

# Planning for Distributed Resources

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# Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

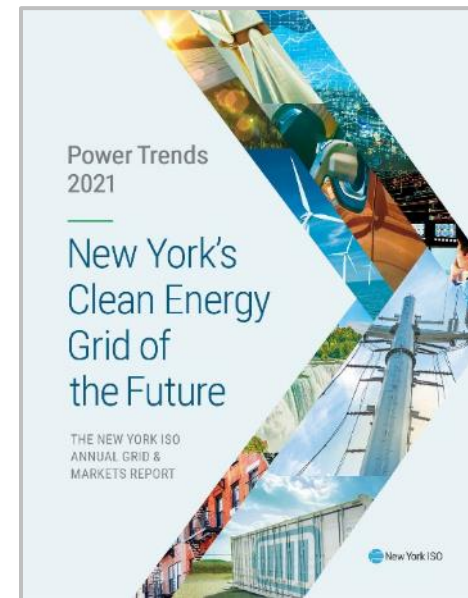


# Power Trends 2021: New York's Clean Energy Grid of the Future

Current and emerging trends transforming the grid and electricity markets.

## Key Themes: Enhanced Planning for the Future Grid

- The future grid will require new transmission to connect remote renewable resources to areas of the state where most energy is consumed.
  - Construction of new transmission is underway, but more needs to be done.
- NYISO's planning provides expert, independent information to:
  - inform market enhancements needed to integrate clean energy resources;
  - inform public policy development;
  - proactively identify reliability needs on the grid; and
  - inform of investment opportunities in support of the Clean Energy Grid of the Future.

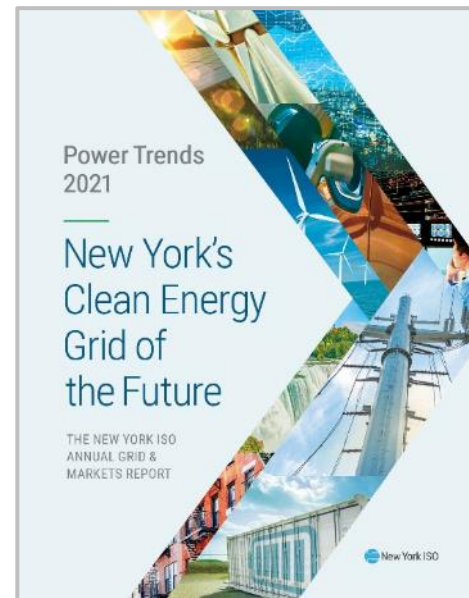


# Power Trends 2021: New York's Clean Energy Grid of the Future

Current and emerging trends transforming the grid and electricity markets.

## Key Themes: The Essential Role of NYISO's Markets

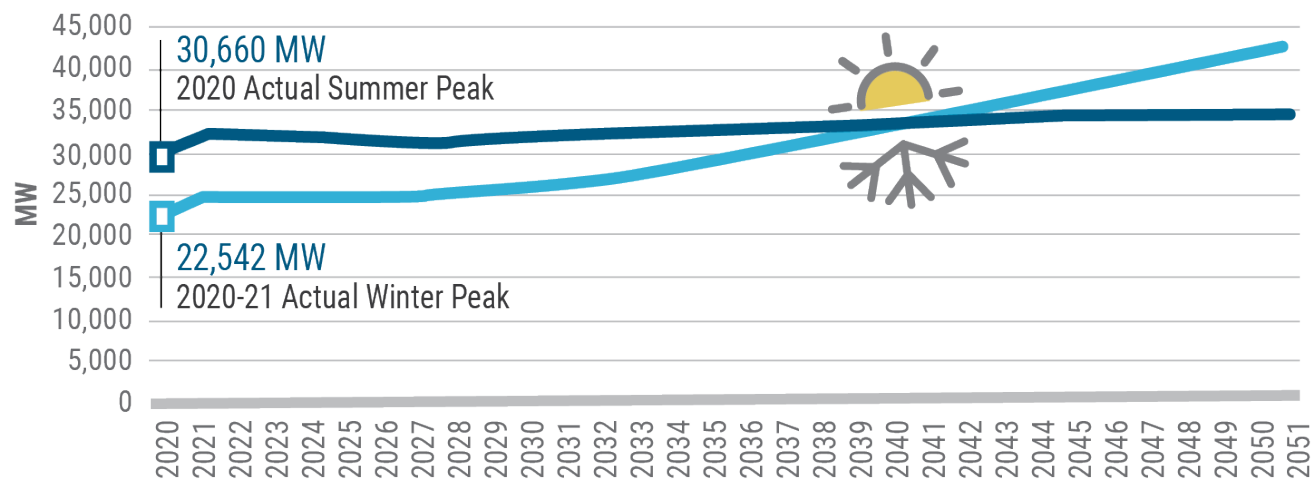
- The electric system is becoming more dynamic, decentralized, and reliant on weather-dependent intermittent generation.
- The NYISO's innovative wholesale electricity markets are empowering the changes envisioned by the CLCPA by aligning market signals with reliability, including:
  - new tools to integrate distributed energy resources (DERs) that blend the roles of supply and consumption;
  - energy storage participation rules for integrating new storage technologies, including co-located resources; and
  - engaging stakeholders in a Comprehensive Mitigation Review to evaluate and propose reforms to the mitigation rules for market entry of clean energy resources into its capacity market.



# 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.

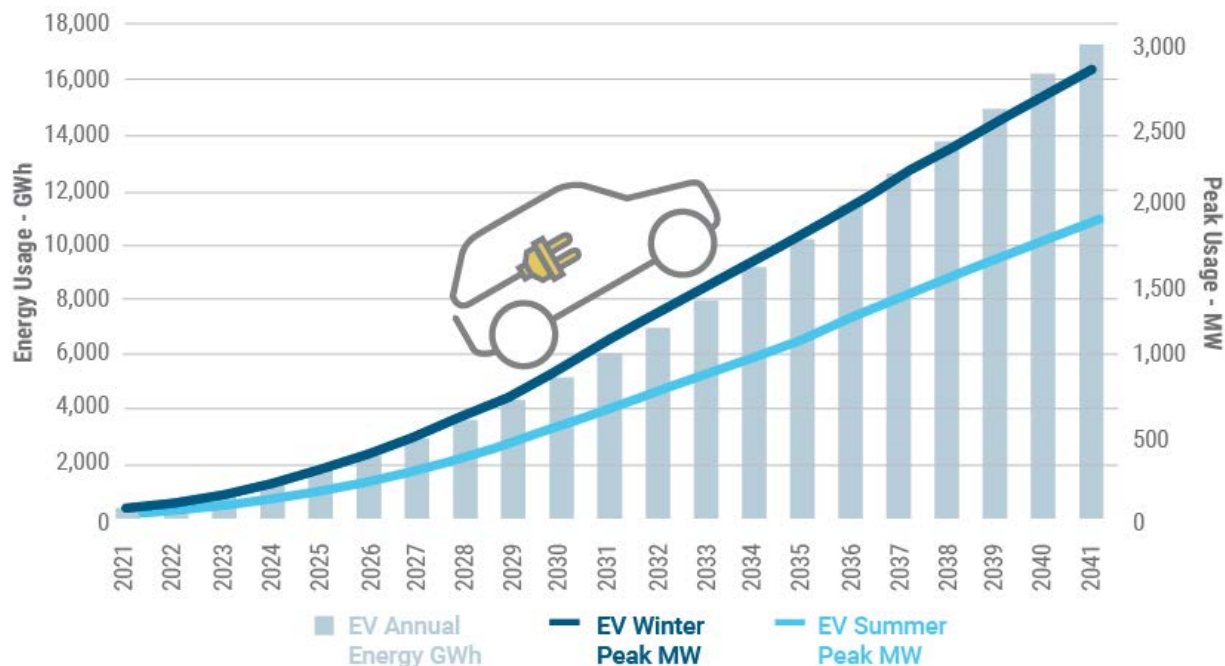
## Electric Summer & Winter Peak Demand: 2020-2051



# Electric Vehicle Energy & Peak Impacts Forecast

## 2021-2041

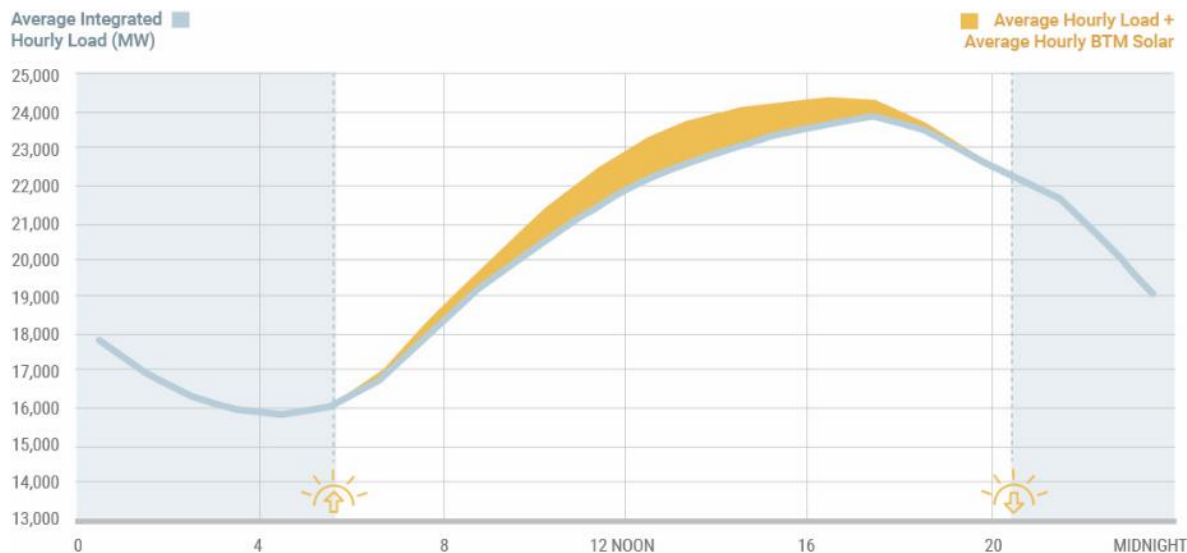
- Forecast of EV impacts on summer and winter peak demand and energy usage.
- Forecasts assume over 4.5 million total EV purchases in New York State by 2040
- The impacts on peak demand periods may be mitigated through policies that incent off-peak charging.



# Integrating Behind-the-Meter Solar

- More than 2,500 MW of BTM solar is installed across the state.
- NYISO implemented solar forecasting tools to anticipate the contribution of solar as well as provide real-time estimates of BTM solar production.
- BTM solar resources reduce demand and lower the amount of energy delivered by the bulk power system.

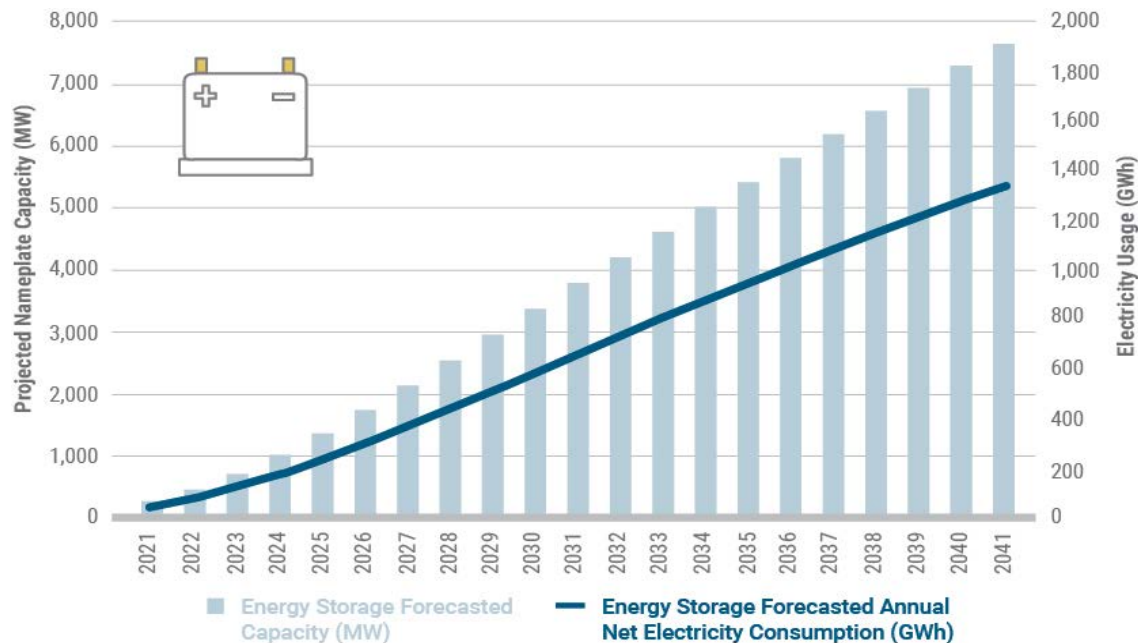
**Average Hourly Behind-the-Meter Solar Production: Summer**



# Energy Storage Capacity & Energy Usage Forecast

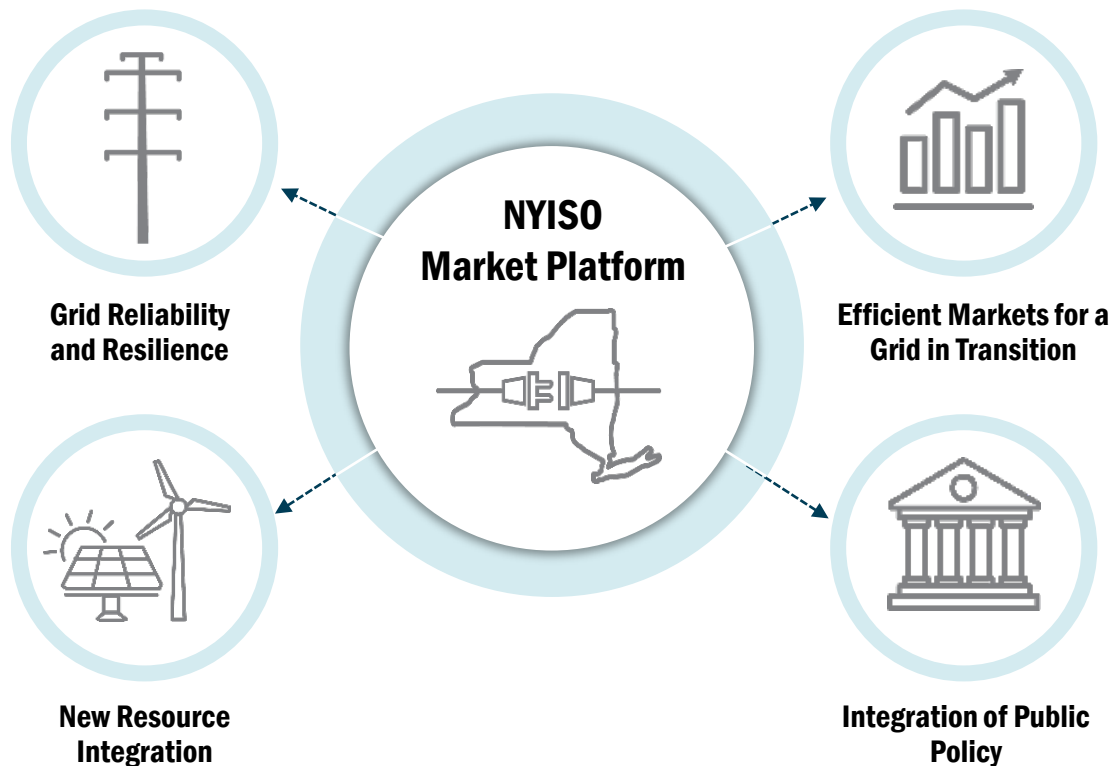
## 2020-2041

- Energy storage resources may be installed to supply the transmission system, distribution system, or a customer's facility.
- Behind-the-meter storage works to reduce demand on the transmission system rather than supply it.
- All storage resources consume a small amount of electricity due to charging and discharging cycles (projected to be <1% of statewide load).

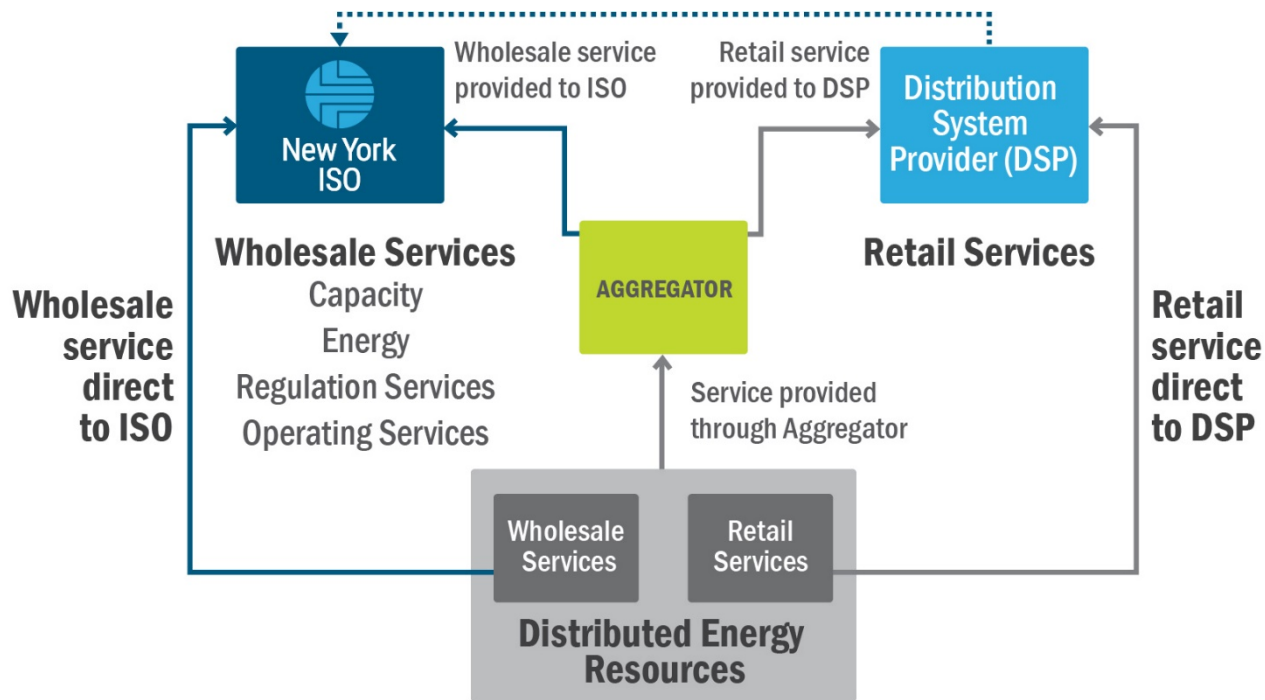




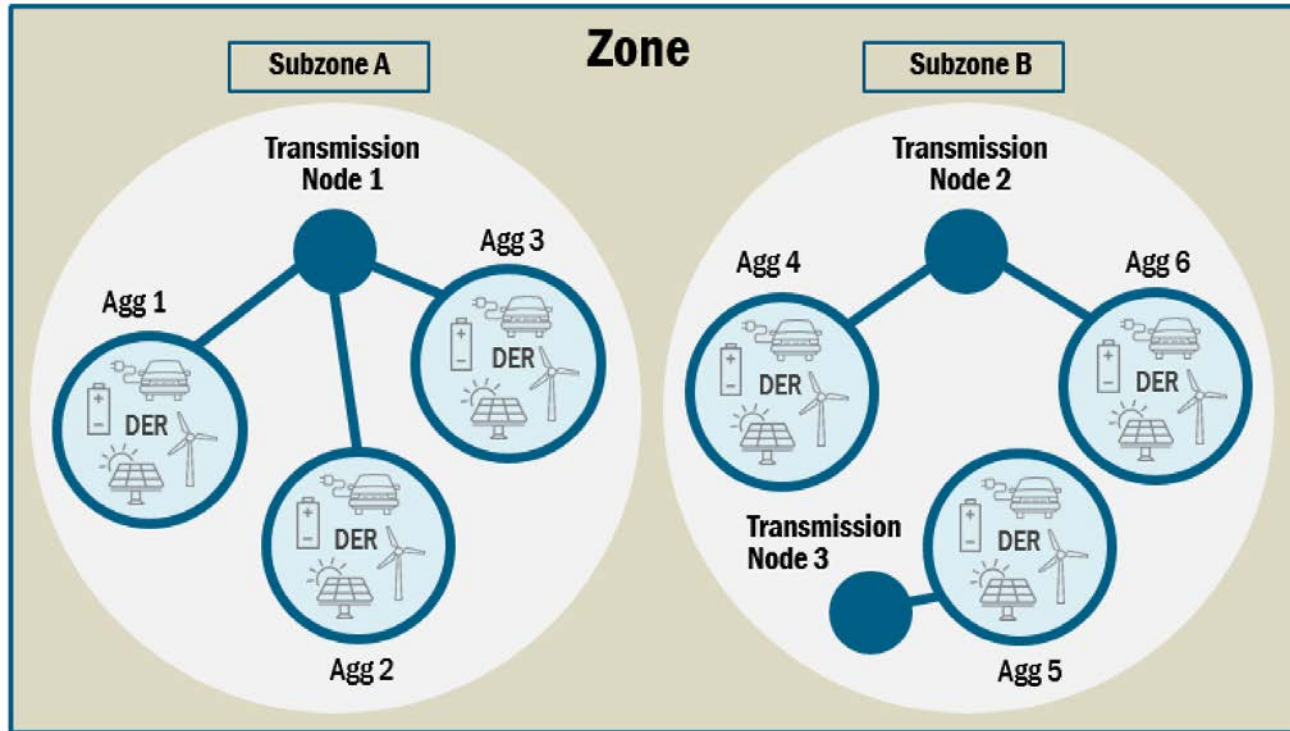
# Enhancing Wholesale Electricity Markets to Meet Changing Needs



# Integrating DER in NYISO-Administered Wholesale Electricity Markets



# Aggregations & Transmission Nodes



# Questions?