Modernize and Protect U.S. Energy Infrastructure

Our energy infrastructure is increasingly inadequate for our growing demand and economy. Blackouts, brownouts, service interruptions, and rationing could become commonplace without new and upgraded capacity. Critical energy infrastructure must also be adequately protected from both terrorist threats and natural disasters.

Stable energy supplies delivered to homes, businesses, and fueling stations across the country underpin a robust U.S. economy. More than 80% of our country’s energy infrastructure is owned and managed by the private sector. U.S. transmission lines span more than 200,000 miles, U.S. oil pipelines could circle the equator eight times, and U.S. natural gas pipelines carry natural gas over 1.8 million miles each year. Robust investments are needed to modernize, protect, and upgrade these critical assets, which are essential to America’s national security, economic security, and way of life. Federal, state, and local governments and the private sector must work together to enable needed expansions and upgrades to this aging infrastructure.

In August 2003, the power failure that affected 50 million people in the United States and Canada was not caused by a single extraordinary event on a single system, but rather a series of routine events that quickly became unmanageable because of an aging electricity distribution system lacking redundancy. National laboratories and others that have evaluated the weak points in our energy infrastructure have identified similar scenarios where a seemingly modest, routine occurrence can cascade into a debilitating energy supply disruption in very short order. The Energy Independence and Security Act of 2007 (EISA2007) supports the accelerated modernization of the nation’s electricity distribution and transmission system. With the rapid deployment of smart power grid technology, our systems could self-diagnose and repair problems, accommodate new demand-response strategies, and promote greater efficiency through advanced metering and appliances that can interact with the grid using communications protocols that can be layered with electricity delivery. To improve security, efficiency, and reliability in our regional transmission grids, the next administration must place a high priority on transitioning to a sophisticated smart power grid.
In addition, most energy forecasts routinely assume that new power plants, oil refineries, pipelines, electricity distribution and transmission lines, liquefied natural gas (LNG) terminals, and tankers (as well as the roads, railroads, barges, and seaports that support energy production, conversion, and distribution) will be built or expanded whenever there is demand and a simple economic incentive to do so. Unfortunately, the reality is that regulatory uncertainty, permitting challenges, and litigation, as well as organized opposition, have delayed or suspended new investment in needed infrastructure. Capital has flowed to other investments offering quicker returns. Meanwhile, demand for new infrastructure in China, India, and elsewhere in the developing world has driven up the cost of steel, concrete, and manufactured components that make up much of our infrastructure. Therefore, the next administration should direct the DOE, in cooperation with the Department of Transportation, to undertake a robust, systems analysis of energy and associated infrastructure dynamics and requirements from 2009 through the year 2030, and ask the Department of Energy’s Energy Information Administration (EIA) to incorporate this analysis into its forecasting methods. In addition, the new administration will need to vigorously exercise, and Congress will need to strengthen, provisions in EPAct2005 that provide federal backstop authority for the establishment of new electricity transmission lines.

In Section 7 of the Natural Gas Act, Congress gave the Federal Energy Regulatory Commission (FERC) the authority to site natural gas pipelines, including eminent domain authority. EPAct2005 gave FERC authority to site transmission facilities, including eminent domain authority, but only under certain conditions – generally if state siting processes breakdown. Congress should simplify siting for electric transmission facilities and other energy facilities in interstate commerce (such as pipelines for carbon capture and storage) by giving FERC the same authority as it has to site natural gas pipelines under Section 7 of the Natural Gas Act.

Terrorist threats, cyber attacks, and natural disasters also have the potential to directly impact the reliability and security of our energy systems. It is incumbent upon the federal government to provide leadership and coordination with the private sector and international organizations to ensure protection of critical infrastructure. As outlined in the U.S. Department of Homeland Security’s National Infrastructure Protection Plan published in 2006, nine federal agencies are designated responsible for coordinating critical infrastructure protection for key resources, including transportation systems; nuclear reactors, materials, and waste; energy (petroleum, natural gas, and electricity); hydroelectric dams; and chemical facilities. Because our economy is closely connected with the reliability of global infrastructure, the federal government must more closely coordinate with foreign governments and international organization for infrastructure protection needs.

In addition, the nation’s four Strategic Petroleum Reserve (SPR) sites hold approximately 727 million barrels of crude oil for use in the case of a severe supply disruption. In an interconnected global energy environment, SPR must be expanded to 1 billion barrels as authorized in EPAct2005 to ensure availability of crude oil in the case of a significant domestic or international supply disruption.

»Next: Chapter 12 – Address Critical Shortages of Qualified Energy Professionals