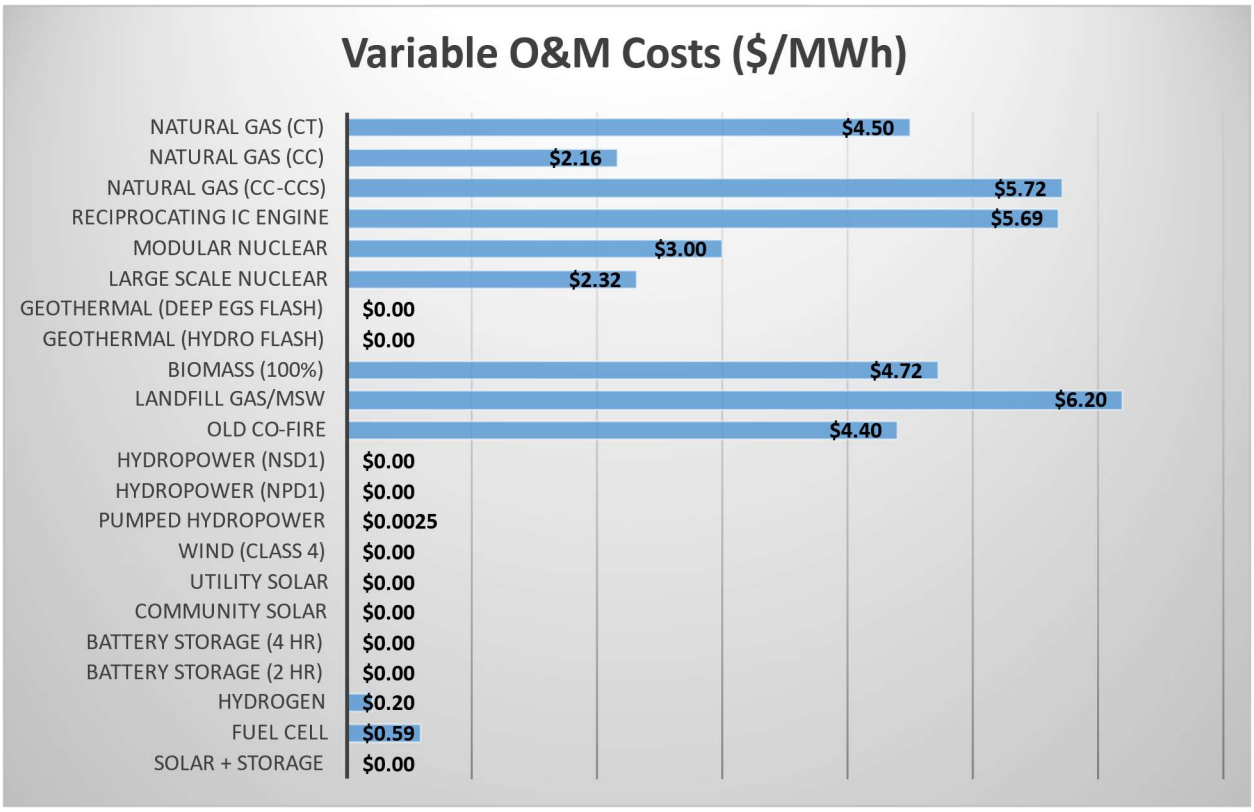
Appendix B – Phase I Supply Side Option Data

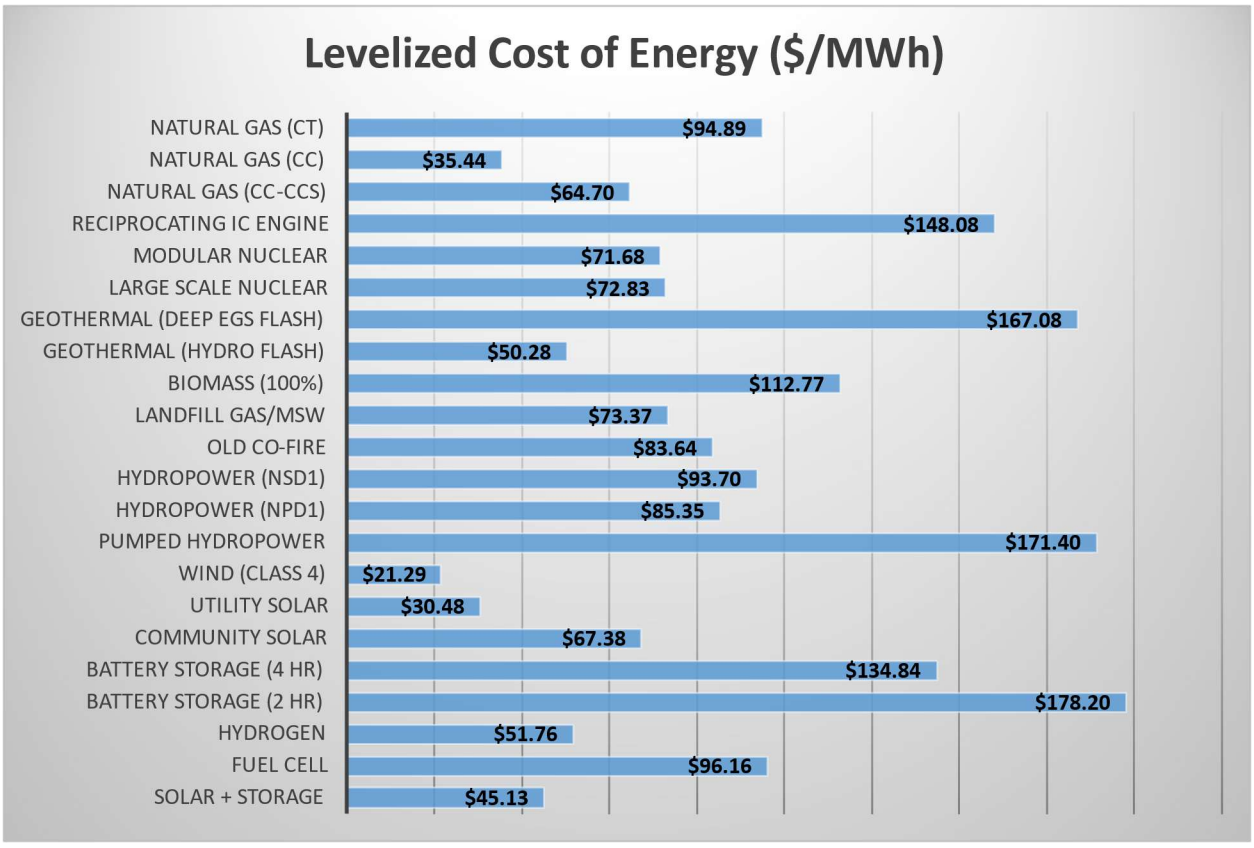

Capacity Factor
NATURAL GAS (CT) 11.90%
NATURAL GAS (CC) 55.00%
NATURAL GAS (CC-CCS) 55.00%
RECIPROCATING IC ENGINE 15.30%
MODULAR NUCLEAR 95.00%
LARGE SCALE NUCLEAR 92.50%
GEOTHERMAL (DEEP EGS FLASH) 90.00%
GEOTHERMAL (HYDRO FLASH) 90.00%
BIOMASS (100%) 60.60%
LANDFILL GAS/MSW 90.00%
OLD CO-FIRE 60.60%
HYDROPOWER (NSD1) 65.64%
HYDROPOWER (NPD1) 61.73%
PUMPED HYDROPOWER 10.57%
WIND (CLASS 4) 42.85%
UTILITY SOLAR 27.22%
COMMUNITY SOLAR 15.38%
BATTERY STORAGE (4 HR) 16.70%
BATTERY STORAGE (2 HR) 8.30%
HYDROGEN 50.00%
FUEL CELL 72.90%
SOLAR + STORAGE 28.00%

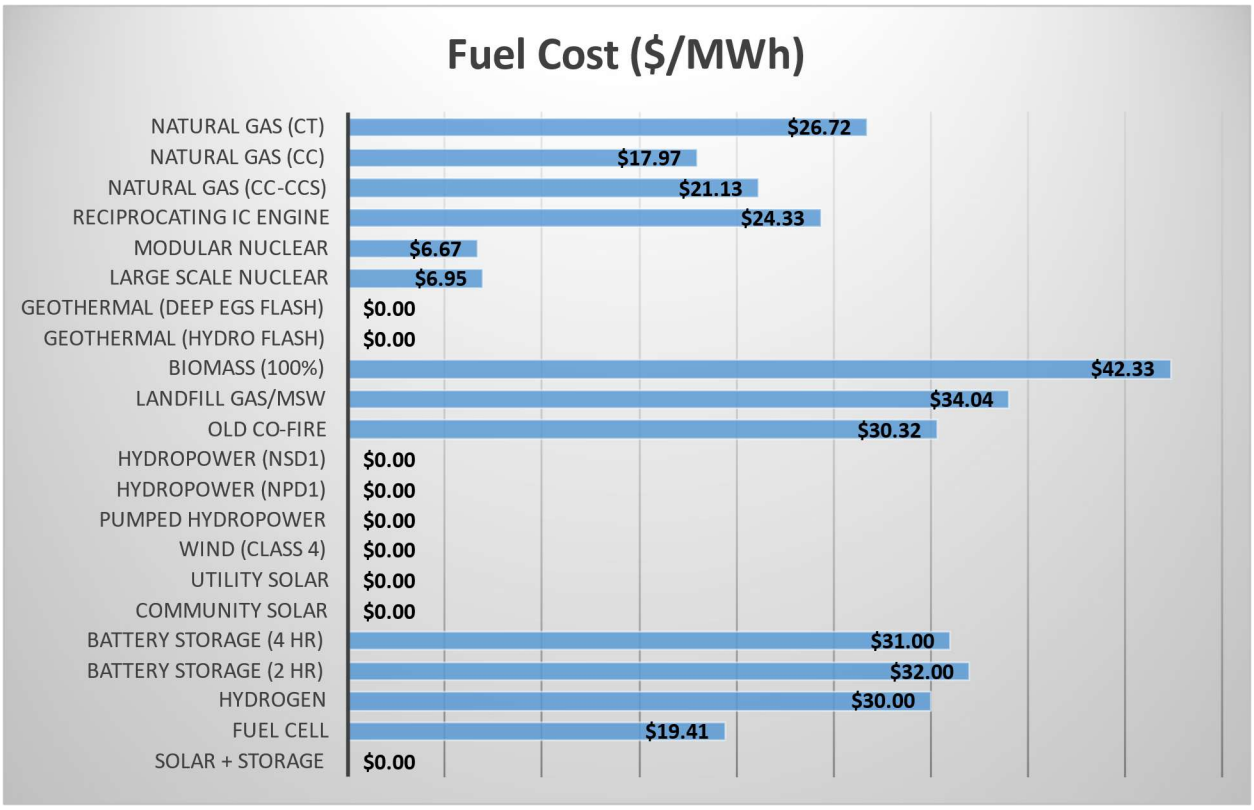

Capital Cost ($/kW)
NATURAL GAS (CT) $943
NATURAL GAS (CC) $1,044
NATURAL GAS (CC-CCS) $2,666
RECIPROCATING IC ENGINE $1,810
MODULAR NUCLEAR $6,191
LARGE SCALE NUCLEAR $6,125
GEOTHERMAL (DEEP EGS FLASH) $14,486
GEOTHERMAL (HYDRO FLASH) $4,522
BIOMASS (100%) $4,020
LANDFILL GAS/MSW $3,546
OLD CO-FIRE $3,916
HYDROPOWER (NSD1) $7,484
HYDROPOWER (NPD1) $6,383
PUMPED HYDROPOWER $2,100
WIND (CLASS 4) $1,491
UTILITY SOLAR $1,566
COMMUNITY SOLAR $2,003
BATTERY STORAGE (4 HR) $1,633
BATTERY STORAGE (2 HR) $963
HYDROGEN $899
FUEL CELL $6,700
SOLAR + STORAGE $1,755

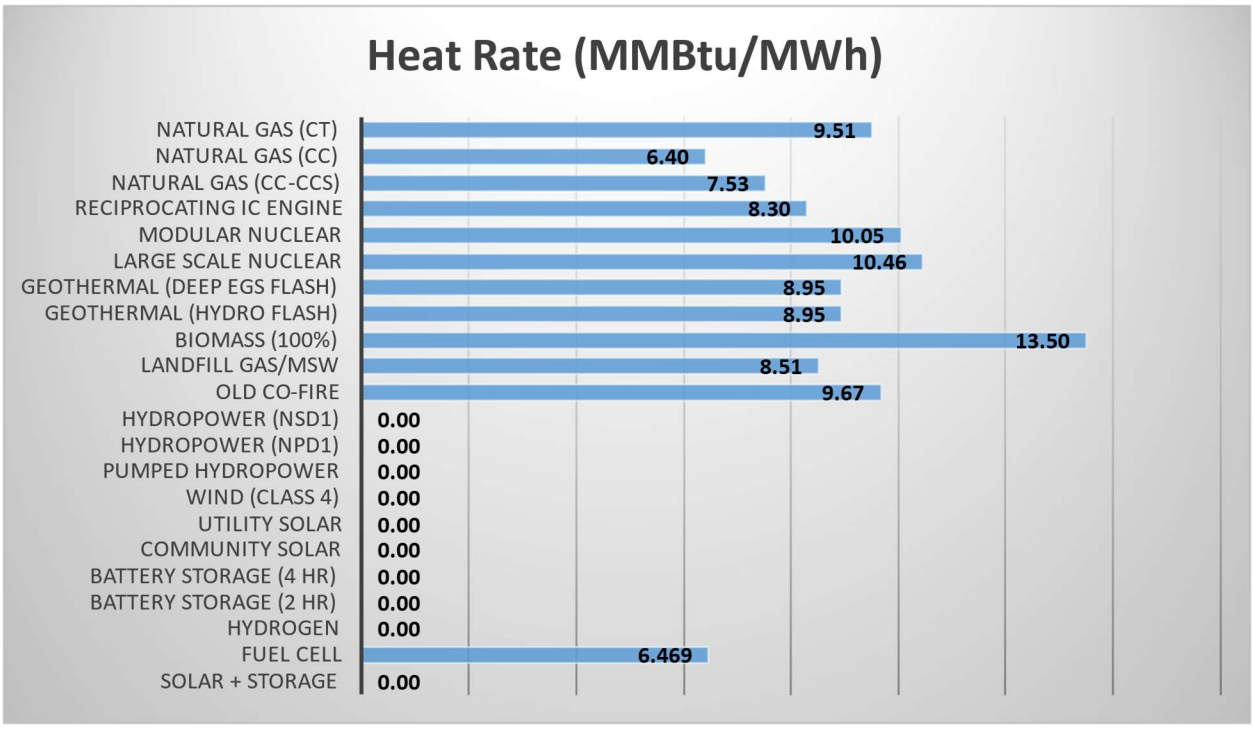

Annual Energy Production (kWh/kW)
NATURAL GAS (CT) 1,042.44
NATURAL GAS (CC) 4,818.00
NATURAL GAS (CC-CCS) 4,818.00
RECIPROCATING IC ENGINE 1,340.28
MODULAR NUCLEAR 8,322.00
LARGE SCALE NUCLEAR 8,103.00
GEOTHERMAL (DEEP EGS FLASH) 7,884.00
GEOTHERMAL (HYDRO FLASH) 7,884.00
BIOMASS (100%) 5,308.56
LANDFILL GAS/MSW 7,884.00
OLD CO-FIRE 5,308.56
HYDROPOWER (NSD1) 5,750.37
HYDROPOWER (NPD1) 5,407.33
PUMPED HYDROPOWER 925.93
WIND (CLASS 4) 3,754.06
UTILITY SOLAR 2,384.81
COMMUNITY SOLAR 1,346.91
BATTERY STORAGE (4 HR) 1,462.92
BATTERY STORAGE (2 HR) 727.08
HYDROGEN 4,380.00
FUEL CELL 6386.04
SOLAR + STORAGE 2,452.80

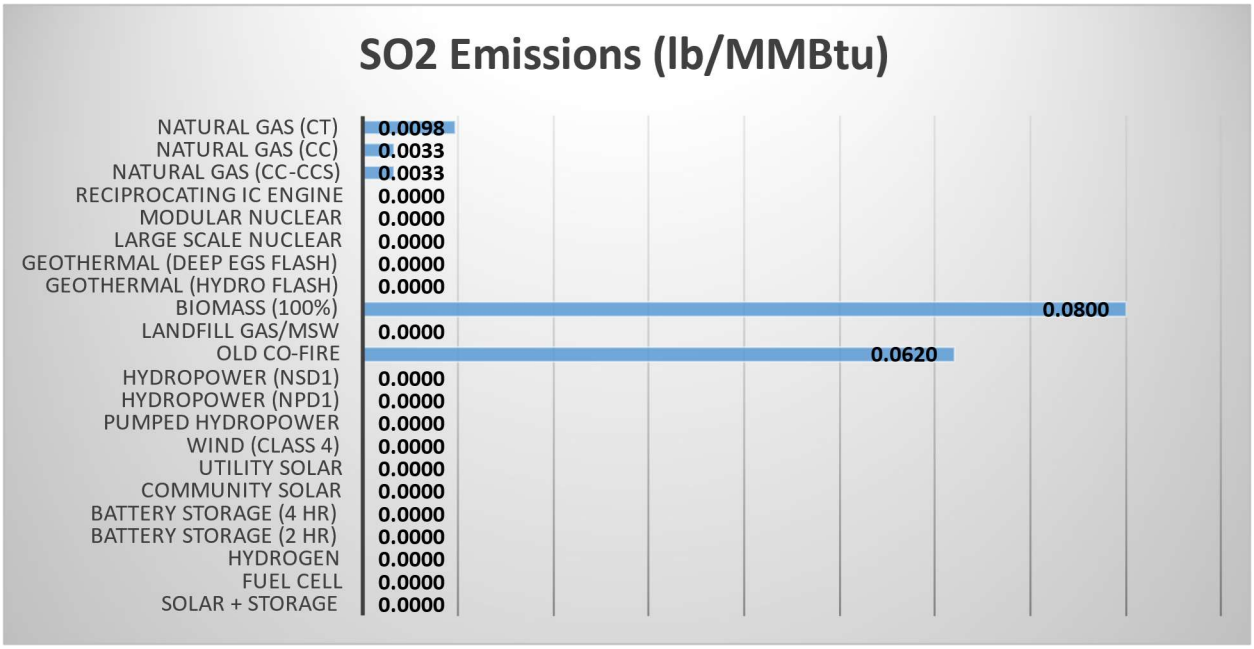

Fixed O&M Costs ($/kW-yr)
NATURAL GAS (CT) $11.39
NATURAL GAS (CC) $12.86
NATURAL GAS (CC-CCS) $26.99
RECIPROCATING IC ENGINE $35.16
MODULAR NUCLEAR $95.00
LARGE SCALE NUCLEAR $118.99
GEOTHERMAL (DEEP EGS FLASH) $268.10
GEOTHERMAL (HYDRO FLASH) $137.43
BIOMASS (100%) $122.98
LANDFILL GAS/MSW $20.10
OLD CO-FIRE $39.70
HYDROPOWER (NSD1) $134.55
HYDROPOWER (NPD1) $120.25
PUMPED HYDROPOWER $15.90
WIND (CLASS 4) $43.21
UTILITY SOLAR $18.76
COMMUNITY SOLAR $18.00
BATTERY STORAGE (4 HR) $40.83
BATTERY STORAGE (2 HR) $40.83
HYDROGEN $33.29
FUEL CELL $30.78
SOLAR + STORAGE $32.17

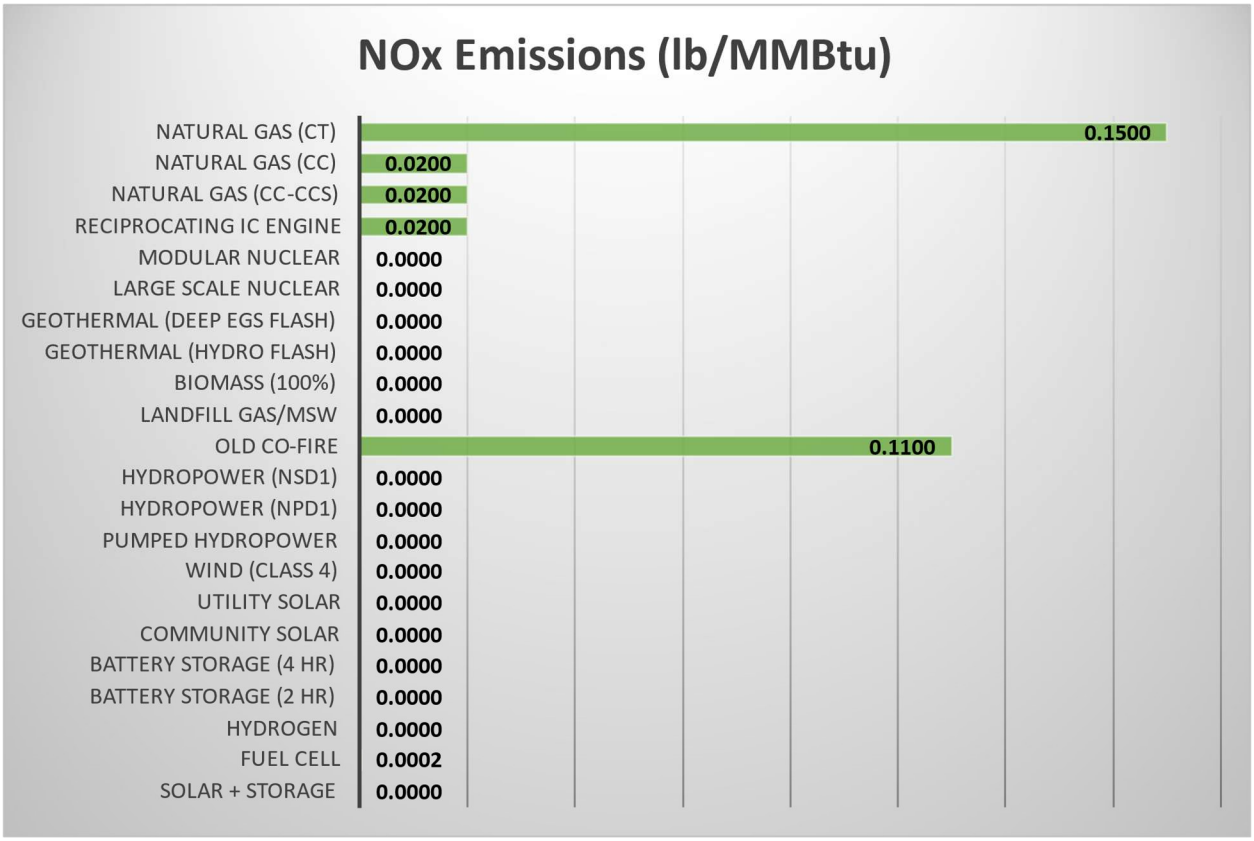

Variable O&M Costs ($/MWh)
NATURAL GAS (CT) $4.50
NATURAL GAS (CC) $2.16
NATURAL GAS (CC-CCS) $5.72
RECIPROCATING IC ENGINE $5.69
MODULAR NUCLEAR $3.00
LARGE SCALE NUCLEAR $2.32
GEOTHERMAL (DEEP EGS FLASH) $0.00
GEOTHERMAL (HYDRO FLASH) $0.00
BIOMASS (100%) $4.72
LANDFILL GAS/MSW $6.20
OLD CO-FIRE $4.40
HYDROPOWER (NSD1) $0.00
HYDROPOWER (NPD1) $0.00
PUMPED HYDROPOWER $0.0025
WIND (CLASS 4) $0.00
UTILITY SOLAR $0.00
COMMUNITY SOLAR $0.00
BATTERY STORAGE (4 HR) $0.00
BATTERY STORAGE (2 HR) $0.00
HYDROGEN $0.20
FUEL CELL $0.59
SOLAR + STORAGE $0.00

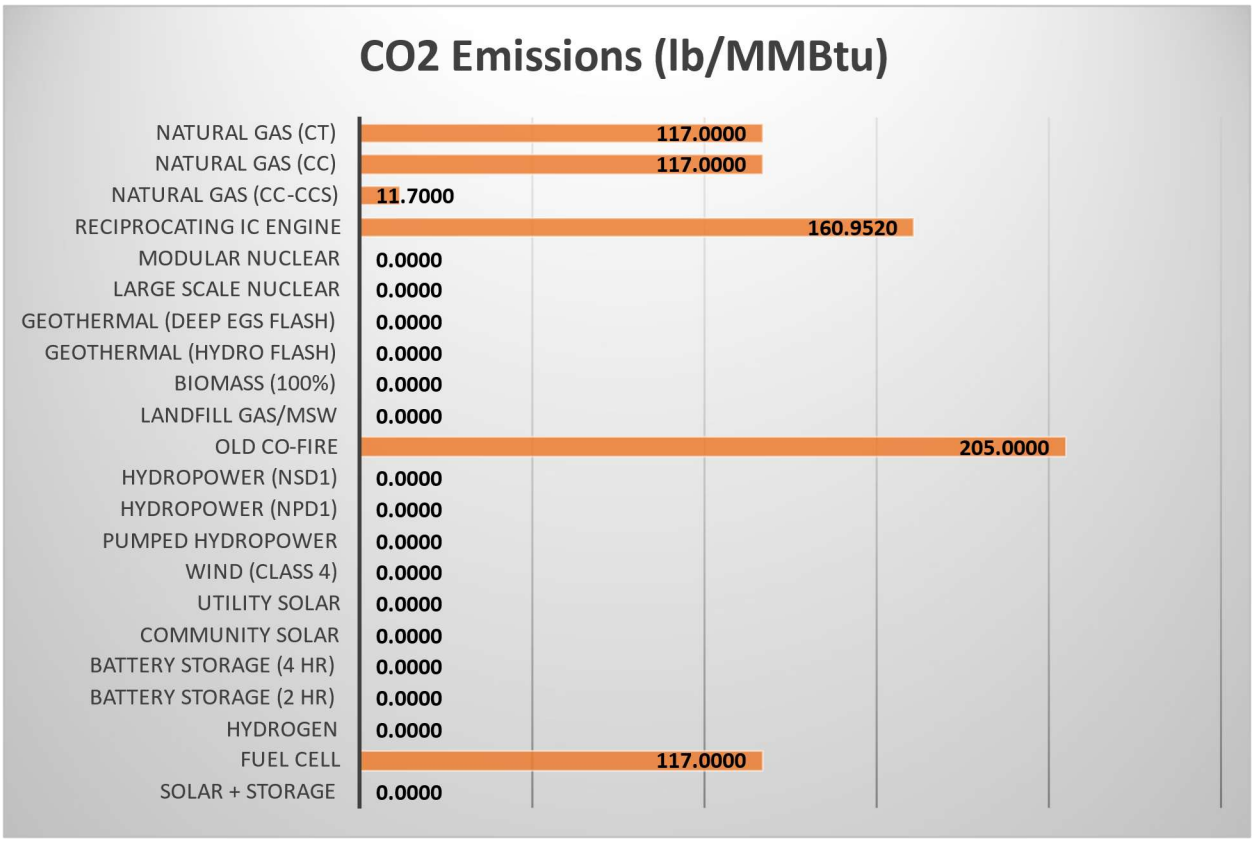

Levelized Cost of Energy ($/MWh)
NATURAL GAS (CT) $94.89
NATURAL GAS (CC) $35.44
NATURAL GAS (CC-CCS) $64.70
RECIPROCATING IC ENGINE $148.08
MODULAR NUCLEAR $71.68
LARGE SCALE NUCLEAR $72.83
GEOTHERMAL (DEEP EGS FLASH) $167.08
GEOTHERMAL (HYDRO FLASH) $50.28
BIOMASS (100%) $112.77
LANDFILL GAS/MSW $73.37
OLD CO-FIRE $83.64
HYDROPOWER (NSD1) $93.70
HYDROPOWER (NPD1) $85.35
PUMPED HYDROPOWER $171.40
WIND (CLASS 4) $21.29
UTILITY SOLAR $30.48
COMMUNITY SOLAR $67.38
BATTERY STORAGE (4 HR) $134.84
BATTERY STORAGE (2 HR) $178.20
HYDROGEN $51.76
FUEL CELL $96.16
SOLAR + STORAGE $45.13

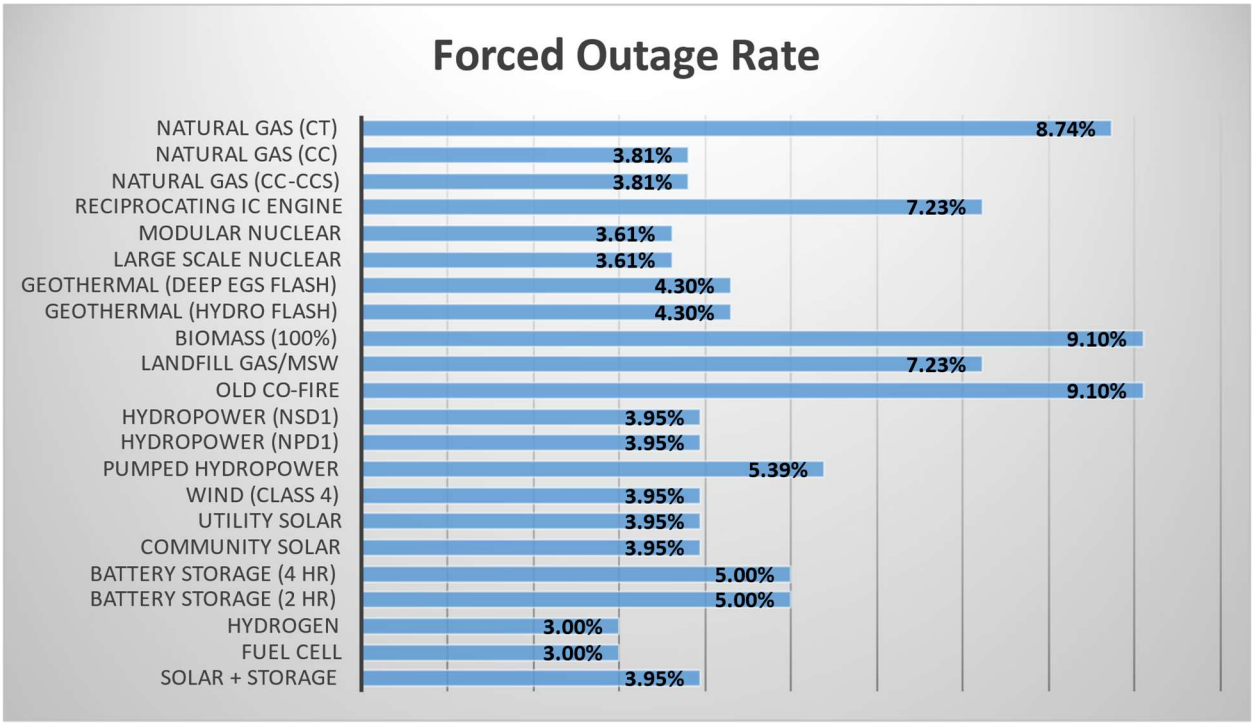

Fuel Cost ($/MWh)
NATURAL GAS (CT) $26.72
NATURAL GAS (CC) $17.97
NATURAL GAS (CC-CCS) $21.13
RECIPROCATING IC ENGINE $24.33
MODULAR NUCLEAR $6.67
LARGE SCALE NUCLEAR $6.95
GEOTHERMAL (DEEP EGS FLASH) $0.00
GEOTHERMAL (HYDRO FLASH) $0.00
BIOMASS (100%) $42.33
LANDFILL GAS/MSW $34.04
OLD CO-FIRE $30.32
HYDROPOWER (NSD1) $0.00
HYDROPOWER (NPD1) $0.00
PUMPED HYDROPOWER $0.00
WIND (CLASS 4) $0.00
UTILITY SOLAR $0.00
COMMUNITY SOLAR $0.00
BATTERY STORAGE (4 HR) $31.00
BATTERY STORAGE (2 HR) $32.00
HYDROGEN $30.00
FUEL CELL $19.41
SOLAR + STORAGE $0.00

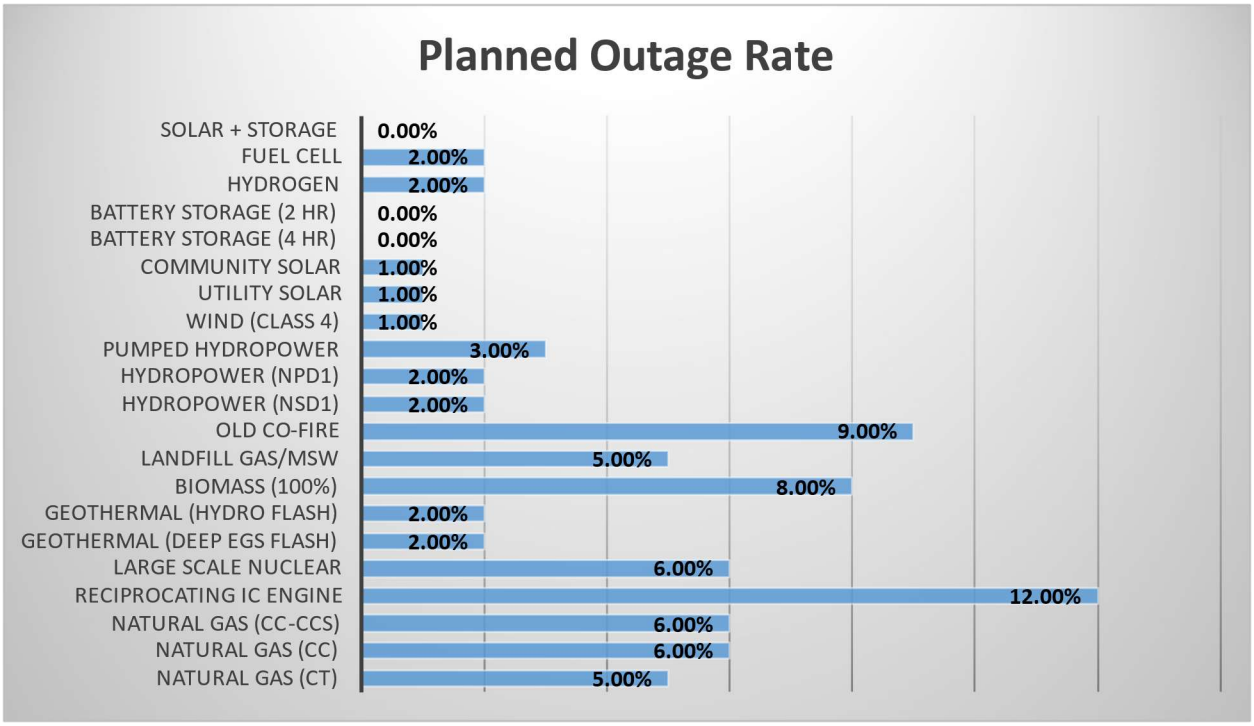

Heat Rate (MMBtu/MWh)
NATURAL GAS (CT) 9.51
NATURAL GAS (CC) 6.40
NATURAL GAS (CC-CCS) 7.53
RECIPROCATING IC ENGINE 8.30
MODULAR NUCLEAR 10.05
LARGE SCALE NUCLEAR 10.46
GEOTHERMAL (DEEP EGS FLASH) 8.95
GEOTHERMAL (HYDRO FLASH) 8.95
BIOMASS (100%) 13.50
LANDFILL GAS/MSW 8.51
OLD CO-FIRE 9.67
HYDROPOWER (NSD1) 0.00
HYDROPOWER (NPD1) 0.00
PUMPED HYDROPOWER 0.00
WIND (CLASS 4) 0.00
UTILITY SOLAR 0.00
COMMUNITY SOLAR 0.00
BATTERY STORAGE (4 HR) 0.00
BATTERY STORAGE (2 HR) 0.00
HYDROGEN 0.00
FUEL CELL 6.469
SOLAR + STORAGE 0.00

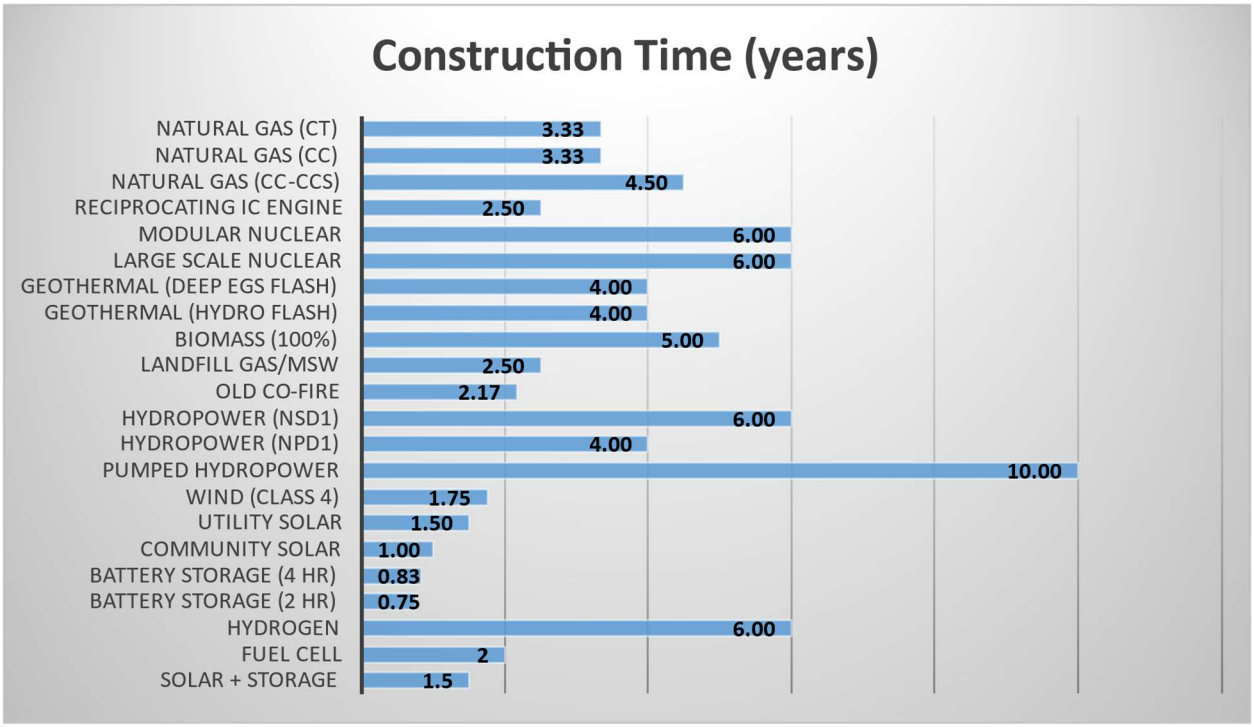

SO2 Emissions (lb/MMBtu)
NATURAL GAS (CT) 0.0098
NATURAL GAS (CC) 0.0033
NATURAL GAS (CC-CCS) 0.0033
RECIPROCATING IC ENGINE 0.0000
MODULAR NUCLEAR 0.0000
LARGE SCALE NUCLEAR 0.0000
GEOTHERMAL (DEEP EGS FLASH) 0.0000
GEOTHERMAL (HYDRO FLASH) 0.0000
BIOMASS (100%) 0.0800
LANDFILL GAS/MSW 0.0000
OLD CO-FIRE 0.0620
HYDROPOWER (NSD1) 0.0000
HYDROPOWER (NPD1) 0.0000
PUMPED HYDROPOWER 0.0000
WIND (CLASS 4) 0.0000
UTILITY SOLAR 0.0000
COMMUNITY SOLAR 0.0000
BATTERY STORAGE (4 HR) 0.0000
BATTERY STORAGE (2 HR) 0.0000
HYDROGEN 0.0000
FUEL CELL 0.0000
SOLAR + STORAGE 0.0000

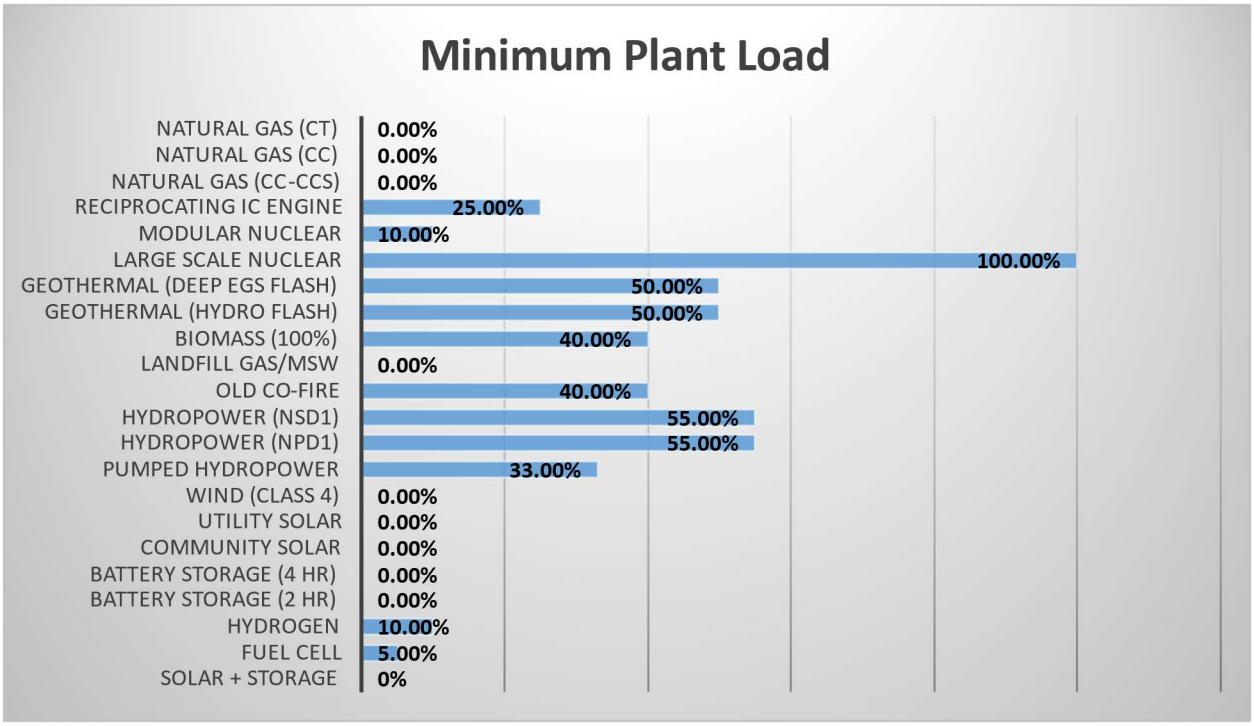

NOx Emissions (lb/MMBtu)
NATURAL GAS (CT) 0.1500
NATURAL GAS (CC) 0.0200
NATURAL GAS (CC-CCS) 0.0200
RECIPROCATING IC ENGINE 0.0200
MODULAR NUCLEAR 0.0000
LARGE SCALE NUCLEAR 0.0000
GEOTHERMAL (DEEP EGS FLASH) 0.0000
GEOTHERMAL (HYDRO FLASH) 0.0000
BIOMASS (100%) 0.0000
LANDFILL GAS/MSW 0.0000
OLD CO-FIRE 0.1100
HYDROPOWER (NSD1) 0.0000
HYDROPOWER (NPD1) 0.0000
PUMPED HYDROPOWER 0.0000
WIND (CLASS 4) 0.0000
UTILITY SOLAR 0.0000
COMMUNITY SOLAR 0.0000
BATTERY STORAGE (4 HR) 0.0000
BATTERY STORAGE (2 HR) 0.0000
HYDROGEN 0.0000
FUEL CELL 0.0002
SOLAR + STORAGE 0.0000


CO2 Emissions (lb/MMBtu)
NATURAL GAS (CT) 117.0000
NATURAL GAS (CC) 117.0000
NATURAL GAS (CC-CCS) 11.7000
RECIPROCATING IC ENGINE 160.9520
MODULAR NUCLEAR 0.0000
LARGE SCALE NUCLEAR 0.0000
GEOTHERMAL (DEEP EGS FLASH) 0.0000
GEOTHERMAL (HYDRO FLASH) 0.0000
BIOMASS (100%) 0.0000
LANDFILL GAS/MSW 0.0000
OLD CO-FIRE 205.0000
HYDROPOWER (NSD1) 0.0000
HYDROPOWER (NPD1) 0.0000
PUMPED HYDROPOWER 0.0000
WIND (CLASS 4) 0.0000
UTILITY SOLAR 0.0000
COMMUNITY SOLAR 0.0000
BATTERY STORAGE (4 HR) 0.0000
BATTERY STORAGE (2 HR) 0.0000
HYDROGEN 0.0000
FUEL CELL 117.0000
SOLAR + STORAGE 0.0000


Forced Outage Rate
NATURAL GAS (CT) 8.74%
NATURAL GAS (CC) 3.81%
NATURAL GAS (CC-CCS) 3.81%
RECIPROCATING IC ENGINE 7.23%
MODULAR NUCLEAR 3.61%
LARGE SCALE NUCLEAR 3.61%
GEOTHERMAL (DEEP EGS FLASH) 4.30%
GEOTHERMAL (HYDRO FLASH) 4.30%
BIOMASS (100%) 9.10%
LANDFILL GAS/MSW 7.23%
OLD CO-FIRE 9.10%
HYDROPOWER (NSD1) 3.95%
HYDROPOWER (NPD1) 3.95%
PUMPED HYDROPOWER 5.39%
WIND (CLASS 4) 3.95%
UTILITY SOLAR 3.95%
COMMUNITY SOLAR 3.95%
BATTERY STORAGE (4 HR) 5.00%
BATTERY STORAGE (2 HR) 5.00%
HYDROGEN 3.00%
FUEL CELL 3.00%
SOLAR + STORAGE 3.95%


Planned Outage Rate
SOLAR + STORAGE 0.00%
FUEL CELL 2.00%
HYDROGEN 2.00%
BATTERY STORAGE (2 HR) 0.00%
BATTERY STORAGE (4 HR) 0.00%
COMMUNITY SOLAR 1.00%
UTILITY SOLAR 1.00%
WIND (CLASS 4) 1.00%
PUMPED HYDROPOWER 3.00%
HYDROPOWER (NPD1) 2.00%
HYDROPOWER (NSD1) 2.00%
OLD CO-FIRE 9.00%
LANDFILL GAS/MSW 5.00%
BIOMASS (100%) 8.00%
GEOTHERMAL (HYDRO FLASH) 2.00%
GEOTHERMAL (DEEP EGS FLASH) 2.00%
LARGE SCALE NUCLEAR 6.00%
RECIPROCATING IC ENGINE 12.00%
NATURAL GAS (CC-CCS) 6.00%
NATURAL GAS (CC) 6.00%
NATURAL GAS (CT) 5.00%


Construction Time (years)
NATURAL GAS (CT) 3.33
NATURAL GAS (CC) 3.33
NATURAL GAS (CC-CCS) 4.50
RECIPROCATING IC ENGINE 2.50
MODULAR NUCLEAR 6.00
LARGE SCALE NUCLEAR 6.00
GEOTHERMAL (DEEP EGS FLASH) 4.00
GEOTHERMAL (HYDRO FLASH) 4.00
BIOMASS (100%) 5.00
LANDFILL GAS/MSW 2.50
OLD CO-FIRE 2.17
HYDROPOWER (NSD1) 6.00
HYDROPOWER (NPD1) 4.00
PUMPED HYDROPOWER 10.00
WIND (CLASS 4) 1.75
UTILITY SOLAR 1.50
COMMUNITY SOLAR 1.00
BATTERY STORAGE (4 HR) 0.83
BATTERY STORAGE (2 HR) 0.75
HYDROGEN 6.00
FUEL CELL 2
SOLAR + STORAGE 1.5


Minimum Plant Load
NATURAL GAS (CT)
NATURAL GAS (CC)
NATURAL GAS (CC-CCS)
RECIPROCATING IC ENGINE
MODULAR NUCLEAR
LARGE SCALE NUCLEAR
GEOTHERMAL (DEEP EGS FLASH)
GEOTHERMAL (HYDRO FLASH)
BIOMASS (100%)
LANDFILL GAS/MSW
OLD CO-FIRE
HYDROPOWER (NSD1)
HYDROPOWER (NPD1)
PUMPED HYDROPOWER
WIND (CLASS 4)
UTILITY SOLAR
COMMUNITY SOLAR
BATTERY STORAGE (4 HR)
BATTERY STORAGE (2 HR)
HYDROGEN
FUEL CELL
SOLAR + STORAGE
0.00%
0.00%
0.00%
25.00%
10.00%
100.00%
50.00%
50.00%
40.00%
0.00%
40.00%
55.00%
55.00%
33.00%
0.00%
0.00%
0.00%
0.00%
0.00%
10.00%
5.00%
0%

Appendix C – Demand Side Management Data

Release date: February 2017
Revised date: May 2018

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Stoves (units with both an oven and a cooktop)							
Have a stove	108.0	19.8	5.3	14.5	24.8	17.2	7.7
1	105.8	19.1	5.1	14.0	24.3	16.7	7.5
2 or more	2.2	0.7	0.3	0.5	0.6	0.4	Q
Do not have a stove	10.2	1.2	0.3	0.9	1.5	0.9	0.6
Most-used stove fuel							
Electricity	66.4	8.8	3.0	5.8	15.1	9.5	5.7
Natural gas	35.2	9.1	1.4	7.7	8.7	7.1	1.6
Propane	5.5	1.6	0.8	0.8	0.9	0.5	0.4
Dual fuel	0.9	0.3	Q	Q	Q	Q	Q
Do not have a stove	10.2	1.2	0.3	0.9	1.5	0.9	0.6
Most-used stove usage: cooktop part							
0 times per week	3.4	0.4	Q	Q	0.8	0.5	0.3
1 to 3 times per week	16.9	2.2	0.4	1.8	4.1	3.0	1.1
4 to 7 times per week	50.5	9.5	2.5	6.9	11.9	8.1	3.8
8 to 14 times per week	23.9	4.7	1.5	3.2	5.3	3.5	1.8
15 or more times per week	13.3	3.0	0.8	2.3	2.7	2.1	0.6
Do not have a stove	10.2	1.2	0.3	0.9	1.5	0.9	0.6
Most-used stove usage: oven part							
0 times per week	18.4	3.2	0.5	2.7	3.0	2.1	0.9
1 to 3 times per week	56.7	10.7	2.9	7.8	13.6	9.2	4.3
4 to 7 times per week	28.1	5.1	1.6	3.5	7.2	5.0	2.1
8 to 14 times per week	3.6	0.4	Q	0.2	0.9	0.6	0.3
15 or more times per week	1.1	0.3	Q	Q	0.2	Q	Q
Do not have a stove	10.2	1.2	0.3	0.9	1.5	0.9	0.6
Separate cooktops							
Have a separate cooktop	17.1	2.5	0.7	1.9	2.5	1.5	1.0
1	16.7	2.5	0.7	1.8	2.4	1.4	1.0
2 or more	0.3	Q	N	Q	Q	Q	N
Do not have a separate cooktop	101.1	18.5	5.0	13.5	23.9	16.6	7.2
Most-used separate cooktop fuel							
Electricity	9.6	1.2	0.3	0.9	1.4	0.7	0.7
Natural gas	6.4	1.1	Q	0.9	1.0	0.8	0.2
Propane	1.1	0.2	Q	Q	Q	Q	Q
Do not have a separate cooktop	101.1	18.5	5.0	13.5	23.9	16.6	7.2

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Most-used separate cooktop usage							
0 times per week	2.1	0.4	Q	Q	0.3	Q	Q
1 to 3 times per week	3.0	0.5	Q	0.4	0.5	0.3	Q
4 to 7 times per week	6.7	0.9	Q	0.7	1.1	0.7	0.4
8 to 14 times per week	3.4	0.5	Q	0.3	0.5	0.3	0.2
15 or more times per week	1.9	0.2	Q	Q	0.2	Q	Q
Do not have a separate cooktop	101.1	18.5	5.0	13.5	23.9	16.6	7.2
Separate wall ovens							
Have a separate wall oven	13.9	1.6	0.4	1.2	2.1	1.3	0.8
1	9.9	1.2	0.2	1.0	1.4	1.0	0.5
2 or more	4.0	0.4	Q	Q	0.6	0.3	0.3
Do not have a separate wall oven	104.4	19.4	5.2	14.2	24.3	16.8	7.5
Most-used separate wall oven fuel							
Electricity	11.9	1.2	0.3	0.9	1.8	1.1	0.8
Natural gas	1.8	0.4	Q	0.3	0.2	0.2	Q
Propane	Q	Q	Q	N	Q	N	Q
Do not have a separate wall oven	104.4	19.4	5.2	14.2	24.3	16.8	7.5
Most-used separate wall oven usage							
0 times per week	2.0	0.3	Q	Q	Q	Q	Q
1 to 3 times per week	6.1	0.7	Q	0.5	0.9	0.6	0.3
4 to 7 times per week	4.6	0.5	Q	0.3	0.7	0.4	0.3
8 to 14 times per week	0.8	Q	Q	Q	0.2	Q	Q
15 or more times per week	0.3	Q	N	Q	Q	Q	Q
Do not have a separate wall oven	104.4	19.4	5.2	14.2	24.3	16.8	7.5
Frequency of hot meals cooked							
No hot meals cooked	0.9	Q	Q	Q	Q	Q	Q
Less than once a week	2.4	0.4	Q	Q	0.6	0.3	0.3
About once a week	2.6	0.4	Q	Q	0.4	0.3	Q
A few times each week	19.9	3.1	0.6	2.5	4.3	2.9	1.4
Once a day	36.1	7.2	2.3	4.9	8.6	5.9	2.7
2 times a day	38.1	6.8	1.6	5.1	8.8	5.9	2.9
3 or more times a day	18.2	3.0	0.8	2.2	3.6	2.7	0.9

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Microwave ovens							
Have a microwave oven	113.6	19.6	5.4	14.2	25.7	17.6	8.1
1	108.9	18.7	5.1	13.6	24.4	16.7	7.7
2 or more	4.7	0.9	0.3	0.5	1.3	0.9	0.4
Do not have a microwave oven	4.6	1.4	0.2	1.2	0.6	0.5	0.2
Microwave oven usage							
0 times per week	1.6	0.3	Q	Q	0.3	0.3	Q
1 to 3 times per week	10.6	2.0	0.6	1.4	2.0	1.3	0.7
4 to 7 times per week	39.0	7.1	1.7	5.4	8.3	6.0	2.3
8 to 14 times per week	27.9	4.8	1.6	3.2	6.6	4.7	1.9
15 or more times per week	34.5	5.3	1.4	4.0	8.4	5.4	3.1
Do not have a microwave oven	4.6	1.4	0.2	1.2	0.6	0.5	0.2
Outdoor grills and fuel							
Use an outdoor grill	69.3	11.6	3.3	8.4	17.4	12.0	5.4
Natural gas	4.1	1.0	Q	0.9	0.9	0.6	0.3
Propane	42.2	8.7	2.8	5.9	10.5	7.0	3.5
Charcoal	22.3	1.9	0.3	1.6	5.7	4.1	1.5
Some other fuel	0.7	Q	N	Q	0.3	0.2	Q
Do not use an outdoor grill	48.9	9.4	2.4	7.0	9.0	6.1	2.9
Small kitchen appliances used at least once each week (more than one may apply)							
Toaster	74.0	13.2	3.8	9.5	18.2	12.3	5.9
Toaster oven	28.7	6.9	2.0	4.8	4.4	3.1	1.3
Coffee maker	75.9	13.6	3.8	9.8	17.6	12.2	5.4
Slow cooker	33.3	5.0	1.1	3.9	8.5	5.7	2.8
Food processor	12.1	2.3	0.6	1.7	2.1	1.5	0.6
Rice cooker	14.3	2.2	0.4	1.8	2.2	1.7	0.5
Blender or juicer	30.8	5.5	1.1	4.4	5.7	4.1	1.6
Some other small kitchen appliance[3]	12.3	2.1	0.4	1.7	3.0	1.9	1.1
Refrigerators							
Use a refrigerator	117.4	20.8	5.6	15.2	26.2	18.0	8.3
1	82.3	14.4	4.1	10.3	17.4	12.2	5.2
2 or more	35.1	6.4	1.5	4.9	8.8	5.8	3.0
Do not use a refrigerator	0.9	Q	Q	Q	Q	Q	Q

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Most-used refrigerator size							
Half-size or compact	0.9	Q	N	Q	Q	Q	Q
Small (less than 17.6 cubic feet)	6.8	1.6	0.5	1.1	1.3	0.9	0.4
Medium (17.6 to 22.5 cubic feet)	59.1	10.9	3.0	7.9	13.5	9.3	4.2
Large (22.6 to 29.5 cubic feet)	48.7	7.9	2.0	5.9	11.1	7.6	3.5
Very large (more than 29.5 cubic feet)	1.9	0.3	Q	Q	0.2	Q	Q
Do not use a refrigerator	0.9	Q	Q	Q	Q	Q	Q
Most-used refrigerator type							
Half-size/compact	0.9	Q	N	Q	Q	Q	Q
One door	9.8	2.1	0.6	1.5	2.1	1.3	0.8
Two doors, top freezer	51.4	10.8	2.7	8.1	11.9	8.4	3.5
Two doors, bottom freezer	15.5	3.1	1.1	2.1	3.8	2.6	1.3
Two doors, side by side	36.8	4.3	1.2	3.1	7.8	5.4	2.4
Three or more doors	2.9	0.4	Q	0.3	0.6	0.3	0.2
Do not use a refrigerator	0.9	Q	Q	Q	Q	Q	Q
Most-used refrigerator age							
Less than 2 years old	15.9	3.0	0.9	2.1	3.3	2.3	0.9
2 to 4 years old	26.2	4.1	1.3	2.8	5.6	3.8	1.8
5 to 9 years old	41.1	7.4	2.0	5.4	9.0	6.2	2.8
10 to 14 years old	21.9	3.8	0.8	3.0	5.3	3.6	1.7
15 to 19 years old	7.5	1.5	0.3	1.3	1.9	1.2	0.7
20 or more years old	4.7	0.9	0.2	0.7	1.2	0.8	0.3
Do not use a refrigerator	0.9	Q	Q	Q	Q	Q	Q
Most-used refrigerator through-the-door ice service							
Yes	41.4	4.8	1.3	3.5	8.6	5.8	2.8
No	76.0	16.0	4.3	11.7	17.6	12.2	5.4
Do not use a refrigerator	0.9	Q	Q	Q	Q	Q	Q
Second refrigerator							
Use a second refrigerator	35.1	6.4	1.5	4.9	8.8	5.8	3.0
Do not use a second refrigerator	83.2	14.6	4.1	10.5	17.5	12.3	5.3

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Second refrigerator size							
Half-size or compact	8.1	1.4	0.5	0.9	1.9	1.2	0.7
Small (less than 17.6 cubic feet)	5.5	1.0	Q	0.8	1.4	1.0	0.4
Medium (17.6 to 22.5 cubic feet)	14.5	2.8	0.5	2.3	3.8	2.6	1.3
Large (22.6 to 29.5 cubic feet)	6.8	1.2	0.3	0.9	1.7	1.0	0.6
Very large (more than 29.5 cubic feet)	0.2	N	N	N	Q	N	Q
Do not use a second refrigerator	83.2	14.6	4.1	10.5	17.5	12.3	5.3
Second refrigerator type							
Half-size or compact	8.1	1.4	0.5	0.9	1.9	1.2	0.7
One door	5.9	0.8	Q	0.7	1.4	0.8	0.6
Two doors, top freezer	14.1	3.1	0.6	2.5	4.0	2.8	1.2
Two doors, bottom freezer	1.1	0.3	Q	Q	0.2	Q	Q
Two doors, side by side	5.7	0.8	Q	0.6	1.3	0.8	0.4
Three or more doors	Q	N	N	N	Q	Q	N
Do not use a second refrigerator	83.2	14.6	4.1	10.5	17.5	12.3	5.3
Second refrigerator age							
Less than 2 years old	2.7	0.3	Q	Q	0.5	0.3	0.2
2 to 4 years old	5.0	0.9	Q	0.7	1.2	0.8	0.4
5 to 9 years old	9.8	1.7	0.4	1.4	2.3	1.4	0.9
10 to 14 years old	9.2	1.7	0.4	1.2	2.5	1.8	0.7
15 to 19 years old	4.7	1.0	0.2	0.8	1.2	0.8	0.4
20 or more years old	3.6	0.7	0.2	0.5	1.1	0.7	0.4
Do not use a second refrigerator	83.2	14.6	4.1	10.5	17.5	12.3	5.3
Second refrigerator location							
Basement	6.8	2.3	0.7	1.6	3.0	1.8	1.2
Garage	16.0	2.2	0.3	2.0	3.9	2.8	1.1
Outside	1.8	0.2	Q	0.2	Q	Q	Q
Main floor of house	8.8	1.1	0.4	0.8	1.4	0.8	0.6
Some other location	1.7	0.6	Q	0.4	0.4	0.3	Q
Do not use a second refrigerator	83.2	14.6	4.1	10.5	17.5	12.3	5.3
Separate freezers							
Use a separate freezer	38.1	6.0	1.3	4.6	10.2	6.5	3.7
1	34.2	5.3	1.1	4.2	9.1	6.1	3.0
2 or more	3.9	0.7	0.2	0.5	1.1	0.4	0.7
Do not use a separate freezer	80.1	15.0	4.3	10.7	16.2	11.6	4.6

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Most-used separate freezer size							
Half-size or compact	3.3	0.4	Q	Q	1.0	0.6	0.4
Small (less than 17.6 cubic feet)	11.8	1.9	0.4	1.6	2.8	1.9	0.9
Medium (17.6 to 22.5 cubic feet)	15.2	2.4	0.6	1.8	3.9	2.3	1.5
Large (22.6 to 29.5 cubic feet)	7.2	1.2	0.2	1.0	2.3	1.5	0.8
Very large (more than 29.5 cubic feet)	0.5	Q	N	Q	0.2	Q	Q
Do not use a separate freezer	80.1	15.0	4.3	10.7	16.2	11.6	4.6
Most-used separate freezer type							
Upright	17.8	2.9	0.6	2.3	4.3	2.8	1.4
Chest	20.3	3.1	0.8	2.3	5.9	3.7	2.2
Do not use a separate freezer	80.1	15.0	4.3	10.7	16.2	11.6	4.6
Most-used separate freezer age							
Less than 2 years old	3.9	0.7	Q	0.6	0.9	0.6	0.3
2 to 4 years old	6.0	0.9	0.2	0.7	1.2	0.7	0.5
5 to 9 years old	11.1	1.8	0.4	1.4	3.0	2.0	1.0
10 to 14 years old	8.0	1.1	0.3	0.8	2.2	1.3	0.8
15 to 19 years old	4.2	0.7	Q	0.6	1.2	0.7	0.5
20 or more years old	4.9	0.8	Q	0.6	1.7	1.2	0.6
Do not use a separate freezer	80.1	15.0	4.3	10.7	16.2	11.6	4.6
Dishwashers and usage							
Have a dishwasher	79.7	12.0	3.1	8.8	17.1	11.2	5.9
Used 0 times per week	16.0	2.1	0.5	1.6	2.4	1.8	0.6
Used 1 time per week	13.3	2.1	0.5	1.6	2.8	1.6	1.2
Used 2 to 3 times per week	25.7	3.9	1.2	2.8	6.1	4.2	1.9
Used 4 to 6 times per week	15.1	2.5	0.7	1.8	3.8	2.3	1.5
Used 7 or more times per week	9.5	1.4	0.3	1.0	2.1	1.3	0.7
Do not have a dishwasher	38.6	9.0	2.5	6.5	9.3	6.9	2.4
Dishwasher age							
Less than 2 years old	11.3	1.6	0.5	1.1	2.3	1.5	0.8
2 to 4 years old	16.1	2.0	0.6	1.4	3.4	2.2	1.2
5 to 9 years old	26.9	4.1	1.0	3.0	5.8	4.0	1.8
10 to 14 years old	16.4	2.6	0.6	2.1	3.7	2.2	1.4
15 to 19 years old	5.1	0.9	0.3	0.7	1.1	0.7	0.4
20 or more years old	4.0	0.7	0.1	0.6	0.8	0.5	0.2
Do not have a dishwasher	38.6	9.0	2.5	6.5	9.3	6.9	2.4

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Most-used dishwasher cycle type							
Normal or default cycle *without* heated dry	14.4	2.3	0.7	1.6	3.1	1.8	1.3
Normal or default cycle *with* heated dry	36.9	5.6	1.5	4.1	8.8	5.8	3.0
Heavy or "pots and pans" cycle	5.1	0.9	Q	0.7	1.1	0.7	0.4
Light or delicate cycle	1.8	0.3	Q	Q	0.4	0.2	Q
Energy saver	5.4	0.9	0.3	0.6	1.4	0.9	0.5
Do not have or use a dishwasher	54.5	11.1	3.0	8.1	11.7	8.7	2.9
Clothes washers							
Have a clothes washer at home	97.4	14.9	4.1	10.8	22.0	15.0	7.1
Top-loading	73.5	11.0	2.9	8.1	16.8	11.6	5.2
Front-loading	23.8	3.9	1.2	2.7	5.2	3.4	1.8
Do not have a clothes washer at home	20.8	6.1	1.5	4.6	4.3	3.1	1.2
Clothes washer age							
Less than 2 years old	15.1	2.7	0.7	2.0	2.8	2.0	0.8
2 to 4 years old	22.1	3.2	1.1	2.1	4.6	3.0	1.6
5 to 9 years old	34.7	4.9	1.2	3.7	7.8	5.2	2.6
10 to 14 years old	17.1	2.7	0.6	2.0	4.7	3.2	1.5
15 to 19 years old	5.4	1.0	0.3	0.7	1.3	1.0	0.3
20 or more years old	3.0	0.5	Q	0.4	0.8	0.5	0.3
Do not have a clothes washer at home	20.8	6.1	1.5	4.6	4.3	3.1	1.2
Clothes washer usage							
0 loads per week	1.2	Q	Q	Q	0.3	Q	Q
1 to 4 loads per week	59.8	9.3	2.4	6.9	12.8	8.6	4.1
5 to 9 loads per week	26.9	4.4	1.4	3.0	6.4	4.5	1.9
10 to 15 loads per week	8.0	1.0	0.3	0.7	2.2	1.4	0.8
More than 15 loads per week	1.4	0.2	Q	Q	0.3	0.2	Q
Do not have a clothes washer at home	20.8	6.1	1.5	4.6	4.3	3.1	1.2
Usual water temperature setting for the wash cycle							
Hot	6.6	1.1	0.2	0.8	1.3	1.0	0.3
Warm	47.5	7.2	1.8	5.3	12.0	8.1	3.9
Cold	42.0	6.7	2.0	4.6	8.5	5.7	2.8
Do not have or use a clothes washer at home	22.1	6.1	1.5	4.6	4.6	3.3	1.3

Table HC3.7 Appliances in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Usual water temperature setting for the rinse cycle							
Hot	2.3	0.3	Q	Q	0.3	0.2	Q
Warm	23.2	3.5	0.8	2.7	5.1	3.2	1.9
Cold	70.7	11.1	3.2	7.9	16.4	11.3	5.0
Do not have or use a clothes washer at home	22.1	6.1	1.5	4.6	4.6	3.3	1.3
Clothes dryer and fuel							
Have a clothes dryer at home	94.9	14.3	4.0	10.3	21.9	14.8	7.1
Electricity	75.8	10.2	3.3	6.9	15.3	9.2	6.1
Natural gas	17.9	3.7	0.5	3.2	6.3	5.4	0.9
Propane	1.3	0.4	0.2	Q	0.3	Q	Q
Do not have a clothes dryer at home	23.3	6.7	1.7	5.1	4.5	3.2	1.2
Clothes dryer age							
Less than 2 years old	11.7	1.9	0.5	1.4	2.2	1.5	0.7
2 to 4 years old	20.2	2.7	0.8	1.9	4.2	2.8	1.4
5 to 9 years old	33.9	4.8	1.4	3.3	7.8	5.3	2.5
10 to 14 years old	19.0	2.9	0.7	2.3	5.2	3.6	1.6
15 to 19 years old	6.2	1.2	0.3	0.9	1.5	1.0	0.4
20 or more years old	4.0	0.8	0.2	0.6	1.1	0.7	0.5
Do not have a clothes dryer at home	23.3	6.7	1.7	5.1	4.5	3.2	1.2
Clothes dryer usage							
0 loads per week	2.1	Q	Q	Q	0.3	Q	0.2
1 to 4 loads per week	56.8	8.5	2.2	6.3	12.5	8.4	4.1
5 to 9 loads per week	26.3	4.1	1.3	2.8	6.5	4.6	1.9
10 to 15 loads per week	8.3	1.2	0.4	0.8	2.3	1.5	0.8
More than 15 loads per week	1.4	Q	N	Q	0.3	0.2	Q
Do not have a clothes dryer at home	23.3	6.7	1.7	5.1	4.5	3.2	1.2

[1]Housing characteristics data were collected between August 2015 and April 2016.

[2]Total U.S. includes all primary occupied housing units in the 50 states and the District of Columbia. Vacant housing units, seasonal units, second homes, military houses, and group quarters are excluded.

[3]Some other small kitchen appliance includes stand mixers, bread makers, waffle makers, electric can openers, sandwich makers, coffee grinders, and many other reported appliances.

Q = Data withheld because either the Relative Standard Error (RSE) was greater than 50% or fewer than 10 cases responded.

N = No cases responded.

Notes: Because of rounding, data may not sum to totals. See RECS Terminology for definition of terms used in these tables.

Source: U.S. Energy Information Administration, Office of Energy Consumption and Efficiency Statistics, Forms EIA-457A and EIA-457C of the 2015 Residential Energy Consumption Survey.

Products that earn the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
www.energystar.gov

CHANGE FOR THE BETTER WITH ENERGY STAR

Life Cycle Cost Estimate for 1 ENERGY STAR Qualified Residential Refrigerator(s)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

Enter your own values in the gray boxes or use our default values.

Number of units	1	
Electricity Rate ($/kWh)	$ 0.120	
Choose the type of refrigerator	7-Side Mount Freezer with through-the-door ice	
	ENERGY STAR Qualified Unit	**Conventional Unit**
Initial cost per unit (estimated retail price)	$2,100	$1,800
Refrigerator Fresh Volume (ft^3)	18	18
Refrigerator Freezer Volume (ft^3)	5	5
Refrigerator Total Volume (ft^3)	23	23

Annual and Life Cycle Costs and Savings for 1 Residential Refrigerator(s)

	1 ENERGY STAR Qualified Unit(s)	1 Conventional Unit(s)	Savings with ENERGY STAR
Annual Operating Costs*			
Energy costs	$77	$84	$7
Total	**$77**	**$84**	**$7**
Life Cycle Costs*			
Energy costs	$770	$840	$70
Energy consumption (kWh)	*8,359*	*9,113*	*754*
Purchase Price for 1 unit(s)	$2,100	$1,800	-$300
Total	**$2,870**	**$2,640**	**-$230**
Simple payback of initial additional cost (years)†			**>13**

* *Annual costs exclude the initial purchase price. All costs, except initial cost, are discounted over the products' lifetime using a real discount*

† *A simple payback period of zero years means that the payback is immediate.*

Summary of Benefits for 1 Residential Refrigerator(s)

Initial cost difference	**$300**
Life cycle savings	**$70**
Net life cycle savings (life cycle savings - additional cost)	**-$230**
Simple payback of additional cost (years)	**>13**
Life cycle energy saved (kWh)	**754**
Life cycle air pollution reduction (lbs of CO_2)	**1,161**
Air pollution reduction equivalence (number of cars removed from the road for a year)	**0.10**
Air pollution reduction equivalence (acres of forest)	**0.12**
Savings as a percent of retail price	**-11%**

Assumptions for Residential Refrigerators			
Category	**Value**		**Data Source**
Power			
ENERGY STAR Qualified Unit			
Initial cost per unit	$2,100		
Refrigerator Fresh Volume	18	ft^3	DOE 2004
Refrigerator Freezer Volume	5	ft^3	DOE 2004
Adjusted Volume	26.15	ft^3	DOE 2004
Lifetime	13	years	DOE 2004
Annual Unit Energy Consumption			
For Selected Refrigerator Type	643	kWh	Calculated.
1-Manual Defrost Refrigerators	407	kWh	DOE 2004
2-Partial Automatic Defrost Refrigerators	407	kWh	DOE 2004
3-Top Mount Freezer without through-the-door ice	452	kWh	DOE 2004
4-Side Mount Freezer without through-the-door ice	541	kWh	DOE 2004
5-Bottom Mount Freezer without through-the-door ice	492	kWh	DOE 2004
6-Top Mount Freezer with through-the-door ice	529	kWh	DOE 2004
7-Side Mount Freezer with through-the-door ice	643	kWh	DOE 2004
Conventional Unit (New Unit)			
Initial cost per unit	$1,800		
Refrigerator Fresh Volume	18	ft^3	DOE 2004
Refrigerator Freezer Volume	5	ft^3	DOE 2004
Adjusted Volume	26.15	ft^3	DOE 2004
Lifetime	13	years	DOE 2004
Annual Unit Energy Consumption			
For Selected Refrigerator Type	701	kWh	Calculated.
1-Manual Defrost Refrigerators	479	kWh	DOE 2004
2-Partial Automatic Defrost Refrigerators	479	kWh	DOE 2004
3-Top Mount Freezer without through-the-door ice	532	kWh	DOE 2004
4-Side Mount Freezer without through-the-door ice	636	kWh	DOE 2004
5-Bottom Mount Freezer without through-the-door ice	579	kWh	DOE 2004
6-Top Mount Freezer with through-the-door ice	623	kWh	DOE 2004
7-Side Mount Freezer with through-the-door ice	701	kWh	DOE 2004
Usage			
Number of operating hours per day	24	hours/day	DOE 2004
Number of operating days per year	365	days/year	DOE 2004
Number of operating hours per year	8,760	hours/year	Calculated.
Discount Rate			
Commercial and Residential Discount Rate (real)	4%		A real discount rate of 4 percent is assumed, which is roughly equivalent to the nominal discount rate of 7 percent (4 percent real discount rate + 3 percent inflation rate).
Energy Prices			
2006 Commercial Electricity Price	$ 0.0952	$/kWh	EIA 2008
2006 Residential Electricity Price	$ 0.1200	$/kWh	EIA 2008
Carbon Emissions Factors			
Electricity Carbon Emission Factors	1.54	lbs CO_2/kWh	EPA 2008
CO_2 Equivalents			
Annual CO_2 sequestration per forested acre	9,700	lbs CO_2/acre-yr	EPA 2007
Annual CO_2 emissions for "average" passenger car	12,037	lbs CO_2/acre-yr	EPA 2007

If you have any questions, please contact: ESCalcs@cadmusgroup.com.
Calculator last updated: 08/08

ENERGY STAR

ABOUT FOR PARTNERS SEARCH

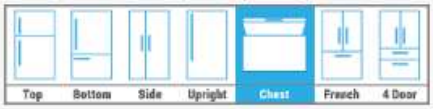
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Find out how much your old refrigerator or freezer costs to operate and how much you can save by flipping it to ENERGY STAR.

1. Pick one of the following for your savings:
   - (●) Replace my main refrigerator/freezer
   - ( ) Remove my extra refrigerator/freezer
2. Find your state's electricity price per kilowatt hour or use the national average. 0.1200 (Tip: Check your utility bill.)
3. Pick the picture that best represents your refrigerator/freezer:



Approximate Model Year: 1993-2000

Capacity (or Size): 19.0-21.4 Cubic Feet

CALCULATE SAVINGS →

This Flip Your Fridge calculator is designed to provide an estimate of the savings associated with replacing or removing an old refrigerator or freezer with a new ENERGY STAR certified model. Actual savings may vary based on use, upkeep, and other factors. Assumptions are based on a combination of historical data (adjusted for degradation based on the age of the refrigerator/freezers) and calculations cited in the ENERGY STAR specifications.

If you have trouble using this tool, please contact appliances@energystar.gov

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Your Information

Model:	19.0-21.4 Cubic Feet Chest Freezer
Electricity Rate:	$0.1200
Annual Cost:	$81.60
Annual kWh:	680 kWh

Flip Your Fridge Savings

$189 over five years

542 lbs of carbon pollution over five years

10,509 lbs more of carbon pollution when you properly recycle your old refrigerator

Learn more, including information on refrigerator rebates in your area.

LEARN MORE →

ENERGY STAR refrigerators and freezers are independently certified to save energy. Special offers may be available in your area.

REBATE FINDER → PRODUCT FINDER →

START OVER →

This Flip Your Fridge calculator is designed to provide an estimate of the savings associated with replacing or removing an old refrigerator or freezer with a new ENERGY STAR certified model. Actual savings may vary based on use, upkeep, and other factors. Assumptions are based on a combination of historical data (adjusted for degradation based on the age of the refrigerator/freezers) and calculations cited in the ENERGY STAR specifications.

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Release date: February 2017
Revised date: May 2018

Table HC7.7 Air conditioning in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Air-conditioning equipment							
Use air-conditioning equipment	102.8	17.8	4.2	13.6	24.4	16.7	7.6
Do not use air-conditioning equipment	15.4	3.2	1.4	1.8	2.0	1.4	0.6
Type of air-conditioning equipment used (more than one may apply)							
Use central air-conditioning equipment	76.1	7.4	1.5	5.9	18.6	12.4	6.2
Without a heat pump	55.4	5.8	1.2	4.6	16.6	11.2	5.4
With a heat pump	20.7	1.6	0.3	1.3	2.0	1.2	0.7
Use individual air-conditioning units	32.1	11.3	2.8	8.5	7.0	5.2	1.8
With 1 unit	15.9	4.6	1.3	3.3	4.1	2.9	1.2
With 2 units	9.6	3.8	0.9	2.9	2.1	1.6	0.5
With 3 or more units	6.6	2.9	0.7	2.2	0.8	0.6	Q
Do not use air-conditioning equipment	15.4	3.2	1.4	1.8	2.0	1.4	0.6
Central air-conditioning equipment age							
Less than 2 years old	8.3	0.8	Q	0.7	1.8	1.3	0.5
2 to 4 years old	11.7	1.0	Q	0.8	2.3	1.5	0.8
5 to 9 years old	22.4	2.3	0.4	2.0	5.2	3.4	1.7
10 to 14 years old	17.2	1.6	0.5	1.2	4.5	2.9	1.7
15 to 19 years old	9.2	0.9	0.3	0.6	2.6	1.8	0.8
20 or more years old	7.3	0.7	Q	0.6	2.1	1.4	0.7
Do not use central air-conditioning equipment	42.1	13.6	4.1	9.5	7.8	5.7	2.1
Have thermostat for central air-conditioning equipment							
Yes	74.7	7.2	1.5	5.7	18.4	12.2	6.2
Programmable thermostat	47.9	5.1	1.0	4.1	11.5	7.9	3.6
Non-programmable thermostat	26.8	2.1	0.5	1.6	6.9	4.3	2.5
No	1.4	Q	Q	Q	0.2	0.2	Q
Do not use central air-conditioning equipment	42.1	13.6	4.1	9.5	7.8	5.7	2.1

Table HC7.7 Air conditioning in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Central air-conditioning equipment control							
Set one temperature and leave it there most of the time	34.0	3.0	0.5	2.5	8.6	5.7	2.9
Manually adjust the temperature at night or when no one is at home	19.6	1.8	0.4	1.4	4.1	2.6	1.5
Program the thermostat to automatically adjust the temperature during the day and night at certain times	13.7	1.5	0.3	1.3	4.1	2.8	1.3
Turn equipment on or off as needed	8.8	1.1	0.4	0.6	1.8	1.3	0.5
Household does not have control over the equipment	Q	N	N	N	N	N	N
Do not use central air-conditioning equipment	42.1	13.6	4.1	9.5	7.8	5.7	2.1
Most-used individual air-conditioning unit age							
Less than 2 years old	6.4	1.9	0.6	1.3	1.2	0.8	0.4
2 to 4 years old	10.0	3.0	0.7	2.3	2.3	1.7	0.6
5 to 9 years old	9.8	4.2	1.0	3.2	2.1	1.6	0.4
10 to 14 years old	3.7	1.3	0.3	1.0	1.0	0.7	0.2
15 to 19 years old	1.3	0.5	Q	0.4	Q	Q	Q
20 or more years old	1.1	0.3	Q	0.3	0.3	Q	Q
Do not use individual air-conditioning units	86.1	9.7	2.8	6.9	19.4	12.9	6.5
Most-used individual air-conditioning unit control							
Set one temperature and leave it there most of the time	9.8	2.9	0.8	2.2	2.5	1.9	0.6
Manually adjust the temperature at night or when no one is at home	5.8	1.8	0.4	1.4	1.5	1.1	0.5
Program the thermostat to automatically adjust the temperature during the day and night at certain times	1.5	0.6	Q	0.4	0.2	Q	Q
Turn equipment on or off as needed	14.8	5.9	1.4	4.5	2.8	2.1	0.7
Some other way	Q	Q	Q	N	N	N	N
Do not use individual air-conditioning units	86.1	9.7	2.8	6.9	19.4	12.9	6.5

Table HC7.7 Air conditioning in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Summer indoor daytime temperature when someone is home							
69 degrees or less	19.9	4.9	1.5	3.4	5.2	3.9	1.3
70 degrees	17.4	3.0	0.9	2.1	4.3	3.0	1.3
71 to 73 degrees	20.5	3.7	0.7	3.0	5.5	3.7	1.7
74 to 76 degrees	26.3	4.3	0.7	3.6	6.1	4.1	2.0
77 to 79 degrees	13.0	1.0	Q	0.9	2.4	1.3	1.1
80 degrees or more	5.7	0.8	0.3	0.6	0.8	0.6	0.2
Do not use air-conditioning equipment	15.4	3.2	1.4	1.8	2.0	1.4	0.6
Summer indoor daytime temperature when no one is home							
69 degrees or less	14.0	3.2	0.9	2.3	3.9	2.9	1.1
70 degrees	13.0	2.2	0.6	1.6	3.2	2.2	1.0
71 to 73 degrees	14.5	2.5	0.4	2.0	4.2	2.8	1.4
74 to 76 degrees	25.5	5.1	1.2	3.9	6.5	4.6	1.9
77 to 79 degrees	15.9	1.7	0.2	1.5	3.3	2.2	1.1
80 degrees or more	19.9	3.2	0.8	2.4	3.1	2.0	1.1
Do not use air-conditioning equipment	15.4	3.2	1.4	1.8	2.0	1.4	0.6
Summer indoor temperature at night							
69 degrees or less	25.8	5.7	1.8	3.9	6.4	4.9	1.6
70 degrees	20.0	4.0	0.9	3.0	4.8	3.3	1.5
71 to 73 degrees	19.1	3.1	0.5	2.5	5.1	3.3	1.8
74 to 76 degrees	23.3	3.7	0.7	3.0	5.2	3.3	1.8
77 to 79 degrees	10.4	1.0	Q	0.9	2.1	1.3	0.8
80 degrees or more	4.2	0.4	Q	Q	0.7	0.6	Q
Do not use air-conditioning equipment	15.4	3.2	1.4	1.8	2.0	1.4	0.6
Air-conditioned basement							
Yes	14.2	2.1	0.3	1.8	8.1	4.8	3.4
No	17.5	7.2	1.9	5.2	6.3	4.5	1.8
Not asked (air-conditioned homes with no basement)	39.9	1.8	0.5	1.3	3.8	3.0	0.9
Not asked (un-air-conditioned homes, apartments, and mobile homes)	46.7	10.0	2.9	7.1	8.1	5.8	2.3

Table HC7.7 Air conditioning in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Air-conditioned attic							
Yes	1.6	0.5	Q	0.4	0.5	0.3	Q
No	39.9	6.1	1.4	4.7	9.6	6.5	3.1
Not asked (air-conditioned homes with no attic)	30.0	4.5	1.2	3.3	8.2	5.5	2.7
Not asked (un-air-conditioned homes, apartments, and mobile homes)	46.7	10.0	2.9	7.1	8.1	5.8	2.3
Air-conditioned, attached garage							
Yes	1.0	Q	Q	Q	0.2	Q	Q
No	41.1	5.8	1.2	4.5	10.9	7.2	3.7
Not asked (air-conditioned homes with no attached garage)	29.4	5.2	1.5	3.7	7.2	4.9	2.2
Not asked (un-air-conditioned homes, apartments, and mobile homes)	46.7	10.0	2.9	7.1	8.1	5.8	2.3
Dehumidifiers and usage							
Have a dehumidifier	16.7	5.4	1.6	3.8	6.9	5.1	1.9
Do not use	0.4	Q	Q	Q	0.3	Q	Q
Used less than 4 months	5.5	2.1	0.8	1.3	2.1	1.7	0.5
Used 4 to 6 months	6.5	1.7	0.5	1.2	3.2	2.2	0.9
Used 7 to 9 months	2.0	0.7	Q	0.6	0.7	0.5	0.2
Used 10 to 11 months	Q	Q	Q	Q	Q	Q	Q
Turned on all 12 months	2.1	0.7	Q	0.6	0.7	0.5	0.2
Do not have a dehumidifier	101.5	15.6	4.0	11.6	19.4	13.0	6.4
Use an evaporative or swamp cooler (asked only in arid areas)							
Yes	2.8	N	N	N	N	N	N
No	54.8	N	N	N	N	N	N
Not asked	60.6	21.0	5.6	15.4	26.4	18.1	8.3

Table HC7.7 Air conditioning in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Fan types used (more than one may apply)							
Ceiling fans	85.1	12.1	3.0	9.1	19.8	13.5	6.4
Floor, window, or table fans	54.4	11.0	3.6	7.4	13.8	9.5	4.3
Whole house fans	6.1	0.9	Q	0.9	1.5	1.0	0.5
Attic fans	8.7	1.8	0.2	1.6	2.1	1.3	0.8
Number of ceiling fans used							
0	33.1	8.9	2.6	6.2	6.5	4.6	1.9
1	21.3	3.8	1.0	2.9	5.3	3.7	1.6
2	18.8	3.0	0.9	2.1	4.6	3.1	1.5
3	15.2	2.4	0.7	1.7	3.8	2.6	1.1
4 or more	29.8	2.9	0.5	2.4	6.2	4.0	2.2

[1]Housing characteristics data were collected between August 2015 and April 2016.

[2]Total U.S. includes all primary occupied housing units in the 50 states and the District of Columbia. Vacant housing units, seasonal units, second homes, military houses, and group quarters are excluded.

Q = Data withheld because either the Relative Standard Error (RSE) was greater than 50% or fewer than 10 households responded.

N = No cases responded.

Notes: Because of rounding, data may not sum to totals. See RECS Terminology for definition of terms used in these tables.

Source: U.S. Energy Information Administration, Office of Energy Consumption and Efficiency Statistics, Forms EIA-457A and EIA-457C of the 2015 Residential Energy Consumption Survey.

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CHANGE FOR THE BETTER WITH ENERGY STAR

Life Cycle Cost Estimate for 1 ENERGY STAR Qualified Room Air Conditioner(s)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

Enter your own values in the gray boxes or use our default values.

Number of units	1	
Electricity Rate ($/kWh)	$0.120	
Choose your city from the menu at right	NE-North Platte	
	ENERGY STAR Qualified Unit	**Conventional Unit**
Initial Cost per Unit (estimated retail price)	$389	$338
Energy Efficiency Ratio (EER)	12.1	9.8
Cooling Capacity of Air Conditioner (Btu/hr)	10,000	10,000

Annual and Life Cycle Costs and Savings for 1 Room Air Conditioner(s)

	1 ENERGY STAR Qualified Unit(s)	1 Conventional Unit(s)	Savings with ENERGY STAR
Annual Operating Costs*			
Energy cost	$63	$78	$15
Energy consumption (kWh)	*529*	*653*	*124*
Maintenance cost	$0	$0	$0
Total	**$63**	**$78**	**$15**
Life Cycle Costs*			
Operating costs (energy and maintenance)	$472	$583	$111
Energy costs	$472	$583	$111
Energy consumption (kWh)	*4,760*	*5,878*	*1,117*
Maintenance costs	$0	$0	$0
Purchase price for 1 unit(s)	$389	$338	-$51
Total	**$861**	**$921**	**$60**
	Simple payback of initial additional cost (years)†		**3.4**

** Annual costs exclude the initial purchase price. All costs, except initial cost, are discounted over the products' lifetime using a real discount rate of 4%. See "Assumptions" to change factors including the discount rate.*

† *A simple payback period of zero years means that the payback is immediate.*

Summary of Benefits for 1 Room Air Conditioner(s)

Initial cost difference	**$51**
Life cycle savings	**$111**
Net life cycle savings (life cycle savings - additional cost)	**$60**
Simple payback of additional cost (years)	**3.4**
Life cycle energy saved (kWh)	**1,117**
Life cycle air pollution reduction (lbs of CO_2)	**1,721**
Air pollution reduction equivalence (number of cars removed from the road for a year)	**0**
Air pollution reduction equivalence (acres of forest)	**0**
Savings as a percent of retail price	**15%**

Assumptions for Room Air Conditioners

Category	Value	Data Source
Power		
ENERGY STAR Qualified Unit		
Initial Cost Per Unit	$389	
Energy Efficiency Ratio (EER)	12.1	ENERGY STAR Criteria
Cooling Capacity of Air Conditioner (Btu/hr)	10,000 Btu/hr	Typical room air conditioner size, April 2009
Lifetime	9 years	Appliance Magazine, September 2008
Conventional Unit (Manufactured After 1994)		
Initial Cost Per Unit	$338	
Energy Efficiency Ratio (EER)	9.8	DOE Federal Test Procedure 10 CFR 430, Appendix F
Cooling Capacity of Air Conditioner (Btu/hr)	10,000 Btu/hr	Typical room air conditioner size, April 2009
Lifetime	9 years	Appliance Magazine, September 2008
Maintenance		
Labor cost (per hour)	$20	EPA 2004
Labor time (hours)	0	EPA 2004
Usage		
Full-Load Cooling Hours		
Full-Load Cooling Hours for Selected Location	640	EPA 2002
CO-Colorado Springs	523	EPA 2002
IA-Des Moines	941	EPA 2002
NE-Grand Island	851	EPA 2002
Discount Rate		
Commercial and Residential Discount Rate (real)	4%	A real discount rate of 4 percent is assumed, which is roughly equivalent to the nominal discount rate of 7 percent (4 percent real discount rate + 3 percent
Energy Prices		
Commercial Electricity Price	$0.0953 $/kWh	US Department of Energy, Annual Energy Outlook 2011 (Early Release),
Residential Electricity Price	$0.1200 $/kWh	(converted from 2009 to 2010 dollars), http://www.eia.gov/forecasts/aeo/er/
Carbon Dioxide Emissions Factors		
Electricity Carbon Emission Factor	1.54 lbs CO_2/kWh	EPA 2011
CO_2 Equivalents		
Annual CO_2 sequestration per forested acre	10,347 lbs CO_2/yr	EPA's Greenhouse Gas Equivalencies Calculator,
Annual CO_2 emissions per average passenger car	11,244 lbs CO_2/yr	http://www.epa.gov/cleanenergy/energy-resources/calculator.html

If you have questions, comments or suggestions, please write to calculators@energystar.gov
Calculator last updated April 2009, utility and emission rates updated July 2011

Products that earn the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
www.energystar.gov

CHANGE FOR THE BETTER WITH ENERGY STAR

Life Cycle Cost Estimate for 1 ENERGY STAR Qualified Central Air Conditioner(s)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

Enter your own values in the gray boxes or use our default values.

Choose your city from the menu at right → NE-North Platte

Enter your own values in the gray boxes or use our default values.

Number of units	1	
Electric Rate ($/kWh)	$0.120	
	ENERGY STAR Qualified Unit	**Conventional Unit**
Initial Cost per Unit (estimated retail price with installation)**	$5,256	$4,400
Seasonal Energy Efficiency Ratio (SEER) rating	15.0	13.0
Cooling Capacity of Air Conditioner (Btu/hr)	3 ton	3 ton
Use with programmable Thermostat (Yes/No)	Yes	No

Annual and Life Cycle Costs and Savings for 1 Central Air Conditioner(s)

	1 ENERGY STAR Qualified Units	1 Conventional Units	Savings with ENERGY STAR
Annual Operating Costs*			
Energy cost	$155	$213	$58
Energy consumption (kWh)	*1,290*	*1,772*	*482*
Maintenance cost	$0	$0	$0
Total	**$155**	**$213**	**$58**
Life Cycle Costs*			
Operating costs (energy and maintenance)	$1,635	$2,247	$611
Energy costs	$1,635	$2,247	$611
Energy consumption (kWh)	*18,063*	*24,812*	*6,749*
Maintenance costs	$0	$0	$0
Purchase price for 1 unit(s)	$5,256	$4,400	-$856
Total	**$6,891**	**$6,647**	**-$245**
		Simple payback of initial additional cost (years)†	**>14**

** Annual costs exclude the initial purchase price. All costs, except initial cost, are discounted over the products' lifetime using a real discount rate of 4%. See "Assumptions" to change factors including the discount rate.*

† A simple payback period of zero years means that the payback is immediate.

Summary of Benefits for 1 Central Air Conditioner(s)

Initial cost difference	**$856**
Life cycle savings	**$611**
Net life cycle savings (life cycle savings - additional cost)	**-$245**
Simple payback of additional cost (years)	**>14**
Life cycle energy saved (kWh)	**6,749**
Life cycle air pollution reduction (lbs of CO_2)	**10,393**
Air pollution reduction equivalence (number of cars removed from the road for a year)	**1**
Savings as a percent of retail price	**-5%**

Assumptions for Central Air Conditioners

Category	Value		Data Source
Power			
ENERGY STAR Qualified Unit			
Initial Cost Per Unit			
2.5 ton	$3,252	$5,126	DEER Database 2008
3 ton	$3,413	$5,256	DEER Database 2008
3.5 ton	$3,574	$5,684	DEER Database 2008
4 ton	$3,735	$6,109	DEER Database 2008
5 ton	$4,057		DEER Database 2008
Seasonal Energy Efficiency Ratio(SEER) rating	15.0		EPA 2009
Cooling Capacity of Air Conditioner (Btu/hr)	36,000	Btu/hr	Calculated
Lifetime	14	years	EPA 2006
Conventional Unit			
Initial Cost Per Unit			
2.5 ton	$2,696	$4,250	DEER Database 2008
3 ton	$2,857	$4,400	DEER Database 2008
3.5 ton	$3,018	$4,800	DEER Database 2008
4 ton	$3,179	$5,200	DEER Database 2008
5 ton	$3,501		DEER Database 2008
Seasonal Energy Efficiency Ratio(SEER) rating	13		EPA 2007
Cooling Capacity of Air Conditioner (Btu/hr)	36,000	Btu/hr	Calculated
Lifetime	14	years	EPA 2006
Maintenance			
Labor cost (per hour)	$20		EPA 2004
Labor time (hours)	0		EPA 2004
Usage			
Full-Load Cooling Hours			
Full-Load Cooling Hours for Selected Location	640		ARI Unitary Directory, August 1, 1992 - January 31, 1993
Discount Rate			
Commercial and Residential Discount Rate (real)	4%		A real discount rate of 4 percent is assumed, which is roughly equivalent to the nominal discount rate of 7 percent (4 percent real discount rate + 3 percent inflation rate).
Programable Thermostat Discount Rate	16%		LBNL 2007 (Based on minimum estimated savings)
Energy and Water Prices			
Commercial Electricity Price	$0.0962	$/kWh	National average: US Department of Energy, Annual Energy
Residential Electricity Price	$0.1200	$/kWh	Outlook 2013 (Early Release edition), (converted from 2011 to
Carbon Dioxide Emissions Factors			
Electricity Carbon Emission Factor	1.54	lbs CO_2/kWh	EPA 2013
CO_2 Equivalents			
Annual CO_2 emissions per average passenger car	11,244	lbs CO_2/yr	EPA Greenhouse Gas Equivalencies Calculator, 2013
Usage			
Full-Load Cooling Hours			
Full-Load Cooling Hours for Selected Location	640		EPA 2002
CO-Colorado Springs	523		EPA 2002
IA-Des Moines	941		EPA 2002
NE-Grand Island	851		EPA 2002

If you have questions, comments or suggestions, please write to calculators@energystar.gov
Calculator last updated April 2009, utility and emission rates updated 2013

Release date: February 2017
Revised date: May 2018

Table HC8.7 Water heating in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Fuel used by main water heater							
Natural gas	56.3	10.6	2.0	8.6	16.0	11.3	4.7
Electricity	54.6	6.8	2.0	4.8	9.4	6.2	3.2
Propane	4.2	0.9	0.4	0.5	1.0	0.6	0.3
Fuel oil/kerosene	2.8	2.5	1.2	1.4	N	N	N
Some other fuel	0.3	Q	Q	Q	Q	N	Q
Size of main water heater							
Small (30 gallons or less)	15.3	1.9	0.5	1.4	3.1	2.1	1.0
Medium (31 to 49 gallons)	51.8	7.9	2.2	5.7	12.4	8.7	3.7
Large (50 gallons or more)	31.8	4.3	0.9	3.4	6.7	4.2	2.5
Tankless	3.0	0.8	0.4	0.3	0.6	0.5	0.2
Central water heater in an apartment building	16.3	6.1	1.5	4.6	3.4	2.6	0.9
Age of main water heater							
Less than 2 years old	16.1	3.5	1.0	2.5	3.6	2.6	1.0
2 to 4 years old	23.9	3.9	1.4	2.4	4.9	3.4	1.5
5 to 9 years old	37.8	6.7	1.5	5.2	8.3	5.8	2.5
10 to 14 years old	23.0	3.3	0.7	2.6	5.3	3.5	1.8
15 to 19 years old	8.9	1.4	0.4	1.0	2.3	1.7	0.6
20 years or more	8.6	2.2	0.5	1.7	2.0	1.1	0.9

Table HC8.7 Water heating in homes in the Northeast and Midwest regions, 2015[1]

Number of housing units (million)

		Northeast Census Region			Midwest Census Region		
	Total U.S.[2]	Total Northeast	New England	Middle Atlantic	Total Midwest	East North Central	West North Central
All homes	118.2	21.0	5.6	15.4	26.4	18.1	8.3
Fuel used by secondary water heater							
Natural gas	1.7	Q	Q	Q	0.4	Q	0.2
Electricity	2.3	0.2	Q	Q	Q	Q	Q
Some other fuel	0.4	Q	Q	Q	Q	Q	Q
Do not have a secondary water heater	97.6	14.4	4.0	10.5	22.4	15.3	7.1
Not asked (central water heater in an apartment building)	16.3	6.1	1.5	4.6	3.4	2.6	0.9

[1]Housing characteristics data were collected between August 2015 and April 2016.

[2]Total U.S. includes all primary occupied housing units in the 50 states and the District of Columbia. Vacant housing units, seasonal units, second homes, military houses, and group quarters are excluded.

Q = Data withheld because either the Relative Standard Error (RSE) was greater than 50% or fewer than 10 households responded.

N = No cases responded.

Notes: Because of rounding, data may not sum to totals. See RECS Terminology for definition of terms used in these tables.

Source: U.S. Energy Information Administration, Office of Energy Consumption and Efficiency Statistics, Forms EIA-457A and EIA-457C of the 2015 Residential Energy Consumption Survey.

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Energy Cost Calculator for Electric and Gas Water Heaters

Federal Energy Management Program

This energy cost calculator for electric and gas water heaters is designed as a screening tool that estimates a water heater's lifetime energy cost savings at various efficiency levels.

INPUT SECTION		
Input the following data (if any parameter is missing, calculator will set to default value).		*Defaults*
TYPE OF WATER HEATER	Electric	*Electric*
AVERAGE DAILY USAGE (GALLONS PER DAY)*	64 gallons	*64**
ENERGY FACTOR†	0.92	*0.92 (electric)* *0.61 (gas)*
ENERGY COST	$ 0.12 / kWh	*$0.06 per kWh* *$.60 per therm*
QUANTITY OF WATER HEATERS TO BE PURCHASED	1 unit(s)	*1 unit*

* See assumptions for various daily water use totals.
† The comparison assumes a storage tank water heater as the input type. To allow demand water heaters as the comparison type, users can specify an input EF of up to 0.85; however, 0.66 is currently the best available EF for storage water heaters.

2022 INTEGRATED RESOURCE PLAN
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Calculate Reset

OUTPUT SECTION

PERFORMANCE PER WATER HEATER	YOUR CHOICE	BASE MODEL	FEMP RECOMMENDED LEVEL	BEST AVAILABLE
NEW ENERGY FACTOR	0.92	0.86	0.92	0.95
ANNUAL ENERGY USE kWh	4750	5082	4750	4600
ANNUAL ENERGY COSTS	$ 570 <>	$ 610	$ 570	$ 552
LIFETIME ENERGY COSTS	$ 5535	$ 5923	$ 5535	$ 5360
LIFETIME ENERGY COST SAVINGS	$ 388	$ 0	$ 388	$ 563
LIFETIME ENERGY COST SAVINGS FOR 1 WATER HEATER(S)	$ 388	$ 0	$ 388	$ 563

Your selection of a electric water heater using 64 gallon(s) per day will have a $ 388 energy cost savings per water heater over an estimated 13 year life expectancy compared to the base model.

ASSUMPTIONS

- "Base model" has an efficiency that just meets the national minimum standard for gas and electric water heaters.
- Lifetime energy cost is the sum of the discounted value of the annual energy costs based on assumed water heater life of 13 years.
- Future electricity price trends and a discount rate of 3.2% are based on Federal guidelines.
- $0.09 per kWh for electricity is the Federal average price in the U.S.
- $0.93 per therm for gas is the Federal average price in the U.S.
- Hot water usage estimates:
  - Average shower (8 minutes) = 10 gallons of hot water
  - Average clothes washer (one load) = 7 gallons of hot water
  - Average dishwasher (one load) = 6 gallons of hot water
  - Average kitchen faucet flow = 2 gpm
  - Average bathroom faucet flow = 0.5 gpm

- Average daily usage = 64 gallons of hot water.

DISCLAIMER

This cost calculator is a screening tool that estimates a product's lifetime energy cost savings at various efficiency levels. Maintenance and installation costs do not vary significantly among the same product having different efficiencies; so, these costs are not included in this calculator tool. For a detailed life cycle cost analysis, the Federal Energy Management Program has developed a tool called **Building Life Cycle Cost (BLCC)**. This downloadable tool allows the user to vary interest rates, installation costs, maintenance costs, salvage values, and life expectancy for a product or an entire energy project.

Quick Links

Purchasing Energy-Efficient Residential Gas Storage Water Heaters

Energy- and Cost-Savings Calculators

Purchasing Energy-Efficient Residential Electric Storage Water Heaters

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MUNICIPAL ENERGY AGENCY OF NEBRASKA

Energy Cost Calculator for Electric and Gas Water Heaters

Federal Energy Management Program

This energy cost calculator for electric and gas water heaters is designed as a screening tool that estimates a water heater's lifetime energy cost savings at various efficiency levels.

INPUT SECTION		
Input the following data (if any parameter is missing, calculator will set to default value).		*Defaults*
TYPE OF WATER HEATER	Gas	*Electric*
AVERAGE DAILY USAGE (GALLONS PER DAY)*	50 gallons	*64**
ENERGY FACTOR†	0.61	*0.92 (electric)* *0.61 (gas)*
ENERGY COST	$ 0.97 / therm	*$0.06 per kWh* *$.60 per therm*
QUANTITY OF WATER HEATERS TO BE PURCHASED	1 unit(s)	*1 unit*

* See assumptions for various daily water use totals.
† The comparison assumes a storage tank water heater as the input type. To allow demand water heaters as the comparison type, users can specify an input EF of up to 0.85; however, 0.66 is currently the best available EF for storage water heaters.

2022 INTEGRATED RESOURCE PLAN
APPROVED BY MEAN BOARD 5/19/22

Calculate Reset

OUTPUT SECTION

PERFORMANCE PER WATER HEATER	YOUR CHOICE	BASE MODEL	FEMP RECOMMENDED LEVEL	BEST AVAILABLE
NEW ENERGY FACTOR	0.61	0.59	0.62	0.85
ANNUAL ENERGY USE therm	191	197	188	137
ANNUAL ENERGY COSTS	$ 185 <>	$ 191	$ 182	$ 133
LIFETIME ENERGY COSTS	$ 1918	$ 1981	$ 1887	$ 1379
LIFETIME ENERGY COST SAVINGS	$ 63	$ 0	$ 94	$ 602
LIFETIME ENERGY COST SAVINGS FOR 1 WATER HEATER(S)	$ 63	$ 0	$ 94	$ 602

Your selection of a gas water heater using 50 gallon(s) per day will have a $ 63 energy cost savings per water heater over an estimated 13 year life expectancy compared to the base model.

ASSUMPTIONS

- "Base model" has an efficiency that just meets the national minimum standard for gas and electric water heaters.
- Lifetime energy cost is the sum of the discounted value of the annual energy costs based on assumed water heater life of 13 years.
- Future electricity price trends and a discount rate of 3.2% are based on Federal guidelines.
- $0.09 per kWh for electricity is the Federal average price in the U.S.
- $0.93 per therm for gas is the Federal average price in the U.S.
- Hot water usage estimates:
  - Average shower (8 minutes) = 10 gallons of hot water
  - Average clothes washer (one load) = 7 gallons of hot water
  - Average dishwasher (one load) = 6 gallons of hot water
  - Average kitchen faucet flow = 2 gpm
  - Average bathroom faucet flow = 0.5 gpm

- Average daily usage = 64 gallons of hot water.

DISCLAIMER

This cost calculator is a screening tool that estimates a product's lifetime energy cost savings at various efficiency levels. Maintenance and installation costs do not vary significantly among the same product having different efficiencies; so, these costs are not included in this calculator tool. For a detailed life cycle cost analysis, the Federal Energy Management Program has developed a tool called **Building Life Cycle Cost (BLCC)**. This downloadable tool allows the user to vary interest rates, installation costs, maintenance costs, salvage values, and life expectancy for a product or an entire energy project.

Quick Links

Purchasing Energy-Efficient Residential Gas Storage Water Heaters

Energy- and Cost-Savings Calculators

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DSM Market Potential Calculations

Room Air Conditioner	
Estimated Residential Customers	84,066
Estimated Appliance Saturation	26.52%
Market Eligibility	20.00%
Adoption Rate	25.00%
Estimated Convertable Units	1,115

Central Air Conditioner	
Estimated Residential Customers	84,066
Estimated Appliance Saturation	70.45%
Market Eligibility	34.85%
Adoption Rate	30.00%
Estimated Convertable Units	6,192

Refrigerator	
Estimated Residential Customers	84,066
Estimated Appliance Saturation	99.24%
Market Eligibility	11.45%
Adoption Rate	30.00%
Estimated Convertable Units	2,866

Freezer	
Estimated Residential Customers	84,066
Estimated Appliance Saturation	38.64%
Market Eligibility	49.04%
Adoption Rate	25.00%
Estimated Convertable Units	3,982

Heat Pump Water Heater	
Estimated Residential Customers	84,066
Estimated Appliance Saturation	64.39%
Market Eligibility	36.36%
Adoption Rate	20.00%
Estimated Convertable Units	3,937

Assigned Values			
Discount Rate	(%)		3.00%
Utility Avoided Cost Rate	($/MWh)	$ 42.09	3%
Customer Electrical Retail Rate	($/MWh)	$ 94.40	3%
Customer Natural Gas Retail Rate	($/therm)	$ 0.97	3%

Room Air Conditioner Rebate

Cost/Benefit Component	Unit	Escalation	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	NPV
Energy Savings	**(MWh/yr/unit)**	--	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	
Participants	**(#/yr)**	--	111	111	111	111	111	111	111	111	111	111	
Utility Avoided Cost	**($/yr)**	3%	$ 582	$ 599	$ 617	$ 636	$ 655	$ 674	$ 695	$ 715	$ 737	$ 759	**$5,647**
Utility Administrative Cost	**($/yr)**	3%	$ 14,846	$ 15,291	$ 15,750	$ 16,223	$ 16,709	$ 17,211	$ 17,727	$ 18,259	$ 18,807	$ 19,371	**$144,137**
Utility Incentive Rate	**($/unit)**	--	$ 40	$ 40	$ 40	$ 40	$ 40	$ 40	$ 40	$ 40	$ 40	$ 40	
Utility Incentive Cost	**($/yr)**	--	$ 4,458	$ 4,458	$ 4,458	$ 4,458	$ 4,458	$ 4,458	$ 4,458	$ 4,458	$ 4,458	$ 4,458	**$38,028**
Customer Incremental Cost	**($/unit)**	--	$ 51	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	
Customer Incremental Cost	**($/yr)**	--	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	$ 1,226	**$10,458**
Customer Electrical Bill Savings	**($/yr)**	3%	$ 1,305	$ 1,344	$ 1,384	$ 1,426	$ 1,468	$ 1,512	$ 1,558	$ 1,604	$ 1,653	$ 1,702	**$12,666**
Customer Natural Gas Bill Savings	**($/yr)**	3%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**

Program Administrator Cost Test = A ÷ (B+C)	**0.0310**
Customer Cost Benefit Test = (E+F) ÷ D	**1.2112**
Total Resource Cost Test = A ÷ (B+D)	**0.0365**

Central Air Conditioner Rebate

Cost/Benefit Component	Unit	Escalation	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	NPV
Energy Savings	**(MWh/yr/unit)**	--	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	0.482	
Participants	**(#/yr)**	--	619	619	619	619	619	619	619	619	619	619	
Utility Avoided Cost	**($/yr)**	3%	$ 12,562	$ 12,939	$ 13,327	$ 13,727	$ 14,139	$ 14,563	$ 15,000	$ 15,450	$ 15,913	$ 16,391	**$121,962**
Utility Administrative Cost	**($/yr)**	3%	$ 14,846	$ 15,291	$ 15,750	$ 16,223	$ 16,709	$ 17,211	$ 17,727	$ 18,259	$ 18,807	$ 19,371	**$144,137**
Utility Incentive Rate	**($/unit)**	--	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	
Utility Incentive Cost	**($/yr)**	--	$ 185,761	$ 185,761	$ 185,761	$ 185,761	$ 185,761	$ 185,761	$ 185,761	$ 185,761	$ 185,761	$ 185,761	**$1,584,583**
Customer Incremental Cost	**($/unit)**	--	$ 856	$ 856	$ 856	$ 856	$ 856	$ 856	$ 856	$ 856	$ 856	$ 856	
Customer Incremental Cost	**($/yr)**	--	$ 344,278	$ 344,278	$ 344,278	$ 344,278	$ 344,278	$ 344,278	$ 344,278	$ 344,278	$ 344,278	$ 344,278	**$2,936,760**
Customer Electrical Bill Savings	**($/yr)**	3%	$ 28,174	$ 29,020	$ 29,890	$ 30,787	$ 31,710	$ 32,662	$ 33,642	$ 34,651	$ 35,690	$ 36,761	**$273,537**
Customer Natural Gas Bill Savings	**($/yr)**	3%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**

Program Administrator Cost Test = A ÷ (B+C)	**0.0706**
Customer Cost Benefit Test = (E+F) ÷ D	**0.0931**
Total Resource Cost Test = A ÷ (B+D)	**0.0396**

Refrigerator Rebate

Cost/Benefit Component	Unit	Escalation	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	NPV
Energy Savings	(MWh/yr/unit)	--	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	
Participants	(#/yr)	--	287	287	287	287	287	287	287	287	287	287	
Utility Avoided Cost	($/yr)	3%	$ 736	$ 758	$ 781	$ 804	$ 828	$ 853	$ 879	$ 905	$ 932	$ 960	$7,144
Utility Administrative Cost	($/yr)	3%	$ 14,846	$ 15,291	$ 15,750	$ 16,223	$ 16,709	$ 17,211	$ 17,727	$ 18,259	$ 18,807	$ 19,371	$144,137
Utility Incentive Rate	($/unit)	--	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	
Utility Incentive Cost	($/yr)	--	$ 17,196	$ 17,196	$ 17,196	$ 17,196	$ 17,196	$ 17,196	$ 17,196	$ 17,196	$ 17,196	$ 17,196	$146,685
Customer Incremental Cost	($/unit)	--	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	
Customer Incremental Cost	($/yr)	--	$ 40,124	$ 40,124	$ 40,124	$ 40,124	$ 40,124	$ 40,124	$ 40,124	$ 40,124	$ 40,124	$ 40,124	$342,266
Customer Electrical Bill Savings	($/yr)	3%	$ 1,650	$ 1,700	$ 1,751	$ 1,803	$ 1,857	$ 1,913	$ 1,971	$ 2,030	$ 2,091	$ 2,153	$16,023
Customer Natural Gas Bill Savings	($/yr)	3%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$0

Program Administrator Cost Test = A ÷ (B+C)	0.0246
Customer Cost Benefit Test = (E+F) ÷ D	0.0468
Total Resource Cost Test = A ÷ (B+D)	0.0147

Freezer Rebate

Cost/Benefit Component	Unit	Escalation	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	NPV
Energy Savings	(MWh/yr/unit)	--	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	
Participants	(#/yr)	--	398	398	398	398	398	398	398	398	398	398	
Utility Avoided Cost	($/yr)	3%	$ 5,279	$ 5,438	$ 5,601	$ 5,769	$ 5,942	$ 6,120	$ 6,304	$ 6,493	$ 6,688	$ 6,889	$51,257
Utility Administrative Cost	($/yr)	3%	$ 14,846	$ 15,291	$ 15,750	$ 16,223	$ 16,709	$ 17,211	$ 17,727	$ 18,259	$ 18,807	$ 19,371	$144,137
Utility Incentive Rate	($/unit)	--	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	
Utility Incentive Cost	($/yr)	--	$ 23,892	$ 23,892	$ 23,892	$ 23,892	$ 23,892	$ 23,892	$ 23,892	$ 23,892	$ 23,892	$ 23,892	$203,804
Customer Incremental Cost	($/unit)	--	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	
Customer Incremental Cost	($/yr)	--	$ 15,928	$ 15,928	$ 15,928	$ 15,928	$ 15,928	$ 15,928	$ 15,928	$ 15,928	$ 15,928	$ 15,928	$135,869
Customer Electrical Bill Savings	($/yr)	3%	$ 11,841	$ 12,196	$ 12,562	$ 12,939	$ 13,327	$ 13,727	$ 14,139	$ 14,563	$ 15,000	$ 15,450	$114,960
Customer Natural Gas Bill Savings	($/yr)	3%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$0

Program Administrator Cost Test = A ÷ (B+C)	0.1473
Customer Cost Benefit Test = (E+F) ÷ D	0.8461
Total Resource Cost Test = A ÷ (B+D)	0.1831

Heat Pump Water Heater Rebate

Cost/Benefit Component	Unit	Escalation	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	NPV
Energy Savings	(MWh/yr/unit)	--	2.242	2.242	2.242	2.242	2.242	2.242	2.242	2.242	2.242	2.242	
Participants	(#/yr)	--	394	394	394	394	394	394	394	394	394	394	
Utility Avoided Cost	($/yr)	3%	$ 37,152	$ 38,266	$ 39,414	$ 40,597	$ 41,815	$ 43,069	$ 44,361	$ 45,692	$ 47,063	$ 48,475	$360,697
Utility Administrative Cost	($/yr)	3%	$ 14,846	$ 15,291	$ 15,750	$ 16,223	$ 16,709	$ 17,211	$ 17,727	$ 18,259	$ 18,807	$ 19,371	$144,137
Utility Incentive Rate	($/unit)	--	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400	
Utility Incentive Cost	($/yr)	--	$ 157,480	$ 157,480	$ 157,480	$ 157,480	$ 157,480	$ 157,480	$ 157,480	$ 157,480	$ 157,480	$ 157,480	$1,343,336
Customer Incremental Cost	($/unit)	--	$ 850	$ 850	$ 850	$ 850	$ 850	$ 850	$ 850	$ 850	$ 850	$ 850	
Customer Incremental Cost	($/yr)	--	$ 177,165	$ 177,165	$ 177,165	$ 177,165	$ 177,165	$ 177,165	$ 177,165	$ 177,165	$ 177,165	$ 177,165	$1,511,253
Customer Electrical Bill Savings	($/yr)	3%	$ 83,325	$ 85,824	$ 88,399	$ 91,051	$ 93,783	$ 96,596	$ 99,494	$ 102,479	$ 105,553	$ 108,720	$808,976
Customer Natural Gas Bill Savings	($/yr)	3%	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$0

Program Administrator Cost Test = A ÷ (B+C)	0.2425
Customer Cost Benefit Test = (E+F) ÷ D	0.5353
Total Resource Cost Test = A ÷ (B+D)	0.2179

Appendix D – Public Comment

Summary

Public Comments Timely Received on MEAN IRP

86 public comments timely received on or before the deadline (May 14, 2022 at 5:00 pm CT), from the following members of the public. Note: Some comments were submitted jointly, and some commenters submitted multiple comments.

Luke Danielson, Sustainable Development Strategies Group (SDSG)
Tess Peterson (individually and on behalf of Sustainable Development Strategies Group (SDSG))
Rebecca Henderson
Kate Clark
Jorge Rodriguez
Yolanda Perez
Jeffery Delaney
Steven Schechter
Doug Miller
Sustainable Development Strategies Group (SDSG)
Nebraska Interfaith Power & Light
Nebraska Sierra Club
Bold Nebraska
Gunnison Valley Climate Crisis Coalition
Western Colorado University's Sustainability Coalition
Western Solar Society
Nebraska Farmers Union
Nebraskans for Peace
Nebraska Beyond Coal Campaign
Center for Rural Affairs
Kallie Klein (individually and on behalf of Sustainable Development Strategies Group (SDSG))
KK DuVivier
Ted Light, Lighthouse Energy Consulting
John Cobb
Indianola Sustainability Committee
Ardie Carson
Barbara Kauffman
Katherine Norgard
Brian Smerch
John Mason
Cathy Smerch
Linda Paulaitis
Charles R. McGinnis
lipanddave
Patricia Del Tredici
Dana Delaney
Emily Artale
Sue Williamson

Janet H Carroll
Nancy Wicks
Alan C Peterson, MD
Nicole Blaser
Mary Beth Flemming
Frank Stern
Laird Cagan, MD
Richard Stromberg
Michael Bell
Julia Metzger
Patricia Harrington
George Sibley
Nancy Gruber-Meier
Will Toor, Colorado Energy Office
Frank Sandoval
Steffanie Chain
Chuck Kutscher, Ph.D., Colorado Renewable Energy Society
Darcie Perkins
Scott Desmarais
Neil Windsor
Julie Bremer
Karen Janssen
Sonda Donovan
Joan Swift
Randy Swift
Ethel Pogoloff
Dr. John Hausdoerffer
Dr. Ricardo Vazquez
Ashely Woolman
Western Sustainability Coalition
Bob Goettge
Laura Martineau

1. Concerns with the public participation process and timeline

Summary of Comments: Commenters sought clarification on the timing of the IRP process, opportunities for public participation and how best to keep informed. Some commenters also suggested longer timelines for all or a portion of the IRP process such as the written and oral comment periods and selection of new resources, postponement of Board approval, and alternative regional or state-specific locations for public meetings. One commenter requested MEAN post comments publicly on the MEAN website. One commenter requested for its comment letter to be circulated to each MEAN director prior to the April 21, 2022 public workshop. Overall, it appears there was some confusion among many of the commenters as to MEAN's service territory – many of the commenters live in areas not served by MEAN communities, but MEAN accepted their public comments and the response is described below.

MEAN Response and Action Taken: MEAN staff reviewed the timeline for public meetings at which the IRP would be discussed, which included more than 16 public meetings, and adjusted the due date for written public comments on the draft IRP to ensure adequate time for the MEAN Board to consider public comments prior to approval of the IRP. MEAN responded to commenters on April 18, 2022 with an explanation of the 2-year public process and a link to the MEAN public webpage dedicated to the IRP, which contains explanations of the IRP process, timing, and opportunities for public participation, including the written public comment period on the draft IRP and links to details of various MEAN IRP public meetings and workshops at which public participation would be allowed. Many of the meetings were held virtually, which allowed for potentially world-wide participation. The Kearney, Neb. location of the in-person meeting in May 2022 for the IRP approval is centrally located for MEAN's diverse footprint which spans Iowa, Nebraska, Colorado, and Wyoming. As requested, MEAN also forwarded a copy of the requesting commenter's letter to each MEAN director prior to the April 21, 2022 public workshop. At the public workshop the time allotted for public comments was sufficient for MEAN to hear all public comments: There was a total of four public commenters, and none of the comments took the entire time allotted (MEAN had allotted three minutes per speaker). At the prior open, public meetings over the 2-year period at which the IRP was discussed, no public comments were received, but the meetings were noticed publicly in advance as required by law with "Integrated Resource Plan" clearly identified on the agenda. Section II.D. includes a brief description of public participation opportunities, and Appendix A contains meeting materials (public notices, agenda, meeting minutes, and presentations) for all public meetings at which the IRP was presented and discussed. It should be noted that the Integrated Resource Planning process is a thorough and detailed undertaking, and MEAN has designed the public participation schedule to gather input for all steps in the process. The public participation process does not start with the draft release. Rather, MEAN has allowed and encouraged participation regarding inputs, assumptions, options, criteria, and modeling procedures over the two-year period via the series of public meetings described above.

2. Concerns about climate change

Summary of Comments: Commenters expressed concerns about climate change and encouraged MEAN to transition to renewable energy. Some commenters offered suggested timelines such as immediately, by 2030 or 2035. A small number of commenters also stated MEAN's IRP should include specific analysis of the contributory risks and effects of severe weather events caused by climate change.

MEAN Response and Action Taken: MEAN's 2050 Vision is a response to environmental concerns. MEAN's long-term resource contracts represent a limitation on the changes MEAN can make in the future portfolio. In addition, MEAN has a number of outstanding bonds for such resources. MEAN is a minority owner in all coal plants in the portfolio, and therefore has little control over the operating life or retirement date of these resources. See Section IV.G. and Section VI.A. for explanation. Attempts to circumvent these existing contracts would introduce significant undue cost escalation to all MEAN members, bond compliance concerns, and possibly risk legal action against MEAN. For each opportunity to add new future resources when existing contracts expire, MEAN is prioritizing non-carbon resources. MEAN has not been informed of the planned closure or retirement of any contracted resources. However, if these developments occur, MEAN will

evaluate the resulting resource needs according to the recommendations of this IRP and the 2050 Vision.

3. **Concerns that IRP plan's timeframe to divest of coal is too slow; encourage development of an interim goal to be renewable sooner (particularly with wind and solar)**

Summary of Comments: Commenters expressed concern that the IRP plan's timeframe to divest of coal is too slow and expressed concern with fossil fuel use. Some commenters were interested in learning closure dates for coal plants; one commenter also provided a table showing inaccurate information regarding the owned plants and implied that MEAN would be extending coal contracts. Many of these commenters encourage development of an interim goal and/or concrete steps to be renewable sooner (particularly with wind and solar). As noted in #1 above, it appears there was some confusion among many of the commenters as to MEAN's service territory – many of the commenters live in areas not served by MEAN communities, but MEAN accepted their public comments and the response is described below. One commenter raised the question of how MEAN would handle a lack of coal supply to feed the plants.

MEAN Response and Action Taken: MEAN's long-term resource contracts represent a limitation on the changes MEAN can make in the future portfolio. In addition, MEAN has a number of outstanding bonds for such resources. MEAN is a minority owner in all coal plants in the portfolio, and therefore has little control over the operating life or retirement date of these resources. See Section IV.G. and Section VI.A. for explanation. Attempts to circumvent these existing contracts would introduce significant undue cost escalation to all MEAN members, bond compliance concerns, and possibly risk legal action against MEAN. For each opportunity to add new future resources, MEAN is prioritizing non-carbon resources. The quoted IRP excerpt submitted by one commenter implying MEAN will be extending terminating coal contracts is incorrect; that quoted excerpt in the IRP clearly relates to extending terminating contracts under which MEAN serves the load of its members. MEAN has not been informed of any planned closure or retirement of any contracted resources; contracts relating to owned resources continue through the longer of the life of the unit (and any applicable transmission facilities) or the date all payment obligations cease, and the length of power purchase agreements and participation agreements is as stated in the IRP. However, if these developments occur, MEAN will evaluate the resulting resource needs according to the recommendations of this IRP and the 2050 Vision. The table submitted by one commenter with inaccurate information about closure dates for owned resources should not be relied upon by the public. To clarify this misunderstanding, a column has been added to the table in Figure VI-1 showing the contract terms for MEAN's resources. In response to the comment regarding the availability of coal supply in the future, MEAN would anticipate in that event the owners would evaluate fuel switching or decommissioning at that time. Coal contracts are typically multi-year contracts, an anticipated lack of coal supply would likely be known, and would be factored into resource planning. In response to this type of event MEAN would likely have an opportunity to add non-carbon resources for capacity and energy. The MEAN Board of Directors governs MEAN and in 2020, the Board approved a resolution laying out a vision to a carbon neutral power resource portfolio by 2050. As part of that vision, MEAN has identified opportunities in the coming years to transition toward carbon neutrality as power purchase agreement contracts expire and capital debt is paid on its shared ownership of power resources with other utilities. A survey of MEAN membership indicated that a majority of members are supportive of setting an interim 2035 carbon neutrality target percentage. The Power Supply Committee and the Board

will consider setting this goal in the near future. It is recommended and expected that this target will be set after the procurement of resources in 2023-24, which will give a more accurate projection of energy generation.

4. Concerns that renewables should be considered reliable and cheaper than coal

Summary of Comments: Commenters encouraged MEAN to consider the low cost for wind and solar compared with coal. One commenter expressed support for the results of MEAN's modeling analysis. Some commenters also stated renewables should be considered reliable.

MEAN Response and Action Taken: The IRP contains four portfolio options for wind and solar resources. No future additions of coal resources are considered. However, MEAN's existing long-term contracts for coal resources dictate that MEAN must receive and pay for the output of the resources and/or pay the costs incurred by the resource. In addition, MEAN has a number of outstanding bonds for such resources. MEAN is required to pay the costs of these resources through the contract and bond terms, and in so doing, it becomes the most economical option to use the generation of these resources to serve load. To increase future carbon free energy purchases to replace the generation of carbon-emitting resources under contract while still paying for the coal generation or to generate far in excess of load needs would result in unnecessary cost increases to MEAN members. Non-compliance with the terms of the contracts could result in legal action, bond compliance concerns, and additional financial penalties. Therefore, future portfolios are sized with the assumption that MEAN will continue to utilize the output of resources to which MEAN is contractually obligated. For each opportunity to add new future resources when existing contracts expire, MEAN is prioritizing non-carbon resources in agreement with the results of the IRP analysis. The reliability of renewable resources is determined by the hourly modeling based on hourly generation profiles of existing and proposed renewable resources and the energy generation available to serve hourly load. Resource adequacy regulations require MEAN to maintain accredited capacity equal to its peak demand plus transmission losses and reserve margin. All power generation resources depend on some form of fuel supply to ensure they are reliable. These fuels supplies can be fossil fuels, wind, water, or sunlight. Due to the intermittent nature of renewable resources, they do not receive comparable accreditation for capacity as dispatchable resources do. All future portfolios were sized to provide adequate energy and capacity as required.

5. Concerns with MEAN's process for selecting new resources and concerns about natural gas units

Summary of Comments: Commenters expressed concern with the timeline and process for selection of new resources, requesting additional time for public comments. Some commenters also encouraged MEAN not to invest in any new natural gas units. A small number of commenters expressed concern with MEAN's assumptions about the costs of carbon capture technologies. As noted in #1 above, it appears there was some confusion among many of the commenters as to MEAN's service territory – many of the commenters live in areas not served by MEAN communities, but MEAN accepted their public comments and the response is described below.

MEAN Response and Action Taken: MEAN staff reviewed the opportunities for public participation and confirmed the more than 16 public meetings over a 2-year period, including both virtual meetings and in-person meetings at a central location to MEAN's diverse footprint,

provide ample opportunity. All resource exploration has been shared with the Power Supply Committee and the Board of Directors in previous public meetings (November 2019, January 2020, August 2020, November 2020, January 2021, May 2021, November 2021, January 2022, and April 2022). The reference to communication with developers and resource owners is typical investigation and due diligence when performing resource modeling, and all gathered information was shared with the Power Supply Committee and the Board of Directors at the previously referenced public meetings. MEAN conducts this type of research on an ongoing basis to obtain updated and accurate input values for resource modeling. MEAN staff does not and cannot make resource acquisitions unilaterally without Board approval. MEAN has not entered into discussions or negotiations regarding a natural gas resource. MEAN's operation and cost data for natural gas combined cycle units with carbon capture were obtained from the National Renewable Energy Laboratory 2019 Annual Technology Baseline. All resource cost data is regularly updated as available.

6. Concerns with energy efficiency and energy conservation programs

Summary of Comments: Commenters encouraged MEAN to increase energy efficiency and energy conservation.

MEAN Response and Action Taken: MEAN has implemented many demand side management and energy efficiency programs over the years in acknowledgement of the energy and demand savings achievable. MEAN has already adopted the programs with the highest cost-benefit ratio and has plans to continue these programs due to their savings. These programs are described in Section VIII, and additional information is available on MEAN's website. The historical savings of these programs are demonstrated in tables in Section VIII. This justifies the continuation of MEAN's existing DSM programs and the successful DSM programs of MEAN member communities, as well as ongoing analysis of future DSM programs with changes in associated costs and rates. MEAN conducted a thorough cost-benefit analysis of the programs rated most likely to see participation in member communities. See Section XIII Demand Side Management Evaluation for explanation and results of this analysis and Appendix C for inputs and calculations. MEAN continues to monitor potential new programs and regularly holds these discussions within the Services Committee. The low electricity costs throughout MEAN's footprint make payback of these programs more difficult to achieve than in some other regions. Through work with the Nebraska Municipal Power Pool organization and other statewide utilities, MEAN continues to seek opportunities to assist communities with education efforts. Recent educational sessions have been made available for MEAN member communities on topics including Electric Vehicle Charging Stations and Community Solar Projects. MEAN's Services Committee regularly evaluates the potential for future programs and continuing education opportunities that align with overall member interest and budget limitations.

7. Concerns with managing demand

Summary of Comments: Commenters encouraged MEAN to manage demand to reduce peak loads; one commenter was supportive of MEAN's efforts on AMI.

MEAN Response and Action Taken: MEAN has implemented many demand side management programs over the years in acknowledgement of the energy and demand savings achievable. MEAN has already adopted the programs with the highest cost-benefit ratio and has plans to

continue these programs due to their savings. The potential and historical energy and demand savings of MEAN's programs and the programs administered by member communities are demonstrated in tables in Section VIII. This justifies the continuation of MEAN's existing DSM programs and the successful DSM programs of MEAN member communities, as well as ongoing analysis of future DSM programs with changes in associated costs and rates. Demand response methods are typically a function of retail utilities, and as such, MEAN is assisting our member communities by investigating several potential new demand response technologies. Some of these are described in Section XIII. In response to recent member inquiries, MEAN's agenda for the May 2022 meetings includes discussions to explore retail end user battery storage systems and the potential application for peak demand savings. MEAN also has plans to investigate a program to offer incentives for residential EV chargers and anticipates that several communities will have a high degree of interest to participate. The potential applications and developments of this project will prompt a high level of collaboration between MEAN staff and member community staff to explore potential demand and energy profiles and resource utilization. This project will be introduced for discussion and consideration at a future Services Committee meeting. MEAN is in the process of initiating an Advanced Metering Infrastructure program to enhance the potential of demand response programs in member communities. To date, fifteen members have signed letters of intent, representing approximately 9,000 electric meters. With the proliferation of residential distributed generation, electric vehicle charging, and residential energy storage, AMI offers significant opportunity for demand control for the enhancement of DSM technologies.

8. **Concerns about MEAN's Renewable Pools and representations made regarding sales of renewables to cities**

   Summary of Comments: Commenters expressed concern with MEAN's representations regarding the level of renewables contracted to certain MEAN communities such as Gunnison, Aspen and Glenwood Springs, Colorado who desire to be 100% renewable.

   MEAN Response and Action Taken: When MEAN established its Renewable Resource Pools, it was designed at the Members' request that the energy was generated by MEAN's renewable resources in their portfolio. In turn, Renewable Energy Credits were received from that generation for the communities that requested Renewable Energy from those Resource Pools to claim that energy. Over the course of one year, MEAN's Renewable Resource Pools generate enough energy to meet the energy requirements to meet the Community's annual electric usage. As MEAN replaces resources in its portfolio with more renewables, it will continue to bring benefit to all MEAN ratepayers. MEAN Members initiated discussions in January to restructure the two current Renewable Resource Pools (Wind and Landfill Gas) to include additional renewable resources as MEAN reviews opportunities to add solar and additional hydropower to its portfolio.

9. **Urge MEAN board to reject the current IRP and require management to redraft the plan.**

   Summary of Comments: Commenters urged the MEAN board to reject the current IRP and require management to redraft a plan that addresses inadequacies. Inadequacies listed by commenters include the following items summarized above in #1, #3, #5, and #6.

   MEAN Response and Action Taken: MEAN believes the IRP meets the requirements. For the reasons stated in MEAN's responses to #1, #3, #5 and #6 above, does not believe a redraft of the IRP would be necessary or helpful.

10. Summary of other comments received

a. One commenter, a consultant hired by another commenter to review MEAN's draft IRP, confirmed MEAN's draft IRP appears to generally implement a sound methodology with high-level results that are in line with IRPs produced by other utilities in the US. Comments included the following:

i. MEAN should incorporate the Vision into its IRP analysis as a modeling constraint
MEAN Response and Action Taken: MEAN's 2050 Vision was used as a parameter to select qualified supply side resources in the Phase I evaluation and to determine the performance of each portfolio in the Phase II modeling. See Section III.C., Section IX.E., Section XII.D., Section XIV.A., Section XV.A., and Section XVI.A.3.

ii. Acquiring a natural gas fired resource would likely result in an increase in overall carbon emissions that would need to be offset to achieve carbon neutrality; methane has a much higher global warming potential than carbon dioxide, this should be included as part of the economics for any natural gas-fired resource
MEAN Response and Action Taken: Carbon emissions were considered as a measurement of portfolio performance in terms of carbon intensity over the 15-year time frame and the quantification of the impact of a carbon tax on resource emissions. The IRP analysis does not include upstream emissions of natural gas facilities, just as it does not consider upstream emissions from the manufacture of wind turbines, solar panels, or batteries.

iii. Need to improve evaluation of energy efficiency programs
MEAN Response and Action Taken: See #6 above.

iv. Using a flat avoided cost rate does not capture the time-based value of energy efficiency
MEAN Response and Action Taken: The avoided cost used in the analysis is MEAN's actual avoided cost as approved by the MEAN Board of Directors and updated each year based on MEAN's actual cost of energy. A calculation of the time-based value of energy efficiency may be applicable to the Utility Cost Test portion of the analysis but would not be applicable to the Participant Cost Test as MEAN's wholesale rates are not seasonal or time-of-day dependent and few MEAN members offer time-of-day rates. The MEAN IRP utilized the same cost-benefit analysis described in the referenced study.

v. Commenter offered best practices for considering demand-side resources
MEAN Response and Action Taken: Please see Section XIII for evaluation of future demand side management options. DSM programs with the most benefit have already been implemented by MEAN. We continue to evaluate future programs and present these options to the Services Committee for consideration.

vi. Cost and risk of success need to be reflected in the analysis of natural gas combustion turbine combined with carbon capture and storage
MEAN Response and Action Taken: The option to add a Natural Gas Combined Cycle Unit with Carbon Capture was among the highest ranking options as evaluated in the Phase I process. Please see Section XII.G. The cost and feasibility risk of new technologies is always a consideration and is highly project specific. As stated in the report, MEAN would

conduct updated analysis specific to an actual resource prior to seeking Board approval for a new resource contract.

vii. Member surveys introduce bias; IRPs should be quantitative exercises in balancing cost and risk

MEAN Response and Action Taken: The member survey conducted in relation to the demand side management evaluation asked members to rate the likely participation of their retail end users in each proposed program. We maintain that this is a metric best estimated by MEAN representatives rather than utilizing national average values. The member survey conducted regarding the Phase I supply side resource criteria was utilized to obtain a relative rating of the importance of certain criteria in the evaluation in order to reflect member priorities and was not a substitute for the objective data used in the analysis. Please see Appendices B and C for the metrics used in the analysis relating to the Phase I evaluation and the DSM analysis, respectively. Please see Section XIV for the description of the quantitative analysis used in the Phase II modeling to calculate cost and risk. Specifically, Sections XIV.E. and XIV.F. explain the quantitative steps within this detailed process.

viii. AMI by itself does not provide energy or capacity savings

MEAN Response and Action Taken: Agreed. This is stated in Section XIII.H. "…AMI offers significant opportunity for demand control for the enhancement of DSM technologies."

ix. Costs and benefits of EV charging stations should be considered carefully

MEAN Response and Action Taken: Agreed. This was a topic of discussion at the IRP workshop. As stated in Section XIII.G., "The potential applications and developments of this project could prompt a high level of collaboration between MEAN staff and member community staff and intense study of community interest, use profiles, and retail rate structure. This project will be introduced for discussion and consideration at a future Services Committee meeting."

x. Even considering the flexibility benefits of an NGCC resource, the IRP still identified renewable resources as providing some of the best options for low cost, low risk, and low carbon resources

MEAN Response and Action Taken: NGCC options were included to explore the relative performance of resources that could offer energy and full accredited capacity as an alternate to intermittent resources with low accreditation values that require additional capacity purchases to achieve resource adequacy.

xi. Consider a mix of both solar and wind resources for diversity in generation and geographically diverse

MEAN Response and Action Taken: Geographic diversity offers benefits to MEAN's membership. This is recognized in the implementation of the DG Policy and the proposed solution of siting MEAN-contracted resources in member communities.

xii. Additional load does not in itself lower the volume of carbon emissions

MEAN Response and Action Taken: Load acquisition is not pursued as a solution to lower portfolio emissions but has the result of reducing the carbon intensity of the portfolio. If

MEAN can add load and serve it using non-carbon resources, this is considered an overall benefit to the regional system similar to the concept of "beneficial electrification."

xiii. Consider the ITC for solar; one additional commenter suggested MEAN consider the PTC for wind

MEAN Response and Action Taken: See Section IX.F. of the IRP. As a public power utility, MEAN is ineligible for tax credits under current law. Not wanting to speculate as to whether a future wind or solar resource would be procured as a PPA or an ownership, and not wanting to speculate about the future of tax credits, MEAN conservatively opted to not include tax credits to test the performance of these resources in terms of cost in a "worst-case" scenario. **The results prove that wind and solar resources are still beneficial even without the credits.** Further, the current potential legal issues of solar tariffs throw into question the ability to secure a solar resource that would come online in 2024.

xiv. Consider how the different portfolios it considers in the IRP perform in a future with electrification; one additional commenter also expressed that MEAN should be modeling a load scenario with electrification.

MEAN Response and Action Taken: Due to the likelihood of an accelerated rate of electrification in the future, MEAN is planning to conduct an internal study on this future scenario, including recalculation of resource needs and resizing of portfolio resources. In this manner, the resource options can be compared within this future. As MEAN has an immediate term resource need that will be secured prior to the widespread impact of electrification, a study can include the addition of these immediate resources preliminary to the addition of resources to satisfy additional load due to electrification. Staff believes that the electrification study is best conducted outside of the IRP analysis. MEAN is actively supporting electrification efforts with the consideration of the residential EV charger incentive and the new AMI project.

b. Two commenters expressed concern with the timeline and process for selection of recommended portfolio options. One commenter also asked for clarification on these matters.

MEAN Response and Action Taken: MEAN responded to requesting Commenter with a copy of the relevant section of the draft IRP (Section XVI.B.) that explains the process for MEAN's Power Supply Committee to recommend a portfolio option(s) for approval by the MEAN Board of Directors. MEAN also notified Commenter that as of April 28, 2022 no recommendation had been made. The IRP document contains a section that summarizes the conclusions of the Phase II modeling analysis, which lists the portfolios with the best modeling results. During the IRP workshop, membership discussions favored these portfolios.

c. One commenter suggested that MEAN consider applying the social cost of carbon to its resources and potential future resources.

MEAN Response and Action Taken: There has been no consensus on a calculated social cost of carbon, and the various calculations to date span a wide range of costs. As an alternative methodology of assigning a cost to carbon emissions, the IRP applies three different schedules of carbon tax to all portfolios in the model. Please see Section IX.H., Section XIV.F., and XV.C.

d. One commenter expressed hope there will be something analogous to Lincoln Electric System's decarbonization goal in the MEAN draft IRP.
MEAN Response and Action Taken: The MEAN Board of Directors in 2020 approved a resolution laying out a vision to a carbon neutral power resource portfolio by 2050. MEAN's website contains a description of the 2050 Vision and the direction MEAN is taking to make progress toward this goal. The MEAN website includes information and applications for MEAN's energy efficiency programs. The IRP lists the energy savings of existing demand side management programs and evaluates the cost-to-benefit ratio of future potential DSM programs. The IRP contains a measurement of the carbon intensity of each portfolio over the 15-year time frame of the analysis to determine which portfolios contribute to a reduction in carbon emissions.

e. One commenter suggested MEAN ensure that the opportunity for public comment has a higher profile on the internet. Commenter also suggested MEAN think how public groups such as Nebraskans for Solar can be helpful to MEAN in getting the message out to those who may be interested.
MEAN Response and Action Taken: MEAN staff reviewed the MEAN public webpage dedicated to the IRP and considered but declined (as a not-for-profit entity) to make payment to search engines that index websites. MEAN encouraged members to post the draft IRP in their communities to facilitate public comment.

f. One commenter forwarded a copy of an Inside Clean Energy email newsletter with an article about battery storage. Other commenters also expressed support for battery storage.
MEAN Response and Action Taken: Portfolios 8 and 9 incorporate 4-hour battery storage with wind and solar generation. These portfolios were not the highest performing in the analysis. However, MEAN expects the capital cost of battery storage to decrease in the near future, and updated analysis will continue to consider these options as prices become more favorable. This is stated in Section XVI.A.

g. One commenter forwarded a 2/9/2021 article summarizing research that indicated air pollution from burning fossil fuels like coal and diesel was responsible for about 1 in 5 deaths worldwide.
MEAN Response and Action Taken: MEAN reviewed the article and intends to continue to transition toward carbon neutrality per MEAN's Board-approved resolution laying out a vision to a carbon neutral power resource portfolio by 2050. The Phase II modeling includes scenarios that apply a carbon tax as a method by which to quantify the impact of emissions. The carbon intensity of each portfolio is calculated and shown graphically in the report.

h. One commenter expressed concern with portfolios that include hydropower, stating hydropower is becoming an increasingly undependable source in a warming and drying world. One other commenter expressed support for small hydro resources.
MEAN Response and Action Taken: MEAN analyzed 10 portfolio options in SPP and 9 portfolio options in the West. Hydropower was included as one of those portfolios for both SPP and the West. Prudent utility practice generally encourages resource diversity in a portfolio. Currently, MEAN's Resource Mix (Figure VI-16) contains 8 different resource types. This resource diversity helps protect utilities to avoid major cost impacts to their customers due to cost increases or loss of energy production in any of its resource types. Cost increases generally occur from fuel price increases, where loss of energy production can occur from resource outages or in the case of wind, solar and hydro; environmental conditions such as low wind, reduced radiance periods or droughts. In the past 10 years, WAPA hydropower has imposed a cost adder during drought conditions and experienced periods where excess generation was available during above average

snowpack years. No resource is immune to price or production variability and that becomes a driver in establishing a diverse resource portfolio to reduce financial impacts of any one resource type and help maintain steady power supply costs for rate stability. Geographic diversity is also a consideration for resource locations to minimize concentrations of resources to reduce significant impacts from weather events, transmission outages and constraints, and energy losses. MEAN and its members have several small hydropower projects in their portfolio.

i. One commenter expressed support for the solar portfolio with additional leased capacity from member generation and collaboration with communities to put MEAN solar resources in communities that would not count against their local generation limit.
MEAN Response and Action Taken: Solar resources provide more accredited capacity than wind resources, but still may require additional capacity to avoid overbuilding a facility to achieve the equivalent capacity of a dispatchable resource. MEAN's member generation is a means of achieving this combination of solar energy with accredited capacity as an economic solution. MEAN is developing policy to formalize siting of MEAN generation in Member communities to provide benefit to the community and all MEAN members (VII.D.). MEAN recently facilitated a Request for Proposal for members to achieve greater economies of scale to install solar directly in their communities (VII.C.). MEAN assisted the City of Gunnison to obtain a DOLA grant for nearly a half million dollars to help fund the solar project in the airport parking area noted by the commenter.

j. One commenter expressed concern that the management of MEAN has no interest in serving their customers with the highest quality and cleanest energy options. The commenter offered analysis of options for MEAN's energy mix and suggestions for transmitting energy from Colorado to the east and solar placement. Additional comments were made regarding energy generation within Nebraska and the benefits that RTO markets provide.
MEAN Response and Action Taken: MEAN constructed the first wind farm in Nebraska that became operational in 2002. This wind farm was nearly tripled in size in 2018 with decommissioning of the original turbines and replacement with larger more efficient units. This original wind farm was inspired by MEAN communities desiring to add renewable wind energy to MEAN's resource mix and this provided the opportunity for MEAN communities to customize their community portfolios with renewables. The MEAN Board has approved 6 new or expanded renewable projects since 2012. Through MEAN's Renewable Distributed Generation Policy and current work to develop MEAN-Contracted Distributed Generation, energy produced locally can offset the load for the communities in Western Colorado. Gunnison, CO has already initiated this effort in its solar project at their airport. In addition, Oak Creek, CO installed a rooftop solar array at the Oak Creek town hall. Despite the competitive pricing received through MEAN's solar RFP for MEAN community solar under the Renewable Distributed Generation Policy, some Colorado communities are limited on affordable access to land that is favorable to solar development. The corresponding high property costs add costs to the project that can make it uneconomic. Section VII on Distributed Generation describes the multiple efforts being taken in these areas. There are currently challenges in moving energy from the Western Slope of Colorado to the east, which include electric losses, transporting through several different transmission providers' systems (which accumulates transmission charges across each system), obtaining sufficient DC Tie rights and megawatt quantities to meet the DC Tie minimums and activate the ties, and then transmission costs to transmit to load on the east. MEAN is involved in the Midcontinent Independent System Operator (MISO) and the Southwest Power Pool (SPP) RTO markets. In the West, MEAN is actively involved in the formulation of formal markets and joined the Western Energy Imbalance Service in late 2019 that went live in February 2021. MEAN has communicated

its intent to join a future SPP West RTO and is also closely following the latest offering in the West under development, SPP's Markets + (III.H). The SPP RTO West has the potential to reduce the transmission cost impacts of moving energy between MEAN's east and west regions. MEAN is actively involved in and supports regional markets as not only a way to minimize the impacts of renewable generation due to the variability, but also to reduce carbon emissions by virtue of economic dispatch (VI.C & VI.D). MEAN is evaluating a potential solar project located near Sidney, NE that has similar NREL Resource Range characteristics as Colorado due to its geographic location (VII.G.2). The majority of MEAN's communities located in Nebraska are in the SPP footprint. There are Nebraska communities MEAN serves located on the west side of the DC Ties. In regard to the comment about renewable energy generation within Nebraska, MEAN's current nameplate capacity in the SPP footprint is 36% renewable or carbon free generation comprised of wind, hydropower and nuclear (Figure VI-7). From an energy perspective, these resources are projected to provide 41% of MEAN's available energy in 2022 (Figure VI-19). MEAN's IRP will culminate in the selection of preferred portfolios to consider for future resources. **Renewable resources summarily emerge as the most desirable in the Phase II Analysis (XIV).**

k. Two commenters noted Colorado's adoption of the Climate Action Plan to Reduce Pollution, the associated goals, and the direction being taken by certain Colorado utilities. One commenter encouraged MEAN to voluntarily achieve the same level of emissions reductions for power that is being imported into Colorado.
MEAN Response and Action Taken: MEAN continues to monitor Colorado's actions closely. MEAN and its members coordinate to balance the needs of members across the four-state area. Renewable resources that emerge in the Phase II Analysis will be an important step in the carbon emissions reduction of MEAN's Colorado portfolio.

l. Two commenters expressed support for increasing reliance on locally sited generation. One of these commenters also expressed support for islandable systems as extreme weather increases. One of these commenters questioned the operational capabilities of MEAN member generators.
MEAN Response and Action Taken: Through MEAN's Renewable Distributed Generation Policy and current work to develop MEAN-Contracted Distributed Generation, energy produced locally can offset the load for the communities and provide the ability for local reliability during potential transmission outages. Section VII.D. notes the multiple benefits that include grid modernization with distributed generation and micro-grid systems. MEAN will continue prioritizing locally sited renewable resources. MEAN member generators are required to meet all requirements established by the AMPP as well as all regulatory requirements of the RTO's and Balancing Authorities where they are located. They are exercised quarterly and tested annually to ensure they are accredited in compliance with all applicable requirements. Over the past 5 years, MEAN's member generators have achieved a start reliability key performance indicator over 92% and over 96% each of the past three annual tests. These resources are a reliable and valuable option for capacity to support renewable resources that have lower capacity accreditation due to the intermittent nature of the resources.

m. Three commenters expressed concern with the use of surveys of MEAN's membership, as commenters did not believe this is an effective or appropriate method of public involvement.
MEAN Response and Action Taken: As a wholesale electric supplier to municipalities in a four-state area, MEAN's "customers" are its members. Members represent the interests of their respective communities. MEAN gauges interest of its members in a variety of ways. The survey method used for the IRP was a valuable tool to gather preference data for MEAN communities to facilitate Committee and Board decisions. As always, end-use customers always have the

opportunity to engage locally in and with their community, in addition to engaging in MEAN quarterly public meetings. MEAN requested members to post the draft IRP within their communities to facilitate public involvement. As described in #1 above, MEAN also accepted written public comments and oral public comments.

n. A small number of commenters expressed concern that MEAN should increase the allowance for communities to self-supply electricity using renewable resources.
MEAN Response and Action Taken: MEAN's Renewable Distributed Generation Policy currently allows MEAN's total requirements participants to self-supply a portion of their load with qualifying renewable resources or purchase power agreements. MEAN, as the total requirements supplier to its participating communities, has issued tax-exempt bonds to finance a number of existing resources in MEAN's portfolio. Due to bond covenants, MEAN is limited in the extent to which MEAN can allow its total requirements participants to self-supply and replace purchases from MEAN; however, in consultation with bond counsel MEAN increased the allowance from 2% to 5% under the Policy several years ago. To date, only two MEAN total requirements participants have utilized the Policy allowance, and neither project reached the 5% cap.

o. One commenter expressed concern that MEAN should keep making progress toward carbon-neutrality even though technological advancements will be necessary to reach 100% carbon neutrality.
MEAN Response and Action Taken: MEAN agrees with the commenter that progress can be made toward carbon neutrality and that technological advancements will be necessary to reach 100% carbon neutrality. Our analysis shows MEAN can add renewables to the portfolio to continue progressing toward the 2050 Vision.

p. One commenter expressed concern regarding the "future" category in the IRP.
MEAN Response and Action Taken: The purpose of the IRP is to develop long-range implementation plans to serve MEAN's total requirements participants' power supply requirements. This includes the identification of future needs and analysis to determine the optimal resources to supply future needs. Charts showing future resources are a graphical representation of the need to add resources to the portfolio in the future to supply capacity and energy for load. The subsequent content of the report describes the analysis to model MEAN's portfolio with a variety of potential future resources to determine which will be most beneficial in terms of cost, risk, and environmental impact. MEAN's IRP will culminate in the selection of preferred portfolios to consider for future resources. **Renewable resources summarily emerge as the most desirable in the Phase II Analysis (XIV).**

q. One commenter expressed concern that it is unclear what the WAPA Capacity and Energy Displacement Agreement is, what facilities produce the WAPA energy, and what kind of energy is supplied under the agreement.
MEAN Response and Action Taken: The IRP thoroughly explains the WAPA Capacity and Energy Displacement Agreement and that MEAN receives power from WAPA hydro resources (MEAN does not receive Renewable Energy Credits for this resource). The agreement does not specify particular WAPA hydropower resources from which the energy must be generated.

r. One commenter expressed concern regarding whether replacement power provided by WAPA under the MEAN member WAPA-CRSP allocation agreements would be carbon free.
MEAN Response and Action Taken: MEAN's members are not required to take replacement power from WAPA. As the total requirements supplier and agent for the members, MEAN has the option

whether to take replacement power. With the recent drought conditions and offers from WAPA to supply replacement power, MEAN has declined and has served members with other MEAN resources.

Appendix E – Board Resolution

Agenda Items Number: 6

MEAN Board of Directors

INTEGRATED RESOURCE PLAN

Date:	May 19, 2022
Initiator/Staff Information Source:	Shannon Coleman
Action Proposed:	Information/Approval

As part of the Western Area Power Administration (WAPA) Energy Planning and Management Program (EPAMP), MEAN is required, as a WAPA firm electric service customer, to prepare and submit an Integrated Resource Plan (IRP) on behalf of MEAN and its Total Requirements Participants.

As part of the IRP process, MEAN is also required to allow for ample opportunities for full public participation and accomplishes this by discussing the IRP and resource planning at a series of meetings and workshops open to the public, with opportunities for oral public comments, and by publicly posting the draft IRP and accepting oral and written public comments.

After a two-year process involving at least 16 public meetings MEAN publicly posted the draft IRP on April 19, 2022. MEAN received additional public comments at a public workshop held April 21, 2022, and through the written public comment period. The final IRP will address all public comments made during the written public comment period. The proposed 2022 IRP included as *Attachments B, B1 & B2* in the meeting packet includes a summary of all public comments received on or before May 11, 2022, plus necessary housekeeping clean-ups. Written public comments received after May 11, 2022, and before the May 14, 2022, 5 pm CT deadline will also be addressed in the final IRP as described in the proposed resolution. An up-to-date copy of the draft will be available online on or about May 16, 2022, at https://mean.nmppenergy.org/about/means-integrated-resource-plan.

RESOLUTION

WHEREAS, Western Area Power Administration ("WAPA") requires its customers to prepare and submit an Integrated Resource Plan ("IRP") every five years, and

WHEREAS, MEAN has prepared an IRP for submission to WAPA in 2022 to comply with the requirements of the WAPA Energy Planning and Management Program for MEAN and its total requirements participants.

NOW, THEREFORE, BE IT RESOLVED by the MEAN Board of Directors that the Integrated Resource Plan is determined to meet the requirements and is approved as presented, with additional updates to be incorporated in response to public comments and to include the following future portfolios in the recommended action plan:

- *SPP: Portfolio(s) 1A, 2, 7, 8, 9*
- *West: Portfolio(s) 1A, 2, 7, 8, 9*

BE IT FURTHER RESOLVED by the MEAN Board of Directors that staff is hereby authorized and directed to submit the IRP to WAPA in 2022 on behalf of MEAN and its total requirements participants.

BE IT FURTHER RESOLVED by the MEAN Board of Directors that the Board of Directors reserves the right to modify the 2022 IRP to take into account changed circumstances and operational and economic considerations.