

The Power of New York's **Wholesale Electricity Markets**

How the New York ISO promotes competition,
reliability and value for consumers



New York Independent System Operator

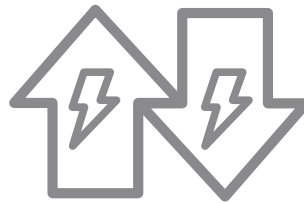
Meeting demand with supply

How the New York ISO manages wholesale energy markets



**EVERY 5 MINUTES,
24/7, 365**

Electricity in NY
is bought and sold
through energy markets



**MEETING
POWER DEMAND**

Market prices promote
reliability by reflecting
the needs of the system



INNOVATION

Expert planning
analysis to keep
the grid reliable
and resilient



“ The independence of the NYISO ensures integrity and trust in the information they provide to policymakers, regulators, and the energy industry as a whole. ”

MICHAEL CUSICK

Chairman of the New York State Assembly Energy Committee

How do energy markets benefit NY consumers?

⇒ Market competition & price signals:

- Drive least-cost solutions to meeting reliability
- Attract innovation and investment to the grid where and when needed
- Encourage suppliers to maximize efficiency, benefiting consumers and our environment

⇒ Markets reward innovations that improve supply performance and transmission efficiency



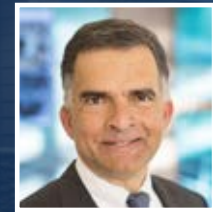
“ NYISO market operations are fundamental to ensuring long-term energy needs, cost benefits and positive environmental impacts for all New Yorkers. ”

RICH DEWEY
President & CEO, NYISO



“ Our independent, competitive market structure has produced a grid that is resilient, efficient and innovative. ”

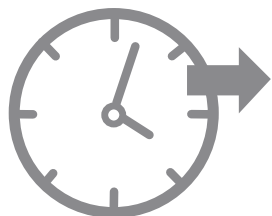
RANA MUKERJI
Senior Vice President, NYISO



Value of wholesale energy markets

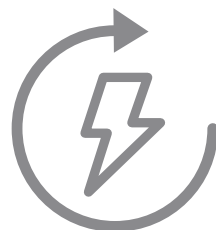
Under the strictest reliability rules, the New York ISO energy markets meet consumption with the least-cost resources available.

RELIABILITY



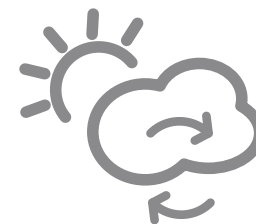
Provides day-ahead and real-time commitments

AVAILABILITY



Ensures energy dispatch at all times

FLEXIBILITY



Allows for changes in operating conditions

NYISO markets annual numbers

156,000 GWh
delivered to
New York consumers

700+
power
generating units

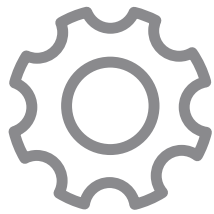
\$5.3B
in market
transactions

435
wholesale energy
market participants

Additional NYISO power markets

These markets allow the New York ISO to meet the demands of the dynamic and changing electric grid.

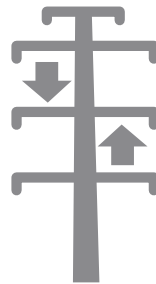
CAPACITY MARKETS



Ensure enough generation to meet peak demand

and encourages generators to invest in new technology and deactivate outdated resources

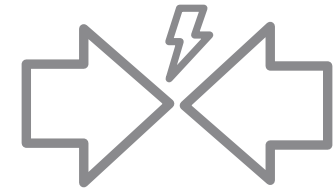
DEMAND RESPONSE



Reduce consumption

when and where needed, supporting reliability and benefiting the environment

ANCILLARY SERVICES



Every 6 seconds

resources compete to respond to changing system needs

New York power sector emissions reductions

SOURCE: US EPA Air Markets Program data since NYISO launched competitive markets

↓ 52%
Carbon
Dioxide CO₂

↓ 88%
Nitrogen
Oxide NO_x

↓ 99%
Sulfur
Dioxide SO₂

NYISO market innovations

DER participation model

⇒ Distributed Energy Resources (DERs) including solar, wind and other small-scale power generation, are poised to transform the electric grid.

We are pursuing programs to integrate DER-generated power to provide:

- Improved energy security, fuel diversity, and resilience
- Opportunity for load reduction in areas facing transmission constraints
- Support for the state's energy goals while improving market efficiency



NYISO market innovations

Energy storage

⇒ As the grid continues to evolve, Energy Storage Resources (ESRs) help promote reliability and efficiency, particularly when balancing intermittent renewable generation such as solar or wind.

Whether from batteries, pumped hydro or flywheels, ESRs can:

- **Reduce system peak demand and lower overall power costs**
- **Offer flexible ramping to ease integration of intermittent resources**
- **Provide operating reserves while taking greater advantage of clean energy**

NYISO market innovations

Solar integration

⇒ Integrate grid-scale solar to support resource flexibility and resilience:

- Enable the development of new solar projects on New York's bulk power system
- Use forecast tools to more efficiently integrate solar resources into wholesale energy markets
- Expand pioneering wind integration rules for solar

NYISO market innovations

Carbon pricing

⇒ The New York ISO is the first to propose incorporating the social cost of carbon into wholesale energy markets.

We are collaborating with stakeholders on a proposal to:

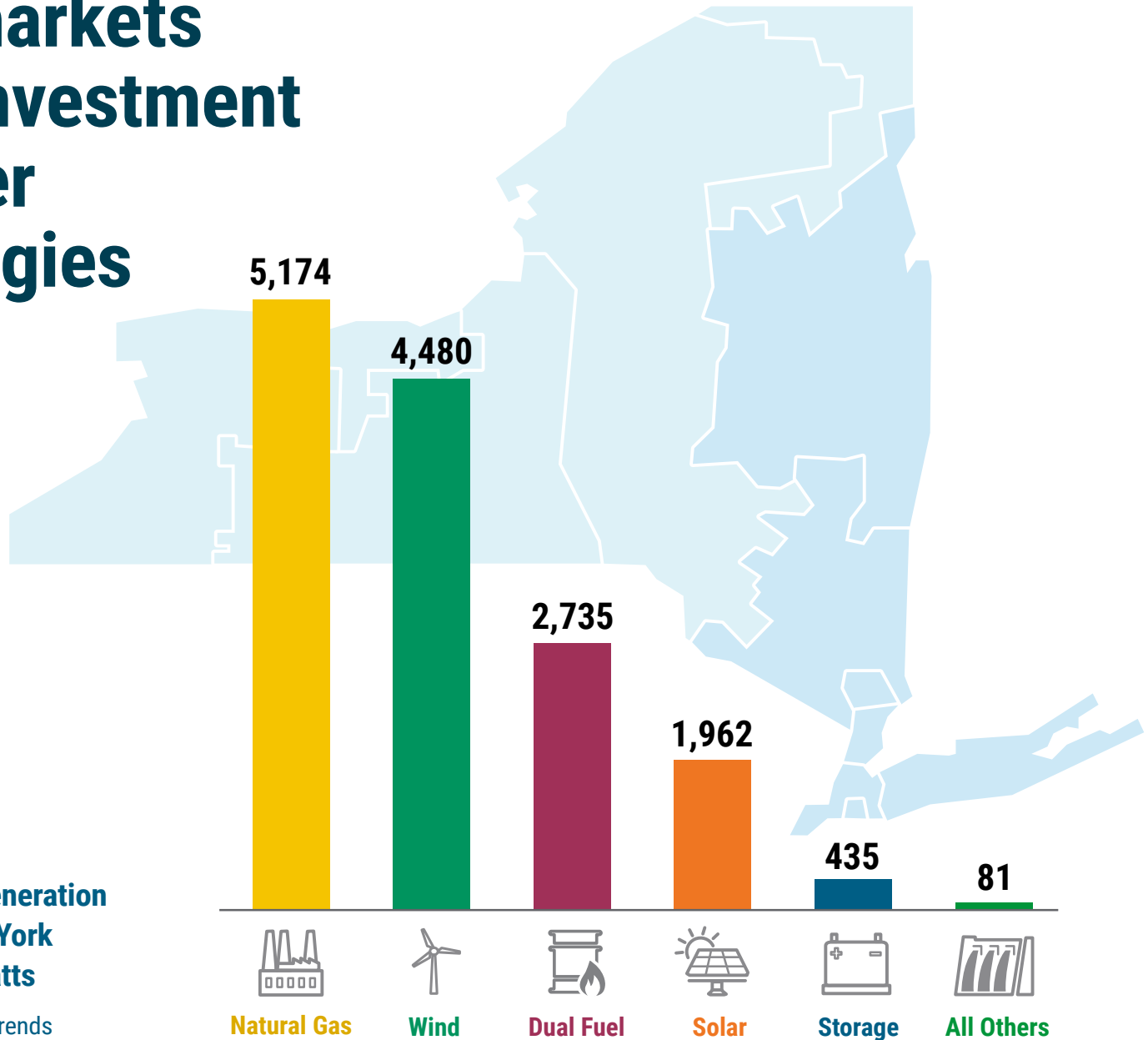
- **Better align wholesale energy markets and New York State environmental objectives**
- **Embed a cost per ton of CO₂ emissions in the sale of wholesale power**
- **Create price signals for generators to minimize emissions and better site renewables where they can provide the most benefit**

NYISO markets attract investment in cleaner technologies

A diverse fuel portfolio helps to keep consumer prices low and ensures generation needs are met.

⇒ Proposed new generation facilities in New York State, in megawatts

Source: 2018 Power Trends

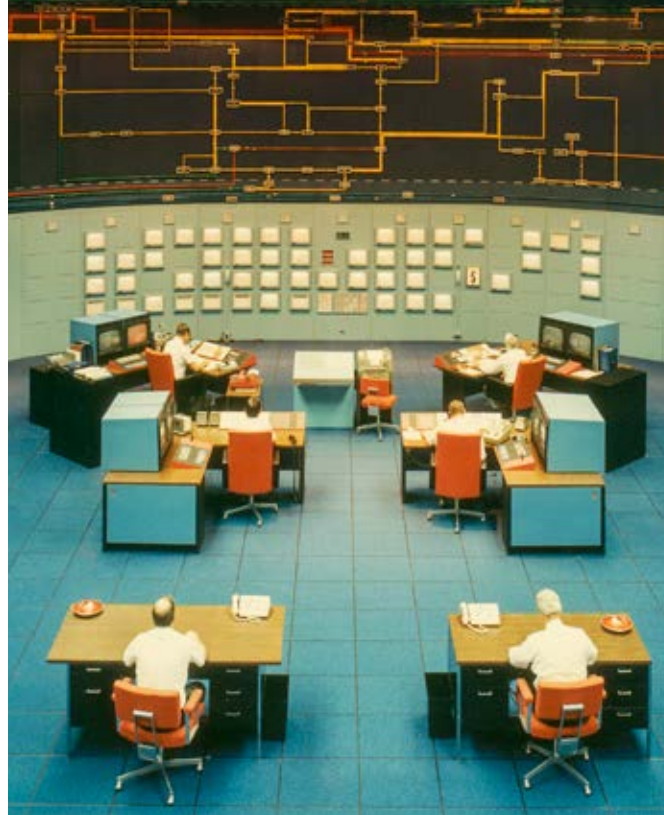


20 years of market innovations

The New York Power Pool became the NYISO in 1999 to launch a new market exchange to reduce costs for consumers.

Under our shared governance; transmission owners, generation owners, consumers and others work together in the ongoing design and operation of the electric market.

Today's markets continue to benefit consumers and providers alike by encouraging new and cleaner technologies while keeping prices low, and the grid resilient and reliable.





The People Who Power New York

Engineers, operators, analysts, economists and technologists dedicated to a reliable & sustainable power grid.

Independent and transparent by design

Unaffiliated with market interests, our mission is to serve the public under the oversight of state, federal and reliability organizations.

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NewYorkISO



nyiso

570+

Dedicated employees



435

Wholesale energy market participants



19.8M

New Yorkers served



1 of 9

ISO/RTOs in North America



New York Independent System Operator