New York ISO
Independent System Operator

Economic Planning Process

2023-2042 System & Resource Outlook

Jason Frasier, Nischal Rajbhandari, & Sarah Carkner
Long Term Assessments

Electric System Planning Working Group (ESPWG)

Tuesday August 22, 2023

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Agenda

- Outlook Scope & Schedule Review
- 2023-2042 System & Resource Outlook Assumptions
- Next Steps
- Questions, Comments, & Feedback
- Outlook Data Catalog

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Outlook Scope & Schedule Review

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System & Resource Outlook Scope

Model Development

- Benchmark
- Assumptions
- Reference Cases
- Sensitivities

Congestion Assessment

- Historic & Future Transmission Congestion
- Congestion Relief Analysis

Analyses

- Resources to Meet Policy Objectives
- Renewable Pockets & Energy Deliverability
- Renewable Generation Profiles
- Future Resource Attributes

Report, Appendix, Data Catalog, & Fact Sheet

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Preliminary Targeted Study Schedule

2023 Q3	Month	July					August				September			
	Week	1	2	3	4	5	1	2	3	4	1	2	3	4
	Benchmarking	X	X	X										
	Assumptions Development	X	X	X	X	X	X	X	X	X	X	X	X	X
	CapEx Model Development	X	X	X	X	X	X	X	X	X	X	X	X	X
	Production Cost Model Development	X	X	X	X	X	X	X	X	X	X	X	X	X
	CapEx Results													
	Production Cost Results													
	Analyses													
	Report													

2023 Q4	Month	October					November				December			
	Week	1	2	3	4	5	1	2	3	4	1	2	3	4
	Benchmarking													
	Assumptions Development	X	X	X	X	X	X	X	X	X				
	CapEx Model Development	X	X	X	X	X	X	X	X	X				
	Production Cost Model Development	X	X	X	X	X	X	X	X	X	X	X	X	X
	CapEx Results										X	X	X	X
	Production Cost Results													
	Analyses													
	Report													

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2023-2042 System & Resource Outlook Preliminary High-Level Assumptions

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Preliminary High-Level Assumptions

Assumptions	Base	Contract	Policy
Load	2023 Gold Book Baseline Forecast	2023 Gold Book Baseline Forecast	2023 Gold Book Policy Forecast, CAC Integration Analysis
Generation	2023 Gold Book List of Generators	Consistent with Base Case	Consistent with Contract Case (including new generation)
New Generation	As per the inclusion rules in the 2022 RNA/2023 Q3 STAR	2022 NYSERDA RFP additions	Determined by policies and economics via capacity expansion modeling
Retirements	2022 RNA/2023 Q3 STAR	Age and contract based	Determined by policies and economics via capacity expansion modeling
Transmission Topology (Powerflow Case)	2022 RNA	2022 RNA	2022 RNA
New Transmission Projects	LIPPTN, CHPE, Northern NY Priority Transmission	LIPPTN, CHPE, Northern NY Priority Transmission, JU P1/P2, BCEH, CPNY	LIPPTN, CHPE, Northern NY Priority Transmission, JU P1/P2, BCEH, CPNY

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Base Case Assumptions

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Base Case Assumptions Summary

- Load forecast from 2023 NYISO Gold Book Baseline forecast
- Fuel forecast based on EIA's 2023 Annual Energy Outlook forecast of national delivered price
- Generator and transmission assumptions consistent with 2022 RNA and 2023 Q3 STAR assumptions with modifications up to the Base Case lockdown date
- External pool model updates based on ISO/RTO public information (load forecasts, generator additions, and retirements)
- Study years for models: 2025, 2030, 2035, 2040 and 2042

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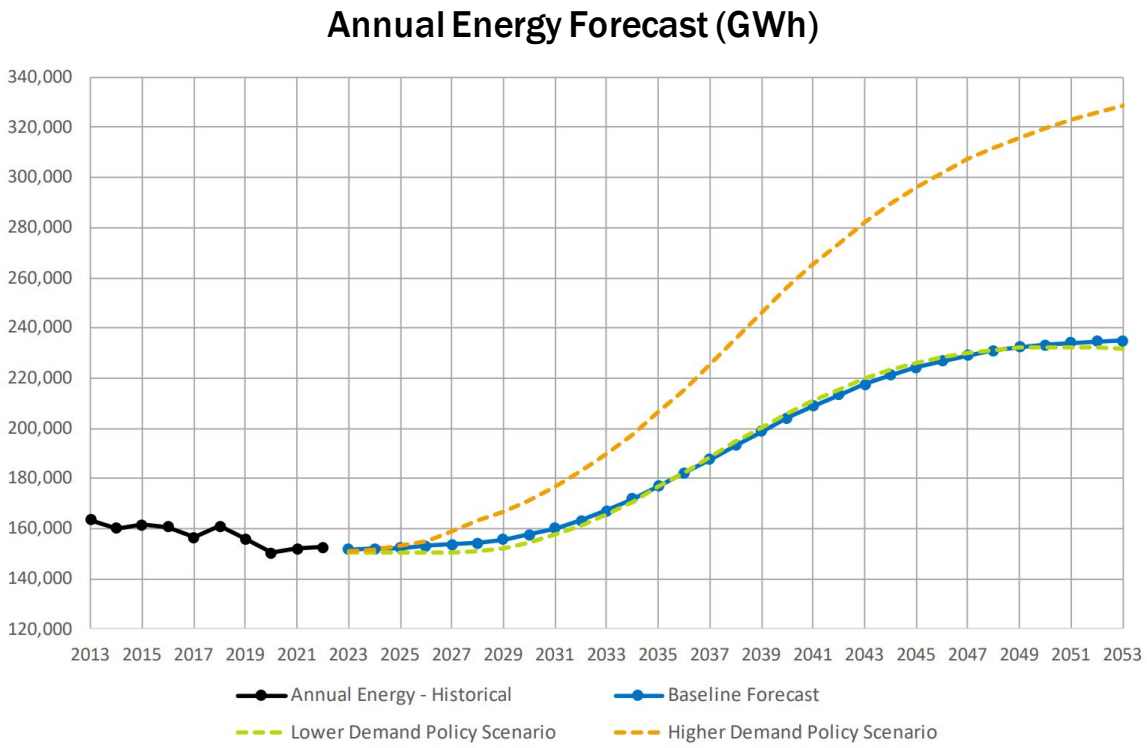
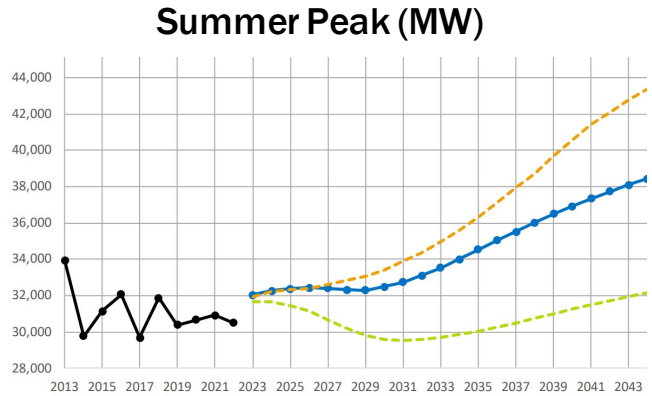
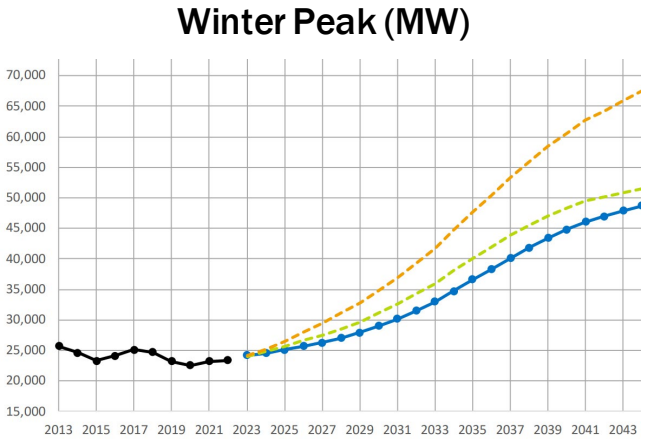
NYISO Load Forecast







Source: 2023 NYISO Goldbook

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Large Load Assumptions

- **Large load forecast consistent with 2023 Q3 STAR assumptions which include:**
  - Q0580 – WNY STAMP
  - Q0776 – Greenidge Load (BTM)
  - Q0849 – Somerset Load
  - Q0580 – Cayuga load
  - Q0979 – North Country Data Center (load increase)
  - Q1536 – White Pine Phase 1 (Micron)
  - Q1446 – Massena Green Hydrogen (Air Products and Chemicals)

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NYISO Generation

- **Additions**
  - 2022 RNA Large Gen Additions
    - Q495 Mohawk Solar
    - Q579 Bluestone Wind
    - Q612 South Fork Wind Farm I
    - Q617 Watkins Glen Solar
    - Q618 High River Solar
    - Q619 East Point Solar
    - Q637 Flint Mine Solar
    - Q695 South Fork Wind Farm II
    - Q720 Trelina Solar Energy Center
    - Q721 Excelsior Energy Center
    - Q758 Sithe Independence GS1 through GS4 9MW uprate
  - 2022 RNA Small Gen Additions
    - Q581 Hills Solar
    - Q734 Ticonderoga Solar
    - Q759 KCE NY6
    - Q769 North County Energy Storage
    - Q807 Hilltop Solar
    - Q848 Fairway Solar
    - Q855 NY13 Solar
  - 2023 Q3 STAR Gen Additions
    - Q529 Silver Lake Solar
    - Q591 Highview Solar
    - Q706 High Bridge Solar
    - Q828 Valley Solar
    - Q832 CS Hawthorn Solar
    - Q833 Dolan Solar

2022 RNA Assumptions 2023 Q3 STAR Assumptions

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NYISO Generation

- **Retirements/Removals**
  - Albany LFGE (Zone F, 5.6 MW)
  - Nassau Energy Corporation (Zone K, 38.5 MW)
  - Gowanus 1-1 through 1-7 (Zone J, 117.1 MW)
  - Gowanus 4-1 through 4-8 (Zone J, 138.8 MW)
  - Madison County LF (Zone E, 1.6 MW)
  - Western NY Wind (Zone B, 6.6 MW)
  - Astoria GT 01 (Zone J, 12.1 MW)

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Transmission Updates

- Model Q631 – Champlain Hudson Power Express (CHPE) as in service in 2026
  - Modeled as direct injection into NYC
- Model Q1125 – Northern NY Priority Transmission Projects fully in service in 2026
- Include selected Long Island Public Policy Transmission Need solution (Propel NY Alternate 5 – T051) in service 2030

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Emissions Allowance Price Forecast Considerations

- **Emissions allowance price forecasts from 2021-2040 Outlook**
  - Methodology (slides 19-22): Link
  - Final Forecast Values: Link
- **Updates considered in emissions allowance price modeling**
  - **RGGI** – *2021-2040 Outlook* modeled PA as joining RGGI in 2023
  - **CSAPR** – ozone season NO_X program changes and regulatory uncertainty only impact price (and not state participation in states) modeled
  - **Ontario Carbon Price** – update to apply carbon price only to emissions released above the industry-specific benchmark emissions rate. Aligns with methodology used by IESO (link)

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External Area Model Updates

- **ISO-NE:**
  - Load: ISO-NE Website (link here)
  - Generation/Retirements: CELT / FCA
- **PJM:**
  - Load: PJM Website (link here)
  - Generation / Retirements
- **IESO:**
  - Load and generation assumptions reflective of 2022 Annual Planning Outlook

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Hurdle Rates

- Calculated in the benchmark process
- Used to tune import/export transactions
- Represent inter-market friction and financial transaction costs
- Values presented with benchmark results

Commitment Hurdle Rate	Export (from NYCA)		Import (into NYCA)	
	2021 System & Resource Outlook	2023 System & Resource Outlook	2021 System & Resource Outlook	2023 System & Resource Outlook
PJM	$4.00	$4.00	$2.00	$5.50
Linden VFT	$5.00	$5.00	$2.50	$2.50
Neptune	$8.00	$8.00	$1.80	$1.80
HTP	$8.00	$8.00	$3.00	$6.00
ISONE	$3.00	$3.20	$2.00	$2.00
Cross Sound Cable	$2.00	$2.00	$1.00	$1.00
Northport Norwalk Cable	$4.00	$4.00	$2.00	$2.00
IMO	$6.00	$7.50	$3.00	$3.00

Dispatch Hurdle Rate	Export (from NYCA)		Import (into NYCA)	
	2021 System & Resource Outlook	2023 System & Resource Outlook	2021 System & Resource Outlook	2023 System & Resource Outlook
PJM	$2.00	$2.00	$0.50	$4.50
Linden VFT	$3.00	$3.00	$0.50	$0.50
Neptune	$6.00	$6.00	$0.80	$0.80
HTP	$6.00	$6.00	$1.00	$4.00
ISONE	$1.00	$1.20	$ -	$ -
Cross Sound Cable	$ -	$ -	$ -	$ -
Northport Norwalk Cable	$2.00	$2.00	$1.00	$1.00
IMO	$4.00	$5.50	$1.00	$1.00

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Contract & Policy Case Assumptions Update

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Contract Case Assumptions

- **Incremental changes to the Base Case**
  - Renewable generation resource additions will be based on the current NYSERDA Renewable Energy Credit (REC) contracts database. Incremental additions will consider resources already included in the Base Case due to the inclusion rules.
  - Inclusion of approved Phase 1 and 2 transmission projects approved in February 2023 PSC Order including the Brooklyn Clean Energy Hub.

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Policy Case Assumptions

- Incremental changes to the Contract Case, including additional assumptions specific to achievement of policy objectives. More detail to come at future ESPWG meetings
- Ongoing assessment of assumptions specific to the Policy Case, including:

Assumption	Source
Load Forecasts and Load Shapes	To be derived from the 2023 Gold Book, CAC Integration Analysis
Candidate Generators for Expansion	EIA Annual Energy Outlook 2023 and based on stakeholder feedback
Policy Mandates	CLCPA Targets

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Capacity Expansion Enhancements

- Several recommended enhancements to the capacity expansion model, based on "lessons learned" discussions with stakeholders and the MMU review of the *2021-2040 Outlook*, are currently undergoing review, testing, and evaluation
- Ongoing assessment of proposed enhancements to the capacity expansion model for use in the Policy Case, including:
  - Addition of external pools
  - Time representation methodology
  - Addition of generation supply curves for renewable technologies
  - Updated ELCC curves

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Next Steps

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Next Steps

- Draft Assumption Matrices
- Model Improvement Update
- Load, Fuel and Emissions Price Forecasts
- Upcoming Stakeholder Presentations
  - Thursday, 9/21 ESPWG

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Questions, Comments, & Feedback?

Email additional feedback to:
JFrasier@nyiso.com
one week prior the next ESPWG

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2023-2042 System & Resource Outlook Data Catalog

Report

Report Placeholder

Study Summary

Summary Placeholder

Stakeholder Presentations

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

Report Appendices

Data Documents

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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

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