



2302 Great N. Drive
Fargo, ND 58102
(701) 241-8632
dave.sederquist@xcelenergy.com

July 1, 2020

—Via Electronic Filing & Federal Express—

Steven M. Kahl, Executive Secretary
North Dakota Public Service Commission
600 East Boulevard, Dept. 408
Bismarck, ND 58505

RE: NORTHERN STATES POWER COMPANY
BIENNIAL TEN-YEAR PLAN

Dear Mr. Kahl:

In accordance with Section 49-22-04 of the North Dakota Century Code, Northern States Power Company, doing business as Xcel Energy, hereby submits 10 copies of its Annual Ten-Year Plan for Major Generation and Transmission Facilities in the state of North Dakota. The information contained in the report complies with the rules and regulations of the North Dakota Public Service Commission, as well as the provisions of the Settlement Agreement in Case No. PU-10-657.

In compliance with section 69-06-02-02 of the Commission's Administrative rules, notice of the filing has been given to each state agency and officer entitled to notice as designated in section 69-06-01-05. Section 69-06-02-02 also requires the Company to serve the plan on county auditors in certain circumstances, but because the Company does not propose any new generation sites or transmission corridors in this plan, it is not filing the report with any county auditors. A service list is attached.

Please feel free to contact me at dave.sederquist@xcelenergy.com or (701) 241-8632 if you have any questions regarding this report.

Sincerely,

A handwritten signature in blue ink that reads 'David H. Sederquist'.

DAVID H. SEDERQUIST
SR. REGULATORY CONSULTANT
XCEL ENERGY

Enclosures

c: Service List (WITHOUT ENCLOSURES)

CERTIFICATE OF SERVICE

I, Paget Pengelly, hereby certify that I have this day served notice of the foregoing document on the attached list of persons by delivery by hand or by causing to be placed in the U.S. mail at Minneapolis, Minnesota.

TEN-YEAR PLAN FOR MAJOR GENERATION AND TRANSMISSION FACILITIES IN THE STATE OF NORTH DAKOTA

Dated this 1st day of July 2020

/s/

Paget Pengelly
Regulatory Administrator

Northern States Power Company d/b/a Xcel Energy
2020 North Dakota Ten-Year Plan
Service List – Notice of Filing

Steven. M. Kahl
Executive Secretary
North Dakota Public Service Commission
600 East Boulevard Ave., Dept. 408
Bismarck, ND 58505

Aeronautics Commission
PO Box 5020
Bismarck, ND 58502

Attorney General
State Capitol Building, 1st Floor
600 East Boulevard Ave., Dept. 125
Bismarck, ND 58505

Department of Agriculture
State Capitol Building, 6th Floor
600 East Boulevard Ave., Dept. 602
Bismarck, ND 58505-0020

Department of Health
State Capitol Building
2nd Floor Judicial Wing
600 East Boulevard Ave.
Bismarck, ND 58505-0200

Department of Human Services
State Capitol, Judicial Wing
600 East Boulevard Ave., Dept 325
Bismarck, ND 58505-0250

ND Department of Labor & Human Rights
State Capitol, 13th Floor
600 East Boulevard Ave., Dept 406
Bismarck, ND 58505-0340

Department of Commerce
Division of Economic Development & Finance
Century Center
1600 East Century Ave., Suite 2
PO Box 2057
Bismarck, ND 58502-2057

Energy Development Impact Office
1707 N. 9th St
PO Box 5523
Bismarck, ND 58506-5523

Game & Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095

North Dakota Industrial Commission
Geological Survey
1016 East Calgary Ave.
Bismarck, ND 58503

Governor's Office
State Capitol Building, 1st Floor
600 East Boulevard Ave., Dept 101
Bismarck, ND 58505-0001

Department of Transportation
608 East Boulevard Ave.
Bismarck, ND 58505-0700

State Historical Society of North Dakota
Heritage Center, Capitol Grounds
612 East Boulevard Ave.
Bismarck, ND 58505-0830

Indian Affairs Commission
State Capitol, 1st Floor Judicial Wing – Rm 117
600 East Boulevard Ave.
Bismarck, ND 58505-0300

Job Service of North Dakota
1000 East Divide Ave
PO Box 5507
Bismarck, ND 58506-5507

Department of Trust Lands
1707 N. 9th St.
PO Box 5523
Bismarck, ND 58506-5523

Parks and Recreation Department
1600 East Century Ave., Suite 3
Bismarck, ND 58503-0649

Soil Conservation Committee
2718 Gateway Ave., Ste. 104
Bismarck, ND 58503-0585

State Water Commission
900 East Boulevard Ave., Dept. 770
State Office Building
Bismarck, ND 58505-0850

United States Department of Defense
Minot Air Force Base
201 Summit Drive
Minot, ND 58701

United States Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501

United States Army Corps of Engineers
3319 University Dr,
Bismarck, ND 58504

Federal Aviation Administration
Bismarck Airports District Office, BIS-ADO-600
2301 University Drive, Building 23B
Bismarck, ND 58504

North Dakota Transmission Authority
c/o North Dakota Industrial Commission
600 E. Boulevard Ave., Dept 405
State Capitol, 14th Floor
Bismarck, ND 58505-0840

North Dakota Pipeline Authority
c/o North Dakota Industrial Commission
600 E. Boulevard Ave., Dept 405
State Capitol, 14th Floor
Bismarck, ND 58505-0840

**NORTH DAKOTA
TEN YEAR PLAN**

Northern States Power Company

July 2020

TABLE OF CONTENTS

INTRODUCTION	3
SECTION A: Existing Electric Generation Facilities	4
SECTION B: Electric Generation Facilities Under Construction.....	5
SECTION C: Proposed Generation Construction Within the Next Five Years	5
SECTION D: Proposed Generation During the Next Ten Years.....	6
SECTION E: Existing Transmission Facilities (Electric).....	7
SECTION F: Existing Transmission Facilities (Natural Gas).....	9
SECTION G: Proposed Electric Transmission Construction in the Next Five Years.....	9
SECTION H: Proposed Gas Transmission Construction In the Next Five Years	9
SECTION I: Proposed Electric and Gas Transmission During the Next Ten Years.....	9
SECTION J: Regional Coordination	10
SECTION K: Environmental Information	12
SECTION L: Projected Demand for Service.....	13
SECTION M: Other Information.....	18

INTRODUCTION

In accordance with the rules and regulations of the North Dakota Public Service Commission (Commission) governing the siting of energy conversion and transmission facilities pursuant to Chapter 49-22 of the North Dakota Century Code, Northern States Power Company - Minnesota (NSPM or the Company), hereby files this Ten-Year Plan.

The NSP-Minnesota operating company (NSPM) has service territory in North Dakota, South Dakota, and Minnesota. NSPM's affiliate, NSP-Wisconsin (NSPW) has service territory in Wisconsin and Michigan. NSPM and NSPW plan, build, and operate a single integrated electric production and transmission system to meet the electrical needs of their customers (the NSP System) under an agreement accepted by the Federal Energy Regulatory Commission known as the Interchange Agreement. We presently serve approximately 95,000 retail electric customers in North Dakota around Fargo, Grand Forks, and Minot, and 59,000 natural gas customers in the Fargo and Grand Forks areas. The Company owns just over 455 miles of transmission lines and 21 substations (69kV and above) in North Dakota.

Section M of this Ten-Year Plan contains expanded information in compliance with the Settlement Agreement in Case No. PU-07-776 and Order points in Case Nos. PU-08-907 and PU-08-908 including:

- A summary of the major power purchase agreements we plan to pursue over the next 5 years,
- A summary of anticipated future applications for an Advance Determination of Prudence (ADP), and
- A report regarding reductions in energy production at our base load generation units due to the existence of wind generation, and the impacts and costs of cycling coal plant production to accommodate off-peak wind generation.

Ten copies of this Ten-Year Plan are being filed with the Commission. Notices of the filing of this report have been given to those agencies and officers designated in Article 69-06-01-05 of the Administrative Code. A copy of the plan is being filed pursuant to Article 69-06-02-02 of the North Dakota Administrative Code with the County Auditor of each county in which any part of a site or corridor is proposed to be located.

SECTION A: Existing Electric Generation Facilities

The following North Dakota electric generating facilities are either owned and operated by NSPM, or the power generated is purchased by NSPM. A full list of all generating plants owned by the NSPM and NSPW companies (i.e., the NSP System) can be found in Section M of this report.

Border Winds Wind Facility

The Company owns and operates the 150 MW Border Winds wind facility near Rolla, North Dakota. The facility is comprised of 75 Vestas V100 2.0 MW turbines with variable pitch blades. The Border Winds footprint spans nearly 25,000 acres in the northeastern part of Rolette County. The plant went into service in December 2015.

Courtenay Wind Facility

The company owns and operates the 200 MW Courtenay wind facility north of Jamestown, North Dakota. The facility is comprised of 100 Vestas V100 2.0 MW turbines with variable pitch blades. The Courtenay facility spans nearly 25,000 acres in northeastern Stutsman County. The plant went into service in December 2016.

Foxtail Wind Facility

The Company owns and operates the 150 MW Foxtail Winds facility located 20 miles west of Ellendale, North Dakota. The facility is comprised of 7 Vestas V110 and 68 Vestas V120 2.0 MW turbines with variable pitch blades. The Foxtail facility spans nearly 20,000 acres in western Dickey County. The plant went into service in December 2019. It is the Company's first wind facility in the state to employ an aircraft detection lighting system (ADLS), in compliance with North Dakota law.

Purchases of Power Produced in North Dakota.

Xcel Energy currently has a twenty-year power purchase agreement (PPA) ending January 18, 2026 with Acciona Wind Energy USA for energy supplied from its 11.88 MW Velva Wind farm located in McHenry County, North Dakota. Xcel Energy also has a twenty-year PPA ending December 31, 2039 with ALLETE Clean Energy for energy supplied from its 105.6 MW Glen Ullin Energy Center wind facility located in Mercer and Morton Counties, North Dakota.

See Section M for a listing of *all* generating plants currently owned and operated by NSPM or NSPW that serve the NSP System.

No unit retirements of NSPM generation facilities in North Dakota are planned within the next ten years.

SECTION B: Electric Generation Facilities Under Construction

NSPM does not have any generation facilities under construction in North Dakota.

SECTION C: Proposed Generation Construction Within the Next Five Years

The Company filed its 2020-2034 Upper Midwest Resource Plan (IRP) with the North Dakota Public Service Commission on July 1, 2019 (Case No. PU-19-220). The Company filed a substantive supplement to the IRP on June 30, 2020.

The five-year “Action Plan” within the 2020-2034 IRP runs from 2020 through 2024 and does not include any new generation investments in North Dakota. In fact, the Action Plan does not contemplate any *incremental* capacity additions on the NSP System through 2024; rather, actions in the first five years remain focused on addressing previously approved or pending resource additions and retirements, wind repowering, procurement to meet specific customer needs, and growth of Demand Side Management programs. Following are brief descriptions of the near-term investments or purchase agreements by resource type included in the five year Action Plan:

- **Wind.** The Company continues to make progress on its 1,850 MW portfolio of wind generation resulting from recent requests for proposals and acquisitions. See Table C-1 below for the Company-owned projects scheduled to be in-service in the next five years. The Company also plans to issue a solicitation in 2020 for repowering existing wind resources as part of its COVID-19 economic stimulus proposal. This could result in an 800-1,000 MW repowering portfolio.
- **Solar.** In its COVID-19 economic stimulus proposal the Company included the addition of up to 460 MW of solar additions to interconnect at the Sherco plant site substation, potentially within the next five years.
- **Hydro.** The Company plans to add an incremental 125 MW of energy and capacity in 2021 through a purchase agreement with Manitoba Hydro previously approved by the Commission in 2011
- **Nuclear.** Within the next five years, the Company plans to initiate a Certificate of Need proceeding in Minnesota and a Supplemental License Renewal process with the Nuclear Regulatory Commission to obtain the

needed approvals for a 10 year life extension of the Monticello nuclear plant.

- **Natural Gas/Oil Peaking.** The Company plans to extend the lives of Blue Lake Units 1-4 through 2023, and continue development planning for the Sherco combined cycle unit during the next five years.
- **Coal.** The Company continues to prepare for retirement of Sherco Unit 2 in 2023.
- **Demand Response.** The IRP Action Plan includes the acquisition of 400 MW of incremental Demand Response resources in Minnesota by 2023, as well as significantly increased levels of Energy Efficiency.

The Company notes that the addition of a natural gas combustion turbine (CT) in North Dakota by the end of 2025, as included to in a previous rate settlement (Case No. PU-12-813), is beyond the timeline of the proposed five-year Action Plan. The analysis and discussion of a potential North Dakota CT will be addressed in the Action Plan of Xcel Energy’s *next* Integrated Resource Plan.

New Company-owned resource additions included in our current five-year Action Plan are shown in Table C-1 below (approved power purchase agreements going into effect during the next five years are listed in Section M):

Table C-1. Approved NSPM Generation Additions (2020-2024)

Resource	Type	MW	Location	In-Service
Crowned Ridge II	Wind	200	Watertown, SD	Nov-20
Freeborn	Wind	200	Glenville, MN	Dec-20
Blazing Star II	Wind	200	Hendricks, MN	Dec-20
Freeborn	Wind	200	Glenville, MN	Dec-20
Dakota Range I & II	Wind	300	Watertown, SD	2021

Note: Three wind project recently achieved commercial operation, and thus are not included in Table C-1: Blazing Star 1 (200 MW) was completed in April of 2020 and Foxtail (150 MW) and Lake Benton (100 MW) were completed in 2019. The remaining projects in the 1,850MW portfolio were PPAs and are listed in Section M.

SECTION D: Proposed Generation During the Next Ten Years

The previously mentioned natural gas CT in North Dakota notwithstanding, the Company has no specific plans to build any additional electric generation facilities in the State of North Dakota over the next 10 years.

The system resource actions proposed for beyond the next five years in the recently filed Supplement Preferred Plan include:

- Adding 3,500 MW of cumulative utility-scale solar between 2025 and 2031.¹
- Adding 2,250 MW of incremental wind between 2032 and 2034 and repowering existing wind resources when economical.
- Retiring Sherco Unit 1 in 2026, King in 2028, and Sherco Unit 3 by 2030.
- Adding a natural gas CC at the Sherco site in 2026, prior to ceasing coal operations at Sherco Unit 1.
- Identifying opportunities to locate more generation in North Dakota.
- Pursuing a MN Certificate of Need and license extension with the NRC for the Monticello nuclear plant.
- Adding approximately 2,600 MW of cumulative firm peaking resources between 2030 and 2034; these additions could be hydrogen-fueled generation, storage or DR, in addition to CTs, depending on cost, reliability, and state policy goals.
- Growing our DR portfolio by approximately 550 MW, to a total portfolio size of approximately 1,500 MW.
- Achieving average annual energy savings of over 780 GWh, through our EE programs.

SECTION E: Existing Transmission Facilities (Electric)

Our existing electric transmission line facilities in North Dakota are listed in Table E-1 below.

Table E-1. NSP Transmission Lines in North Dakota

Line Description	Line #	kV	Mileage
Bison-Alexandria SS (MRES)	955	345	34
Total 345 kV			34
Letellier-Drayton	912	230	28.7
Prairie-Grand Forks (WAPA)	916	230	6.8
Maple River-Wahpeton (MPC)	910	230	3.6
Maple River-Sheyenne	911	230	6.6
Sheyenne-Fargo(WAPA)	915	230	4.3

¹ The plan to add these resources is contingent on the existence of sufficient transmission infrastructure and reasonable interconnection costs.

Sheyenne-Lake Park (MPC)	911	230	1.4
Audubon (OTP)-Hubbard (MP)	909	230	38.3
Glenboro (MHEB)-Peace Garden	920	230	2.0
Peace Garden-Rugby (OTP)	920	230	54.4
McHenry (GRE)-Magic City	924	230	20.48
Total 230 kV			166.58
Maple River-Red River #1	839	115	5.6
Maple River-Red River #2	839	115	5.6
Maple River-Cass County	839	115	2.7
Cass Co. Tap-Moderow (MPC)	839	115	1.9
Moderow (MPC)-Sheyenne	839	115	1.5
Cass County-Sheyenne	866	115	3.5
Mallard-Souris	860	115	5.3
Souris-Magic City	850	115	7.0
Magic City-Velva	850	115	15
Velva-McHenry	850	115	5.2
McHenry-Neal	850	115	0.2
Prairie-Nordic1	5510	115	2.0
Prairie-Nordic2	5511	115	2.0
Total 115 kV			57.48
Gateway-Grand Forks Steam	746	69	0.9
Gateway-Prairie	746	69	5.5
Grand Forks (WAPA)-Central	786	69	4.6
Central-Sugar Hills	786	69	0.8
Sugar Hills-Park	786	69	0.8
Prairie-Emerado	772	69	13.3
Prairie-Thompson	733	69	8.5
Thompson-Reynolds	773	69	7.0
Reynolds-South	773	69	10.0
South-Hillsboro Tap	773	69	8.6
Hillsboro Tap-Hillsboro	773	69	1.9
Hillsboro-Trail County	773	69	1.0
Trail County-Elm River	773	69	9.3
South-Mayville (MPC)	768	69	12
Mayville (MPC)-Mayville	768	69	1.2
Mayville-Hatton	768	69	14.8
Elk Valley-Larimore	776	69	1.7
Total 69 kV			101.9

No transmission line facilities in North Dakota are scheduled for retirement within the next ten years. Xcel Energy is planning on retiring six of the twelve capacitor banks located at the Prairie substation in Grand Forks. Recent studies have shown these capacitor banks are no longer needed to maintain adequate voltages in the area.

SECTION F: Existing Transmission Facilities (Natural Gas)

NSPM operates an 11.9 mile intrastate natural gas pipeline facility in the state of North Dakota, from an interconnection with Williston Basin Interstate Pipeline Company near Mapleton, North Dakota, to our natural gas distribution system in Fargo, North Dakota. The Commission granted a Certificate of Public Convenience and Necessity and Corridor Certificate for this facility in Case No. PU-400-89-426.

We have no plans to retire this intrastate natural gas pipeline within the next 10 years.

SECTION G: Proposed Electric Transmission Construction in the Next Five Years

NSPM does not currently have plans to construct new electric transmission facilities in North Dakota within the next five years.

SECTION H: Proposed Gas Transmission Construction in the Next Five Years

NSPM does not currently have plans to construct new natural gas pipeline transmission facilities in North Dakota within the next five years.

SECTION I: Proposed Electric and Gas Transmission During the Next Ten Years

NSPM does not currently have plans to construct either new electric transmission or natural gas pipeline transmission facilities in North Dakota within the next 10 years.

SECTION J: Regional Coordination

MISO Planning

All major transmission planning performed by the Company is now coordinated through MISO on a regional basis. MISO issues its annual MISO Transmission Expansion Plan (MTEP) after coordinated planning and stakeholder review.

The Company participated in a large regional Multi Value Project (MVP) study with Midcontinent Independent System Operator (MISO) to determine what large regional transmission build-outs would be necessary to increase the overall reliability and efficiency of the transmission system. The costs of these projects are being shared among beneficiaries across the entire MISO North/Central footprint. These projects qualify for MVP cost treatment based on their contributions to increased reliability, economic benefits, or compliance with one or more of the states' renewable requirements.

Sub-Regional Planning

As a result of complying with the Federal Energy Regulatory Commission Order No. 890 rules, MISO has also implemented Sub-Regional Planning Meetings as part of their annual MTEP development process. We participate in the Western Region meetings. These Sub-Regional Planning meetings provide forums for stakeholder input and coordination of plans and we actively participate in each one. This joint planning is intended to maximize use of existing facilities and minimize the amount of new facilities. More information regarding this joint planning is available at the following link:

<https://www.misoenergy.org/planning/planning/>

Xcel Energy also participates in transmission planning with a regional group of utilities called the Minnesota Transmission Owners (MTO). The MTO consists of all of the investor-owned, cooperative, and municipal utilities that own transmission facilities 100 kV and above in Minnesota. Several MTO members (e.g., Xcel Energy, Great River Energy, Otter Tail Power, etc.) also own significant transmission facilities in North Dakota. In addition to the biennial planning work of the MTO, the MTO utilities also coordinate their transmission planning activities with MISO's MTEP process.

Targeted Planning Studies

The Company participates in all MISO targeted planning studies, which are studies that happen outside the normal MTEP process. MISO has performed three targeted studies in the last two years.

The first targeted study was the Renewable Integration Impact Assessment. The primary purpose of the Renewable Integration Impact Assessment (RIIA) is to methodically find system integration inflection points driven by increasing levels of renewable generation. Industry studies have shown that the complexity for renewable integration escalates non-linearly with increasing penetrations of renewables. Over certain ranges of renewable penetration, complexity is constant when spare capacity and flexibility exist, but at specific penetration levels when they are depleted, complexity rises dramatically. These are system inflection points, where the underlying infrastructure and/or system operations need to be modified to reliably achieve the next tranche of renewable deployment. This study aims to find those inflection points, and examine potential solutions to mitigate them. This study is available at the following link:

https://www.misoenergy.org/planning/policy-studies/Renewable-integration-impact-assessment/#nt=%2Fria&type%3ABackground%20and%20Results&t=10&p=0&s=FileName&sd=d_esc

The second study was the Southwest Power Pool Coordinated System Plan. This study was performed to examine if any potential transmission projects between the two markets had mutual benefits. The study examined seven unique transmission projects for the regional planning process. MISO and SPP staff worked together with stakeholders from both markets to determine benefits through a collaborated effort. The transmission options were tested using Adjusted Production Cost (APC) benefits. No projects met the criteria for selection. The Southwest Power Pool Coordinated System Plan is available at the following link:

<https://cdn.misoenergy.org/MTEP17%20Book%203%20Policy%20Landscape106028.pdf>

Finally, MISO performed the Footprint Diversity Study. This studies focus was on the transfer rights between MISO North and MISO South using MISO operated facilities. The primary focus was on potential ways to increase the interface capability using economic drivers. Thirty Five transmission projects were analyzed for potential benefits and none passed the minimum 1.25 Benefit/Cost ratio needed to move on in the next phase of the analysis. The Footprint Diversity Study is available at the following link:

<https://cdn.misoenergy.org/MTEP17%20Book%201%20Transmission%20Studies106030.pdf>

SECTION K: Environmental Information

Clean Energy Fleet Transition

In the past two decades, the NSP Companies have placed a higher priority on making prudent investments in the NSP System to improve its environmental standing. Older, inefficient coal-fired plants have either been replaced with highly efficient natural gas plants or renovated to improve efficiency and reduce emissions. Coal generation now accounts for about a fourth of the energy our customers use, while natural gas has grown to supply another fourth of their needs. Baseload nuclear power plants, which reliably supply nearly 30 percent of the energy our customers use, have been relicensed and upgraded to enable them to operate safely and reliably until the early 2030s. Wind energy now supplies 15 percent of the energy our customers use and provides a hedge against rising fuel prices.

Given our investments in renewable energy and baseload nuclear power plants, carbon-free resources now supply 54 percent of the energy used by our customers. Since 2005, the NSP System has reduced total carbon emissions by over 40 percent. This long-term strategy provides value to customers in the form of declining fuel costs and emissions reductions.

Regional Haze Planning

During the first planning period for Regional Haze (2006-2017), Xcel Energy was required to conduct *Best Available Retrofit Technology* (BART) studies for Sherco Units 1 and 2 based on the age of the units. Our King plant was excluded from this requirement as it had already installed *Best Available Control Technology* (BACT) as part of the Company's *Metropolitan Emission Reduction Project* and no further controls were required at that time. Sherco Unit 3 was not evaluated under the first planning period for Regional Haze as it was constructed after the time period subject to BART studies.

As a result of the first Regional Haze planning period new, lower emission limits were established for Sherco Units 1 and 2 for both oxides of nitrogen (NO_x) and sulfur dioxide (SO₂) to reflect application of BART on the units. Subsequent legal action ensued which ultimately lead to a settlement agreement resulting in new SO₂ emission limits for Sherco Unit 3 to reflect actual emissions rather than the previously permitted levels.

As a result, Xcel Energy will be proposing a compliance strategy for the second Regional Haze planning period (2018-2028) that will consist of the following components:

- Commit to the retirement of Sherco Unit 2 by 12/31/2023

- Commit to the retirement of Sherco Unit 1 by 12/31/2026
- Commit to the retirement of King Unit 1 by 12/31/2028
- Commit to the retirement of Sherco Unit 3 by 12/31/2030
- No further addition of NO_x and SO₂ emission control technologies on King and Sherco units.

The operational model that informed compliance with the second Regional Haze planning period is the Xcel Energy IRP. The IRP incorporates Xcel Energy’s three strategic priorities of Lead the Clean Energy Transition, Enhance our Customer Experience, and Keep Bills Low. The IRP outlines how the company will aggressively work to keep our customers’ bills low while simultaneously reducing carbon emissions by more than 80 percent in the Upper Midwest by 2030, on our way to achieving our vision to provide all customers with 100 percent carbon-free electricity by 2050. Retirement of the King and Sherco units is a significant component of this plan.

Land Use Planning

Specific environmental information and efforts to involve land-use planning agencies will be provided to the Commission in future regulatory filings pertaining to specific facilities identified for construction.

SECTION L: Projected Demand for Service

The NSP System integrates electric generation and transmission to serve customers in North Dakota, South Dakota, Minnesota, Wisconsin, and Michigan. Xcel Energy produces long-range median NSP System forecasts of native energy requirements and summer and winter peak demands. For planning purposes, we also develop a “bandwidth” of projected scenarios to supplement our median forecasts. These scenarios are intended to represent uncertainty in a “business-as-usual” view reflecting a relatively narrow range of U.S. economic growth with no fundamental change in the relationship between the regional and national economies. Table L-1 shows the long-range NSP System forecast of native energy requirements and summer and winter peak demands. Table L-2 shows the North Dakota contribution to this system peak forecast (i.e., North Dakota’s “coincident-peak”).

The forecast for the NSP System is based on forecasts of state jurisdictional sales by major customer class: residential (with and without space heating), small commercial and industrial, and large commercial and industrial. Each customer class is modeled independently for the five states in the NSP System. The native

energy requirements are subsequently determined by applying a loss factor to total sales.

The NSP System peak is apportioned to state jurisdictions based on their native energy requirements and respective load factors. Consequently, the summer and winter “peak loads” provided in Table L-2 represent the North Dakota jurisdiction customer demand at the time the overall NSP System seasonal peak demand is occurring. The integrated NSP System peak demand is appropriate for generating capacity requirement forecasting.

The North Dakota 25-year historical native energy requirements and the North Dakota “non-coincident” peak demand is shown in Table L-3 below. The North Dakota non-coincident peak is the state’s highest demand irrespective of when the NSP System peak occurs. The non-coincident peak demand is used in evaluating transmission capacity requirements because the transmission system must always be capable of supplying the full local customer demand. Due to load diversity caused primarily by weather variations among states within the NSP System, non-coincident peak customer demands in our North Dakota service area can be as much as 25 percent higher than it is during the hour in which the total system peak demand occurs. These local non-coincident peak demands determine the need for transmission improvements required for load serving functions

Table L-1. NSP System Energy & Peak Loads (2020-2038)

Forecast Year	Energy (GWh)	Summer Peak (MW)	Winter Peak (MW)
2020	40,985	8,713	6,134
2021	41,847	8,824	6,225
2022	42,231	8,946	6,198
2023	41,980	8,969	6,181
2024	41,835	8,978	6,145
2025	41,494	8,955	6,096
2026	41,367	8,934	6,063
2027	41,235	8,926	6,034
2028	41,241	8,919	6,007
2029	40,884	8,901	5,974
2030	40,697	8,882	5,949
2031	40,592	8,873	5,936
2032	40,735	8,874	5,939
2033	40,669	8,890	5,994
2034	41,161	8,972	6,157
2035	42,240	9,162	6,299
2036	43,303	9,327	6,473
2037	44,118	9,520	6,612
2038	45,027	9,682	6,755
Average Annual Growth Rate (2018-2036)			
% Growth:	0.5%	0.6%	0.5%
Notes:	1) Peak Load is <i>coincident</i> to the NSP System peak.		
	2) Winter Peak = MISO Winter Peak season, 2020 is 2020 - 2021 winter peak.		
	3) Peak Load is the Base Peak (uninterrupted)		

Table L-2. ND Juris. Energy & Coincident Peak Loads (2020-2038)

Forecast Year		Energy (GWh)	Summer Coincident Peak (MW)	Winter Coincident Peak (MW)
2020		2,248	334	355
2021		2,308	341	354
2022		2,336	348	359
2023		2,342	352	361
2024		2,355	355	363
2025		2,353	357	363
2026		2,354	357	362
2027		2,354	358	361
2028		2,364	359	361
2029		2,359	361	361
2030		2,359	364	361
2031		2,359	367	362
2032		2,370	370	363
2033		2,366	372	363
2034		2,366	375	364
2035		2,368	378	364
2036		2,381	381	365
2037		2,380	384	366
2038		2,385	387	366
Average Annual Growth Rates, 2020-2038				
% Growth:		0.3%	0.8%	0.2%
Notes:	1.)	Peak Load is <i>coincident</i> to the Xcel Energy system peak.		
	2.)	Winter Peak = 2020 is 2020 - 2021 winter peak.		
	3.)	Peak Load forecast growth from 2030 - 2038 is based on average summer and winter ND peak growth rates from 2020 through 2029.		

Table L-3. ND Juris. Energy & Non-Coincident Peak Loads (1995-2019)

Year	Energy (GWh)	Annual Growth	Non-Coincident Peak (MW)	Annual Growth
1995	1,916		362	
1996	1,984	3.5%	382	5.5%
1997	1,911	-3.7%	351	-8.1%
1998	1,958	2.5%	352	0.3%
1999	1,950	-0.4%	363	3.1%
2000	2,053	5.3%	370	1.9%
2001	2,048	-0.2%	384	3.9%
2002	2,119	3.5%	403	4.8%
2003	2,171	2.4%	395	-2.0%
2004	2,158	-0.6%	403	2.2%
2005	2,289	6.1%	426	5.7%
2006	2,353	2.8%	439	3.0%
2007	2,378	1.1%	463	5.5%
2008	2,478	4.2%	427	-7.8%
2009	2,379	-4.0%	427	0.0%
2010	2,422	1.8%	445	4.2%
2011	2,441	0.8%	449	0.9%
2012	2,419	-0.9%	468	4.2%
2013	2,479	2.5%	453	-3.2%
2014	2,491	0.5%	444	-2.0%
2015	2,418	-2.9%	456	2.7%
2016	2,379	-1.6%	436	-4.4%
2017	2,348	-1.3%	423	-3.0%
2018	2,403	2.3%	417	-1.4%
2019	2,357	-1.9%	422	1.1%

SECTION M: Other Information

1. NSP System Generating Plants

Listed in Table M-1 below are all of the generating facilities owned and operated by NSPM or NSPW (collectively, the NSP System).

Table M-1. NSP System Generating Plants

<u>Resource</u>	<u>Fuel</u>	<u>Capacity</u>	<u>Location</u>
Sherburne County	Coal	1,879 MW	Becker, MN
Prairie Island	Nuclear	1,092 MW	Red Wing, MN
Monticello	Nuclear	646 MW	Monticello, MN
High Bridge	Natural Gas CC	606 MW	St. Paul, MN
Allen S. King	Coal	511 MW	Oak Park Heights, MN
Riverside	Natural Gas CC	508 MW	Minneapolis, MN
Wheaton	Natural Gas, Fuel Oil	311 MW	Wheaton, WI
Angus Anson	Natural Gas CT	386 MW	Sioux Falls, SD
Black Dog	Natural Gas CC, CT	530 MW	Burnsville, MN
Blue Lake	Nat Gas CT, Fuel Oil	542 MW	Shakopee, MN
Inver Hills	Natural Gas CT	369 MW	Inver Grove, MN
Nobles	Wind	200 MW	Worthington, MN
Courtenay	Wind	200 MW	Courtenay, ND
Pleasant Valley	Wind	200 MW	Austin, MN
Blazing Star 1	Wind	200 MW	Hendricks, MN
Border Winds	Wind	150 MW	Rolla, ND
Foxtail	Wind	150 MW	Kulm, ND
French Island	Wood, RDF, Fuel Oil	175 MW	La Crosse, WI
Grand Meadow	Wind	100 MW	Dexter, MN
Lake Benton II	Wind	100 MW	Lake Benton, MN
Jim Falls	Hydro	60 MW	Chippewa River, WI
Bay Front	Wood, Nat Gas	26 MW	Ashland, WI
Wissota	Hydro	40 MW	Chippewa River, WI
Holcombe	Hydro	35 MW	Chippewa River, WI
Cornell	Hydro	33 MW	Chippewa River, WI
St. Croix Falls	Hydro	26 MW	St. Croix River, WI
Chippewa Falls	Hydro	24 MW	Chippewa River, WI
Red Wing	Refuse	18 MW	Red Wing, MN
Wilmarth	Refuse	17 MW	Mankato, MN
Hennepin Island	Hydro	14 MW	Minneapolis, MN
Dells	Hydro	13 MW	Chippewa River, WI
Big Falls	Hydro	9 MW	Flambeau River, WI
Cedar Falls	Hydro	7 MW	Red Cedar River, WI
Menomonie	Hydro	5 MW	Red Cedar River, WI

Apple River	Hydro	3	MW	Apple River, WI
Ladysmith	Hydro	3	MW	Flambeau River
Superior Falls	Hydro	2	MW	Montreal River, WI
Thornapple	Hydro	2	MW	Flambeau River, WI
Trego	Hydro	2	MW	Namekagon River, WI
Riverdale	Hydro	1	MW	Apple River, WI
Saxon	Hydro	1	MW	Montreal River, WI
White River	Hydro	1	MW	White River, WI
Hayward	Hydro	0	MW	Namekagon River, WI
Total		9,097	MW	

2. Approved Power Purchase Agreements

Table M-2. Power Purchases

Resource	Type	MW	Location	In-Service
Deuel Harvest	Wind	100	Deuel, SD	2020
Dakota Range III	Wind	150	Watertown, SD	2021

Note: Crowned Ridge I (200 MW) went into service in April 2020.

3. Summary of Advance Determination of Prudence Filings

Pending ADP Petitions

Project	Date Filed	Case No.
98.9 MW Mower County Wind Facility	08/30/2019	PU-19-310

Anticipated ADP Petitions

Project	Est. Filing Date
NA	NA

4. Report on the Effects of Wind Generation on Baseload Plants

In the Commission's orders on the Company's applications for Advance Determination of Prudence for the Nobles and Merricourt Wind Projects dated August 12, 2009 in Case Nos. PU-08-907 and PU-08-908, the Commission included the following order point:

2. NSP will report to the extent possible, as part of its annual 10-year plan, all

reductions in the energy produced at its base load generation units that would not have occurred except for the existence of wind generation. The report will include the time of the event, length of the event, base load plant affected, and the amount of energy not produced at the base load plant during the event.

Order Point 2 Compliance

The Company performed an analysis of the NSP system performance over 8,784 hours from the first hour on May 1, 2019 through the last hour on April 30, 2020. To establish a criteria as to what would constitute reductions in energy production, we looked at the set points for each unit established in our Energy Management System. Units have an economic maximum and an economic minimum set point that comprise the normal dispatch range. For the purposes of this study, we assumed that any time a unit was not operating at its economic maximum, it was “backed down”. We then attributed the cause of the reduced baseload production each hour to load, wind, market dispatch, or some combination based on the net energy position for the NSP system over the hour.

As an example, let’s assume load is 500 MWs, wind is 100 MWs and Sherco Unit 1 is the only baseload resource online with a maximum capability of 680 MWs. By itself, the NSP system would only need 400 MWs from Sherco to serve load. If the unit were in fact dispatched to 400 MWs by MISO, we would attribute 180 MWs of backed down generation to our load ($680 - 500$), and 100 MWs to the wind. If MISO backed the unit down further to 300 MWs, the additional 100 MW reduction would be attributed to market dispatch. There are also times when baseload units remain loaded above the level necessary to serve the NSP system load net of wind generation due to the market wide demand for energy.

It is important to note that the cause of reductions in baseload energy production cannot be determined with certainty given the regional dispatch of generation in MISO. Wind generation may play a role in MISO market dispatch decisions, but the Company does not have enough information to determine definitively the cause of these decisions. Nevertheless, the analysis described above provides a reasonable framework for assessing the impact of wind on the NSP system.

The results show that the total amount of energy not produced that could have been produced during the study period if no baseload generation was backed down was 8,360,953 MWhs. Wind production contributed to 3,051,628 MWh or 36.5% of MWhs backed down. Changes in customer load accounted for 166,509 MWh or 2.0% of the MWhs backed down. MISO Market Dispatch was responsible for 5,142,816 MWh or 61.5% of the MWhs backed down. There were many hours where baseload generation was backed down due to a combination of market dispatch, wind production, and customer loads.

Out of the 366 days evaluated, there were 378 cycles in which wind generation contributed to backing down base load generation. We define a cycle as the period of time over which the base load generation was backed down. As an example, on May 4, 2019, base load generation was backed down for three consecutive hours in part due to wind generation. On July 1, 2019, base load generation was backed down for one hour in part due to wind generation. These were each counted as a cycle.