

# City of New York

## *Public Policy Transmission Needs Proposal*

November 15, 2018

# Transmission Study Overview

- **Context:** NYC is 30% of the state's load and 40% of its GHG emissions
- **Study Goal:** NYC modeled a series of scenarios that would achieve the following public policy goals:
  - Renewable Energy Standard (50x30)
  - 80x50 GHG Emissions Reduction Goals
- **Key Findings:** Additional transmission pathways into Zone J and voltage support are needed to achieve these goals

# Market Simulation: Key Assumptions

## General Assumptions:

- Study year: 2030
- Demand: NYISO Gold Book 2030 values
- Additional upstate renewables: NYISO 2018 PPTN study values
- Natural gas price: NYISO CARIS (approx. \$5, varies monthly)

**Transmission:** AC Transmission included in all scenarios (generic modeling)

**Modeling Platform:** PowerGEM PROBE LT production cost and market simulation software (8760) utilizing a full transmission network model

## Zone J Generation Assumptions:

- Retire GTs built prior to 1973
- Replacement GTs – 600 MW total
- Solar – 1000 MW per NYC target
- Storage – 400 MW total
- No PSEG-Con Ed wheeling
- 1200 MW offshore wind connected directly into zone J (generic modeling at various sites)

# Market Simulation: Scenario Approach

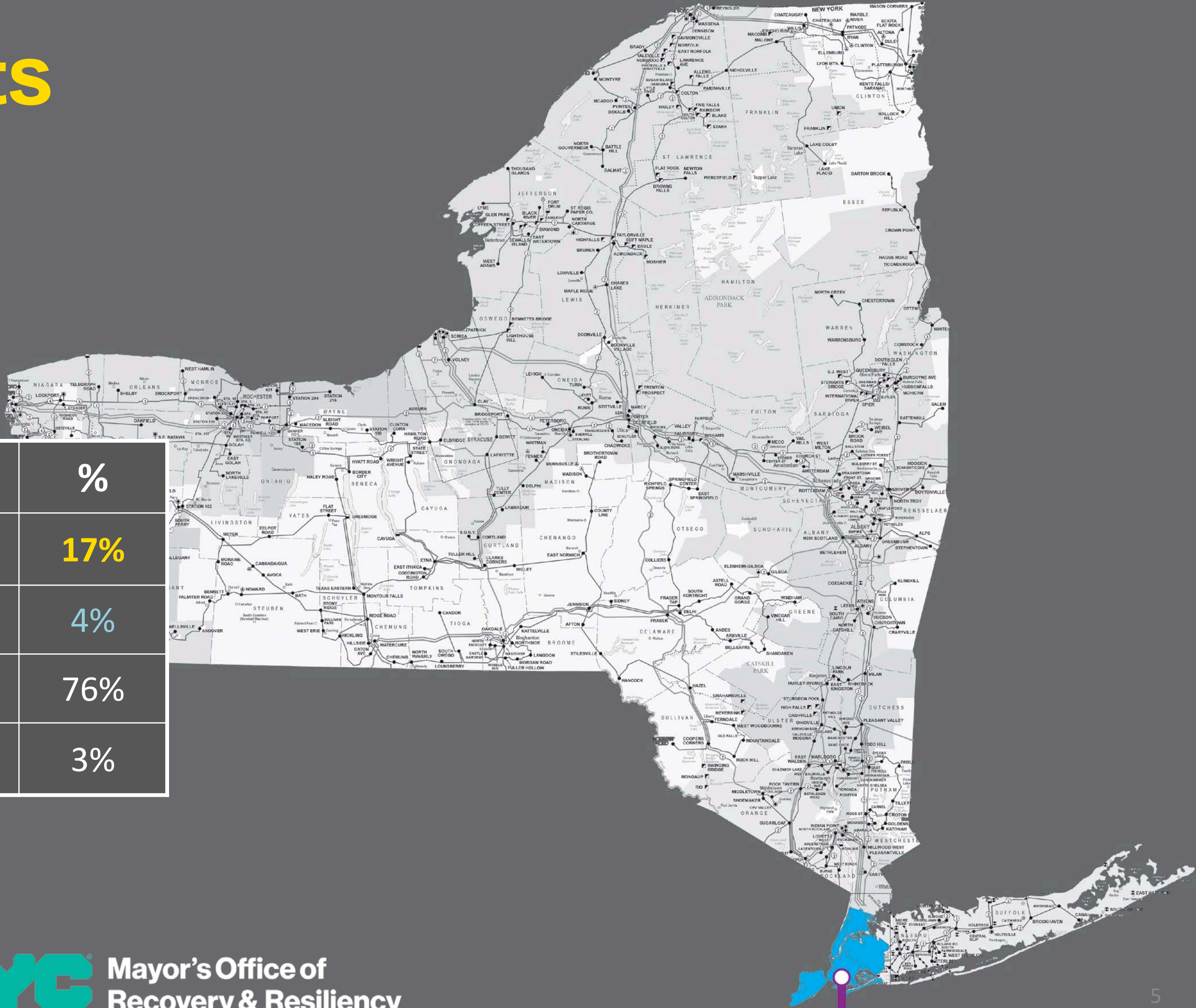
- Base case and new transmission scenarios were modeled with voltage and thermal limits
- Sensitivities performed:
  - Upstate voltage support for select scenarios
  - Thermal limits only (no voltage restrictions) for select scenarios



# Base Case Results

*with Offshore Wind (1,200 MW)*

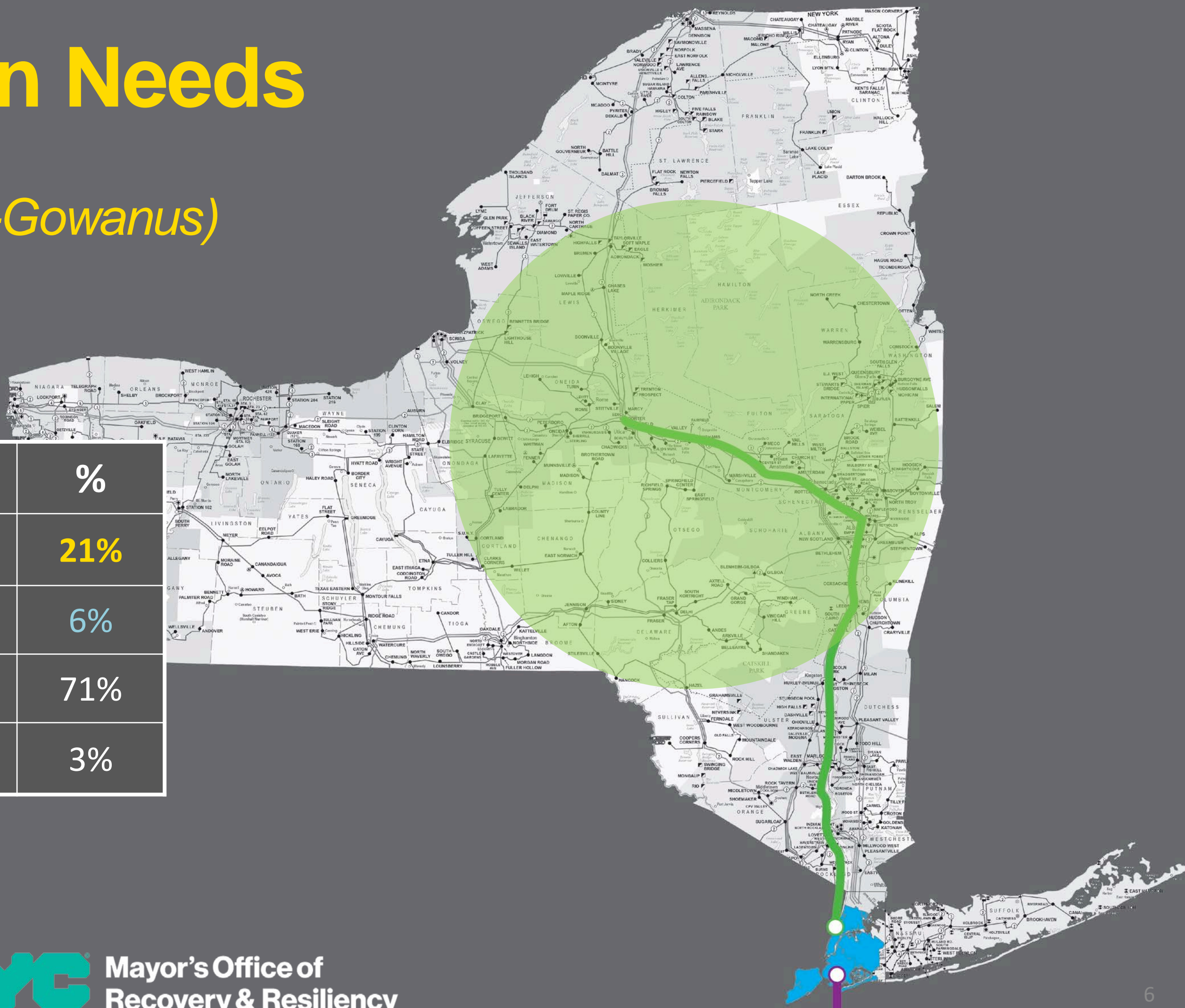
2030 Resource Mix Supplying Zone J	%
Renewables (Solar, Wind, Hydro)	17%
Nuclear	4%
Fossil Fuel	76%
Other (Storage, Imports, Wood)	3%





# New Transmission Needs

*with Offshore Wind (1,200 MW)  
Upstate Line (1,000 MW Marcy-Gowanus)  
Upstate Voltage Support*



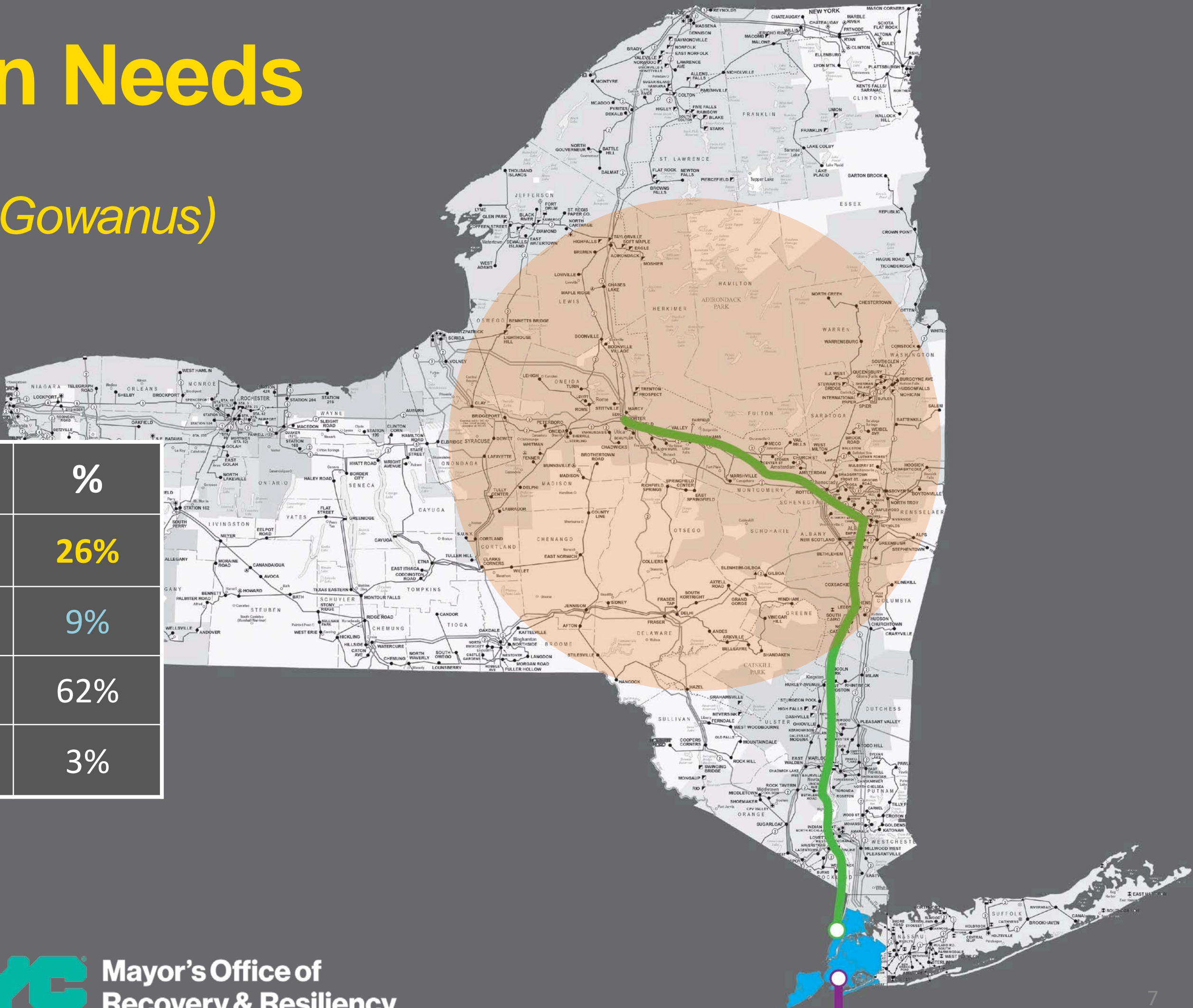
2030 Resource Mix Supplying Zone J	%
Renewables (Solar, Wind, Hydro)	21%
Nuclear	6%
Fossil Fuel	71%
Other (Storage, Imports, Wood)	3%



# New Transmission Needs

*with Offshore Wind (1,200 MW)  
Upstate Line (1,000 MW Marcy-Gowanus)  
Thermal Limits only*

2030 Resource Mix Supplying Zone J	%
Renewables (Solar, Wind, Hydro)	26%
Nuclear	9%
Fossil Fuel	62%
Other (Storage, Imports, Wood)	3%





# New Transmission Needs

*with Offshore Wind (1,200 MW)  
Canadian Hydropower (1,000 MW)*

2030 Resource Mix Supplying Zone J	%
Renewables (Solar, Wind, Hydro)	32%
Nuclear	3%
Fossil Fuel	62%
Other (Storage, Imports, Wood)	2%

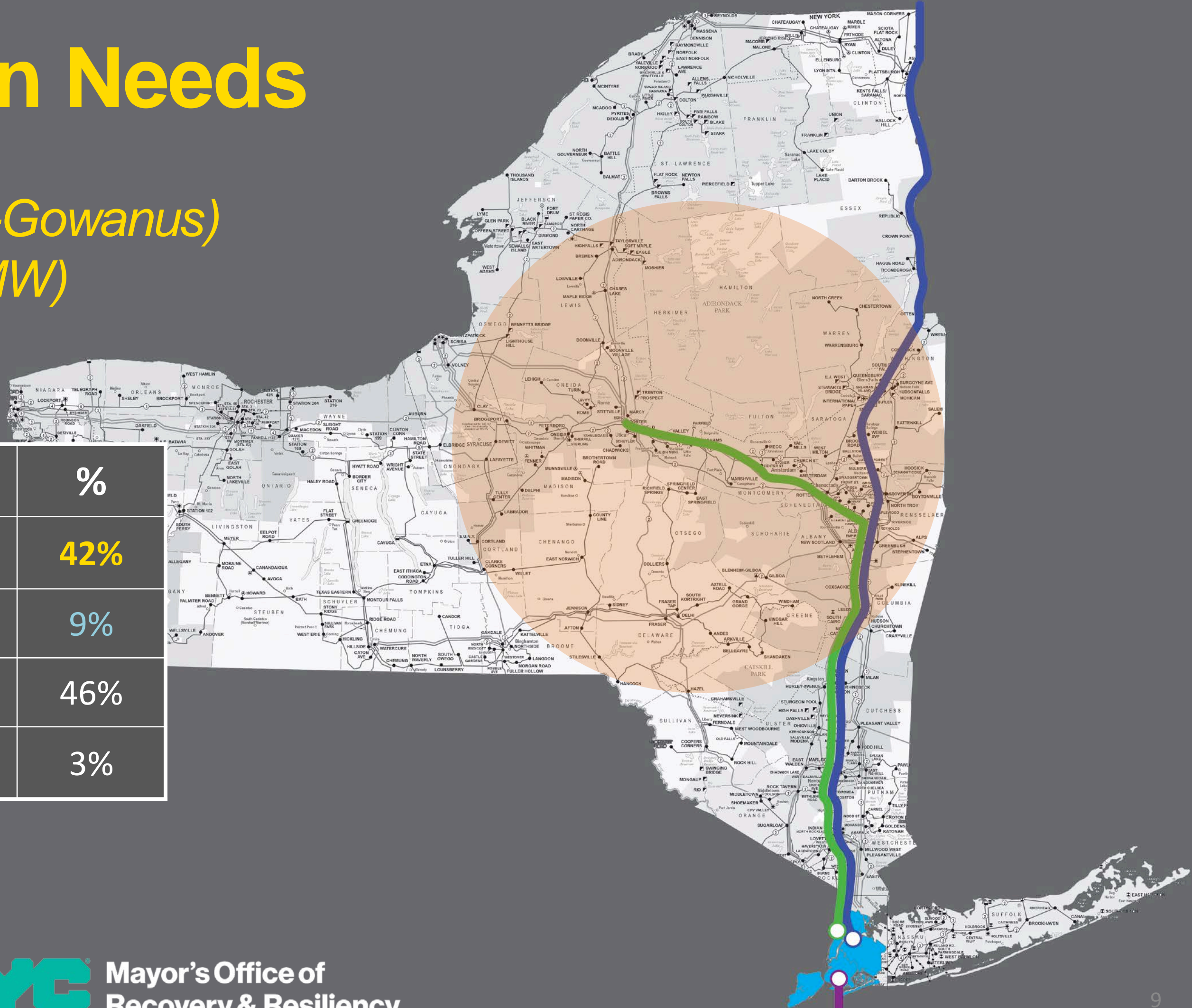




# New Transmission Needs

*with Offshore Wind (1,200 MW)  
Upstate Line (1,000 MW Marcy-Gowanus)  
Canadian Hydropower (1,000 MW)  
Thermal Limits Only*

2030 Resource Mix Supplying Zone J	%
Renewables (Solar, Wind, Hydro)	42%
Nuclear	9%
Fossil Fuel	46%
Other (Storage, Imports, Wood)	3%



# Questions?

**Susanne DesRoches**

Deputy Director, Energy and Infrastructure  
[sdesroches@cityhall.nyc.gov](mailto:sdesroches@cityhall.nyc.gov)

New York City  
Mayor's Office of Sustainability  
Mayor's Office of Resiliency



# Appendix

# PPTN Market Simulation Assumptions 1

- Study year 2030
  - Natural gas price according to NYISO CARIS (approx. \$5, varies monthly)
  - Demand per NYISO Gold book values for 2030
- Retired generation:
- All remaining coal plants in NYCA are retired
  - Indian Point Energy Center
  - Ginna
  - NYC GTs built prior to 1973: Astoria, Gowanus, Narrows, Ravenswood, Arthur Kill, 59th St, and 74th St GTs



# PPTN Market Simulation Assumptions 2

New generators explicitly modeled:

- Gas: Cricket Valley, CPV Valley, Bayonne
- Onshore renewables: Arkwright wind, Copenhagen wind, Riverhead solar, Shoreham solar
- Offshore wind: 1200 MW offshore wind connected directly into zone J (generic modeling at various sites)

Additional upstate renewables modeled per NYISO PPTN study values

NYC generation assumptions:

- Replacement GTs – 600 MW total
- Solar – 1000 MW per NYC target
- Storage – 400 MW total
- No PSEG-ConEd wheeling

# PPTN Market Simulation Assumptions 3

Renewable capacity factor assumptions:

- Onshore wind – overall average 26.3% (varies by plant location)
- Offshore wind – 40%
- Solar – 15.2%
- AC Transmission Proceeding transmission upgrade included in base model (generic modeling)
- PowerGEM PROBE LT production cost and market simulation software was used to provide annual (i.e. 8760 hour) production cost simulation, utilizing a full transmission network model



# PPTN Market Simulation Assumptions 4

- Simulations accounted for major interface transfer limits, per standard transfer limit process
- No transmission limits
- Thermal limits only
- Most restrictive of thermal and voltage limits (all interface appeared voltage limited)