Macro Grid Initiative

An **ACORE** Program

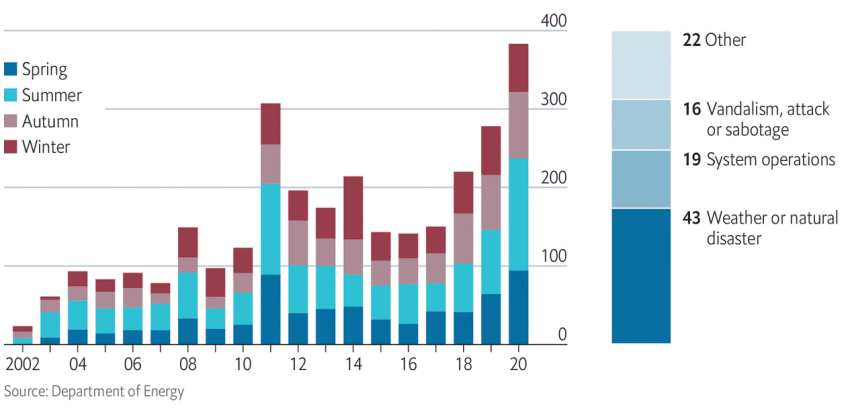
National Security Depends on a Robust Transmission Grid

Reliable electric power is essential to our national security. As the backbone of the nation's electric power grid, a more robust high-voltage transmission network would help ensure U.S. military bases and emergency services in their surrounding communities remain fully operational at all times. Strategic investments in the nation's high-voltage transmission backbone will add new capacity and flexibility, enabling the system to withstand extreme weather events and other threats. Moreover, increased electrification of transportation expected in the years ahead will help reduce our dependence on foreign oil while also mitigating the worst effects of climate change. Expanding transmission to tap the nation's lowest-cost clean energy resources to serve that demand is critical.

Robust transmission ensures reliable electric power for mission assurance and the people and communities supporting military bases.

The Department of Defense runs global military operations from U.S. bases, which require a resilient and dependable power supply to ensure mission readiness. To complement on-base generation and microgrids, a reliable power grid is vital to support the thousands of military workers working and living on- and off-base, and the goods and services supporting these U.S. bases and the surrounding communities. Extreme weather events are increasing in frequency and severity and are already the principal contributor to the recent increase in the duration of U.S. power outages.[1] Ensuring continuous reliability requires a more robust, better-interconnected transmission network.

Weather-driven power outages are increasing



Source: Department of Energy

The Economist

Robust transmission ensures reliable electric power in the face of new and changing threats.

Power systems are subject to an increasing variety and magnitude of threats. While traditional reliability protocols plan for reliable operation during and after system contingencies, such as large generator or transmission line outages, changing threats call for more robust regional and interregional transmission. A recent report by national security experts noted: "Our electricity grid's resilience—its ability to withstand shocks, attacks and damages from natural events, systemic failures, cyberattack or extreme electromagnetic events, both natural and man-made—has emerged as a major concern for U.S. national security and a stable civilian society."[2] The report points to large-scale transmission as a solution: "Transmission buildout is critical to resilience as it can relieve line overloading—or 'congestion' in industry jargon—on the existing system, lessening the compounding risks that come with a strained grid that could then be tested by an extreme weather event or an attack incident. Moreover, by enabling further development of renewable energy resources over wider geographic areas, well-planned transmission expansion can make targeted attacks on the grid more difficult to plan and carry out."[3]

Expanding the transmission system can help facilitate a reduced dependence on oil.

Our nation's continued reliance on fossil fuels leaves us vulnerable to the fluctuations of global oil markets and foreign actors. Electrification of transportation can significantly reduce America's dependence on globally priced energy sources, such as oil. It will also increase power demand and strain current transmission capacity. Improving access to low-cost renewables is the best way to address the anticipated surge in electricity needs.[4] A recent Princeton study found that the U.S. will need to expand our current transmission grid 60 percent by 2030 to accommodate decarbonization goals, which would include increasing the percentage of American light-duty vehicles to 17 percent.[5] That study also found that achieving a 96 percent electrified vehicle fleet by 2050, in addition to other grid decarbonization goals, will require more than tripling the size of the existing U.S. transmission grid.[6] Other studies from MIT and NREL have reached similar results.[7]

A robust transmission system is necessary to reduce greenhouse gas emissions to avoid the worst impacts of climate change.

Rapid decarbonization of the electricity, transportation, and commercial and residential buildings sectors requires a national transmission network optimized for the best wind and solar resources. Researchers at Princeton University, MIT and the National Academies of Science, Engineering and Medicine project this transformation of the electricity system will require, at a minimum, doubling the existing transmission capacity. According to NREL, the resilience benefits of these strategic investments exceeds the costs.[8]

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ENDNOTES

[1] Allen-Dumas et al., Extreme Weather and Climate Vulnerabilities of the Electric Grid: A Summary of Environmental Sensitivity Quantification Methods, OAK RIDGE NATIONAL LABORATORY (2019) (noting that "Extreme weather is the leading cause of electric power outage events, especially for the most significant disruptions" and "Climate change has led to an increase in the frequency and intensity of extreme weather events, raising concerns about the resilience of the electric grid to present and future climate and weather hazards. For example, increased severity of extreme weather events was the principal contributor to an observed increase in the duration of U.S. power outages between 2000 and 2012.") https://www.energy.gov/sites/prod/files/2019/09/f67/Oak%20Ridge%20National%20Laboratory%20EIS%20Response.pdf

[2] NCGR, Grid Resilience: Priorities for the Next Administration, at 1, 2020.

[3] Id.

[4] Larson et al., Net-Zero America: Potential Pathways, Infrastructure, and Impacts, PRINCETON UNIVERSITY (2020) https://netzeroamerica.princeton.edu/img/Princeton_NZA_Interim_Report_15_Dec_2020_FINAL.pdf

[5] Id.

[6] Id.

[7] Brown and Botterud, The Value of Inter-Regional Coordination and Transmission in Decarbonizing the US Electricity System, JOULE (2020) https://doi.org/10.1016/j.joule.2020.11.013

Mai et al., Electrification Futures Study: Scenarios of Electric Technology Adoption and Power Consumption for the United States, NATIONAL RENEWABLE ENERGY LABORATORY (2018) https://www.nrel.gov/docs/fy18osti/71500.pdf