



# The Critical Value of New York's Energy Markets

.....

NYISO's role in powering  
a reliable, efficient grid

.....



# About NYISO

## An independent authority in determining New York's energy future



**Robert Fernandez**  
Interim President  
& CEO

“ The pace of change is driven by technology and by public policy. **Our independent research, effective power grid and market operations are fundamental** to ensuring the long term energy needs of New Yorkers in terms of cost, efficiency and environmental impact. ”



**Rana Mukerji**  
Senior Vice President,  
Market Structures

“ The NYISO will **coordinate closely with policy makers, utilities, and other stakeholders** to ensure the value of distributed resources is captured and realized in our markets. ”



“ **NYISO maintains financial transparency and fiscal responsibility** at the core of our mission. ”

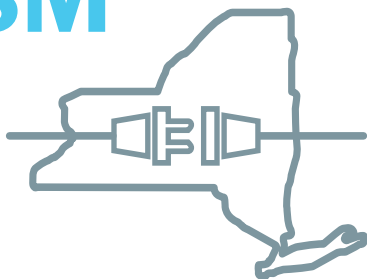
**Cheryl Hussey**  
Vice President & CFO



## NYISO's footprint

**19.8M**

New  
Yorkers  
served



**3,000**

simultaneous,  
live data status  
points monitored  
and managed



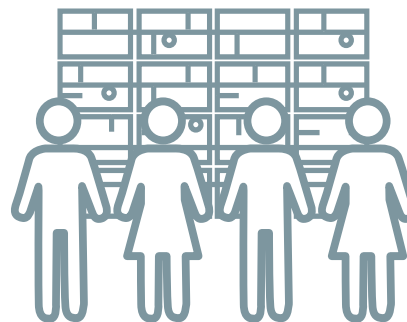
**11,173**

circuit  
miles of  
transmission  
managed  
and monitored



**570+**

employees  
operating  
the grid  
24/7



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# NYISO mission

## The four pillars of NYISO's mission

### GRID RELIABILITY

Every minute of every day, we coordinate and direct the flow of electricity over the state's high-voltage transmission system and adhere to over 1,000 reliability standards.

## 1966

New York establishes centralized grid operations

## 1999

NYISO assumed responsibility for designing, administering and monitoring wholesale electricity markets

We meet the strictest reliability standards under the regulation of:

## FERC



## NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION



The NYISO logo, which includes a stylized map of New York State followed by the letters "ISO" in a bold, sans-serif font.



## The four pillars of NYISO's mission

### MARKET OPERATIONS

Competitive markets produce value for suppliers and customers.



#### TRANSPARENCY

Markets create transparent price signals that establish a level playing field for all market participants.

#### RELIABILITY

Price signals reflect system conditions and drive investment and operation decisions that ensure reliability.

#### INNOVATION

Competition incentivizes cost reductions through efficiency, demand response, and technology advancement.

#### ENVIRONMENT

Markets favor lower operating costs creating incentives for renewable resources that promote efficiency and reduce emissions.

## \$5.3B

in NYISO  
market  
transactions  
in 2017

## 434

Market  
Participants

## 33,956 MW

record peak  
demand,  
July 2013



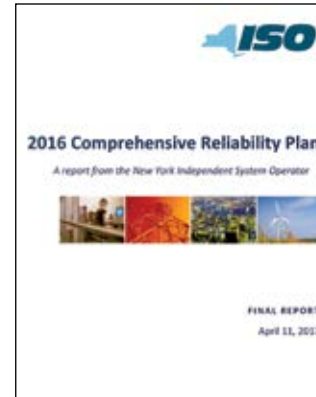
## The four pillars of NYISO's mission

### SYSTEM PLANNING

We conduct studies, analyses, and modeling to make sure New York's future electricity needs will be met through a comprehensive, transparent forward looking planning process.



↓ [Reliability Needs Assessment \(RNA\)](#)



↓ [Comprehensive Reliability Plan \(CRP\)](#)



↓ [Congestion Assessment and Resource Integration Study \(CARIS\)](#)



“ The NYISO's Comprehensive System Planning Process (CSP) is unique in that we evaluate transmission, generation and demand response on a comparable basis. **It is the primary tool for the NYISO to inform transmission expansion and electric infrastructure investment decisions.** ”

**Zach Smith**

Vice President,  
System and Resource  
Planning



## The four pillars of NYISO's mission

### INDEPENDENT INFORMATION

We are a trusted source in providing factual information to policymakers, stakeholders and investors in the power system.



**Emilie Nelson**  
Vice President,  
Market Operations

“ The NYISO is charting a course toward the future grid. We’re developing a new Energy Management System/Business Management System that will build upon our capabilities and create a platform to integrate more sophisticated tools for renewables and regional coordination. ”



Power Trends



5-Year Strategic Plan

# NYISO impact

## Emissions reductions

In conjunction with rigorous air quality standards, New York's competitive markets for wholesale electricity have led to cleaner, more efficient generation. This has resulted in significant reductions in emissions.

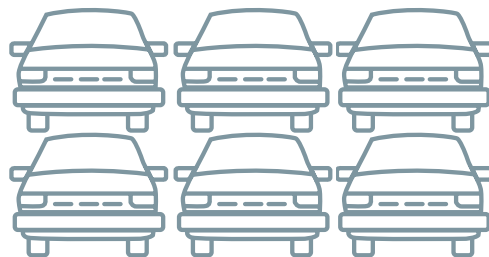
# 31.7M

tons of carbon emissions avoided in 2017 vs. 2000

New York power sector emissions rates since NYISO launched its competitive markets in 2000, as derived from US EPA Air Markets Program Data

# 52%

**CARBON DIOXIDE CO<sub>2</sub>**  
a greenhouse gas



(equivalent to approximately 6M passenger vehicles)

# 88%

**NITROGEN OXIDE NO<sub>x</sub>**  
contributes to ozone pollution



# 99%

**SULFUR DIOXIDE SO<sub>2</sub>**  
contributes to acid rain





## Market efficiency

NYISO's wholesale electricity markets encourage innovation and competition. Expanded partnerships in broader regional markets throughout the U.S. and Canada have also improved access to renewables.

### \$7.8B

reduced fuel costs  
due to improved  
grid efficiencies

Gains as a result of NYISO's stewardship

## 1,400MW

**NEW POWER**  
created through  
power generator  
efficiencies



(enough to power  
1.4M homes)

## 300%

**GAINS IN GRID  
EFFICIENCY**  
compared to  
national average

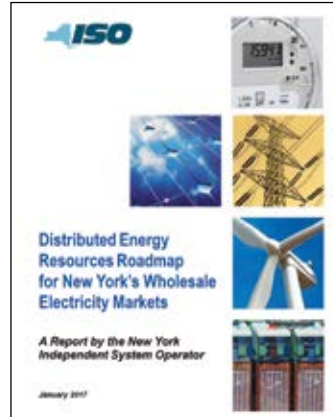
## \$612.9M

**IN SAVINGS**  
from reduced energy  
reserves

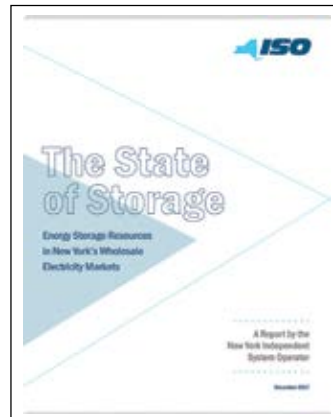
## Integrating renewables

We have established a Distributed Energy Resources Roadmap that supports grid reliability by participating in energy markets with objectives to:

- ▶ Optimize measurement and verification
- ▶ Leverage behind-the-grid contributions
- ▶ Better utilize resources that offer elasticity



📄 [Distributed Energy Roadmap \(DER\)](#)



📄 [The State of Storage](#)

“ NYISO efforts to integrate renewables align with New York State’s reforming the energy vision initiatives. **We are creating a path for consumers and emerging technologies to support grid reliability by participating in energy markets.** ”



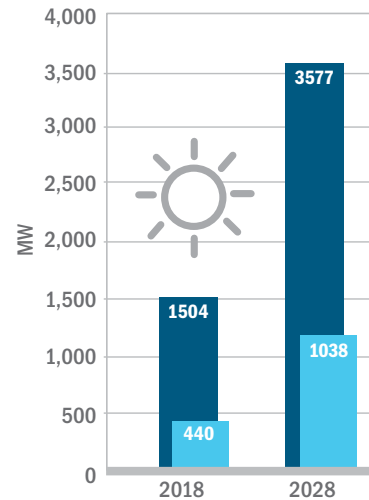
**Mike DeSocio**  
Senior  
Manager,  
Market  
Structures

## Growing green power

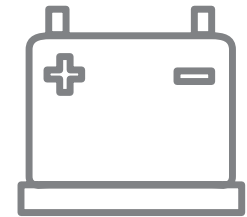
NYISO is recognized for leadership in renewable market design and innovation.

### Integrated Solar Forecasted Capacity vs. Peak July Impact

- Impact at 4pm in late July
- Forecast Installed Capacity

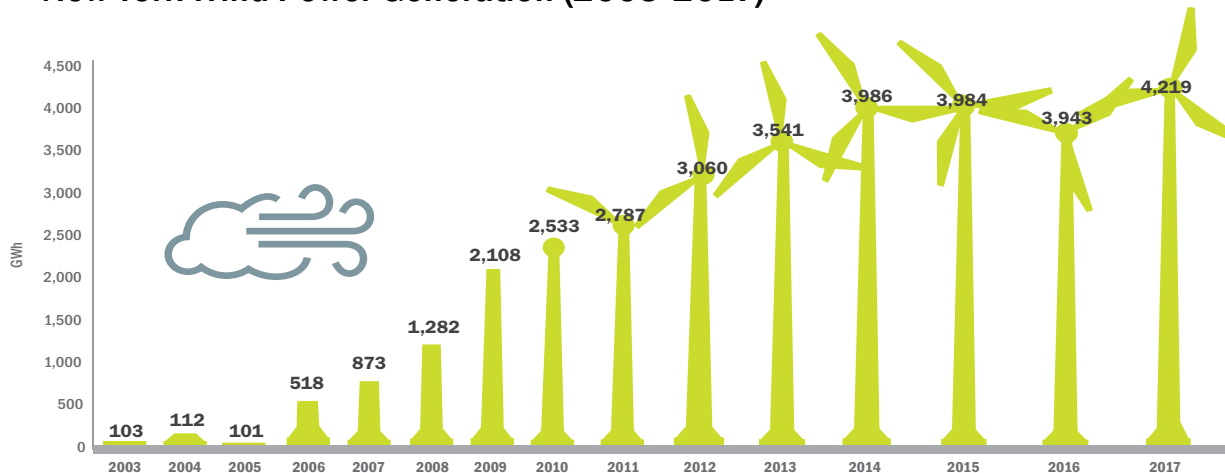


### An Industry First for Storage



The NYISO became the first grid operator in the nation to implement approved market rules for Energy Storage Resources.

### New York Wind Power Generation (2003-2017)





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