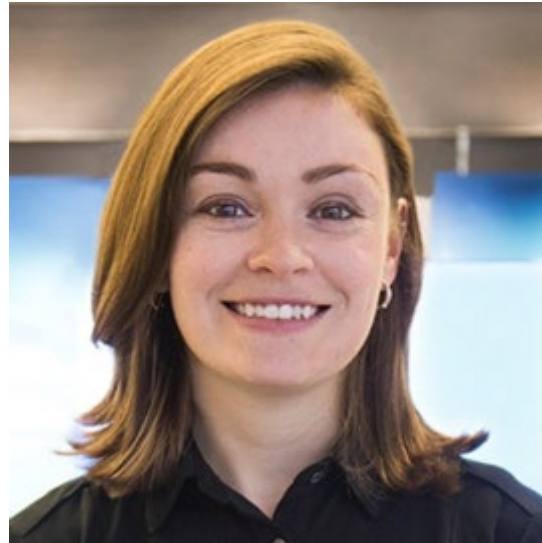




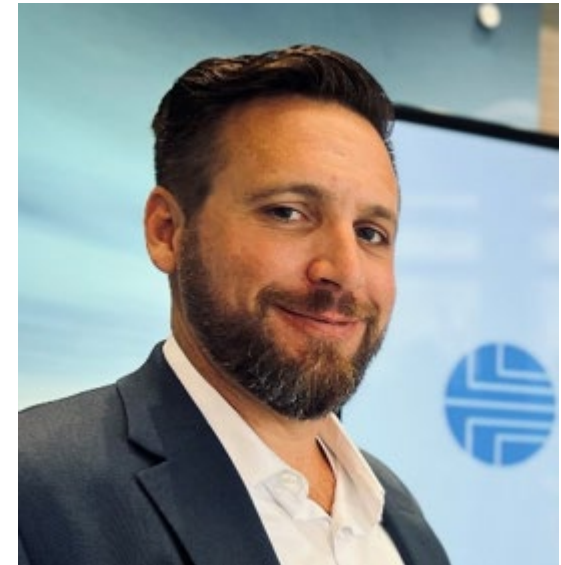
Credit: South Fork Wind

Learning from the Experts Webinar Series

Understanding the Bridge between Existing and New Energy Sources



Sarah Carkner
Manager, Long Term
Assessments
NYISO



Jason Frasier
Senior Manager,
Transmission Planning
NYISO

September 30, 2026

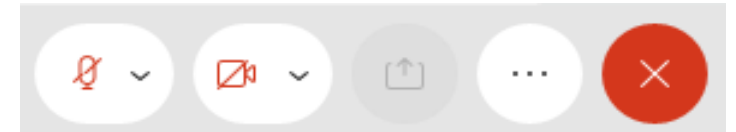
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Learning from the Experts

This webinar series is hosted by NYSERDA's offshore wind team and features experts in offshore wind technologies, development practices, and related research.

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The views and opinions expressed in this presentation are those of the presenter and do not represent the views or opinions of NYSERDA or New York State.



NYSERDA



Bridging Energy Sources: Today and In the Future

Jason Frasier

Senior Manager, Transmission Planning

Sarah Carkner

Manager, Long Term Assessments

NYSERDA Learning from the Experts Webinar Series

Wednesday, September 30, 2026

Agenda

- **New York Bulk System Planning**
- **Current Power System Trends in New York**
- **Planning For Existing and New Energy Sources**
- **Planning For the Evolving System**
 - Planning for Offshore Wind
- **Key Insights from the Outlook**
- **Q&A**

New York Bulk System Planning

NYISO: Delivering the #gridofthefuture

We are engineers, operators, analysts, economists, and technologists dedicated to a reliable and sustainable power grid

600+

Dedicated
employees

700

Power generating
units

33,956 MW

Record
peak demand in 2013

450

Wholesale
energy market
participants

11,300

Circuit miles of
transmission managed
and monitored

151,059 GWh

Delivered to
New York
consumers in 2025

FOLLOW US



Our Mission and 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



NYISO's Purpose

We are dedicated to a reliable, sustainable power grid and competitive markets.

- ✓ **Maintaining** and enhancing regional reliability
- \$ **Operating** open and fair wholesale electricity markets
- 👉 **Planning** the bulk power system for the future
- 🔍 **Providing** factual information to policymakers, stakeholders, and investors.



New York Bulk System Planning

- **As the Independent System Operator, the NYISO plays a key role supplying critical information associated with achievement of state policies to market participants, policymakers, and the public**
 - Extensive studies and analyses are conducted on a routine basis to evaluate the evolving grid and inform of potential challenges
 - NYISO focuses on bulk transmission system planning, while the Transmission Owners plan for their local transmission and distribution systems

Planning For New Generation

- In order for proposed generation projects to integrate into the electric grid, they must complete the necessary **interconnection studies** and procedures
- Today's discussion is not intended to review the interconnection processes, but rather discuss **how the NYISO evaluates future scenarios** with high amounts of new renewable generation
- Specially, the discussion includes:
 - How the NYISO plans for new energy resources
 - How the electric system may evolve with existing and new energy resources
 - Insights on systems with and without new offshore wind



Comprehensively Plan

system & resources to elicit market-based and regulated infrastructure investments to maintain system reliability, improve market efficiency, and fulfill public policy needs

Reliably Interconnect
competitive generation,
load and transmission
projects to the New York grid

NYISO System & Resource Planning

Accurately Forecast
short-term and long-term electricity demand for grid & market operations, system planning, and NYISO budgeting

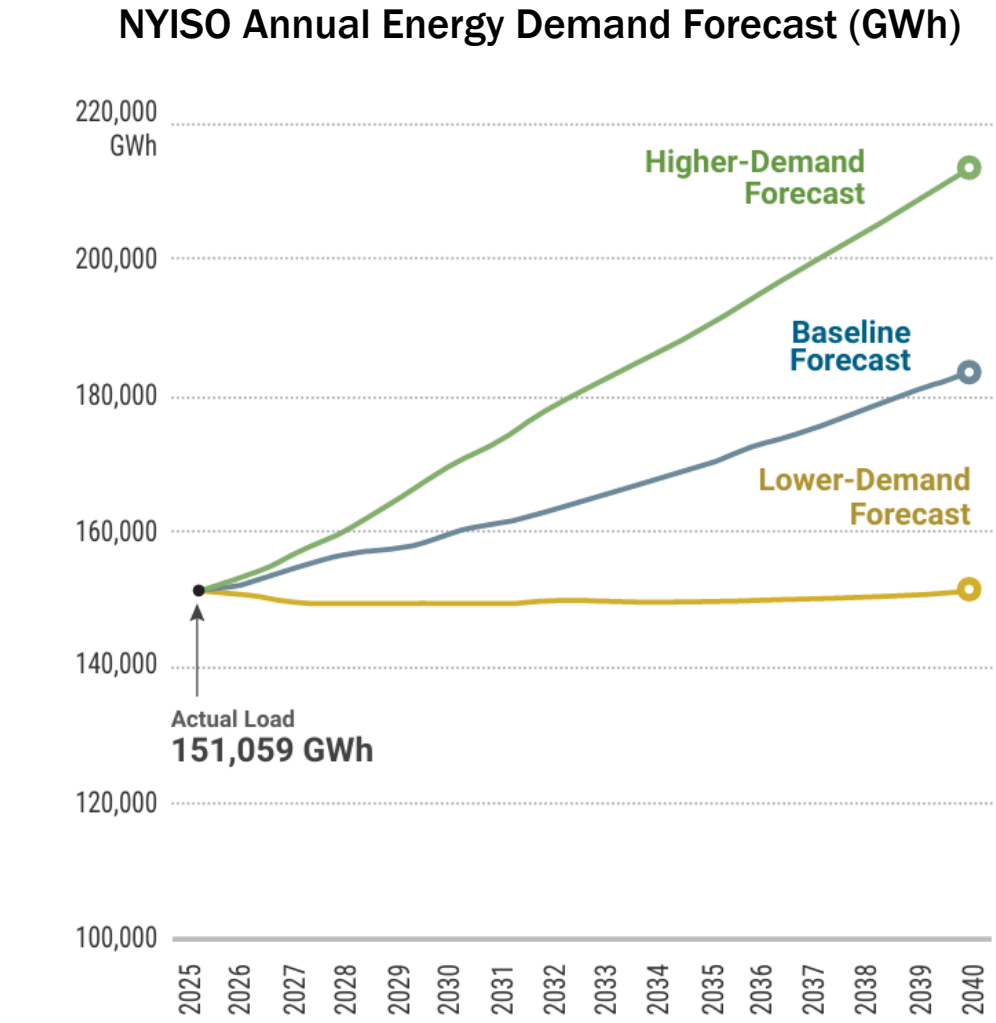


Independently Provide
authoritative information
to promote economic and environmental
improvements
in balance with reliability requirements

Current Power System Trends in New York

Power System Landscape in New York: Demand

- Demand flat previous 5 years
- Policy driven electrification expected to increase demand annually through 2040
- >12,000 MW of large loads in NYISO interconnection queue

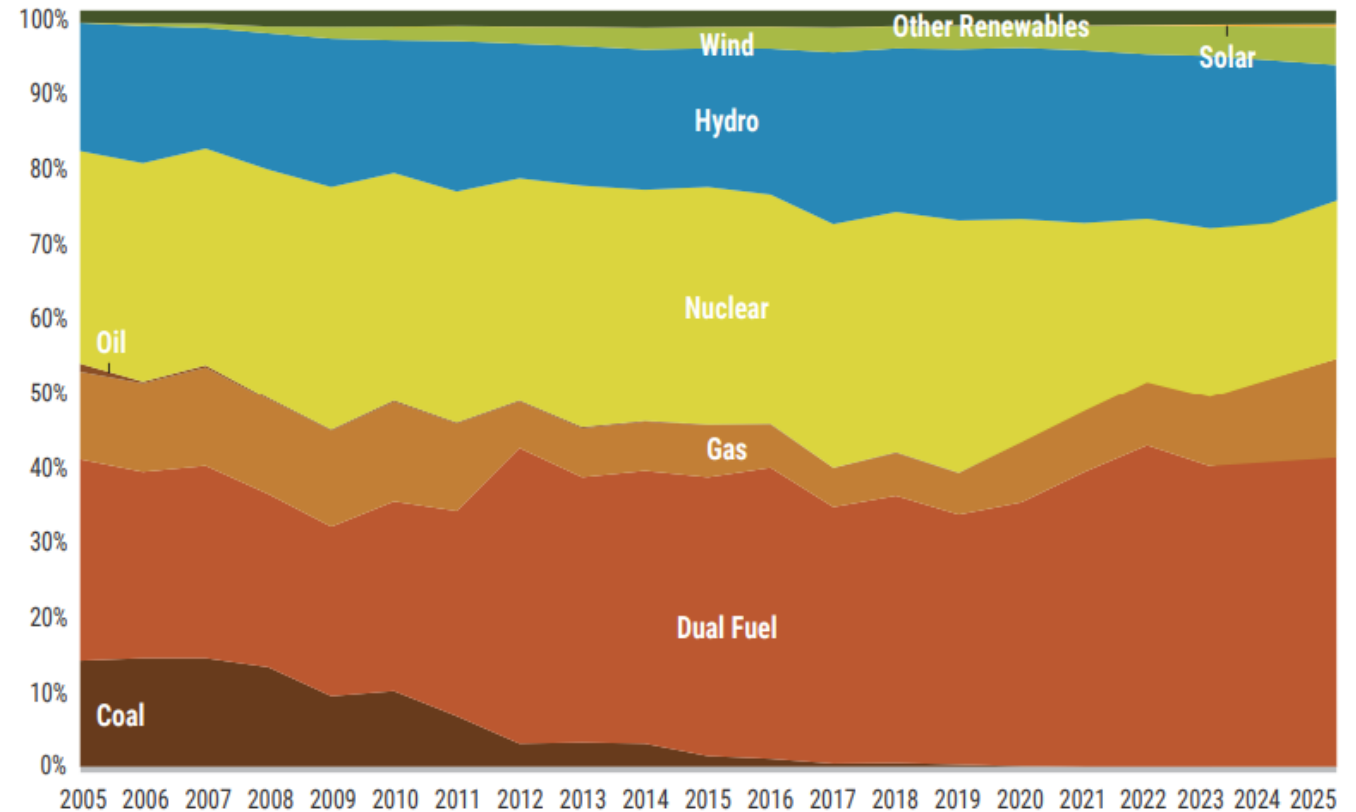


Source: NYISO Goldbook & Power Trends Reports

Power System Landscape in New York: Supply

- Growth of renewables in previous 5 years
- Increasing share of natural gas generation due to retirements outpacing new generation

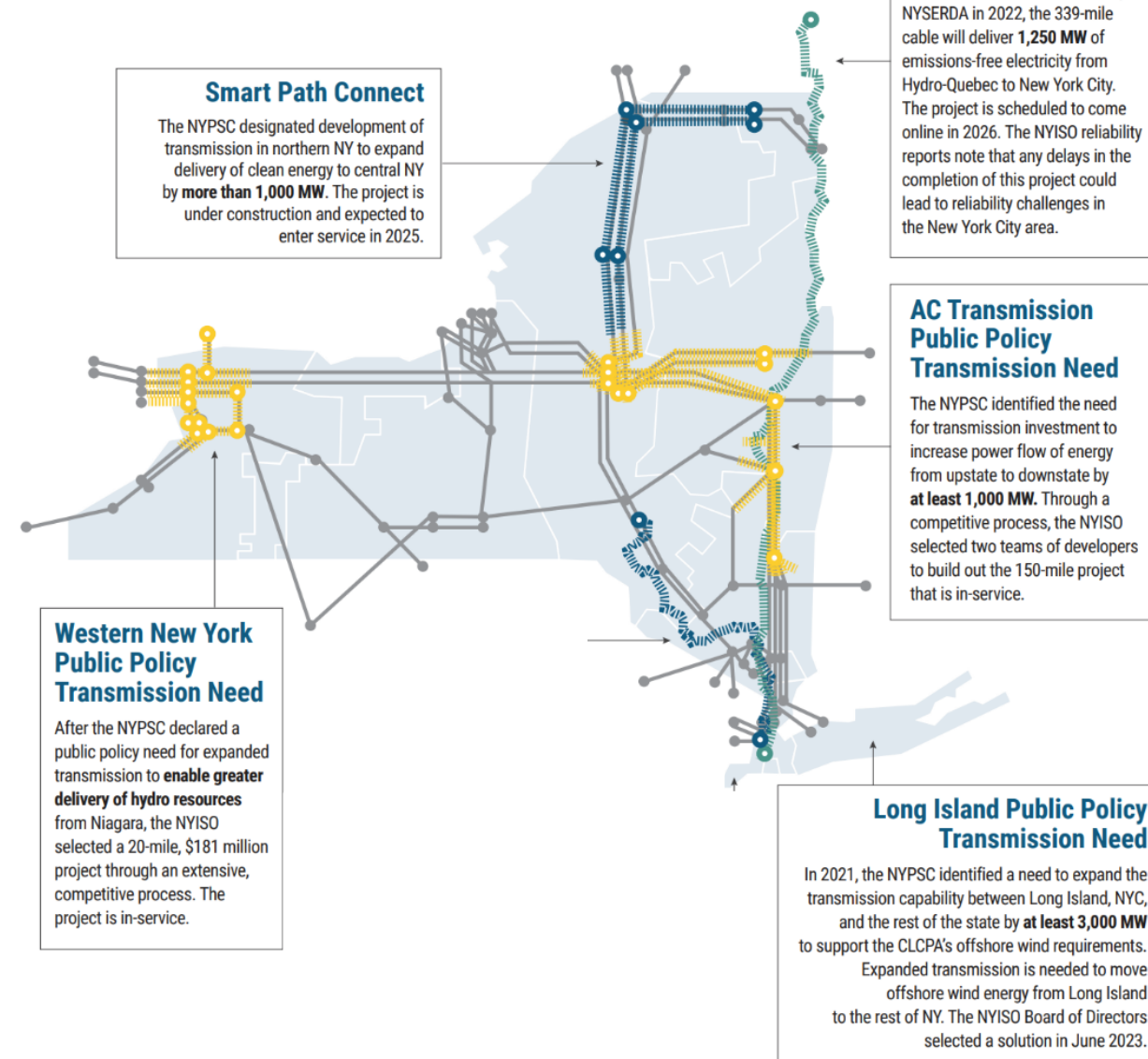
NYISO Annual Generation by Type (%)



Source: NYISO Power Trends Report

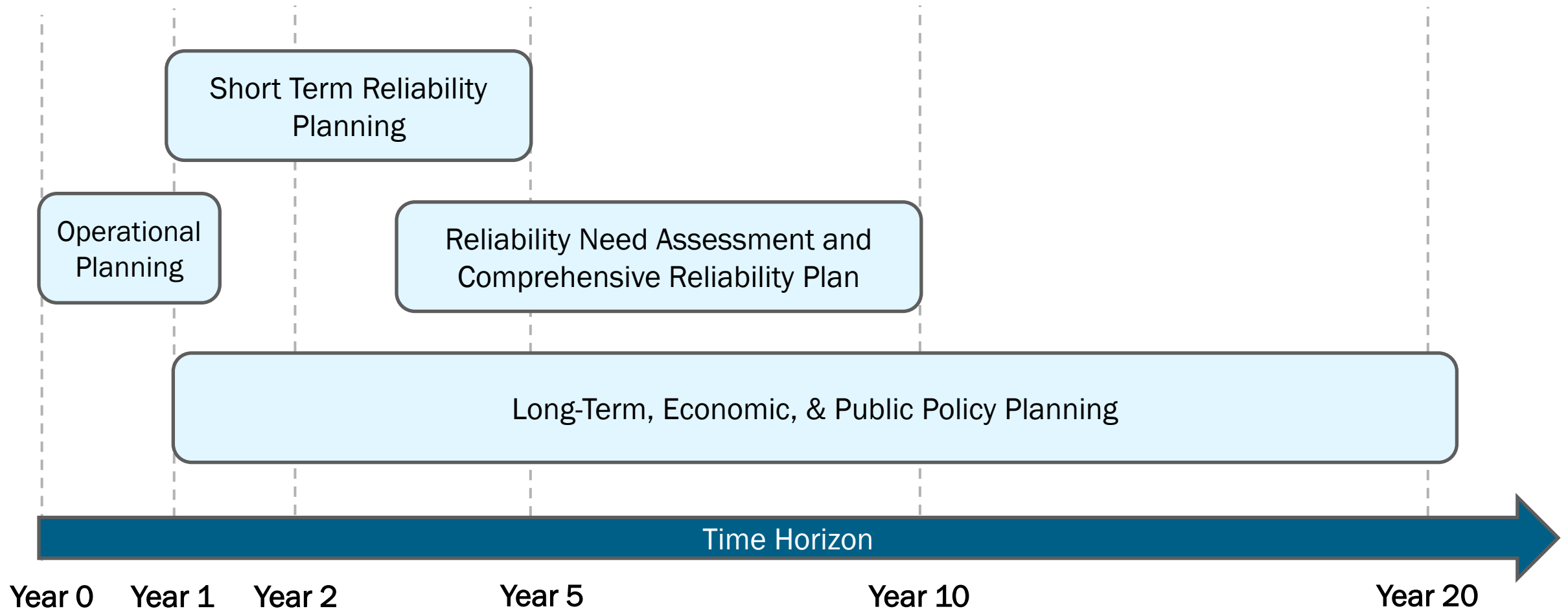
Power System Landscape in New York: Transmission

- Over \$10B of bulk transmission development in last decade resulting from the NYISO's Public Policy Transmission Planning Process and state-level efforts
- Additional approved projects are anticipated within the next decade, including Long Island Public Policy Transmission and Joint Utilities' Phase 1 & Phase 2 local transmission projects



Planning For Existing and New Energy Sources

Planning Study Horizons



Operational Planning

Reliability Planning Process

Economic & Public Policy Planning

NYISO's Long Term Planning

- **The System & Resource Outlook is the NYISO's 20-year long term assessment of future system conditions and identifies transmission investment opportunities in New York**
- **Among other things, the Outlook:**
 - Produces a twenty-year projection of system conditions for demand, generation, and transmission across the transmission system
 -  Evaluates possible resource mixes to meet projected energy needs
 - Informs stakeholders and policymakers where future transmission investment opportunities may exist
 - Identifies renewable generation pockets
 -  Determines potential challenges to meeting the New York State CLCPA targets

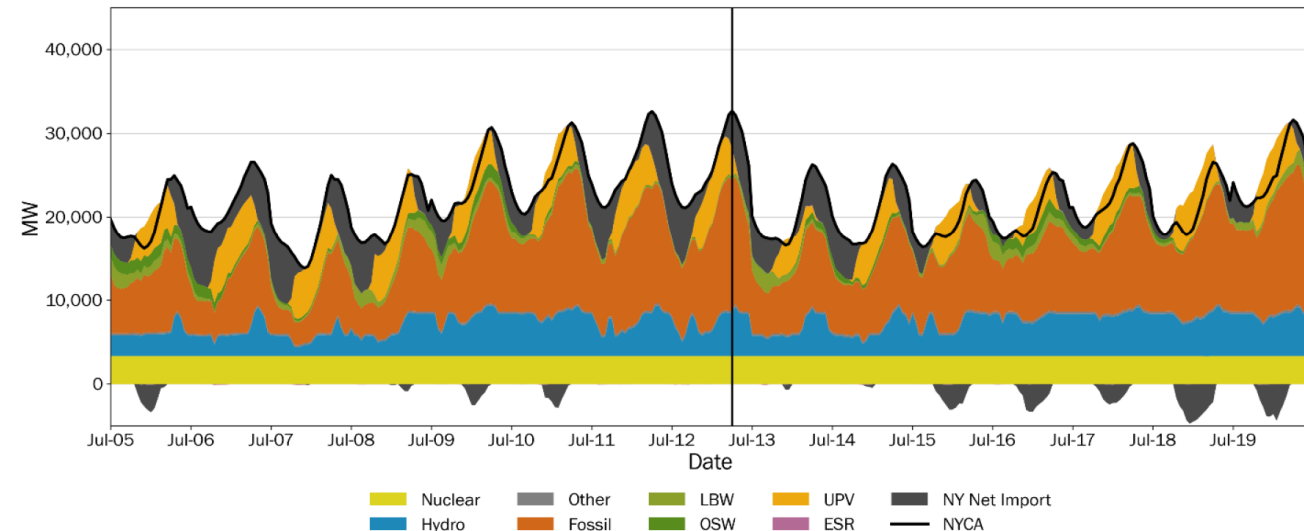
Existing and New Resources

- The System & Resource Outlook assesses multiple future scenarios
- Two of these futures are primarily focused on generation and transmission changes in the near term (e.g., 5-10 years)
 - Base Case
 - Aligns with base case inclusion rules for NYISO reliability studies
 - Approximately 4.2 GW of renewables and battery storage resources are added as firm additions by 2028
 - Approximately 900 MW of fossil-fuel fired generation is assumed to retire by 2031
 - Contract Case
 - Adds approximately 3.5 GW of renewables by 2030
 - Assumes approximately 1 GW of aging fossil retirements occur by 2030, 3 GW by 2035

Insights on the Existing & Planned System

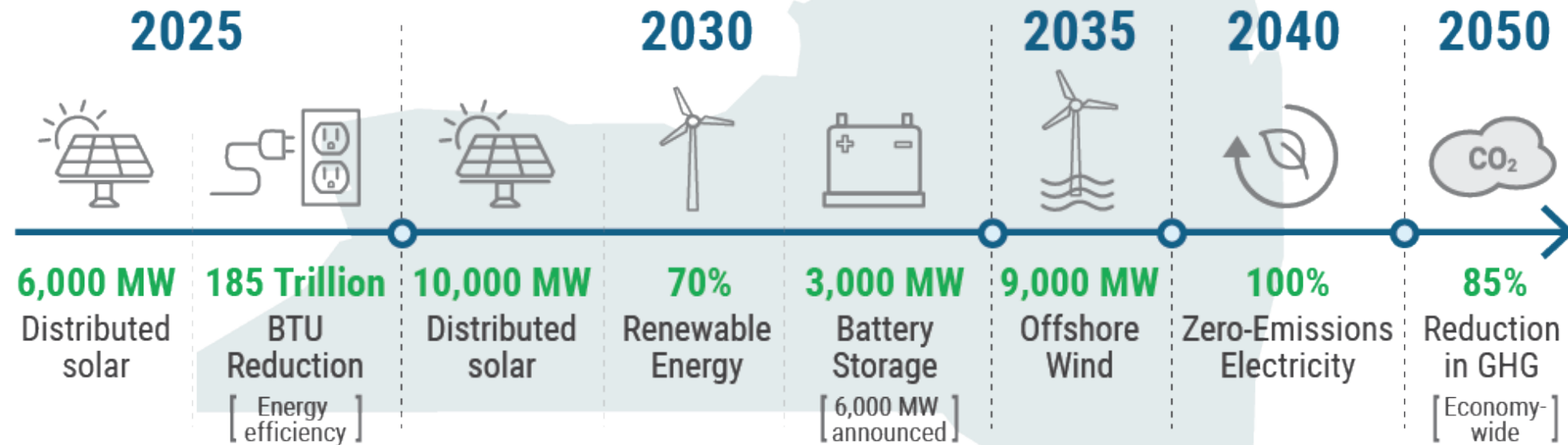
- A scenario in the Outlook shows that the increase in renewable generation overall led to lower net imports over the summer peak period
- Even with added renewable capacity and decreased fossil fuel-fired capacity due to the retirement of aging fossil generators, there is significant fossil generation to meet energy needs

2030 Summer Peak Load Weeks – Hourly Projection



Planning For The Evolving System

Energy Policy Mandates



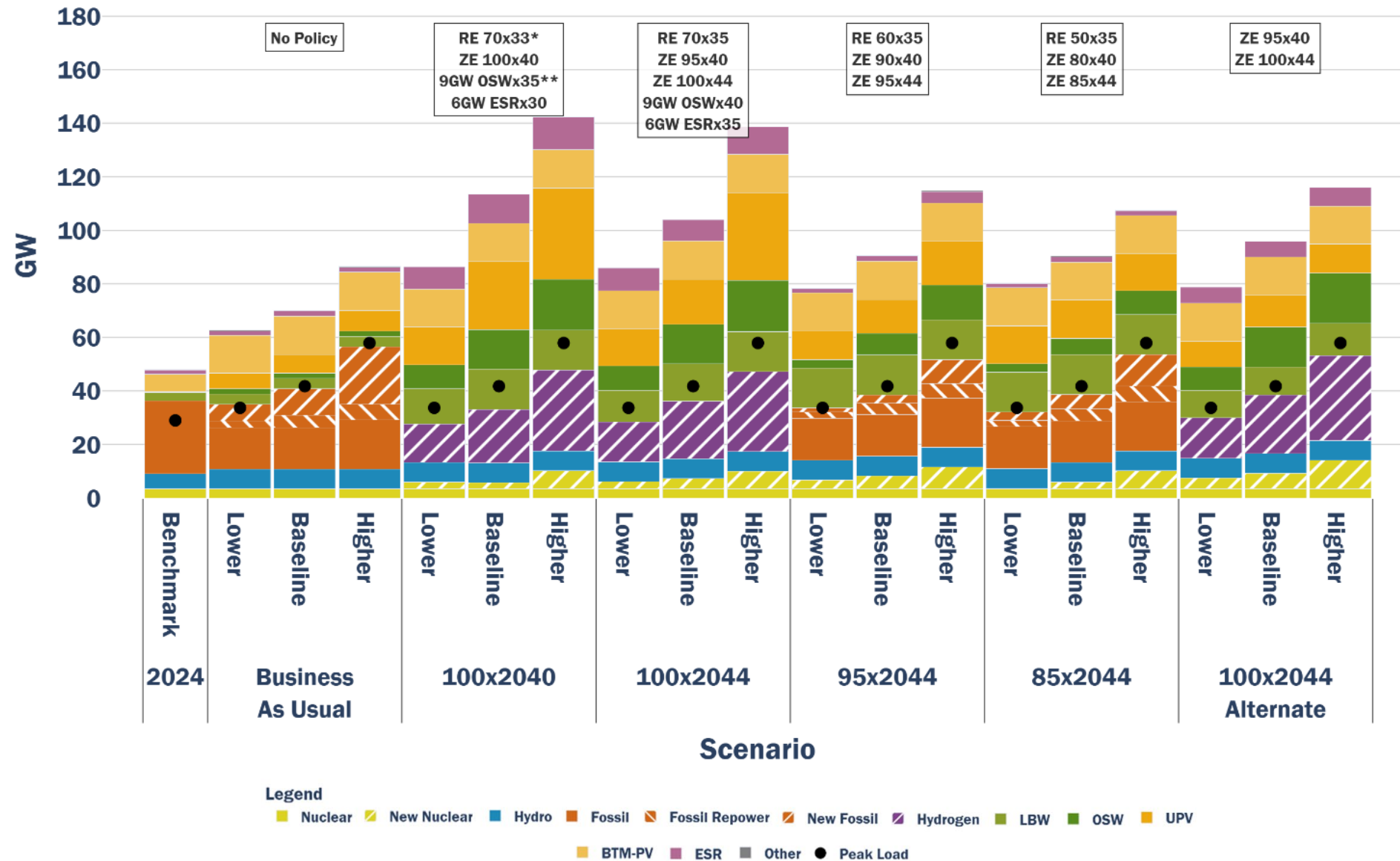
Planning for New Energy Sources in the Evolving System

- **Leveraging capacity expansion modeling into planning processes, the NYISO evaluates various future system conditions and provide insights on questions such as:**
 - What type of generation should be built and how much?
 - Where should generation be built in the state?
 - When should generation get built?
 - What are the primary drivers for projected resource mixes (e.g., load, policy mandates, planning reserve margins, etc.)?
 - What areas have economic generation opportunity that is limited by inter-zonal transmission?
- **Answering these questions and understanding the potential impacts to the system help to identify challenges associated with an accelerated adoption of renewable and zero-emitting technologies**

Scenario Planning

- The NYISO conducts scenario planning in many of its studies to assess a range of future outcomes as to how the grid may evolve
- Key variables that change among scenarios include:
 - Demand forecast
 - Generator retirements
 - New resources
 - Progress towards decarbonization of the electric sector
- Through scenario planning, the NYISO can assess many different possible futures; evaluate possible resource mixes; and identify challenges and opportunities for new resources and transmission in New York

Policy Scenarios: 2044 Resource Capacity



Planning For Offshore Wind

Planning for OSW Downstate

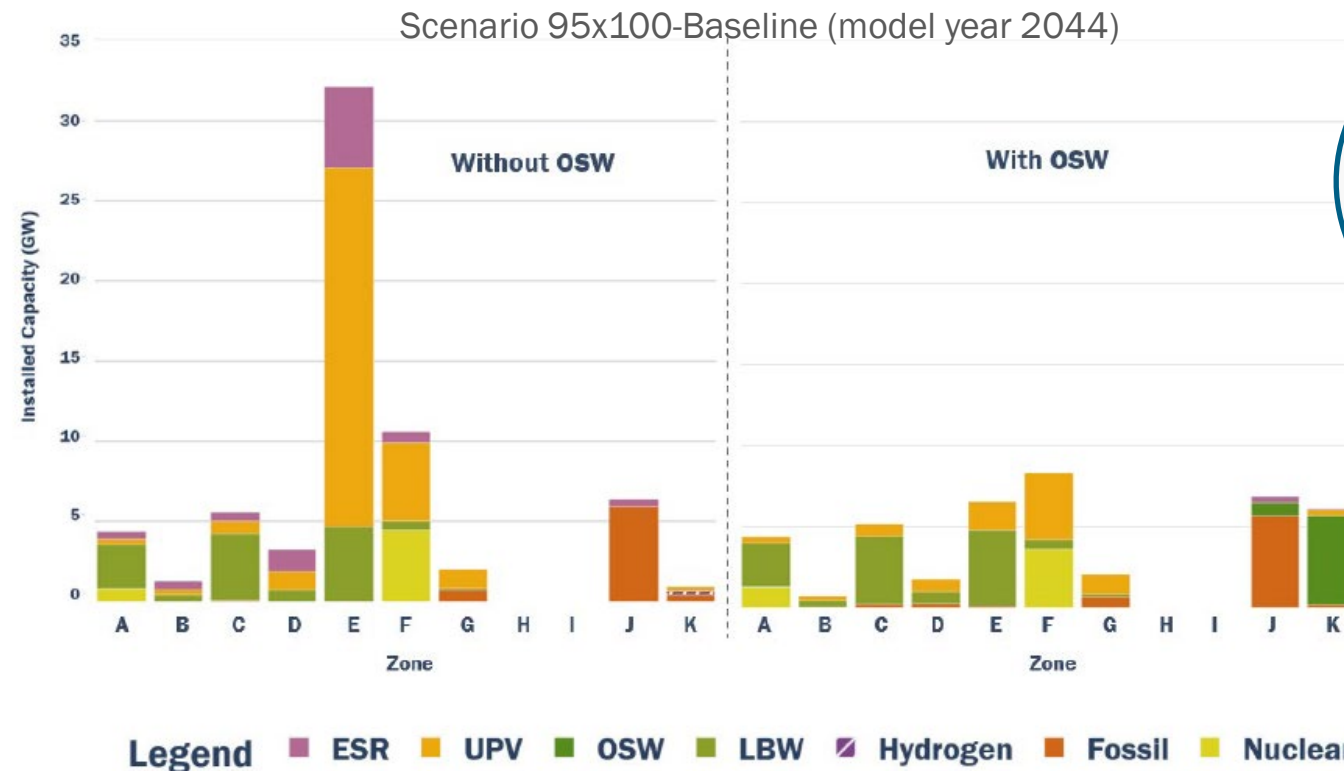
- **Of viable technologies, offshore wind is the most probable renewable resource option in downstate zones**
 - Land-based wind and utility solar are not feasible at scale in densely populated urban areas
- **If integrated, offshore wind would enable clean energy downstate and help serve demand in localized areas**

Planning for OSW Downstate (cont.)

- The prospect of OSW connecting to downstate zones and its impact on the evolving grid was significantly altered in 2025 due to federal action to halt certain activities related to the development of offshore wind, which resulted in the New York State Public Service Commission withdrawing the New York City Public Policy Transmission Need
- Absent additional offshore wind integration, achieving decarbonization policies in New York will be challenging and significant investment in other clean energy resources would be needed
 - This would also place additional strain on the supply chain for renewable resource development, due to the magnitude of resources that would be needed to meet renewable energy targets

Progressing Towards Decarbonization Policies Without New OSW

- Without new offshore wind in New York, achieving renewable and emissions-based targets will be challenging



30 GW of clean energy resources would be needed to offset 6 GW of offshore wind capacity in scenarios with high renewable energy targets

Key Insights from the Outlook

Key Insights from the Outlook

- Policy design directly determines the scale and composition of future resource development
- Firm, dispatchable capacity remains essential in all futures to serve demand and provide essential grid services
- Coordinating resource development with generation retirements is increasingly critical to maintaining sufficient margins

Key Questions Facing System Planning

- How do changes to the generation fleet impact transmission congestion?
- How does new transmission impact projected generation mix?
- How does demand (e.g., electrification, EVs) impact projected generation mix?
- What technologies can fit the needs of dispatchable resources in a highly decarbonized future?

Questions, Comments, & Feedback?

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Ventolines | October 8, 2026

Cable Installation

Ventolines | November 5, 2026

Towers, Nacelles, and Blades

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- How Offshore Wind Farms are Installed
- Logistics of Offshore Wind Operations and Maintenance

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