

2020 WIND CURTAILMENT REPORT

I. INTRODUCTION

The Commission's April 4, 2006 Order regarding curtailment payments to wind developers (Docket No. E999/AA-04-1279) requires the Company to provide in future AAA reports a projection of wind generation curtailment costs given existing and planned wind-generated energy purchases and transmission system needs. The Commission's June 12, 2019 Order in Docket No. E999/CI-03-802 approved the disposition of AAA reporting requirements as agreed to by the Company and the Department. The Company and the Department agreed that curtailment reporting could be reformatted to provide support for increased curtailment, in addition to providing detailed curtailment data by unit and by curtailment code.

Below we summarize the Company's experience regarding wind curtailment payments and provide a discussion of the drivers for increased wind curtailment payments during the 2020 reporting year as compared to the 2020 forecast. Part C, Attachment 2 shows detailed curtailment payments by unit and by curtailment code, in compliance with the Commission's February 6, 2008 Order in Docket Nos. E,G999/AA-06-1208 and E002/M-04-1970 *et al.*

We most recently discussed and provided an estimate of potential curtailment payments and the assumptions used to develop our 2021 curtailment forecast in our May 1, 2020 Petition and July 31, 2020 Reply Comments in Docket No. E002/AA-20-417. We will provide an estimate of 2022 curtailment payments, including forecast assumptions, in our 2022 fuel forecast Petition to be filed on May 1, 2021.

II. CURTAILMENT OVERVIEW

The Company expects that some level of wind curtailment from Power Purchase Agreement (PPA) facilities will occur in the foreseeable future. The reasons driving the curtailment have shifted from primarily local transmission constraints on NSP's transmission system in southwest Minnesota to regional transmission system congestion on the MISO system. The regional congestion, which results in negative LMP, was the largest driver of curtailment during this reporting period. Additionally, the nature of transmission congestion is accentuated by the large concentration and increased level of wind facility operations in Minnesota, North Dakota, South Dakota, and Iowa.

Significant transmission improvements in southwestern Minnesota and the region such as the CapX2020 transmission projects (CapX2020) and all but one of of MISO

Multi-Value Projects (MVPs) are now in-service and will positively impact curtailment by reducing local congestion. However, the Company believes future curtailment in this area will continue to occur because of regional congestion and the resulting negative LMP in the MISO energy market, along with transmission outages required for construction, maintenance or repair activities and wind generation projects going into service before all required transmission facilities are completed.

To better manage regional congestion, MISO and the industry utilize Dispatchable Intermittent Resources (DIRs), which provides better management of the wind resources. Under this system, a number of existing PPA wind facilities that are capable of operating as DIR, along with all new wind facilities, are registered with MISO as DIR. DIR facilities are given set point instructions every five minutes and rely on Automated Generation Control (AGC) technology, which automatically controls wind project output. DIR allows wind generators to be operated more like traditional generating facilities and, as a result, MISO is able to more quickly and accurately respond to system conditions.

Table 1 shows the existing PPA wind facilities associated with this report that are registered and operate as DIR.

Table 1
DIR PPA Facilities

Wind Project	MW
Big Blue	36
Cisco	8
Crowned Ridge 1	200
Fenton	200
Glen Ullin Wind	100
MinnDakota	150
Moraine II	50
Mower County	100
Odell	200
Prairie Rose	200
Valley View	10
Zephyr	30
Total	1,284

The federal Production Tax Credit (PTC), which provides tax benefits to wind generating plants, is scheduled to expire over the next few years. As in the past, the uncertainty of PTC expiration is closely connected with increases in wind curtailment, since wind projects are often put into service to meet PTC eligibility requirements even though the necessary transmission upgrades were not completed. The Company

is aware of 6,287 MW of new wind generation in Minnesota, North Dakota, South Dakota, and Iowa that has recently gone into service, or is expected to go into service in 2021. This includes 2,100 MW of Company-owned and PPA wind. Table 2 shows planned wind developments by NSP and other regional companies. All of these wind developments will be registered and operated as DIRs.

Table 2
Wind Generation Additions¹

Company	MW	Location	In-Service Dates
Alliant Energy	1,150	IA	2019-2020
Great River Energy ²	309	ND	2020-2023
MidAmerican	2,216	IA	2019-2020
Minnesota Municipal Power Agency	111	MN	2021
Minnesota Power	250	MN	2020
Northern States Power	2,100	ND, SD, MN	2019-2021
Ottertail Power	150	ND	2020
Total	6,287		

The required transmission upgrades for these wind projects were not all be in-service at the time the projects begin producing energy – including the Cardinal - Spring Green - Dubuque area 345 kV Line. A number of transmission facilities that were identified in the interconnection studies as overloaded were, or will be taken out of service and rebuilt.³ This will have a negative effect on LMP pricing in the MISO energy market that has and will continue to impact real-time wind generation on the NSP System.

III. TRANSMISSION SYSTEM IMPROVEMENTS

Since 1994, wind energy resources have been the dominant factor in determining the need for transmission infrastructure improvements in southwestern Minnesota. To meet this need, the Company, often in cooperation with other utilities, has planned, engineered and constructed a number of projects designed to increase the

¹ This does not include the wind repowering projects that NSP is pursuing.

² Great River Energy has announced plans to install an additional 800 MW of wind generation in 2022 and 2023.

³ This is especially true in the area around Big Stone in South Dakota. A significant number of 115 kV and 230 kV lines, mostly owned by Otter Tail Power Company are being taken out of service and rebuilt. Xcel Energy will also be rebuilding an existing 345 kV that connects to the Twin Cities.

transmission capacity in that area. Table 3 shows historic southwest Minnesota projects that increased the available transmission outlet in that area.

Table 3
Southwest Minnesota Wind Limits

Transmission Project	Transmission Owner	In-Service Date
425 MW Wind Transmission Expansion Project	Xcel Energy	December 2006
825 MW Wind Transmission Expansion Project	Xcel Energy	June 2008
Buffalo Ridge Incremental Generation Outlet (BRIGO)	Xcel Energy	December 2009

The Company also participated in the development of three CapX2020 transmission projects, all of which have gone into service and are helping reduce wind curtailment on the NSP system. Table 4 lists the CapX2020 transmission projects.

Table 4
CapX2020 Transmission Projects

Transmission Project	Transmission Owner	Actual/Planned In-Service Date
Brookings County - Southeast Twin Cities 345 kV Line	Xcel Energy, Great River Energy	March 26, 2015
Fargo North Dakota - Northwest Twin Cities 345 kV Line	Xcel Energy, Great River Energy	April 2, 2015
Southeast Twin Cities - LaCrosse, Wisconsin 345 kV Line	Xcel Energy, SMMPA and non-MISO	September 16, 2016

In addition to the transmission projects discussed above, a number of other new transmission infrastructure projects, including all but one of the Multi-Value Projects (MVP), have been placed in service. The remaining MVP is expected to be completed in 2023. The MVPs were designed to expand and enhance the region’s transmission system, reduce congestion, provide access to affordable energy sources, and meet public policy requirements including renewable energy mandates. The completion of the MVP projects, particularly the ones listed in the following table, have had, or will have, a positive impact on Company-owned and PPA wind facilities.

Table 5
MVP Projects

Transmission Project	Transmission Owner	Planned/Actual In-Service Date
Big Stone South to Brookings County 345 kV Line	Ottertail Power Company, Xcel Energy	September 8, 2017
Lakefield Jct. - Winnebago - Winco - Kossuth County & Obrien County - Kossuth County - Webster 345 kV Line	MidAmerica Energy, ITC Midwest	September 27, 2018
North LaCrosse - North Madison	American Transmission Company, Xcel Energy	December 12, 2018
Winco to Hazleton 345 kV Line	MidAmerica Energy, ITC Midwest	July 18, 2019
Ellendale to Big Stone South 345 kV Line	Ottertail Power Company, Montana Dakota Utilities	February 5, 2019
Cardinal - Spring Green - Dubuque area 345 kV Line	American Transmission Company, ITC Midwest	End 2023

One of the design goals for the North LaCrosse - North Madison and Cardinal - Spring Green - Dubuque area 345 kV Lines was to increase the transmission export capacity from Iowa and Minnesota into the 345 kV system in Wisconsin that connects to the Milwaukee and Illinois load centers.

IV. WIND GENERATION, CURTAILMENT AND CURTAILMENT PROJECTIONS

Chart 1 shows planned and installed Company-owned and PPA wind generation facilities throughout the NSP service territory on an incremental and cumulative basis.

Chart 1
NSP Wind Development
 (2003 – 2021)

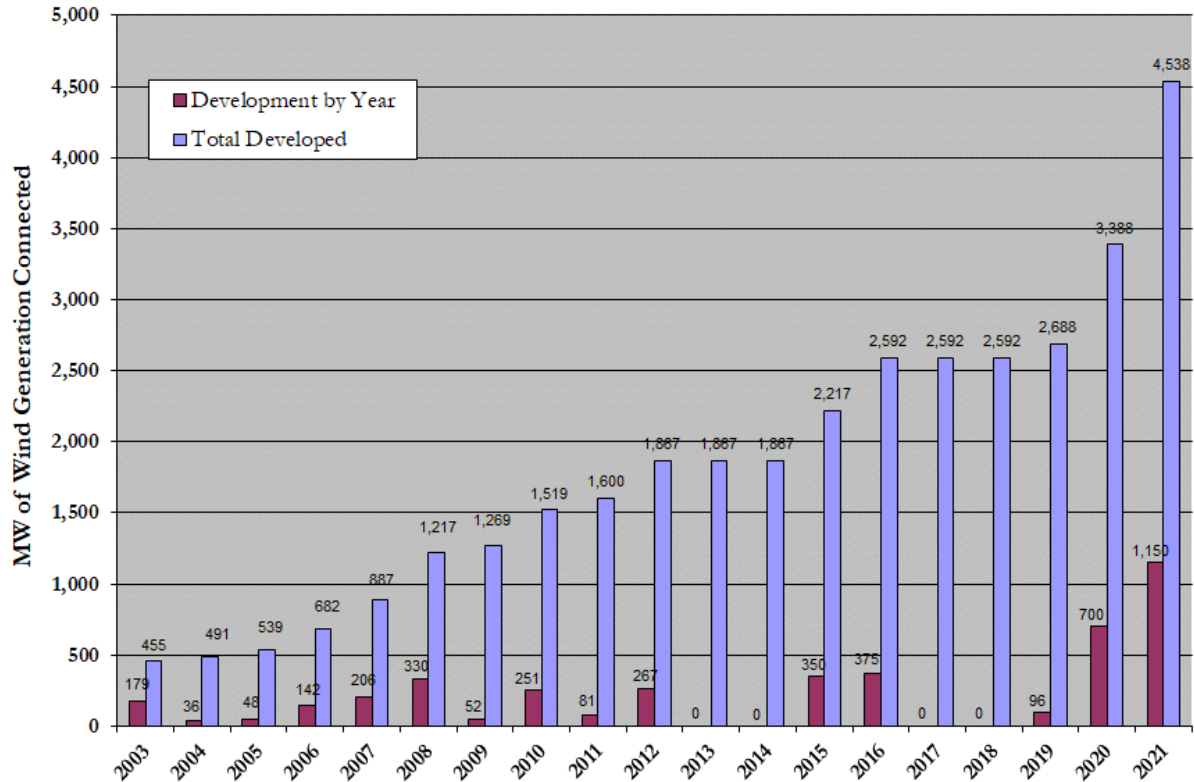
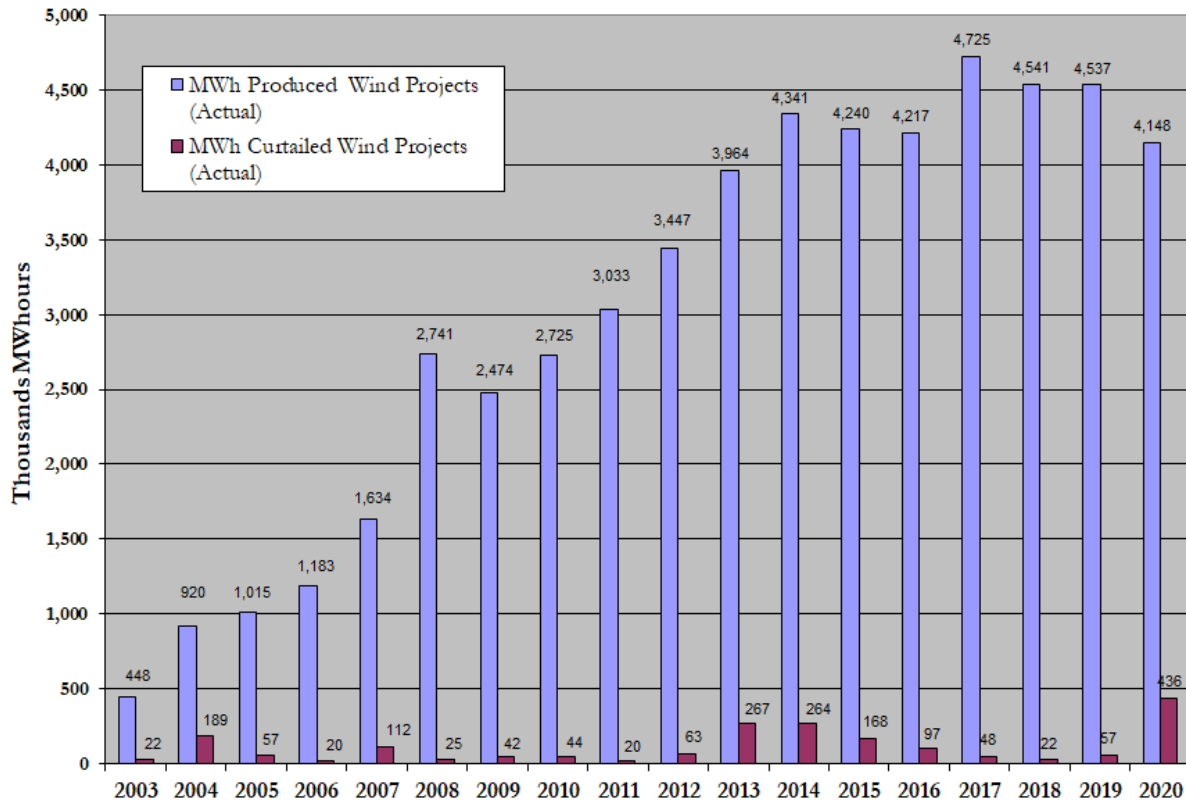


Chart 2 shows the comparison between total wind energy produced and the wind energy curtailed from the projects through December 2020.⁴ Despite the lead/lag time associated with generation and transmission development, Chart 2 shows that wind curtailment is small compared to the total wind generation delivered.

Wind curtailment, as a tool to manage wind generation volumes when necessary, has had the positive benefit of facilitating a large amount of wind resources to be added to the system, which would not otherwise have been possible.

⁴ Part C, Attachment 2.

Chart 2
NSP Wind Production & Curtailment (MWh)
 (2003 – 2020)



Curtailment during 2020 was broken up into two categories to better explain the reasons for the curtailment and its cause. To support the analysis the Company identified hours during 2020 where local transmission-related outages impacted wind projects. These hours were assigned as Transmission Curtailment. During hours where transmission outages did not occur, or where transmission outages did not impact a specific wind farm, the hours were assigned as DIR Curtailment⁵ based on if a project was registered as a DIR. This hourly information was then compared to hourly curtailment data for each of the reporting wind farms and total MWh and curtailment costs were calculated. It should be noted that the hourly data was only assigned one category and did not overlap and Transmission Curtailment was not assigned for regional transmission outages.

⁵ The Company stopped performing manual curtailment of non-DIR PPA wind facilities during the 2018/2019 AAA period since analysis of the economic impact of manual curtailment showed minimal customer economic value.

The Transmission Curtailment was very small compared to the DIR Curtailment during 2020. The results of the Transmission and DIR analysis are summarized in Table 6.

Table 6
2020 Wind Curtailment MWh and Costs

Events	MWh	Costs
Transmission Events	6,384	\$291,759
DIR Curtailment Events	429,889	\$19,321,213
Totals	436,273	\$19,612,973

It is important to note that of the \$19,612,973 in total curtailment costs, the vast majority of these costs are associated with the contractual energy price of the PPAs. These are contractually obligated sunk costs which are not economically relevant to the decision to curtail the generation from a wind farm.⁶

Transmission Curtailment Events

Wind curtailment costs totaling \$291,759 were due to the transmission events described below.

The primary goal when planning construction and maintenance work that will impact wind generation output is to perform multiple outages at the same time, and schedule these activities during times when wind is normally at its lowest levels – typically the summer months in the NSP service territory. While Xcel Energy attempts to plan outage work with this principle in mind, this is not always possible. Summer months are also high load months and transmission outages may not be possible due to load serving needs.

It should be noted that only specific wind generation facilities are used to manage the transmission events. For example, a Split Rock – Nobles County 345 kV line outage could be managed by limiting output of Nobles, Chanarambie Power Partners, Fenton, Ridgewind, or Moraine II.

The Company experienced planned and unplanned outages of the Split Rock – Nobles County 345 kV line, Fenton – Nobles County #1 & #2 115 kV lines and Nobles County TR10 Transformer that contributed to curtailment during this period. The facilities were taken out of service as the result of adverse weather conditions, for

⁶ The PPA contract language can generally be described as “take or pay” in which NSP must pay for the wind energy that could be produced, regardless of whether it actually is produced or if it is curtailed.

NSP and other utility maintenance activities, and to accommodate upgrades related to interconnecting new generating facilities.

Curtailment Procedures

MISO performs a 10-minute forecast every five minutes which is used as the maximum limit for the wind farm in the Unit Dispatch System. MISO sends five-minute dispatch instructions to DIR wind farms. When LMP drops below the offer price of the DIR unit, the farm is automatically dispatched down. The setpoint is sent to the DIR wind farm, and the facility is automatically curtailed. It should be noted that not all DIR farms are equipped with setpoint controls. In such situations, a phone call or e-mail is required to initiate a DIR curtailment. Non-DIR units are not equipped with setpoint control.

DIR Curtailment Events

Wind curtailment costs totaling \$19,321,213 were due to the MISO-directed DIR control as described below.

DIR related curtailment was due to negative LMP prices associated with congestion throughout the Minnesota and Iowa region due to regional transmission outages, or local congestion due to local transmission outages, as well as the higher levels of wind generation present where all required transmission improvements have not been completed or where sufficient transmission outlets did not exist.

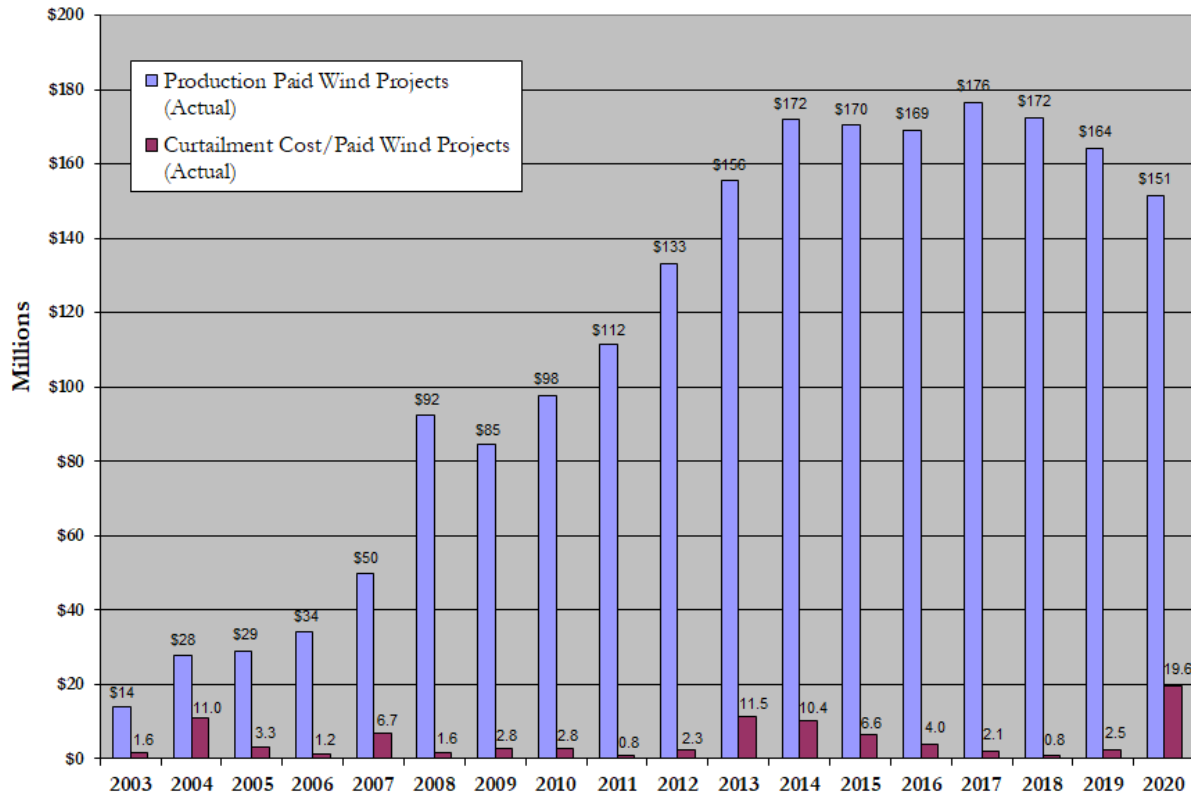
Both PTC and non-PTC DIR wind farms are managed by MISO through automatic control, and these facilities are required to comply with the MISO cost signals. Failure to comply would expose the Company to Revenue Sufficiency Guarantee charges.

V. WIND PRODUCTION AND CURTAILMENT PAYMENTS

Chart 3 shows the corresponding production and curtailment costs for 2003 through 2020.⁷ As with wind generation produced and curtailed, paid curtailment is a very small portion of total cost of wind generation on the system.

⁷ The data for 2018-2020 is shown in Part C, Attachment 2.

Chart 3
NSP Wind Production & Curtailment Payments
 (2003 – 2020)



The Company has typically provided estimates of future potential curtailment payment estimates in the AAA Report. However, going forward these estimates will be provided in our fuel forecast Petition, including the one that will be filed on May 1, 2020. The Company is projecting future curtailment will occur because of regional congestion and the resulting negative LMP in the MISO energy market, along with transmission outages required for construction, maintenance or repair activities and wind generation projects going into service before all required transmission facilities are completed.

Significant transmission improvements in southwestern Minnesota and the region such as the CapX2020 transmission projects (CapX2020) and all but one of the MISO Multi-Value Projects (MVPs)⁸ are now in-service and have positively impacted curtailment by reducing local congestion. However, the Company anticipates that wind generation curtailment and associated payment to vendors will continue to occur

⁸ The Cardinal - Hickory Creek 345 kV MVP line is scheduled to go into service in late 2023.

over the coming years because of regional congestion and the resulting negative LMP in the MISO energy market, along with transmission outages required for construction, maintenance, or repair activities and wind generation projects going into service before all required transmission facilities are completed. System conditions and wind project development are very dynamic and actual curtailment may vary from that projected in this report. The Company will continue to participate in discussions regarding transmission planning and operations to identify needs and work to manage future costs. We will continue to refine and gather information for use in future updates to be submitted with subsequent AAA reports.

The Company continues to utilize initiatives to reduce curtailment. Examples include, where possible, scheduling transmission activities which can impact curtailment during low wind months.

Part C, Attachment 2

Wind Curtailment Report

Docket Nos. E002/M-02-51, E002/M-00-622, E002/M-04-404,
E002/M-04-864, E,G999/AA-04-1279, E002/M-05-1850,
E002/M-05-1934 & E002/M-06-85, E002/M-08-1487,
E002/M-09-1366

2020 AAA Period

List of Wind Projects

LAKE BENTON I

LAKE BENTON II

CHANARAMBIE

MORaine (Formerly Navitas)

NAE (Multiple Sites)

VELVA

FENTON (enXco)

FPL ENERGY MOWER COUNTY

MINNDAKOTA (Formerly Ivanhoe)

LINCOLN HEIGHTS WIND NORTH & SOUTH (Formerly Norgaard N & S)

BUFFALO RIDGE WIND ENERGY (Formerly Wind Power Partners 1993)

JEFFERS WIND 20, LLC

UILK

EWINGTON

MORaine II WIND LLC

PRAIRIE ROSE

ZEPHRY WIND LLC

BIG BLUE WIND FARM

VALLEY VIEW WIND

RIDGEWIND POWER PARTNERS LLC

GRANT COUNTY WIND LLC

ADAMS WIND GENERATIONS LLC

ODELL

WOODSTOCK HILLS

**Northern States Power Company
Electric Utility - State of Minnesota
Wind Curtailment Summary Report - Total
2020 AAA Period**

Production Month	Date Paid		Wind Production Delivered		Lost Production		Total Xcel Energy Paid
	Delivered MWh	Lost MWh	MWh Delivered	Amount Xcel Energy Paid	Lost MWh	Amount Xcel Energy Paid	
Jan-18			517,112.61	19,554,286.92	1,511.09	61,457.59	\$ 19,615,744.51
Feb-18			418,166.06	15,810,253.22	233.23	10,491.35	\$ 15,820,744.57
Mar-18			456,664.46	17,253,894.46	840.25	35,475.95	\$ 17,289,370.41
Apr-18			389,872.84	14,871,852.82	2,458.29	108,258.95	\$ 14,980,111.77
May-18			321,602.85	12,231,504.86	805.13	39,345.01	\$ 12,270,849.87
Jun-18			376,960.04	14,294,249.66	956.44	37,717.50	\$ 14,331,967.16
Jul-18			252,109.41	9,524,606.84	558.38	25,341.15	\$ 9,549,947.99
Aug-18			260,557.95	9,854,956.67	564.99	26,170.63	\$ 9,881,127.30
Sep-18			372,900.25	14,204,082.85	1,483.22	64,512.97	\$ 14,268,595.82
Oct-18			406,941.22	15,440,333.05	392.86	18,908.20	\$ 15,459,241.25
Nov-18			391,946.75	14,949,146.73	1,497.05	66,292.63	\$ 15,015,439.36
Dec-18			376,229.82	14,485,535.21	10,741.09	338,305.25	\$ 14,823,840.46
Total-18			4,541,064.26	\$ 172,474,703.29	\$ 22,042.03	\$ 832,277.18	\$ 173,306,980.47
Jan-19			409,935.57	15,794,417.19	2,691.44	138,614.09	\$ 15,933,031.28
Feb-19			316,550.82	12,067,583.35	1,755.04	84,703.94	\$ 12,152,287.29
Mar-19			411,474.86	15,202,176.47	1,869.04	93,395.08	\$ 15,295,571.55
Apr-19			320,446.94	11,945,738.10	15,514.36	714,235.19	\$ 12,659,973.29
May-19			419,819.81	14,792,059.29	8,719.31	367,154.52	\$ 15,159,213.81
Jun-19			307,889.93	10,765,318.39	2,914.02	116,848.22	\$ 10,882,166.61
Jul-19			261,647.61	9,175,408.30	5,882.20	225,357.99	\$ 9,400,766.29
Aug-19			238,064.67	8,453,872.37	1,705.60	68,807.54	\$ 8,522,679.91
Sep-19			422,465.39	15,040,484.98	1,016.19	47,264.76	\$ 15,087,749.74
Oct-19			527,632.25	18,941,335.79	11,579.78	477,171.98	\$ 19,418,507.77
Nov-19			484,992.26	17,217,454.47	1,823.17	77,334.60	\$ 17,294,789.07
Dec-19			416,115.75	14,719,570.78	1,533.90	70,503.00	\$ 14,790,073.78
Total-19			4,537,035.83	\$ 164,115,419.48	57,004.05	\$ 2,481,390.91	\$ 166,596,810.39
Jan-20			399,651.01	14,281,994.44	1,583.27	65,900.77	\$ 14,347,895.21
Feb-20			503,731.90	17,936,163.91	5,269.02	229,785.49	\$ 18,165,949.40
Mar-20			491,554.55	17,679,218.49	19,126.61	849,968.99	\$ 18,529,187.48
Apr-20			426,745.32	15,159,859.92	19,377.19	842,513.17	\$ 16,002,373.09
May-20			295,839.59	11,005,702.99	38,161.09	1,789,868.33	\$ 12,795,571.32
Jun-20			303,865.09	11,215,457.53	68,698.92	3,054,847.02	\$ 14,270,304.55
Jul-20			203,130.29	7,708,535.67	11,701.62	508,971.38	\$ 8,217,507.05
Aug-20			267,227.71	10,037,747.80	13,175.80	604,055.79	\$ 10,641,803.59
Sep-20			284,608.69	10,541,870.58	55,057.72	2,436,060.69	\$ 12,977,931.27
Oct-20			293,763.86	10,900,396.21	73,618.56	3,273,477.66	\$ 14,173,873.87
Nov-20			350,138.46	12,659,381.03	87,314.17	3,902,384.06	\$ 16,561,765.09
Dec-20			327,718.91	12,277,242.13	43,189.37	2,055,139.30	\$ 14,332,381.43
Total-20			4,147,975.37	\$ 151,403,570.70	436,273.34	\$ 19,612,972.65	\$ 171,016,543.35

**Northern States Power Company
 Electric Utility - State of Minnesota
 Wind Curtailment Summary Report - Curtailment Reason Code 1 (ATC)
 2020 AAA Period**

Production Month	Date Paid		Wind Production Delivered		Lost Production		Total Xcel Energy Paid
	Delivered MWh	Lost MWh	MWh Delivered	Amount Xcel Energy Paid	Lost MWh	Amount Xcel Energy Paid	
Jan-18							
Feb-18							
Mar-18							
Apr-18							
May-18							
Jun-18							
Jul-18							
Aug-18							
Sep-18							
Oct-18							
Nov-18							
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Jun-20							
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Aug-20							
Sep-20							
Oct-20							
Nov-20							
Dec-20							
Total-20							

**Northern States Power Company
 Electric Utility - State of Minnesota
 Wind Curtailment Summary Report - Curtailment Reason Code 2 (Low Load)
 2020 AAA Period**

Production Month	Date Paid		Wind Production Delivered		Lost Production		Total Xcel Energy Paid
	Delivered MWh	Lost MWh	MWh Delivered	Amount Xcel Energy Paid	Lost MWh	Amount Xcel Energy Paid	
Jan-18							
Feb-18							
Mar-18							
Apr-18							
May-18							
Jun-18							
Jul-18							
Aug-18							
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Oct-18							
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Feb-20							
Mar-20							
Apr-20							
May-20							
Jun-20							
Jul-20							
Aug-20							
Sep-20							
Oct-20							
Nov-20							
Dec-20							
Total-20							

Northern States Power Company
Electric Utility - State of Minnesota
Wind Curtailment Summary Report - Curtailment Reason Code 3 (MISO)
2020 AAA Period

Production Month	Date Paid		Wind Production Delivered		Lost Production		Total Xcel Energy Paid
	Delivered MWh	Lost MWh	MWh Delivered	Amount Xcel Energy Paid	Lost MWh	Amount Xcel Energy Paid	
Jan-18			161,780.11	7,280,301.87	1,511.09	61,457.59	\$ 7,341,759.46
Feb-18			113,091.36	5,536,884.67	233.23	10,491.35	\$ 5,547,376.02
Mar-18			208,117.65	8,568,537.26	840.25	35,475.95	\$ 8,604,013.21
Apr-18			152,131.99	7,033,848.29	2,458.29	108,258.95	\$ 7,142,107.24
May-18			128,803.87	5,936,773.66	805.12	39,345.01	\$ 5,976,118.67
Jun-18			164,397.54	7,366,182.11	956.44	37,717.50	\$ 7,403,899.61
Jul-18			103,125.62	4,460,620.74	558.38	25,341.15	\$ 4,485,961.89
Aug-18			112,300.16	5,084,272.85	564.99	26,170.63	\$ 5,110,443.48
Sep-18			136,694.24	6,133,579.28	1,483.22	64,512.97	\$ 6,198,092.25
Oct-18			55,002.98	2,166,371.84	392.86	18,908.20	\$ 2,185,280.04
Nov-18			110,378.69	4,609,900.25	1,497.05	66,292.63	\$ 4,676,192.88
Dec-18			157,458.72	6,744,439.49	10,741.09	338,305.25	\$ 7,082,744.74
Total-18			1,603,282.93	\$ 70,921,712.31	22,042.02	\$ 832,277.18	\$ 71,753,989.49
Jan-19			34,790.48	1,584,575.48	2,691.44	138,614.09	\$ 1,723,189.57
Feb-19			46,095.81	1,975,647.30	1,755.04	84,703.94	\$ 2,060,351.24
Mar-19			133,223.00	5,104,484.91	1,869.04	93,395.08	\$ 5,197,879.99
Apr-19			132,374.40	5,618,629.76	15,514.36	714,235.19	\$ 6,332,864.95
May-19			143,861.13	6,224,849.74	8,719.31	367,154.52	\$ 6,592,004.26
Jun-19			103,936.66	4,463,954.31	2,914.02	116,848.22	\$ 4,580,802.53
Jul-19			64,936.43	2,490,433.42	5,882.20	225,357.99	\$ 2,715,791.41
Aug-19			65,097.85	2,490,144.14	1,705.60	68,807.54	\$ 2,543,812.57
Sep-19			152,102.41	6,518,938.81	1,016.19	47,264.76	\$ 6,566,203.57
Oct-19			192,968.52	8,558,704.45	11,579.78	477,171.98	\$ 9,035,876.43
Nov-19			85,834.03	3,248,563.99	1,823.17	77,334.60	\$ 3,325,898.59
Dec-19			143,811.28	6,362,151.94	1,533.90	70,503.00	\$ 6,432,654.94
Total-19			1,299,031.99	\$ 54,641,078.25	57,004.06	\$ 2,481,390.91	\$ 57,107,330.05
Jan-20			152,447.62	6,394,615.97	1,583.27	65,900.77	\$ 6,460,516.74
Feb-20			199,042.07	8,284,249.02	5,269.02	229,785.49	\$ 8,514,034.51
Mar-20			190,537.12	7,939,476.63	19,126.61	849,968.99	\$ 8,789,445.62
Apr-20			158,348.00	6,624,111.36	19,377.19	842,513.17	\$ 7,466,624.53
May-20			145,484.94	6,215,334.19	38,161.09	1,789,868.33	\$ 8,005,202.52
Jun-20			226,908.24	8,515,332.08	68,698.92	3,054,847.02	\$ 11,570,179.10
Jul-20			116,826.05	4,996,335.18	11,701.62	508,971.38	\$ 5,505,306.56
Aug-20			168,459.46	6,230,107.58	13,175.80	604,055.79	\$ 6,834,163.37
Sep-20			210,090.70	7,707,155.08	55,057.72	2,436,060.69	\$ 10,143,215.77
Oct-20			211,822.27	7,810,296.30	73,618.56	3,273,477.66	\$ 11,083,773.96
Nov-20			290,736.26	10,515,693.78	87,314.17	3,902,384.06	\$ 14,418,077.84
Dec-20			268,369.30	9,992,099.21	43,189.37	2,055,139.30	\$ 12,047,238.51
Total-20			2,339,072.03	\$ 91,224,806.38	436,273.34	\$ 19,612,972.65	\$ 110,837,779.03

**Northern States Power Company
 Electric Utility - State of Minnesota
 Wind Curtailment Summary Report - Curtailment Reason Code 4 (Other-Paid)
 2020 AAA Period**

Production Month	Date Paid		Wind Production Delivered		Lost Production		Total Xcel Energy Paid
	Delivered MWh	Lost MWh	MWh Delivered	Amount Xcel Energy Paid	Lost MWh	Amount Xcel Energy Paid	
Jan-18							
Feb-18							
Mar-18							
Apr-18							
May-18							
Jun-18							
Jul-18							
Aug-18							
Sep-18							
Oct-18							
Nov-18							
Dec-18							
Total-17							
Jan-19							
Feb-19							
Mar-19							
Apr-19							
May-19							
Jun-19							
Jul-19							
Aug-19							
Sep-19							
Oct-19							
Nov-19							
Dec-19							
Total-19							
Jan-20							
Feb-20							
Mar-20							
Apr-20							
May-20							
Jun-20							
Jul-20							
Aug-20							
Sep-20							
Oct-20							
Nov-20							
Dec-20							
Total-20							