



National Infrastructure Protection Plan

Energy Sector

The Energy Sector is one of 18 critical infrastructure sectors established under the authority of Homeland Security Presidential Directive 7 (HSPD-7). Each sector is managed by a Sector-Specific Agency (SSA) that provides sector-level performance feedback to the Department of Homeland Security (DHS) to enable assessment of national, cross-sector critical infrastructure protection and resilience programs. In accordance with the National Infrastructure Protection Plan (NIPP), each SSA is responsible for developing and implementing a Sector-Specific Plan (SSP), in collaboration with public and private sector partners, and for encouraging the development of appropriate information-sharing and analysis mechanisms.

Sector Overview

The U.S. energy infrastructure fuels the economy of the 21st 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, supplying fuels to the transportation industry, electricity to households and businesses, and other sources of energy that are integral to growth and production across the Nation.

The energy infrastructure is divided into three interrelated segments: electricity, petroleum, and natural gas. The U.S. electricity segment contains more than 6,413 power plants (includes 3,273 traditional electric utilities and 1,738 nonutility power producers) with approximately 1,075 gigawatts of installed generation. Approximately 48 percent of electricity is produced by combusting coal (primarily transported by rail), 20 percent in nuclear power plants, and 22 percent by combusting natural gas. The remaining generation is provided by hydroelectric plants (6 percent), oil (1 percent), and by renewable (solar, wind, and geothermal) and other sources (3 percent).

Electricity generated at power plants is transmitted over 203,930 miles of high-voltage transmission lines. Voltage is stepped down at substations before being distributed to 143 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, such as supervisory control and data acquisition systems or distributed control 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 525,000 crude oil-producing wells, 30,000 miles of gathering pipeline, and 51,000 miles of crude oil pipeline.

There are 150 operable petroleum refineries, 116,000 miles of product pipeline, and 1,400 petroleum terminals. Petroleum also relies on sophisticated control and IT systems to manage production and distribution.

Natural gas is also produced, piped, stored, and distributed in the United States and imports of liquefied natural gas (LNG) have increased. Overall natural gas production has increased due to shale production. There are more than 478,562 gas production and condensate wells and 20,215 miles of gathering pipeline in the country. Gas is processed (impurities removed) at over 500 operable gas processing plants and there are almost 319,208 miles of interstate and intrastate pipeline for the transmission of natural gas. Gas is stored at 401 underground storage fields and 109 LNG peaking facilities. Finally, natural gas is distributed to homes and businesses over 1,200,000 miles of distribution pipelines. The heavy reliance on pipelines to distribute products across the Nation highlights the interdependencies between the Energy and Transportation Systems Sectors.

The reliance of virtually all industries and modes on electric power and fuels means that all sectors have some dependence on 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 cybersecurity.

Sector Partnerships

The Department of Energy (DOE), as the SSA for the Energy Sector, coordinates sector information sharing through relationships with public and private sector partners, as well as other effective approaches. In addition, the Energy Sector works with other concerned organizations, such as the Federal Energy Regulatory Commission (FERC), the North American Electric Reliability Corporation (NERC), the Department of Transportation, DHS, 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 required the implementation of mandatory electricity reliability standards in the U.S. The reliability standards, created by NERC and approved by FERC, are paralleled by implementation in Canada.

The Electricity Subsector Coordinating Council (ESCC) represents electricity subsector owners and operators and meets on a regular basis to discuss coordination of sector-wide, policy-related activities and initiatives designed to improve the reliability and resilience of the electricity subsector, including physical and cyber infrastructure. The Oil and Natural Gas Subsector Coordinating Council (ONG SCC) represents oil and natural gas subsector owners and operators. This council, formed by 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 representatives from the industry to serve as chair and co-chair of the ONG SCC and act as the liaisons to DOE, DHS, and other partners through the NIPP sector partnership framework.

An Energy Sector Government Coordinating Council (GCC) was established in early 2004, co-chaired by DHS and DOE, and representing Federal energy-related organizations, as well as State and local governments. The GCC meets with their SCC counterparts to share information, discuss current initiatives, and coordinate solutions to issues affecting the sector. 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.

For questions or more information, please contact NIPP@dhs.gov or visit www.dhs.gov/nipp.



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