

Climate Change Vulnerability Study and Resilience Plan

Working Group Meeting 4

Sept 28, 2023



Welcome & Introductions

Project Context

Climate Change Resilience Plan

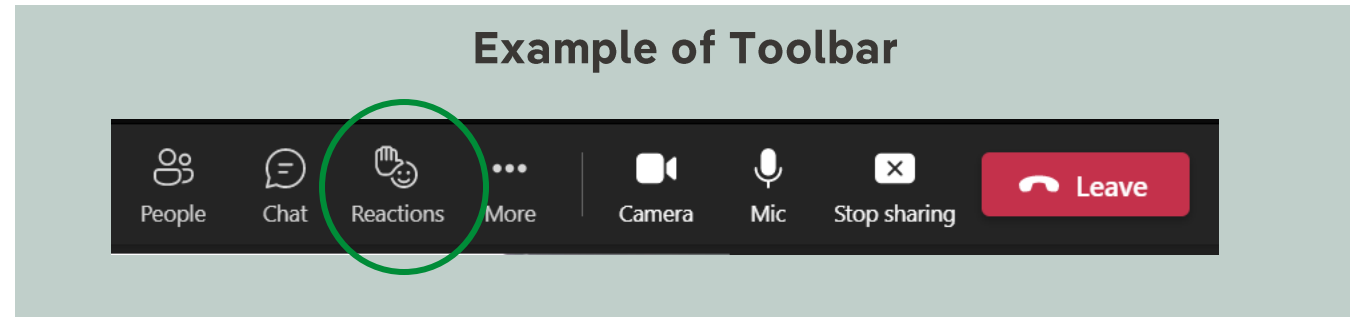
Discussion

Next Steps

Welcome & Introductions



- Please use the ***raise hand function*** at any point during the presentation to ask a question or add it to the chat.
- The meeting will be recorded
- The presentation was provided to everyone in advance of today's Working Group session.
- If you have technical difficulties or need assistance with the Microsoft Teams please message jeffrey.meek@icf.com



Registered Working Group Participants



Name	Organization or Affiliation
Avni Pravin	AGREE
Ziang Zhang	Binghamton University
Erika Pierce	Westchester County Board of Legislators
Aimee Dailey	Broome County Planning
Beth Lucas	Broome County Planning
Gillian Sloan	Broome County
Owlen Huxley	C&S Companies
Brian Eden	Campaign for Renewable Energy
Barry Carr	Clean Communities of CNY
Abigail McHugh-Grifa	Climate Solutions Accelerator of the Genesee-Finger Lakes Region
Kristen Van Hooreweghe	Climate Solutions Accelerator of the Genesee-Finger Lakes Region
Molly Ryan	Clinton County IDA
Kelly Donoghue	Clinton County Office of Emergency Services
Eric Day	Clinton County Office of Emergency Services
Patrice Perry	Columbia County Planning Department
Guillermo Metz	Cornell Cooperative Extension Tompkins County
Karim Beers	Cornell Cooperative Extension Tompkins County
Robert Corpora	Cortland County
Michael Mager	Couch White, LLP for Multiple Intervenors
Melanie Franco	Couch White, LLP for Multiple Intervenors
Rick Mancini	Customized Energy Solutions
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Romy M Fain, PhD	Heat Inverse
Michael Jagielski	Koffman Southern Tier Incubator
Andrew Brodell	Livingston County OEM
Will Gall	Livingston County OEM
Amanda Kaier	Mohawk Valley Economic Development District, Inc
Clement Chung	Monroe County Department of Environmental Services
Madison Quinn	Monroe County
Aferdita Bardhi	NYS Department of Public Service
Biola Daniel	NYS Department of Public Service
Bridget Frymire	NYS Department of Public Service
Eric Moore	NYS Department of Public Service
Greg Crawford	NYS Department of Public Service

Name	Organization or Affiliation
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Kerri Green	Schuyler County Partnership for Economic Development
Jeffrey Eisenhauer	Siemens
Jack Wheeler	Steuben County
Heather Brown	Sullivan County
Jennifer de Souza	The Raymond Corporation
Mike Straight	Tier Energy Network
Jeff Smith	Tier Energy Network, Rotary
Hailley Delisle	Tompkins County
Peter Bardaglio	Tompkins County Climate Protection Initiative
Katie Borgella	Tompkins County Dept of Planning and Sustainability
Fion MacCrea	Town of Alfred
Jason Keding	Town of Boston
Dr. Mitch Tucker	Town of Boston
Brendan Ryan	Town of Brighton
Evert Garcia	Town of Brighton
Jerry Vernold	Town of Hancock
Pat Wartinger	Town of Henrietta Sustainability Committee
C.J. Randall	Town of Ithaca
Hilary Swartwood	Town of Ithaca
Katherine Daniels	Town of North Salem
Norma J Burris	Town of Orange
Josheph Wilson	Village of Dryden
James Basile	Village of Fair Haven
Dave McDowell	Village of Sodus Point
Thomas Lyon	Wayne County Economic Development & Planning
Ryan Dwyer	Westchester County
Brian Meyers	Wyoming County



- **Project Lead:** Ed Roedel, Principal Engineer – Strategic Planning
- **Stakeholder Engagement:** Dave Gridley, Director – Government & Community Relations
- **Regulatory Lead:** Lori Cole, Manager – Regulatory & Tariffs

- **Study Support:** ICF
 - Judsen Bruzgul – Project Lead
 - Jeffrey Meek – Stakeholder Lead



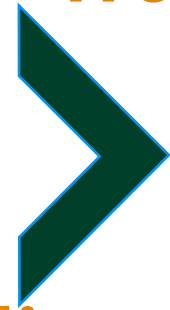
Reminder: Working Group Overview



- Provide a platform for open and constructive discussion of key issues affecting NYSEG and RG&E's climate resilience planning.
 - Gather input and insights from external stakeholders and subject matter experts on strengths and gaps
 - Learn about parallel efforts and connection points
- This is the fourth Working Group (WG) meeting. Today's meeting is focused on the Climate Change Resilience Plan (CCRP).
- The draft CCRP will be shared for comments in advance of the filing in November.



Welcome & Introductions



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Climate Change Resilience Plan

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Overview of PSL



- March 2022, PSL Section 66 (29) became effective for NY electric utilities
- Conduct a **Climate Change Vulnerability Study (Study)** and develop a **Climate Change Resilience Plan (Plan)**
- The Study must include an evaluation of the electric grid's vulnerability to climate-driven risks
- The Plan must address the findings of the Study for the next ten- and twenty-year periods
- Engage and collaborate with stakeholders
- The Study and Plan must be filed in the fall of 2023, with updates at least every five years





Vulnerability Study



Climate Change Vulnerability Study

New York State Electric & Gas and
Rochester Gas & Electric

September 2023

The Climate Change Vulnerability Study distributed on 8/26 and filed on 9/22.

- Includes summary of climate projections and exposure
- Provides the process and methodology for evaluation the vulnerability of electrical infrastructure to climate hazards

Reminder

Adaptation

Actions to increase resilience to climate change

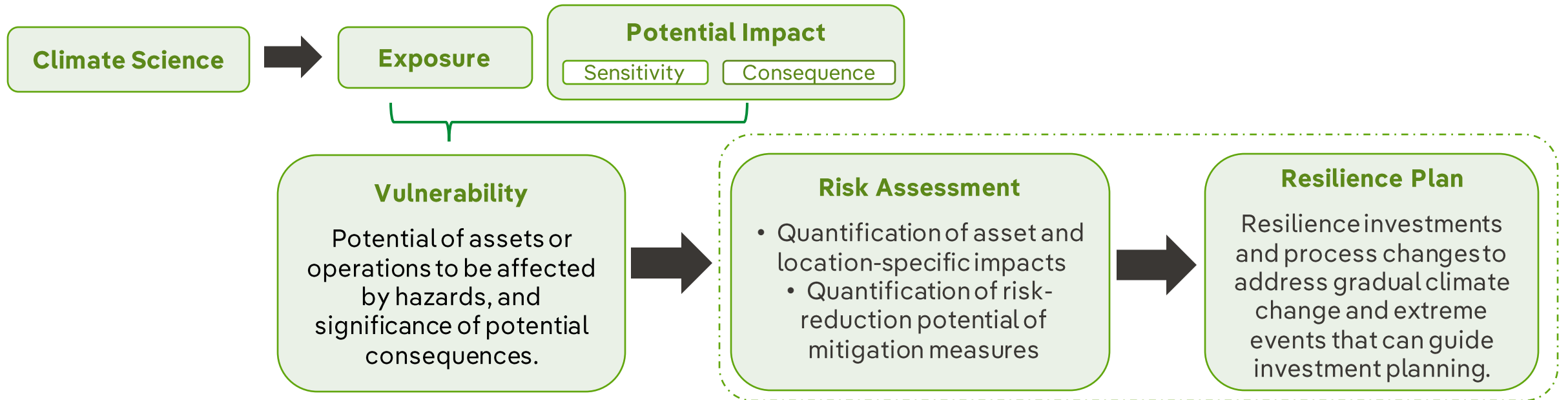
The goal is to increase the reliability and safety for customers. Examples of resilience strategies are:

- Infrastructure hardening
- Undergrounding lines
- Building new storm barriers
- Changes to design standards

Today's Focus



- Update on the study progress since the last WG meeting.
- Provide information on the climate resilience planning process.
- Review content for the Climate Change Resilience Plan (CCRP) and implementation steps.
- Discuss identified strategies for increasing resilience to further protect customers.

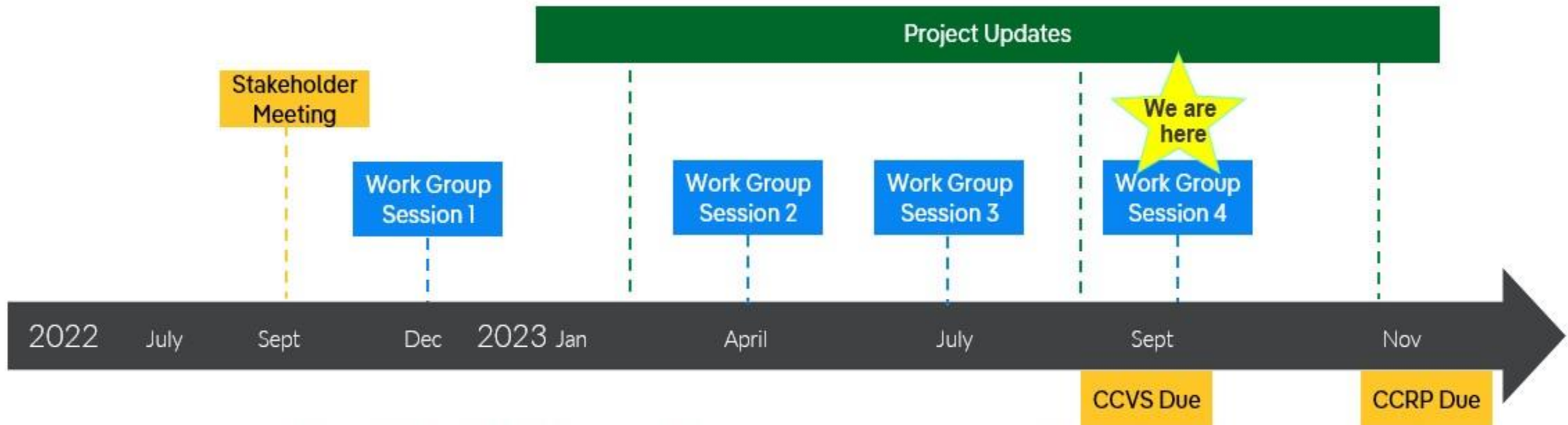


Reminder: Efforts to Date



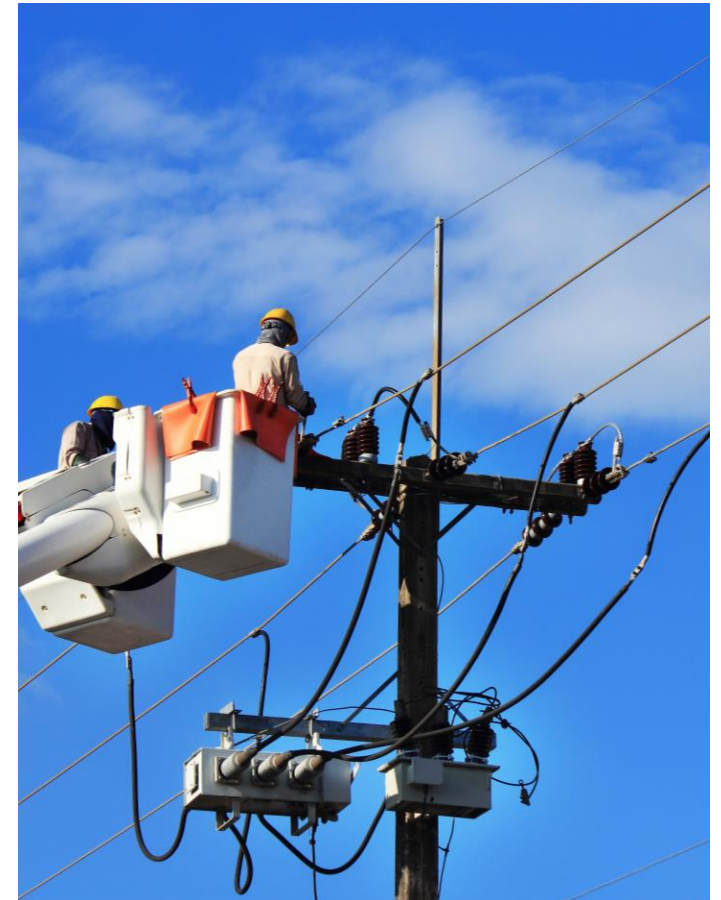
Previous WG Session Topics:

- Climate science summary & sample asset exposure findings
- Process for determining physical impacts of climate change on infrastructure
- Analysis of exposure, sensitivity, and consequence
- Review of climate change vulnerability study content
- Review of climate change resilience plan content





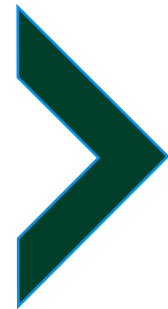
Question on progress
to date?





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Reminder: File date Nov 21



Climate Change Resilience Plan

New York State Electric & Gas and
Rochester Gas & Electric

November 2023

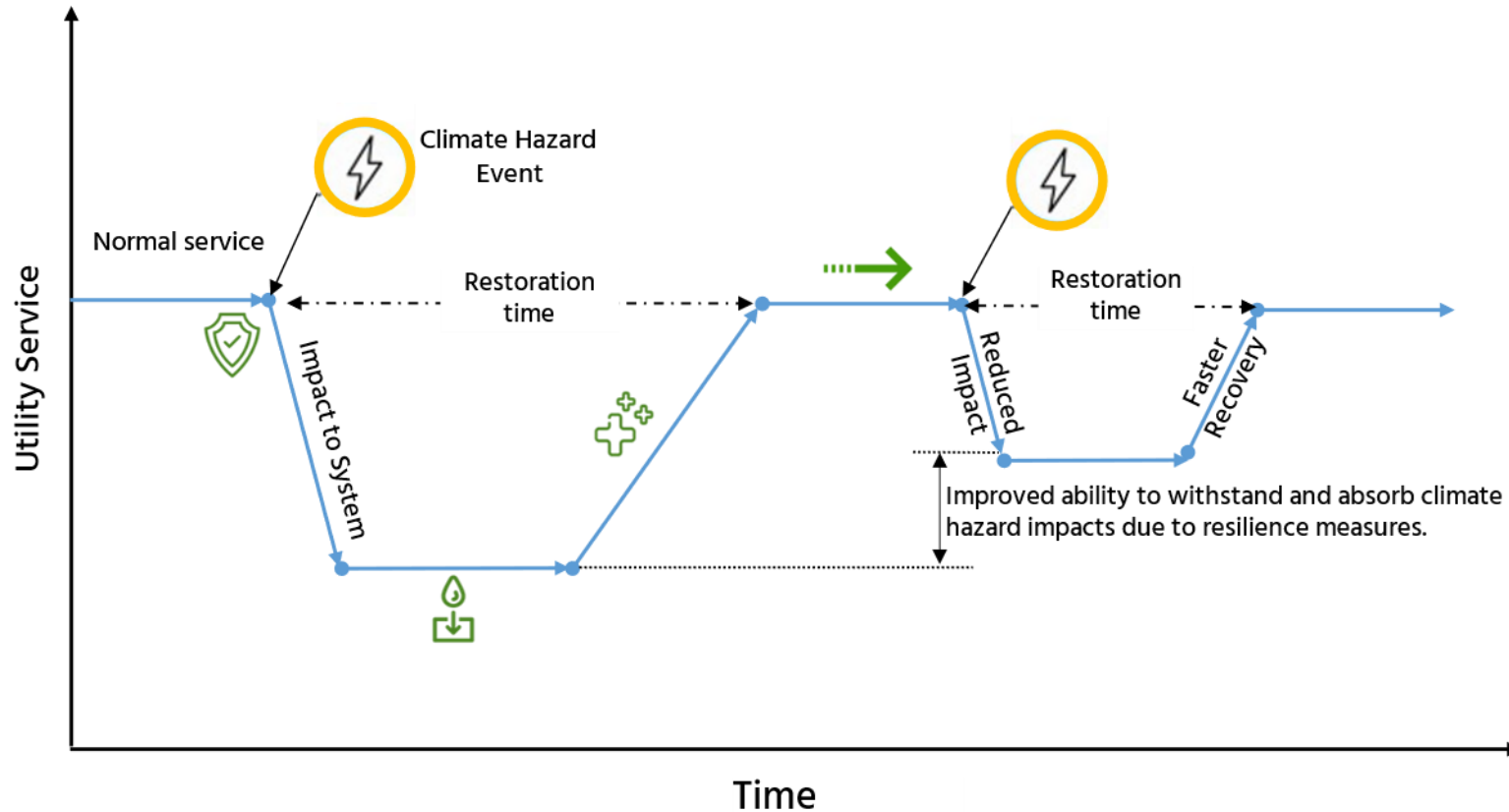
Outline

1. Introduction and Background
2. Engagement of the Climate Resilience Working Group
3. Multi-pronged Resilience Strategy and Approach
4. Consideration of Equity
5. Investment Plan
6. Governance
7. Performance Measures
8. Conclusion and Next Steps
9. Appendices

Resilience Plan Framework



Pursue a multi-pronged resilience strategy with four dimensions: Withstand, absorb, recover, and advance and adapt.



1. Strengthen assets and operations to **withstand** the adverse impacts of a climate hazard event.



2. Increase the system's ability to **anticipate** when a climate hazard event may occur and **absorb** its effects.



3. Bolster the system's ability to quickly **respond and recover** in the aftermath of a climate hazard event.




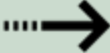


4. Advance and adapt the system to address a continuously changing threat landscape and perpetually improve resilience.

Resilience Journey To Date



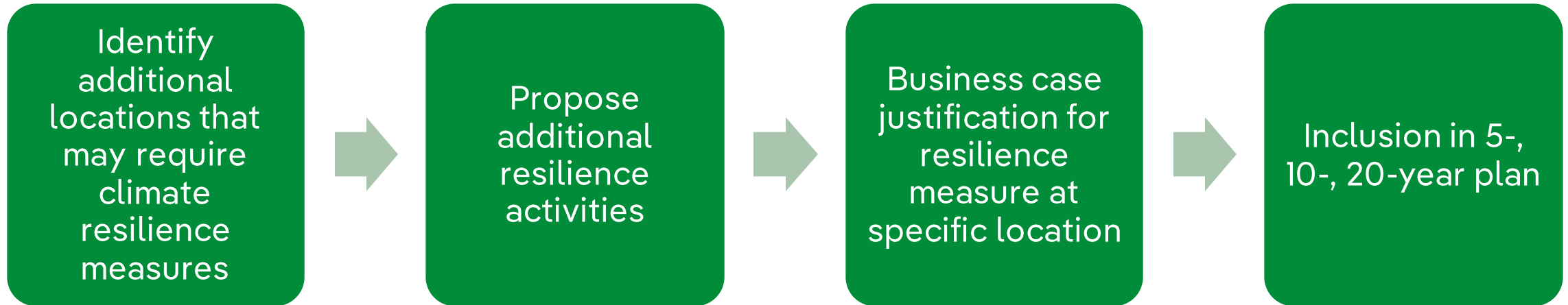
NYSEG and RG&E's previous and the now pending rate cases include resilience improvements to the transmission and distribution systems through a variety of projects and programs. Many of these have a direct increase to resilience to priority climate hazards identified in the CCVS.

Activity	Resilience Benefits
Pole replacement	Withstand exposure to wind gusts, wind and ice, and flooding 
Line upgrades (T & D)	
Substation Rebuild (flooding & strengthening)	
SCADA Switches, reclosers and automation	Absorb impact by reducing outage extent.   Recover efficiently by quickly identifying fault location
Trip savers	
Doubled Circuits	Advance and adapt by building redundancy and ability to transfer loads in the event of an outage.  Increased capacity allows adapting to temp. increase
Load Transfer	
Substations Rebuild (capacity)	

Current Climate Change Resilience Plan



NYSEG and RG&E are evaluating additional locations, beyond those already proposed in the pending rate case, that may require adaptation activities based on climate projections.



When there is more than one resilience measure alternative, decide which one is best.

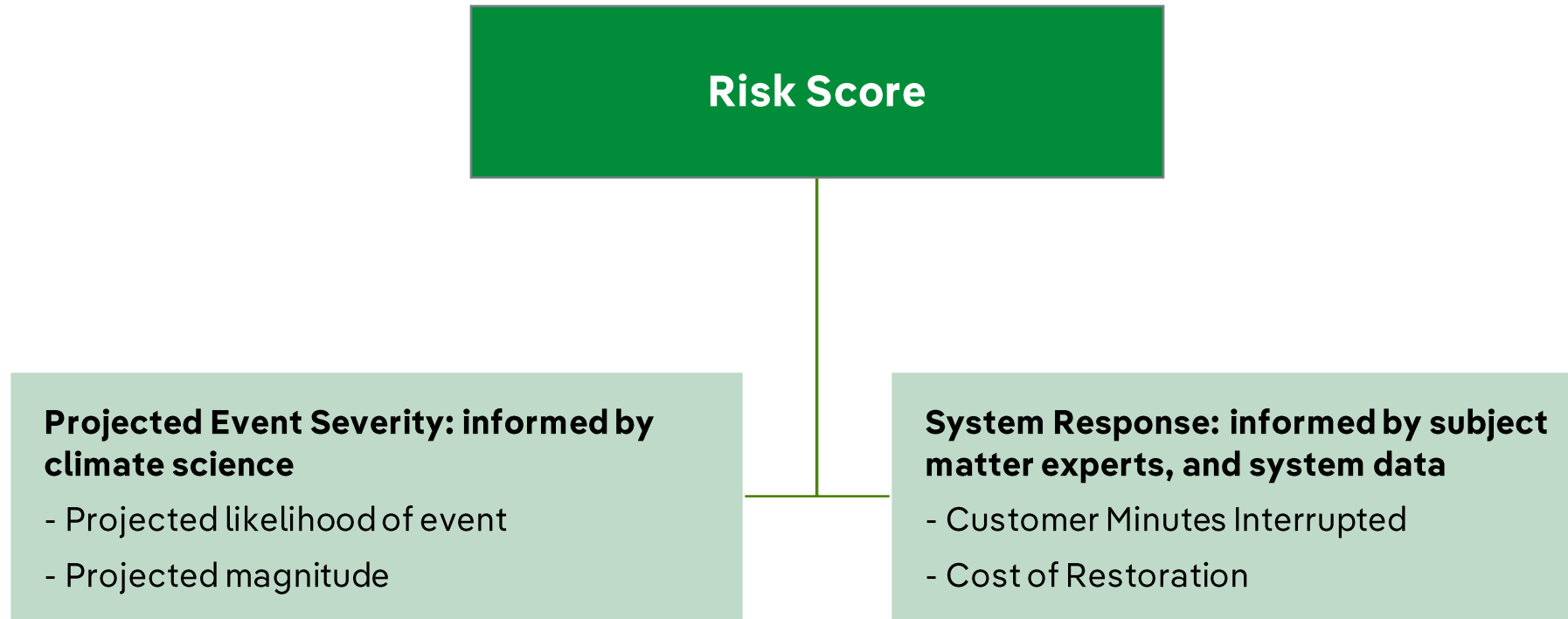


Identifying Locations

Calculating Risk Scores



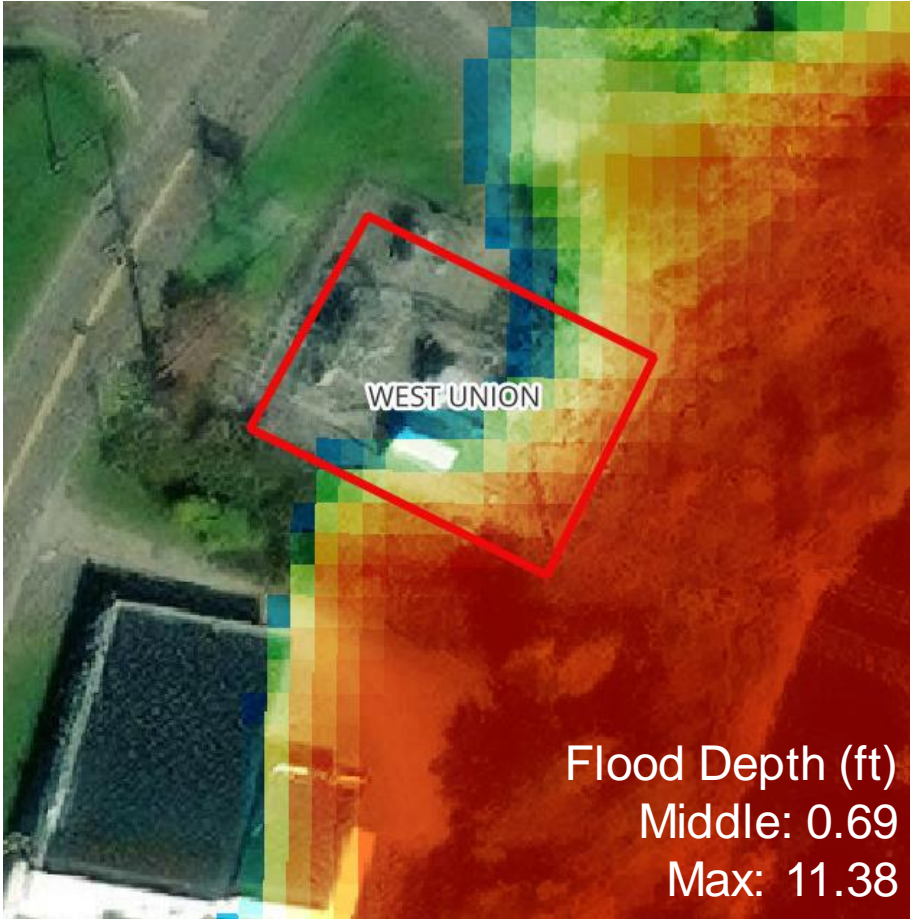
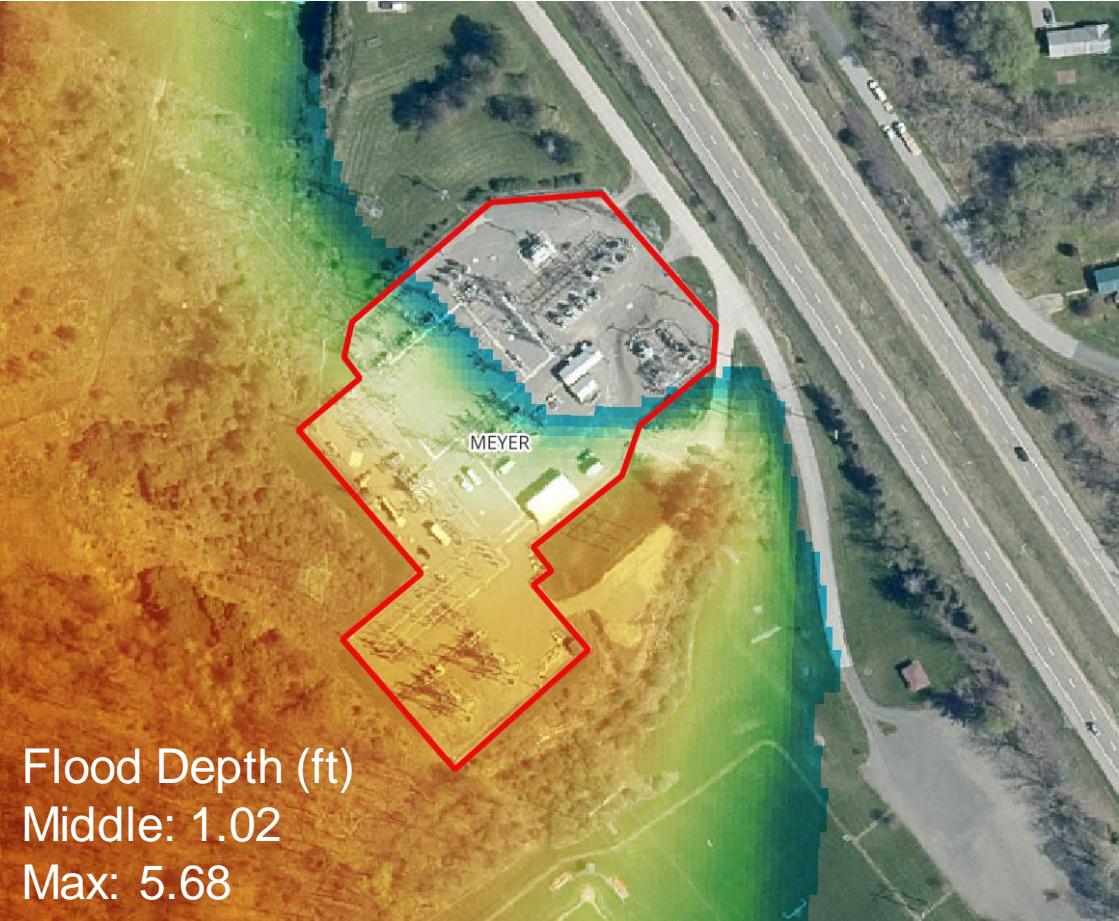
Risk scores are being calculated by asset + hazard combination and vetted within the study team to identify additional locations that may require resilience activities.



Substations and Flooding



Location-specific review of climate data is being conducted to determine the risk level.



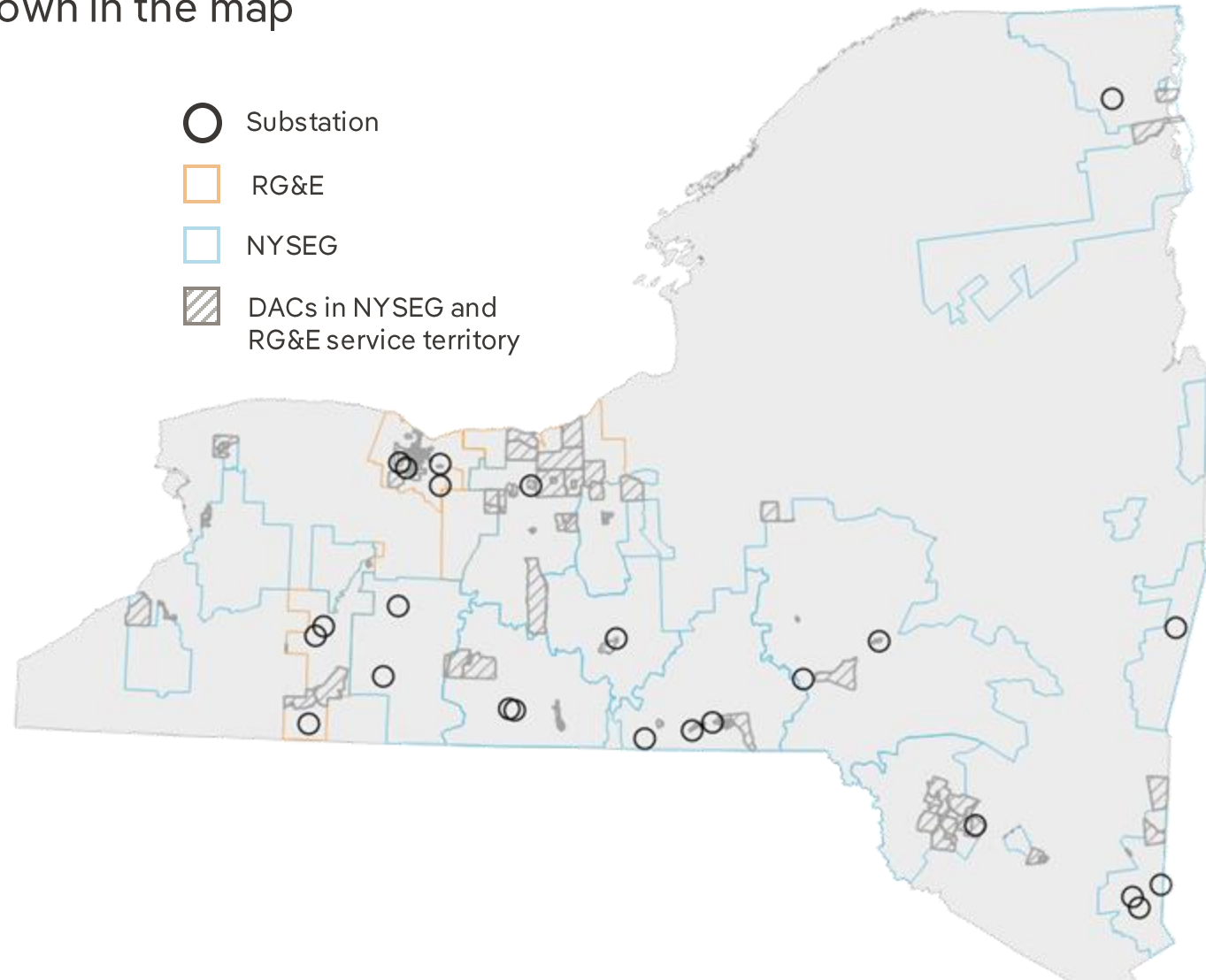
Substations and Flooding – Risk Score Preliminary results



The tables show the top 5 scoring substations to 1-in-500-year flood risk for NYSEG and RG&E. Additional substations for each are shown in the map

NYSEG		
Substation Name	Number of Customers	Flood Depth (ft)
Goudey	2,972	26
Mountindale	2,656	9
Castle Garden	3,670	18
Meyer	3,508	6
Putnam	3,753	10

RG&E		
Substation Name	Number of Customers	Flood Depth (ft)
218	2,874	4
67	1,088	4
173	1,098	3
85	978	10
168	1,713	1



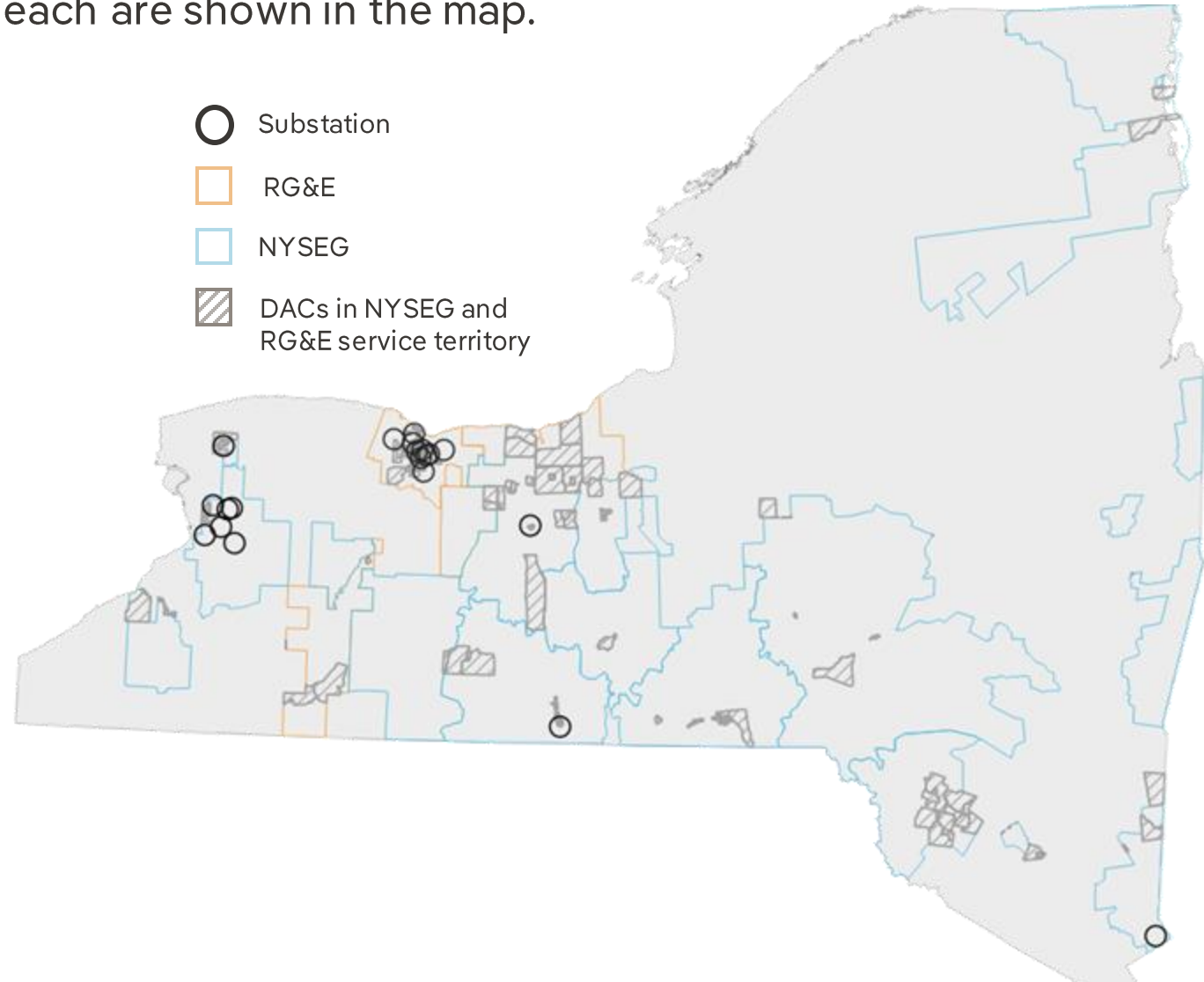
Substations and Heat – Risk Score Preliminary results



The tables show the top 5 scoring substations to 1-in-100-year, 2050 scenario, temperatures for NYSEG and RG&E. Additional substations for each are shown in the map.

NYSEG		
Substation Name	Number of Customers	Degrees above 104°F
Walden	8,017	6.3
Neversink	999	6.4
Swift Street	2,794	4.7
Hilldale	1,960	6.4
Crafts	5,266	6.3

RG&E		
Substation Name	Number of Customers	Degrees above 104°F
127	4,563	4.72
174	810	7.71
175	886	7.71
125	1,473	4.72
247	944	7.71



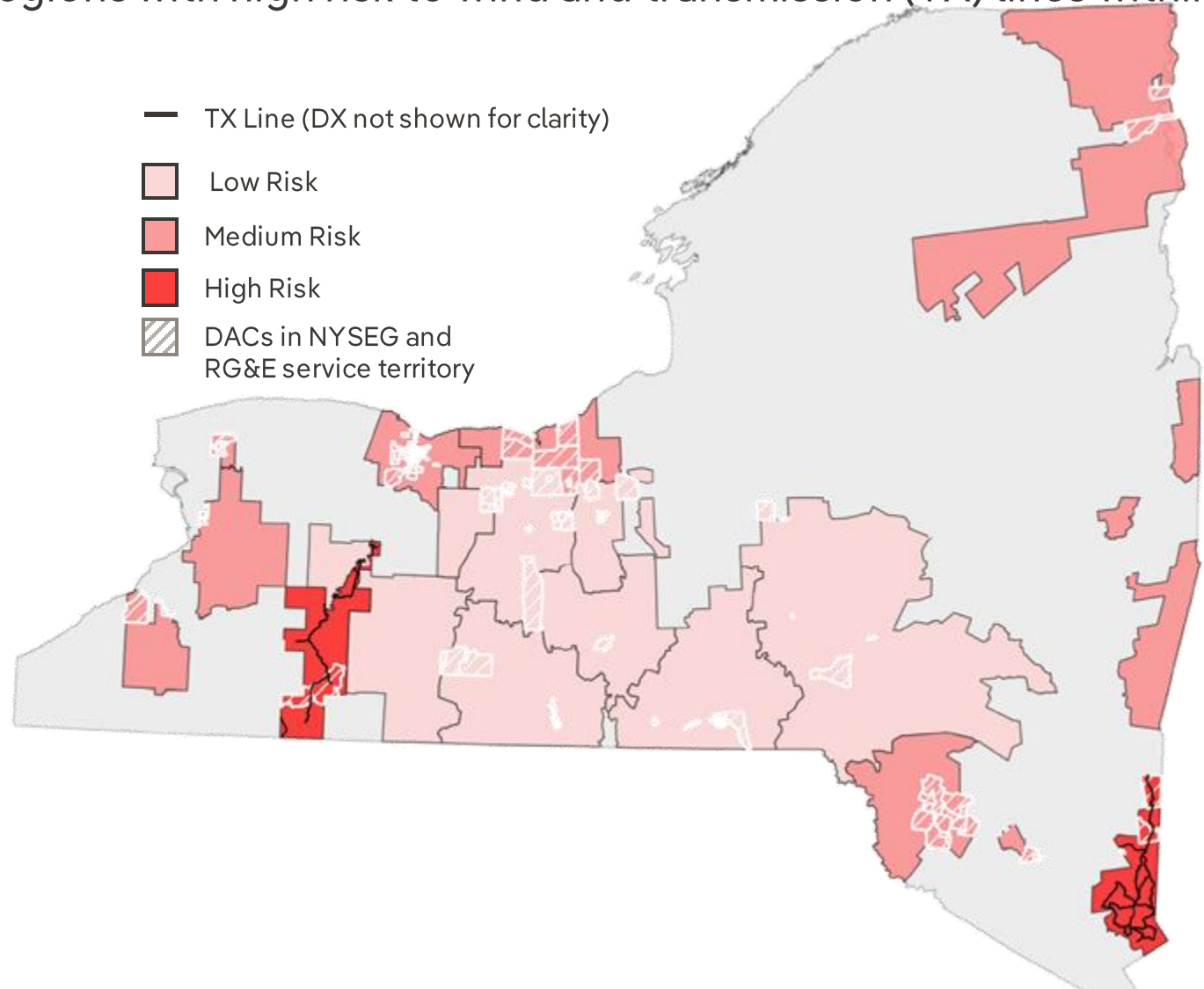
Distribution and Wind – Risk Preliminary results



The tables show the top 5 scoring distribution (DX) circuits with exposure and historical outages due to major wind events. The map shows the regions with high risk to wind and transmission (TX) lines within.

NYSEG		
Circuit Name	Number of Customers	Wind exposure score (out of 10)
Dover Plains 494	2,058	10
Tilly Foster 438	1,819	10
Ten Mile River 444	1,741	10
Carmel 502	1,503	10
Croton Falls 446	1,310	10

RG&E		
Circuit Name	Number of Customers	Wind exposure score (out of 10)
8373 - 7705	1454	9
246 - 120702	948	9
109 - 519502	2758	10
167 - 121102	773	9
418 - 527002	2687	10



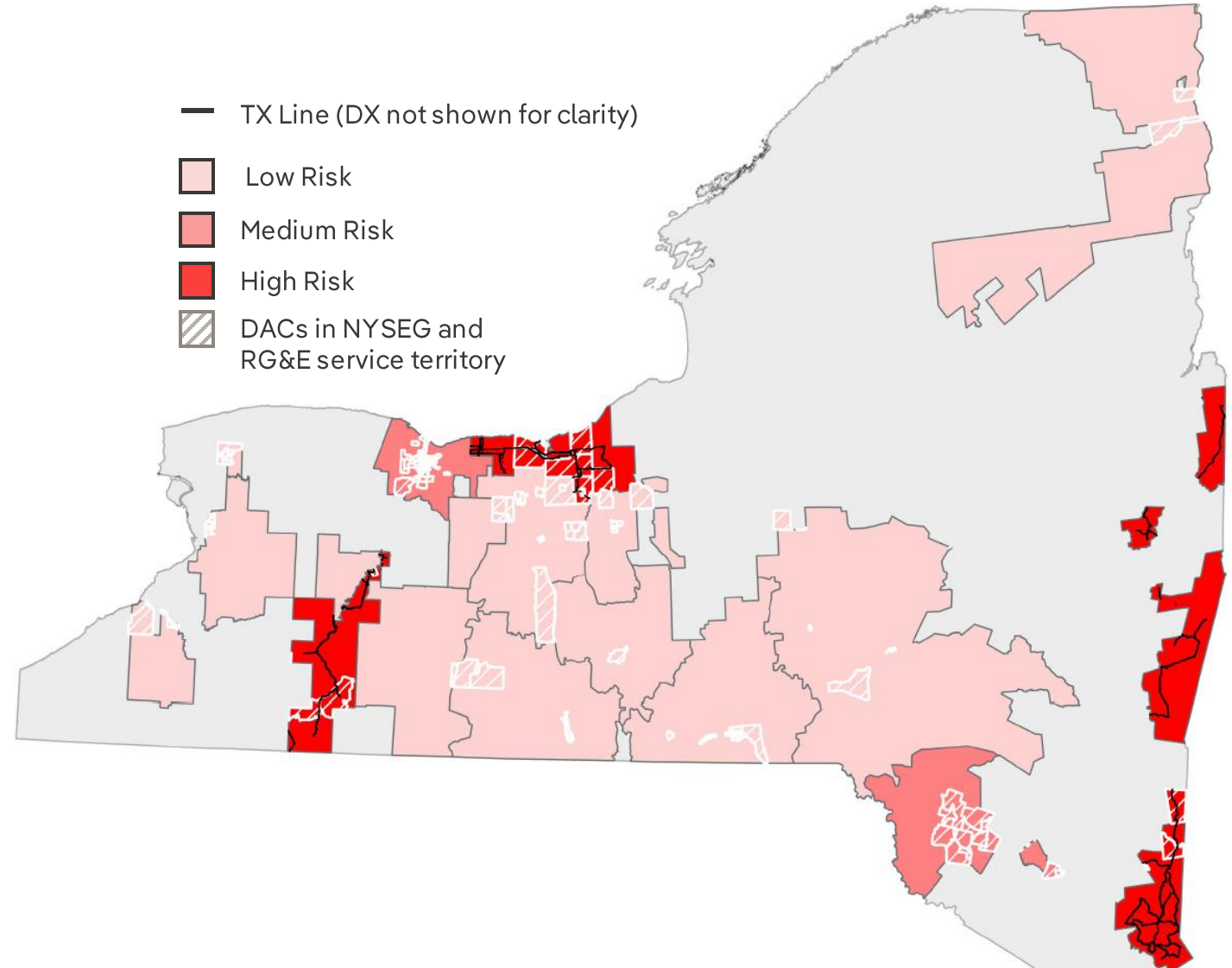
Distribution and Wind and Ice – Preliminary results

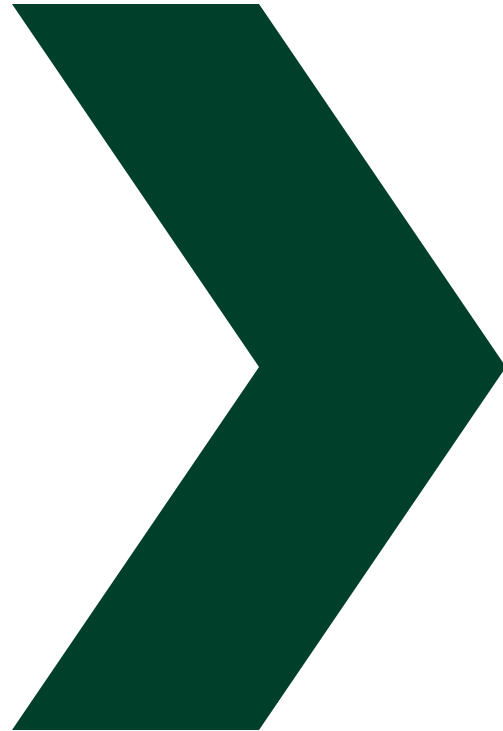


The tables show the top 5 scoring distribution circuits with exposure and historical outages due to major wind events coupled with ice risk. The map shows the regions with high risk to wind and ice.

NYSEG		
Circuit Name	Number of Customers	Wind and ice exposure score (out of 10)
Sylvan Lake 478	2,395	9
Raylinski 606	4,529	8
Union Valley 433	2,317	9
Carmel 501	2,208	9
Union Valley 432	2,103	9

RG&E		
Circuit Name	Number of Customers	Wind and ice exposure score (out of 10)
8373 - 7705	1454	5
202 - 5194	2040	6
205 - 5202	1922	6
71 - 512902	3032	10
246 - 120702	948	5





Business Case Justification

Scoring utility and community benefits



System Reliability (scored from 1 to 5)

- Provides insight on whether a resilience measure being proposed is in an area with historically lower reliability relative to others in the service territory.

Community Safety (scored from 1 to 5)

- Based on the count of critical facilities that provide health- and safety-related services to the community (e.g., hospitals, police stations, water treatment plants, shelters) associated to each circuit.

Community Resilience (scored from 1 to 5)

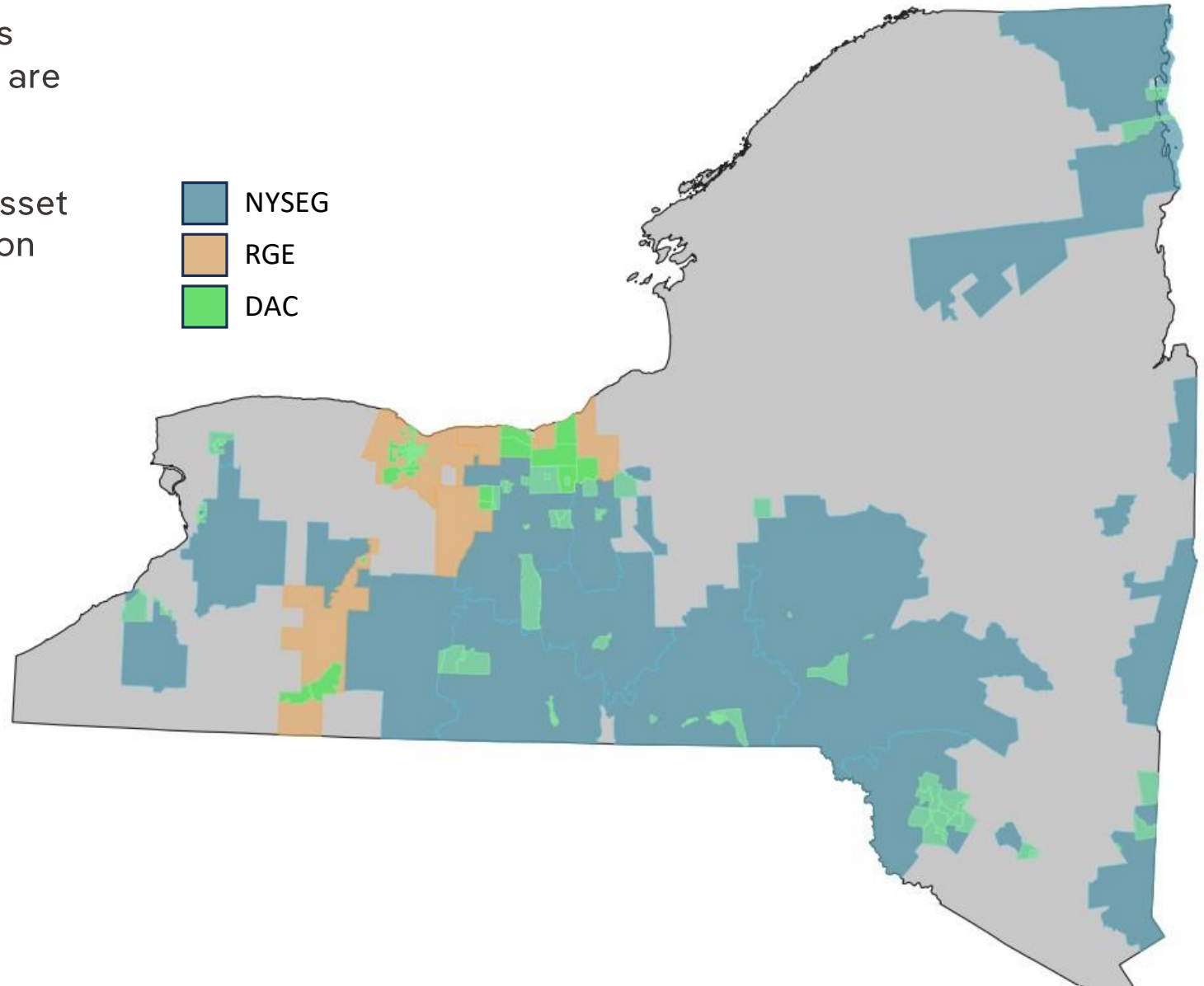
- Provides insight into the extent of the impact on the region due to an electrical outage. It is based on the type of critical facilities and the population they serve, and the number of customers served.

Map of DACs in Avangrid's Service Territory



The location of Disadvantaged Communities (DAC) in NYSGE and RG&E service territory are shown in the map.

This information is used to determine if an asset identified for potential climate risk adaptation serves a DAC.



Benefits Scoring – Flooding Example



PLACEHOLDER VALUES

Substation Name	Reliability Score	Safety Score	Resilience Score	BCJ Score (x/15 * 100)	Serves a DAC?
Goudey	4.5	5	3	83%	Yes
Mountindale	3	4	5	80%	Yes
Castle Garden	4	4	2	67%	Yes
Meyer	3	4	2	60%	No
Putnam	3.5	5	4	83%	No

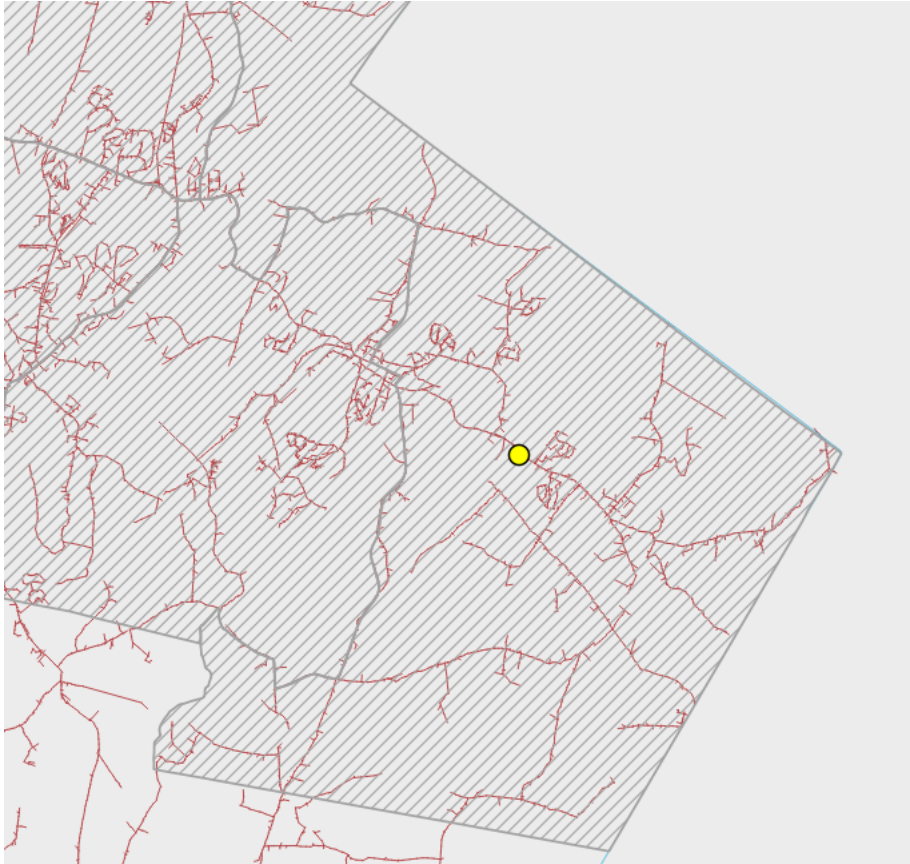
Substations with Distribution Circuits and DAC



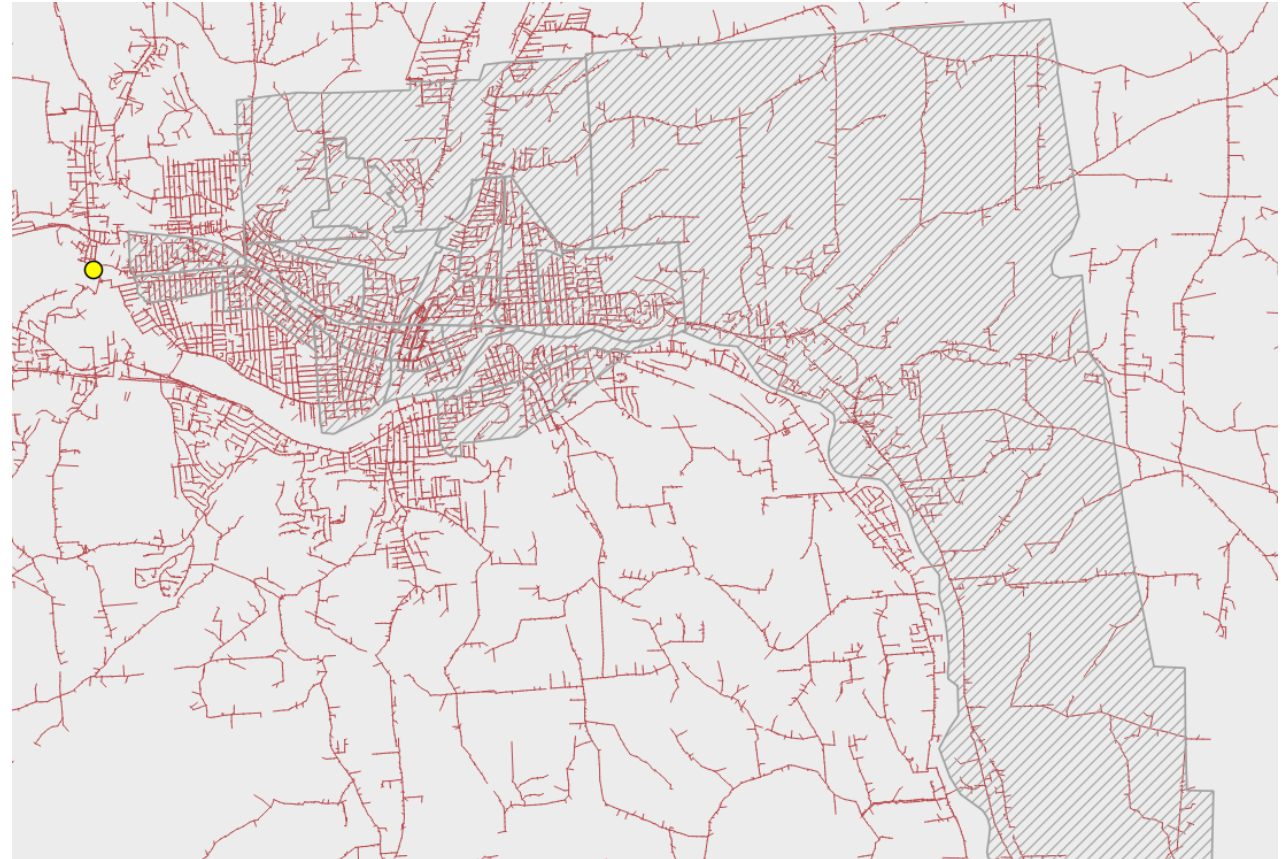
The substation and associated distribution circuits are mapped to determine if they serve a DAC.

- Substation
- ▨ DAC in NYSEG and RG&E service territory
- Distribution Circuit

Mountaindale



Goudey





PLACEHOLDER SCORES

Measure	Asset Improvement	Flexibility	Hazards addressed	Passive or Active	Cost (order of magnitude)	Total (x/25 * 100)
Rebuild	5	5	5	5	1	84
Floodwall	1	5	1	3	3	52
Elevate	3	3	1	5	5	68

Asset improvement: scored based on the extent to which the resilience measure may result in improving asset condition, capacity, or redundancy.

Flexibility score: scored based on the extent to which the resilience measure can be augmented as it becomes needed over time.

Hazards addressed: score based on the number of climate hazards that the resilience measure reduces the risk to.

Passive or Active: score based on the level of human interaction required to activate the resilience measure.

Cost: score based on the rough order of magnitude cost to construct the resilience measure.



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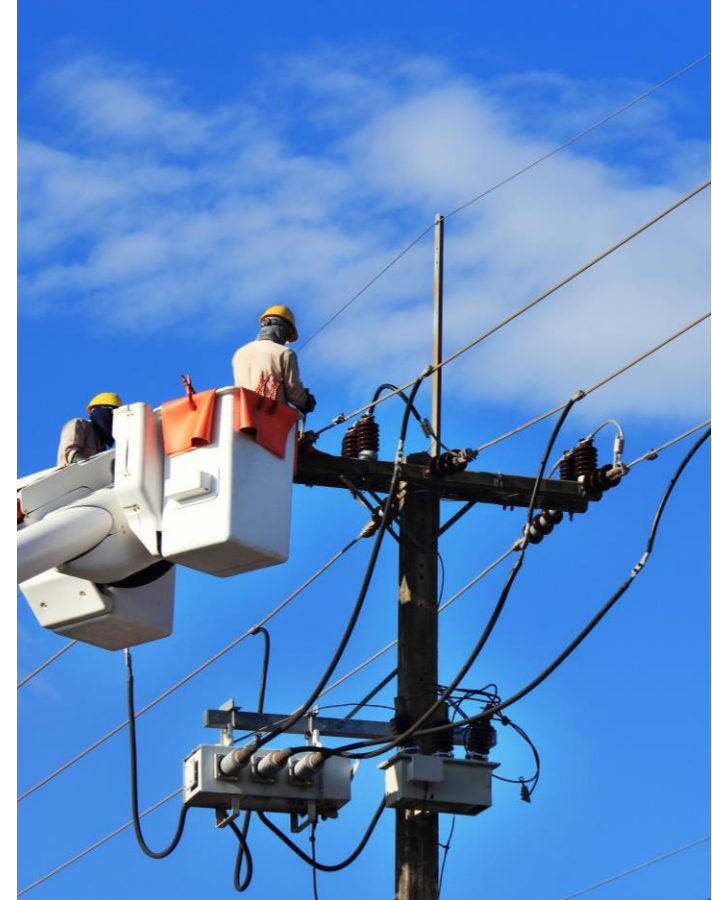
Discussion

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Feedback on the
process, resilience plan,
and input on future
topics

Discussion Questions will be presented
via the in-meeting poll





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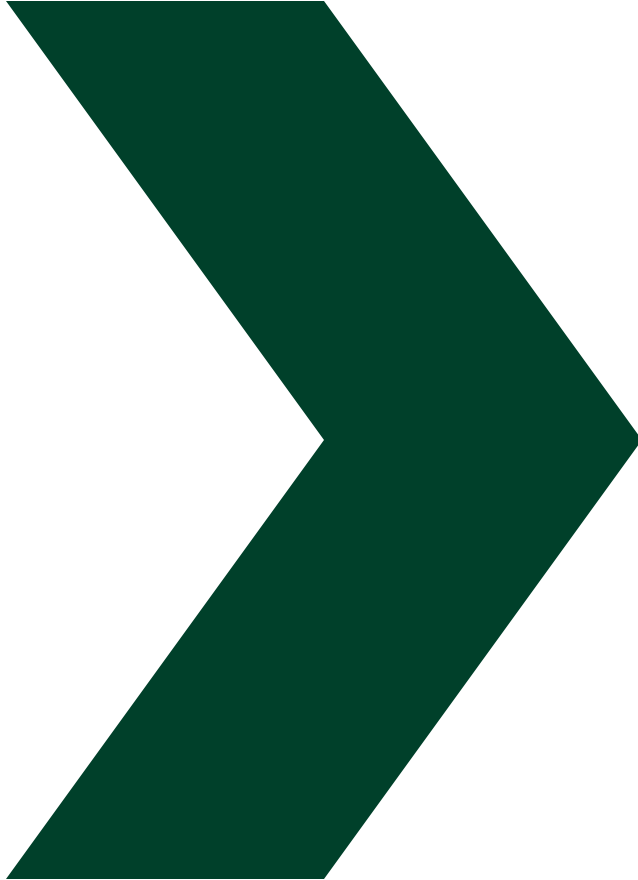


Next Steps

Summary of Stakeholder Engagement



- Many thanks to all the participants over these four Working Group sessions! Your input has been valuable.
- We will continue building towards the resilience plan filing (November 2023).
- We will send a draft of the Resilience Plan for comments and then the final Plan once filed.
- We anticipate two Working Group meetings in 2024. The dates and topics are to be determined.



Thank You!

Please send any follow up questions or comments to:
nyseg.rge.publicaffairs@avangrid.com

