U.S. Department of Energy’s Partnership for Energy Sector Climate Resilience

Craig Zamuda, Ph.D.
Senior Policy Advisor

Office of Energy Policy and Systems Analysis
U.S. Department of Energy
Vulnerabilities

- All regions/energy subsectors are vulnerable to extreme weather and climate stress
- Vulnerabilities vary by region, depending upon energy infrastructure present
- Network interdependencies and energy supply chains can extend vulnerabilities across regions

**Climate Stress**
- Increasing temperatures and heat waves
- Increasing heavy downpours
- Increasing sea level rise and storm surge
- Increasing frequency of intense hurricanes
Partnership for Energy Sector Climate Resilience

- Announced in April 2015 in response to industry requests

- Provides a mechanism for sustained engagement between DOE and energy companies, starting with a focus on electric utilities, to address the risks associated with extreme weather and climate

- Collaborate to:
  - Exchange information and best practices
  - Provide user-friendly extreme weather and climate data and decision tools;
  - Assess incentives and disincentives associated with regulations and policies;
  - Assess cost and benefits of resilience actions;
  - Identify metrics for measuring success in enhancing resilience and use them to assess progress;
  - Identify key gaps and opportunities related to the development and deployment of resilient energy technologies, practices and policies.

- Creates a forum where companies pursuing action on extreme weather and climate resilience can receive recognition
Partnership for Energy Sector Climate Resilience: Members

- Membership includes 17 power companies and growing:
  - Represents approximately 20% of U.S. generating capacity, serving approximately 25% of U.S. customers
  - Includes broad array of companies geographically dispersed across the Nation:

- **Investor-Owned**
  - AVANGRID
  - Consolidated Edison of New York
  - Entergy
  - Exelon Corporation
  - National Grid
  - Pacific Gas and Electric
  - Pepco Holdings Inc.
  - Public Service Electric and Gas
  - San Diego Gas and Electric/ Sempra
  - Southern California Edison
  - Xcel Energy

- **State/Municipal**
  - Austin Energy
  - New York Power Authority
  - Seattle City Light
  - Sacramento Municipal Utility District

- **Federal**
  - TVA

- **Cooperative**
  - Great River Energy
Work Streams: Assess risks from extreme weather and other natural hazards, and develop cost/benefit methodologies

- Conduct analysis and publish reports to help Partners and other stakeholders understand national and regional risks

- Collaborate with Federal Partners (NOAA, NASA, DHS, and others) to provide down-scaled climate model output for assessing current and potential future vulnerabilities

- Develop uniform methods for economic analysis of costs and benefits of resilience investments.
Work Streams - Conduct Analysis and Provide Guidance and Best Practices to Inform Future Planning

- Provide general guidance for stakeholders to conduct robust vulnerability assessments and develop resilience plans

- Support Partners in conduct of a vulnerability assessment and develop resilience solutions
  - Partner Vulnerability Assessments Summary
  - Partner Resilience Solutions Summary
The Energy Sector is investing billions to “build back better”

Investments include making physical and structural improvements to “harden” the system components as well as planning and modifying operations to enhance resilience

Solutions with co-benefits (e.g., those that decrease costs, help meet energy efficiency or clean energy targets, or improve reliability independent of climate events) are the most commonly implemented
Ongoing EPSA Resilience Activities

- **Sponsor Partnership Resilience Workshop**
  Collaborating with Partner utilities and state regulators to sponsor a workshop focusing on effective approaches and best practices for making the business case for resilience investments.

- **Develop Model Framework for defining a Resilient Electric Utility**
  Developing white paper that characterizes the operational and design characteristics of a resilient electric utility to guide future resilience planning and infrastructure investment.

- **Characterize Energy System Vulnerabilities**
  Collaborating with other DOE programs and the United States Global Climate Research Program to provide a national, regional and local perspective on impacts of climate and extreme weather on the Nation’s energy system.

- **Advance information, methodologies and tools to manage risks**
  Co-leading a pilot program with NOAA regional resilience centers to provide current and historic extreme weather observations and downscaled projections for utility resilience planning.
For Additional Information

Craig Zamuda, Ph.D.
Senior Policy Advisor
Office of Energy Policy and Systems Analysis
U.S. Department of Energy
craig.zamuda@hq.doe.gov

➢ Reports


