

2023-2042

System & Resource Outlook

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State of the Grid – Key Themes

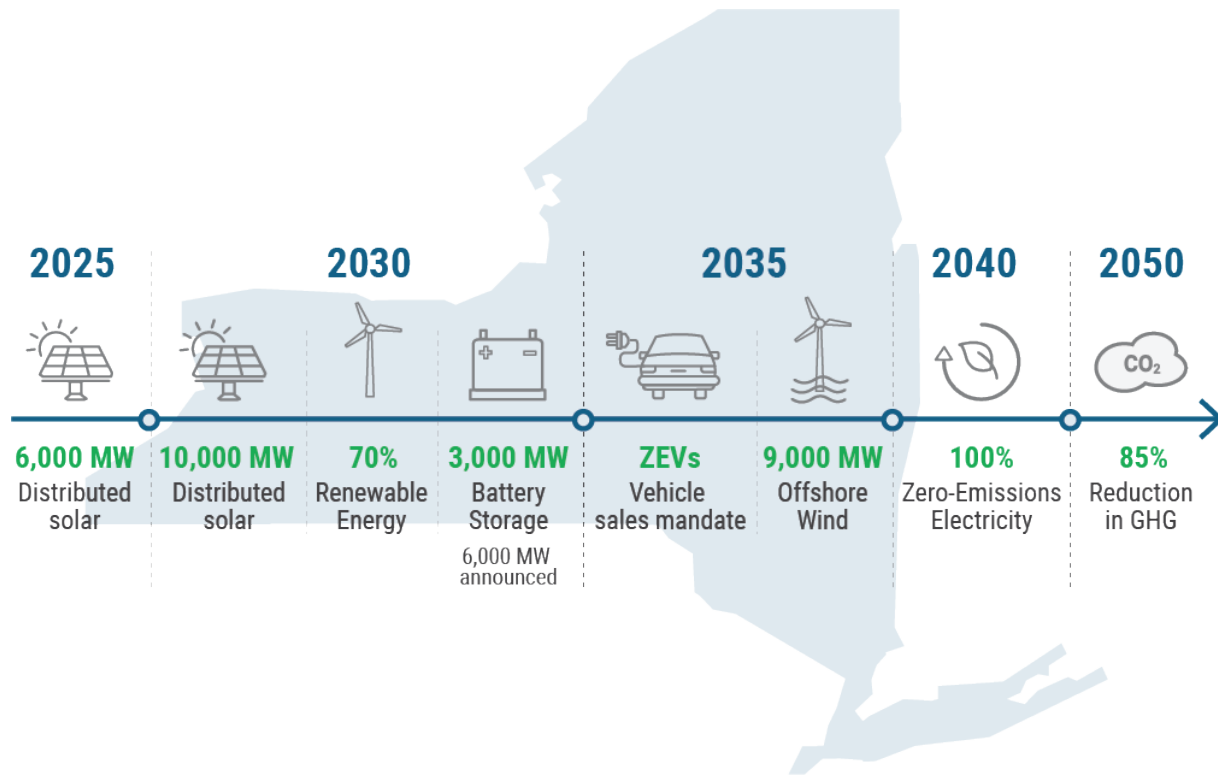
- Public policies continue to drive rapid change in the electric system in the state.
- **Narrowing Reliability Margins:** Electrification programs and economic development initiatives are driving projected demand higher. Generator deactivations are outpacing new supply additions.
- The potential for delays in construction of new supply and transmission, higher than forecasted demand, and extreme weather are threatening reliability and resilience to the grid
- **Summer 2024:** Electricity supplies are adequate to meet expected summer demand under normal conditions, but extreme weather and other factors pose reliability risks.
- New York is projected to become a winter-peaking system in the 2030s, primarily driven by electrification of space heating and transportation.

State of the Grid – Key Themes (Cont.)

- On the coldest days, the availability of natural gas for power generation may be limited and significant interruptions to natural gas supply can disrupt reliable operations.
- NYISO's interconnection processes continue to evolve to balance developer flexibility with the need to manage the process to more stringent timeframes.
- To achieve the mandates of the CLCPA, new emission-free supply capable of providing the necessary reliability services are needed to replace the capabilities of today's generation. Such new supply is not yet available on a commercial scale.
- The wholesale electricity markets administered by the NYISO exist as an important tool to attract necessary investments to facilitate the transition of the grid in the coming decades.

Public Policy Influence on Resource Mix

- Public policies are shaping investment on the grid, particularly the CLCPA
- Competitive markets will channel investment to achieve these goals while maintaining reliability at the lowest possible cost

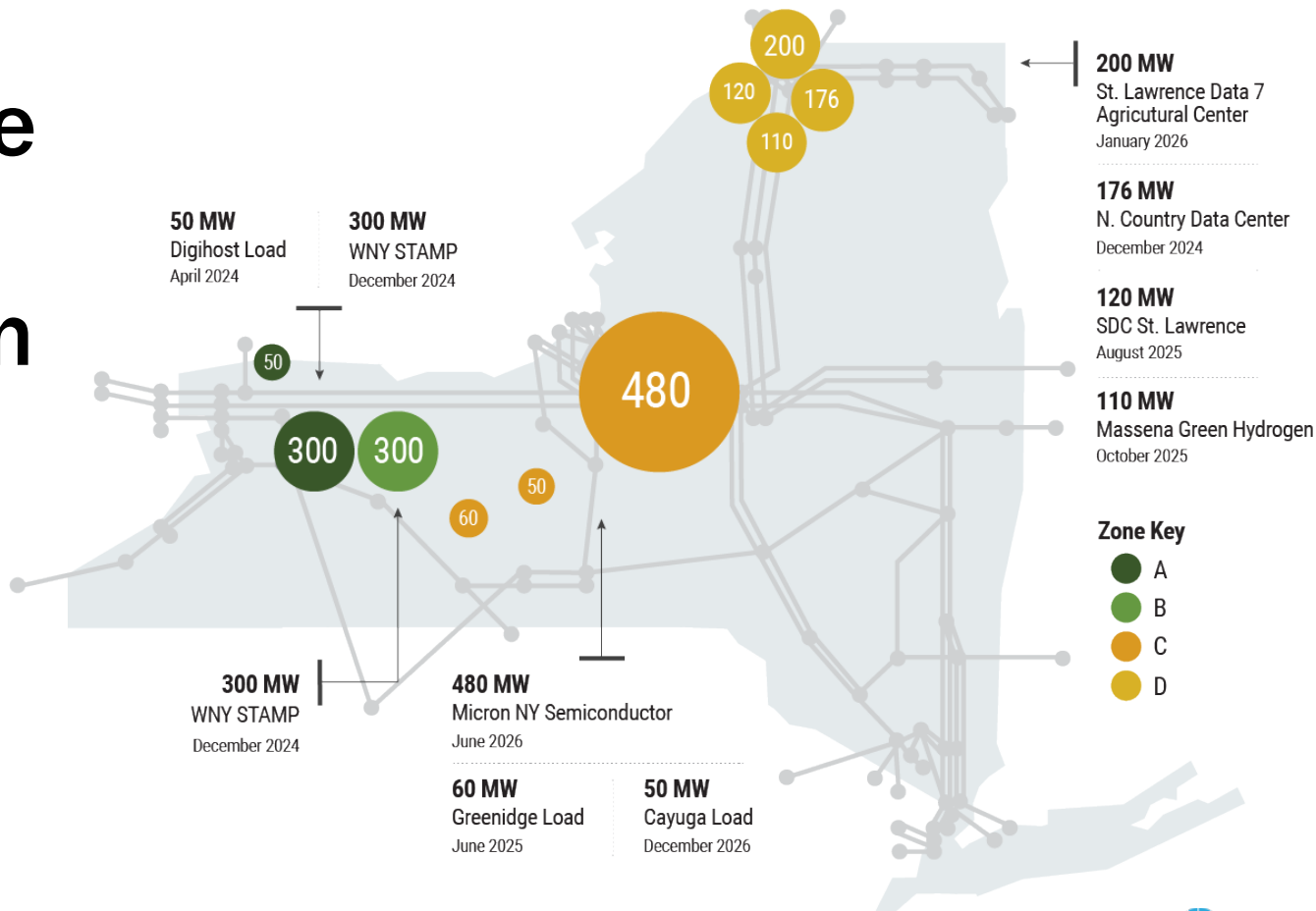


Demand

Key Findings: Demand

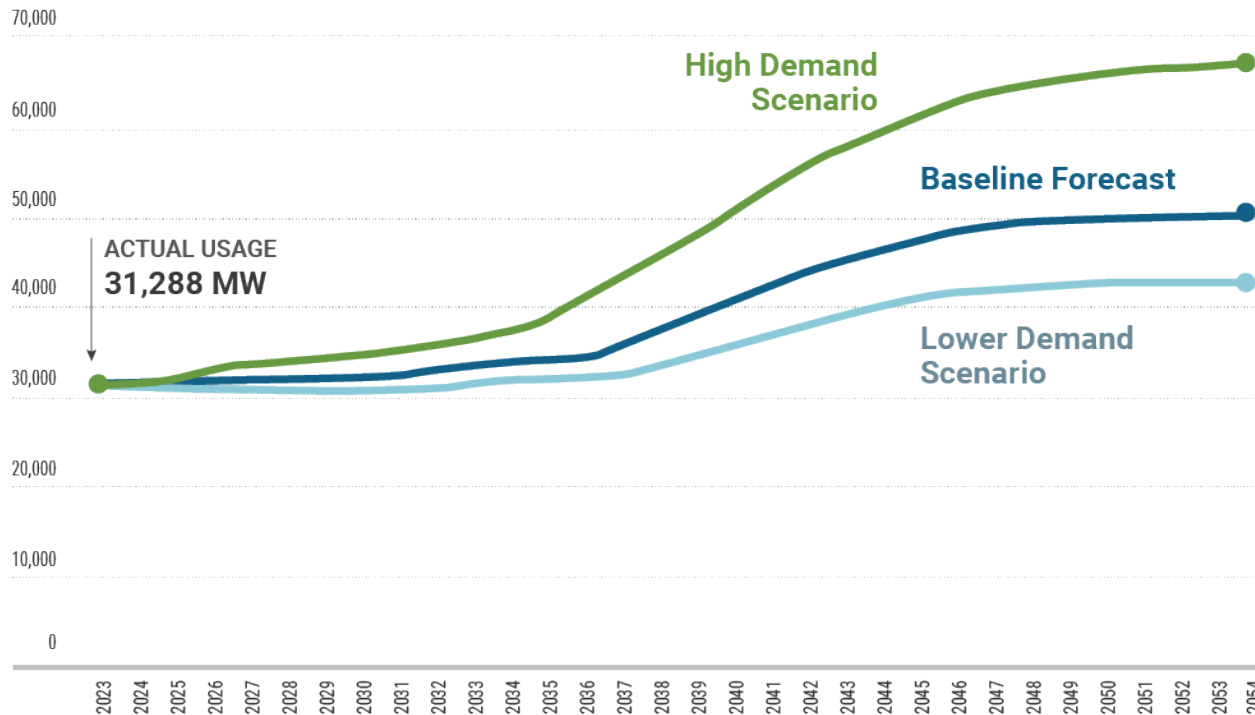
- ✓ **Electric energy consumption is projected to increase significantly in response to the economic development and decarbonization energy policies. Resources and the transmission system necessary to meet the changing energy demand need to evolve accordingly.**
- ✓ **Siting large loads in electrical 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 Large Load Projects in New York State



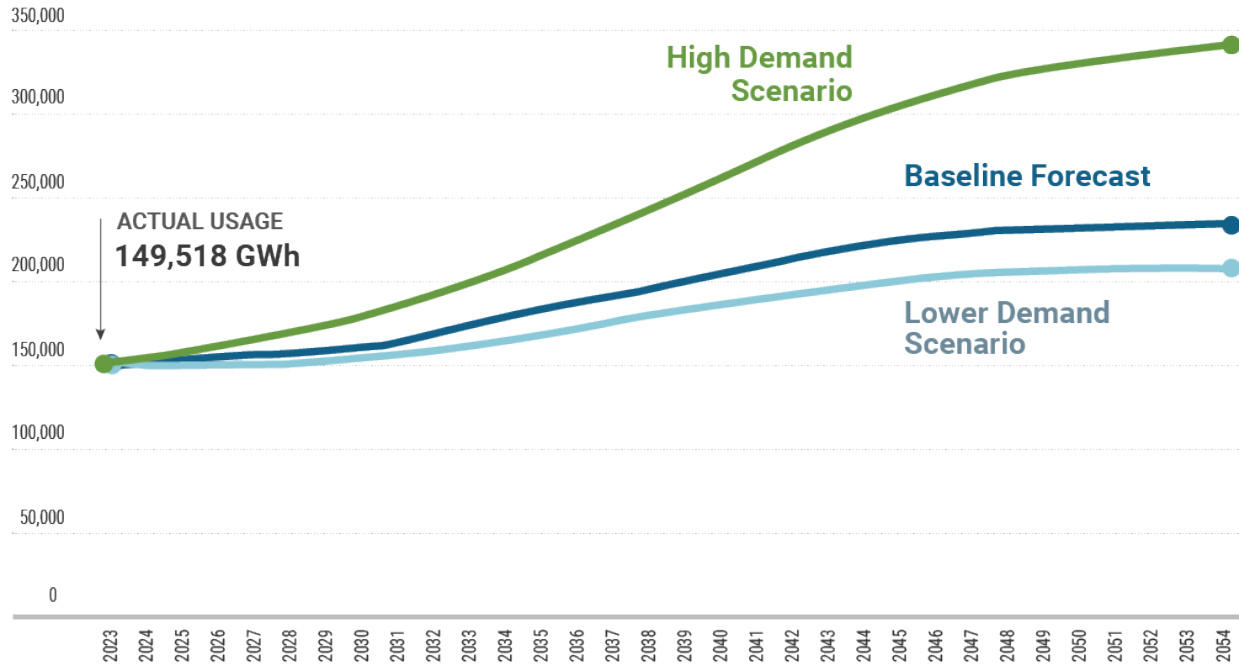
Actual & Forecast Peak Demand (MW)

Electric Energy Demand Forecast in New York State: 2023-2054



Actual & Forecast Energy Usage (GWh)

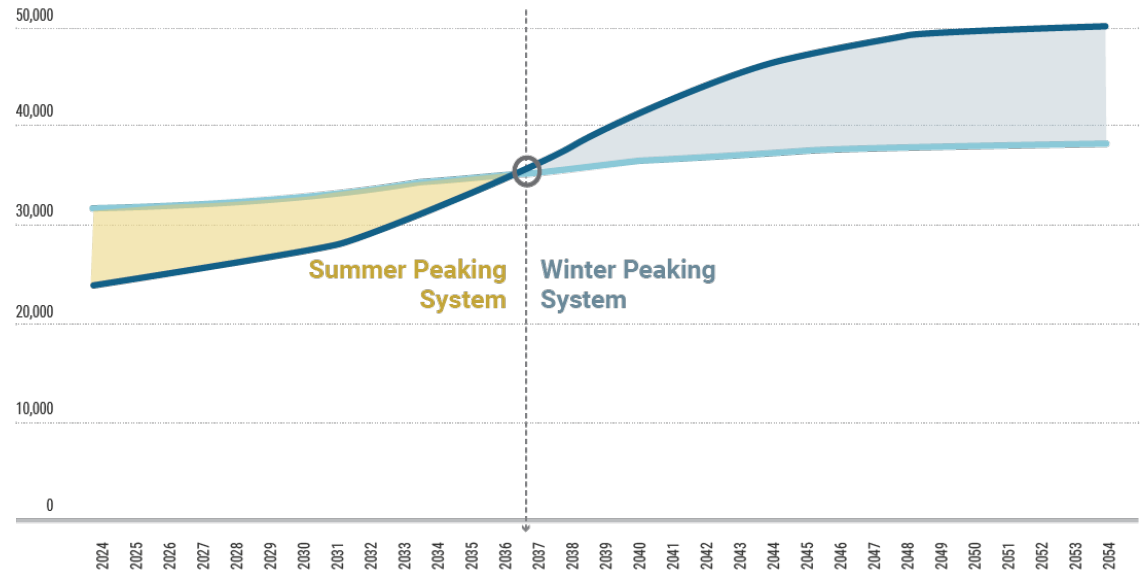
Electric Energy Load Forecast in New York State: 2023-2054



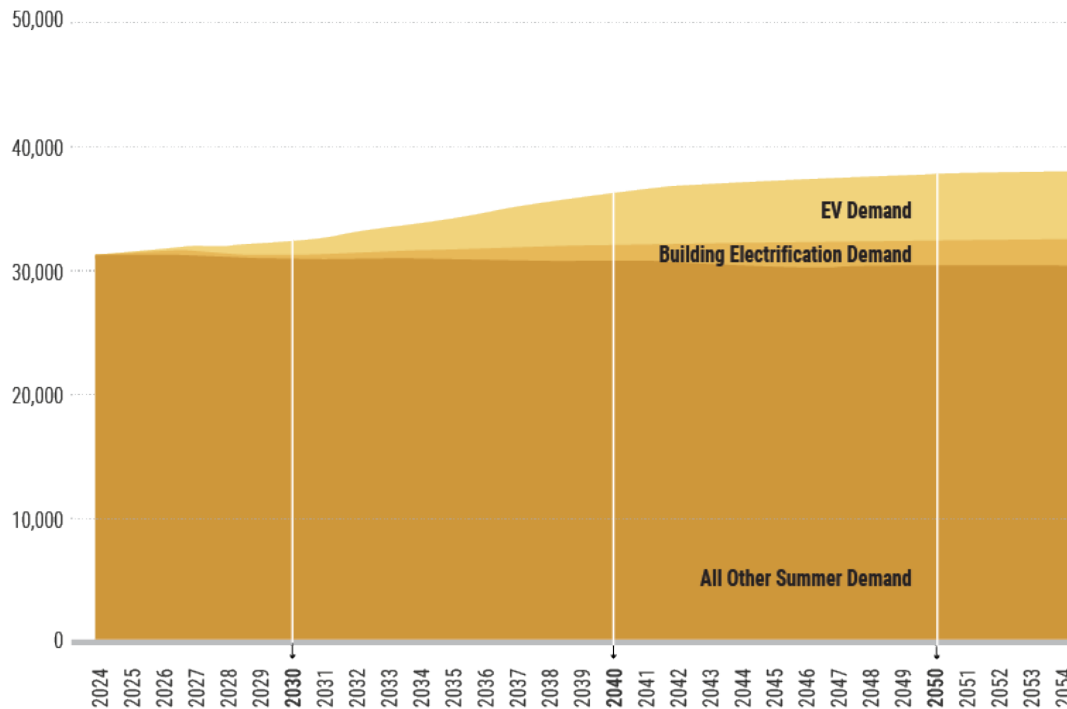
Demand Trends: Peak Demand Forecast

- The NYISO winter and summer peak load forecasts suggest that electrification will drive a shift in NY from a summer-peaking system to a winter-peaking system.
- The timing and degree of this shift will be influenced by EV and heat pump technology adoption.

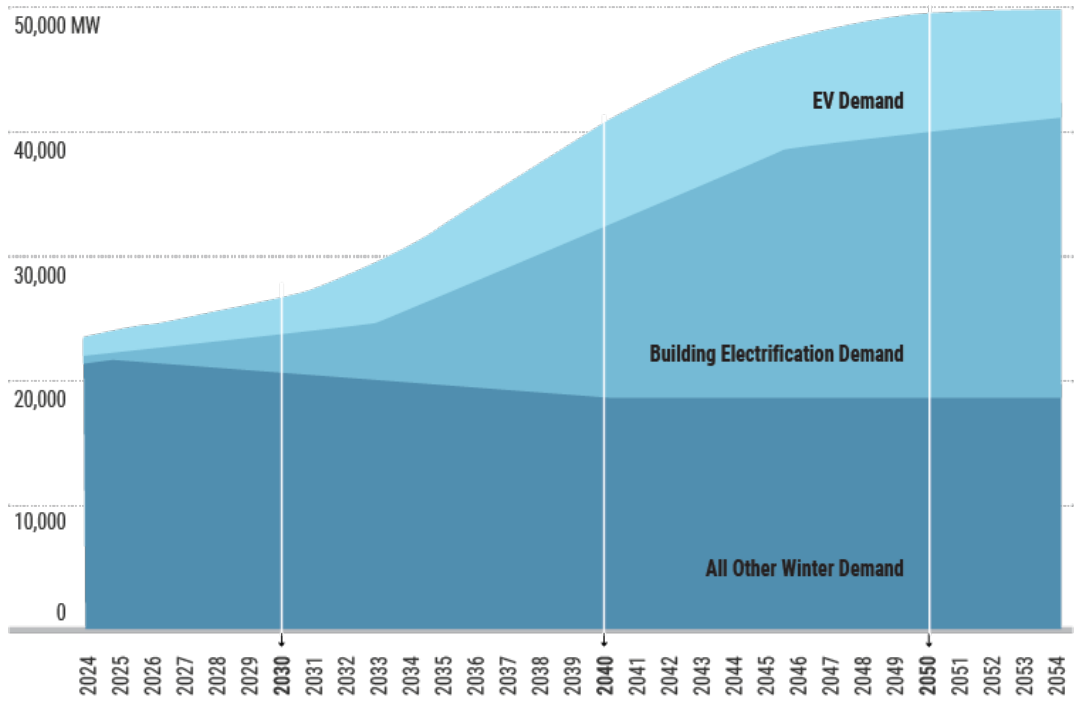
Electric Summer & Winter Peak Demand: 2024-2054



Expected Impact of Electrification on Statewide Summer Peak Demand (MW)



Expected Impact of Electrification on Statewide Winter Peak Demand (MW)



Supply Resources

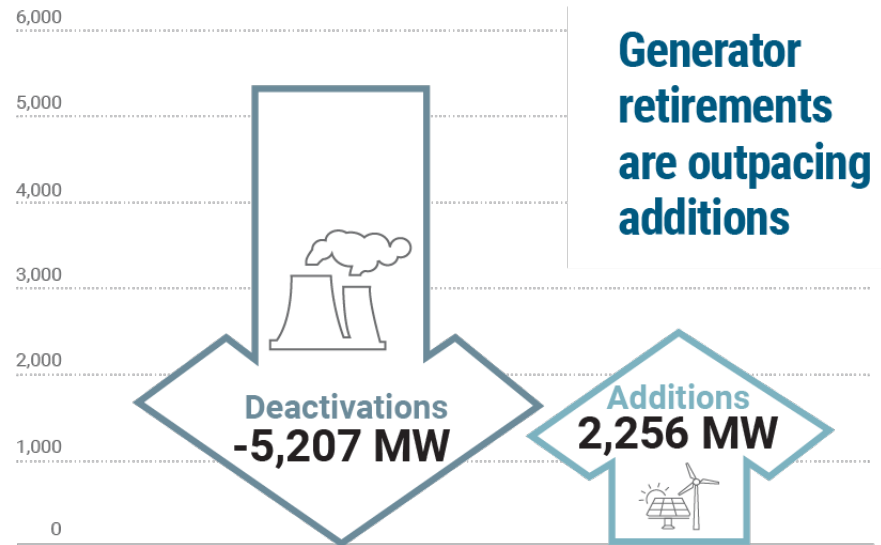
Key Findings: Supply Resources

- ✓ 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.
- ✓ New York will require three times the capacity of the current New York generation fleet to meet projected future electricity demands.
- ✓ 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.
- ✓ Uncertainty in siting new renewable generation could lead to delays in or inefficient expansion of the transmission and distribution systems.

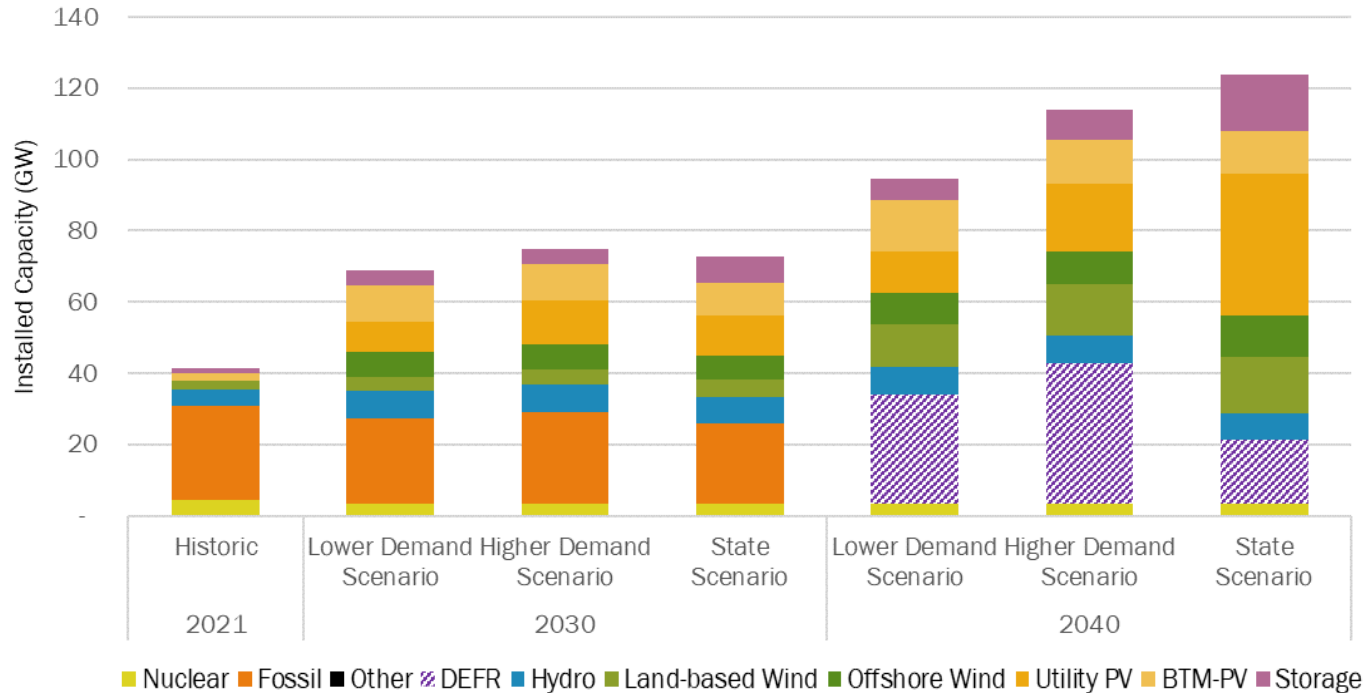
Additions, Uprates, and Retirements

- Growing imbalance between generator deactivations and additions is contributing to shrinking reliability margins
 - Deactivating resources tend to be dispatchable and located downstate
 - Generator additions are largely renewable resources located upstate
 - New resources do not provide the same reliability services as exiting resources
- Since the CLCPA was approved in 2019, interconnection requests have quadrupled
- NYISO and stakeholders working to enhance process efficiency while maintaining reliability benefits

Nameplate Capacity: 2019-2023



2030 & 2040 Installed Capacity



System Needs for a 70% Renewable Grid

■ Dispatchability to address renewable balancing

- Dispatchable: Resources that can follow instructions to increase or decrease output on a minute-to-minute basis
- Short Notification: Resources that can start quickly (<10 minutes)
- Zero/Minimal Downtime: Resources that can cycle often with minimal to zero downtime

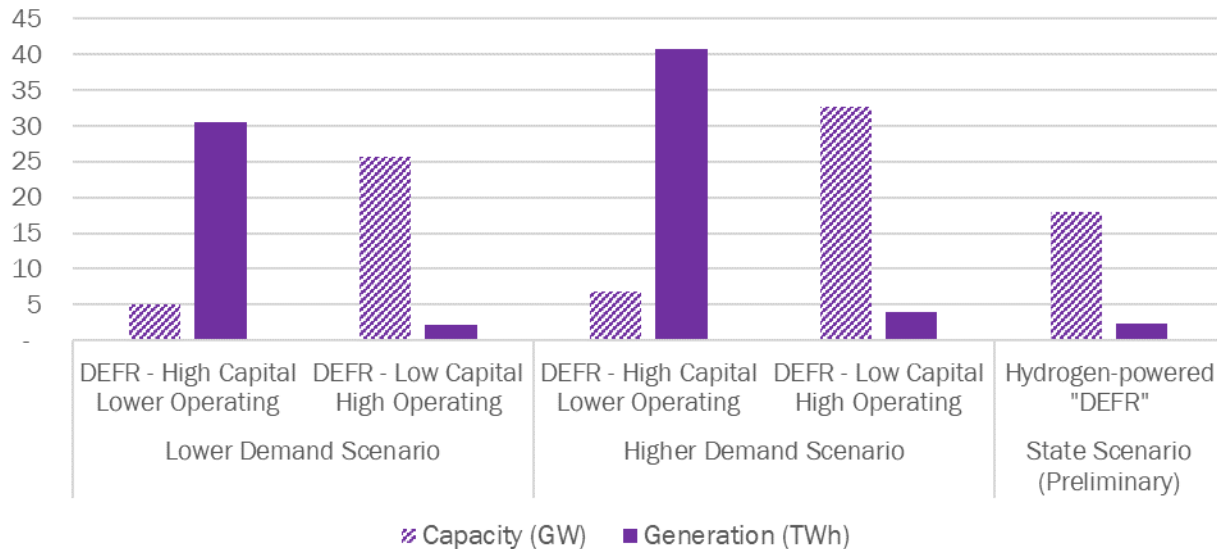
■ Flexibility to address renewable uncertainty

- Fast ramping: Resources that can quickly follow net load to manage ACE (Area Control Error – which measures regional generation to load balance) on a second-to-second basis
- Energy Secure: Resources that can provide energy for multiple hours and days regardless of weather, storage, or fuel constraints

■ Support Power System Stability, Strength, and Minimize Operational Risk

- Resources that can hold their bus voltage regardless of topology or resource commitment
- Resources sized to avoid extreme contingency scenarios, where contingency reserves may be expensive or unavailable and loss of generation does not contribute to LOLE/EUE

Dispatchable Emission-Free Resources: 2040 Capacity and Generation



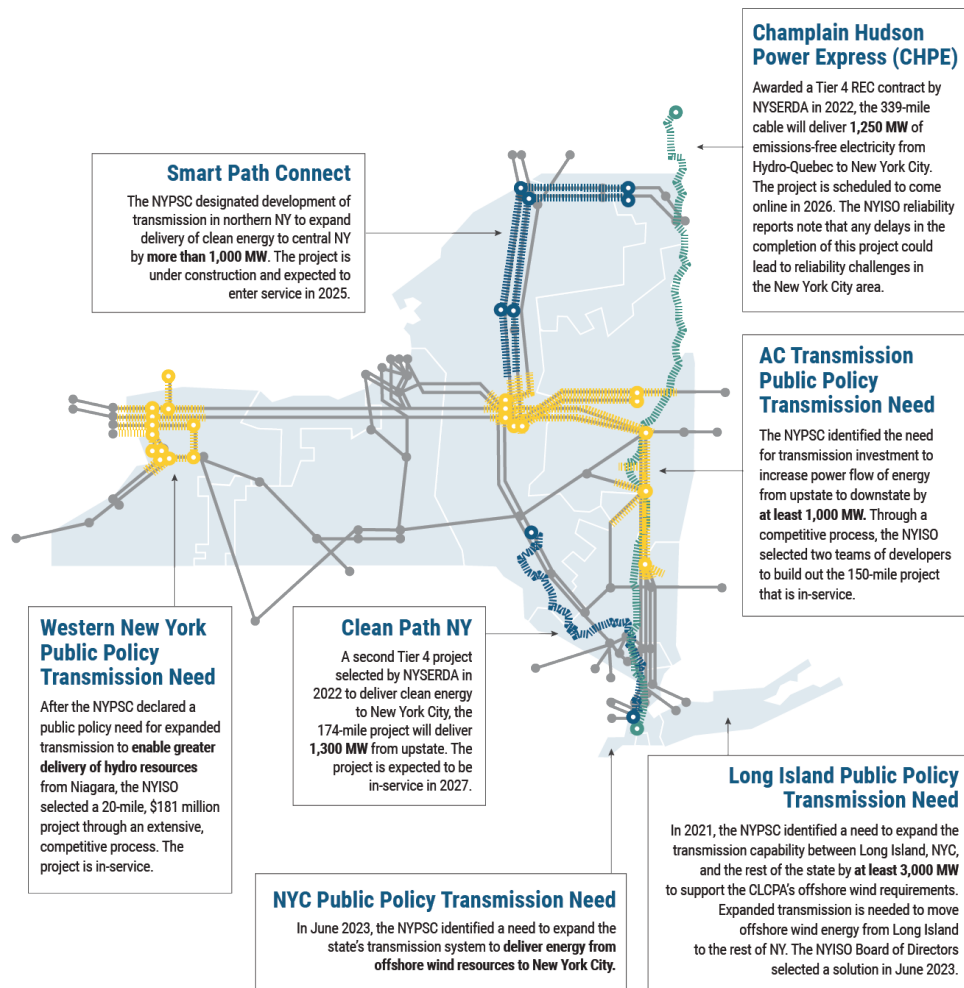
Transmission

Key Findings: Transmission

- ✓ **Historic levels of investment in the transmission system are happening but more will be needed.**
- ✓ **Actionable expansion opportunities: To fully utilize the transmission facilities already in place, additional dynamic reactive power support must be added to the grid in upstate New York to alleviate curtailment over the Central East interface.**
- ✓ **Opportunities for further transmission investment in Western and Northern New York should be monitored as resources are developed in those regions.**
- ✓ **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.**

Ongoing Transmission Planning and Construction

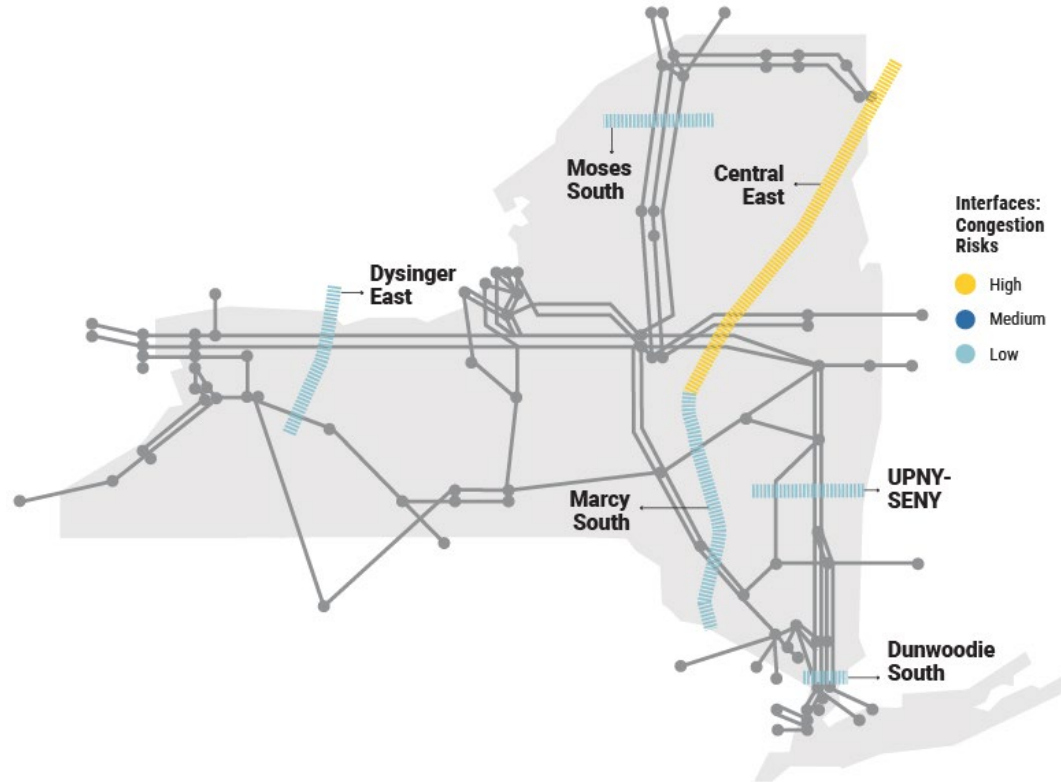
The NYISO's planning process is supporting an unprecedented expansion of the transmission system in support of CLCPA goals.



NYC Public Policy Transmission Need

- The PSC issued an order in 2023 declaring that the Climate Leadership and Community Protection Act (CLCPA), constitutes a Public Policy Requirement driving the need for additional transmission facilities to deliver the output of offshore wind generating resources to New York City interconnection points.
- The Order calls for complete, end-to-end solutions that will accommodate the full output of at least 4,770 MW of incremental offshore wind generation injected into New York City (Zone J) and will have a high degree of constructability based on a timely and realistic construction schedule.
- Projects shall plan to complete all permitting and construction activities necessary to achieve an in- service date no later than January 1, 2033.
- Proposals are due June 17, 2024, at which time NYISO will be evaluating the projects to identify the more efficient or cost-effective solution.

Bulk Interface Curtailment Risk



Questions?