

# 2023-2042 System & Resource Outlook

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Manager, Long Term Assessments

**Management Committee (MC)**

Thursday, June 27, 2024 - NYISO

Revised June 25, 2024

# Agenda

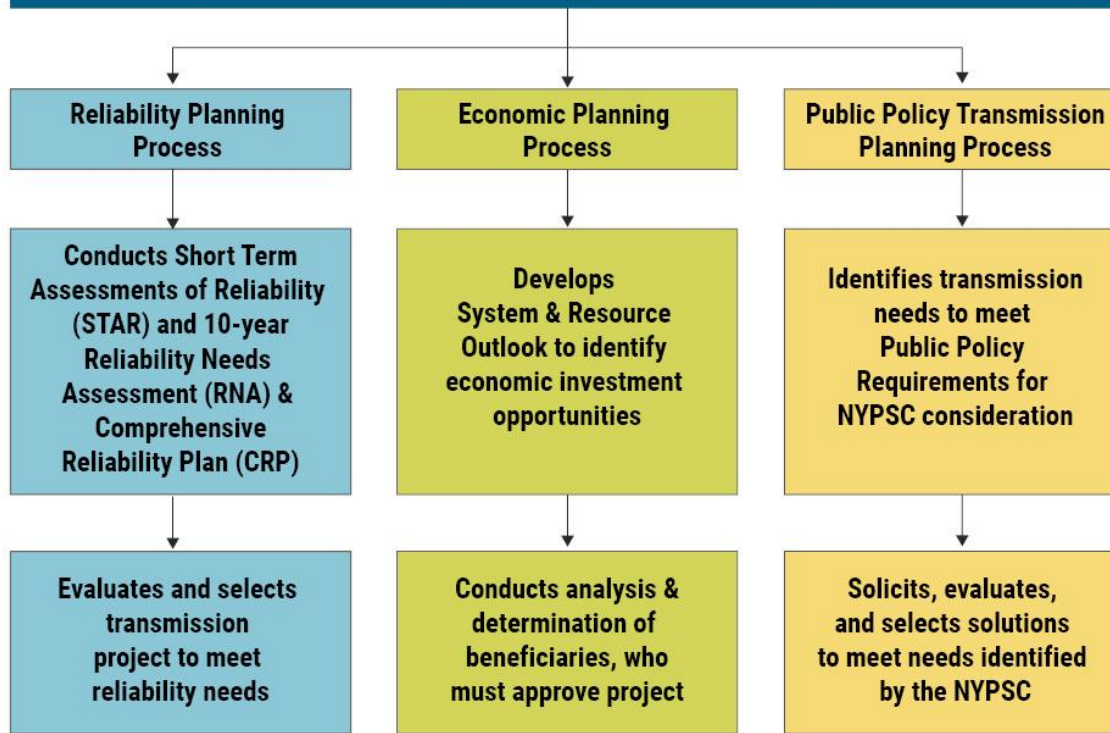
- **Overview of Economic Planning Process**
- **Report & Technical Appendices**
- **Key Findings**
- **Next Steps**
- **Outlook Data Catalog**

# Revised Documents Posted

- **Since its initial posting, the draft 2023-2042 System & Resource Outlook report and Appendices G, I, and J were revised as follows:**
  - Correct the in-service date assumed for a subset of renewable resources in the Higher Demand scenario
    - Only 2030 & 2035 in Higher Demand Policy Scenario are impacted
  - Addition of Tier 4 utilization for the Policy Case to address stakeholder feedback
  - Minor ministerial edits
- **The revised documents are posted with the June 27, 2024 MC meeting materials**

# Overview of Economic Planning Process

# NYISO Comprehensive System Planning Process



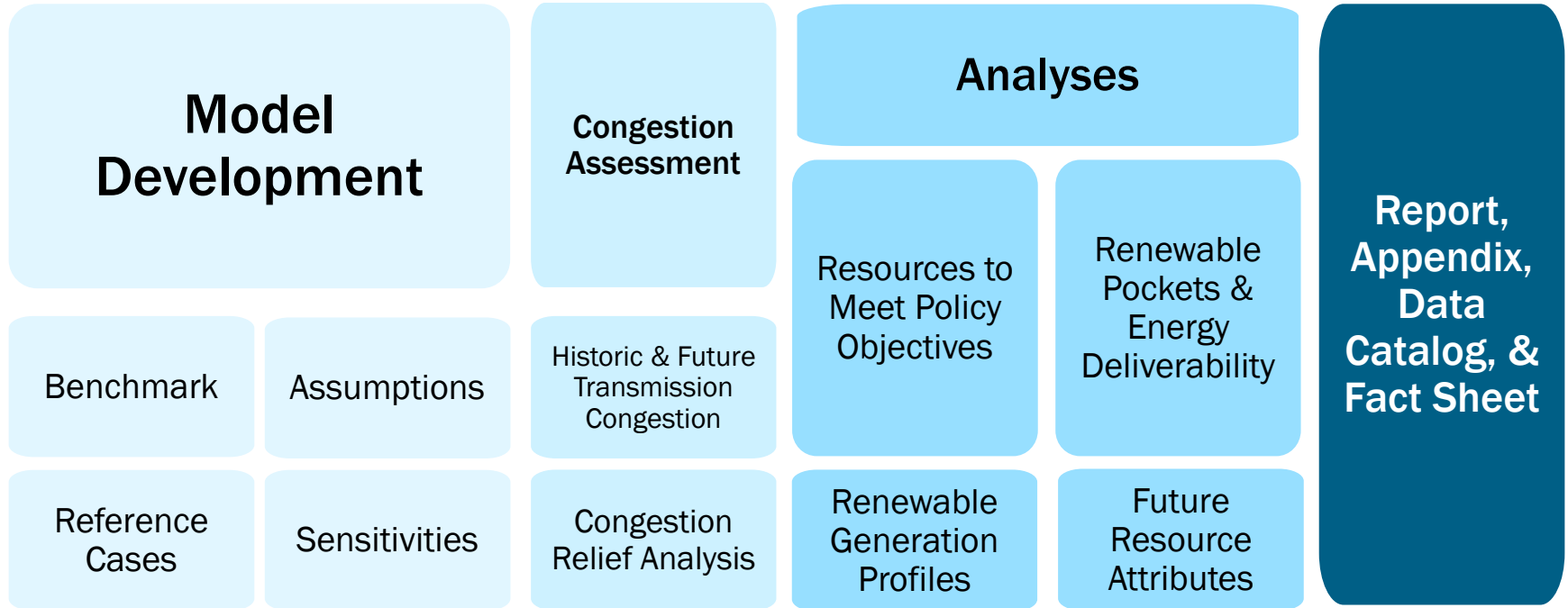
# System & Resource Outlook: Objectives

1. Create a biennial report that summarizes the current assessments, evaluations, and plans in the biennial Comprehensive System Planning Process
2. Produce a twenty-year projection of system conditions for demand, generation, and transmission across the New York transmission system
3. Identify, rank, and group congested elements
4. Assess the potential benefits of addressing congestion
5. Develop informative scenario cases
6. Perform technical analyses to inform stakeholders and interested parties

# Uses for System & Resource Outlook

- Identify potential challenges to meeting the New York State CLCPA mandates
- Inform stakeholders and policymakers where future public policy needs may exist
- Define renewable generation pockets
- Prepare system models to perform Economic Transmission Project Evaluation and/or Requested Economic Planning Studies

# System & Resource Outlook Scope





# Report & Technical Appendices

# Table of Contents

## EXECUTIVE SUMMARY

### SYSTEM & RESOURCE OUTLOOK OVERVIEW

### STATE OF SYSTEM & RESOURCE PLANNING

- Comprehensive System Planning Process
- Reliability Planning Process and Short-Term Reliability Process
- Public Policy Transmission Planning Process
- New York State's Coordinated Grid Planning Process (CGPP)
- Generator Interconnection
- State of the New York Grid
- Planned Generation

### DEMAND: EVOLVING LOAD AND SYSTEM TRENDS

- Energy and Peak Demand Forecasts
- Large Loads
- Key Takeaways

### RESOURCES: PATHWAYS TO POLICY ACHIEVEMENT

- Supply and Demand Analysis
  - Scenario Capacity & Demand
  - Renewable Resource Characterization
- System Resources in the Scenarios
  - Beyond 2040

- Dispatchable Emission-Free Resources
- System Performance
- Key Takeaways

### TRANSMISSION: OPPORTUNITIES FOR EFFICIENCY

- Renewable Generation Pockets
- Energy Deliverability
- Bulk Transmission Constraints
- Actionable expansion opportunities: Dynamic reactive power support for Central East
- Monitor Western New York
- Monitor Northern New York
  - Interregional Transmission
  - Additional Bulk Transmission Benefits
  - Key Takeaways

### NEXT STEPS AND RECOMMENDED ACTIONS

- Next Steps
- Recommendations and Observations

# System & Resource Outlook Appendices

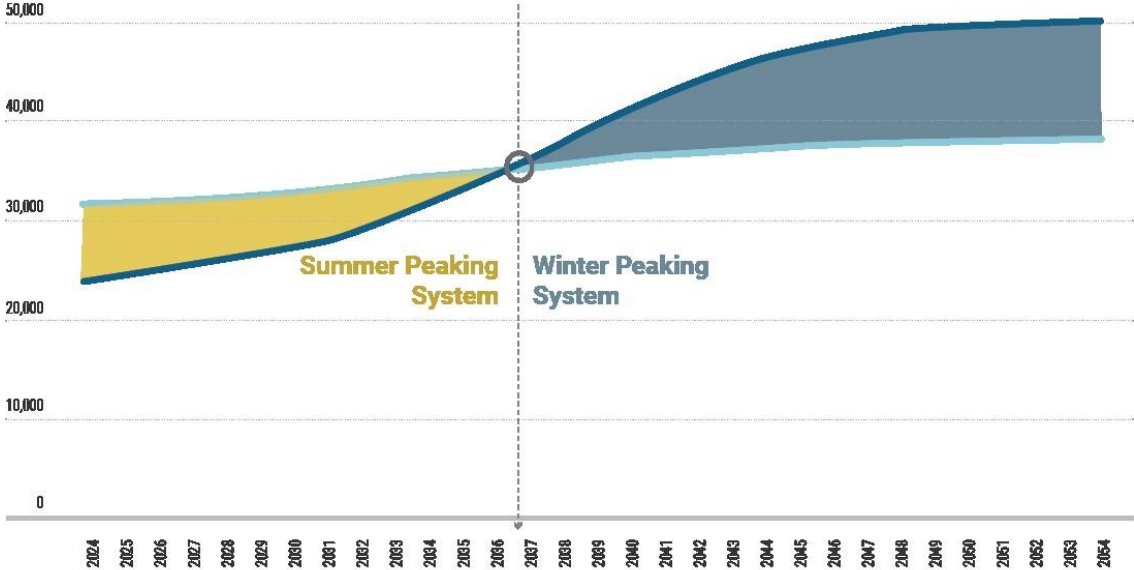
- **Appendix A: Production Cost Model Benchmark**
- **Appendix B: Production Cost Assumptions Matrix**
- **Appendix C: Capacity Expansion Assumptions Matrix**
- **Appendix D: Modeling & Methodologies**
- **Appendix E: Renewable Profiles & Variability**
- **Appendix F: Dispatchable Emission-Free Resources**
- **Appendix G: Production Cost Model Results**
- **Appendix H: Capacity Expansion Model Results**
- **Appendix I: Transmission Congestion Analysis**
- **Appendix J: Renewable Generation Pockets**
- **Appendix K: Capacity Expansion Model Sensitivity Analysis**

# Key Findings

# Key Finding 1: Demand

- ✓ **Electric energy consumption is projected to increase significantly in response to the economic development and decarbonization energy policies. The resources and transmission system necessary to meet the changing energy demand needs to evolve accordingly.**

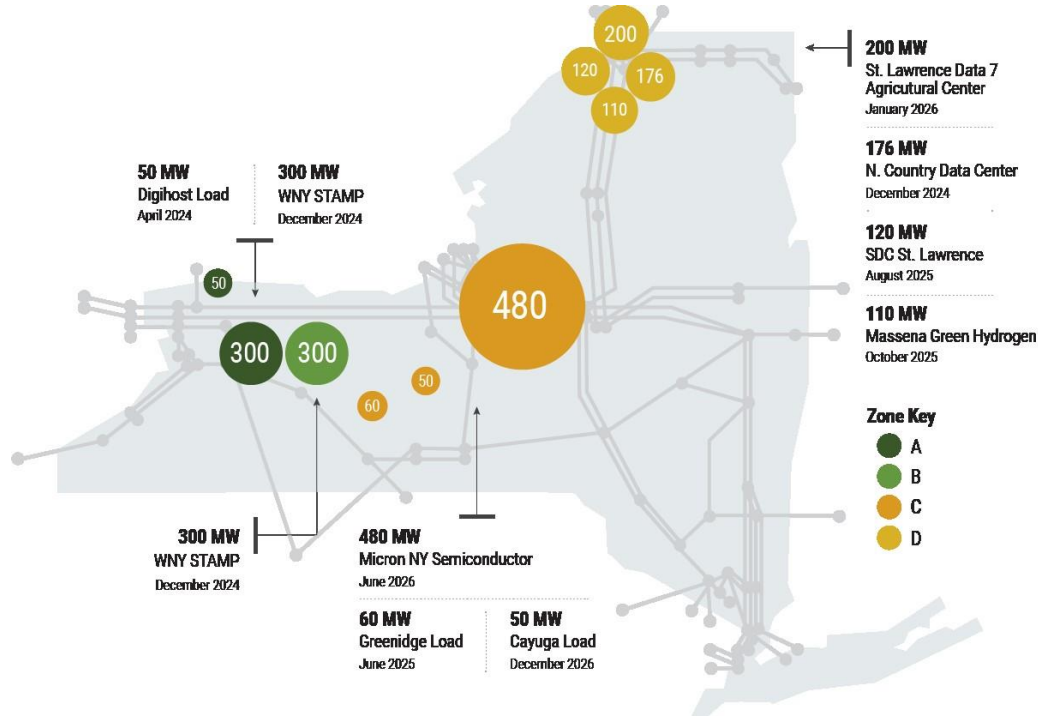
# Peak Load Forecast for Summer & Winter (MW)



# Key Finding 2: Demand

- ✓ **Siting large loads in electrical proximity to renewable resources, or siting resources near large loads, may benefit both the loads and the resources, particularly if located upstream of known constraints.**

# New York Large Load Projection

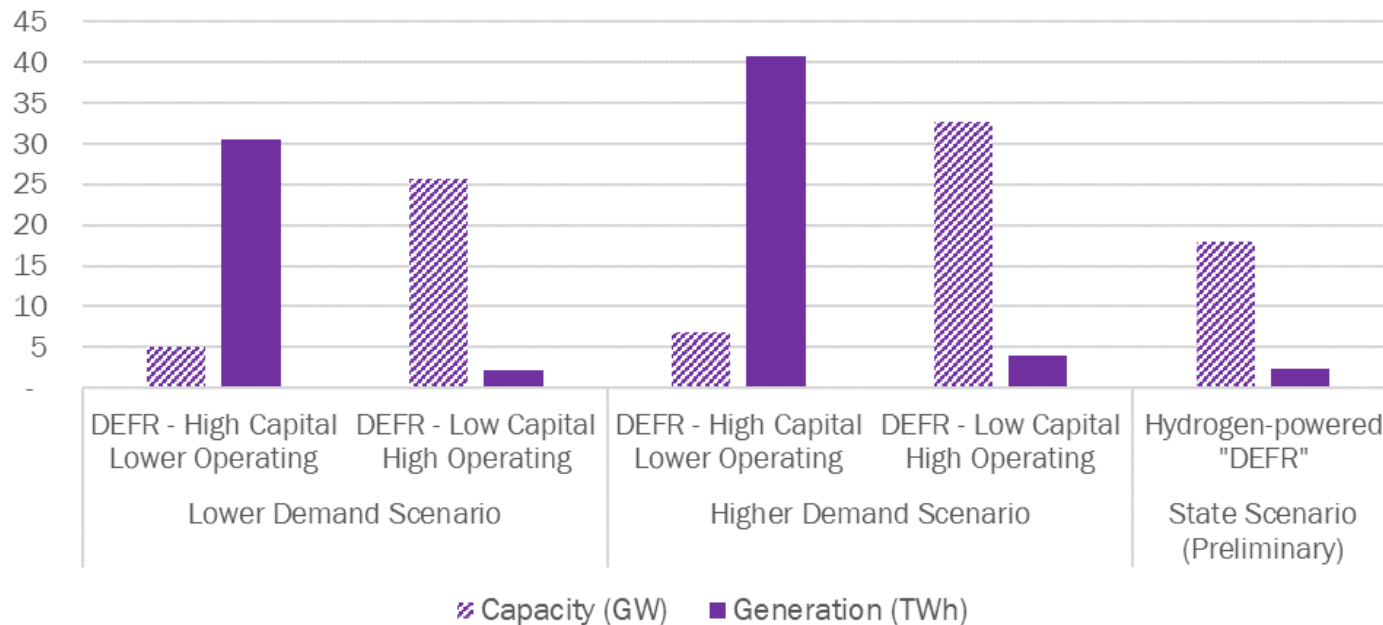




# Key Finding 3: Supply Resources

- ✓ Dispatchable emission-free resources must be developed to provide the capacity, energy, and other essential grid services required to achieve the policy mandate for a zero-emissions grid by 2040.

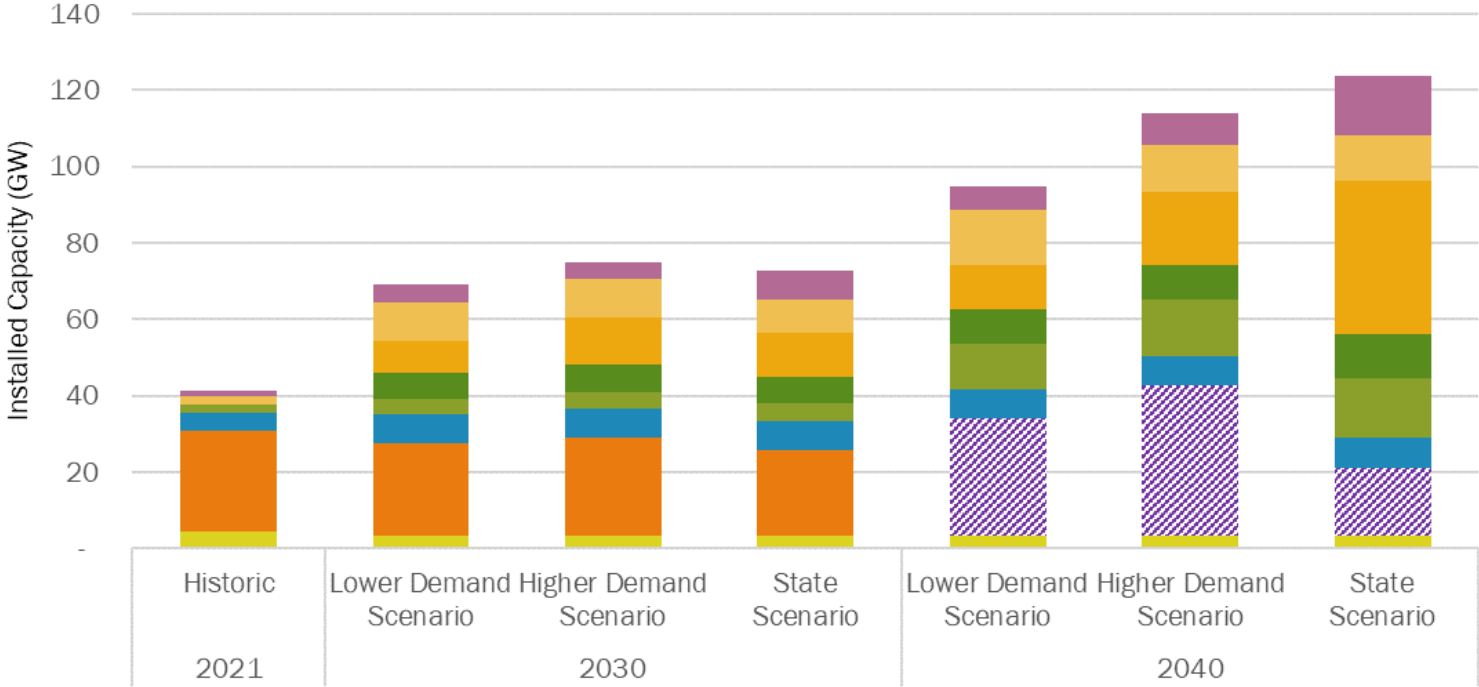
# Dispatchable Emission-Free Resource Capacity and Generation in 2040



# Key Finding 4: Supply Resources

- ✓ **New York will require three times the capacity of the current New York generation fleet to meet projected future electricity demands.**

# NYCA Installed Capacity for Policy Case Scenarios



# Key Finding 5: Supply Resources

- ✓ **The coordination of new generator additions and existing generator retirements is essential to maintain the reliability of the New York power system while simultaneously pursuing achievement of CLCPA.**

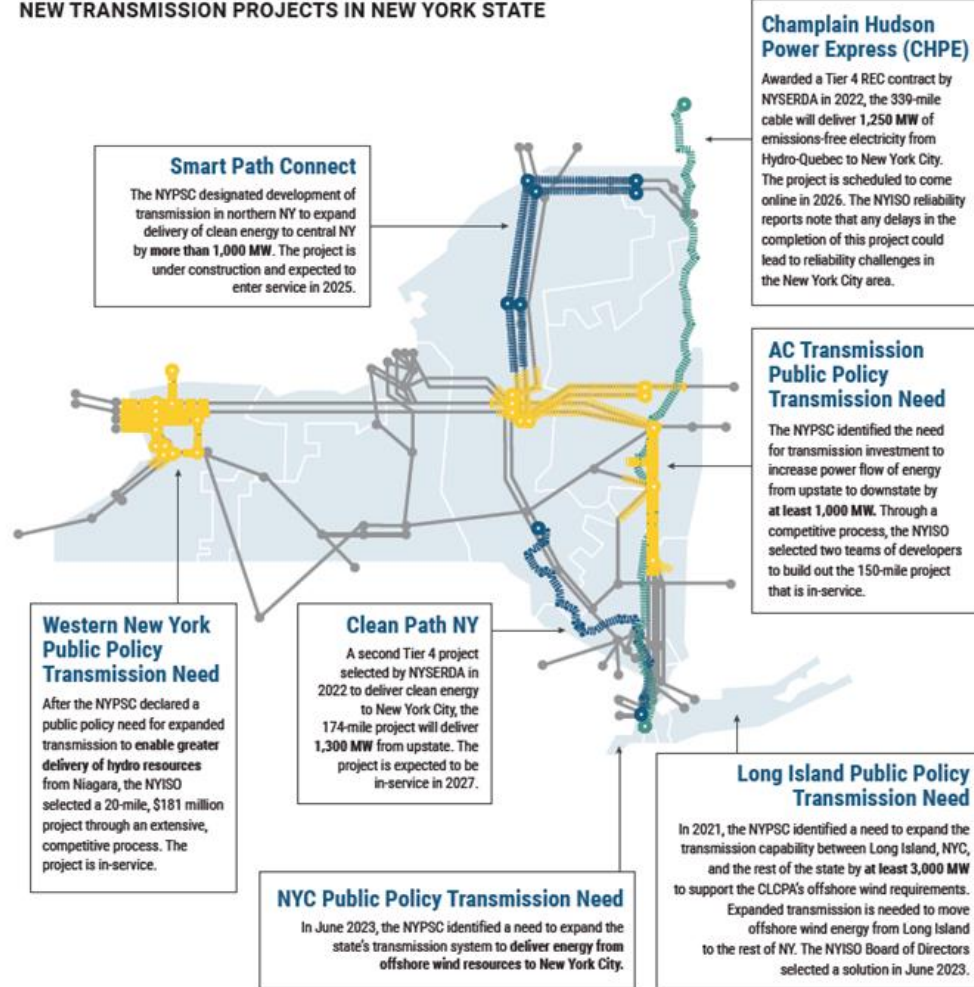
# Key Finding 6: Supply Resources

- ✓ **Uncertainty in siting new renewable generation could lead to delays in or inefficient expansion of the transmission and distribution systems.**

# Key Finding 7: Transmission

- ✓ **Historic levels of investment in the transmission system are happening but more will be needed.**

# NEW TRANSMISSION PROJECTS IN NEW YORK STATE

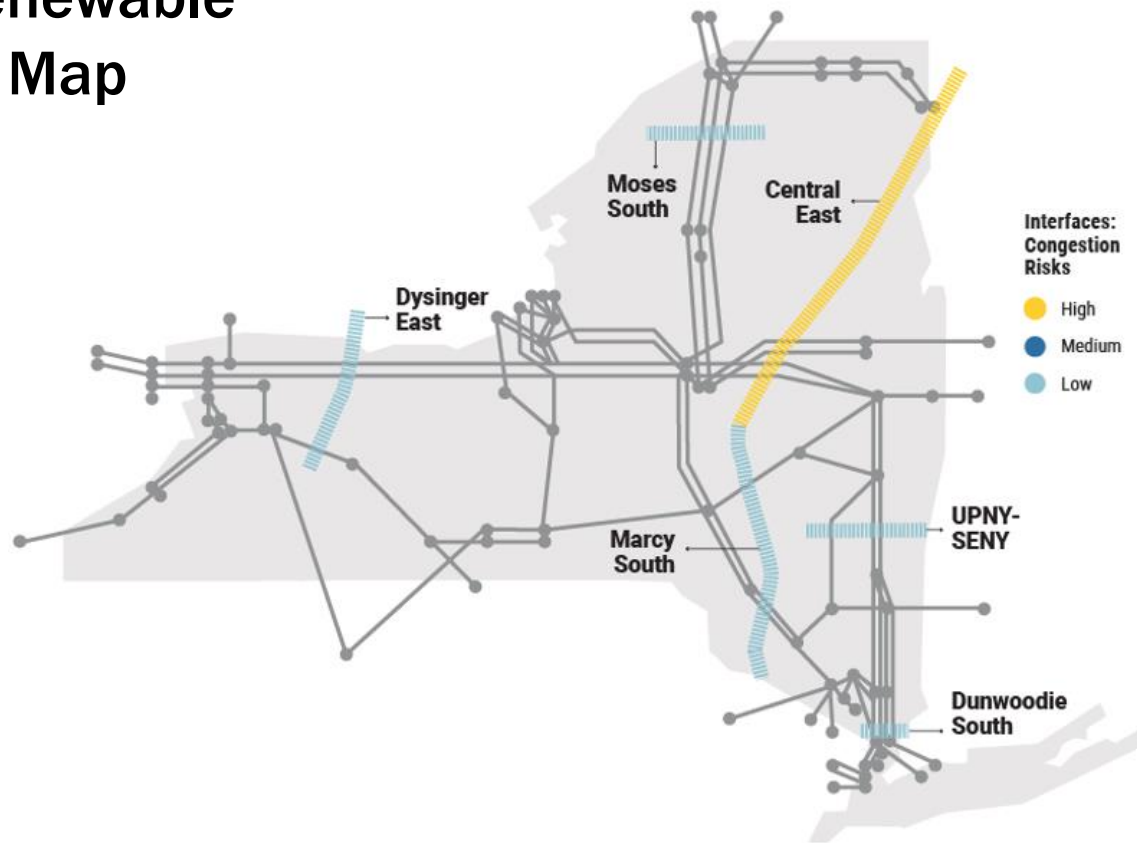




# Key Finding 8: Transmission

- ✓ **Actionable expansion opportunities: Additional dynamic reactive power support must be added to the grid in upstate New York to alleviate congestion and fully utilize the transmission capability of the Central East interface.**

# Bulk Transmission Renewable Generation Resource Map

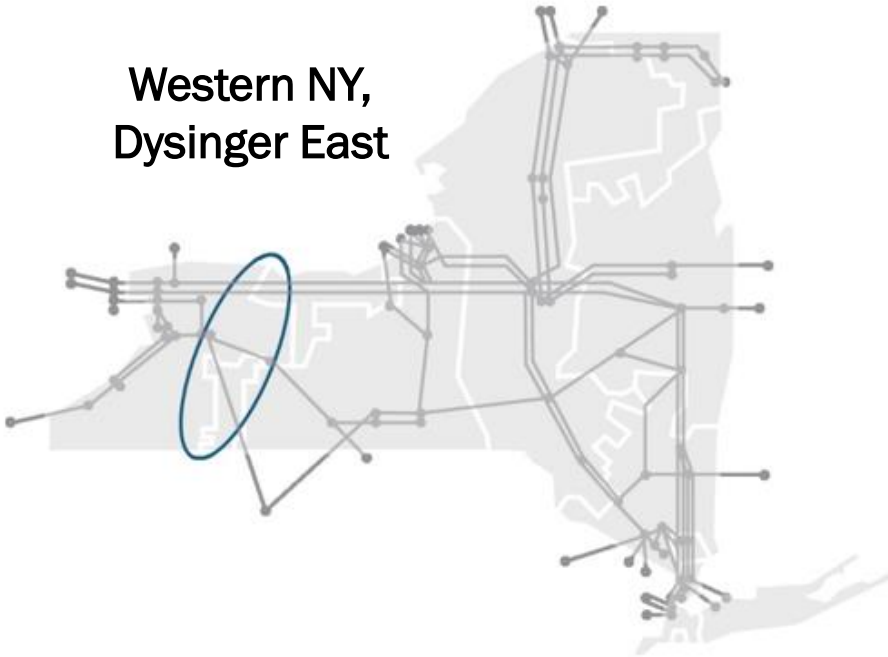


# Key Finding 9: Transmission

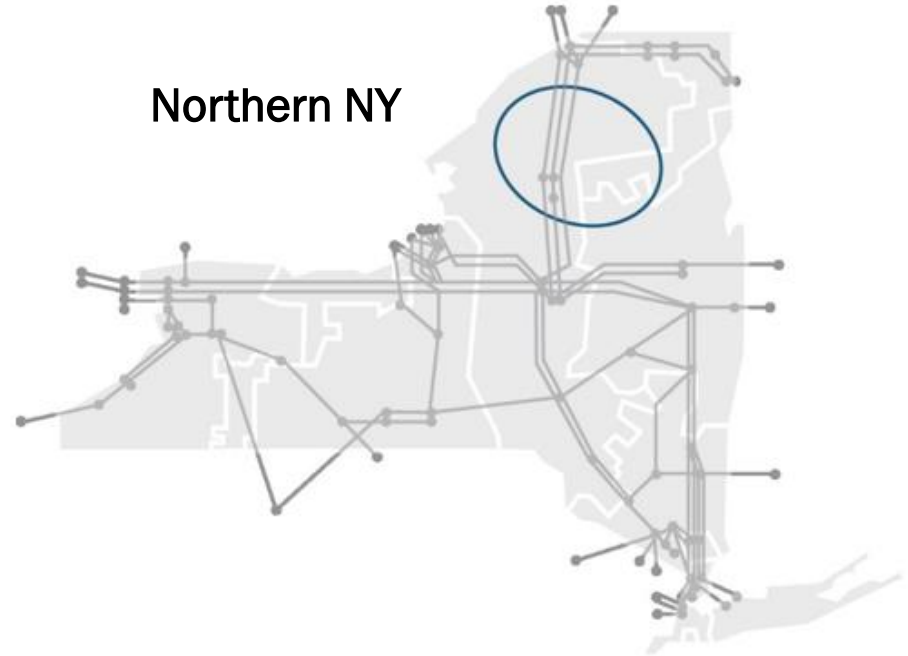
- ✓ Opportunities for further transmission investment in Western and Northern New York should be monitored as resources are developed in those regions.

# Western and Northern NY Bulk Transmission Areas

Western NY,  
Dysinger East



Northern NY



# Key Finding 10: Transmission

- ✓ **Planning energy exchange with neighboring systems is becoming more complex and will be increasingly so in the future as each system transitions to more decarbonized systems.**

# NYISO Interregional Connections



# Next Steps

# Next Steps

- **Seek Management Committee recommendation**
- **Seek Board of Directors approval in July 2024**



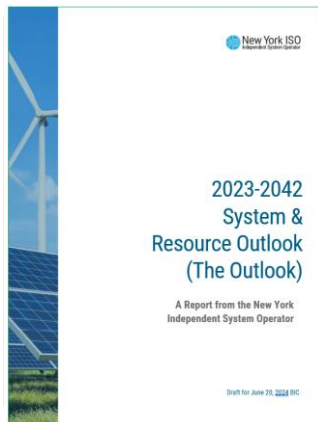
# Questions, Comments, & Feedback?

Email additional feedback to:  
[SCarkner@nyiso.com](mailto:SCarkner@nyiso.com)

# 2023-2042 System & Resource Outlook Data Catalog

## Stakeholder Presentations

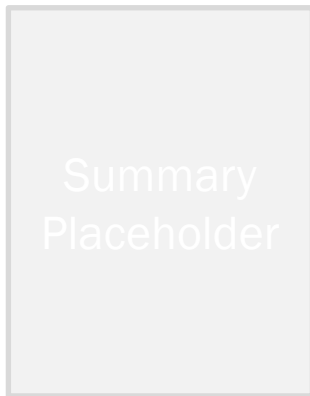
Report



## Report Appendices

Appendix A: Production Cost Model Benchmark  
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Appendix I: Transmission Congestion Analysis  
Appendix J: Renewable Generation Pockets  
Appendix K: Capacity Expansion Model Sensitivities

Study Summary



## Data Documents

Reference Case Input Assumptions  
Reference Case Results

### November 18, 2022

[2021 Outlook Lessons Learned](#)  
[NYSERDA Outlook Suggestions](#)

### June 16, 2023

[2023-2042 Outlook Kickoff](#)

### July 17, 2023

[2023-2042 Outlook Benchmark](#)  
[2023-2042 Outlook Update](#)

### August 22, 2023

[2023-2042 Outlook Preliminary Reference Case Assumptions](#)

### September 21, 2023

[2023-2042 Outlook Reference Case Assumptions Update](#)

### October 24, 2023

[2023-2042 Outlook Reference Case Assumptions Update](#)

### November 2, 2023

[2023-2042 Outlook Reference Case Assumptions Update & Preliminary Base Case Results](#)

### November 21, 2023

[2023-2042 Outlook Reference Case Updates](#)

### December 19, 2023

[2023-2042 Outlook Reference Case Updates & Preliminary Contract Case Results](#)

### January 23, 2024

[2023-2042 Outlook Reference Case Updates](#)

### February 22, 2024

[2023-2042 Outlook Reference Case Updates & Final Base & Contract Case Results](#)

### March 1, 2024

[2023-2042 Outlook Preliminary Contract Case Renewable Pockets & Capacity Expansion Scenario Results](#)

### March 21, 2024

[2023-2042 Outlook Policy Case Updates](#)

### April 4, 2024

[2023-2042 Outlook Policy Case Updates](#)

### April 30, 2024

[2023-2042 Outlook Policy Case Updates & Preliminary Policy Case Renewable Pockets](#)

### May 3, 2024

[2023-2042 Outlook Status Updates](#)

### May 14, 2024

[2023-2042 Outlook Status Updates and Preliminary Draft Report](#)

### June 7, 2024

[2023-2042 Outlook Preliminary Key Findings and Draft Report](#)

# Our Mission & Vision



## Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



## Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation