

July 1, 2024

**VIA EMAIL and U.S. MAIL**

North Dakota Public Service Commission  
c/o Steven Kahl, Executive Secretary  
600 E. Boulevard Ave., Dept. 408  
Bismarck, ND 58505

**RE: Minnesota Power's Ten-Year Plan – July 2024**

Dear Mr. Kahl:

Enclosed is Minnesota Power's North Dakota Ten-Year Plan pursuant to N.D.C.C. § 49-22-04. The original and a copy of the Plan will be sent to the address above with copies filed with the Mercer, Morton, and Oliver County auditors.

Further, pursuant to N.D. Amin. Code 69-06-01-05, the enclosed Notice will be sent to the state agencies and officers as designated on the attached Notice Service List.

If you have any questions or need additional information, please contact me at 218-355-3082 or [cvatalaro@allete.com](mailto:cvatalaro@allete.com).

Yours truly,



Claire Vatalaro  
*Regulatory Compliance Specialist*

CMRV:th  
Enc.

# **TEN-YEAR PLAN**

**Minnesota Power**  
**An operating division of ALLETE, Inc.**  
**Duluth, Minnesota**

Prepared for the North Dakota Public Service Commission  
Pursuant to Section 49-22-04 of the  
North Dakota Century Code

**July 2024**

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**Minnesota Power’s**  
**TEN-YEAR PLAN**

**INTRODUCTION**

Minnesota Power, an operating division of ALLETE, Inc., provides retail electric service to northeastern Minnesota and wholesale service to 15 municipal customers in Minnesota and one private utility in Wisconsin. Minnesota Power has historically maintained an energy resource portfolio of coal, hydro, and biomass. In an effort to meet Minnesota’s Renewable Energy Standard (RES) and Carbon Free Standard (CFS) (Minn. Stat. § 216B.1691) and diversify its energy resource portfolio, Minnesota Power has been implementing a renewable development plan, which is captured in the Company’s *EnergyForward* resource strategy. The *EnergyForward* resource strategy incorporates a diverse renewable strategy including hydroelectric, solar, biomass, and wind resources. Under this strategy, Minnesota Power is delivering 50 percent renewable energy to customers and is the first Minnesota utility to achieve this milestone. Over the past 15 years, the Company has undertaken an intentional effort to increase its deployment of renewable energy. In 2006 and 2007, Minnesota Power began purchasing the entire output of the Oliver County Wind Energy Center 1 and 2 (just under 100 megawatts (“MW”)), wind farms built and operated by NextEra Energy in North Dakota. In 2008, Minnesota Power constructed the Taconite Ridge Energy Center, the first commercial wind generating station in northern Minnesota. The Bison Wind Energy Center (“Bison”) in North Dakota came next, with four phases of the project completed between 2010 and 2015. Bison, now the largest wind farm in North Dakota with a capacity of just under 500 MW, leverages premier wind resources to deliver carbon-free energy to the Company’s customers. In late 2020, Minnesota Power added 250 MW of wind energy through a Power Purchase Agreement (“PPA”) with the completion of the Nobles 2 Wind Farm. Combined, these wind projects added more than 850 MW of renewable electricity to the Company’s generation portfolio. The Company is committed to achieving an 80 percent reduction in carbon emissions by 2035 compared to 2005 levels and is working towards the recent carbon-free energy by 2040. The wind and solar approved in Minnesota Power’s 2021 IRP will help to achieve both the RES and CFS. While delivering increasingly clean energy to customers, *EnergyForward* is also aimed at delivering safe, reliable, and affordable energy to customers across a smarter grid that is increasingly resilient. In the 2021 Integrated Resource Plan, the Minnesota Public Utilities Commission approved between 300 and 400 MW of new wind resources, up to 300 MW of new solar resources, and at least 100 MWh of storage demonstration projects by 2026, as practicable. Minnesota Power will use a bidding process for its future resource acquisitions for the projects.

<sup>1</sup>Minnesota Power also continues to purchase energy and capacity from Square Butte Electric Cooperative’s Milton R. Young Unit 2 plant that is delivered via Minnesota Power’s +/- 250kV direct current transmission line (“DC Line”) that runs between the Square Butte Substation in Center, North Dakota and Minnesota Power’s Arrowhead Substation near Duluth, Minnesota.

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<sup>1</sup> January 9, 2023 Order, Minnesota Public Utilities Commission Docket No. E-015/RP-21-33

## Minnesota Power's Ten-Year Plan

### SECTION A: Existing Energy Conversion Facilities<sup>2</sup>

Bison 1—81.8 MW

Bison 2—105 MW

Bison 3—105 MW

Bison 4—201.6 MW

Hydro Operations—120.8 MW

- St. Louis River System—87.6 MW
  - Knife Falls Hydro Electric Station—2.4 MW
  - Scanlon Hydro Electric Station—1.6 MW
  - Thomson Hydro Electric Station—72 MW
  - Fond du Lac Hydro Electric Station—11.6 MW
- Winton Hydro Electric Station—4.0 MW
- Prairie River Hydro Electric Station—1.1 MW
- Mississippi River System—24.5 MW
  - Little Falls Hydro Electric Station—4.7 MW
  - Blanchard Hydro Electric Station—18 MW
  - Sylvan Hydro Electric Station—1.8 MW
  - Pillager Hydro Electric Station—1.5 MW

Hibbard Energy Center—60 MW

Boswell Energy Center Unit 3—352 MW

Boswell Energy Center Unit 4—582 MW (468 MW Minnesota Power capacity)

Laskin Energy Center Units 1 and 2—98 MW (natural gas)

Taconite Ridge Wind Energy Center—25 MW

Camp Ripley Solar Facility—10 MW

(Non-regulated) Rapids Energy Center—25 MW

Purchases

- Square Butte—Young 2—80 MW in 2022
- Oliver County Wind Energy Centers I and II—98.6 MW

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<sup>2</sup> Nameplate capacity.

- Wing River Wind—2.5 MW
- Manitoba Hydro—250 MW
- U.S. Solar—1 MW (community solar garden)
- Nobles 2 Wind Energy Center—250 MW
- Nemadji Trail Energy Center—116.2 MW (20% ownership in natural gas facility in Superior) Note that the NTEC project is going through the permitting process in Wisconsin. The exact in service date is unknown due to a longer than expected permitting process in WI.
- Sylvan Solar – 15.2 MW
- Laskin Solar – 5.6 MW
- Jean Duluth Solar – 1.6 MW
- HSC Solar Garden - .4 MW

Minnesota Power’s 2021 Integrated Resource Plan (“2021 Plan”) in Minnesota Public Utilities Commission (“MPUC”) Docket No. E015/ RP-21-33 (available on the MPUC’s eDockets website: <https://www.edockets.state.mn.us/EFiling/search.jsp> or Minnesota Power’s website at: <https://www.mnpower.com/IRP2021> was filed on February 1, 2021. The filing provides further information on these generation facilities and is available upon request..

**SECTION B: Energy Conversion Facilities under Construction**

**SECTION C: Proposed Energy Conversion Facilities on Which Construction is Intended Within the Ensuing Five Years**

Minnesota Power may make individual applications to the North Dakota Public Service Commission (“NDPSC”) for approval of additional North Dakota wind facilities when the timing is determined.

**SECTION D: Proposed Energy Conversion Facilities during the Next Ten-Year Time Period**

See response to Section C.

**SECTION E: Existing Transmission Facilities (Electric)**

On December 31, 2009, Minnesota Power acquired the Square Butte +/- 250kV HVDC<sup>3</sup> Line that runs 465 miles between the Square Butte Substation in Center, North Dakota and Minnesota Power’s Arrowhead Substation near Duluth, Minnesota. In 2013 Minnesota Power upgraded the capacity of the HVDC Line to 550 MW to assure deliverability of the Bison Wind Projects.

In 2009, Minnesota Power placed in-service a 230kV alternating current (“AC”) transmission line

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<sup>3</sup> High voltage direct current

(PU-09-587), approximately 22 miles in length that is required to transmit wind generation from the Bison 1 Wind Project substation to the proposed point of interconnection within the existing Square Butte Substation near Center, North Dakota. This transmission line will also be utilized as a generator outlet for future Minnesota Power wind projects.

To facilitate development of additional wind projects in North Dakota, Minnesota Power constructed additional transmission facilities that interconnect with the 230kV AC transmission line and the Square Butte Substation. Minnesota Power obtained NDPSC approval for an additional 10-mile western extension of the 230kV AC transmission line (PU-11-620) and that line is used for Minnesota Power's Bison 4 Wind Project.

Minnesota Power is a project participant in the CapX2020 transmission initiative, which includes the Twin Cities – Fargo 345kV Project that begins near Fargo, North Dakota and terminates at Monticello, Minnesota.

**SECTION F: Existing Transmission Facilities (Pipeline)**

None.

**SECTION G: Proposed Transmission Facilities on Which Construction is Intended Within the Ensuing Five Years**

Minnesota Power's HVDC Modernization Project is planned for implementation between 2025 and 2030. The HVDC Modernization Project is needed to modernize aging HVDC assets and improve the reliability of the regional transmission system. The existing HVDC terminal located near Center, ND, has operated for over 45 years, more than 15 years beyond its 30-year design life. In recent years, Minnesota Power has experienced HVDC terminal outages due to failures in the control system, power electronics, transformers, and other components. The orderly replacement of the HVDC terminal equipment is prudent to ensure continuous, efficient delivery of energy resources into the future.

To modernize the HVDC terminal and implement the latest technology, new electrical infrastructure will be constructed on a new site near Minnesota Power's existing HVDC system, located near the existing Square Butte East Substation. Minnesota Power is currently preparing project applications for submittal to Oliver County and the North Dakota Public Service Commission in the second half of 2024. Pending regulatory approvals, construction of the HVDC Modernization Project facilities could begin in 2025 and continue through project completion in the 2028 to 2030 timeframe.

The DC terminals were designed by General Electric ("GE") for a 30 year operating lifetime and currently have been operating reliably for over 45 years. The main components of the HVDC terminals include the thyristor valves and cooling, converter transformers, and smoothing reactors to complete the energy conversion. The original vendor, GE, left the HVDC business in the 1980s and in recent years it has been increasingly difficult to procure spare parts as the technology is becoming obsolete and the original designers are well into retirement. Minnesota Power has researched reverse engineering solutions to this technology issue, but has had limited results and thus spare and replacement parts for the HVDC system remain limited. By taking action to modernize the HVDC system, Minnesota Power will greatly reduce the likelihood of equipment failures and line outages.

Modernization of the aging infrastructure will allow Minnesota Power to continue to provide reliable operations and access to its North Dakota wind resources. It will also provide an opportunity to upgrade the system with additional capabilities, including an increase transfer capability from the current 550 MW and a more flexible operational profile with bi-directional flows.

Minnesota Power is actively pursuing the project and looking for an opportunity to execute it while balancing system reliability needs with costs to customers and prioritization of all capital projects. Following detailed specification and competitive bidding of the project, the earliest expected in-service date for the project is 2027. Depending on the final scope of the project Minnesota expects that permit approvals by ND PSC may be required.

**SECTION H: Proposed Transmission Facilities on Which Construction is Intended Within the Ensuing Five Years (Pipeline)**

None.

**SECTION I: Proposed Transmission Facilities during the Next Ten Year- Time Period (Electric and Pipeline)**

See response in Section G.

**SECTION J: Regional Coordination**

Minnesota Power's 2021 Plan in MPUC Docket No. E015/RP-21-33 (available on the MPUC's eDockets website: <https://www.edockets.state.mn.us/EFiling/search.jsp>) contained extensive transmission and regional coordination information in Appendix F and is available upon request. Further information is available in the Minnesota Transmission Owners' Biennial Transmission Plan filed in MPUC Docket No. E999/M-23-91 and available at: <http://minnelectrans.com>.

**SECTION K: Environmental Information**

Minnesota Power's 2021 Plan in MPUC Docket No. E015/RP-21-33 (available on the MPUC's eDockets website: <https://www.edockets.state.mn.us/EFiling/search.jsp>) contained extensive environmental information in Appendix E and is available upon request.

**SECTION L: Projected Demand for Service**

Minnesota Power's 2021 Plan in MPUC Docket No. E015/RP-21-33 (available on the MPUC's eDockets website: <https://www.edockets.state.mn.us/EFiling/search.jsp>) contained extensive demand and energy forecasting information and is available upon request. Minnesota Power also files annually with the MPUC an Annual Forecast Report in accordance with MPUC rules and that can be made available upon request.

## **PLAN Service List**

Mr. Steven Kahl, Executive Secretary  
**Public Service Commission**  
600 E. Boulevard Ave., Dept. 408  
Bismarck, ND 58505

**Oliver County Auditor**  
P O Box 188  
Center, ND 58530-0188

**Morton County Auditor**  
210 Second Avenue NW  
Mandan, ND 58554-3158

**Mercer County Auditor**  
P O Box 39  
Stanton, ND 58571-0039



AN ALLETE COMPANY

July 1, 2024

## NOTICE OF FILING

Please take notice that on July 1, 2024, Minnesota Power, 30 West Superior Street, Duluth, Minnesota, filed a Ten-Year Plan with the North Dakota Public Service Commission pursuant to N.D.C.C. § 49-22-04. Notice of the filing of this plan is pursuant to N.D. Admin. Code 69-06-02-02 to the following state agencies and officers as designated in N.D. Admin. Code 69-06-01-05:

1. Aeronautics Commission
2. Attorney General
3. Department of Agriculture
4. Department of Career and Technical Education
5. Department of Commerce, Division of Community Service
6. Department of Health
7. Department of Human Services
8. Department of Labor
9. Department of Transportation
10. Economic Development & Finance Commission
11. Energy Development Impact Office
12. Game and Fish Department
13. Geological Survey
14. Governor
15. Indian Affairs Commission
16. Job Service North Dakota
17. Parks and Recreation Department
18. Soil Conservation Committee
19. State Historical Society of North Dakota
20. State Land Department
21. State Water Commission

Yours truly,

*Claire Vatalaro*

Claire Vatalaro  
*Regulatory Compliance Specialist*

CMRV:th

## NOTICE Service List

Chairman  
**Aeronautics Commission**  
P O Box 5020  
Bismarck, ND 58502-5020

**Attorney General**  
600 East Boulevard Avenue, Dept. 125  
Bismarck, ND 58505

Commissioner  
**Department of Agriculture**  
600 East Boulevard Avenue, Dept. 602  
Bismarck, ND 58505-0020

Director & Exe. Officer  
**Dept. of Career & Tech. Edu.**  
600 East Boulevard Avenue, Dept. 270  
Bismarck, ND 58505-0610

Director  
**Department of Commerce**  
P O Box 2057  
Bismarck, ND 58503

State Health Officer  
**Department of Health**  
600 East Boulevard Avenue  
Bismarck, ND 58505-0200

Executive Director  
**Department of Human Services**  
600 East Boulevard Avenue, Dept. 325  
Bismarck, ND 58505-0250

Commissioner **Department of Labor**  
600 East Boulevard Avenue, Dept. 406  
Bismarck, ND 58505-0340

Director  
**Department of Transportation**  
608 East Boulevard Avenue  
Bismarck, ND 58505-0700

Director  
North Dakota Department of Commerce  
**Economic Develop. & Finance Division**  
P O Box 2057  
Bismarck, ND 58503

**Energy Development Impact Office**  
P O Box 5523  
Bismarck, ND 58505-5523

Director  
**Game and Fish Department**  
100 North Bismarck Expressway  
Bismarck, ND 58501-5095

State Geologist  
**Geological Society**  
600 East Boulevard Avenue  
Bismarck, ND 58505-0840

Governor  
**State of North Dakota**  
600 East Boulevard Avenue  
Bismarck, ND 58505-0001

Executive Director  
**Indian Affairs Commission**  
600 East Boulevard Ave. Rm 117  
Bismarck, ND 58505

Executive Director  
**Job Service North Dakota**  
P O Box 5507  
Bismarck, ND 58506-5507

**Parks & Recreation Department**  
1600 East Century Avenue, Suite 3  
Bismarck, ND 58503-0649

Soil Conservation Specialist  
**State Soil Conservation Committee**  
2718 Gateway Avenue, Unit 104  
Bismarck, ND 58503

Director  
**State Historical Society of North Dakota**  
612 East Boulevard Avenue  
Bismarck, ND 58505-0830

Commissioner  
**State Land Department**  
P O Box 5523  
Bismarck, ND 58505-5523

State Engineer  
**State Water Commission**  
900 East Boulevard Avenue, Dept. 770  
Bismarck, ND 58505-0850