EPRI ELECTRIC POWER RESEARCH INSTITUTE

Energy and Environment

"Climate Change Vulnerabilities of and Adaptation Strategies for New York's Future Electric System"

Stakeholder Workshop

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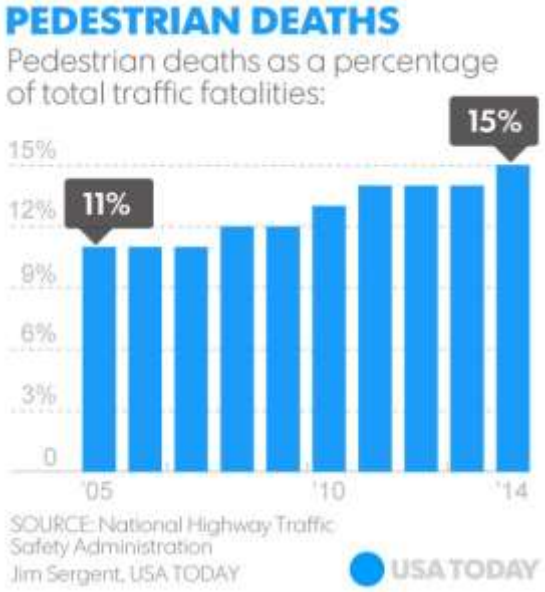
Tuesday May 16, 2017

SUNY Global Center, New York, NY

Safety Moment



Introductions

- Name
- Organization
- What are you working on related to resiliency?

EPRI: Born in a Blackout

Founded in 1972 as an independent, non-profit center for public interest energy and environmental research

New York City, The Great Northeast Blackout, 1965

- 450+ participants in more than 30 countries
- EPRI members generate approximately 90% of the electricity in the United States
- Annual budget > $400 million

EPRI's approach to Resiliency

Physical Security | **Weather Events** | **Cyber Security** | **Solar Storm**

Hardening, Recovery, Survivability

Line-test—EPRI High Voltage Laboratory, Lenox, MA

http://eprijournal.com/making-distribution-grids-stronger-more-resilient/

Extreme weather and climate resiliency affect the electric system via multiple pathways and at various scales

	Vulnerability	Driver	Risk
Supply and Distribution	Hydropower	precipitation, snowmelt, runoff	Reduced hydropower resource availability
	Thermoelectric units	air temp	Reduced thermal efficiency of power generation
	Power plants near water	sea level rise, precipitation	Flood risk in low-lying coastal and riverine areas
	Water-cooled units	water temp	Temp of intake and discharge water, cooling efficiency
	Wind and solar	wind speed & direction, clouds	Availability / predictability of renewable power
	T&D lines	air temp	Line efficiency, sagging lines
	Utility assets	extreme weather, storms	Power outages, infrastructure damage
Demand	Total consumption	air temp, extreme weather	Changes in HDDs / CDDs Changes in demand shapes and regional patterns
	Peak demand	air temp, humidity, extreme weather	Increase in summer peak load, power outages

Adapted from NYSERDA (2011)

"Informing how NY's *electric system of the future* might operate in the *climate of the future*"

- Assessing costs and benefits at the system-level

Costs

  - How might electric system operations change over time in response to climate? What is the potential impact on cost and performance if changes are not planned for?

Benefits

  - How might investments and operation evolve differently if changes are anticipated?
    → climate adaptation and resiliency in system planning

- New 2-year EPRI-NYSERDA project "Climate Change Vulnerabilities of and Adaptation Strategies for NY's Future Electric System"
  - Objective: Assess NYS electricity system performance, vulnerabilities, and adaptation strategies under a future climate
  - Value: Help decisionmakers and planners design and operate system to be resilient to climate change and meet policy objectives at least cost

Session 1 – Setting the Scene: Perspectives on Climate Resilience

Addressing the climate threat in NY

DOE Partnership for Energy Sector Climate Resilience

Session 2 – Project Overview

Delavane Diaz, EPRI
Stephen Shaw, SUNY-ESF
David Young, EPRI
Mary Collins, SUNY-ESF

Session 3: Utility Panel

Framing questions

- How are you considering future climate conditions in your long-term planning processes?
- How does this research project complement or inform those activities?
- How are you thinking about sea level rise or flooding in your planning processes?

Session 4: Stakeholder input and wrap-up

- Today's slides will be posted at eea.epri.com/events
- We will be convening a Utility Advisory Group and looking for your input
  - ~3 webcasts over next 12 months

- Some common themes and perspectives from today…
- Reactions and reflections from Project Advisory Committee

- Parallel study of sea level rise impacts
  - Input and key considerations

Session 4: Stakeholder perspectives on resiliency issues

1. What are the top climate resiliency concerns at your organization? (e.g., policy driver, physical threats)

2. Should resiliency be handled differently from reliability? (e.g., planning, investment, operations)

3. What are the key research gaps and emerging issues related to climate resiliency analysis?

Together…Shaping the Future of Electricity

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