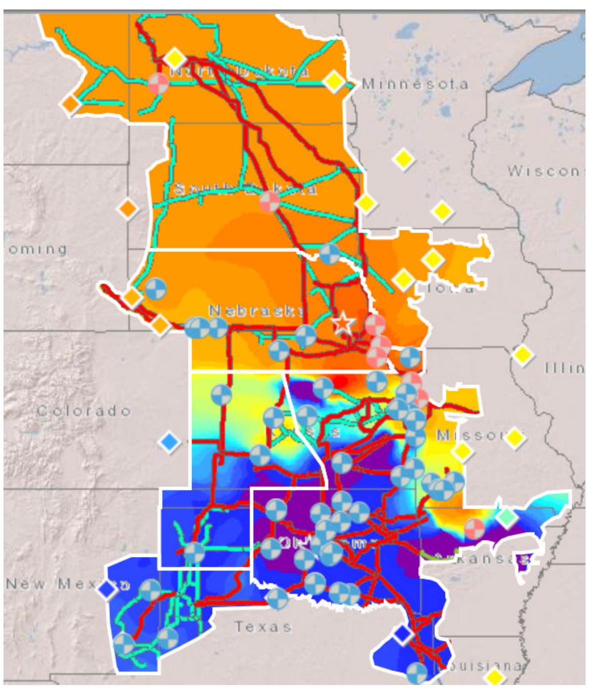
Winter Storm Fern: Transmission Constraints, Price Spikes, and Grid Reliability

A brief backgrounder on market outcomes and transmission performance during the January 2026 cold snap.

Key Takeaways

Transmission and Fern

- Winter Storm Fern began January 25, 2026, bringing a prolonged cold snap across much of the United States.
- Throughout this period, market data showed price separation – that is, where power gets trapped behind a transmission bottleneck, it results in a price spike on the other side of the constraint because of a lack of sufficient power.
- The result is price spikes in constrained areas, leading to cost increases for customers.
- Regional and interregional transmission mitigates these constraints and save customers money by allowing regions to share surplus power during extreme weather instead of raising prices through reliance on only local generation.



For instance, along the MISO–SPP border in Missouri, wind power was available but stuck behind a constraint, while gas plants struggled in sub-20°F temperatures. Market analysts have noted that relieving this bottleneck could have significantly reduced prices on the constrained side of the interface.

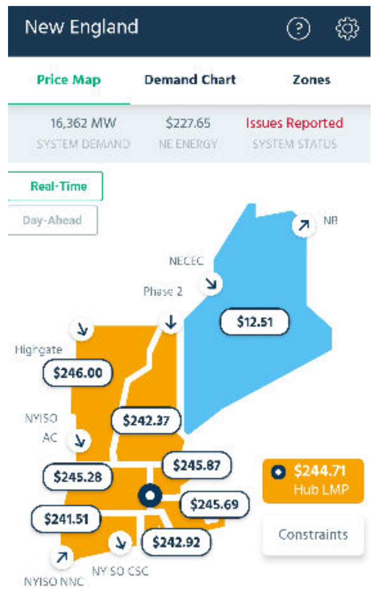
We also saw negative prices in places like Illinois, while prices spike in Indiana, Michigan, and Louisiana, because low-cost wind physically can't move to higher-demand areas. In

PJM, wind was curtailed not because it isn't blowing, but because limits on major transmission ties prevent it from flowing east to where load (and prices) are higher.

During the storm, outages and fuel supply disruptions also affected some gas plants in several regions, reinforcing the value of a diverse generation mix and stronger transmission connections that allow regions to rely on a wider pool of resources during extreme weather.

NECEC

The New England Clean Energy Connect (NECEC) began operation on January 16, 2026, and has already begun reducing prices in Maine where it delivers power. Here is a snapshot showing price separation between Maine, which receives power from the NECEC, and the remainder of ISO-NE, which would clearly benefit from additional regional transmission.



- However, during Winter Storm Fern, it did not consistently deliver hydropower to Massachusetts because of the contractual agreement that applies to power sold on the line, and the market conditions in Quebec during the cold snap. Quebec faced its own extreme weather and demand needs during the storm, but the transmission line operated as intended.
- The episode underscores the importance of greater investment in intraregional and interregional transmission to improve system resilience during extreme conditions.

Transmission Means Increased Reliability and Decreased Costs

- Overall, well-planned, long-distance, high-capacity transmission delivers both reliability and cost savings – providing roughly $5 in economic and reliability benefits for every $1 invested.

Background

Transmission and Winter Storm Fern

- During Winter Storm Fern, the cold snap strained power systems, market data show that transmission bottlenecks are driving sharp electricity price differences on opposite sides of constraints.
- Transmission shows its value during extreme weather through price separation – when low-cost power is available in one part of a region but cannot reach customers elsewhere because transmission capacity is limited. When that happens, customers in constrained areas must rely on higher-cost local generation resources, even though cheaper power exists nearby.
- Nationwide, grid congestion costs have exceeded $10 billion per year for four consecutive years, reaching more than $12 billion in 2024. Prior to 2021, congestion costs had generally remained below $6 – 8 billion annually – highlighting how transmission constraints are becoming more frequent and more expensive.
- Recent market outcomes during this storm illustrate the problem clearly:
    - In PJM Interconnection, electricity prices exceeded $1,500/MWh at some Mid-Atlantic nodes, while prices were negative in nearby parts of Illinois at the same time.
    - In Texas and across parts of the Midwest, congestion drove prices above $1,000/MWh in constrained areas, even as wind-heavy regions experienced negative prices because surplus generation could not be delivered.
    - Along the MISO–SPP border in Missouri, wind power was available but trapped behind a binding transmission constraint, while gas plants struggled to perform in sub-20°F temperatures. Analysts estimate that relieving this bottleneck could have lowered prices on the constrained side by more than $800/MWh.
- More broadly, negative prices in Illinois are occurring at the same time as price spikes in Indiana, Michigan, and Louisiana, because low-cost wind generation physically cannot move to higher-demand areas. In PJM, wind is being curtailed not because it isn't producing, but because limits on major transmission ties prevent it from flowing east to where load – and prices – are higher.

At the same time, outages and fuel supply disruptions affecting some gas generators during the cold snap highlight the importance of maintaining a diverse resource mix and strengthening transmission connections so regions can draw on resources from a wider geographic area during extreme weather events.

- These storm-driven price splits are exactly what regional and interregional transmission is meant to address. Transmission saves customers money by allowing regions to share surplus power during extreme weather instead of forcing customers to rely on the most expensive local resources.

The NECEC Line During Winter Storm Fern

- One of the major transmission-related stories during Winter Storm Fern involved the New England Clean Energy Connect (NECEC), a newly energized transmission line running from Quebec through western Maine. NECEC was designed to deliver hydropower from Hydro-Québec to Massachusetts under a state procurement that dates back to 2016.
- During parts of Winter Storm Fern, Hydro-Québec did not deliver power via NECEC and at times was importing power from New England through a separate transmission line. This outcome was not the result of a transmission outage or constraint. Quebec was experiencing extreme weather at the same time and required resources to meet its own local demand. More broadly, Quebec has regularly imported power from New England in recent years, including following droughts that reduced hydropower availability.
- If anything, the situation that unfolded in New England reinforces the need for greater investment in intraregional and interregional lines. One line doesn't solve all of our problems. It takes multiple to ensure a reliable and resilient grid that mitigates against price spikes.
    - During Winter Storm Uri in 2021, regions such as MISO, SPP, and PJM were able to exchange power across numerous transmission interfaces, helping maintain reliability across the broader Eastern Interconnection. By contrast, Texas has only two direct current (DC) transmission ties to the Eastern Interconnection, contributing to its limited ability to import power during that event.
- Bottom line: Imports via the NECEC will be an important part of the robust and diverse portfolio of resources that are needed to meet the region's needs. Building additional planned transmission within New England would spread those benefits further across the region.
- While New England did not experience power outages as a result of reduced NECEC deliveries, the unexpected lack of supply required increased reliance on oil-fired generation. These units were operating in part to ensure that limited natural gas supplies were preserved for home heating during the cold snap.
- To maintain system reliability, ISO New England requested and received emergency authorization under Federal Power Act section 202(c) from the U.S. Department of Energy, allowing generators to operate at maximum output levels regardless of certain environmental regulations. DOE granted similar authorizations during the storm for ERCOT, NYISO, PJM, and Duke Energy.
- Under the contracts between Hydro-Québec and Massachusetts utilities, Hydro-Québec could face penalties for nonperformance, depending on the circumstances.
    - Reporting by RTO Insider notes that the power purchase agreement allows for supply interruptions without penalties in cases of force majeure or physical outages, and that other interruptions can be cured through additional deliveries in the same or following year under comparable conditions.

- NECEC remained operational throughout the storm and continued to support grid stability. The reduced southbound flow reflected resource availability and contractual provisions, not a failure of transmission infrastructure.

Transmission Means Increased Reliability and Decreased Costs

- Our recent study from last summer showed $5 in reliability and economic benefits for every $1 invested in well-planned, long distance, high-capacity transmission.
    - Specifically that study shows that well-planned transmission reduces congestion on the grid, unlocks access to lower-cost generation resources, and improves overall system efficiency. By displacing more expensive or underutilized local generation, transmission reduces the cost of supplying electricity, ultimately leading to lower retail electricity prices for consumers.
- According to a recent study by WIRES and Grid Strategies, for every $1 billion in transmission investments that is delayed, consumers lose between $150 million and $370 million in net benefits per year of delay
- Increased transmission capacity is critical to improving grid reliability. Incremental interregional transmission enables higher generation diversity and access in the face of uncertainties like fuel or generation loss, transmission outages, and extreme weather events.
- Such benefits were evident during Winter Storm Uri. While MISO and SPP experienced a “handful of short duration” outages, ERCOT’s capacity outages averaged 34,000 MW for two consecutive days. More than 4.5 million people lost power, some for up to four days, while temperatures were below freezing. ERCOT has just two DC transmission tie lines to the Eastern Interconnection and imported only 800 MW of power throughout the week. MISO’s imports, meanwhile, peaked at 13,000 MW.
- During Winter Storm Elliott, one additional gigawatt of interregional transfer capability between TVA and MISO would have delivered $79 million in savings.