

Congress of the United States

House of Representatives

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

2321 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, DC 20515-6301

(202) 225-6371
www.science.house.gov

September 9, 2015

Honorable Gene Dodaro
Comptroller General
Government Accountability Office (GAO)
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Dodaro:

Maintaining access to our nation's electric power grid is critical to sustaining our economy, providing emergency and healthcare services, and supporting our national and homeland security. Access to electrical power, however, may be impaired or disabled due to severe storms, an aging electrical infrastructure, or physical or cyber attacks. Intentional or not, the results of these incidents are the same. Whether in sweltering heat or severe weather, the lack of electricity can pose serious dangers, particularly to young children, the elderly, and the infirm and result in major economic losses. When the power goes out grocery stores struggle to maintain their produce. Gas stations cannot continue to operate. Hospitals must rely on back-up generators for power. Schools close down. Businesses fail to open. Police, fire and other emergency response operators become overwhelmed. The consequences from a major loss of power are obvious.

In 2012, super storm Sandy damaged 650,000 homes, knocked out power to 8.5 million customers, and resulted in 72 deaths and an estimated \$65 billion in damages. An additional 87 deaths are considered indirectly due to Sandy, "50 of which were attributed to power outages."¹ Low level physical and cyber assaults against the grid are also routine. *USA Today* published an investigative report in March 2015 regarding security of the electric grid that found that physical attacks on the U.S. power grid occur more than once per week. Between 2011 and 2014 electric utilities reported that 348 physical attacks caused outages or other power disturbances. During the same time period 14 cyberattacks also caused similar outages.

Electricity outages pose serious dangers and result in major economic losses. A recent 'value of service' study estimated that the private cost of outages borne by customers who lost power due to weather events between 2003-2012 ranged from \$18 to \$33 billion per year. In years with

¹ "Economic Benefits of Increasing Electric Grid Resilience to Weather Outages," Executive Office of the President, August 2013, available here: www.whitehouse.gov/sites/default/files/docs/grid_resiliency_report_final.pdf

record breaking storms, weather related outage costs rose to between \$40 and \$75 billion.² This did not include costs associated with non-weather related outages.

The electric grid is one of the nation's 16 critical infrastructures, but it is considered a 'unique' critical infrastructure because so many of the other sectors, such as emergency services, communications, water and wastewater systems, financial services, and transportation systems are dependent on uninterrupted access to electricity to operate effectively. When the electric grid goes down, all the other services it enables stop functioning. And existing back-up systems may not be enough. Traditional back-up generators, for instance, frequently rely upon gasoline to provide emergency power, and are often only able to provide power for a few hours or a few days, at most. As seen in the aftermath of Hurricane Sandy, the ability to distribute gasoline to fuel emergency generators, automobiles, and other vehicles was severely limited because few gasoline stations had manual pumps that could operate without electricity, and most stations did not have their own back-up generators to keep the pumps working or to process sales.

It is unlikely that government, commercial, or other efforts will be able to prevent every unplanned outage or natural disruption of the U.S. power grid or for that matter every cyber or physical attack on the electricity infrastructure. In addition to a focus on prevention, the electrical system and the services that depend on it need to be hardened to withstand and quickly recover from unexpected challenges in general. These systems should be as resilient and flexible as possible so that they can quickly mitigate and respond to such outages and disruptions.

In 2014, GAO released a report on *Climate Change: Energy Infrastructure Risks and Adaptation Efforts*, describing energy infrastructure risks specifically related to weather. A year earlier, GAO released *Climate Change: Future Federal Adaptation Efforts Could Better Support Local Infrastructure Decision Makers*, looking at, among other things, "federal efforts to address local adaptation needs, as well as potential opportunities for improvement." These two reports are relevant to this request. The importance of hardening the electrical infrastructure and increasing its resilience to natural disasters and intentional attacks is reflected in a number of federal programs, but the actual implementation of these methods will primarily occur in the private sector, and at the local and state government levels. There are a number of new technologies, analytical tools, and operational measures that are being developed and tested to make the grid more resilient. But it is not clear how well these efforts will address the needs of power companies, utilities or governments or be implemented by them.

Given the issues highlighted above and the serious public consequences when towns, cities, states or regions loss power, I request that GAO address the following questions:

- **Grid Resiliency/Dependency.** What projects/programs has the federal government supported or is currently supporting that addresses the issues of grid resiliency and dependency? How successful have these efforts been and what lessons can be learned from them? Are there specific areas of federal research regarding the resiliency/dependency of the power grid that appear worthy of investment?

² Ibid.

- **Alternative Power Supplies.** What projects/programs has the federal government supported or is currently supporting that could help address short or long-term electric power outages, particularly at the local level, and provide temporary access to electrical power supplies that are not dependent on the bulk power infrastructure? How successful have these efforts been and what lessons can be learned from them? Are there specific areas of federal research regarding alternative electric power supplies that are not connected to the nation's power grid that appear worthy of investment?
- **Power Grid R&D.** What, if any, additional areas of federal research or development should be explored that could help identify solutions to provide local, state, or federal government agencies, businesses, homes, or essential services with alternative access to electricity when the bulk electrical system is experiencing an outage? Is there promising research in this area that is being supported by the private sector?

Please have your staff contact Douglas Pasternak of the Committee's Minority Staff at (202) 226-8892 to discuss this request.

Your assistance in this matter is greatly appreciated.

Sincerely,

A handwritten signature in blue ink, appearing to read "Don Beyer".

Donald S. Beyer, Jr.
Ranking Member
Subcommittee on Oversight
Committee on Science, Space & Technology