BY KRISTY HARTMAN

Introduction

Securing the nation’s energy supply and protecting energy infrastructure is a major concern given the nation’s dependence on reliable and uninterrupted energy delivery. America’s energy system faces many risks, including natural disasters, energy supply disruptions, cyber attacks and deliberate acts of terrorism. The United States relies on coal, oil, natural gas, nuclear power and renewable sources to generate electricity, provide transportation, heat and cool buildings, and keep industries operating. A disruption in one part of this complex and interconnected network can easily impact other parts of the system, resulting in serious human and economic consequences.

State policymakers are concerned about the impact these disruptions could have on the economy, public health and safety, and the environment. More than 80 percent of the energy infrastructure is owned and managed by the private sector, so modernizing and protecting the energy system will require a coordinated effort between federal, state and local officials as well as private entities. State policies play a critical role in energy security by ensuring that energy infrastructure is resilient and that officials can quickly respond to shortages, disruptions and emergencies.
State Energy Assurance Plans

Through the American Recovery and Reinvestment Act (ARRA) of 2009, the U.S. Department of Energy provided almost $38 million in grant funding to states to assist them in developing and implementing energy assurance and resiliency plans. The 47 states and the District of Columbia have used the funds to plan for energy supply disruptions and to lessen the impact that incidents can have on the economy, public health and safety and the environment. Each state recipient has revised its energy assurance policies or created a new plan that focuses on improving coordination across state and local agencies, as well as among states, regions and the private sector. They have also worked to train personnel on energy infrastructure supply systems, identify roles and responsibilities within state and local governments and improve recovery and restoration capabilities. These plans have also addressed how vulnerabilities to critical energy infrastructure can be reduced by policies and programs that can enhance security and resiliency. For example, combined heat and power systems have allowed for evacuation in coastal environments. Each state recipient has revised its energy assurance plans. Under this grant program, states have developed mechanisms to track energy supply disruptions including response, restoration and recovery times. These plans address disruptions to all energy resources including electricity, oil and gas, and renewable sources and are designed to provide a response to all potential hazards including threats to cyber-security. States have also been active in conducting exercises to test their plans as well as participating in exercises that encourage regional communication and coordination. All state energy assurance plans will be completed by the fall of 2013.

Below are examples of state energy assurance planning efforts:

- **Georgia** implemented the Georgia Online Disaster Awareness Geospatial System (GoDAWGS), which integrates data from various sources for analysis and information sharing.
- **Montana's** Department of Environmental Quality (DEQ) developed an energy supply disruption tracking system, which includes historical energy statistics, DEQ's GIS-based energy resource mapping and provides a quickly accessible contact list in case of an emergency.
- **Oklahoma** prepared a plan and produced an energy assurance video highlighting safety during tornado season.
- **Oregon** prepared an Earthquake Risk Study for Oregon's Critical Energy Infrastructure Hub that identified measures that could be taken to reduce the damage to energy infrastructure in the event of a major earthquake.
- **Texas** completed an outage database to help track energy disruptions. This allows the Emergency Management Response Team to sort by utility, zip code, or county and data are available to the public. Also, the Railroad Commission of Texas developed a Supply Disruption Tracking Plan consisting of three separate systems to track natural gas utilities, intrastate natural gas pipeline, gas processing plants, crude oil pipelines and refineries.
- **Washington** developed a GIS-system that allows utilities to share power outage maps that can be integrated into a statewide view available in the state's emergency operations center.

It is important that the state energy assurance plans remain viable and adaptable after the ARRA grant program is complete. There are many ways states can sustain and maintain energy assurance capabilities such as providing education, trainings and exercises. This is best done by developing partnerships with agencies, leveraging existing resources and assuring a commitment of the resources needed to maintain the necessary level of preparedness.

Emergency Response to Natural Disasters

Super storm Sandy in 2012, Hurricane Irene in 2011 and other recent natural disasters have demonstrated that disruptions to regional energy infrastructure can have dramatic effects, causing tremendous hardship, major economic losses and spreading far beyond the immediate area of disturbance. Both Irene and Sandy caused widespread damage to electric power transmission and distribution infrastructure, including substations, transmission lines, and utility poles and left millions of people without power. According to the U.S. Department of Energy's report ‘Comparing the Impacts of Northeast Hurricanes on Energy Infrastructure’, nearly 7 million customers lost power across 14 states and the District of Columbia during Hurricane Irene. By comparison, Super storm Sandy and the November 2012 nor'easter caused outages to almost 8.7 million customers across 24 states and as far west as Illinois.

Additionally, these weather events drastically impacted the region's petroleum infrastructure. Sandy and Irene caused flooding and power outages at refineries, pipelines and petroleum terminals in the New York Harbor area, a key distribution center for petroleum delivery to markets in New York, New Jersey, Pennsylvania and New England. The storms resulted in a reduced supply of petroleum and led to temporary price increases. Survey data from the U.S. Energy Information Administration (EIA) showed that nine days after Super storm Sandy reached landfall, terminals in the New York harbor transporting petroleum products had only returned to 61 percent of their pre-storm levels. The reduced supply at the terminals and the power outages at retail refueling states led to widespread gasoline shortages around New York City for weeks following Super storm Sandy. In response to these fuel shortages, New Jersey, New York City and two New York counties —Nassau and Suffolk—established fuel rationing programs in order to alleviate long lines at gas stations.

Many federal, state, local and tribal partners coordinated efforts to provide assistance following these storms. The response efforts included situational updates, easing regulations and releasing additional fuel reserves. For example, in the wake of Super storm Sandy, the President authorized a loan of ultra low sulfur diesel fuel from the Northeast Home Heating Oil Reserve. The ultra low sulfur diesel fuel was provided to federal, state and local responders in New York and New Jersey to fuel their emergency equipment—including generators and water pumps—and to fuel...
responder vehicles. According to the U.S. Department of Energy, this was the first time a release from the reserve had been authorized since its founding in 2000. State and local governments also addressed impacts by rationing fuel, easing state regulations, enforcing price gouging laws and facilitating power restoration.

**State Legislative Action**

**ENERGY SUPPLY AND EMERGENCY PREPAREDNESS RESPONSE PLANS**

Energy assurance planning requires preparation and an understanding of the complexity and scope of the nation’s energy assets. It also includes the development of emergency response procedures that help decision makers protect against threats and quickly recover from energy disruptions. At least eight states have proposed bills this session that revise or adopt new provisions for maintaining energy emergency preparedness plans. Topics include: requiring certain residences and businesses to install standby generators, requiring utility service providers to report emergency interruptions online and by telephone and requiring additional gas pipeline safety measures. At least 15 pending bills in seven states would consolidate state agencies to improve coordination and governance during energy emergencies. In addition, several states have introduced bills that enhance energy security by providing tax benefits, credits or financing measures to promote the adoption of emergency preparedness equipment. The legislation introduced this session aims to mitigate the impacts of energy shortages and develop strategies to improve the response to energy emergencies.

- **California**—A.B. 869 (pending) requires the Public Utilities Commission, gas corporations and electric corporations that provide service to more than 5,000 customers to develop and publish emergency response plans.
- **Connecticut**—H.B. 6653 (enacted) streamlines regulations within Connecticut’s Department of Energy and Environmental Protection to assist municipalities.
- **Hawaii**—S.B. 1080 and H.B. 849 (both pending) delineate the emergency management functions and powers of the governor and mayors.
- **Maryland**—S.B. 481 (enacted) establishes a task force to study the implementation of tax benefits for emergency preparedness. Additionally, Maryland introduced several bills this session requiring the Maryland Emergency Management Agency (MEMA) to establish emergency response standards for gas transmission companies.
- **New Jersey**—At least six bills introduced this session would require electric and gas public utilities to file certain information regarding emergency preparedness including maps and utility infrastructure to municipal emergency management personnel. At least nine pending bills in New Jersey address the installation of standby emergency generators in certain residences and businesses including hospitals, nursing homes, gas stations and grocery stores.
- **New York**—A.B. 2136 and S.B. 3500 (both pending) would provide New York’s Division of Homeland Security and Emergency Services with the power to decide if the sale, lease or operation of state-owned critical infrastructure would threaten public security.
- **Pennsylvania**—S.B. 35 (pending) provides authority to the governor relating to disaster preparedness and emergency management activities.
- **Utah**—H.B. 302 (enacted) allows the governor to obtain information from energy resource producers, manufacturers, suppliers and consumers to determine whether shortages or an emergency will require energy resource conservation measures.
- **Virginia**—S.B. 766 (pending) would provide a tax exemption for the purchase of hurricane preparedness equipment.

**INCREASING ENERGY INDEPENDENCE**

At least 22 states have introduced legislation this session that aim to enhance U.S. energy security by reducing the nation’s dependence on foreign oil. Most bills focus on supporting domestic natural gas or renewable energy technologies to decrease the nation’s oil dependency.

- **Alaska**—H.J.R. 7 (pending) urges Congress to pass legislation to open the coastal plain of the Arctic National Wildlife Refuge (ANWR) in order to further U.S. energy independence by increasing oil and gas exploration, development, and production.
- **Delaware**—H.B. 179 (pending) supports energy efficiency investments that decrease vulnerability to energy price spikes and increase energy security.
- **Hawaii**—S.B. 18 (pending) establishes a renewable transportation fuels production tax credit to achieve greater energy security for the state.
- **Maine**—Two bills—H.B. 651 (enacted) and H.B. 886 (pending)—establish new fossil fuel reduction goals and promote renewable energy sources such as solar and wind to increase energy independence for the state.
- **Massachusetts**—H.B. 2935 (pending) requires the state to adopt a plan for replacing all use of coal as an energy resource by 2020 with renewable energy alternatives in order to increase energy security.
- **Louisiana**—H.C.R. 132 (adopted) urges Congress to enact legislation that promotes growth of domestic alternative fuel sources and reduces dependence on foreign oil.
- **Pennsylvania**—H.R. 249 (pending) urges the President and Congress to support the increased production and use of American natural gas to increase energy security.
- **Tennessee**—S.B. 582 (enacted) establishes the natural gas energy independence program, which supports increased investments in alternative fuel vehicles and fueling infrastructure.

**KEYSTONE XL PIPELINE**

Additionally, 13 states introduced and eight states passed resolutions urging Congress, the president or the U.S. Department of State to expediently review and approve the permit application for the TransCanada Keystone XL pipeline. The proposed 1,700 mile expansion to the Keystone pipeline would connect Cushing, Okla. to the oil refineries in the Gulf Coast of Texas as well as
connect a new pipeline from the oil sands in Alberta, Canada to Steele City, Neb.

Proponents argue that the current pipeline, along with the proposed Keystone XL extension, would have the capacity to transport 830,000 barrels of oil per day to Gulf Coast and Midwest refineries, reducing the nation’s dependence on imported oil. Opponents to the Keystone XL pipeline, however, are raising environmental and public health concerns and some critics have argued that the pipeline does little to address domestic energy security. In 2012, the Congressional Budget Office (CBO) published a report on energy security in the U.S., which concluded that there may be benefits to increased domestic oil production, but that the benefits would not increase the nation’s energy security. Completing the proposed Keystone XL pipeline and increasing North American oil production may promote economic growth and create jobs, but critics have used CBO’s findings to argue that the pipeline will not provide energy independence since energy and oil prices depend upon other oil producing countries and global demand.

BIOFUELS

In an effort to mitigate the impacts of volatile global oil prices, some states have introduced bills incentivizing the increased use of biofuels as a way to increase U.S. energy security. Most states have adopted some sort of biofuel incentive, but at least eight states cited energy security as a key reason for introducing legislation in 2013. The U.S. imports approximately half of its petroleum, two-thirds of which is used for transportation. Relying
heavily on foreign oil supplies may put the U.S. at risk for supply disruptions and price shocks. Biofuels, the most common of which are ethanol and biodiesel, however, can be produced in the U.S. and used in conventional vehicles. Ethanol can currently be used by all gasoline vehicles in concentrations up to about 10 percent and biodiesel can be used in conventional diesel engines without modifications.

- **Hawaii**—At least six bills introduced in 2013 broaden the biofuel production tax credits or provide funding toward biofuel research and development.
- **Iowa**—S.C.R. 5 (pending) urges the federal government to renew its commitment to energy security by requiring the increased domestic production and use of renewable fuels such as ethanol, cellulosic biofuels and biodiesel.
- **Kentucky**—H.B. 212 (enacted) requires an increase in the use of ethanol, cellulosic ethanol and biodiesel to reduce the state government’s dependence on petroleum-based transportation fuels.
- **Minnesota**—At least six bills introduced this session establish a minimum biofuel content for all gasoline sold in the state.
- **New Jersey**—A.R. 167 and S.R. 106 (both adopted) support the development of biofuels to achieve greater national security.
- **New York**—S.B. 2699 (pending) establishes a pilot program to test the financial feasibility of replacing some or all of New York’s roadway medians existing plantings with biofuel crops and using the fuel generated to replace imported oil used in New York’s diesel vehicle fleet.
- **Rhode Island**—S.B. 816 and H.B. 5802 (both enacted) encourage the production of biofuels by requiring that all heating oil sold in the state contain 5 percent of a bio-based product.

### ELECTRICITY RELIABILITY

At least 31 bills were introduced in 11 states highlighting the need for grid modernization, electricity reliability or financing projects to enhance the nation’s energy security. State legislation cited aging infrastructure and more frequent weather events as key reasons for additional regulation and investment in the nation’s electricity distribution and transmission system.

- **California**—A.B. 66 (pending) requires that an electrical corporation submit an annual reliability report, which includes the frequency and duration of interruptions and requires remediation of reliability deficiencies.
- **Connecticut**—S.B. 408 (failed) would have modernized the state’s electric delivery system.
- **Hawaii**—S.B. 120 (enacted) authorizes economic incentives and cost recovery regulations to accelerate electric utility cost reduction and increase investments to modernize electrical grids.
- **Maine**—The Legislature voted to override Governor Paul LePage’s veto of H.B. 1128, which among other provisions, promotes electricity reliability to enhance energy security in the state.
- **New Jersey**—At least seven bills introduced this session relate to maintaining and strengthening the state’s energy infrastructure by ensuring reliable electric service.
- **Washington**—H.B. 1030 (pending) concerns siting inter-state electricity transmission lines to increase grid reliability and security.

### SMART GRID

At least eight states have introduced legislation in 2013 that addresses smart grid technology. Smart grid refers to technologies that enable more reliable and efficient delivery of electricity. An electricity disruption can cause a series of failures that impact multiple sectors including transportation, banking,
ntrications and security. Implementing smart grid technologies will make the electric power system better prepared to prevent emergencies and smart grid provides better feedback of grid operations so responses are more accurate and timely. Effective state energy assurance plans incorporate smart grid to improve energy response times and reduce vulnerability and risk. Tools such as smart meters, which provide real-time measurement of electricity, help utilities identify outages, improve emergency response and prevent some outages altogether.

- **Hawaii**—H.B. 1256 (pending) promotes electricity reliability by applying a feed-in tariff to net energy metering.
- **Missouri**—S.B. 6 (pending) would allow telecommunications service providers to attach equipment to rural electric cooperatives’ utility poles for smart grid purposes to promote the deployment of smart grid technologies.
- **New York**—A.B. 1932 (pending) establishes a grid modernization program, which includes investments in smart grid technology. Additionally, A.B. 6508 (pending) promotes the use of smart grid deployment in the state.
- **North Carolina**—H.B. 921 (pending) would require electric utilities to provide smart meters to help customers control their energy costs.
- **West Virginia**—Two bills (H.B. 2210 and H.B. 2323) failed this session, which would have required the West Virginia Public Service Commission to evaluate smart grid technologies and whether they should be implemented in the state.

**CYBER SECURITY**

The nation’s electric grid interconnects the physical electric infrastructure with a wide range of information technology components including networks, software and data. As states invest more in smart grid technologies, which connect software to utility operations and computer systems to consumer information, vulnerabilities and potential cyber threats increase. Since January 2013, at least five states have considered legislation to mitigate cyber security vulnerabilities.

- **Hawaii**—H.B. 462 (pending) establishes a statewide Cyber Security Council to identify and assess critical computer infrastructure and identify cyber security best practices.
- **Massachusetts**—H.B. 3431 (pending) establishes a special commission to study the preparedness of the Commonwealth for natural disasters.
- **Minnesota**—H.B. 1702 and S.B. 1565 (both pending) would require a commission to determine whether vulnerabilities to cyber terrorism against and how the state should address any shortcomings.
- **New Jersey**—A.B. 3079 (pending) establishes a Cyber Security Bureau focused on identifying and mitigating vulnerabilities to the state’s cyber security infrastructure, responding to cyber events and promoting cyber security awareness.
- **Nevada**—A.B. 42 (failed) would have established a Cyber Institute to promote the development and teaching of cyber security techniques and to enhance U.S. security.

**TERRORISM**

Certain types of terrorist attacks could threaten the nation’s energy infrastructure. Cyber attacks have the potential to damage critical infrastructure, but biological attacks, radiological weapons or electromagnetic pulse (EMP) devices could also cause significant infrastructure damage. Some states are considering legislation to study the impacts on the nation’s energy infrastructure resulting from deliberate acts of terrorism.

- **Hawaii**—S.B. 1081 and H.B. 850 (both pending) establish a homeland security office to provide a comprehensive program to protect Hawaiians citizens, infrastructure and government from terrorism and threat of attack.
- **Iowa**—At least six bills would require a study of state facilities and determine the vulnerabilities of critical state infrastructure and assets to attack.
- **Maine**—H.B. 106 (enacted) which directs the Public Utilities Commission to study the vulnerabilities of the state’s transmission infrastructure and the potential impacts of an EMP capable of disabling, disrupting or destroying a transmission and distribution system. This bill also requires the Public Utilities Commission to identify potential mitigation measures.
- **New Jersey**—A.B. 4096 (pending) establishes the New Jersey Electromagnetic Infrastructure Advisory Commission to advise the governor and the legislature on potential measures to protect the state’s infrastructure from an EMP attack.
- **New York**—A.B. 3477 (pending) establishes the Electromagnetic Critical Infrastructure Protection Commission to study and investigate EMP threats to the state’s infrastructure, gather information, make recommendations and inform local governments and agencies about the hazards of natural and man-made EMP events.
- **Texas**—H.B. 1930 (failed) would have required a commission to study the effects of power outages caused by acts of cyber terrorism, including an EMP, on financial markets and critical infrastructure in the State.

**Sources**


