Transmission & Reliability

How Transmission Keeps the Lights On

Americans for a Clean Energy Grid

Nearly all aspects of modern life depend on reliable electricity. But as extreme weather events become more frequent and the demand for electricity from cars, buildings, and other sectors increases, the strain on our grid only grows. Transmission planners, regulators, and policymakers need to plan *today* to build a modern, reliable grid for *tomorrow.*

"We're just crossing our fingers, hoping that nothing terrible happens again. This all comes down to, for me, reliability And reliability is about risk. So we all need to ask ourselves, what is our risk tolerance?"
— FERC Chairman Willie Phillips, Federal-State Task Force, July 2022

System Shocks — Responding to Extreme Weather

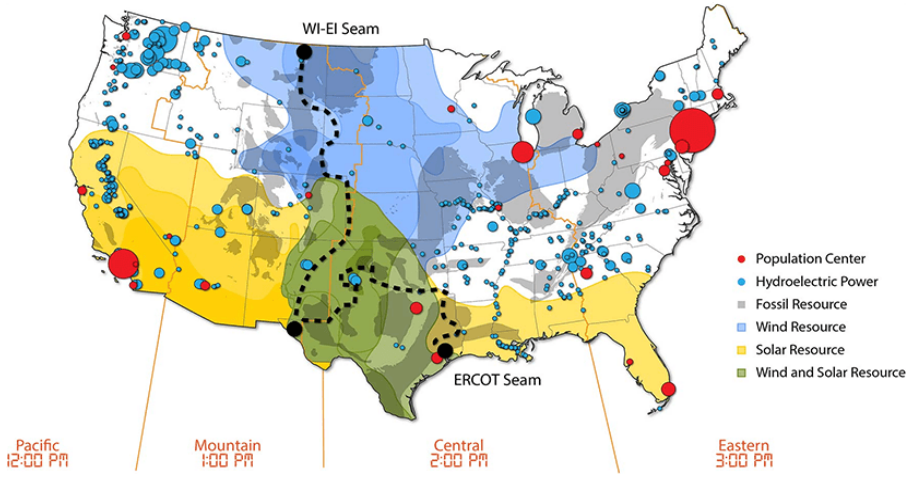
Our electric grid was not designed to withstand the ever-increasing quantity and severity of extreme weather events — from heat waves to winter storms. A 2020 analysis found that major power outages from weather-related events had increased 67% since 2000.[1]

Transmission keeps the lights on by allowing regions to share energy with their neighbors in the event of local disruptions. In a simulation based on a real-world heat wave, unconstrained transmission would have prevented 740,000 customers from losing power. In a simulated polar vortex, transmission would have averted outages for 2 million East Coast customers.[2]

Power outages can be deadly. During Winter Storm Uri in 2021, more than 4.5 million people in Texas lost power while temperatures were below freezing. More than 200 people died, the majority from hypothermia, carbon monoxide poisoning, and other outage related causes.[3]

- **Winter Storm Uri:** The grid operator for Texas, ERCOT, has only two DC transmission tie lines to the Eastern Interconnection and imported just 800 MW of power from SPP over the course of a week. Meanwhile, the Midwest states have hundreds of tie lines with other balancing areas and imported 13,000 MW at the height of the storm, suffering only minimal outages as a result.[4]

- **Winter Storm Elliott:** In December 2022, Winter Storm Elliott caused rolling blackouts in the Southeast because local generation equipment could not perform. Utilities were able to prevent more prolonged outages by importing electricity from MISO and PJM. The central U.S. had more energy — specifically wind — available to share but lacked the transmission capacity to transport it.[5]



Source: National Renewable Energy Laboratory

System Shocks — Protecting Grid Security

Transmission allows resources to be transported across wide areas, making targeted cyber or physical attacks on the grid more difficult to plan and execute. According to leaked excerpts of a 2014 FERC report, "If terrorists are ever able to knock out nine of the nation's 55,000 substations, the U.S. power grid could suffer coast-to-coast blackouts lasting 18 months or more."[6] Greater transmission also allows the U.S. to make full use of its domestic energy resources, reducing dependency on volatile foreign sources.

Reliable Electricity, Every Day of the Year

Transmission helps keep the lights on every day — by reducing grid strain and enabling access to geographically diverse, low-cost energy resources. If the Midwest is producing ample wind energy while New England faces high wintertime demand, grid operators can import cheap, renewable power rather than producing more energy locally. This flexibility reduces the overall generation capacity required to power the grid, and is particularly important as more people power their heating and cooling systems with electricity.

> *"We're in a foot race between implementing this solution and the next time we get hit. If somebody gets hit and we didn't act, it's on us."*
> **— Ted Thomas, Chairman, Arkansas Public Service Commission**
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> *"We know that improving our connectivity with our neighbors will make us more resilient because we've seen it. There is absolutely an appetite that if there were projects to improve resilience."*
> **— Andrew French, Kansas Corporation Commission**

What's Needed?

- **FERC:** In its upcoming final rulemaking, the Commission should require transmission plans to address long-term reliability. This will ensure transmission planning is sufficiently forward-looking as U.S. energy needs rapidly evolve. FERC should also develop a minimum transfer capacity standard that ensures regions can share power with each other.

- **States and RTOs:** Regardless of federal action, state and regional authorities should act now to plan a true grid of the future, taking expected future reliability needs into account. Regions should collaborate to develop sufficient interregional connections to withstand extreme weather and other system disruptions.

Sources

1 Kenward, Alyson, et al, "Power Off: Extreme Weather and Power Outages," (Sept. 2020).

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5 Massie, Toth, Wasted Wind and Tenable Transmission during Winter Storm Elliott (Feb. 2023).

6 Davide Savenije and Ethan Howland, Could terrorists really black out the power grid?, Utility Dive (March 2014).