



# National Infrastructure Protection Plan

## Energy Sector

Homeland Security Presidential Directive 7 (HSPD-7) identified 17 critical infrastructure and key resources (CIKR) sectors and designated Federal Government Sector-Specific Agencies (SSAs) for each of the sectors. Each sector is responsible for developing and implementing a Sector-Specific Plan (SSP) and providing sector-level performance feedback to the Department of Homeland Security (DHS) to enable gap assessments of national cross-sector CIKR protection programs. SSAs are responsible for collaborating with private sector security partners and encouraging the development of appropriate information-sharing and analysis mechanisms within the sector.

### Sector Overview

The U.S. energy infrastructure fuels the economy of the 21<sup>st</sup> century. Without a stable energy supply, health and welfare are threatened and the U.S. economy cannot function. More than 80 percent of the country's energy infrastructure is owned by the private sector.

The energy infrastructure is divided into three interrelated segments: electricity, petroleum, and natural gas. The U.S. electricity segment contains more than 5,300 power plants with approximately 1,075 gigawatts of installed generating capacity. Approximately 49 percent of electricity is produced by combusting coal (primarily transported by rail), 19 percent in nuclear power plants, and 20 percent by combusting natural gas. The remaining generation is provided by hydroelectric plants (7 percent), oil (2 percent), and by renewable (solar, wind, and geothermal) and other sources (3 percent). Electricity generated at power plants is transmitted over 211,000 miles of high-voltage transmission lines. Voltage is stepped down at substations before being distributed to 140 million customers over millions of

miles of lower voltage distribution lines. The electricity infrastructure is highly automated and controlled by utilities and regional grid operators using sophisticated energy management systems that are supplied by supervisory control and data acquisition (SCADA) systems to keep the system in balance.

The petroleum segment entails the exploration, production, storage, transport, and refinement of crude oil. The crude oil is refined into petroleum products that are then stored and distributed to key economic sectors throughout the United States. Key petroleum products include motor gasoline, jet fuel, distillate fuel oil, residual fuel oil, and liquefied petroleum gases. Both crude oil and petroleum products are imported, primarily by ship, as well as produced domestically. Currently, 66 percent of the crude oil required to fuel the U.S. economy is imported. In the United States, there are more than 500,000 crude oil-producing wells, 30,000 miles of gathering pipeline, and 51,000 miles of crude oil pipeline. There are 133 operable petroleum refineries, 116,000 miles of product pipeline, and 1,400 petroleum

terminals. Petroleum also relies on sophisticated SCADA and other systems to control production and distribution; however, crude oil and petroleum products are stored in tank farms and other facilities.

Natural gas is also produced, piped, stored, and distributed in the United States. Imports of liquefied natural gas (LNG) are increasing to meet growing demand. There are more than 448,000 gas production and condensate wells and 20,000 miles of gathering pipeline in the country. Gas is processed (impurities removed) at over 550 operable gas processing plants and there are almost 302,000 miles of interstate and intrastate pipeline for the transmission of natural gas. Gas is stored at 399 underground storage fields and 103 LNG peaking facilities. Finally, natural gas is distributed to homes and businesses over 1,175,000 miles of distribution pipelines. The heavy reliance on pipelines highlights the interdependency with the Transportation Sector and the reliance on the Energy Sector for power means that virtually all sectors have dependencies with the Energy Sector.

The Energy Sector is well aware of its vulnerabilities and is leading a significant voluntary effort to increase its planning and preparedness. Cooperation through industry groups has resulted in substantial information sharing of effective and best practices across the sector. Many sector owners and operators have extensive experience with infrastructure protection and have more recently focused their attention on cyber security.

### **Sector Partnerships**

The Department of Energy (DOE) will coordinate with sector information-sharing organizations through the Homeland Security Information Network and other approaches. In addition, the Energy Sector will work with other concerned organizations such as the Federal Energy Regulatory Commission, the North American Electric Reliability Council, the National Association of Regulatory Utility Commissioners, the National Association of State Energy Officials, and the governments of Canada and Mexico to share energy infrastructure information and plan exercises that address energy infrastructure issues.

On August 8, 2005, President Bush signed the Energy Policy Act of 2005, which requires the implementation of mandatory electricity reliability standards in the U.S. The reliability standards will be paralleled by implementation in Canada. Ongoing monitoring and reporting on implementation of recommendations following the 2003 Northeast Blackout are the responsibility of a joint U.S./Canada oversight group.

The Electricity Sector Coordinating Council (ESCC) represents more than 95 percent of Electricity Sector owners and operators and meets on a regular basis to discuss SSP updates and other security initiatives. The Oil and Natural Gas Sector Coordinating Council (ONG SCC) represents more than 98 percent of Oil and Natural Gas Sector owners and operators. This council, formed by the Oil and Natural Gas trade associations, serves as a broad industry-wide network to help coordinate ongoing industry initiatives, government partnerships, and responsibilities. The council selects a representative from the industry to serve as chair of the ONG SCC and act as the liaison to DHS.

A Government Coordinating Council (GCC) was established in early 2004, co-chaired by DHS and DOE, and representing the Federal energy-related organizations, as well as State and local governments. The GCC has met with their SCC counterparts to share information. With the creation of the DHS Critical Infrastructure Partnership Advisory Council (CIPAC), which reports to the Secretary of Homeland Security, the Energy GCC, the ESCC, and the ONG SCC have formed joint working groups under the CIPAC structure and are working together to protect the Nation's critical energy infrastructure.



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