

NORTH DAKOTA TRANSMISSION AUTHORITY

ANNUAL REPORT

July 1, 2020 to June 30, 2021

OVERVIEW

The North Dakota Transmission Authority (Authority) was created by the North Dakota Legislative Assembly in 2005 at the request of the North Dakota Industrial Commission. The Authority's mission is to facilitate the development of transmission infrastructure in North Dakota. The Authority was established to serve as a catalyst for new investment in transmission by facilitating, financing, developing and/or acquiring transmission to accommodate new lignite and wind energy development. The Authority is a builder of last resort, meaning private business has the first opportunity to invest in and/or build needed transmission.

By statute, the Authority membership is comprised of the members of the North Dakota Industrial Commission. John Weeda was appointed Director of the Authority in February 2018. The Director works closely with the Executive Director of the NDIC, Ms. Karlene Fine. The Authority has no other staff and receives no direct general fund appropriation.

SUMMARY OF ACTIVITIES

Whether the issue is project development or legislative initiatives, the Authority is actively engaged in seeking ways to improve North Dakota's energy export capabilities along with transmission capabilities within the state. To be successful Authority staff must have an understanding of the technical and political challenges associated with moving energy from generator to satisfied customer. Outreach to existing transmission system owners and operators and potential developers in order to understand the nuances of successful transmission infrastructure development is necessary. Another key element for success is working with officials at the state and federal levels to ensure that legislation and public policy are designed to support the movement of electricity generated from North Dakota's abundant energy resources to local, regional, and national markets.

NORTH DAKOTA INDUSTRIAL COMMISSION



Doug Burgum,
Governor



Wayne Stenehjem,
Attorney General



Doug Goehring,
Agriculture Commissioner

NORTH DAKOTA TRANSMISSION AUTHORITY



John Weeda, Director

STATUTORY AUTHORITY

Statutory authority for the Transmission Authority is found in chapter 17-05 of the North Dakota Century Code. Section 17-05-05 N.D.C.C. delineates the powers of the Authority, including:

- 1) make grants or loans to borrow money;
- 2) issue up to \$800 million in revenue bonds;
- 3) enter into lease-sale contracts;
- 4) own, lease, rent and dispose of transmission facilities;
- 5) enter into contracts to construct, maintain and operate transmission facilities;
- 6) investigate, plan, prioritize and propose transmission corridors; and
- 7) participate in regional transmission organizations.

Before the Authority may exercise its power to construct transmission facilities, it must follow a process defined by statute to ensure public participation and comment. In particular, the Authority must publish a notice describing the need for the transmission project. Entities interested in construction of the facilities or furnishing services to satisfy the identified needs have 180 days to respond by filing a notice of intent. If the Authority receives a notice of intent from an interested entity, it may not exercise its power to construct unless the Authority makes a finding that doing so would be in the public interest. In making such a finding, the Authority shall consider the economic impact to the state, economic feasibility, technical performance, reliability, past performance, and the likelihood of successful completion and ongoing operation.

The Authority may finance approved projects through the issuance of bonds. Under current law up to 30 percent of the cost of a project may be financed by selling bonds that include the moral obligation of the State of North Dakota. In other words, up to \$240 million of the Authority's \$800 million total bonding authority may be sold with the moral obligation of the state. The moral obligation component enhances the marketability of the Authority's bonds.

PLANNING

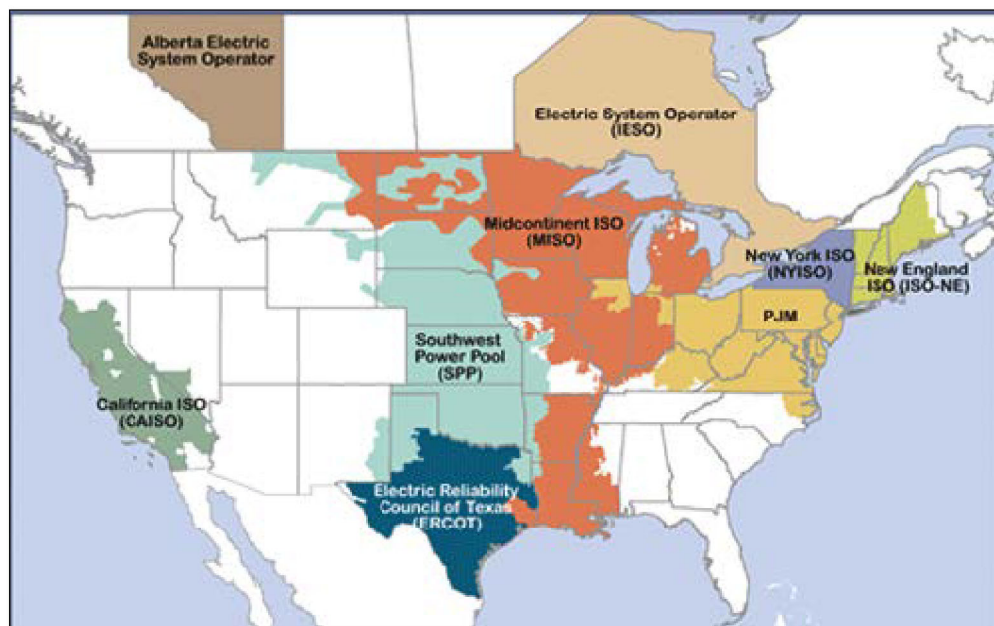
A major portion of the Authority's workload includes observation and achieving a high level of understanding of regional transmission planning. To accomplish this task, the Authority monitors the efforts of regional transmission organizations (RTOs) that represent North Dakota transmission developers. Authorized and recognized by the Federal Energy Regulatory Commission (FERC), RTOs oversee the efficient and reliable operation of the transmission grid. While RTOs do not own any transmission assets, they do provide non-discriminatory access to the electric grid, manage congestion, assure reliability, provide billing and settlement services, and oversee planning, expansion, and interregional coordination of electric transmission.

Many North Dakota service providers have long been participants in the Midcontinent Independent System Operator (MISO). The MISO footprint covers the service territories of Otter Tail Power (OTP), Montana-Dakota Utilities (MDU), Great River Energy (GRE), Xcel, and Missouri River Energy Services (MRES). In addition, they have an agreement with Minnkota Power Cooperative that provides them with many of the same services. In October 2015, the Western Area Power Administration (Western) and Basin Electric Power Cooperative (BEPC) officially joined the Southwest Power Pool (SPP), bringing the entire state of North Dakota under the transmission planning of RTOs. In addition, BEPC members Mountrail-Williams Electric Cooperative and Central Power Electric

Cooperative, Roughrider Electric Cooperative and Mor-Gran-Sou Electric Cooperative have also joined SPP due to their transmission ownership. Combined, North Dakota utilities and transmission developers are part of an extremely complex system that oversees the transmission of over 200,000 megawatts of electricity across 100,000 miles of transmission lines so that utilities can deliver power to homes and businesses in all or part of 20 states.

MISO and SPP also operate the power markets in their respective territory. Pricing for selling electricity into the grid and for buying electricity from the grid is managed by them. This process determines which generating units will be providing generation at any point in time and also which units will provide various ancillary services to sustain voltage, assure reliability, etc.

Regional Transmission Organization and Independent System Operators



*FERC-Recognized Regional Transmission Organizations and Independent System Operators
(www.ferc.gov)*

ND Transmission Authority Planning

The North Dakota Transmission Authority periodically conducts independent evaluation of factors that affect the adequacy of transmission in North Dakota. Two studies of that nature were recently completed.

POWER FORECAST 2019

To help understand the demand for electricity in the growth area in the oil producing counties, the NDTA commissioned Barr Engineering to do a Power Forecast 2019 estimating the growth over the next 20 years. The full study can be obtained from the North Dakota Industrial Commission web site: <http://www.nd.gov/ndic/ic-press/Power%20Forecast%202019.pdf>

In summary, the Power Forecast 2019 (PF19) projects an increase of 71% in energy demand over the next 20 years under the consensus scenario and at least 1000 MW of capacity to meet demand. These projections were highly dependent on oil production forecast. The downturn in the crude oil market in early 2020 had a major impact on demand in the Bakken. The current long-term projections from most sources are that following the downturn of 2020 activity will return to near the previously projected level. The current benchmark price around \$75 per barrel is resulting in increased activity at a little lower rate than previously projected.

Plans are being made to update this study in the 2021-2022 timeframe.

Generator Interconnection Queue and Transmission Plan Review

As a step in understanding the capacity of the grid in North Dakota, Power Systems Engineering was commissioned to review Generator Interconnections that have been evaluated recently. This study revealed that transmission interconnections are getting progressively more complex and expensive to execute. In the summer of 2019 this resulted in most of the projects in MISO and SPP in the region were canceled due to being assessed high cost in the interconnect studies. In many cases the transmission interconnect cost was nearly as much as the cost of installation of the wind generation. A major part of the cost is driven by transmission improvements that are needed a long distance from the interconnect point in both the MISO and SPP evaluations. This is further evidence that a long-term view of the overall grid is needed to identify improvements that are needed before significant increases can be made within ND.

In a follow-up study by Power Systems Engineering the conclusions were that peak power flows are consistently near capacity in most of the North Dakota grid. Projected growth in the future will exceed any remaining capacity within the next few years. The study looked at power flow projections thru 2038 and showed that allowable flows in many areas exceed limits prior to that time.

This study depended on information from the Power Forecast 2019 study so update of that study may impact the projected loading of the grid in this study.

MISO TRANSMISSION EXPANSION PLANNING (MTEP)

The MISO Transmission Expansion Plan (MTEP) is developed annually through an inclusive and transparent stakeholder process. MISO evaluates various types of projects through the MTEP process that, when taken together, build an electric infrastructure to meet local and regional reliability standards, enable competition among wholesale capacity and energy suppliers in the MISO markets, and allow for competition among transmission developers. All North Dakota Projects in the MTEP 19 study were cancelled or postponed.

SPP Integrated Transmission Planning process (ITP)

SPP utilizes their ITP (Integrated Transmission Planning) process that analyzes the system for the next 10 years. This study looks to identify the “needs” of the system and subsequently produces a plan to mitigate those needs whether they are a reliability need, and economic need, or a policy need. The ITP process has been somewhat revised in the past couple of years whereas they used to do a near term every other year, and a 10-year study on the odd years. The current process

combines the two studies into a single ITP study which will be completed each year. They are currently working on projects that were submitted in 2017. Phase 1 of that study will be completed in September 2021. Projects that continue into phase 2 and 3 can expect to be completed in the first half of 2022.

MISO-SPP Joint Transmission Study

The Midcontinent Independent System Operator (MISO) and Southwest Power Pool (SPP) are collaborating on a year-long transmission study designed to identify transmission projects with comprehensive, cost effective and efficient upgrades. Both RTOs are looking for solutions to historical challenges facing generation interconnection customers in areas where their boundaries connect, also known as seams. The study began in December 2020.

This joint study will focus on solutions that the RTOs believe will offer benefits to both their interconnection customers and end use consumers of RTO member companies. While MISO and SPP have an existing Joint Operating Agreement that allows them to work through reliability issues, existing processes do not include the simultaneous evaluation of benefits, or allocation of cost, to both load and interconnection customers.

Each RTO's existing interconnection processes will proceed as planned. The study will run parallel to those with subsequent results expected to be incorporated at the appropriate time. Any projects identified by the joint study will need to be approved by the Board of Directors of the respective RTOs before moving ahead.

The completion of this study is expected by the end of 2021. Several of the alternatives that are ranked well in the preliminary analysis would benefit North Dakota. The most direct impact is a proposed line from Jamestown to Ellendale. Additional lines proposed in the Big Stone area would help reduce congestion that has impacted the market in the Ellendale area where ND has a number of large wind projects and more being proposed.

TRANSMISSION CONSTRUCTION & IMPROVEMENTS

There have been a number of transmission projects completed in recent years. Currently smaller projects are underway that enhance the transmission available to North Dakota generators and their access to the energy markets. The transmission improvements are summarized briefly below.

SPP PROJECTS

Basin Electric Power Cooperative Western ND Projects - The 200-mile 345kV line from the Antelope Valley Station (AVS) to the Neset Substation near Tioga, North Dakota has been fully in service since 2017 and has provided reliable service to the Bakken oil field.

In June 2021 Basin Electric Power Cooperative (BEPC) received approval by the ND PSC for a project involving a 230kV line from the Neset Substation near Tioga to a new substation called North Shore, near Ross, ND. The new 230/115kV substation will also serve as a terminal for Mountrail Williams Electric Cooperative (MVEC), a member of Basin Electric, as MVEC will be constructing a 115kV line from Northshore - New Town. Southwest Power Pool issued the final Notice to Construct (NTC) for these projects which include the 230kV and 115kV transmission lines as well as the Northshore substation to serve the growing demand in the New Town area. BEPC plans to begin construction in July 2021 and complete the project by December 2022.

Mountrail Williams Electric Cooperative has begun construction of the 115kv line from New Town to a midpoint substation called Saterthwaite near the midpoint. That section will be put in service in October 2021. The remainder of the line to Northshore will be coordinated with completion of the 230 kV line by BEPC.

Though it's not new construction, BEPC continues to complete age and replacements projects at various substations.

Transmission studies continue to be completed within the various Southwest Power Pool processes to identify reliability upgrades needed in this region. Basin Electric and its members monitor the load growth in the area and submit plans for approval as needs develop. They work closely with SPP on long term transmission planning.

MISO PROJECTS

Minnkota Power Cooperative (North Dakota) -

Minnkota continues to provide updates to their existing high voltage transmission lines and substations with no new line construction or high voltage substation construction underway at this time. The 20-mile 115 kV transmission line and associated substations located near Edinburg, ND, was completed in early-2021, as noted previously.

Future projects include replacement of a high voltage transformer (230/115 kV) at Drayton, ND in 2022 (\$2.8M). Various high voltage structure replacements and foundation repairs are being done as part of the HV maintenance program (\$2.5M). A new 69/230 kV substation to improve reliability is proposed for the Grand Forks area in 2023 and will include a 230 kV tap line from the existing Prairie-Winger 230 kV line to the new substation site (\$7.3M).

Rebuilds of existing 69 kV transmission lines and distribution substations is ongoing, as well as breaker and protective relaying replacements/upgrades.

Minnkota Power Cooperative (Minnesota) -

Minnkota will be involved in a series of projects to improve reliability of the NW Minnesota bulk electric system. These projects include both 230 kV transmission line and associated substation work and is tentatively scheduled to be started in 2022-2023 timeframe.

Otter Tail Power Company -

Big Stone South to Ellendale (BSSE)

Co-owners Otter Tail Power Company and Montana-Dakota Utilities, Co., energized the 163-mile, 345-kV Big Stone South-Ellendale (BSSE) Transmission Line in early 2019. The BSSE project was one of 17 Multi-Value Projects (MVPs) approved by the Midcontinent Independent System Operator, Inc. (MISO) and state regulatory agencies. To date, the BSSE project, in conjunction with the other MVPs, has enabled over 2200 MW of new generation projects within North Dakota and South Dakota that are either in-service or under construction. There is approximately 800 MW of additional generation currently requesting interconnection to the BSSE project through MISO's interconnection process.

Network Upgrades Related to Generator Interconnection Projects

Otter Tail has recently completed several upgrades to existing transmission lines throughout its service territory to allow for the reliable interconnection of new generation projects. More specifically, Otter Tail has replaced numerous structures along the 230 kV system from Ellendale to Wahpeton during 2020 and finished a reconductor of the Ellendale – Oakes 230 kV line and the Oakes – Forman 230 kV line in early 2021. Otter Tail does not have any additional network upgrades related to new generator interconnections that are pending at this time. The next cycle of interconnection projects in the MISO West region is expected to start interconnection agreement negotiations during the fourth quarter of 2021.

Great River Energy High Voltage Direct Current (HVDC) Refurbishment -

On June 30, 2021 an announcement was made that Rainbow Energy of Bismarck, ND has reached agreement to purchase the Coal Creek Station and the DC line from there to Delano, Minnesota. The deal is subject to some additional regulatory approval but is expected to close by the end of 2021. The business plan is to keep Coal Creek Station operating for at least 10 years. Rainbow intends to pursue adding a carbon capture system to both units of the plant. They also plan to develop the energy park with additional electric loads at the plant site. As capacity on the DC line allows, renewable energy will be developed to utilize the transmission capacity. This plan retains a similar number of jobs at the plant and the mine. In addition, the carbon capture systems and additional electric loads on the plant site have promise of additional construction and operating jobs.

Xcel Energy -

At the end of June 2021 Xcel Energy announced plans to build a gas fired generation plant in North Dakota. In addition, Xcel plans to continue addition of renewable generation in the area and transmission improvements to accommodate those additions.

Montana-Dakota Utilities Transmission Improvements –

MDU is continuing transmission projects in 2021 for North Dakota started in 2020, primarily focused on transmission near the Heskett Power Station and the 230 kV transmission system from Mandan to Ellendale.

Transmission upgrades are being constructed in Mandan near the Heskett Plant. A large 115 kV substation addition at MDU's Mandan Substation and a new 115/69/41.6 kV substation are currently under construction and scheduled to be complete November 2021. Several transmission line rebuilds and line reroutes are required to interconnect the new substation projects and this work will continue into 2022. This will allow retirement of the Heskett Plant and the plant switchyard.

MDU continues the work to upgrade the 230 kV system for the Emmons Logan Wind Farm, reconductoring approximately 100 miles of 230 kV transmission line and replacing approximately 400 transmission line structures on the Mandan to Ellendale 230 kV system. The project is currently under construction and will continue through early 2022.

Great Northern Transmission Line Project –

The Great Northern Transmission Line Project includes approximately 225 miles of new 500 kV transmission line connecting Manitoba to northeastern Minnesota's Iron Range. While not directly impacting North Dakota, the Great Northern Transmission Line is an integral component to realizing the regional reliability, resilience and capturing the synergies between flexible Canadian hydropower resources and intermittent wind resources in the Upper Midwest, as demonstrated in MISO's Manitoba Hydro Wind Synergy Study. The line has been placed in service.

Minnesota Power High Voltage Direct Current System –

Minnesota Power is exploring a modernization of its High Voltage Direct Current (HVDC) system that currently connects North Dakota (at Center) and Minnesota (near Duluth). The project would replace the technology installed in the late '70s to newer HVDC technology at the ends of the lines and additional system capabilities. The project is in the early planning stages.

FUTURE TRANSMISSION CONCEPTS

SOO Green- The SOO Green Renewable Rail project (SGRR) is a 2,100 MW, 349-mile, 525 kV underground high voltage direct current (HVDC) transmission line from Iowa to Illinois, linking utility-scale renewable generation in MISO with customers in PJM. They are pleased with the progress on the permitting process. The company continues to work on certification in the PJM system near Chicago. Design work continues and construction in a little over two years seems achievable.

Once this portion of the project is deemed successful the company does have aspirations to connect the project to North Dakota. CP Rail is a project partner so the railroad right of way to North Dakota is a key to that future extension of the project.

Merchant Transmission- two companies have inquired about merchant transmission to carry power from North Dakota to more distant markets with a transmission fee of some type paying for the transmission service provided. These discussions are in early stages but are a promising idea for expanding the reach of energy from North Dakota.

NORTH DAKOTA UTILITY SCALE GENERATION REPORT (all data is in calendar year)

CURRENT GENERATION RESOURCES

Renewable generation - North Dakota has over 4000 MW of wind generation in service. The average capacity factor for 2018 (measure of actual generation to maximum possible at rated capacity) for the fleet of North Dakota wind generators is approximately 39.1%. If you look at projects that have come on-line since 2013 that increases to 44.6%. That is a reflection of the improvements in technology that are implemented in newer projects.

Solar generation - North Dakota does not currently have any utility scale generation facilities in service, although some are in the MISO and SPP queues.

Thermal coal generation - North Dakota currently has thermal coal generation in service at seven locations. These sites include a total of 11 generating units. The combined capacity of the units is approximately 4,048 MW. The average capacity factor for 2019 was 72%.

Montana-Dakota Utilities retired the 44-MW coal-fired Lewis & Clark Station in Sidney, Montana at year-end 2020. It plans to retire coal-fired Units 1 and 2 at the 100-MW Heskett Station in Mandan, North Dakota in the first quarter of 2022. In the first half of 2023 they will be adding an additional gas fired unit at that site.

Rainbow Energy announced that they expect to close on a transaction to buy the Coal Creek Station and the DC transmission line by the end of 2021. Their plans are to continue to operate the plant in a similar manner. They will be moving forward with the CO2 capture assessment that was started by Great River Energy.

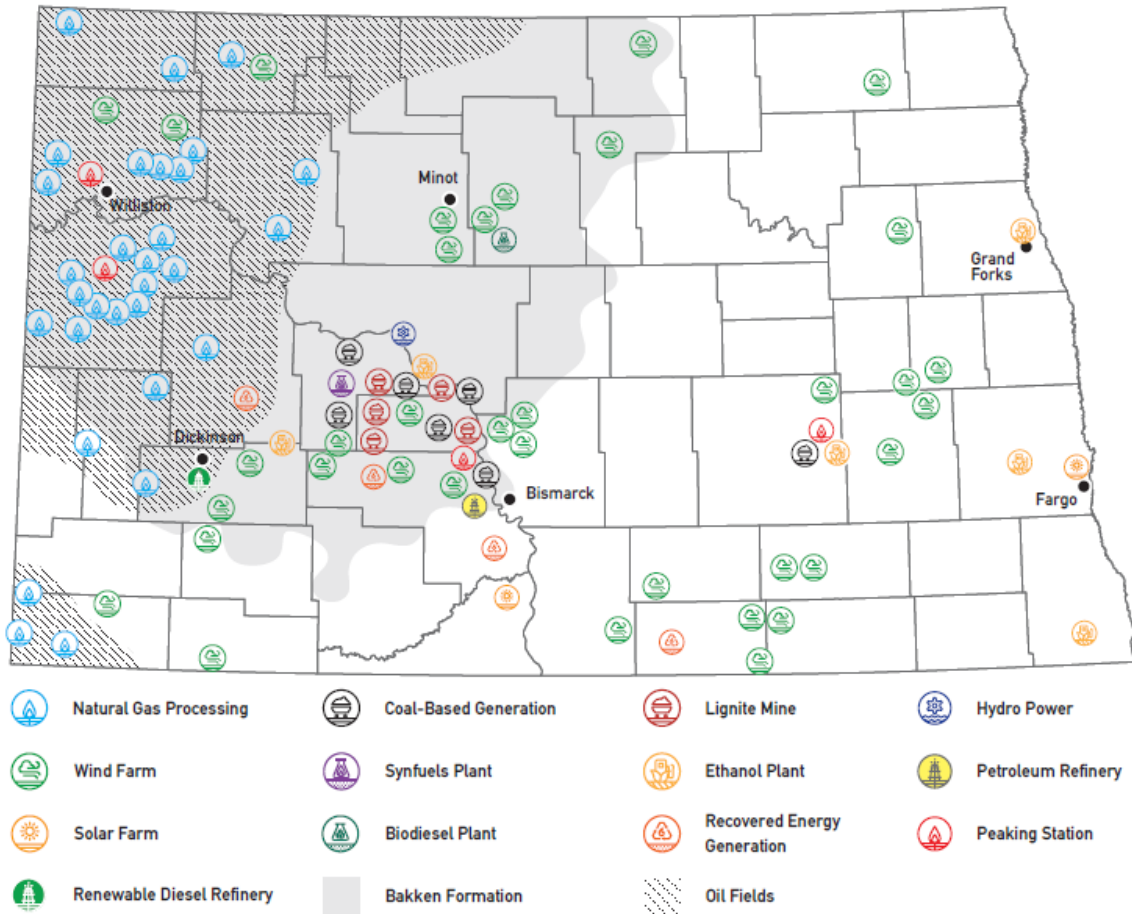
Hydro generation - North Dakota has one hydro generation site containing 5 units with a total capacity of 614 MW. The average capacity factor for 2018 for the hydro unit was 62.2%.

Natural gas generation - North Dakota has three sites for electric generation utilizing natural gas. These three sites contain 21 generating units with total capacity of 596.3 MW. These units are reciprocating engines and gas turbines. There is a variation in summer capacity due to performance of gas generators in hot weather. The two locations in western North Dakota have been running at much higher capacity factors than a typical natural gas peaking plant. This is driven by the low cost of natural gas in the Bakken region and the high and uniform demand. The unit at Mandan on the other hand operates a limited amount to respond to peak demand.

Total Generation - The combined total of all types of utility scale generation is approximately 8,863 MW. The 4,000 MW of wind generation receives a reduced capacity accreditation in the ISO of approximately 600 MW since it is intermittent. This is representative of the amount that is estimated to be available for the peak demand in the summer. Newer installations have been able to demonstrate a little higher capacity for accreditation.

CURRENT GENERATION & ENERGY RESOURCES

energy sites of NORTH DAKOTA



+ Map courtesy of Bismarck State College National Energy Center of Excellence.

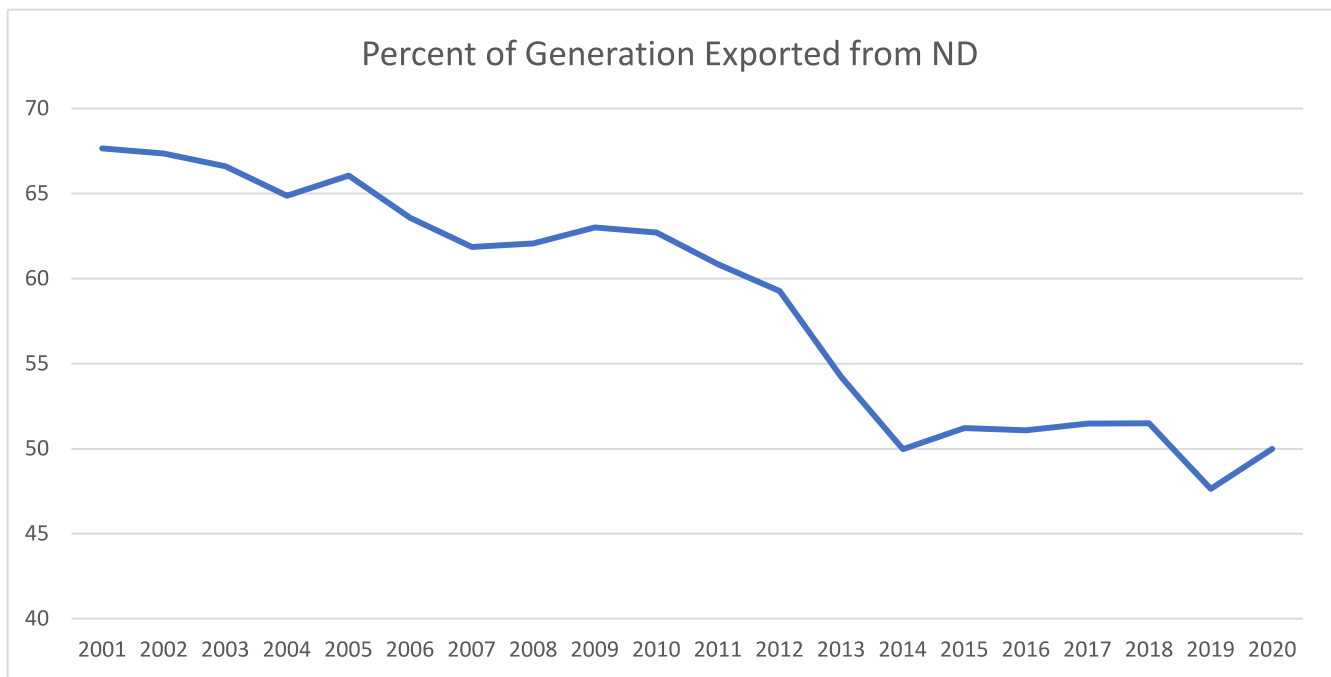
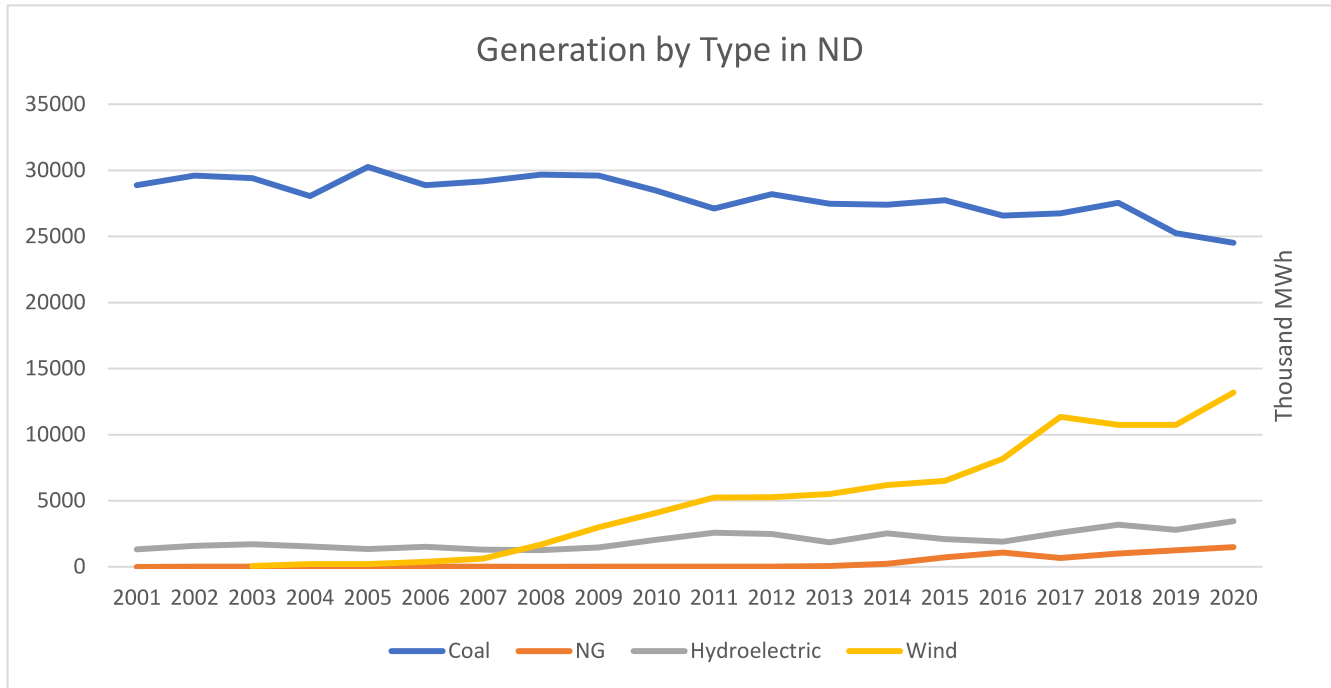
ELECTRIC GENERATION MARKET & UTILIZATION

Electric energy utilization

North Dakota has been a major exporter of electricity since the development of thermal lignite generation in western North Dakota beginning in the 1960s. Transmission was developed along with the generation to export the electric generation primarily to markets to the east. In more recent years North Dakota has become noted as an excellent source of wind generation and additional transmission development has taken place to accommodate getting the additional generation to market.

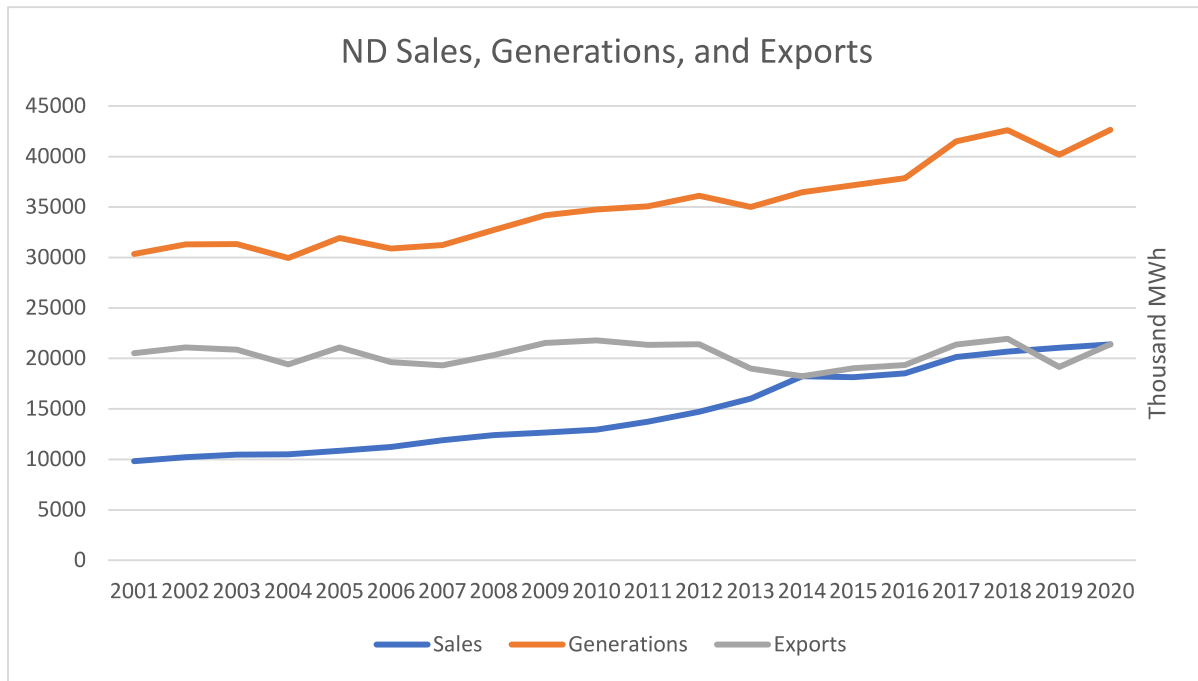
The Energy Information Administration provides data on electric generation for the United States. The information below is derived from their data. In 2020 a total of 42,643 MWhr was generated from all

sources in North Dakota. Of that total 50% was exported outside of the state. Wind generation in 2020 was 31% of total generation for North Dakota. The numbers held quite well and in fact up for industrial use in spite of Covid-19.

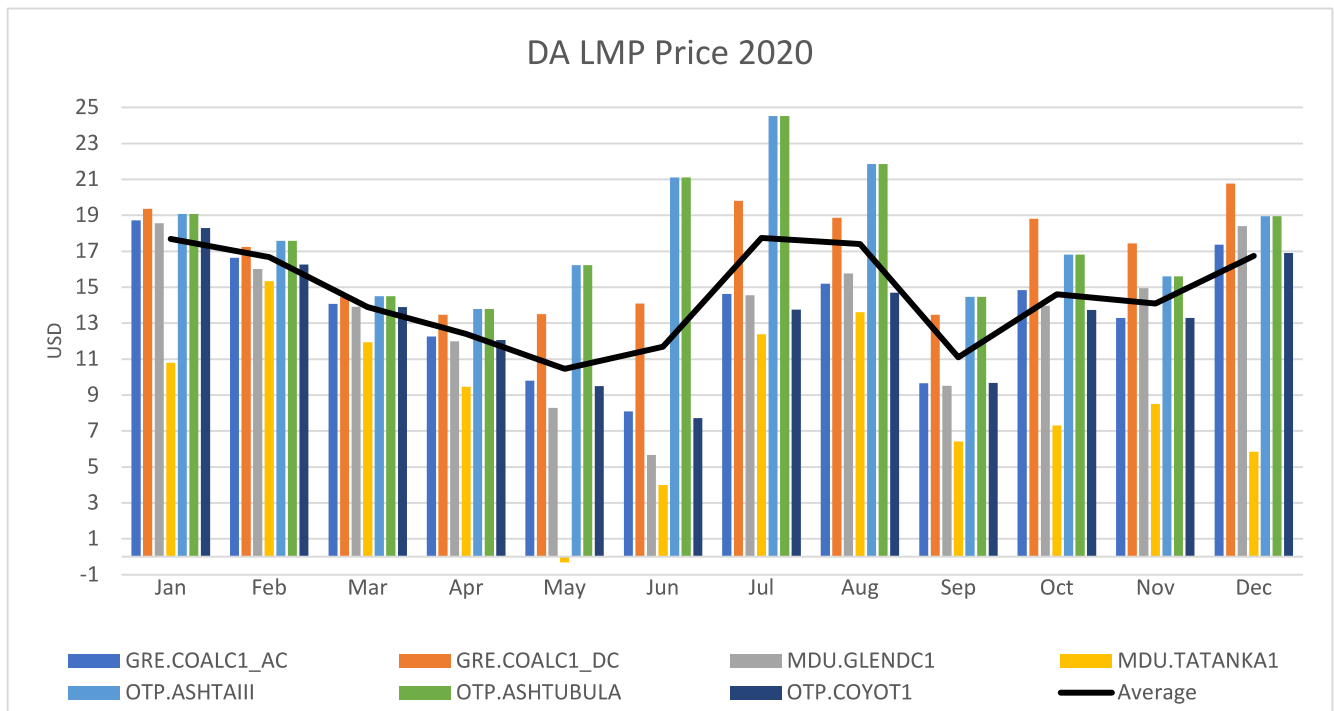


While demand in markets outside of North Dakota and in all but the western part of North Dakota has remained quite flat in recent years, the growth of demand in the Bakken region has been notable.

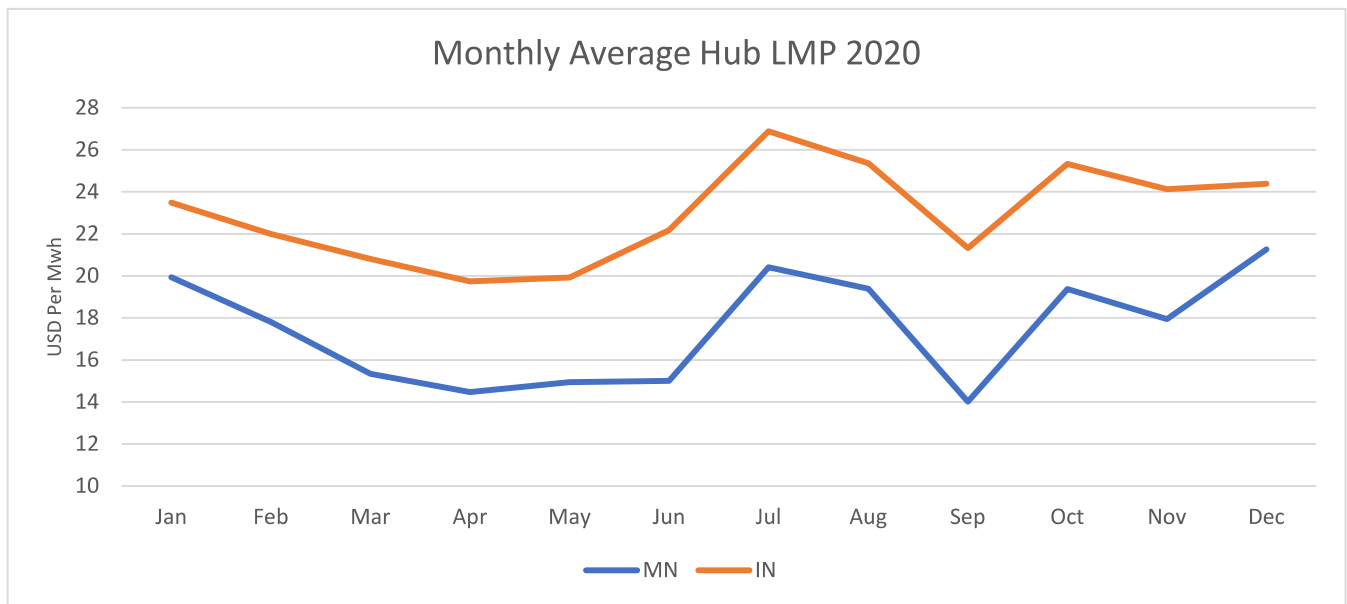
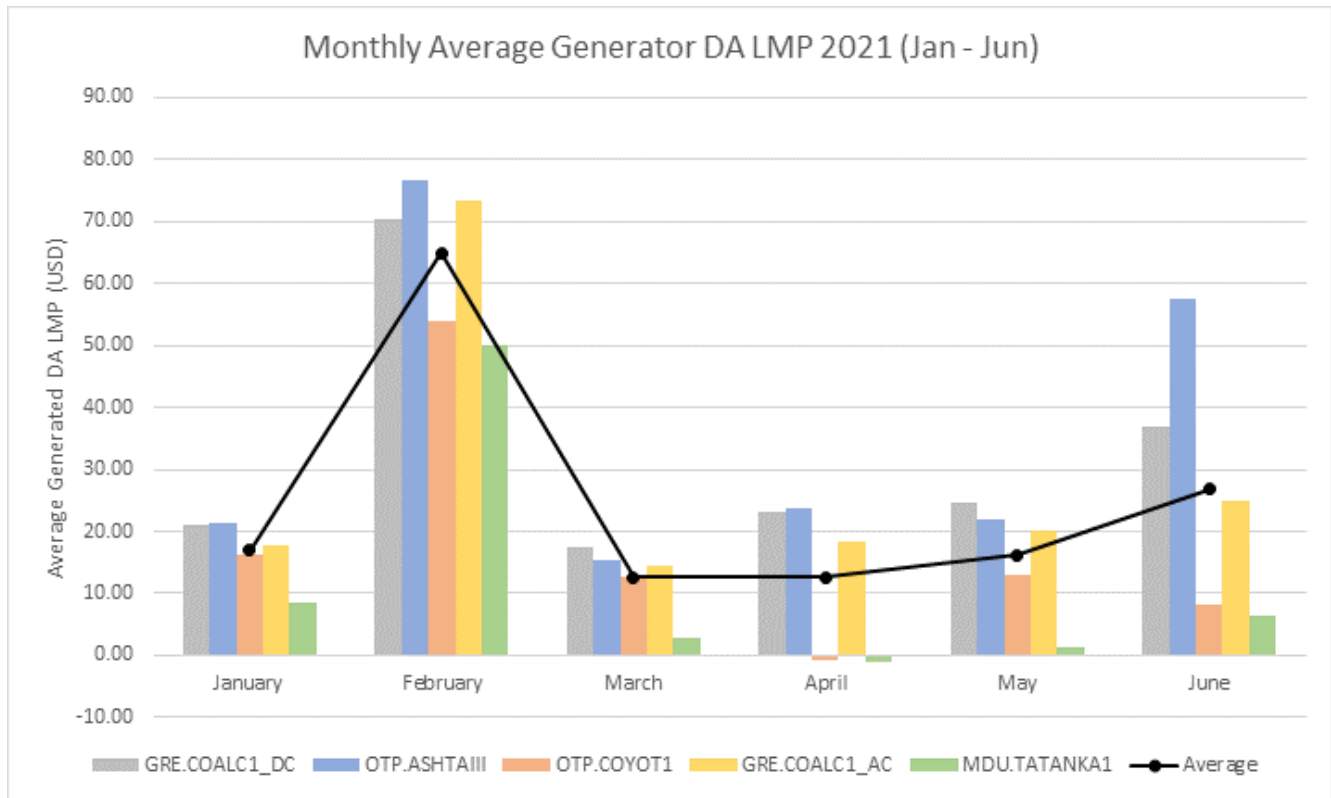
Growth of total generation in the last 16 years has grown from 29,936 MWhr to 42,643 MWhr. Retail sales have grown from 10,516 MWhr to 21,377 MWhr due in large part to growth associated with Bakken oil development. Industrial consumption in ND grew over 1% over 2019 while surrounding states all experienced a decrease.



Wholesale Electric Market - With North Dakota being a net exporter of electricity, the wholesale market price is important to the generators in the state. The graphs below reflect the market price for a variety of locations into which North Dakota electricity is marketed both in the MISO and in the SPP areas.



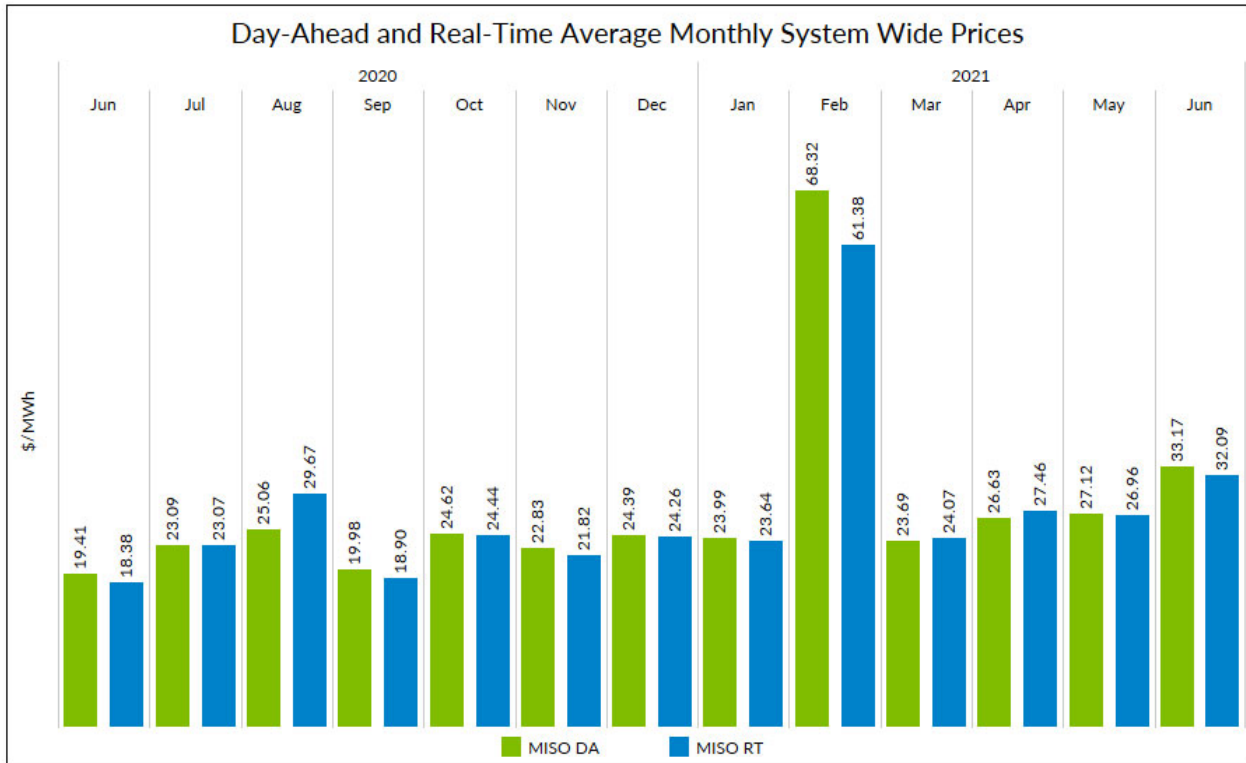
The graph below shows the impact of the February 2021 shortages and the continued strengthening of the market over 2020.



The Indiana hub is a typical point that is indicative of pricing east of MISO. As the graph below shows, pricing in that area is typically more than in Minnesota and potentially an opportunity for North Dakota electricity as avenues open up to ship power further east. However, it should be noted that Indiana (and some other states) have an Indiana first policy when approving renewable energy for the state.

The graphic below shows strengthening of the average MISO market.

MISO System-wide Day-Ahead and Real-Time Locational Marginal Pricing



38

Note: MISO System-Wide price is based on the monthly hourly average of the active hubs
Source: MISO Market and Operations Analytics Department



QUEUES FOR TRANSMISSION ACCESS

A good measure of potential for growth in the industry and future demand for transmission expansion is reviewing the projects in queue at MISO, Minnkota Power Cooperative and SPP. The projects in queue include both wind generation and utility scale solar generation.

MISO QUEUE

MISO total queue ten projects for 2390 MW

Project #	Request Status	Service Date	Transmission Owner	State	Study Cycle	Study Group	Study Phase	Service Type	Summer MW	Winter MW	Fuel
J1040	Active	09/01/2021	Montana-Dakota Utilities Co.	ND	DPP-2018-APR	West	PHASE 3	NRIS	250	250	Wind
J1456	Active	09/01/2023	Otter Tail Power Company	ND	DPP-2019-Cycle	West	PHASE 2	NRIS	300	300	Wind
J1544	Active	09/01/2023	Montana-Dakota Utilities Company	ND	DPP-2020-Cycle	West	PHASE 1	NRIS	200	200	Solar
J1588	Active	09/01/2023	Northern States Power (Xcel Energy)	ND	DPP-2020-Cycle	West	PHASE 1	NRIS	200	200	Solar
J1613	Active	08/01/2023	Northern States Power (Xcel Energy)	ND	DPP-2020-Cycle	West	PHASE 1	NRIS	400	400	Wind
J1622	Active	06/01/2024	Otter Tail Power Company	ND	DPP-2020-Cycle	West	PHASE 1	NRIS	100	100	Solar
J1754	Active	04/01/2023	Great River Energy	ND	DPP-2020-Cycle	West	PHASE 1	NRIS	200	200	Wind
J628	Active	07/01/2022	Great River Energy	ND	DPP-2017-AUG	West	PHASE 3	ERIS	400	400	Wind
J897	Active	10/01/2021	Great River Energy	ND	DPP-2017-AUG	West	PHASE 3	ERIS	190	190	Wind
J975	Active	10/31/2023	Otter Tail Power Company	ND	DPP-2018-APR	West	PHASE 3	ERIS	150	150	Wind

SPP QUEUE

SPP total queue is twenty-six projects for 5045 MW total

GEN Queue Position	Cluster	Proposed In Service Date	MW	GEN Type	Location	State	CA/BA	Point of Interconnection
GEN-2017-010	DISIS-2017-001	10/31/2022	200.1	Wind	Bowman County	ND	WAPA	Rhame 230 kV Sub
GEN-2017-048	DISIS-2017-001	8/30/2024	300	Wind	Williams County	ND	BEPC	Neset 230 kV Substation
GEN-2017-214	DISIS-2017-002	12/1/2020	100	Wind	Ward	ND	WAPA	Logan 230kV Substation
GEN-2017-215	DISIS-2017-002	12/1/2020	100	Wind	Ward	ND	WAPA	Logan 230kV Substation
GEN-2017-216	DISIS-2017-002	12/1/2020	100	Wind	Ward	ND	WAPA	Logan 230kV Substation
GEN-2017-235	DISIS-2017-002	12/1/2020	50	Wind	Ward	ND	WAPA	Logan 230kV Substation
GEN-2017-236	DISIS-2017-002	12/1/2020	50	Wind	Ward	ND	WAPA	Logan 230kV Substation
GEN-2018-008	DISIS-2018-001	9/30/2021	252	Wind	McIntosh	ND		Groton-Leland Olds 345kV Line
GEN-2018-010	DISIS-2018-001	12/1/2021	74.1	Battery	Montrail	ND		Tande 345kV Substation
GEN-2018-039	DISIS-2018-001	12/31/2020	72	Solar	LaMoure	ND		Edgeley 115kV substation
GEN-2018-067	DISIS-2018-002	10/30/2020	255	Wind	Williams	ND		New switching station on Judson-Tande 345kV line
GEN-2019-037	DISIS-2019-001	12/1/2023	150	Solar	Mercer	ND		BEPC 230kV substation
GEN-2020-006	DISIS-2020-001	11/1/2023	250	Solar	Bowman County	ND	BEPC	Bowman 230kV substation
GEN-2020-014	DISIS-2020-001	6/17/2021	60.5	Gas	Alexander	ND	WAPA	Lonesome Creek 115kV
GEN-2020-021	DISIS-2020-001	11/30/2023	235	Wind	Sioux County	ND		LeLeland Olds-Fort Thompson 345kV
GEN-2020-091	DISIS-2020-001	11/2/2025	150	Solar	Alexander	ND	BEPC	Patent Gate Substation 115 kV
GEN-2021-008	DISIS-2021-001	5/9/2026	270	Solar	McKenzie	ND		345kV Bus at BEPC Patent Gate Substation, McKenzie County, ND
GEN-2021-010	DISIS-2021-001	4/1/2027	231	Battery	Williams County	ND		Wheelock 115 kV
GEN-2021-011	DISIS-2021-001	4/1/2027	74.9	Battery	Williams	ND		Wheelock 115 kV
GEN-2021-016	DISIS-2021-001	4/1/2025	250	Wind	McIntosh	ND		Tap Leland Olds – Groton 345 kV
GEN-2021-017	DISIS-2021-001	4/1/2025	74.9	Storage	McIntosh	ND		Tap Leland Olds – Groton 345 kV
GEN-2021-024	DISIS-2021-001	7/31/2023	203.04	Wind	LaMoure	ND		WAPA 230kV Jamestown Substation
GEN-2021-072	DISIS-2021-001	6/1/2024	600	Solar	Mercer	ND		345kV Transmission Line from Antelope Valley to Leland Olds Substation
GEN-2021-094	DISIS-2021-001	8/1/2024	446.5	Combustion Turbine	Mercer	ND		AVS 345kV Substation
GEN-2021-095	DISIS-2021-001	8/1/2025	446.5	Combustion Turbine	Mercer	ND		AVS 345kV substation
GEN-2021-100	DISIS-2021-001	9/15/2026	50	Battery	Mercer	ND		Line side tap using single breaker on Beulah to Center 42kV Feeder

MINNKOTA QUEUE

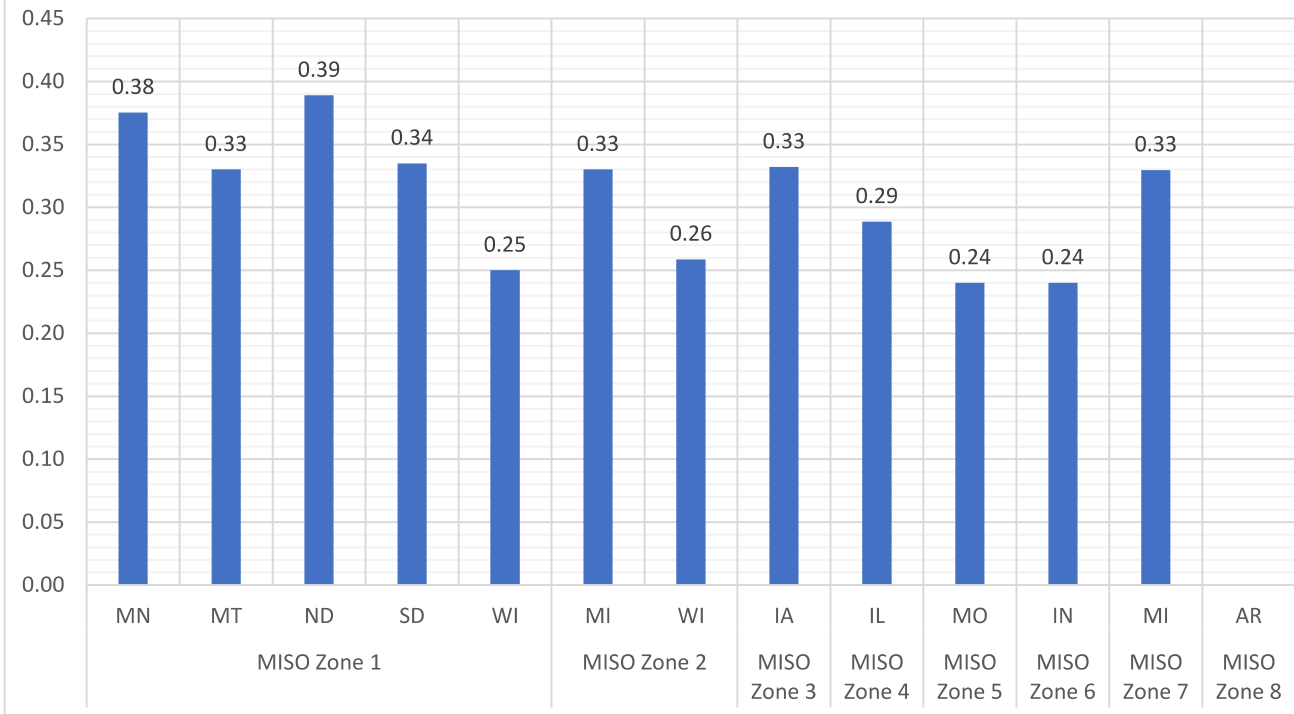
The Minnkota Power Queue includes 6 projects. Two are solar for 350 MW and 4 are wind.

Minnkota Queue Position	Summer Max Output MW	Generation Type	POI Location County/State	Point of Interconnection
MPC03600	200.0	Solar	Richland, ND	Frontier-Wahpeton 230 kV Line
MPC03700	150.0	Solar	Richland, ND	Frontier-Wahpeton 230 kV Line
MPC03800	250.0	Wind	Eddy, ND Wells, ND	Center-Prairie 345 kV Line
MPC03900	151.2	Wind	Eddy, ND Wells, ND	Center-Prairie 345 kV Line
MPC04000	300.0	Wind	Oliver, ND Morton, ND	Square Butte 230 kV Substation
MPC04100	300.0	Wind	Grand Forks, ND	Prairie 230 kV

Minnkota total queue has six project for 1351 MW. All were in the queue when the 2020 report was prepared. All of these projects are in the system impact study phase.

Capacity factors for Wind Generation in the region- The following graph shows the average capacity factors for wind in the region by state. With North Dakota having the highest capacity factor the investment dollars for wind generation will get a better return on investment if the transmission capacity is available to get the generation to market. Since the market demand is primarily to the east that is where the transmission capacity need is the greatest. Wisconsin, Michigan, Illinois and Indiana are states where renewable energy is in demand and where planners would like to be able to transfer generation from North Dakota. Developers weigh the higher return available and the higher prices at the eastern market nodes against the cost of transmission to reach those markets. At this time however the high transmission costs are preventing development in ND with market focus on that region. Resolving that transmission barrier is a focus of the NDTA.

MISO CAPACITY FACTORS BY ZONE AND STATE --BNEF



RENEWABLE ENERGY CERTIFICATES

Each unit of electricity generated from a renewable source such as wind or solar carries with it a Renewable Energy Certificate (REC). The REC program is authorized by the USEPA to encourage renewable generation. The REC is a separate commodity from the electricity. The RECs can be utilized as evidence that the party that “retires” the REC as they utilize electricity supports renewable generation. The REC does not carry a time of day, season or transmission obligation. As such, RECs are used to meet pledges to utilize renewable energy beyond the ability of the grid to deliver on a real time basis.

Many companies are using the RECs as evidence of their commitment to renewable energy. The challenges of grid attributes needed as we move toward a higher level of renewable energy on the grid is not addressed by the use of RECs so it is important to recognize that a commitment beyond the use of RECs will be required in the near future.

GOVERNMENT ACTION

Another function of the Authority staff is to act as a resource for elected officials and policymakers and provide the necessary information to help make informed decisions. Whether the issue involves working on state energy policy regarding transmission development, or commenting on federal transmission legislation and regulations, the Authority serves as a resource for decision-makers. In

the last year the Authority was involved on several fronts working with the following entities: The EmPower ND Commission, Governor's Office, the North Dakota Legislature, Attorney General's Office, Department of Commerce, the ND Public Service Commission, the Bank of North Dakota and the ND Congressional Delegation.

- **EmPower ND Commission** - The Authority was an active participant in the EmPower ND Commission work. Authority activities included briefing the Commission on transmission issues in North Dakota and participating in development of Commission goals.
- **ND Legislature**- the 2021 legislative session was deeply involved in energy issues for which they sought NDTA input
- **Interagency Coordination** - As important as everything else discussed in this report, is the coordination of efforts among the various government entities with oversight, or interest in transmission development. In particular, regular meetings are held with the representatives from the Public Service Commission to discuss transmission issues and receive updates from RTOs.
- **WIND**-NDTA works with the group of developers through their trade association to collect information about renewable projects and to share activities of the NDTA.

The Public Service Commission, the Governor's staff and the NDTA participated in the Midwest Governors association work on setting goals for grid modernization. The goal of a carbon neutral North Dakota has an impact on the conversation. The MGA states are expressing interest in learning more about how the goal can be achieved. A seminar is planned for August 2021 to present the vision.

CONCLUSION

The electric transmission system in North Dakota is operating well and serving the load reliably with the current generation. However, transmission congestion is increasing and in parallel with that the wholesale prices are more volatile. The increased retail demand in North Dakota has contributed to the current good operation of the grid. The events of 2020 resulted in demand destruction both in the Bakken area and the surrounding markets. Increased oil prices have driven new activity in the Bakken area. The industry has become more efficient in many ways so the impact on electric demand may see some impact in addition to the delay inserted by both the low prices and the Covid-19 impact.

The reduced size of the queues at MISO, MPC and SPP is evidence of the transmission issues that exist outside of ND as well. Since 2019-2020 fiscal year when most projects that received their allocated transmission interconnect cost were cancelled due to the high costs, the queues reflect hesitancy to submit additional projects until it is clearer how to interconnect with reasonable cost.

Meanwhile, some counties such as Mercer and McLean passed ordinances limiting renewable generation. Wildlife considerations have tempered ability to permit wind generation in some areas of the state. Both McLean and Mercer counties are reassessing their ordinances. With a path forward for Coal Creek Station, it is likely that additional wind projects will be requested in McLean County.

The Direct Current Transmission line from Coal Creek Station to Minnesota will be a good demonstration case as all or portions of that line capacity become available on a subscription basis. If renewable generation interests contract for the available capacity on the line it will demonstrate the concept of merchant transmission. That will be a good signal for financing future merchant transmission capacity.

**NORTH DAKOTA TRANSMISSION AUTHORITY
STATE CAPITAL, 14TH FLOOR
600 E. BOULEVARD AVE. DEPT. 405
BISMARCK, ND 58505-0840
PHONE: 701.355.2189**

DISCLAIMER

This report utilizes data from various sources. Those sources are appreciated for their willingness and availability. If users of this report utilize that information, please go to the source to assure the most accurate and up to date information.

Thanks for the Energy Information Administration (eia), Southwest Power Pool (SPP), Midcontinent Independent System Operator (MISO), area utilities and WIND and their members especially.

MISO DISCLAIMER

MISO makes no representations or warranties of any kind, express or implied, with respect to the accuracy or adequacy of the information contained herein. MISO shall have no liability to recipients of this information or third parties for the consequences arising from errors or discrepancies in this information, for recipients' or third parties' reliance upon such information, or for any claim, loss or damage of any kind or nature whatsoever arising out of or in connection with (I) the deficiency or inadequacy of this information for any purpose, whether or not known or disclosed to miso, (II) any error or discrepancy in this information, (III) the use of this information, or (IV) any loss of business or other consequential loss or damage whether or not resulting from any of the foregoing.