

Creating a Risk Assessment Culture for State Energy Infrastructure Decision Making



Decisions regarding how to secure and invest in our Nation's energy infrastructure are often complex. Limited resources and investment returns, tight budgets, and lack of information can hinder the process of how to best maintain or improve existing infrastructure or build new energy facilities and systems. Threats or hazards that can impact energy infrastructure and the consequences of those impacts must be known to reduce vulnerabilities. Risk assessment can help to inform decision making when securing and building resilient energy infrastructure.

Methods and Tools for Assessing Risk

Many approaches have been developed to analyze components of risk related to energy infrastructure. Private industry, trade and research organizations, Federal and State agencies, as well as National Laboratories have developed resources that can be used to assess risk. Risk assessment approaches range from general descriptions of state energy profiles and infrastructure (qualitative) to methods based on scoring and specific metrics that analyze risk of energy assets and systems (quantitative).

Examples of current methodologies or tools that have been developed to evaluate risk or components of risk include but are not limited to:

- Relative risk metric methodologies included in State Energy Assurance Plans (EAPs),
- The Threats and Hazards Identification and Risk Assessment (THIRA) methodology created by FEMA,
- NOAA's Weather and Climate Toolkit to help visualize large amounts of climate and weather data, and
- The Interdependent Energy Infrastructure Simulation System (IEISS) created by Los Alamos National Lab to model impacts of system disruptions on energy infrastructure.

U.S. Department of Energy

State Energy Risk Assessment Initiative

The Energy Infrastructure Modeling and Analysis (EIMA) Division of the Department of Energy's Office of Electricity Delivery and Energy Reliability (DOE/OE) is leading a State Energy Risk Assessment Initiative to better understand potential impacts to energy infrastructure. The Initiative is a collaborative effort with the National Association of State Energy Officials (NASEO), the National Association of Regulatory Utility Commissioners (NARUC), the National Conference of State Legislatures (NCSL), and the National Governors Association (NGA).

The goal of the State Energy Risk Assessment Initiative is to increase States' awareness of risk to energy systems so that officials can be better prepared to make informed decisions related to energy systems and infrastructure investments, resilience and hardening strategies, and asset management.

Office of Electricity Delivery and Energy Reliability – Providing national leadership to ensure that the Nation's energy delivery system is secure, resilient and reliable.



U.S. Department of Energy State Energy Risk Assessment Strategy

Goals of Initiative

- Increase States' awareness of risk related to energy infrastructure systems to help them better prepare for disruptions and to make more informed decisions
- Inform and assist States on available analytical capabilities and resources for identifying and evaluating energy infrastructure risks
- Provide a suite of scalable, easily-applied analytical tools, methods, and processes to enable States to better assess risks to energy systems and assets

Objectives In Pursuit of Goals

1. Determine State energy risk assessment needs
2. Assess current practices in State-level energy risk analysis
3. Identify tools, methods, and processes to evaluate risk related to energy assets and systems
4. Engage with key stakeholders (across entire risk analysis development cycle)

Benefits of Initiative

- Improved energy risk assessment and awareness develops a stronger energy risk management culture among State entities.
- A better understanding of risk facilitates integration of energy risk assessment into existing State energy assurance plans and planning processes.
- A strong risk management process promotes transparent and defensible investment and mitigation decisions.

Components of Energy Risk Assessment

Assessing risk to energy infrastructure is a complex, ever-evolving, and continuous process with many different stakeholders and systems. To arrive at the clearest picture of the risk associated with a State's energy systems and infrastructure, there are several components to consider:

- **Threats and Hazards**

Identifying man-made threats and natural hazards helps to establish the boundaries for how a State may need to prepare for events.

- **Vulnerabilities**

Knowing how susceptible an energy asset is to a disruption (natural or man-made) helps in gaining a better understanding of how vulnerable an asset may be. This allows decision makers to focus resources on better protecting the most vulnerable assets.

- **Consequences**

Assessing impacts that result when energy infrastructure assets are disrupted by a threat or hazard helps to determine the level and type of damages or loss that can occur. Economic losses, loss of life or human health, loss of infrastructure functionality, loss of service, and degradation of public opinion and trust are consequences that should be considered.

- **Criticality**

Certain energy infrastructure assets may be especially important to ensuring energy infrastructure continuity. Being able to identify the assets that are most critical to the infrastructure or that provide significant support to other critical infrastructure systems helps to more effectively determine overall risk and prioritize mitigation strategies.

- **Interdependencies**

Understanding the interconnected nature of energy infrastructure and identifying the interdependencies between the energy sector and other sectors plays an important role in quantifying the cascading impacts of a given disruption.

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