

# **BASIN ELECTRIC POWER COOPERATIVE**

A Touchstone Energy® Cooperative 

## **SOUTH DAKOTA TEN YEAR PLAN**

**2024**



## Table of Contents

20:10:21:04 - EXISTING ENERGY CONVERSION FACILITIES .....	3
20:10:21:05 - PROPOSED ENERGY CONVERSION FACILITIES .....	4
20:10:21:06 - EXISTING TRANSMISSION FACILITIES .....	5
20:10:21:07 - PROPOSED TRANSMISSION FACILITIES .....	6
20:10:21:08 - COORDINATION OF PLANS .....	6
20:10:21:09 - SINGLE REGIONAL PLAN.....	6
20:10:21:10 - SUBMISSION OF REGIONAL PLAN.....	7
20:10:21:11 - UTILITY RELATIONSHIPS .....	7
20:10:21:12 - EFFORTS TO MINIMIZE ADVERSE EFFECTS .....	9
20:10:21:13 - EFFORTS RELATING TO LOAD MANAGEMENT .....	12
20:10:21:14 - LIST OF REPORTS.....	13
20:10:21:15 - CHANGES IN STATUS OF FACILITIES .....	13
20:10:21:16 - PROJECTED ELECTRIC DEMAND .....	13
20:10:21:17 - CHANGES IN ELECTRIC ENERGY DEMAND .....	21
20:10:21:18 - SERVICE AREA MAP.....	21
EXHIBIT 1 - SUMMER/WINTER LOADS BY STATE.....	22
EXHIBIT 2 - EASTERN SYSTEM SUMMER/WINTER LOAD RESOURCES .....	25

## 20:10:21:04 - EXISTING ENERGY CONVERSION FACILITIES

### Spirit Mound Station

1. Located six miles north of Vermillion, South Dakota and declared available for commercial operation in June 1978.
2. The station is composed of two combustion turbines, fired with number 2 fuel oil obtained from Midwest markets. The nameplate capacity of each unit is 67.5 MW; the units currently have a net rating of 60 MW each.
3. Spirit Mound Station was constructed primarily as a peaking unit to be used as reserves during outages of other Basin Electric or Mid-Continent Area Power Pool (MAPP) resources. Now the station is dispatched by the Southwest Power Pool during times of low generation available on the system. Therefore, operation of the station is limited. Net generating production in 2022 was 7,954 MWh and 8,841 MWh in 2023.
4. Spirit Mound Station does not require water for production of electricity.
5. Spirit Mound Station consumed 787,486 gallons of fuel oil during 2022 and 896,899 gallons during 2023.
6. A projected date of removal from service for Spirit Mound Station has not been determined.
7. Since there are no retirement plans for the facility in the next 10 years, decommissioning plans do not need to be provided at this time.

### Groton Generation Station (Unit 1 & 2)

1. Located near Groton, South Dakota, Unit 1 was declared available for commercial operation in July 2006 and Unit 2 was declared available for commercial operation in July 2008.
2. The station is composed of two gas fired combustion turbines for a total winter rated net capability of 188 MW.
3. The Groton Generation Station produced 159,725 MWh in 2022 and 201,862 MWh in 2023.
4. The Groton Generation Station requires water for production of electricity. The Groton Generation Station used 5,235,400 gallons in 2022 and 6,776,700 gallons in 2023.
5. The fuel source is natural gas. The Groton Generation Station consumed 1,663 MMCF in 2022 and 1,949 MMCF in 2023.
6. A projected date of removal from service for the Groton Generation Station has not been determined.
7. Since there are no retirement plans for the facility in the next 10 years, decommissioning plans do not need to be provided at this time.

### Crow Lake Wind Project

1. Located near White Lake, South Dakota and was fully operational in February 2011.
2. The project consists of 108 1.59MW wind turbines for a total of 172MW.

3. The Crow Lake Wind project was constructed as part of Basin Electric's overall power supply to serve its members. Net generating production in 2022 was 385,268 MWh and 343,841 MWh in 2023.
4. The Crow Lake Wind Project does not require water for electricity production.
5. This is a wind power project and therefore no fuel is consumed.
6. A projected date of removal from service for the wind turbines has not been determined.
7. Since there are no retirement plans for the project in the next 10 years, decommissioning plans do not need to be provided at this time.

#### Deer Creek Station

1. Located near Brookings, South Dakota and declared available for commercial operation in August 2012.
2. The station is a combined cycle unit with duct-firing, producing a 297 net MW summer and winter rating.
3. The Deer Creek Station produced 769,726 MWh in 2022 and 1,060,906 MWh in 2023.
4. The Deer Creek Station requires water for production of electricity. The Deer Creek Station used 5,898,000 gallons of well water in 2022 and 6,636,000 gallons in 2023.
5. The fuel source is natural gas. The Deer Creek Station consumed 5,396 MMCF in 2022 and 7,396 MMCF in 2023.
6. A projected date of removal from service for the Deer Creek Station has not been determined.
7. Since there are no retirement plans for the facility in the next 10 years, decommissioning plans do not need to be provided at this time.

#### **20:10:21:05 - PROPOSED ENERGY CONVERSION FACILITIES**

Basin Electric is currently siting up to a 1400 MW natural gas generation facility in northwestern North Dakota in response to sustained load growth in the region. This facility is targeting a commercial operation date in 2030 or earlier. Basin Electric is also evaluating renewable project opportunities under the Rural Utility Service New ERA program.

Basin Electric, Dairyland, and ALLETE, Inc. are working together on the development of a natural gas combined cycle facility in Superior, Wisconsin. The proposed plant is estimated to have an installed capacity of 550-625 MW. Basin Electric announced ownership of 30% share of the project in September of 2021. In January of 2020, the project received a Certificate of Public Convenience and Necessity (CPCN) from the Public Service Commission of Wisconsin (WI). The WI Department of Natural Resources re-issued an air construction permit in September of 2023. The project is awaiting a Coastal Zone Consistency Determination from the Wisconsin Department of Administration and a wetland permit from the United States Army Corps of Engineers. The project entered an application with MISO in June 2017 to include the plant in the August 2017 generator interconnection study group. The Generation Interconnection Agreement was executed by all parties in 2020. The in-service date is currently

estimated to be in 2029 but is subject to change until the necessary permits have been granted to the project.

**20:10:21:06 - EXISTING TRANSMISSION FACILITIES**

<u>Location</u>	<u>Type</u>	<u>Conductor</u>	<u>Voltage</u>
Leland Olds-Groton	Steel Tower	2183.5 MCM	345 kV
Groton-Crocker	Steel Tower	2183.5 MCM	345 kV
Crocker-Watertown	Steel Tower	2183.5 MCM	345 kV
Leland Olds-Chappelle Creek	Steel Tower	2183.5 MCM	345 kV
Chappelle Creek -Ft. Thompson, SD	Steel Tower	2183.5 MCM	345 kV
Antelope Valley-Broadland	Steel Tower	2-2306 MCM	345/500 kV*
Philip-Philip Tap, SD	Wood Pole	954 MCM	230 kV
Broadland-Huron, SD	Steel Tower	2306 MCM	230 kV
Spearfish-Yellow Creek, SD	Wood/Steel Pole	1272 MCM	230 kV
Yellow Creek, SD-Osage, WY	Wood/Steel Pole	1272 MCM	230 kV
New Underwood-Rapid City DC Tie	Wood/Steel Pole	1272 MCM	230 kV
Dry Creek Substation SD			230/115 kV
Crocker Substation SD			345 kV
Chappelle Creek Substation SD			345 kV
Groton, SD Substation			345/115 kV
Storla, SD Substation			230/115 kV

Retirement dates on these facilities are indeterminate.

\*The Antelope Valley-Broadland transmission line is constructed for 500 kV operation but is currently being operated at 345 kV. Operation at 500 kV will be considered if that is the most cost-effective method of increasing system capacity to accommodate future requests for transmission service along that path.

#### **20:10:21:07 - PROPOSED TRANSMISSION FACILITIES**

Basin Electric does not have any new transmission projects planned or proposed in South Dakota at this time. There are several generation interconnection requests under the Southwest Power Pool (SPP) generation interconnection queue that have requested interconnection to Basin Electric facilities, however, none of these have reached the point of a signed interconnection agreement at this time.

#### **20:10:21:08 - COORDINATION OF PLANS**

Basin Electric provides capacity and energy above the Western Area Power Administration's (WAPA) allocations to those preference customer cooperatives that have executed electric service contracts with Basin Electric. In order to provide service Basin Electric must augment WAPA's existing transmission system. Existing transmission facilities listed in section 20:10:21:06 are coordinated facilities which tie into WAPA's existing transmission system. The Miles City, Montana, to New Underwood, South Dakota, line constructed by WAPA is also a coordinated transmission line which provides service to Basin Electric, Montana-Dakota Utilities Co. and WAPA customers. The Groton 345/115 kV substation constructed by Basin Electric provides Northwestern Energy additional capacity in the Aberdeen-Groton area. The Rapid City Asynchronous Tie and associated transmission facilities are coordinated with Black Hills Power, Inc. and the Western Area Power Administration.

On October 1, 2015, Basin Electric joined SPP. One of SPP's roles is the Planning Coordinator function. SPP performs this function through its Integrated Transmission Plan process.

#### **20:10:21:09 - SINGLE REGIONAL PLAN**

The Spearfish-Yellow Creek and Yellow Creek-Osage 230 kV lines are part of a regional plan with Black Hills Power, Inc. to provide transmission service and electric power to consumers of Basin Electric's member cooperatives and Black Hills Power, Inc. in the Spearfish-Deadwood-Rapid City-Hot Springs area of South Dakota. Also, in joint effort with Black Hills Power, Inc., the Rapid City Asynchronous Tie is part of a single regional plan.

SPP provides the regional plan for the Basin Electric facilities in the eastern interconnection required for FERC Order 890 and 1000.

## **20:10:21:10 - SUBMISSION OF REGIONAL PLAN**

Future joint transmission studies between Basin Electric and Black Hills Power, Inc., which show the potential need for transmission to support the northeast area of Wyoming and the Black Hills area of South Dakota, will be submitted to the commission.

## **20:10:21:11 - UTILITY RELATIONSHIPS**

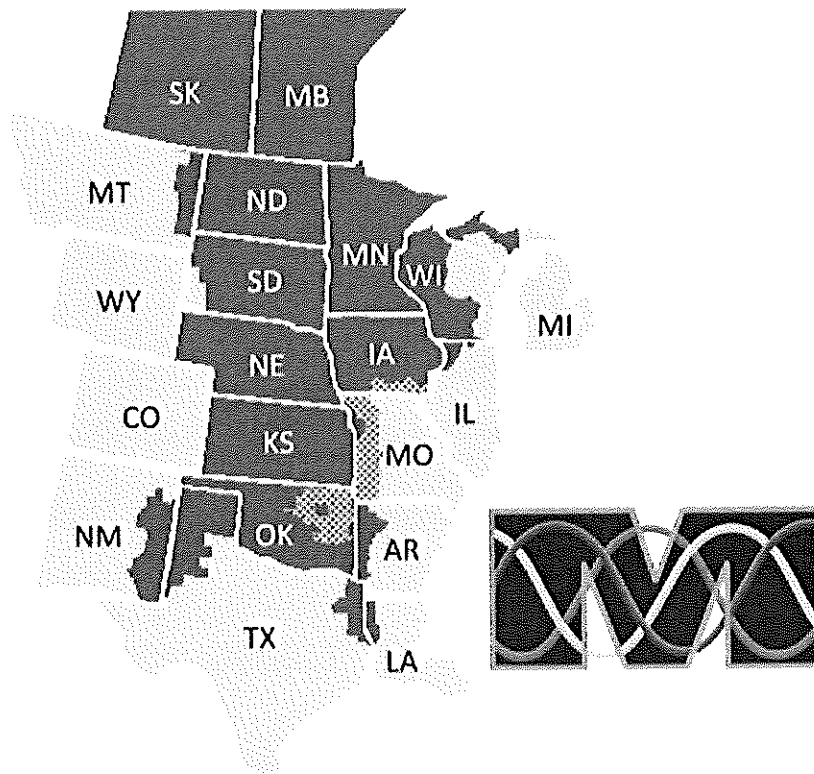
### **Common Use System**

Basin Electric Power Cooperative, Powder River Energy Corporation, and Black Hills Power, Incorporated filed with the FERC a joint open access transmission system tariff (OATT) titled the Common Use System Tariff effective Oct. 15, 2003. The Administration Agreement for the Common Use System Tariff provides for the establishment of a Coordinating Committee to jointly oversee the planning, coordination and construction of facilities in the service area of the tariff. The previous transmission agreement, between the parties titled Agreement for Transmission Service and the Common Use of Transmission Systems, dated Jan. 1, 1986, also provided for this type of coordinated planning. Examples of this coordinated planning include the Spearfish to Yellow Creek 230 kV line, the Yellow Creek to Osage 230 kV line, and the Rapid City Asynchronous Tie.

### **Midwest Reliability Organization**

Midwest Reliability Organization (MRO) is a non-profit organization dedicated to ensuring the reliability and security of the bulk power system (BPS) in the north central region of North America, including parts of both the United States and Canada. MRO is one of eight regional entities in North America operating under authority from regulators in the United States through a delegation agreement with the North American Electric Reliability Corporation (NERC) and in Canada through arrangements with provincial regulators. The region includes more than 200 organizations that are involved in the production and delivery of electricity including municipal utilities, cooperatives, investor-owned utilities, transmission system operators, federal power marketing agencies, Canadian Crown Corporations, and independent power producers.

The primary responsibilities of MRO are to ensure compliance with mandatory Reliability Standards by entities who own, operate, or use the interconnected, international BPS, to conduct regional assessments of the grid's ability to meet the demands for electricity, and to analyze regional system events.



### Southwest Power Pool

Basin Electric joined the Southwest Power Pool (SPP) in October 2015. SPP oversees the bulk electric grid and wholesale power market in the central United States on behalf of a diverse group of utilities and transmission companies in 14 states including South Dakota. SPP establishes practices for system design, planning, adequacy, regional transmission service tariff, interconnections, operation, reliability, market designs and efficiency, and market power mitigation that will help to assure efficient and reliable power supply among the systems in SPP and SPP transmission customers. Basin Electric participates on various committees and work groups as a function of SPP. The SPP planning and interconnection processes are the main avenue for transmission project development in South Dakota.

### Mid-West Electric Consumers Association

Basin Electric Power Cooperative is a member of the Mid-West Electric Consumers Association (Mid-West). Mid-West, which was founded in 1958, is a regional coalition of consumer-owned electric utilities that purchase power from the federal multi-purpose projects in the Pick-Sloan Missouri Basin Program. The Association is governed by a board comprised of four directors from each state, with representation balanced between types of consumer-owned systems, and they meet four times a year. Mid-West's Water & Power Planning Committee meets throughout the year to assure timely

consideration of issues and develops technical information & policy recommendations for consideration by the board of directors.

### **20:10:21:12 - EFFORTS TO MINIMIZE ADVERSE EFFECTS**

The primary obligation of Basin Electric is to provide an adequate wholesale supply of dependable, low-cost electric power to its member systems, consistent with the public interest. In conjunction with this, Basin Electric endeavors to maximize the socio-economic benefits associated with electrical generation and transmission projects and to minimize negative impacts associated with these projects. This is particularly true with respect to protecting the agricultural lifestyle and productivity of this region.

The Cooperative remains committed to preserving and enhancing the ecological balance of this region for the benefit of future generations. It is the policy of Basin Electric that environmental impacts be monitored and steps taken to mitigate and alleviate adverse effects. Basin Electric has instituted a variety of programs designed to maximize the most efficient use of energy and to benefit the human, agricultural, and biological environments.

Projects proposed by Basin Electric that have a federal nexus adhere to the requirements of the associated Federal Agency's Environmental Policies and Procedures which describe the procedures for compliance with the provisions of the National Environmental Policy Act (NEPA). Through the NEPA process, Basin Electric encourages state, federal and public participation in proposed projects so that once potential impact issues are identified appropriate mitigation measures can be formulated with the assistance of the participants to minimize potential impacts. An Environmental Assessment is developed which includes a comprehensive discussion and evaluation of environmental issues and serves as a baseline document for subsequent environmental regulatory permits and a federal Environmental Impact Statement when required. The goal of this process is to select a facility location that best minimizes environmental, cultural, and socio-economic impacts and engineering and construction costs.

Basin Electric adheres to the appropriate South Dakota statutes regulating industrial development projects such as electrical generating facilities and high-voltage transmission lines and substations. In addition, it is Basin Electric's practice to inform affected state and federal agencies when prospective projects are identified to solicit their input early in the planning process.

Clean air and clean water are important to our environment and future generations. Our region continues to rank as one of the areas with the cleanest air in the nation, and almost all of our generation resources were built with best available pollution control technologies at the time of their construction. Our generation resources have long histories of compliance with environmental standards. As this history demonstrates, our commitment to the environment and environmental compliance remains strong and is a core value of our cooperative.

Recent environmental projects at our main baseload generation facilities are discussed below follow by details of recent EPA rulemakings affecting integrated

resource planning. The recent projects at our baseload generation facilities were initiated in response to EPA rulemakings. Basin Electric and subsidiaries have been proactive in meeting these new federal emissions standards ahead of schedule. Through year-end 2023, Basin Electric had invested \$2.04 billion in environmental control technology. Approximately \$202 million was invested in the operation and maintenance of those controls in 2023.

The following projects have been undertaken at our majority-owned coal-based facilities to ensure compliance with federal standards. It is important to note that all of Basin Electric facilities are in full compliance with all federal and state environmental standards and permits.

- Leland Olds Station: The first round of EPA's Regional Haze Rule required greater emission control through the installation of Best Available Retrofit Technology, or BART at Leland Olds. To achieve this, Basin Electric has installed wet limestone scrubbers in both units to control sulfur dioxide (SO<sub>2</sub>) emissions. Unit 2's scrubber was commissioned in 2012; Unit 1's was commissioned in 2013. For nitrogen oxide (NO<sub>x</sub>) control, BART required the installation of Selective Non-Catalytic Reduction (SNCR) technology on both units that were put into service in April of 2017. The BART compliance requirements were effective April 2017. Over-fire air combustion control has also been incorporated into both units at the Leland Olds Station. This technology introduces air high in the boiler, which reduces combustion temperatures. Since formation of NO<sub>x</sub> is in large part a function of temperature and oxygen availability, over-fire air technology reduces these emissions. A refined coal process had also been installed on both units to help with mercury and NO<sub>x</sub> reduction. However, this system has since been removed. A post-combustion sorbent injection system to provide additional mercury control was put in place in 2015. EPA finalized the Effluent Limitations Guidelines (ELG) rule on Sep. 30, 2015. The ELG rule sets limits for seven types of wastewater generated from power plants including a zero-discharge limit on bottoms ash transport water (BATW). As a result of this rule, a submerged flight conveyor system that will recycle BATW has been installed at Leland Olds. The 2015 Coal Combustion Residual Rule (CCR Rule) mandated the closure of unlined surface impoundments upon a specified triggering event. An update to this rule was finalized in 2020. The actions Leland Olds took to comply with the ELG rule also brought the facility into compliance with the CCR Rule.
- Laramie River Station: Over-fire air combustion control technology was incorporated into all three units at the Laramie River Station in 2009, 2010, and 2011 to aid in the reduction of NO<sub>x</sub> emissions. Low-NO<sub>x</sub> burners were incorporated into all three units at Laramie River between 2012, 2013, and 2014. Laramie River is also an affected BART facility which required additional NO<sub>x</sub> controls to be installed at Laramie River. A Selective Catalytic Reduction (SCR) system was installed on Unit 1 in 2019 and SNCRs on Units 2 and 3 in 2018. A refined coal process had also been installed in all three units at LRS to help with mercury and NO<sub>x</sub> reduction. However, this system has since been removed. A post-combustion mercury emission control system which injects activated carbon or another reagent was also installed on all units in 2015. Basin Electric is in the process of

implementing a long-term compliance plan to comply with the CCR Rule at Laramie River. Compliance will consist of closing two and retrofitting three surface impoundments in accordance with deadlines promulgated by EPA.

- Antelope Valley Station: Designed to be environmentally sound, over \$400 million have been invested in capital pollution control asset investments for Antelope Valley to date. The startup fuel has been switched from fuel oil to natural gas for both units. Under Further Reasonable Progress in the State of North Dakota's Regional Haze State Implementation Plan, AVS was required to install advanced overfire air technology and low-NO<sub>x</sub> burners for enhanced control of NO<sub>x</sub>. Unit 1 was retrofitted in the spring of 2014 and Unit 2 in the spring of 2016. For SO<sub>2</sub> removal, the capacity of the lime slaking system for the Antelope Valley Station's dry scrubbers was enhanced. The dry scrubber utilizes a lime-based slurry to remove up to 90% SO<sub>2</sub> emissions from flue gas as it passes through the dry scrubbers. The additional slaking capacity allows for more lime to be available should high sulfur lignite coal be burned. A refined coal process had also been installed in both units to help with mercury and NO<sub>x</sub> reduction. However, this system has since been removed. A post-combustion mercury emission control system has been installed at both units. Fabric filter bag houses capture and remove up to 99% of particulate matter. Each bag house contains more than 8,000, 35-foot-tall bags. Antelope Valley is a "zero-discharge" facility; even water is used efficiently only leaving the plant site through evaporation.

In April 2024 EPA finalized three major rulemakings that will have significant impacts on Basin Electric's existing coal fleet and future natural gas units. These rules are discussed below:

**Greenhouse Gas Rule:** The EPA finalized a new rule to regulate greenhouse gas (GHG) emissions from power plants, specifically carbon dioxide (CO<sub>2</sub>). In general, the rule set the Best System of Emission Reduction (BSER) for existing coal-fired units and new natural gas fired turbines. In the final rule EPA determines that carbon capture and sequestration (CCS) with 90% capture of CO<sub>2</sub> is adequately demonstrated and cost reasonable for and considers it to be BSER.

For existing coal-fired steam generating units, EPA has finalized different levels of BSER depending upon how long the unit will continue to operate. For units that have a federally enforceable commitment to cease operations prior to January 1, 2032, the units are exempt from the final rule. Units that operate on or after January 1, 2032, and cease operation before January 1, 2039, are considered medium-term coal units. For medium-term units, EPA has determined that BSER is co-firing 40% natural gas by 2030. Units that are planned to operate on or after January 1, 2039, are considered long-term coal units. EPA has determined that 90% CCS is BSER.

EPA breaks new and reconstructed fossil fuel-fired combustion turbines into three subcategories: low load, intermediate and baseload. Units in the low load subcategory are required to operate less than 20% of the time and use lower-emission fuels (natural gas and distillate oil). Intermediate load CTs are those that have a capacity factor greater than or equal to 20% and less than 40% based on

percent of potential electric sales. Intermediate units are highly efficient simple cycle or combined cycle technology and must meet a CO<sub>2</sub> emission rate of 1,170 lb CO<sub>2</sub>/MWh-g. Base load units are those with a capacity factor greater than 40%. For these units, BSER is highly efficient combined cycle technology upon startup with an emission rate of 800-900 lb CO<sub>2</sub>/MWh-g and 90% CCS by January 1, 2032, and meeting an emission rate of 100 lb CO<sub>2</sub>/MWh-g.

EPA plans to issue a GHG rule for existing gas units in the near future.

Mercury and Air Toxics Standards (MATS): The final rule revises the existing EGU MATS rule as part of the Clean Air Act mandated risk and technology review (RTR). The final MATS rule does the following:

- Lowers the filterable particulate matter (fPM) from 0.030 lb/MMBtu to 0.010 lb/MMBtu;
- Eliminates the mercury subcategory from lignite units thereby lowering the mercury emission limit for those units from 4.0 lb/TBtu to 1.2 lb/TBtu; and
- Requires the use of PM continuous emission monitoring systems (CEMS) to demonstrate compliance with the fPM standard.

CCR Legacy Rule: The final rule revises and contains additional requirements for CCR facilities. The final CCR Legacy Rule does the following:

- Establishes requirements for legacy CCR surface impoundments;
- Establishes definition, applicability and requirements for new term, Coal Combustion Residuals Management Units (CCRMUs)
- Limits the use of CCR for beneficial use on facility site.

### **20:10:21:13 - EFFORTS RELATING TO LOAD MANAGEMENT**

Throughout the Basin Electric service area, local rural electric cooperatives maintain load management plans that vary from voluntary peak alert programs to very sophisticated central control systems.

Basin Electric staff offers some technical assistance and assists in efforts to coordinate energy management and/or load management programs to best benefit the entire Basin Electric service area.

Basin Electric staff emphasizes the wise use and management of available resources to provide the most economical supply of energy to the consumer, rather than only a conservation or peak shaving program.

Basin Electric has a load management rate whereby four customers are participating - the City of Manning Municipal Light Plant, Iowa (6 MW), Cargill Wet Corn Mill Plant (4 MW) near Wahpeton, North Dakota, the City of Dike, Iowa (2.5 MW), and the Mountrail Williams Electric Cooperative Office Complex (4 MW) in Williston, North Dakota.

## **20:10:21:14 - LIST OF REPORTS**

No reports at this time.

## **20:10:21:15 - CHANGES IN STATUS OF FACILITIES**

The entire Chamberlain Wind Project was decommissioned in October of 2023.

## **20:10:21:16 - PROJECTED ELECTRIC DEMAND**

1. Exhibit 1 represents Basin Electric's historical and projected sales to its Class A and D members. This exhibit represents Basin Electric's supplemental power supply responsibility to the Class A and D members. As a supplemental power supplier, Basin Electric is responsible for providing the members' requirements in excess of the fixed amount of power they receive from the Western Area Power Administration and other sources.

An econometric based load forecast was completed in early 2024. The econometric forecasting system in the load forecast is a bottom-up process that begins by developing econometric equations and forecasts for each distribution cooperative. The total system consists of approximately 350 forecasting equations and over 700 explanatory variables. Annual and monthly forecasts of energy and demand are conducted for a 30+ year period. The distribution cooperative forecasts are combined to obtain the generation and transmission cooperative forecasts (G&T's). The G&T's power requirements are then separated into various power supply responsibilities. The Basin Electric components are combined to obtain the Basin Electric total power supply responsibility.

The modeling and forecasting is performed at Basin Electric. Throughout the modeling and forecasting process there is constant communication and review by member systems. Historical energy data is combined with external data obtained from government and private sector sources as well as membership consultation to form econometric forecasting equations. External projections of explanatory economic and demographic variables used in the forecasting process are obtained from the Food and Agricultural Policy Research Institute at the University of Missouri-Columbia, Missouri; Woods & Poole Economics, Inc.; IHS Markit, the US Department of Energy, Washington, D.C., along with various other sources.

2. Basin Electric's service area is electrically divided into four assessment areas across two electrical interconnections. The majority of Basin Electric's system resides in the eastern interconnection consisting of the Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO) assessment areas. In the western interconnection Basin Electric's system resides in the Northwest Power Pool (NWPP) and the Rocky Mountain Power Area (RMPA) assessment areas, which can be further broken down into the WAPA Upper

Great Plains West (WAUW) and NorthWestern Energy (NWMT) Balancing Authority Area's (BAA) in the NWPP area and the WAPA Colorado-Missouri (WACM) and PacifiCorp East (PACE) BAA's in the RMPA. These interconnections are separated by the east-west ties which are boundaries that separate two major electrical regions of the United States. This boundary essentially runs south from Fort Peck, Montana, approximately along the South Dakota-Wyoming, Nebraska-Wyoming, and Colorado-Kansas borders.

As a result of this, Basin Electric must construct additional generating capacity or purchase capacity and energy on both sides of the ties in order to serve its member load requirements across all 4 assessment areas.

The resources available to Basin Electric to serve its members east-side requirements in SPP and MISO are as follows:

- a) Leland Olds Station: Leland Olds Unit 1 was placed in-service on January 9, 1966, and is a base-load coal fueled unit located near Stanton, North Dakota, with a net capacity of 220 MW. Leland Olds Unit 2 is a coal fueled unit that was placed in-service on Dec. 15, 1975, and its net capacity is rated at 440 MW.
- b) Antelope Valley Station: Basin Electric operates two 450 MW (net) thermal-generating base load coal fired units near Beulah, North Dakota. Unit 1 began commercial operation on July 1, 1984, and Unit 2 began partial commercial operation on June 1, 1986.
- c) Laramie River Station: Basin Electric, together with five other consumer-owned power supply entities, began construction in July 1976 on the Laramie River Station near Wheatland, in southeast Wyoming. The station's three units became fully operational in November 1982. As project manager and operating agent for the Missouri Basin Power Project (MBPP), Basin Electric was assigned overall responsibility for the design, construction and operation of the power plant and related transmission. Units 2 and 3 of the Laramie River Station are electrically connected to the western system; Unit 1 is electrically connected to the eastern system. In 2018, Heartland Consumer Power District sold their share of the Laramie River Station to Tri-State G&T, and in 2021 the Wyoming Municipal Power Agency sold their share to Basin Electric because they became an All-Requirements member of Basin Electric. So today there are only 3 other owners of the Laramie River Station besides Basin Electric. The amount of power that Basin Electric receives from the east side unit is 92 MW (net).
- d) Spirit Mound Station: Basin Electric placed in service on June 30, 1978, two fuel oil-fired combustion turbines. The combined net winter rating of the two units is 120 MW and the net summer rating is 95 MW. The capacity is intended to be used primarily as reserves or replacement during initial outages of base load units or during peak load periods when

existing base load units cannot meet the demand. The Spirit Mound Station is located near Vermillion, South Dakota.

- e) Earl F. Wisdom Unit 1: Basin Electric and Corn Belt Power Cooperative, one of Basin Electric's member cooperatives, negotiated a power supply contract which provides that Corn Belt Power will sell to Basin Electric Corn Belt Power's 38 MW of uncommitted capacity and associated energy from the Earl F. Wisdom Unit 1. In return, Corn Belt Power entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to Corn Belt Power all of Corn Belt Power's capacity and energy requirements in excess of the power and energy available to Corn Belt Power from the Western Area Power Administration. In accordance with the Utility Mercury and Air Toxics Standards (MATS), Unit 1 stopped burning coal in January of 2014. Corn Belt Power and Basin Electric completed a retrofit of Unit 1 to switch from coal to natural gas for fuel. This retrofit was completed in June of 2014.
- f) Earl F. Wisdom Unit 2: Basin Electric partnered with Corn Belt Power Cooperative to build the 80 MW natural gas peaking unit near Spencer, Iowa. Basin Electric owns one half of the unit which was placed in service in April 2004. Basin Electric purchases 87.5% of Corn Belt Power's owned half in response to Corn Belt Power entering into a Wholesale Power Contract; therefore Basin Electric has 93.75% or 75 MW from the 80 MW combustion turbine.
- g) Groton Generation Station: Basin Electric commissioned Groton Unit 1 in 2006 and Unit 2 in 2008. These LMS 100 natural gas units provide peaking power. Unit 1 has a net winter rating of 95 MW and Unit 2 has a net winter rating of 93 MW.
- h) Culbertson Generation Station: Basin Electric commissioned Culbertson Unit 1 in 2010. The LMS 100 natural gas unit provides peaking power. The unit has a net winter rating of 95 MW.
- i) Deer Creek Station: Basin Electric commissioned the Deer Creek Station in August 2012. The unit is a combined-cycle natural gas facility that provides intermediate power. The unit has a net winter rating of 297 MW.
- j) Pioneer Generation Station: The Pioneer Generation Station northwest of Williston, North Dakota was built to serve the increasing demand for electricity by member cooperatives in northwest North Dakota. Unit 1 started commercial operation in 2013, Unit 2 and Unit 3 started commercial operation in 2014, and twelve natural gas reciprocating internal combustion engines (RICE) referred to as units 11 through 22 started commercial operation in 2017. Each of the first three units has 45 MW of net generating capability and the twelve RICE units have a net generating capability of 8.9 MW each giving the station a total rating of approximately 242 MW. Unit 1 of Pioneer Generation Station features a

clutch that allows the turbine to uncouple from the generator, allowing the generator to provide transmission system voltage support. This feature, if needed, is used to provide fast-acting reactive power which will stabilize the transmission system in the area. The additional combustion turbines, Units 4 and 5, are F-class simple cycle CTs with a net generating capability projected to be 240 MW each. The additional RICE units, Units 31-36, are projected to have a net generating capability of 18.3 MW each. Commercial operation for this additional 583 MW of generation is expected in 2025.

- k) Lonesome Creek Station: The Lonesome Creek Station is located near Watford City, North Dakota. Commercial Operation for Lonesome Creek Unit 1 began in December 2013, Units 2 and 3 in January 2015, Units 4 and 5 in March 2017, and Unit 6 in October 2021. Each unit consists of a LM 6000 natural gas combustion turbine and provides peaking power. Each unit has a net winter rating of 45 MW for a total station generating capability of 270 MW. Unit 1 has a synchronous clutch located between the combustion turbine and generator allowing the generator rotor to spin independent of the turbine providing voltage stability to the electric grid.
- l) Minot Wind Project: Basin Electric, in partnership with Central Power Electric Cooperative, has constructed a wind energy project 14 miles south of Minot, North Dakota. The first two turbines totaling 2.6 MW of generating capability were placed into commercial service in February 2002, and were recently decommissioned in March of 2022. Three additional turbines totaling 4.5 MW of generating capability were added in December 2009. The energy is delivered to members as part of Basin Electric's overall power supply.
- m) PrairieWinds 1: Basin Electric has constructed a wind energy project of 77 turbines near Minot, North Dakota. The project has a generating capability of 115.5 MW and was placed into commercial service in December 2009.
- n) Crow Lake Wind Project: Basin Electric has constructed a wind energy project of 108 turbines near White Lake, South Dakota. The project has a generating capability of 172 MW and was placed into commercial service in 2011. Basin Electric owns 107 turbines or approximately 170.4 MW and has a purchase power contract with Mitchell Technical Institute for the power out of the last turbine.
- o) WAPA Peaking Capacity: In 1968, Basin Electric executed a long-term contract with the federal government for United States Bureau of Reclamation (now WAPA) hydro peaking from the dams in the Missouri River Basin. This contract currently provides Basin Electric with 268.2 MW of winter peaking capacity at load and for Basin Electric to return a like amount of energy to Western during off-peak periods.

- p) George Neal IV: Basin Electric and Northwest Iowa Power Cooperative (NIPCO), one of Basin Electric's member cooperatives negotiated a new power supply contract which provides that NIPCO will sell to Basin Electric NIPCO's 31 MW of uncommitted capacity and associated energy from Unit No. 4 of the George Neal Generating Station (Neal IV). In return NIPCO entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to NIPCO all of NIPCO's capacity and energy requirements in excess of the power and energy available to NIPCO from the Western Area Power Administration.

Basin Electric and Corn Belt Power Cooperative, one of Basin Electric's member cooperatives, negotiated a power supply contract which provides that Corn Belt Power will sell to Basin Electric Corn Belt Power's 73 MW of uncommitted capacity and associated energy from Unit No. 4 of the George Neal Generating Station (Neal IV). In return, Corn Belt Power entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to Corn Belt Power all of Corn Belt Power's capacity and energy requirements in excess of the power and energy available to Corn Belt Power from the Western Area Power Administration.

- q) Walter Scott 3 and 4: Basin Electric and Corn Belt Power, one of Basin Electric's member cooperatives, negotiated a power supply contract which provides that Corn Belt will sell to Basin Electric Corn Belt Power's 26 MW of uncommitted capacity and associated energy from Unit No. 3 and 45 MW of uncommitted capacity and associated energy from Unit No. 4 of the Walter Scott Energy Center. In return, Corn Belt Power entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to Corn Belt Power all of Corn Belt Power's capacity and energy requirements in excess of the power and energy available to Corn Belt Power from the Western Area Power Administration.
- r) Western Native American Purchase: Basin Electric receives a Native American Allocation of 39.9 MW in the winter and 41.1 MW in the summer season. This allocation is a result of congressional action that made federal power available to the Native Americans.
- s) Rapid City DC Tie: Basin Electric and Black Hills Power, Inc. have jointly constructed a 200 MW asynchronous tie at Rapid City, South Dakota. This tie enables Basin Electric to serve load located west of the east-west ties, using capacity and/or energy from east side resources and vice versa, load located east of the east-west ties, using capacity and/or energy from west side resources. The Basin Electric ownership percentage is 65% and the Black Hills Power, Inc. ownership percentage is 35%. Currently, Basin Electric has rights to 130 MW of the tie.

- t) Stegall (David Hamil) DC Tie: Tri-State G&T Association constructed a 110 MW asynchronous tie at Stegall, Nebraska. Basin Electric has acquired all rights to this tie. This enables Basin Electric to serve load located west of the east-west ties, using capacity and/or energy from east side resources and vice versa.
- u) Sidney DC Tie: Western Area Power Administration constructed a 200 MW asynchronous tie at Sidney, Nebraska. Basin Electric has acquired 50 MW of west to east rights to this tie. This enables Basin Electric to serve load located on the eastern system using capacity and/or energy from west side resources.
- v) Other Short-Term Resources: Basin Electric has also entered into a number of short-term purchase agreements to meet contractual power supply obligations. Due to the relatively short-term duration of these arrangements no specifics are provided.
- w) Long Term Resource: Basin Electric has entered into long-term purchase agreements to meet contractual power supply obligations.
  - i) Wind Purchases:
    - a) 40 MW west of Edgeley, North Dakota
    - b) Two 49.5 MW projects near Wilton, North Dakota
    - c) 100 MW near Baldwin, North Dakota
    - d) 40 MW near Highmore, South Dakota
    - e) 94 MW near Pollock, South Dakota
    - f) 99 MW near Groton, South Dakota
    - g) 104 MW near Hebron, North Dakota
    - h) 150 MW near Tioga, North Dakota
    - i) Two 150 MW projects near New England, North Dakota
    - j) 197.9 MW near Columbus, North Dakota
    - k) 208 MW near Avon, South Dakota
    - l) 142 MW near Tioga, North Dakota (term starting 1/2023)
    - m) 200 MW near Harold, SD
  - ii) Solar Purchases:
    - a) 114 MW near Rapid City, South Dakota (COD milestone: 3/28/2024)
    - b) 20 MW near Rapid City, South Dakota (COD milestone: 12/31/2024)
  - iii) Peaking Purchases:
    - a) 10 MW City of Madison, South Dakota diesel generators
    - b) Nine 5.5 MW waste heat recover units from Ormat Technologies Inc (3 sites in South Dakota near Wetonka, Clark, and Estelline; 3 in North Dakota; 1 in Montana; 1 in Minnesota; 1 in Iowa)

- c) One 1.1 MW waste heat/steam letdown generator and 14.5 MW combined heat and power generator from Siouxland Energy Cooperative near Sioux Center, Iowa
  - d) 94.2 MW in purchases from CBPC
    - (1) 23.8 MW from Webster City, Iowa
    - (2) 11.1 MW from Estherville, Iowa
    - (3) 10 MW from Spencer, Iowa
    - (4) 42 MW from their share of the Superior, Lakota, Hancock, and Crosswinds wind projects in Iowa
  - e) ~80 MW from North Iowa Municipal Electric Cooperative Association's (NIMECA's) surplus capacity resources in Iowa
  - f) 15.4 MW from Pine Lake ethanol production facility near Steamboat Rock, IA
  - g) 6 MW from Blue Flint ethanol production facility near Underwood, ND
- iv) Other Long Term PPAs:
- a) Tolling Agreement
    - (1) 245-262 MW from LSP Cottage Grove (12/2027-5/2043)
  - b) Capacity Only
    - (1) 75-125 MW from Minnesota Power (6/2022-5/2025)
    - (2) 100 MW from Minnesota Power (6/2025-5/2028)
    - (3) 50-80 MW from Manitoba Hydro (6/2023-5/2028)
    - (4) 75 MW from Dairyland Power Cooperative (6/2023-5/2033)
    - (5) 35-185 MW from Missouri River Energy Services (10/2020-9/2035)
    - (6) 75 MW from NRG Power Marketing (6/2023-5/2025)
    - (7) 101-151 MW from Evergy/Dogwood Energy Facility (6/2021-5/2024)
    - (8) 125 MW from The Energy Authority/Sheldon & Hallam Stations (6/2023-5/2026)
    - (9) 25-50 MW from Rainbow Energy Center (6/2023-5/2027)
    - (10) ~50 MW from National Grid for Crocker Wind accredited capacity (6/2023-5/2031)
- x) Future Power Supply: For discussion of future power supply, please refer to Section 20:10:21:05 (Proposed Energy Conversion Facilities).

The resources available to Basin Electric to serve its members west-side requirements are as follows:

- a) Laramie River Station: The Laramie River Station capacity that Basin Electric receives from Units 2 and 3 on the west is 627 MW (net).

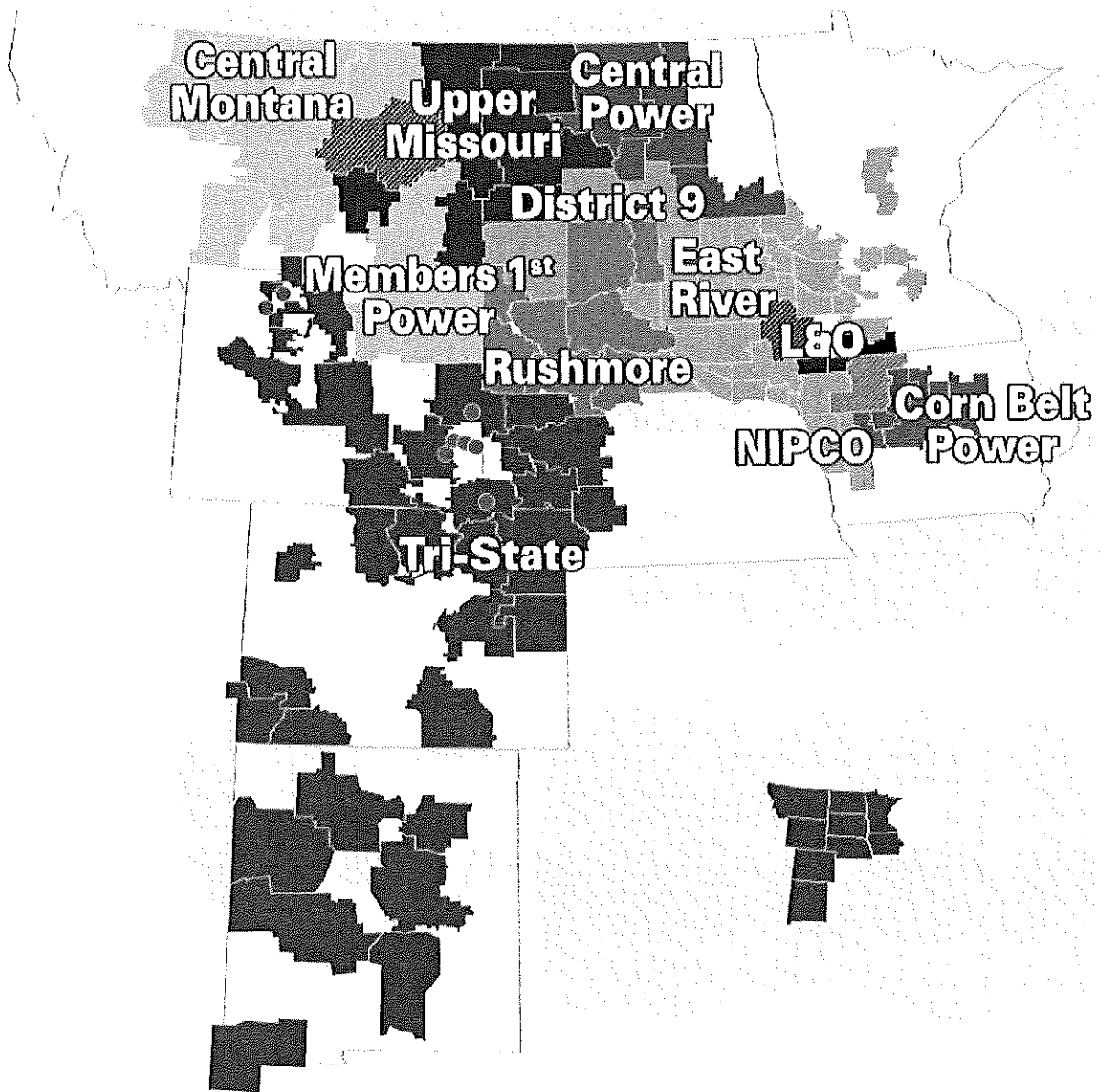
- b) Miles City DC Tie: Basin Electric and WAPA have jointly constructed a 200 MW back-to-back, AC-DC-AC tie at Miles City, Montana. This tie, which provides 40% capacity entitlement, enables Basin Electric to serve Central Montana Electric Power Cooperative Inc., a Class A member with electrical loads located primarily west of the east-west ties, using capacity from east-side resources such as the Antelope Valley Station.
- c) Wyoming Distributed Generation: The Wyoming Distributed Generation originally consisted of 9 peaking units located at 3 sites; Arvada, Hartzog and Barber Creek. One of the units at the Arvada site was retired in late 2021, so now there are 8 units in total across the three sites. These units are natural gas fired combustion turbines each with a net generating capability of 5 MW in the summer and 6 MW in the winter, for a total net generating capability of 40 MW summer and 48 MW winter. These units were released for commercial operation in 2002. These units currently are utilized for reserves for Basin Electric's west side electrical requirements.
- d) Dry Fork Station: Basin Electric, together with the Wyoming Municipal Power Agency (WMPA) began construction of the Dry Fork Station near Gillette in northeast Wyoming in 2007. The station's single unit has a total net generating capability of 405 MW and became fully operational in November of 2011.
- e) Basin Electric owned 92.9% of the station until WMPA became a member of Basin Electric in late 2020 and sold their share of Dry Fork in early 2021 so that Basin Electric now owns 100% of the station.
- f) Long Term PPAs :
  - i) Firm Capacity and/or Firm Energy in NWPP
    - a) 50-75 MW from MacQuarie Energy (formerly "Cargill"; 5/2020-12/2025)
    - b) 100-150 MW from Morgan Stanley Capital Group (1/2019-12/2027)
- g) Future Power Supply: For discussion of future power supply, please refer to Section 20:10:21:05 (Proposed Energy Conversion Facilities).

The projected load values contained in Exhibit 1 were obtained from the econometric based load forecast. Loads in South Dakota are located in SPP, MISO Local Resource Zone 1, and RMRG assessment areas so Basin Electric's loads in each of these areas have been adjusted to an at-generator system coincident basis by allowing for reserves, on-peak losses, and system diversity as outlined in Exhibit 2.

**20:10:21:17 - CHANGES IN ELECTRIC ENERGY DEMAND**

Exhibit 1 shows demand increases.

**20:10:21:18 - SERVICE AREA MAP**



**EXHIBIT 1 - SUMMER/WINTER LOADS BY STATE**

# Basin Electric Member Loads by State

Note: Historical 2000-2021 and Forecasted 2022-2032

## SUMMER Peak Demand (MW)

	ND	%	SD	%	MN	%	IA	%	NE	%	MT	%	CO	%	WY	%	BEPC TOTAL
2000	293	23.0%	302	23.7%	54	4.2%	99	7.8%	215	16.9%	29	2.3%	82	6.5%	200	15.7%	1,273
2001	307	22.2%	343	24.8%	58	4.2%	116	8.4%	227	16.5%	30	2.2%	82	5.9%	218	15.8%	1,380
2002	315	21.3%	352	23.8%	58	3.9%	127	8.6%	254	17.1%	44	3.0%	95	6.4%	236	15.9%	1,480
2003	353	22.9%	346	22.4%	58	3.8%	121	7.9%	239	15.5%	56	3.6%	114	7.4%	254	16.5%	1,541
2004	329	21.2%	354	22.8%	55	3.6%	119	7.7%	233	15.0%	62	4.0%	130	8.4%	271	17.5%	1,554
2005	357	20.7%	400	23.2%	62	3.6%	131	7.6%	270	15.7%	74	4.3%	132	7.6%	296	17.2%	1,722
2006	400	20.5%	440	22.6%	71	3.7%	188	9.7%	273	14.0%	82	4.2%	134	6.9%	358	18.4%	1,947
2007	452	21.9%	461	22.3%	92	4.4%	186	9.0%	262	12.7%	86	4.2%	135	6.6%	389	18.9%	2,063
2008	465	22.5%	421	20.4%	88	4.2%	177	8.6%	270	13.1%	74	3.6%	142	6.9%	426	20.7%	2,062
2009	448	21.4%	438	20.9%	102	4.9%	201	9.6%	232	11.1%	65	3.1%	145	7.0%	400	19.1%	2,090
2010	509	20.5%	472	19.0%	181	7.3%	459	18.5%	238	9.6%	70	2.8%	145	5.9%	407	16.4%	2,482
2011	543	20.8%	548	21.0%	169	6.5%	460	17.7%	280	10.8%	69	2.7%	140	5.4%	396	15.2%	2,607
2012	693	23.1%	596	19.9%	207	6.9%	476	15.9%	333	11.1%	104	3.5%	208	6.9%	377	12.6%	2,994
2013	812	28.5%	572	18.7%	224	7.3%	460	15.0%	299	9.8%	147	4.8%	180	5.9%	370	12.1%	3,063
2014	869	29.3%	508	16.8%	160	5.3%	433	14.3%	311	10.3%	178	5.9%	179	5.9%	372	12.3%	3,029
2015	1,187	34.7%	587	17.2%	212	6.2%	425	12.4%	274	8.0%	186	5.4%	195	5.7%	356	10.4%	3,421
2016	1,141	34.2%	568	17.0%	212	6.4%	470	14.1%	266	7.9%	176	5.3%	200	6.0%	308	9.2%	3,342
2017	1,244	34.8%	585	16.3%	234	6.5%	471	13.2%	293	8.2%	244	6.8%	199	5.6%	309	8.6%	3,578
2018	1,289	35.0%	580	15.7%	240	6.5%	480	13.0%	260	7.1%	245	6.6%	304	8.3%	289	7.8%	3,687
2019	1,426	37.7%	579	15.3%	239	6.3%	480	12.7%	259	6.9%	250	6.6%	278	7.4%	272	7.2%	3,783
2020	1,478	38.4%	596	15.5%	269	7.0%	477	12.4%	272	7.0%	246	6.4%	191	5.0%	323	8.4%	3,851
2021	1,539	38.9%	673	16.1%	299	7.2%	497	11.9%	317	7.6%	262	6.3%	202	4.8%	380	9.1%	4,169
2022	1,677	38.3%	688	15.3%	378	8.6%	495	11.3%	324	7.4%	248	5.7%	188	4.3%	398	9.1%	4,375
2023	1,948	41.4%	672	14.3%	434	9.2%	525	11.2%	312	6.6%	248	5.3%	172	3.7%	391	8.3%	4,702
2024	1,964	41.1%	746	15.6%	349	7.3%	531	11.1%	334	7.0%	317	6.6%	172	3.6%	369	7.7%	4,782
2025	2,133	42.3%	775	15.4%	356	7.1%	574	11.4%	338	6.7%	328	6.5%	172	3.4%	367	7.3%	5,042
2026	2,220	43.0%	789	15.3%	384	7.4%	580	11.2%	339	6.6%	318	6.2%	172	3.3%	360	7.0%	5,161
2027	2,914	49.0%	805	13.5%	389	6.5%	651	10.9%	340	5.7%	321	5.4%	172	2.9%	355	6.0%	5,946
2028	3,133	51.5%	778	12.8%	397	6.5%	640	10.5%	302	5.0%	311	5.1%	165	2.7%	356	5.9%	6,082
2029	3,175	50.7%	830	13.3%	401	6.4%	657	10.5%	341	5.5%	332	5.3%	172	2.8%	352	5.6%	6,269
2030	3,271	51.3%	840	13.2%	405	6.4%	659	10.3%	342	5.4%	339	5.3%	172	2.7%	348	5.6%	6,378
2031	3,276	51.1%	851	13.3%	411	6.4%	662	10.3%	343	5.3%	349	5.4%	172	2.7%	348	5.4%	6,411
2032	3,353	51.5%	862	13.2%	417	6.4%	664	10.2%	343	5.3%	353	5.4%	173	2.6%	349	5.4%	6,514
2033	3,373	51.4%	875	13.3%	423	6.4%	667	10.2%	344	5.2%	357	5.4%	173	2.6%	350	5.3%	6,560
2034	3,379	51.3%	887	13.4%	429	6.5%	670	10.2%	345	5.2%	359	5.4%	173	2.6%	352	5.3%	6,593

## SD Summer Demand Changes

	MW	% diff
2000 to 2001	41	13.5%
2001 to 2002	9	2.7%
2002 to 2003	-6	-1.8%
2003 to 2004	8	2.4%
2004 to 2005	46	13.1%
2005 to 2006	40	10.1%
2006 to 2007	20	4.6%
2007 to 2008	-40	-8.7%
2008 to 2009	17	4.0%
2009 to 2010	35	8.0%
2010 to 2011	76	16.1%
2011 to 2012	48	8.7%
2012 to 2013	-24	-4.1%
2013 to 2014	-64	-11.2%
2014 to 2015	80	15.7%
2015 to 2016	-19	-3.3%
2016 to 2017	17	3.0%
2017 to 2018	-4	-0.7%
2018 to 2019	-1	-0.2%
2019 to 2020	17	3.0%
2020 to 2021	76	12.8%
2021 to 2022	-5	-0.7%
2022 to 2023	4	0.6%
2023 to 2024	76	11.1%
2024 to 2025	29	3.8%
2025 to 2026	14	1.8%
2026 to 2027	16	2.1%
2027 to 2028	-28	-3.4%
2028 to 2029	52	6.7%
2029 to 2030	10	1.2%
2030 to 2031	11	1.3%
2031 to 2032	11	1.3%
2032 to 2033	12	1.4%
2033 to 2034	12	1.4%

# Basin Electric Member Loads by State

Note: Historical 2000-2021 and Forecasted 2022-2032

## WINTER Peak Demand (MW)

	ND	SD	MN	IA	NE	MT	CO	WY	BEPC TOTAL
	ND %	SD %	MN %	IA %	NE %	MT %	CO %	WY %	
00/01	342 27.4%	328 26.2%	57 4.6%	125 10.0%	43 3.4%	34 2.7%	83 6.7%	239 19.1%	1,250
01/02	313 26.2%	300 25.2%	47 3.9%	108 9.1%	37 3.1%	35 2.9%	82 6.9%	270 22.6%	1,193
02/03	377 27.7%	342 25.1%	54 4.0%	128 9.4%	36 2.6%	55 4.0%	103 7.6%	268 19.6%	1,362
03/04	417 27.5%	394 25.9%	60 3.9%	134 8.8%	36 2.3%	62 4.1%	123 8.1%	293 19.3%	1,518
04/05	438 27.4%	417 26.1%	63 3.9%	139 8.7%	44 2.7%	64 4.0%	121 7.6%	314 19.7%	1,599
05/06	463 26.8%	415 24.0%	66 3.8%	187 10.8%	48 2.8%	72 4.2%	121 7.0%	353 20.5%	1,725
06/07	495 25.4%	484 24.9%	111 5.7%	212 10.9%	50 2.6%	71 3.6%	122 6.3%	403 20.7%	1,946
07/08	563 26.3%	524 24.5%	113 5.3%	232 10.8%	50 2.3%	81 3.8%	124 5.8%	454 21.2%	2,140
08/09	623 26.7%	634 26.2%	133 5.5%	276 11.4%	57 2.3%	78 3.2%	138 5.7%	481 19.9%	2,420
09/10	627 23.5%	619 23.2%	169 6.3%	518 19.4%	59 2.2%	74 2.8%	137 5.1%	468 17.5%	2,671
10/11	679 25.2%	622 23.0%	198 7.3%	468 17.4%	55 2.0%	56 2.1%	145 5.4%	477 17.7%	2,698
11/12	835 29.5%	600 21.2%	181 6.4%	443 15.6%	49 1.7%	92 3.2%	180 6.4%	450 15.9%	2,828
12/13	973 32.3%	627 20.8%	194 6.4%	457 15.2%	52 1.7%	101 3.3%	183 6.1%	428 14.2%	3,014
13/14	1,134 31.9%	778 21.9%	253 7.1%	523 14.7%	54 1.5%	183 5.1%	200 5.6%	434 12.2%	3,559
14/15	1,359 37.2%	700 19.2%	233 6.4%	496 13.6%	57 1.6%	191 5.2%	184 5.1%	432 11.8%	3,651
15/16	1,394 39.9%	634 18.2%	229 6.5%	466 13.3%	54 1.5%	161 4.6%	184 5.3%	369 10.6%	3,491
16/17	1,441 38.7%	695 18.7%	249 6.7%	477 12.8%	53 1.4%	242 6.5%	184 5.0%	380 10.2%	3,720
17/18	1,546 39.3%	718 18.3%	281 7.2%	493 12.6%	57 1.4%	245 6.2%	191 4.9%	354 9.0%	3,929
18/19	1,717 42.3%	741 18.2%	289 7.1%	517 12.7%	48 1.2%	236 5.8%	194 4.8%	318 7.8%	4,060
19/20	1,823 44.9%	688 17.0%	235 5.8%	499 12.3%	58 1.4%	256 6.3%	129 3.2%	369 9.1%	4,056
20/21	1,830 43.1%	769 18.1%	284 6.7%	513 12.1%	64 1.5%	256 6.0%	130 3.1%	396 9.3%	4,242
21/22	1,907 43.6%	777 17.8%	331 7.6%	503 11.5%	65 1.5%	245 5.6%	129 2.9%	415 9.5%	4,371
22/23	2,025 43.3%	835 17.8%	393 8.4%	535 11.4%	72 1.5%	267 5.7%	133 2.8%	419 8.9%	4,679
23/24	2,283 46.1%	873 17.6%	351 7.1%	561 11.3%	54 1.1%	304 6.1%	130 2.6%	396 8.0%	4,951
24/25	2,558 48.1%	907 17.1%	358 6.7%	598 11.2%	51 1.0%	328 6.2%	129 2.4%	389 7.3%	5,317
25/26	2,631 48.4%	921 16.9%	383 7.0%	616 11.3%	51 0.9%	328 6.0%	129 2.4%	380 7.0%	5,439
26/27	3,303 53.3%	938 15.1%	387 6.2%	688 11.1%	51 0.8%	330 5.3%	129 2.1%	374 6.0%	6,199
27/28	3,402 54.1%	918 14.6%	394 6.3%	673 10.7%	58 0.9%	322 5.1%	129 2.1%	398 6.3%	6,293
28/29	3,660 55.6%	940 14.3%	397 6.0%	688 10.5%	56 0.8%	330 5.0%	128 1.9%	384 5.8%	6,582
29/30	3,778 56.2%	951 14.1%	401 6.0%	691 10.3%	56 0.8%	337 5.0%	128 1.9%	379 5.6%	6,720
30/31	3,798 56.1%	962 14.2%	405 6.0%	693 10.2%	56 0.8%	346 5.1%	128 1.9%	378 5.6%	6,767
31/32	3,835 55.9%	1,000 14.6%	410 6.0%	702 10.2%	52 0.8%	369 5.4%	129 1.9%	366 5.3%	6,863
32/33	3,915 56.4%	987 14.2%	415 6.0%	699 10.1%	56 0.8%	355 5.1%	128 1.9%	360 5.5%	6,936
33/34	3,929 56.3%	1,000 14.3%	419 6.0%	702 10.1%	56 0.8%	357 5.1%	128 1.8%	383 5.5%	6,975

## SD Winter Demand Changes

	MW Change	% diff
00/01 to 01/02	-28	-8.4%
01/02 to 02/03	42	13.9%
02/03 to 03/04	52	15.0%
03/04 to 04/05	23	5.8%
04/05 to 05/06	-2	-0.5%
05/06 to 06/07	70	16.8%
06/07 to 07/08	40	8.2%
07/08 to 08/09	110	20.9%
08/09 to 09/10	-15	-2.4%
09/10 to 10/11	3	0.5%
10/11 to 11/12	-22	-3.5%
11/12 to 12/13	27	4.5%
12/13 to 13/14	151	24.1%
13/14 to 14/15	-78	-10.0%
14/15 to 15/16	-65	-9.3%
15/16 to 16/17	60	9.5%
16/17 to 17/18	24	3.4%
17/18 to 18/19	23	3.2%
18/19 to 19/20	-53	-7.2%
19/20 to 20/21	82	11.8%
20/21 to 21/22	7	1.0%
21/22 to 22/23	58	7.5%
22/23 to 23/24	38	4.6%
23/24 to 24/25	34	3.9%
24/25 to 25/26	14	1.6%
25/26 to 26/27	17	1.8%
26/27 to 27/28	-20	-2.1%
27/28 to 28/29	22	2.4%
28/29 to 29/30	11	1.1%
29/30 to 30/31	12	1.2%
30/31 to 31/32	37	3.9%
31/32 to 32/33	-13	-1.3%
32/33 to 33/34	13	1.3%

**EXHIBIT 2 - EASTERN SYSTEM SUMMER/WINTER LOAD RESOURCES**

SPP SUMMER SEASON					
	Members' Load Projections*	Contracted Sales to Others	Firm Purchases	Losses & Reserves	Total Responsibility
2024	3,472	149	-277	650	3,994
2025	3,709	149	-377	676	4,157
2026	3,802	149	-377	694	4,268
2027	4,541	149	-607	794	4,877
2028	4,602	149	-607	806	4,950
2029	4,828	149	-607	850	5,220
2030	4,938	149	-607	872	5,352
2031	4,964	149	-607	877	5,383
2032	5,054	149	-607	895	5,491
2033	5,089	149	-607	902	5,532
2034	5,110	149	-607	906	5,558

SPP WINTER SEASON					
	Members' Load Projections*	Contracted Sales to Others	Firm Purchases	Losses & Reserves	Total Responsibility
2024/25	3,889	149	-633	666	4,072
2025/26	4,136	149	-643	713	4,355
2026/27	4,863	149	-873	810	4,949
2027/28	4,911	149	-873	820	5,007
2028/29	5,205	149	-873	877	5,358
2029/30	5,337	149	-873	903	5,516
2030/31	5,378	149	-873	911	5,565
2031/32	5,482	149	-873	932	5,690
2032/33	5,527	149	-873	940	5,744
2033/34	5,556	149	-873	946	5,778

RMPA SUMMER SEASON					
	Members' Load Projections*	Contracted Sales to Others	Firm Purchases	Losses & Reserves	Total Responsibility
2024	586	189	-39	77	814
2025	585	305	-39	77	929
2026	578	383	-39	76	999
2027	573	380	-39	76	990
2028	570	422	-39	75	1,029
2029	571	422	-39	75	1,029
2030	567	429	-38	75	1,033
2031	567	429	-38	75	1,033
2032	568	428	-38	75	1,033
2033	570	426	-38	75	1,033
2034	572	423	-38	76	1,033

RMPA WINTER SEASON					
	Members' Load Projections*	Contracted Sales to Others	Firm Purchases	Losses & Reserves	Total Responsibility
2024/25	580	305	-41	128	972
2025/26	572	370	-41	128	1,027
2026/27	566	345	-41	125	994
2027/28	563	417	-41	124	1,062
2028/29	563	417	-41	124	1,062
2029/30	559	425	-41	123	1,066
2030/31	559	426	-41	123	1,066
2031/32	560	424	-41	123	1,066
2032/33	562	421	-41	124	1,066
2033/34	565	418	-41	124	1,066

MISO Z1 SUMMER SEASON					
	Members' Load Projections*	Contracted Sales to Others	Firm Purchases	Losses & Reserves	Total Responsibility
2024	267	0	0	32	299
2025	272	0	0	32	304
2026	280	0	0	33	313
2027	284	0	0	34	318
2028	289	0	0	35	323
2029	294	0	0	38	332
2030	298	0	0	39	337
2031	302	0	0	41	344
2032	307	0	0	43	350
2033	312	0	0	44	356
2034	317	0	0	44	362

MISO Z1 WINTER SEASON					
	Members' Load Projections*	Contracted Sales to Others	Firm Purchases	Losses & Reserves	Total Responsibility
2024/25	298	0	0	96	395
2025/26	306	0	0	99	405
2026/27	311	0	0	100	411
2027/28	315	0	0	94	409
2028/29	319	0	0	96	415
2029/30	322	0	0	96	418
2030/31	326	0	0	97	423
2031/32	330	0	0	98	428
2032/33	334	0	0	99	433
2033/34	338	0	0	100	439

\* Load Projections include diversity adjustments to account for load levels at time of each assessment area's coincident peak

2024 Resources

Summer Season																									
SPP													WECC - RMPA					MISO Z1							
	LRS			Wisdom									New Gas	Member		Waste			SPP	LRS		WY		MISO Z1	
	LOS	East	AVS <sup>2</sup>	Neal <sup>4</sup>	1&2 <sup>3</sup>	SMS	GGG	CGS	DCS	PGS	LCS	Gen	Purchases <sup>1</sup>	Wind	Heat	Solar	Purchases	West	DFS	Distributed Gen	NTEC	Cottage	MISO Z1		
																					CCGT	Grove	Purchases		
2024	660.0	92.0	900.0	105.1	105.7	97.8	85.0	84.6	297.2	230.6	250.0		168.5	301.6	30.8	81.8	682.4	615.1	379.1	38.8	-	-	323.8		
2025	660.0	92.0	900.0	105.1	105.7	97.8	170.0	84.6	297.2	550.6	250.0		157.8	300.0	30.8	79.6	725.4	615.1	379.1	38.8	-	-	409.1		
2026	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		147.5	305.5	30.8	77.5	499.2	615.1	379.1	38.8	-	-	409.1		
2027	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		131.4	301.4	30.8	75.5	499.0	615.1	379.1	38.8	-	-	309.1		
2028	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		127.1	299.2	30.8	73.5	420.8	615.1	379.1	38.8	153.1	228.6	79.1		
2029	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0	TBD	124.9	286.9	30.8	71.5	400.4	615.1	379.1	38.8	153.1	228.6	79.1		
2030	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		103.4	284.7	30.8	69.6	405.4	615.1	379.1	38.8	153.1	228.6	79.1		
2031	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		92.1	277.1	30.8	67.8	382.0	615.1	379.1	38.8	153.1	228.6	79.1		
2032	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		91.9	275.1	11.1	66.0	380.9	615.1	379.1	38.8	153.1	228.6	79.1		
2033	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		79.4	273.0	10.0	64.3	353.9	615.1	379.1	38.8	153.1	228.6	4.1		
2034	660.0	92.0	900.0	105.1	69.5	97.8	170.0	84.6	297.2	760.8	250.0		79.3	271.0	10.0	62.6	351.4	615.1	379.1	38.8	153.1	228.6	4.1		

Winter Season																									
SPP													WECC - RMPA					MISO Z1							
	LRS			Wisdom									New Gas	Member		Waste			SPP	LRS		WY		MISO Z1	
	LOS	East	AVS <sup>2</sup>	Neal <sup>4</sup>	1&2 <sup>3</sup>	SMS	GGG	CGS	DCS	PGS	LCS	Gen	Purchases <sup>1</sup>	Wind	Heat	Solar	Purchases	West	DFS	Distributed Gen	NTEC	Cottage	MISO Z1		
																					CCGT	Grove	Purchases		
2024/25	660.0	92.0	900.0	105.1	111.9	120.0	93.0	95.0	297.0	239.3	270.0		171.1	716.7	30.8	-	824.4	618.5	402.2	45.6	-	-	394.6		
2025/26	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		150.5	522.4	30.8	-	736.0	618.5	402.2	45.6	-	-	409.3		
2026/27	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		140.1	518.7	30.8	-	509.7	618.5	402.2	45.6	-	-	409.3		
2027/28	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		134.0	510.5	30.8	-	428.0	618.5	402.2	45.6	-	237.4	309.3		
2028/29	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		129.8	490.2	30.8	-	406.2	618.5	402.2	45.6	170.1	237.4	79.3		
2029/30	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0	TBD	127.5	486.8	30.8	-	412.2	618.5	402.2	45.6	170.1	237.4	79.3		
2030/31	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		92.3	474.3	30.8	-	412.1	618.5	402.2	45.6	170.1	237.4	79.3		
2031/32	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		92.1	471.0	11.1	-	376.8	618.5	402.2	45.6	170.1	237.4	79.3		
2032/33	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		91.9	467.7	11.1	-	349.2	618.5	402.2	45.6	170.1	237.4	79.3		
2033/34	660.0	92.0	900.0	105.1	75.0	120.0	188.0	95.0	297.0	805.5	270.0		79.4	464.5	10.0	-	345.8	618.5	402.2	45.6	170.1	237.4	4.3		

Footnotes:  
 1) Member Purchases category includes CBPC, NIMECA, and other purchases through special member purchase rates.  
 2) BEPC owns 24.166% of AVS unit 2 and leases the remaining portion from other owners. The original terms of the lease have been extended by 10 years through 2030.  
 3) For conservative planning purposes, the financial depreciable life of our generating units is used as their assumed remaining useful life, even though no formal retirement decisions have been made. Actual retirement decisions have to be made by BEPC's Board of Directors.