Improving State Coordination for Energy Assurance Planning and Response

Executive Summary

Governors have a critical responsibility to help their states prepare for and respond to natural or human-made disasters, including ensuring that the supply and distribution of energy are secure, reliable and sufficiently resilient to maintain public health and safety, support other critical infrastructure sectors and minimize economic losses. Given that such an effort involves multiple levels of government, the private sector and various non-governmental organizations, one of the most important activities governors can undertake is to effectively coordinate relevant entities within the state before, during and after a disaster. Multiple opportunities exist for governors to improve state coordination for responding to energy emergencies, through enhancements to energy assurance planning and information collection.

Recognizing this, the National Governors Association (NGA) convened a three-day learning lab in **New Jersey** in 2015 that helped governor-designated teams from six states—**Hawaii, Maryland, Michigan, North Carolina, Oklahoma** and **Rhode Island**—examine lessons learned from New Jersey's experience with Hurricane Sandy. State, local, federal and private entities shared their experiences responding to the storm, discussed how the state's institutional approach to response helped its efforts and described how the state has focused its approach since, particularly with respect to investments in infrastructure resiliency. This paper summarizes key takeaways and insights from the learning lab to help other states learn from New Jersey's experience.

Following the NGA learning lab, the six state teams developed specific action items to guide their efforts moving forward. Two actions were common to all six states:

- **Create more robust energy assurance plans**. This action includes ensuring that the plans address the threats to and consequences of any scenario that could affect the energy sector and are aligned with relevant emergency response plans.

- **Enhance communication and information sharing.** This action includes breaking down silos between state agencies that have a role in planning and response activities and improving information-sharing practices before and during disasters among state agencies, the federal government, local governments, utilities and private organizations.

The state teams identified the following other specific actions that warrant consideration:

- Develop and maintain a list of gubernatorial executive orders for use during an energy emergency;
- Create working groups or other opportunities for state-utility information sharing;
- Catalog critical energy infrastructure assets;
- Create or update annexes to state energy assurance plans to specifically address petroleum-based fuels; and
- Explore the feasibility of using distributed energy resources or microgrids to increase resilience.

Two recent developments in energy assurance are worth noting here: the emergence of state resilience officers and the interest in the role for alternative-fuel vehicles during response and recovery.

Introduction

Energy assurance includes efforts to ensure secure, reliable and resilient energy infrastructure and supply. It is a collaborative effort that relies on state, federal and local governments as well as the private sector and non-profit organizations. Energy assurance efforts should address all potential hazards—natural or human-made, physical or cyber—as well as electricity supply, natural gas supply and petroleum products. Because the energy sector supports additional critical infrastructure sectors, such as water, transportation, communications and health care, state energy assurance efforts can help maintain public health and safety and minimize economic losses following an emergency.

Governors are responsible for helping their state maintain energy assurance, which involves coordinating the combined efforts of several state government entities including: state emergency managers; homeland security advisors; energy advisors and state energy offices; and other state agencies, such as transportation, health and public safety departments. Depending on the nature of the disruption, the National Guard may also be activated.

The energy sector faces numerous threats that could harm infrastructure and disrupt energy supplies. These threats include:

- Natural disasters (i.e., hurricanes, tornadoes, earthquakes);
- Cyberattacks;
- Physical attacks on critical infrastructure;
- Natural or human-made electromagnetic disturbances; and
- Human error.

Most states have developed an energy assurance plan as a complement to the state's overall emergency response framework. Energy assurance plans are a critical first step in a state's preparedness for disruptions to the energy system that help identify risks associated with energy sector disruptions and assign roles, responsibilities and communications channels for state and private players. Ideally, states update their plans regularly and exercise the plans when possible to ensure that they can be activated effectively during an emergency.

In 2015, governor-designated teams from six states—**Hawaii, Maryland, Michigan, North Carolina, Oklahoma** and **Rhode Island**—participated in a three-day National Governors Association Center for Best Practices (NGA Center) learning lab focused on improving intrastate coordination and state-federal-private collaboration on energy assurance.[1] The learning lab featured discussions with state, federal and private sector experts involved in **New Jersey's** response to and recovery from Hurricane Sandy. Participating states sent teams that included state energy, homeland security and emergency management officials and each developed a list of future actions to improve their efforts based on individual state needs and lessons learned from New Jersey.

The New Jersey Experience with Energy Assurance

On October 29, 2012, Hurricane Sandy made landfall on the southern coast of New Jersey.[2] The storm affected the entire East Coast, caused significant damage in coastal areas of the Northeast and Mid-Atlantic (particularly **Connecticut**, **New Jersey** and **New York**) and affected residents as far west as **Indiana**. In the end, it ranked as the second-largest Atlantic hurricane on record, displaced more than 23,000 people, left 8.5 million customers without electricity and resulted in 162 deaths across the affected region.[3]

The effect of the storm in New Jersey was significant, with an economic cost estimated at $65 billion.[4] That cost includes serious effects on energy infrastructure and systems: In the immediate aftermath of the storm, as many as 2.7 million households in the state were without electricity (approximately 70 percent of customers). One week after the storm, more than 582,000 customers still did not have electricity.[5] The disruptions in the energy sector also affected transportation fuels: Sixty

percent of gas stations in the state remained closed four days after the storm because of lack of access to fuel or lack of electricity for operation. As a result, the situation forced New Jersey Governor Chris Christie to declare a limited state of emergency that instituted gasoline rationing in the weeks following the storm.[6]

New Jersey, its utilities and the federal government faced considerable challenges in responding to a storm as devastating as Hurricane Sandy, but the state found that certain organizational and operational structures helped improve its response and mitigate some of the effects on energy distribution. For example, the state's emergency operations center specifically included representatives from the energy sector, including the state's coordinator for the Emergency Support Function 12 (ESF-12) (Energy), but also representatives from the electric and gas utilities.[7] That allowed the state to better coordinate its response with utility crews on the ground restoring power.

Since the storm, New Jersey has focused on improving the resilience of its existing infrastructure, including assets in the energy sector. The state found that following the storm, communities or buildings that had access to backup generation, particularly combined heat and power (CHP) systems, were able to maintain electricity and support recovery efforts. For example, Princeton University was able to maintain power following the storm by using its existing 15-megawatt CHP plant.[8] To encourage similar investments going forward, New Jersey is working to improve access to capital for projects to increase the resilience of critical infrastructure. For example, following Hurricane Sandy, the state developed the Energy Resiliency Bank, with the goal of funding backup power and other resilience measures at critical infrastructure nodes and projects selected to maximize economic and resilience benefits to the state.[9] Separately, the state is also undertaking several projects to improve the resilience of its transportation networks. NJ TRANSIT, in partnership with the New Jersey Board of Public Utilities, the U.S. Department of Energy and the Federal Transit Administration is developing a microgrid system capable of maintaining power to the transit system during power disruptions.[10]

Highlights of the Learning Lab: State Takeaways and Activities

During the three-day learning lab held by the NGA Center, the state teams heard from a variety of state, local, federal and private entities involved in the response and recovery efforts in New Jersey following Hurricane Sandy. The individual teams were then given the opportunity to develop a list of state-specific actions to implement following the learning lab. State teams identified key actions that largely focused on two areas:

- **Create more robust energy assurance plans**. This action includes ensuring that the plans address the threats to and consequences of any scenario that might affect the energy sector and are aligned with relevant emergency response plans.

- **Enhance communication and information sharing.** This action includes breaking down silos between state agencies that have a role in planning and response activities and improving information-sharing practices before and during disasters among state agencies, the federal government, local governments, utilities and private organizations.

Each state developed a priority list of actions that would best take advantage of the state's organizational structure, address discrete threats and fit its specific political situation. This section of the paper highlights the actions on each state's list and any progress made to date to implement them.

The team from **Hawaii** identified three areas of need. First, the state set a goal of creating an annex to its existing energy assurance plan that covered petroleum emergency response measures that address both supply and demand issues. Second, the state sought to perform an analysis to quantify the economic benefits

from state or utility investments in energy reliability and resilience. The state team recognized that a better understanding of criteria for energy resilience investment decisions is needed to reduce the human and economic consequences of disasters. Finally, the state recognized a need to engage with its electric utilities to develop a real-time, public-facing power outage map that would cover utilities on each island and help develop situational awareness and improve response and recovery times after a disruption.

Michigan's primary task following the learning lab was to begin the process of updating the state's energy assurance and emergency management plans. Within that context, the state reviewed the plans so that they better aligned with one another and with federal response plans such as the U.S. Department of Homeland Security's National Response Framework. The lessons New Jersey shared led Michigan to address potential gaps in the petroleum annex to the energy assurance plan. Michigan started working with its electric and gas utilities to develop an updated list of critical energy infrastructure that the state could access for planning and response purposes.

In addition to improving its response plans, the Michigan team identified several actions the state could take to improve response, recovery and resilience that the lessons learned from New Jersey influenced directly. First, the team viewed New Jersey's inclusion of energy sector representatives within the state emergency operations center as something that could be valuable for Michigan and identified a need to institutionalize that participation going forward. Second, the state is further exploring New Jersey's governance model as it pertains to emergency management, response and recovery, particularly the emphasis on economic recovery as separate from but integrated with emergency response. Third, Michigan is investigating the role that CHP installations could play in supporting municipal resilience

At the time of the learning lab, the administration of **Maryland** Governor Larry Hogan was in its first year, and the team used the learning lab as an opportunity to gather input for how the new administration might approach energy assurance and emergency response. The team's primary action item was to assemble a working group on energy assurance to develop recommendations for future state action.

North Carolina departed the learning lab having identified several critical areas for activity. The state outlined a plan to undertake a statewide fuel resilience study as part of a broader effort to support energy restoration for through fuel assurance. The state initiated and completed that study earlier this year and included a survey of which fuel stations have backup generators in place already or could be readily connected to mobile generators. North Carolina also released a new ESF-12 Fuel Risk Management Tool that creates fuel assurance plans for local jurisdictions. The state team also recognized the advantage of having an archive of gubernatorial executive orders readily available so that the governor can act immediately following an emergency.

While the state has been participating in quarterly meetings with state, local, federal and private partners around energy emergencies since 2007, the North Carolina team viewed the learning lab as a good opportunity to instigate further communication between energy and homeland security agencies within the state and institutionalize interagency, intergovernmental and state-private communications and coordination going forward. These efforts seek to build off existing communication channels—such as continued representation from electric utilities at the state's emergency operations center and a business emergency operations center to support information sharing with the private sector on a range of items including energy restoration. The state is proactively engaging in multistate planning and exercises around the consequences of an electromagnetic pulse threat. The team also requested annual briefings with utilities to discuss joint planning and other coordination;

the first of these briefings occurred earlier this year, focusing on utility resilience and preparedness.

Oklahoma was another state that prioritized updates to its energy assurance plan within its list of action steps. To facilitate that process, the team proposed organizing a specific work group within the Oklahoma Corporation Commission (the state's utility regulator and the agency responsible for ESF-12) to determine any areas in the plan that need to be reassessed or modernized. The state also sought to explore the creation of a central repository for state-level executive orders. Finally, the Oklahoma team sought to develop capacity within state agencies to take advantage existing utility mutual aid agreements to coordinate resources among utilities in the state.

The team from **Rhode Island** put forth two major action items. First, it sought to develop a catalog of critical infrastructure assets across multiple sectors, including energy, with the aim of aiding future emergency response activities. Second, Rhode Island was interested in the role that microgrids could play in improving resilience and mitigating power outages.[11] The state sought to develop a microgrid demonstration project within the state and has since paired state funds (through proceeds from the Regional Greenhouse Gas Initiative) with a grant from the U.S. Department of Housing and Urban Development to identify potential sites and develop a statewide microgrid program.

Emerging State Energy Assurance Efforts

The actions highlighted in the learning lab or that the participating states identified are not the only actions governors can take. Now, governors also are beginning to explore other opportunities to improve energy assurance that rely on or facilitate coordination among state agencies.

Several states have created specific offices or agencies tasked with longer term recovery and resilience, rather than the immediate emergency response responsibilities of state emergency managers. Following Hurricane Sandy, both **New Jersey** Governor Chris Christie and **New York** Governor Andrew Cuomo created offices specifically focused on rebuilding and recovery.[12] In addition to coordinating economic recovery and relief efforts, they have supported projects to improve the resilience of infrastructure, including energy projects. In **Colorado,** Governor John Hickenlooper adopted the Colorado Resiliency Framework aimed at increasing the state's ability to recover following natural disasters as well as adapt to and thrive amidst changing social, economic and environmental conditions.[13] That framework includes adding responsibilities to the Colorado Resilience and Recovery Office (created in response to the significant flooding the state experienced in 2013) that focus on community, economic, natural environment and infrastructure resilience. Colorado is also one of several states that has a chief resiliency officer in place whose responsibilities include coordinating and unifying state resilience efforts. Most recently, **Oregon** Governor Kate Brown announced the confirmation of her state's first state resilience officer in May 2016.[14]

Another emerging area of interest is the role that alternative-fuel vehicles (AFVs) can play in aiding response efforts, particularly when gasoline and diesel supplies are limited or inaccessible. Although not specifically highlighted during the learning lab, communities in several of the states affected by Hurricane Sandy were able to use AFVs to either aid response efforts or transport affected citizens. The NGA Center is participating in the Initiative for Resiliency in Energy through Vehicles (iREV), which aims to help state energy and homeland security officials understand how they can better work together to incorporate alternative fuel vehicles in emergency response and preparedness activities. The iREV project released several case studies, highlighting how vehicles powered by various alternative fuels (electricity, biodiesel, natural gas and propane) could help support state response efforts during an emergency and the considerations for states in incorporating those vehicles into state fleets.[15]

Conclusion

Although each of the six states participating in the learning lab identified their own list of state-specific action items, the result that most action items fit into two broad categories is telling. The identified actions can serve as a menu of options for all states in identifying "low-hanging fruit" to improve their energy emergency response capabilities and preparedness. The actions seek to improve or institutionalize existing relationships among state agencies or between the state and the private sector. They also build off of existing state efforts and therefore can be replicated to some degree in other states, depending on their specific circumstances. States have significant experience preparing for and responding to emergencies, and the lessons learned from Hurricane Sandy and the actions the learning lab states identified show that there are key opportunities to improve that response by building on existing state energy assurance models.

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202-624-3628

October 2016

This material is based upon work supported by the Department of Energy under Award Number DE-OE0000622.

Recommended citation format: A.Kambour. *Improving State Coordination for Energy Assurance Planning and Response* (Washington, D.C.: National Governors Association Center for Best Practices, October 21, 2016).

Endnotes

[1] National Governors Association Center for Best Practices, "Learning Lab on Enhancing State Energy Assurance Coordination," http://www.nga.org/cms/home/nga-center-for-best-practices/meeting--webcast-materials/page-eet-meetings-webcasts/col2-content/main-content-list/learning-lab-on-enhancing-state.html (accessed September 16, 2016).
[2] The storm is often referred to as "Superstorm Sandy" rather than "Hurricane Sandy" because it was technically a post-tropical cyclone with hurricane-force winds when it made landfall in New Jersey. This paper refers to the storm as "Hurricane Sandy" in alignment with federal agency documents.
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[7] The U.S. Department of Homeland Security has designated 16 critical infrastructure sectors, each of which has designated agencies at the federal level responsible for leading federal response. Emergency Support Function 12 (Energy) covers electricity, oil and gas, with the exception of nuclear power plants and hydroelectric dams.
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