

# 2021-2040 System & Resource Outlook: Lessons Learned Session

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Friday, November 18th, 2022

# Agenda

- **Review of System & Resource Outlook**
- **2021-2040 Outlook Lessons Learned**
- **2023-2042 System & Resource Outlook**
- **Questions, Comments, & Feedback**

# Review of System & Resource Outlook

# Purpose of System & Resource Outlook

- **“...provides a comprehensive overview of system resources and transmission constraints throughout New York, highlighting opportunities for transmission investment driven by economics and public policy.”**
- **“...summarizes the current assessments, evaluations, and plans in the biennial Comprehensive System Planning Process; produces a twenty-year projection of congestion on the New York State Transmission System; identifies, ranks, and groups congested elements; and assesses the potential benefits of addressing the identified congestion.”**

# System & Resource Outlook Scope

**Model  
Development**

**Congestion  
Assessment**

Renewable  
Pocket  
Formation

Projected  
Operations  
& Market  
Impact  
Analysis

Reference  
cases

Sensitives  
and  
Scenarios

Historic &  
Future  
Transmission  
Congestion

Congestion  
Relief  
Analysis

Energy  
Deliverability  
Assessment

# 2021-2040 Outlook Actual Schedule

- **May 2021:** Production cost model benchmark
- **September – October 2021:** Finalize reference case assumptions
- **November - December 2021:** Base & Contract simulations and analysis
- **January-May 2022:** Policy case simulations and analysis
- **May-July 2022:** Draft reports, Market Monitoring Unit comment
- **August 2022:** Business Issues Committee and Management Committee
- **September 2022:** Board of Directors review and approval, Final report
- **October 2022:** Public Information Session

# Power System Tools in The Outlook

- **Production Cost**
  - GE MAPS
- **Capacity Expansion**
  - PLEXOS
- **Powerflow and Transfer Analysis**
  - PowerGEM TARA & Siemens PSS/E

# Outlook Reference Case Models

## ■ Base Case

- Assumptions aligned with Reliability Planning Process

## ■ Contract Case

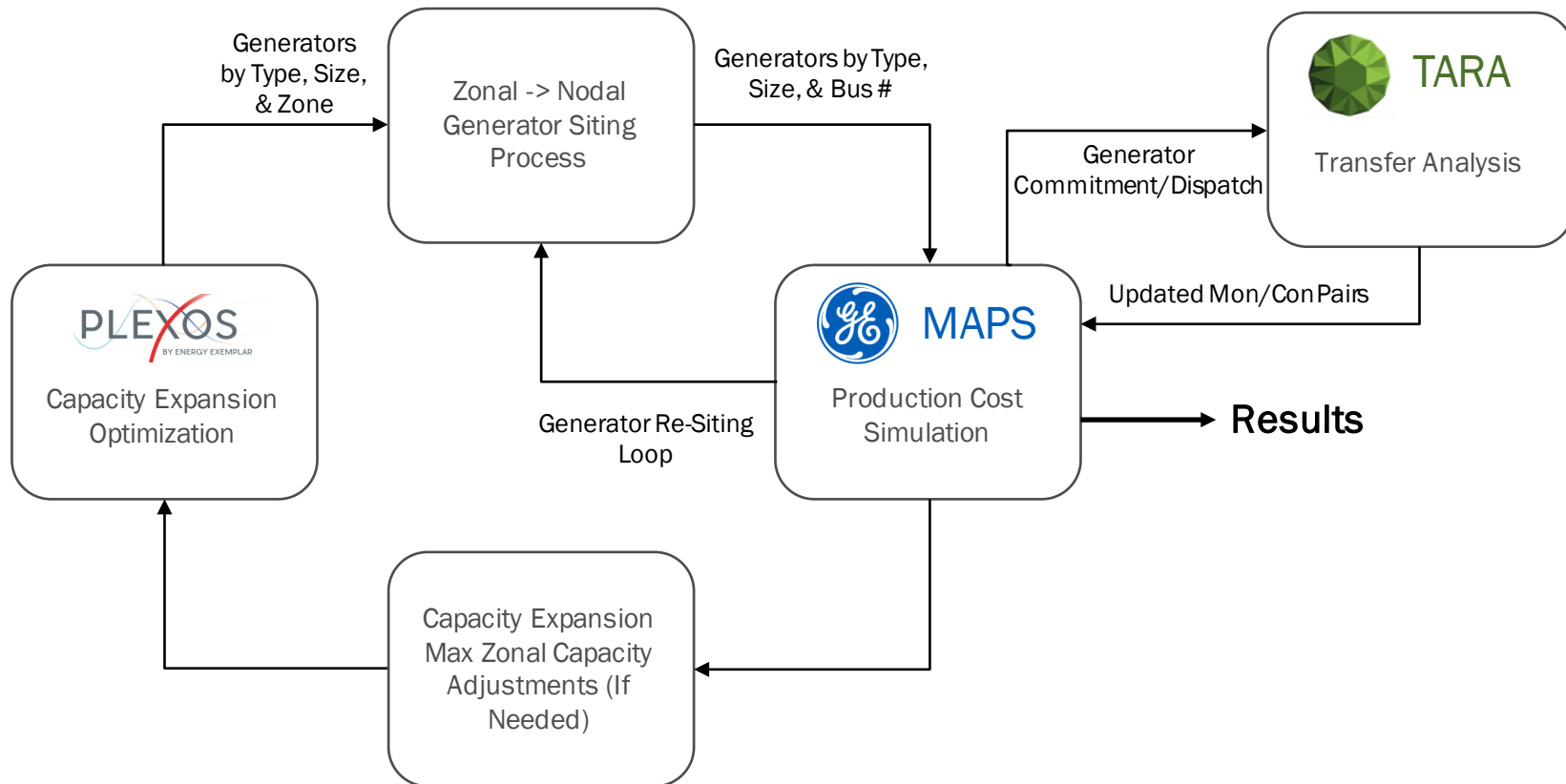
- Base Case + renewable projects with existing REC contracts

## ■ Policy Cases

- Contract Case + New York CLCPA carbon-free targets and goals
- 2 scenarios and many sensitivities
- New York Capacity Expansion model introduced



# Policy Case Simulation Framework



# 2021-2040 Outlook Lessons Learned

# Lessons Learned

- **Next 4 slides review NYISO internal feedback about Outlook process improvements to start conversation, split into the following categories**
  - Study Process
  - Production Cost Model
  - Capacity Expansion Model
  - Model Connections
- **Please ask questions and provide feedback throughout**
- **Slide # 16 opens floor for broader discussion**

# NYISO Lessons Learned:

## Study Process

- Define model development & improvements time
- Earlier publication of draft report
- Assumptions lockdown dates earlier in study process

# NYISO Lessons Learned:

## Production Cost Model

- Quantify “spillage” vs “curtailment”
- Update load & renewable shapes
- Include renewable shape forecast error
- Model index RECs (vs fixed)
- Flexible load model
- Local constraints in 2040 & beyond

# NYISO Lessons Learned:

## Capacity Expansion Model

- ISO-NE, PJM, IESO, & HQ systems
- Recalculate ELCCs for update model
- Intra-zonal model details
- Re-examine load model (17 time slices)
- Energy storage (add longer duration)
- Generation supply cost curves
- REC model
- Technologies available for expansion (DEFERs, etc)

# NYISO Lessons Learned:

## Model Connections

- Refine generation placement methodology
- Generator re-placement loop
- Capacity expansion <-> production cost loop
- Consider adding reserve evaluation model (EPRI DynADOR)

# Stakeholder Lessons Learned

- Floor is open to stakeholders
- What went well?
- What did not go well?
- Where can the models or processes be improved?
- What is the top priority improvement?
  - Note that all improvements will not be able to be addressed due to resource constraints and timing, it is important to hear stakeholders' top priorities



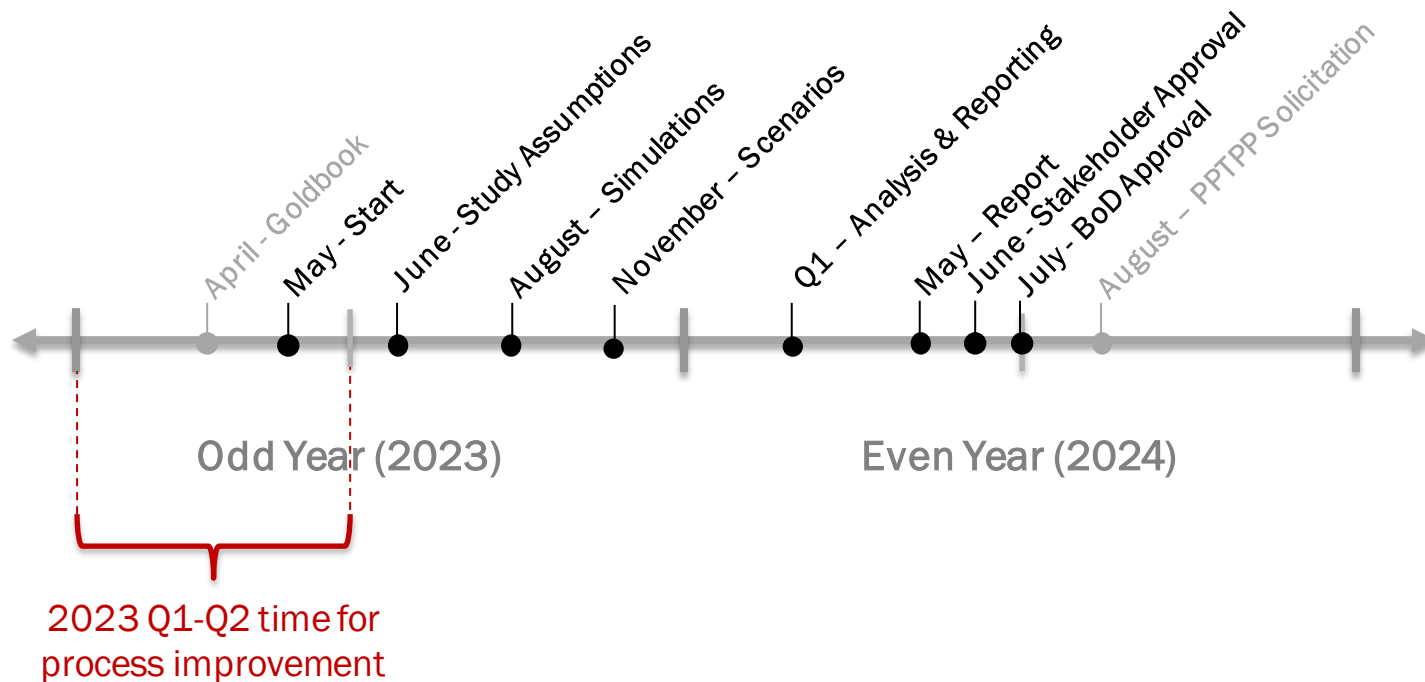
# 2023-2042 System & Resource Outlook

# 2023-2042 System & Resource Outlook

- Feedback from today will be collected and synthesized
- Process and model improvement will occur in Q1/Q2 based on feedback with priority and level of effort taken into consideration
- An update will be provided at ESPWG in Q1/Q2
- Next Outlook study scheduled to begin in May 2023

# '23-'42 System & Resource Outlook

## Preliminary Timeline

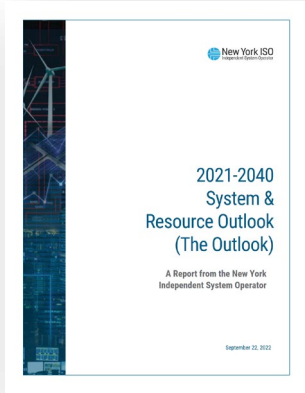


# Questions, Feedback, Comments?

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

# 2021-2040 System & Resource Outlook Data Catalog

Report



Study Summary



## Data Documents

- [Appendix A: Glossary](#)
- [Appendix B: Economic Planning Studies](#)
- [Appendix C: Production Cost Assumptions](#)
- [Appendix D: Capacity Expansion Assumptions](#)
- [Appendix E: Modelling & Methodologies](#)
- [Appendix F: Results Summary & Charts](#)
- [Appendix G: Capacity Expansion Scenarios](#)
- [Appendix H: Base & Contract Case Results](#)
- [Appendix I: Transmission Congestion Analysis](#)
- [Appendix J: Renewable Generation Pockets](#)

- [Capacity Expansion Assumptions Matrix](#)
- [Production Cost Assumptions Matrix](#)
- [Fuel Price Forecast](#)
- [Emissions Price Forecast](#)
- [Contract Case Renewable Projects](#)
- [Hourly Load Forecasts](#)
- [Detailed Model Output Data File](#)
- [MMU Renewable Profiles](#)
- [MMU Hourly LBMPs](#)
- [Outlook Policy Case Additions](#)
- [Policy Case LBMP Summary](#)

## Stakeholder Presentations

- [May 20, 2021](#)  
[Model Benchmark Results](#)
- [September 22, 2021](#)  
[System & Resource Outlook Update](#)
- [October 25, 2021](#)  
[Capacity Expansion Model Primer](#)  
[System & Resource Outlook Update](#)
- [November 19, 2021](#)  
[System & Resource Outlook Update](#)
- [December 19, 2021](#)  
[System & Resource Outlook Update](#)
- [January 25, 2022](#)  
[System & Resource Outlook Update](#)
- [February 9, 2022](#)  
[System & Resource Outlook Update](#)  
[Base & Contract Case Results](#)
- [February 25, 2022](#)  
[System & Resource Outlook Update](#)
- [March 8, 2022](#)  
[System & Resource Outlook Update](#)
- [March 24, 2022](#)  
[System & Resource Outlook Update](#)  
[Contract Case Congestion Analysis](#)
- [April 1, 2022](#)  
[System & Resource Outlook Update](#)
- [April 26, 2022](#)  
[System & Resource Outlook Update](#)
- [May 23, 2022](#)  
[System & Resource Outlook Update](#)
- [June 2, 2022](#)  
[System & Resource Outlook Update](#)
- [June 8, 2022](#)  
[System & Resource Outlook Update](#)  
[Updated 6/2 Presentation](#)
- [June 21, 2022](#)  
[System & Resource Outlook Update](#)
- [August 8, 2022](#)  
[System & Resource Outlook Update](#)
- [August 17, 2022 \(BIC\)](#)  
[System & Resource Outlook Update](#)
- [August 31, 2022 \(MC\)](#)  
[System & Resource Outlook Update](#)
- [October 25, 2022 \(Public Information Session\)](#)  
[System & Resource Outlook](#)



# 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