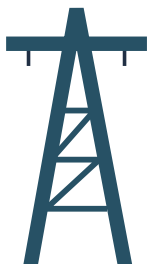


2050 Transmission Study



ISO New England's landmark 2050 Transmission Study offers an overview of the investment needed into the middle of the century to ensure bulk power system reliability throughout the clean energy transition. The results were driven by assumptions about the future resource mix and demand for electricity, provided by the New England states via the Massachusetts Energy Pathways to Deep Decarbonization study.

Under these assumptions, upgrades will be needed to avoid overloading transmission lines and transformers as residents and businesses increasingly rely on electricity to heat buildings and power vehicles, and as offshore wind facilities and other remote renewable resources produce a greater share of the region's power. The study did not examine potential costs to upgrade the distribution system.

Key Takeaways

Reducing peak load significantly reduces cost.

The study analyzed two winter peak loads for 2050: 57 gigawatts (GW), and a 10% reduction to 51 GW. Costs to support the higher peak were nearly \$10 billion greater.

Targeting high-likelihood concerns is highly effective.

Certain transmission system concerns are likely to appear in a wide range of possible scenarios. Projects that address these concerns offer the greatest benefits.

The region can make incremental upgrades.

Rebuilding existing lines with larger conductors, rather than building new lines, could minimize costs – especially in densely populated areas in southern New England.

Generator locations matter.

Locating power producers and connections to offshore wind closer to large population hubs will help reduce strain on the transmission system.

Transformer capacity is crucial.

The system's existing transformers were not designed to handle the vast increases in demand associated with an electrified economy. Adding transformers throughout the system could relieve overloads and support reliability.

Costs in Context

The study's cost estimates should be viewed in the context of how much the region has historically spent on transmission system upgrades each year. **The table below shows how the annual averages for the estimates compare to investment so far this century** to ensure reliability and replace aging equipment.

Timeframe	Average Cost Per Year	Total Costs
2002–2023	\$0.73 billion	\$15 billion
2024–2050 (51 GW peak)	\$0.62 billion to \$0.65 billion	\$16 billion to \$17 billion
2024–2050 (57 GW peak)	\$0.88 billion to \$1.00 billion	\$23 billion to \$26 billion

The study is an unprecedented look at the future of New England's transmission system. Its findings will help stakeholders and the ISO make important decisions about improvements and pathways forward.

Roadmaps

The study developed potential solutions for areas that saw groupings of high-likelihood transmission concerns. **Each "roadmap" consists of several major components, paired with rebuilds of existing lines and other elements to form a complete solution for the relevant area.** While the roadmaps consider both the feasibility of construction and cost, they are not comprehensive or detailed plans for specific projects.

The study presents roadmaps for Greater Boston and northeastern Massachusetts, northwestern Vermont, and for power transfers between northern and southern New England. It also explores solutions in southwestern Connecticut.

Next Steps

The study does not recommend one roadmap over another. The roadmaps are intended to provide a basis of comparison for decision-making by New England stakeholders. The longer-term transmission study process is currently informational, and it does not include a formal mechanism for triggering the construction of new transmission projects.

Stakeholder discussions are underway around creating a process to facilitate the states' achievement of their policy goals. The process will allow the ISO and the New England States Committee on Electricity (NESCOE) to choose which transmission system concerns to address, and to solicit project proposals and advance them toward construction.



ISO New England is the not-for-profit corporation responsible for keeping electricity flowing across the six-state New England region: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. The company's power system engineers, economists, computer scientists, and other professionals ensure that the region has reliable, competitively priced wholesale electricity today and into the future. The ISO is independent – none of the ISO's board members, officers, or employees has a financial interest in any company doing business in the region's wholesale electricity marketplace. The Federal Energy Regulatory Commission (FERC) regulates the ISO.