Powering Growth and Affordability

The Role of Transmission in Economic and National Security

Expanding the US transmission grid can save customers billions of dollars, improve reliability, and strengthen national security. The study shows that delaying transmission expansion costs more than building it.

The Challenge

Surging demand. By 2035, electricity demand could grow dramatically as data centers, manufacturing, electrification, and other large energy users connect to the grid.

Grid bottlenecks. The grid cannot always move electricity where it is needed most. Existing transmission constraints make it harder to connect growing communities and businesses with lower-cost power.

Overview: Transmission expansion delivers value in every future studied. Connecting regions with interregional transmission delivers the biggest gains. Scenarios with expanded interregional transmission deliver two to three times more value than scenarios without it.

Costs are rising and affordability is becoming a growing concern. Without faster transmission expansion, regions must rely on more expensive local resources, congestion increases, economic growth is stalled, and reliability and energy security risks go up.

What the Study Did

S&P Global CERA Consulting examined four regions within the Eastern Interconnection to evaluate how transmission expansion could help meet growing electricity demand, improve reliability, support economic growth and national security, and reduce overall system costs through 2050. The study compared scenarios with limited grid expansion to scenarios where new transmission can be built, identifying the most cost-effective mix of transmission and power generation in each scenario.

Our Key Findings

Customer savings. Transmission delivers benefits in every scenario studied, generating up to $15.3 billion in system value through 2050 compared to scenarios where limited transmission is built. It also sets the stage for lower customer rates, with the largest potential gains in PJM.

Reliability. New transmission improves reliability by making it easier to move power, reduce congestion, and share energy supply across regions.

National security. Reliable transmission supports military installations, defense communities, and the 200,000-company defense industrial base.

Power generation growth. All scenarios assume continued conventional and renewable generation, storage, and advanced nuclear growth; transmission helps deliver that generation where it's needed.

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Key finding: The cost of not building transmission is measured in billions. Transmission-constrained futures leave up to $8.4 billion in potential system value on the table compared with futures that allow greater interregional transmission.

The Cost of Inaction

Higher customer bills. Without faster transmission expansion, customers could pay hundreds of millions of dollars more each year for electricity.

Greater outage risk. Regions with limited transmission expansion may be less able to share power during emergencies or periods of extreme demand.

Higher energy prices. Congested transmission forces reliance on more expensive, less efficient, local resources and infrastructure, adding billions in avoidable capital and production costs by 2050.

Lost economic opportunity. Regions unable to expand transmission risk losing new commercial, manufacturing, and industrial investment to areas with more available grid capacity.

National security exposure. A Virginia case study found that only a modest increase in electricity demand from military facilities and defense-related industries could require significant transmission upgrades.

The Bottom Line

Across every scenario studied, transmission delivers more benefits than costs, returning up to $1.89 in system-wide benefits for every dollar invested. In PJM, benefits exceed $2.30 per dollar invested in high load growth scenarios.

By the Numbers

$15.3B

Maximum net system value delivered through 2050 by transmission expansion in the study's high-demand future.

2 – 3X

More Value. Scenarios with expanded interregional transmission delivered two to three times more value than scenarios without it.

$8.4B

Potential system value left on the table when transmission expansion is constrained.

374 TWh / 45 GW

Additional electricity demand and peak load expected by 2035, driven largely by data centers, manufacturing, and other large energy users.

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