

Smart Grid Investment Grant Project

Management Committee
Project Overview

Brian Zink, Manager Smart Grid Technologies
July 27, 2011

Agenda

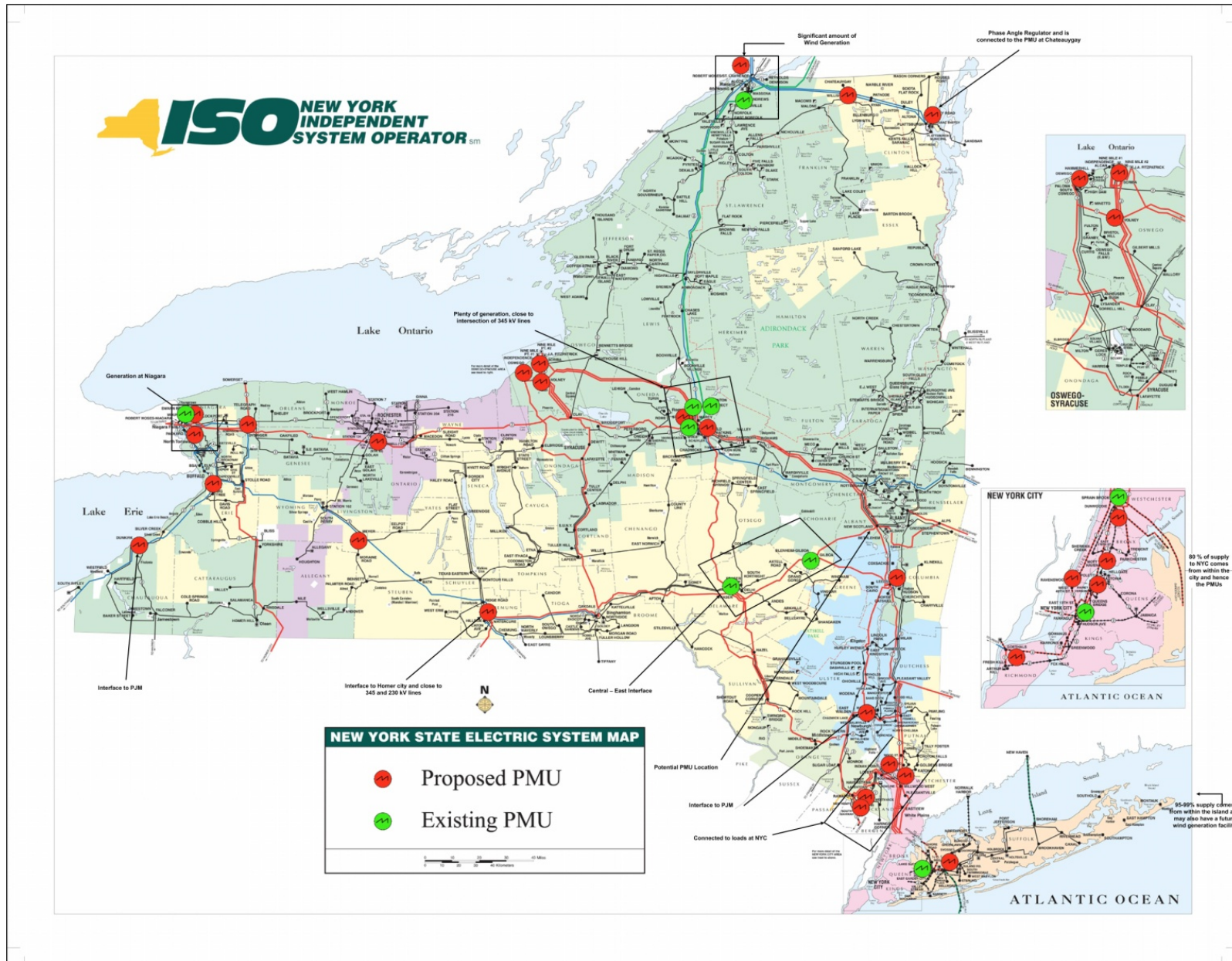
- ◆ **Project at a Glance**
- ◆ **Project Timeline**
- ◆ **Project Team/Organization Structure**
- ◆ **PMO/Grant Administration**
- ◆ **Technical Overview**
- ◆ **Project Schedule Update**
- ◆ **Financial Update**
- ◆ **Success Criteria**

Project at a Glance

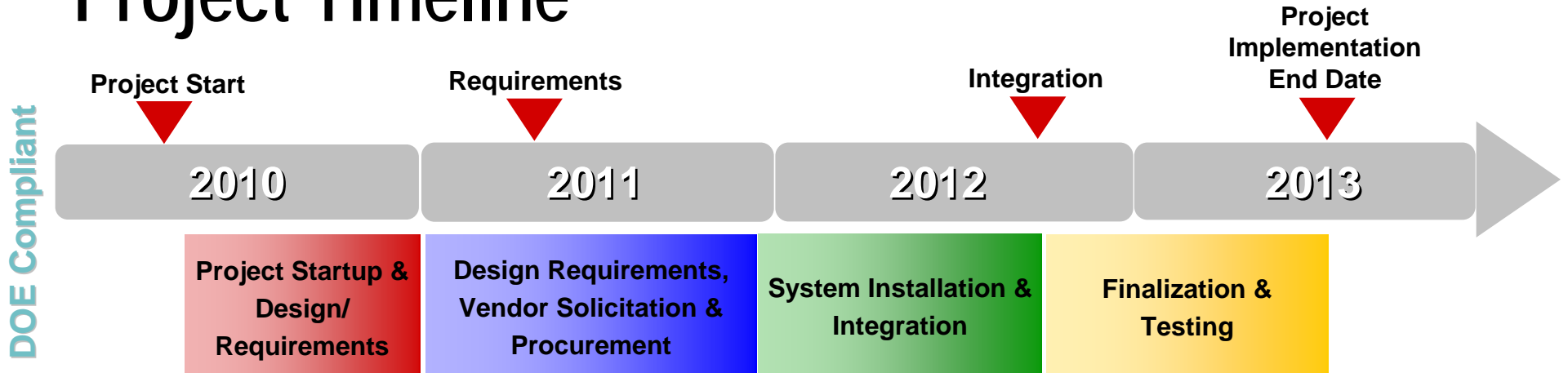
- ◆ Financials:
 - *Total Budget: \$75,710,733*
 - *Federal Share: \$37,828,825*
- ◆ Equipment:
 - *39 Phasor Measurement Units*
 - *8 Phasor Data Concentrators*
 - *788 MVar of Transmission Capacitors*
- ◆ Advanced Applications:
 - *Post-Mortem Analysis*
 - *Enhanced State Estimation*
 - *Situational Awareness*

Vision

- ◆ Improve Reliability through Early Detection / Mitigation
- ◆ Improved Capabilities to Monitor Grid in Real-Time
- ◆ Enhanced Coordination across Grid
- ◆ Increase Efficiency and Reduce Grid Losses
- ◆ Building Foundation for Modernized Grid
 - *Open, Flexible, Interoperable, Secure and Expandable*
- ◆ Design to Support Future State
- ◆ Data Sharing / Collaboration with other ISOs
- ◆ Job Creation
- ◆ Education & Training



Project Timeline



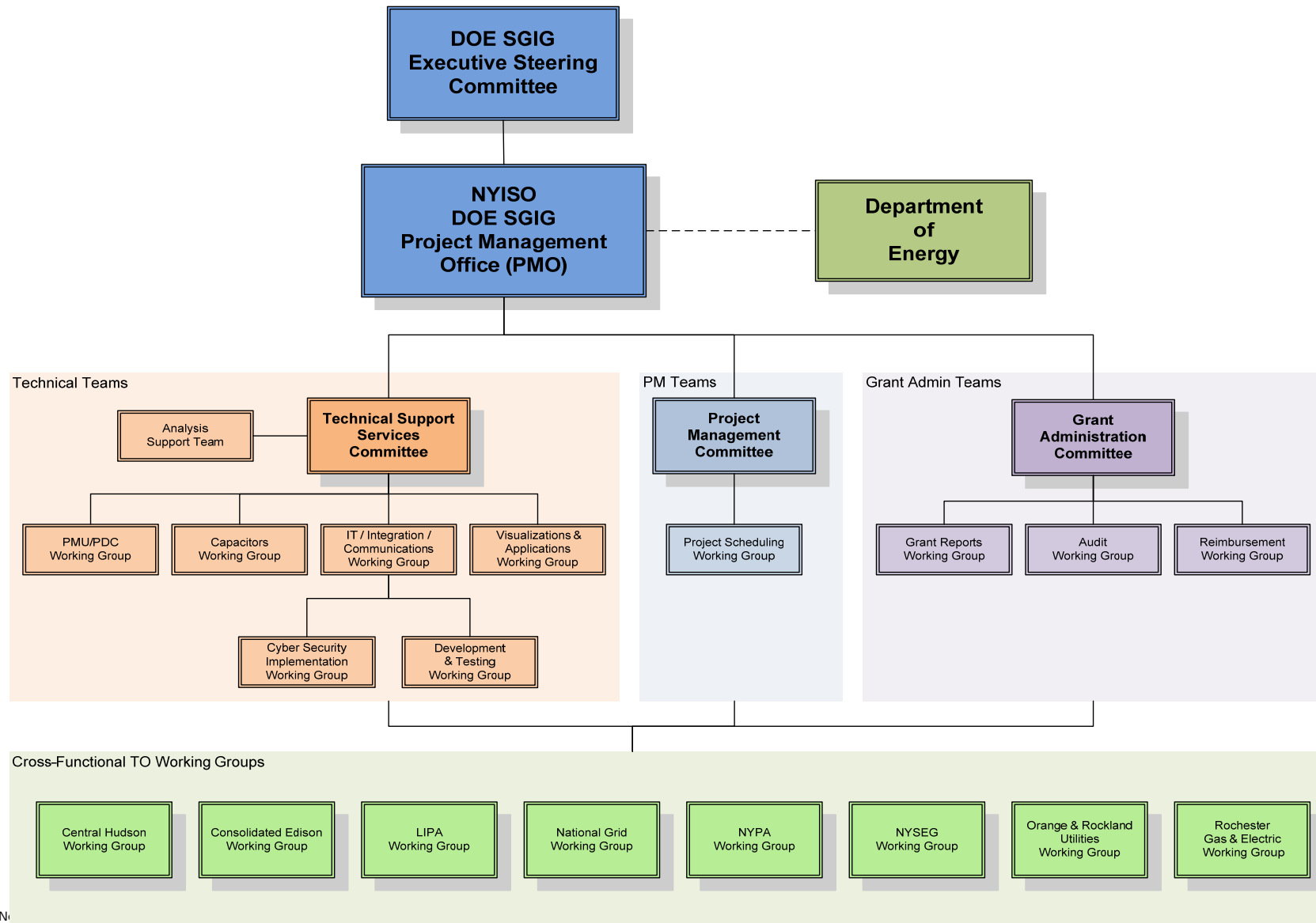
Project Objective: Establish Phasor Management Network which will enhance the ability of NYISO to detect system vulnerabilities and disturbances in real-time and to potentially mitigate their impact.

- ◆ **5 yr project ARRA SGIG SynchroPhasor Project**
 - *3 years to implement*
 - *Follow up 2 years for reporting*
- ◆ **Scope = 3 tracks**
 - *Phasor Management Network*
 - *Studies*
 - *Capacitors*
- ◆ **Grant: \$75.7M**

Project Team

- ◆ NYISO Project Team
 - *Chief Information Officer & Senior Vice President – Rich Dewey*
 - *Manager, Smart Grid Technologies – Brian Zink*
 - *Project Manager – Kathleen Dalpe*
 - *Technical Advisor – Dejan Sobajic*
 - *Lead Architect – Jim McNierney*
 - *Senior Engineer – Peter Lemme*
 - *Project Coordinator – Sandra Cardona*
- ◆ NYISO Supporting Staff
- ◆ Quanta Technology, Crowe Horwath, LLP & PMOLink, LLC
- ◆ New York Transmission Owners
 - *Central Hudson Gas & Electric, Consolidated Edison Co. of NY, New York State Electric & Gas, National Grid, Orange and Rockland, Rochester Gas and Electric, New York Power Authority, Long Island Power Authority*

Project Organization Chart



Project Management Deliverables

- ◆ Project Execution Plan
- ◆ Metrics & Benefits Reporting Plan
- ◆ Cyber Security Plan
- ◆ PMO Artifacts
- ◆ Change Management Process
- ◆ Risk Management Process
- ◆ Communication Plan
- ◆ Integrated Project Schedule

Grant Compliance

- ◆ Policies & Procedures
- ◆ Procedures and Internal Controls Manual
- ◆ Subrecipient Training
- ◆ On-Site Monitoring Visits
- ◆ DOE / ARRA Reporting
 - *Monthly Progress / Earned Value / Risks / Jobs*
 - *Build / Impact Metrics*
- ◆ Financial & Cost Management
 - *NYISO and TO Reimbursement Process*
- ◆ Internal / External Audit
- ◆ PSC Reporting

Technical Deliverables

- ◆ Functional Requirements Specifications – All Complete
 - *Capacitor & Functional Understanding– November 2010*
 - *Phasor Measurement Equipment– November 2010*
 - *TO Control Center Phasor Data Concentrator – January 2011*
 - *Phasor Enhanced State Estimator Applications – February 2011*
 - *Phasor Measurement Network – March 2011*
 - *Communications – March 2011*
 - *Situational Awareness (Visualization) Applications – March 2011*
 - *Voltage Stability Applications – March 2011*

Technical Deliverables

- ◆ PDAC (Phasor Data Acquisition & Control)
 - *Situational Awareness Applications*
 - *Voltage phase angle monitoring*
 - *Interface MW flow*
 - *Local and inter-area frequency oscillation monitoring*
 - *Voltage Stability Monitoring*
 - *Wide area event detection*
 - *Preferred voltage selector*
 - *Voltage magnitude monitoring*
 - *Frequency monitoring*
 - *Phasor Enhanced State Estimation*
 - *Historian / PDC / Visualization tools*
- ◆ Communications Requirements

TO Installation Schedule by Device

Location	Units	Start	Finish	Q3-2011	Q4-2011	Q1-2012	Q2-2012	Q3-2012	Q4-2012	Q1-2013
Capacitors	788 MVARs	10-Jul-11	14-Jan-13		46	86	74	55	511	16
Central Hudson	35 MVARs	1-Oct-11	30-Jun-12		22		13			
National Grid	286 MVARs	1-Sep-11	31-Dec-12			70	61	55	100	
NYSEG	320 MVARs	1-May-12	31-Dec-12						320	
O&R	48 MVARs	26-Jul-11	14-Jan-13			16			16	16
RGE	99 MVARs	10-Jul-11	31-Dec-12		24				75	
Phasor Data Concentrators	8 PDCs	1-Sep-11	2-Jul-12		1	2	5			
Central Hudson	1 PDC	1-Nov-11	30-Jun-12				1			
ConEd	2 PDCs	1-Sep-11	30-Jun-12			1	1			
LIPA	1 PDC	1-Oct-11	31-Dec-11		1					
National Grid	1 PDC	1-Sep-11	30-Jun-12				1			
NYPA	1 PDC	1-Jan-12	15-Jan-12			1				
NYSEG	1 PDC	15-Dec-11	2-Jul-12				1			
RGE	1 PDC	2-Jan-12	21-May-12				1			
Phasor Measurement Units	39 PMUs	6-Jun-11	11-Dec-12	3	6	5	6	15	4	
Central Hudson	1 PMU	1-Nov-11	30-Jun-12				1			
ConEd	14 PMUs	6-Jun-11	11-Dec-12	2	4	1	2	2	3	
LIPA	2 PMUs	1-Oct-11	31-Dec-11		2					
National Grid	12 PMUs	1-Apr-12	31-Jul-12					12		
NYPA	4 PMUs	8-Aug-11	18-May-12	1		2	1			
NYSEG	5 PMUs	1-Nov-11	30-Nov-12			2	2		1	
RGE	1 PMU	1-May-12	1-Oct-12					1		

Capacitor Installations

- O&R change request pending final DOE review will add 16 MVARs of capacitors
- NYSEG expects to submit change request to modify locations and add 100 MVARs of capacitors

Invoice Performance

- ◆ *Eight requests for reimbursement have been submitted to date:*

- ◆ **Reimbursements**

Requested \$3,137,271.83

Received \$3,019,796.16

Outstanding \$117,475.67

DOE Success Criteria

- ◆ Metrics and Benefits Plan
 - *Build Metrics:*
 - Monetary Investments
 - Electricity Infrastructure Assets
 - Jobs
 - *Impact Metrics:*
 - Economic Impact
 - Reliability and Energy Security Impact
 - PMU/PDC System Performance Impact
 - Environmental Impact

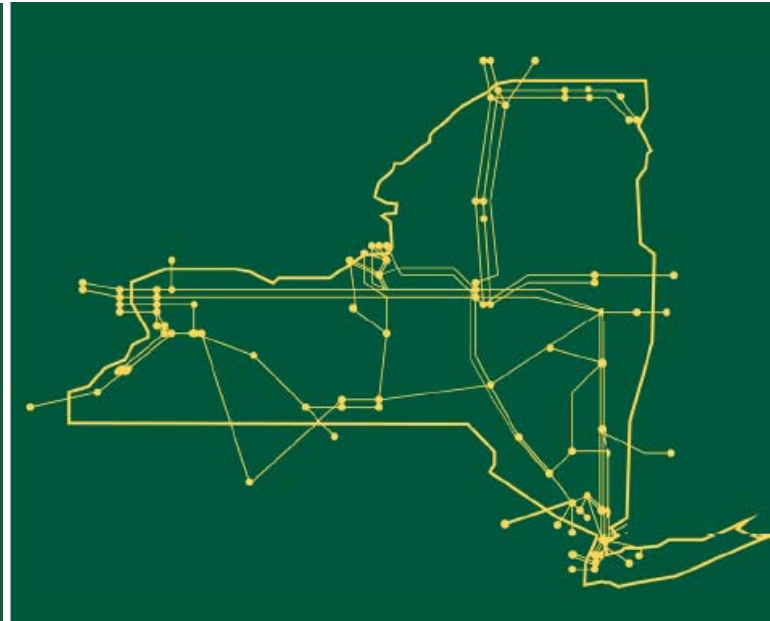
Long-term Success Criteria

- ◆ **Build Foundation for Future Technology:**
 - *Communication Network*
 - *High Speed Synchronized Data Collection*
- ◆ **Wider Situational Awareness – Real-time:**
 - *Sharing of data with other ISOs*
- ◆ **Renewable Integration:**
 - *Utilize wind, solar, etc. efficiently*
- ◆ **Future Technology Innovations:**
 - *Google, GE, IBM, Intel, Verizon, etc.*

Next Steps for 2011

- ◆ NYISO PDAC Vendor Selection for PMN Architecture, Communications & Applications – Q3 2011
- ◆ TO Procurement & Installation of Equipment – Ongoing
- ◆ Support of Monthly/Quarterly DOE Reporting – Ongoing
- ◆ Grant Compliance Monitoring Visits – Ongoing
- ◆ Support of PEP, M&B, Cyber – Ongoing

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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