

Con Edison Climate Change Adaptation

Charles Viemeister
Strategic Planning - Project Manager

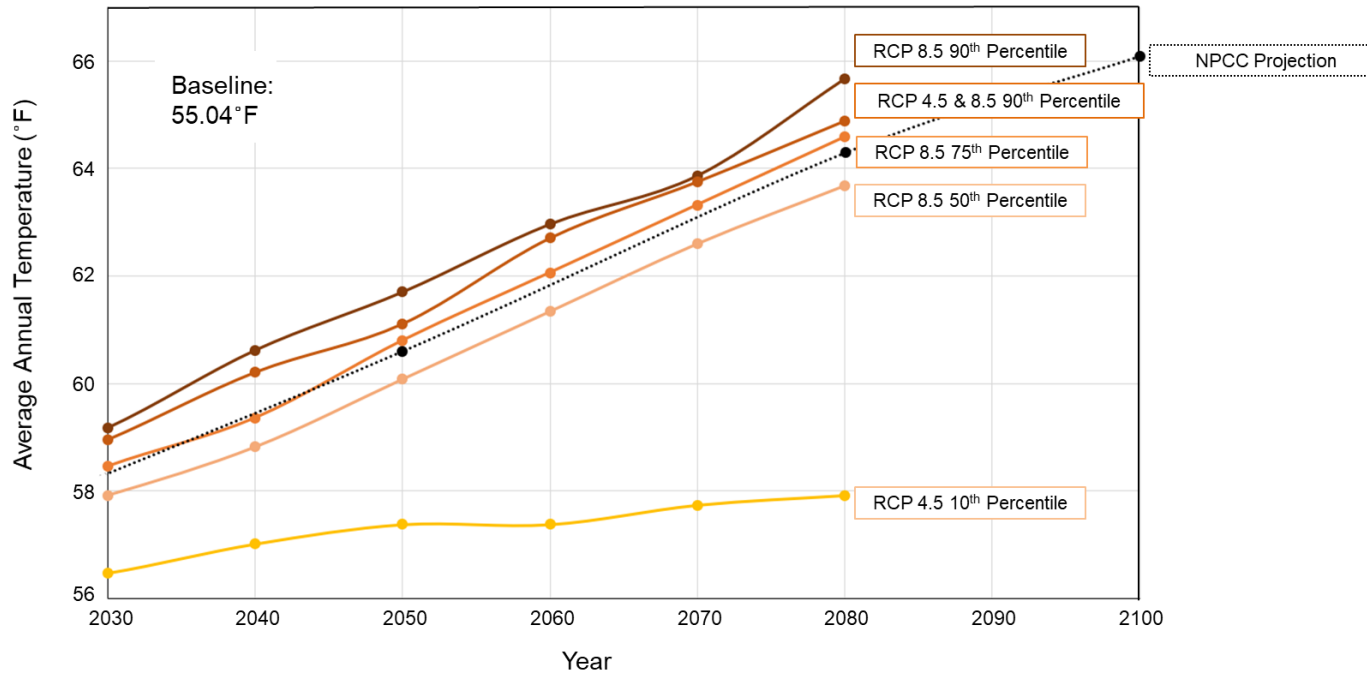
Con Edison Objectives

Climate Change Vulnerability Study (2017- 2019)

- Research and develop a shared understanding of new climate science and projected climate change for the service territory.
- Assess risks potential impacts of climate change on operations, planning and physical assets.
- Review a portfolio of operational, planning and design measures, considering costs and benefits, to improve resilience to climate change.

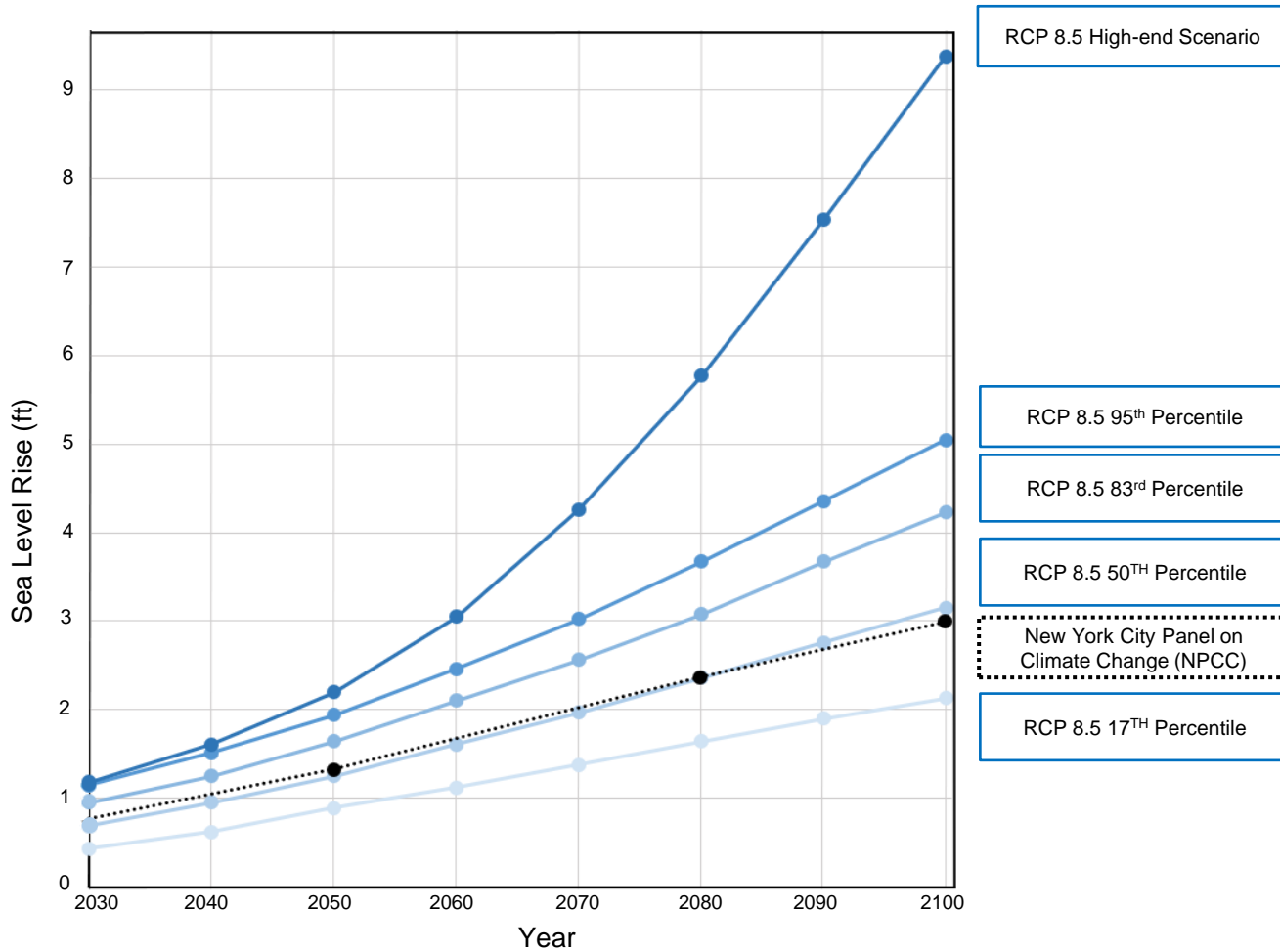
CLIMATE SCIENCE

Temperature: Higher Scientific Confidence in Projections



Representative Concentration Path (RCP) of carbon accumulation in the atmosphere (watts/meter² of heat retained)
RCP 8.5 = global increase of over 4 degrees Celsius by 2100
RCP 4.5 = increase of over 2 degrees Celsius by 2100

Sea Level Rise: Large Variability in Outer Year Projections



Con Edison current design is FEMA 100 year flood plus 1' sea level rise and an additional 2' of freeboard = FEMA+3'

CLIMATE CHANGE VULNERABILITY STUDY

System Impacts and Options

	Ambient Temperature	Temperature Variable	Precipitation	Sea Level Rise	Extreme Events
Impact	De-rate equipment	Load increase Reliability risk	Flooding	Breach protections	Storm damage
Electric	<ul style="list-style-type: none"> Revise equipment ratings Load relief 	<ul style="list-style-type: none"> Load relief Non-wires Smaller networks Feeder loops 	<ul style="list-style-type: none"> Submersible equipment 	<ul style="list-style-type: none"> FEMA+3' to FEMA+5' Submersible equipment 	<ul style="list-style-type: none"> Microgrids Load management (AMI, DER) Resilience hubs Mobile generators Critical spares Contract for mutual aid Diverse suppliers and warehouse locations
Gas			<ul style="list-style-type: none"> Convert from Low to High pressure distribution Install drip pot monitoring 		
Steam			<ul style="list-style-type: none"> Raise steam mains Waterproofing 		

Con Edison Objectives

Vulnerability Study (2017 - 2019)



Implementation Plan (2020)

- Research and develop a shared understanding of new climate science and projected climate change for the service territory.

- Assess risks potential impacts of climate change on operations, planning and physical assets.

- Review a portfolio of operational, planning and design measures, considering costs and benefits, to improve resilience to climate change.

- Selected climate pathway is incorporated into organizational decision making, projects and programs going forward.

- Climate planning requirements documented in specifications, procedures, risk modeling, etc.

- Formulate a governance method for climate change implementation.

SELECTED PATHWAYS FOR ADAPTATION

Life Cycle Tables

Sea Level Rise

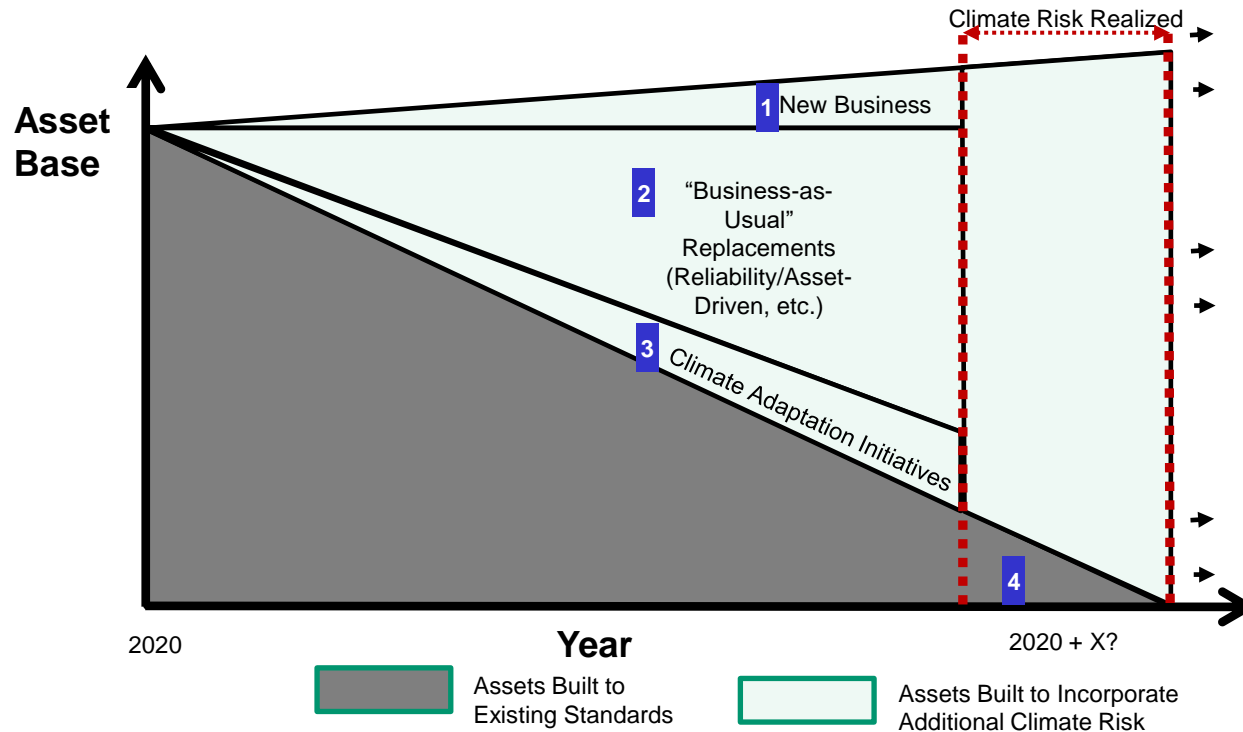
Variable	Location	2030	2050	2080	2100
Sea Level Rise (inches)	Battery	9.3	16	28.5	36

Precipitation

Variable	Location	2030	2040	2050	2060	2070	2080
5-day maximum precipitation (inches)	Central Park	5.4	5.5	5.7	5.7	5.8	5.8
	White Plains	5.3	5.4	5.5	5.6	5.7	5.7
5-day maximum maximum precipitation (inches)	Central Park	10.5	10.6	11.0	11.2	11.3	11.7
	White Plains	9.1	9.2	9.6	9.6	9.6	9.8
Days per year with > 2 inches of precipitation (days)	Central Park	4	4	4	4	5	5
	White Plains	4	5	5	5	5	5
99th percentile daily precipitation (inches)	Central Park	3.0	3.1	3.2	3.2	3.3	3.3
	White Plains	3.1	3.1	3.3	3.3	3.3	3.3

APPLIED CLIMATE PROJECTIONS

Dynamics of Design Decisions



Notes

- 1 Updated standards & processes incorporating the selected climate change pathway for new equipment
- 2
- 3 May comprise of new initiatives (projects & programs) and/or changes to existing initiatives
- 4 Asset base for which climate risk is deemed to be acceptable. Measures may be implemented to manage risk.

Implementation Plan Filing

- Establish Climate Projection Design Pathway(s)
- Incorporate pathway(s) into specification, processes and procedures for:
 - Load forecasting
 - Load relief planning
 - Reliability Planning
 - Asset management
 - Facility planning
 - Emergency response
 - Worker safety
- Formulate a governance method for climate change implementation

CON EDISON OBJECTIVES

Next Steps

- Integrate climate change pathways into day-to-day operations and planning and company mindset
 - Similar to safety and environmental stewardship
- Determine governance structure going forward
- Provide stakeholders with status updates and incorporate feedback
- File Climate Change Implementation Plan with NYS Public Service Commission in December 2020
- Engage stakeholders in 2021 and 2022 on overall progress
- Monitor and manage climate change adaptation

Clarifying Questions?

Charles Viemeister

Strategic Planning – Project Manager

viemeisterc@coned.com