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National Academies report: US grid still vulnerable, action needed

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By [Andrew Coffman Smith](#)

Increasing the resiliency of America's power grid from natural disasters and malicious attacks will require more emergency drills, investment in backup infrastructure and increased coordinated actions between the electricity industry and all levels of government, a new congressionally mandated report recommends.

The National Academies of Sciences, Engineering and Medicine released on July 20 a report, "Enhancing the Resilience of the Nation's Electricity System," on reducing the vulnerability of the U.S. grid to prolonged blackouts that could last three days or longer and extend over several service areas or states. Threats studied in the report include hurricanes, earthquakes, solar storms, cyberattacks by hackers, physical attacks and major operational errors. Congress requested the independent assessment and recommendations from the Academies in 2014 appropriations for the U.S. Department of Energy.

"Outages of this scale leave millions of customers without power, resulting in economic damages estimated in the billions of dollars, posing serious threats to health and public safety, and also potentially compromising national security," said M. Granger Morgan, a professor of engineering at Carnegie Mellon University and chair of the congressionally appointed committee behind the report. "Outages caused by natural disasters are more common than one might think. While the U.S. has not been subject to a large physical assault or cyberattack, both pose serious and growing risks."

At the top of its list of recommendations, the national scientific academy called for an increase in regional emergency preparedness exercises by the electricity industry, in coordination with regional and state agencies, the Federal Energy Regulatory Commission and the North American Electric Reliability Corp., which oversees the resiliency and reliability of the grid for the continental U.S., most of Canada and Baja California, Mexico. These exercises include simulations of accidental failures and forced outages that result in large-scale loss of power.

As there is no single entity in charge of planning, operating or regulating America's grid, the Academies said the task of increasing resiliency will require coordinated actions by state, federal, private and public groups, along with increased cooperation among utility operators, other industry stakeholders, the DOE and the U.S. Department of Homeland Security.

The committee's report also called for increased private and public investment in physical resources to ensure critical electric infrastructure is robust and society is able to cope when the grid does fail. For instance, the study said federal agencies like Energy and Homeland Security should oversee the development of more reliable inventories of backup generation needs and capabilities, like the U.S. Army Corps of Engineers' mobile generator fleet. Priority should also

be given to improving the resiliency and recovery of critical services like electricity for hospitals, first responders, water supplies and communications systems.

The report offers other specific and detailed actions that can be taken by federal, state and regulatory agencies. Among them is the recommendation that owners and operators of electrical infrastructure should work closely with the Energy Department to craft operational arrangements and develop and demonstrate technologies that minimize the likelihood of outages, reduce the impact of a blackout and accelerate the grid's recovery.