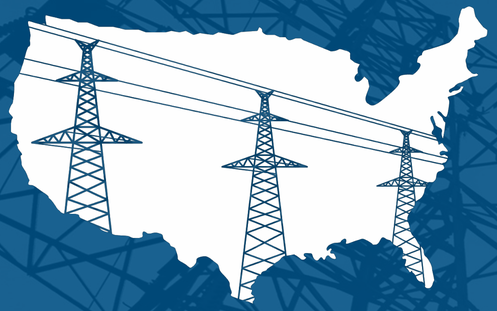


PROTECT OUR POWER

Institute for Energy and the Environment

VERMONT LAW SCHOOL

Mission

- Independent, not-for-profit organization – 501 (c) 3 and (c) 4 status
- Robust, highly-experienced Board of Directors, Staff and Advisory Panel from across relevant government, industry and private sectors
- Mission is to build consensus among government and industry to strengthen our electric grid against all potential attacks

Goals

- Define and prioritize Best Practices that need to be implemented in short- and long-term to make the electric grid more robust and resilient
- Identify the measures to ensure that improvements and upgrades are implemented with a sense of urgency
- Develop innovative proposals to fund improvements, including methods that incentivize utilities to accelerate making grid more resistant to disabling attacks

Leadership

John Lang

Chairman

Fmr. Corporate Treasurer, Aetna

Jim Cunningham

Executive Director

Fmr. President, Pennsylvania Electric Association

Suedeen Kelly

Regulatory Counsel

Fmr. FERC Commissioner

Paul Feldman

Technical Director

Fmr. Chairman, Midcontinent ISO

Richard Mroz

Senior Advisor State, Government Relations

Fmr. President, NJ Board of Public Utilities

Laurence Moskowitz

Strategic Communications Director

CEO, Lumentus

Institute for Energy and the Environment, Vermont Law School

- Provides accessible resources on contemporary energy law and policy with a focus on a cleaner and more resilient grid of the future.
- Distributes scholarly, technical, and practical publications; provides forums and conferences for professional education and issue development.
- Serves as a center for graduate research on energy issues, with environmental awareness.
- IEE research associates are selected from students in the energy and environmental programs at Vermont Law School
- Vermont Law School Top-ranked in the nation for environmental law.

Purpose of Research

- Identify a pathway, or model approach, for state electric utility commissions and their utilities to facilitate timely grid upgrades, identify appropriate financial structure for equitable cost-sharing
- Assess opportunities for state governments to advance grid security and resilience quickly by providing a framework for model state regulatory and legislative initiatives
- Develop streamlined approach that can be used in every state to incentivize utilities and assure complete recovery of costs for improving grid resiliency now
- Provide needed uniformity, help regulatory agencies make timely decisions on need and cost recovery for those upgrades

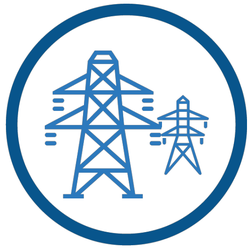
Research Methodology

- **Collected and reviewed primary and secondary sources**
  - Reviewed utility commission dockets and orders
  - Reviewed utility commission and state energy office reports
  - Analyzed state statutes and regulations on utility commission jurisdiction and confidential information statutes
  - Evaluated cybersecurity policies for national trade organizations, state governments, and federal government departments
- **Conducted interviews with**
  - Investor-owned utilities, electric membership cooperatives, public power utilities, national trade associations, and public utility commissions
  - Former Commissioners, Commission staff, Chief Information Security Officers, Chief Executive Officers, Vice-Presidents of Operations, Directors of Regulatory Affairs

Key Areas of Focus

Protecting Confidential Information

Cost Considerations + Cost Recovery Methods



Diversity of Grid System Membership

Resiliency Metrics

Protecting Confidential Information

- **Utilities have abundance of information on addressing cybersecurity vulnerabilities**
  - Sharing between utilities and regulators will help build environment of trust and action
- **Commissions have and should use their authority to increase information flow**
  - Annual filings elevate base knowledge, increase confidence in investment proposals
  - Publicly - and independently- funded grid resiliency research should be disseminated to all potential beneficiaries
- **Resource constraints vary among IOUs, cooperatives, and public power utilities**
  - Human and financial resources vary significantly according to utility size
  - Smaller cooperatives, public power utilities ability to identify, address vulnerabilities is limited
  - New support, funding mechanisms must be explored

Diversity of Grid System Membership

- **Regulatory commission exercise of jurisdiction is inconsistent across distribution system**
  - Commission jurisdiction over the safety and reliability of IOUs is well established
  - Regulation of safety, reliability of cooperative and public power systems is a patchwork, not consistently exercised when available.
- **Resource constraints vary among IOUs, cooperatives, and public power utilities**
  - Human and financial resources vary significantly according to utility size
  - Smaller cooperatives, public power utilities ability to identify, address vulnerabilities is limited
  - New support, funding mechanisms must be explored

Cost Considerations, Recovery Methods

- **Cybersecurity and grid resilience require continuous, incremental investments**
  - Shorter component lifespans, need for continual investment can lead to conflicts over cost recovery for cybersecurity investments
- **Cost recovery mechanisms matter**
  - HOW costs recovered is as important as IF recovered
  - WHEN to file recovery proposal is influenced by WHICH recovery mechanism employed
- **Rate case versus single issue rider approaches**
  - General rate cases remain preferred means for assessing reasonableness, prudence
  - Adjustment clauses, deferral accounts not commonly used for cybersecurity expenses.
  - Single issue riders, special recovery mechanisms useful, but cannot transfer risk to customers
- **Ratepayer benefits must be clear, whether ICS and OT, or incident mitigation and recovery**
  - Benefit calculation, resiliency metrics are key to justifying proposed resiliency investments

Resiliency Metrics

- **Resiliency metrics and resiliency investments.**
  - Resiliency metrics measure grid response, adaptation to low-probability, high-impact events
  - Absent industry-standard resilience metrics, utilities will struggle to justify resilience investments, commissions will struggle to evaluate prudence
- **Metrics are needed across resiliency phases**
  - Individual metrics needed to measure robustness, resourcefulness, recovery, and adaptation
- **Gap exists between metric development and adoption**
  - Despite numerous resiliency metrics projects, no industry consensus or regulatory adoption

PHASE 1 SUMMARY:

The Six C's

COMPLEXITY:

These are challenging issues and will require diverse constituencies to reach agreement on solutions

CONFUSION:

Utilities, regulators and Congress are confused about who is responsible for coordinating the whole

CONSISTENCY:

To the greatest degree possible, the industry needs consistent best practices and solutions applied across the spectrum

COST:

The dollar cost is a significant hurdle, so constituencies must be convinced that the threats are clear and present now.

CLARITY:

The plan of action, including cost recovery, must be clear and articulate a compelling national interest

CREATIVITY:

Building from a clear understanding of the threats and challenges, creativity in developing and implementing solutions is critical

PHASE 1 SUMMARY:

Reasons for Action

DISTRIBUTION SYSTEM VULNERABILITY IS RISING

- Anticipatory threat challenges not being adequately met
- As interconnections and devices increase, so does grid vulnerability
- Dissimilar systems are being linked
- Bright lines between IT and OT fading
- Every access point creates potential vulnerability - IOU, coop or public power

COMPREHENSIVE COORDINATION REQUIRED

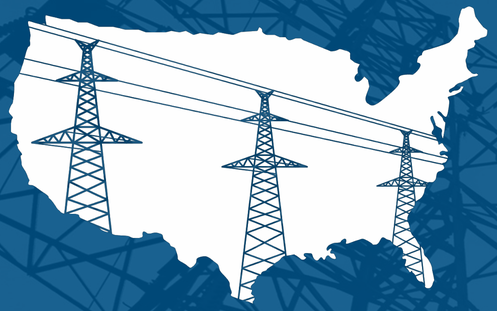
- Managing system vulnerabilities requires plan, action from every entity
- Plan must focus on sharing threat and vulnerability information, establishing best practices, facilitating investment via ratepayer benefits.

DISTRIBUTION SYSTEM VULNERABILITY IS RISING

- Continuous communication is key to addressing cybersecurity vulnerabilities
- Utilities, commissions, legislatures, Governors all can lead.
- Existing programs come from data privacy concerns, adding dedicated staff, or via grid modernization efforts

Next Steps

- Continued research
- Final recommendations for action
- Develop model regulations and legislation



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