

Carbon Pricing in New York

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NYISO by the numbers



19.8M

New Yorkers served

NYISO Footprint



435

Market Participants



11,173

circuit miles of transmission managed and monitored



161,114

total electric energy usage, in GWh, for 2018

Supply & Demand

33,956

record peak demand, in MW, July 2013



700+

power generating units



26%

of electric energy from renewables in 2018

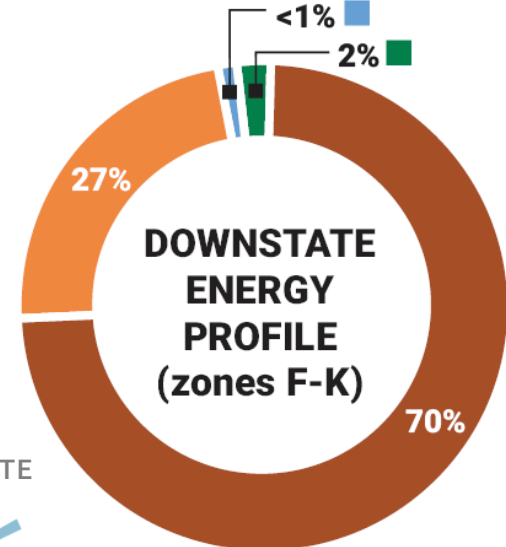
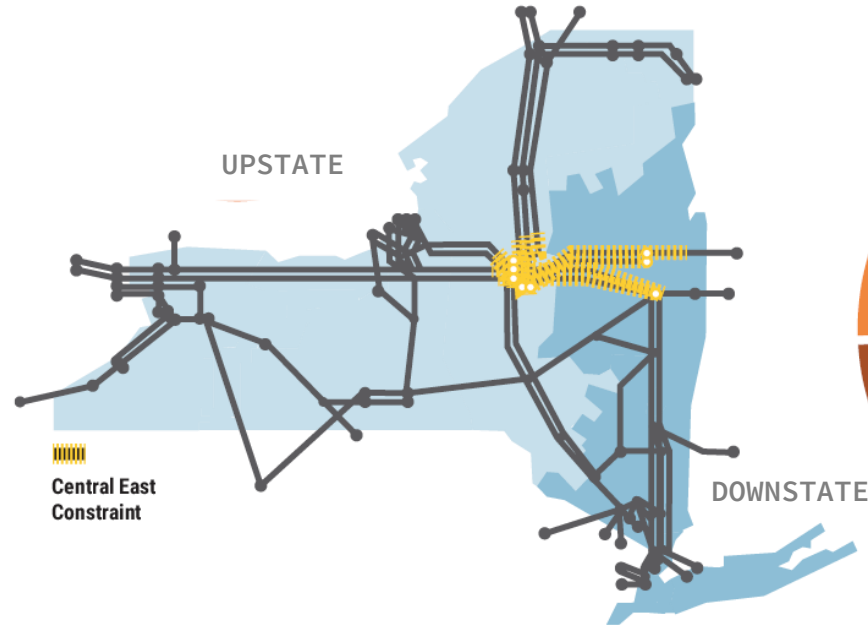
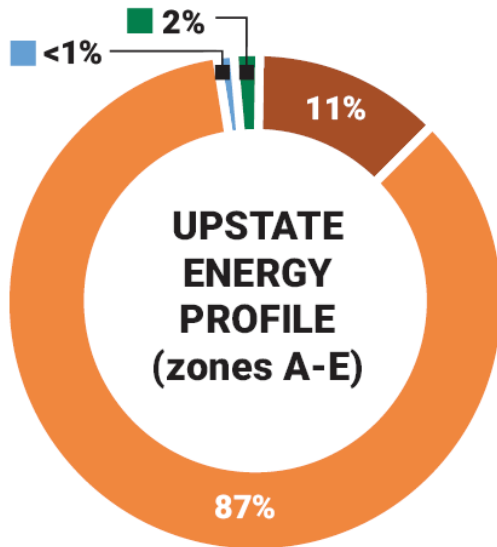


Tale of Two Grids

2018 Regional Energy Production Profiles

Energy Produced from:

- Fossil Fuel
- Zero Emission
- Hydro Pumped Storage
- Other Renewables

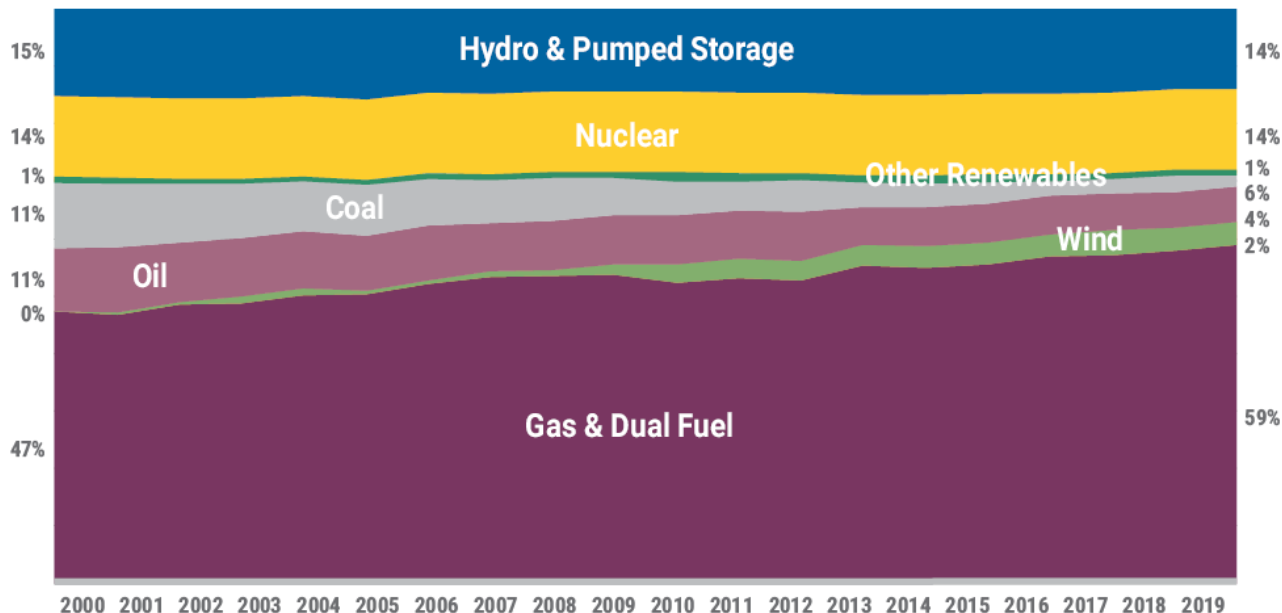


Fuel Mix Trends

New York State Fuel Mix Trends: 2000-2019

Capacity 2000-2019:

- Natural gas & dual-fuel generating capacity grew from 47% to 59%
- Wind power grew from <1% to 4%
- Coal-powered capacity declined from 11% to 2%
- Oil-fired capacity dropped from 11% to 6%



Climate Leadership and Community Protection Act

New York's Climate Leadership and Community Protection Act (2019)

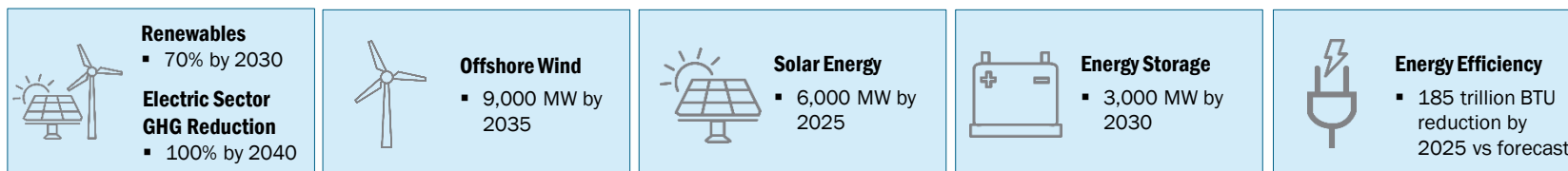
■ Requires:

- **2025:** LSEs must procure 6 GW of PV and a statewide energy efficiency goal of 185 TBTU.
- **2030:** statewide GHG emissions will be limited to 60% of 1990 emissions, a minimum of 70% of state wide generation secured by LSEs for end use in NY shall be generated by renewable energy systems, and LSE's must procure 3 GW of statewide energy storage.
- **2035:** LSEs must procure 9 GW of offshore wind electricity.
- **2040:** statewide electrical demand system will be zero emissions.
- **2050:** emissions will be limited to 15% of 1990 emissions.

Challenge to Harmonize Markets with Public Policy

Wholesale Market Evolution Critical for Clean Energy Goals

New York State Climate Leadership & Community Protection Act



Operations Implications

- Marked increase in number of wholesale resources participating in NYISO markets
- Increased need to monitor congestion on lower voltage circuits from increased participation of distributed resources
- Need to coordinate operations with Distribution Systems Platform (DSP)
- Increased need for flexibility due to resource and load uncertainty (e.g. ramping, load following, quick-start capability)

Market Implications

- Increased participation of Distributed Energy Resources, Micro-Grids and Aggregators in wholesale markets
- Accelerating growth in both grid-scale and rooftop solar as well as on-shore and off-shore wind resources
- Growth in grid-scale storage as well as aggregations of storage with other distributed resources
- Increased regulatory and investment risk from state sponsored resource additions and policy actions
- Increased need to consider mitigation construct

Financial Implications

- Depressed energy prices with the proliferation of zero marginal cost resources (wind and solar), increasing importance of ancillary pricing
- Capacity market increasingly provides majority of fixed cost recovery for quick-start resources needed for flexibility
- Significant increase in number of market participants needing settlement and credit monitoring services
- Complexity of grid and market operations lead to increase in NYISO personnel and budget requirements

NYISO on the Leading Edge of the Energy Transition

NYISO employs six initiatives to address the evolving nature of New York's electricity grid as large scale renewables and distributed energy resources place new demands on electricity markets and grid operations.



Integrating Markets and Public Policy through Carbon Pricing

Carbon Pricing Proposal

- On December 7, 2018, the NYISO released the IPPTF Carbon Pricing Proposal outlining a potential design for incorporating the cost of carbon emissions into the wholesale electricity markets.
 - In 2019, the NYISO and its stakeholders will be finalizing the design, and determining whether the proposal should be implemented.
- The proposal aims to incorporate the cost of carbon, as established by the New York Public Service Commission, in a manner that:
 - Is economically efficient,
 - Avoids major cost shifts among New York customers,
 - Is transparent, and
 - Provides market/regulatory stability

Link to the IPPTF Carbon Pricing Proposal: <https://www.nyiso.com/documents/20142/3911819/Carbon-Pricing-Proposal%20December%202018.pdf/72fe5180-ef24-f700-87e5-fb6f300fb82c>

Stakeholder Process

- The design and associated tariff measures were developed with stakeholders through the NYISO's stakeholder process.
- The complete design can be found in the presentation to the Business Issue Committee (BIC) June 20, 2019
 - https://www.nyiso.com/documents/20142/7129597/6.20.2019_MIWG_Carbon_Pricing_MDC_FINAL.pdf/cf67ebb8-d0fc-7b4b-100f-c3756d6afae8
 - Additional background presentations can be found in the ICAP/MWIG and IPPTF materials

Motivation for Carbon Pricing

Provide a market-oriented approach to bridge state policies and the NYISO markets

- Lessens the impact of negative energy pricing from renewables as penetration increases
- Lessens pressure for out-of-market incentives for non-renewable resources

Provide transparent price signals reflecting carbon externality

- Helps achieve New York State (NYS) decarbonization goals efficiently
- Aligns commitment and dispatch with state policy goals
- Signals investment for reducing carbon, including innovative solutions beyond the NYS Clean Energy Standard
- Fine-tunes solutions with granular prices (e.g., siting of new renewables, storage operation)

Energy Market Operations with Carbon Charges

Participants Submit
Supply Offers

NYISO Commitment &
Dispatch

NYISO Settles
Transactions

- **Market participants** submit supply offers inclusive of their estimated carbon charges.
- **NYISO** minimizes production costs subject to system constraints using commitment and dispatch software.
- **NYISO** charges loads and credits suppliers for energy.
- **NYISO** accounts for carbon charges to suppliers and residuals to load (subject to true-ups).

Study of Effectiveness of the Carbon Pricing Proposal

- **Post CLCPA: Analysis Group's report**
 - The focus is on how New York can best accomplish its goals and meet the Act's mandates for reducing GHG emissions in its power sector and its broader economy.
 - The Report examines how NYISO's proposed carbon-pricing mechanism can help the State meet its new statutory requirements more broadly, efficiently, and effectively.

Incremental value proposition of a NYISO carbon-pricing mechanism: Summary

Outcome	Impact of a Carbon-Pricing Mechanism in NYISO Markets
State policy leadership	Can be exported to other states and regions, supporting New York’s market approach.
Speed of adoption	Can be implemented relatively quickly.
Accelerated entry of renewable projects	Will increase the opportunity for financing of clean energy resources to enter the market in the absence of a long-term REC contract.
Incentives for innovation	Will increase incentives for entrepreneurs and others to develop new supply-side and demand-side technologies, products and services.
Incentives for energy efficiency and other customer-based actions	Has the potential to improve over time price signals to consumers reflecting the full costs of using electricity, and influence consumer access to and use of demand-management technology and practices.
Incentives for efficient transmission investments	Will create strong incentives for cost-effective investment in increased transfer capability between upstate and downstate.
Acceleration of fossil retirements and reduced use of natural gas	Will put financial pressure on existing inefficient fossil units to retire and reduce use of fossil fuels, especially in downstate NY areas. It will also drive increased efficiencies in remaining fossil generation
Compatibility with other policy instruments	Can be a seamless complement to other state policies (e.g., energy efficiency, REC and ZEC contracting), by providing a means to value low-carbon investment and operations in the electric system.
Ability to harmonize policy and markets	Will internalize the cost of GHG emissions into the electric markets, and improve the performance of the wholesale market.
Alignment with wholesale market design	Will support the efficient operations of the NYISO markets.
Consumer cost impacts	Can provide an improved market design, aligned with the state’s carbon-reduction goals, to produce savings to consumers.
Public health impacts	Will reduce local air pollution there in downstate New York
Impacts on disadvantaged communities	Will reduce emissions in downstate Environmental Justice areas.
Limitation of leakage of CO ₂ emissions to other regions	Will limit leakage due to the proposal’s treatment of emissions related to cross-boundary electricity flows.
Revenue streams to public entities	Will increase revenues to NYPA as a power provider in the NYISO markets.

What Comes Next?

- The proposal has proceeded through in the NYISO stakeholder process, and now awaits support from New York State.
- If supported by New York State and ultimately approved by stakeholders, the NYISO Board of Directors and FERC, Carbon Pricing in the wholesale markets would be implemented.

Additional Resource

- <https://www.nyiso.com/carbonpricing>
 - Includes links to the Analysis Group Key Findings Summary and full Analysis Group Report, the IPPTF Carbon Pricing Proposal and the Brattle NY Carbon Study

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

