

Opportunities and Challenges: Transmission in Minnesota



Transmission opportunities in Minnesota

Transmission lines are like highways for electricity, moving power from where it is produced to the cities and communities needing it.¹ Upgrading and expanding Minnesota's transmission grid offers many benefits to rural communities. Developing new transmission lines creates jobs in construction, maintenance, and operations, and enables future power-generation projects.² These efforts create an economic boost for area businesses, as well as tax benefits for the community for years to come. Reliable transmission also attracts manufacturing and other industries, bringing additional job opportunities and making transmission expansion beneficial for the local economy.³

In Minnesota, the new 2040 carbon-free electricity law has heightened an already high demand for connecting renewable energy projects to the transmission grid. Passed in 2023, the law commits the state's utilities to provide their Minnesota customers with 100% carbon-free electricity by 2040, with reporting benchmarks every five years.⁴

As a first step, state and utility officials must:

- Address the rising barriers of transmission congestion and connection problems that could determine whether the state can reach its 2040 goal.
- Work to expand and upgrade the transmission system, which is an important grid component as it helps lower overall energy prices, reduces the magnitude of future price spikes, contributes to a more stable electric grid, and provides more opportunities to connect renewable energy projects to the grid.⁵

Sources

1 Crawford, Brandon. "The Energy Highway: How electricity reaches your home." Citizens Utility Board of Minnesota, Aug. 17, 2023, cubminnesota.org/the-energy-highway-how-electricity-reaches-your-home. Accessed April 2024.

2 "Transmission: Expanding Transmission Helps Local Economies, Strengthens Electric Grid." American Clean Power, November 2023, cleanpower.org/wp-content/uploads/2023/11/ACP_Expanding_Transmission_FactSheet_2023.pdf. Accessed April 2024.

3 Ibid.

4 Olson, Jo. "Minnesota's 100% clean electricity law explained." Fresh Energy, Feb. 20, 2023, fresh-energy.org/minnesotas-100-clean-electricity-bill-explained. Accessed April 2024.

5 Crawford, Brandon. "Electricity Transportation: Why more transmission highways are needed." Citizens Utility Board of Minnesota, Aug. 31, 2023, cubminnesota.org/the-breakdown-of-electricity-transportation-why-more-transmission-highways-are-needed. Accessed April 2024.

Grid investments with economic benefits

In 2023, the U.S. Department of Energy provided \$464 million to help build the Long Range Transmission Planning Tranche 1 portfolio, composed of five high-voltage transmission lines that will span seven states, including Minnesota.⁶

- The portfolio includes an investment of \$10.3 billion into 18 grid projects across the Midwest.
- Overall, Tranche 1 will enable the connection of about 50 gigawatts of renewables, powering 12 million homes and creating more than 200,000 jobs.⁷ About 56,000 of the jobs will be for wind, solar, hybrid, and battery storage projects in Minnesota, western Wisconsin, and North Dakota.⁸

At the state level, Minnesota is seeing economic benefits of transmission through taxes paid on power lines. For example, Jackson County's portion of the 2024 powerline tax was more than \$2.3 million. The revenue is part of the county's annual budget.⁹

The historic investment allows states to leverage federal clean energy funding to deliver reliable, affordable, and safe energy that is increasingly generated by carbon-free and renewable energy resources.

Transmission capacity challenges

Adequate transmission is essential to ensure Minnesotans have reliable electrical service. The 2023 Biennial Transmission Projects Report identified 164 present and foreseeable transmission inadequacies across the state, an increase from a 2021 report that identified 103 transmission inadequacies.^{10,11} Inadequate transmission capacity makes it difficult to connect new renewable energy projects to the grid and increases the cost of power delivered on the system.¹² The identified inadequacies fall into one or more of the following general categories.

- Load interconnection
- Generator interconnection
- Thermal overloads
- Voltage violations

Congestion on the transmission grid can cost Minnesota communities when the infrastructure cannot support the amount of energy generated.

Sources

6 "MN Commerce Department and regional grid operators receive \$464 million from U.S. Department of Energy for innovative electric grid project." Minnesota Department of Commerce, Oct. 18, 2023, mn.gov/commerce/news/?id=17-596688. Accessed April 2024.

7 "Fact Sheet: Renewable Energy & Jobs Impacts via MISO's New Portfolio of Regional Transmission Lines." Clean Grid Alliance, cleangridalliance.org/_uploads/_media_uploads/_source/RE_and_Jobs_impacts_-_MISO_Tranche_1-converted.pdf. Accessed April 2024.

8 Ibid.

9 Personal communication, Kevin Nordquist, Jackson County Auditor/Treasurer, Jackson County, Minnesota, March 29, 2024.

10 "Minnesota's Electric Transmission System, Annual Adequacy Report." Minnesota Department of Commerce, Minnesota Public Utilities Commission, Jan. 15, 2024, lrl.mn.gov/docs/2024/mandated/240278.pdf. Accessed April 2024.

11 "2021 Biennial Transmission Projects Report." Minnesota Electric Transmission Planning, Oct. 29, 2021, minnelectrans.com/documents/2021_Biennial_Report/2021-Biennial-Transmission-Projects-Report.pdf. Accessed April 2024.

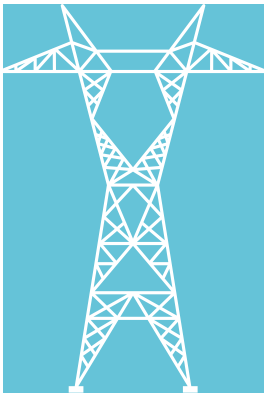
12 "Minnesota's Electric Transmission System, Annual Adequacy Report." Minnesota Department of Commerce, Minnesota Public Utilities Commission, Jan. 15, 2022, house.mn.gov/comm/docs/50851SkFrE6Ed8AqqQoScw.pdf. Accessed April 2024.

Wind farms pay tax revenue to the communities hosting them based on the energy produced. In 2021, some Minnesota townships in the Buffalo Ridge area saw a more than 50% reduction in wind energy production and associated tax revenue due to congestion.¹³ Additionally, more than \$1 million in revenue was lost among three rural Minnesota counties, and another \$700,000 was lost among 15 more.¹⁴

Permitting delays inhibit clean energy connections

According to a 2023 policy statement from the American Society for Civil Engineers, more than 640,000 miles of high-voltage transmission lines across the country are at full capacity.¹⁵ Minnesota's permitting process for clean energy projects is slower than necessary, due in part to inefficiencies, and that hampers the ability to build transmission projects to improve capacity.

For example, the permitting process for large transmission lines that move clean energy across the electric grid averages 673 days.¹⁶ That leaves many projects stuck in the Midcontinent Independent System Operator's queue, waiting for available capacity on the transmission system. Investments in new and improved transmission lines will help reduce strain on the grid and enable the connection of wind, solar, and storage for reliability and fuel cost savings.



With the use of electricity on the rise, the changing energy generation mix, and the growing impact of weather-related events, today's maxed-out grid cannot meet demand with the lowest-cost generators. While there are capacity challenges and permitting delays, opportunities exist for the expansion of transmission to provide Minnesota with economic opportunities and help the state meet its carbon-free electricity goals.

Sources, continued

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14 Ibid.

15 "Policy statement 484 - Electricity generation and transmission infrastructure." American Society of Civil Engineers, July 22, 2023, asce.org/advocacy/policy-statements/ps484---electricity-generation-and-transmission-infrastructure. Accessed April 2024.

16 Rosenthal, Aaron. "Powering Progress: Transforming Clean Energy Permitting for a Greener Minnesota." NorthStar Policy Action, media. websitescdn.net/sites/949/2024/03/Powering-Progress.pdf. Accessed April 2024.