

Climate Change Vulnerability Study

Presented by: Billy Raley, Senior Vice President of Transmission & Distribution (LIPA)
Joanna Weissman, Manager, Climate Change and Resilience (PSEG Long Island)

Prepared for: LIPA Board of Trustees

April 17, 2024

Prioritizing Reliability and Resiliency

- LIPA's Board Policy on [Transmission and Distribution Operations](#), first adopted in November 2021, requires resiliency plans to *“mitigate the effects of climate change through multi-year programs that reduce the number and duration of outages after significant system disruptions”*
- New York State Legislation passed in 2022 requires Investor-Owned Utilities to develop Climate Change Vulnerability Studies (CCVS), followed by multi-year plans to improve climate resiliency
- The Climate Action Council's Scoping Plan recommended that LIPA and other municipal utilities assess climate vulnerabilities and develop resiliency plans
- PSEG Long Island, on behalf of LIPA, conducted a Climate Change Vulnerability Study and is developing a Climate Change Resiliency Plan with climate change adaption measures

Building a decade of Storm **Hardening** and **Resilience**

- **1,400 miles of distribution storm hardening complete**
 - (1,050 miles FEMA-funded/350 miles customer-funded), with a 44% decrease in incidents per mile on hardened vs non-hardened sections
- **Reliability gains over the past decade:**
 - 40% decrease in the frequency of outages
 - 27% decrease in the duration of outages
 - 65% decrease in outages less than 5 minutes
- **Ongoing 5-year Resiliency Plan anticipated to achieve an 18% reduction in Customer Minutes of Interruption from ‘next Isaias’:**
 - Distribution hardening
 - Automated switches to achieve less than 500 customers behind a switch
 - Enhanced vegetation management, including trim-to-sky and hazard tree removal
 - Transmission projects to address load pockets vulnerable to loss of supply



Study Outreach & Stakeholder Engagement

Collaboration with five external stakeholder groups:

- Environmental Advisory Committee
- Consumer Advocacy and Human Service Organizations, including the Public Utility Law Project, the Health and Welfare Council of Long Island, and the EAC Network
- Suffolk County
- Nassau County
- City of New York



Climate Science Review

Climate projections downscaled to the Long Island Service Territory using the New York State Energy Research and Development Authority (NYSERDA) and Columbia University datasets to review:

- Temperatures linked to asset ratings
- Extreme heat and heat waves
- Extreme cold
- Heavy precipitation
- Sea level rise

Supplementary analyses for additional hazards of priority to Long Island service territory, including tropical cyclone winds, thunderstorms, tornadoes, wind lulls, and ice storms

Climate Science Findings

Projections show the potential for:

- Increases in average daily temperatures relevant to utility equipment asset ratings and increases in extreme temperatures
- Increases in heat wave frequency and duration
- Increases in the number of cooling degree days
- Fewer days with colder temperatures
- Small relative increases in heavy precipitation, with year-to-year variability
- Rise in sea level by 16 inches by the 2050s and 30 inches by the 2080s under the 50th percentile (*consistent with previous planning assumptions*)
- Increases in 1-in-10-year maximum sustained wind speeds associated with landfalling tropical cyclones through the late century



Vulnerability Assessment Process

Exposure

Degree to which assets face climate hazards based on location and hazard magnitude

Impact

Potential for negative outcomes in event of exposure

Sensitivity

Potential for negative impacts from climate hazard

Consequence

Magnitude of negative outcomes

Vulnerability

Potential to be affected by climate hazards and the significance of consequences

Mitigation plan to focus on priority vulnerabilities – high exposure risk, high impact

Summary of Key Asset Vulnerabilities

Climate Hazard	Transmission	Distribution	Substation
Extreme Heat (Starting in 2040s)	-	<ul style="list-style-type: none"> Overhead Transformers Pole Mounted Regulators 	<ul style="list-style-type: none"> Transformers and Regulators Switchgear
Coastal and Inland Flooding	-	<ul style="list-style-type: none"> Pad Mount Switchgear 	<ul style="list-style-type: none"> Transformers and Regulators Circuit Breakers Switchgear Instrument Transformers Control Room/Control house/protection and control devices
High Wind	<ul style="list-style-type: none"> Line Structures Overhead Conductors 	<ul style="list-style-type: none"> Overhead Structures Overhead Conductors 	-
Ice	<ul style="list-style-type: none"> Line Structures Overhead Conductors 	<ul style="list-style-type: none"> Overhead Structures Overhead Conductors 	<ul style="list-style-type: none"> Transformers and Regulators

Priority Vulnerabilities – Operations & Planning

- **Worker safety:** More frequent work under adverse conditions, including extreme heat
- **Emergency response:** Increased frequency and magnitude of events with the potential to strain resources (mutual aid and supply chain)
- **Reliability planning:** Increased frequency and intensity of extreme weather events, including storms and heat waves
- **Vegetation management:** Increased frequency and intensity of storms; anticipated increase in vegetation growth
- **Enhance data analytics of asset management:** Opportunity to enhance data analytic capabilities around assets considering climate change effects
- **Capacity planning:** Transmission and Distribution equipment ratings are based on ambient temperatures that will need to be monitored and may need to be adjusted in the future in the event of increasing ambient temperatures
- **Load forecasting:** Adjusting load forecast to increases in heat and humidity

Next Steps





Billy Raley
Senior Vice President
Transmission & Distribution
LIPA

Joanna Weissman
Manager, Climate Change
and Resiliency
PSEG Long Island

Questions?