



Introduction to the NYISO

Power Control Center

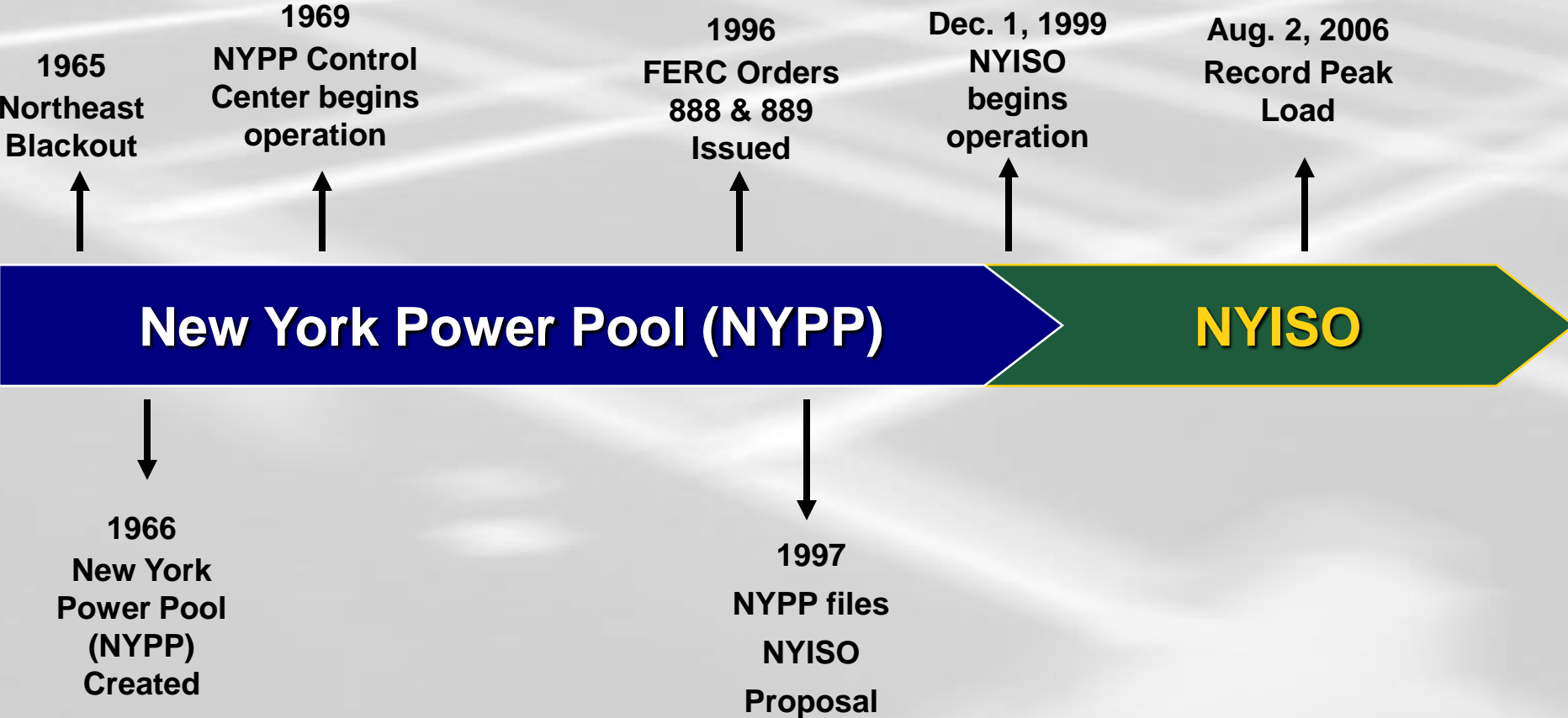
Guilderland, NY

July 21, 2011

Today's Topics

- **NYISO History**
- **NYISO Roles & Governance**
- **NYISO Markets**
- **Building Reliability**
- **Emerging Trends**

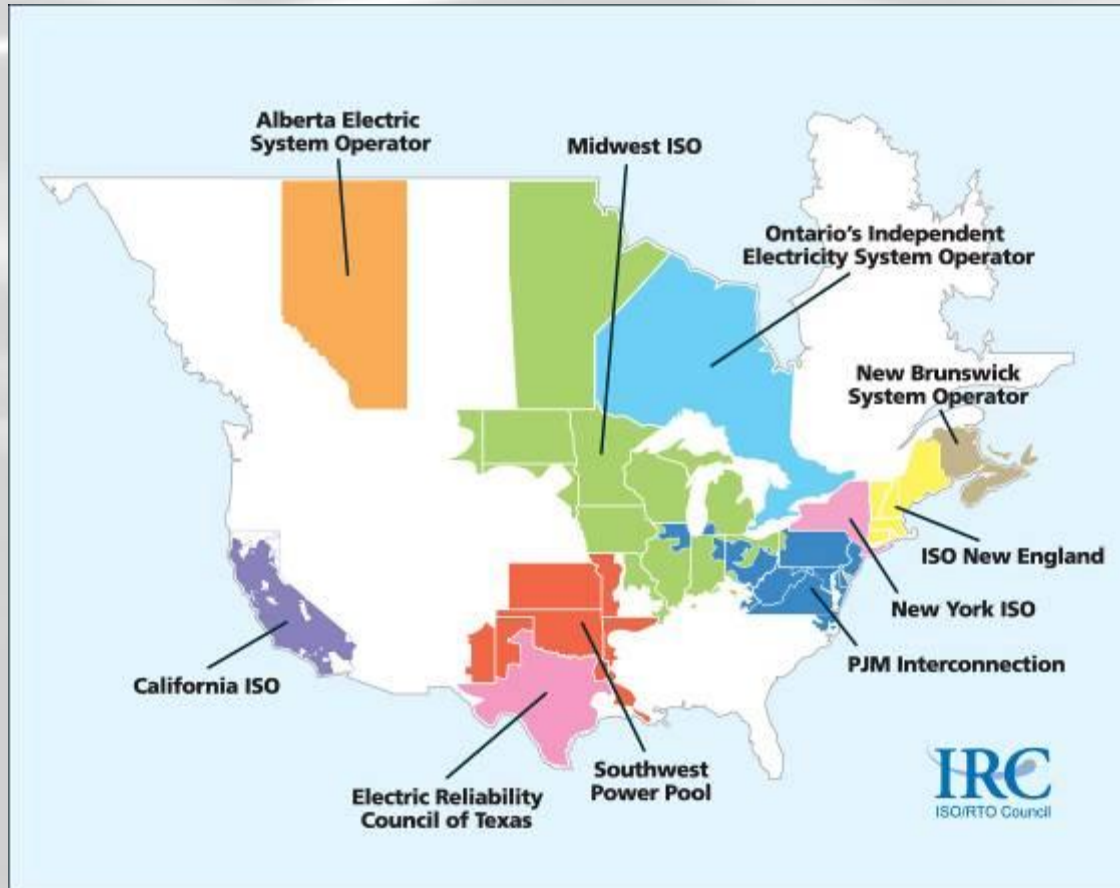
Evolution of the NYISO



ISOs & RTOs

There are now 10 Independent System Operators and Regional Transmission Organizations (ISO/RTOs) in North America.

They serve two-thirds of electricity consumers in the United States and more than one-half of Canada's population.



Roles of the NYISO



Reliable operation of the bulk electricity grid

- *Managing the flow of power on 11,000 circuit-miles of transmission lines from more than 300 generating units*



Administration of open and competitive wholesale electricity markets

- *Bringing together buyers and sellers of energy and related products and services*



Planning for New York's energy future

- *Assessing needs over a 10-year horizon and evaluating projects proposed to meet those needs*



Advancing the technological infrastructure of the electric system

- *Developing and deploying information technology and tools to make the grid smarter*

NYISO Governance

**Board
of
Directors**

10-member Board of Directors with experience in energy, environment, finance, academia, technology and communications

Board members and all employees are independent, with no business, financial, operating or other direct relationship to any Market Participant or stakeholder

**President
& CEO**

**Management
Committee**

NYISO Staff

**Operating
Committee**

**Business
Issues
Committee**

Market Participant stakeholder committees of individuals from market sectors: Transmission Owners, Generation Owners, Other Suppliers, End-Use Consumers, and Public Power & Environmental Parties

Stakeholder Committees

Stakeholder committees include members of marketplace sectors: Transmission Owners, Generation Owners, Other Suppliers, End-Use Consumers, and Public Power & Environmental Parties

MANAGEMENT COMMITTEE

Board Liaison Committee
Budgets and Priorities Working Group
By- Laws Subcommittee
Market Participant Audit Advisory Subcommittee
Tariff Review Subcommittee
Stay Review Subcommittee
Board Selection Subcommittee

BUSINESS ISSUES COMMITTEE

Billing and Accounting Working Group
Installed Capacity (ICAP) Working Group
Market Issues Working Group
Price-Responsive Load Working Group
Electric System Planning Working Group
Interconnection Issues Task Force
Credit Policy Task Force

OPERATING COMMITTEE

Communication and Data Advisory Subcommittee
Transmission Planning Advisory Subcommittee
System Operations Advisory Subcommittee
System Protection Advisory Subcommittee
Electric System Planning Working Group
Restoration Working Group
Interconnection Project Cost Allocation Study WG
Reactive Power Working Group
Interconnection Issues Task Force

Voting Sectors

58% required to pass

End-Use Consumers 20%

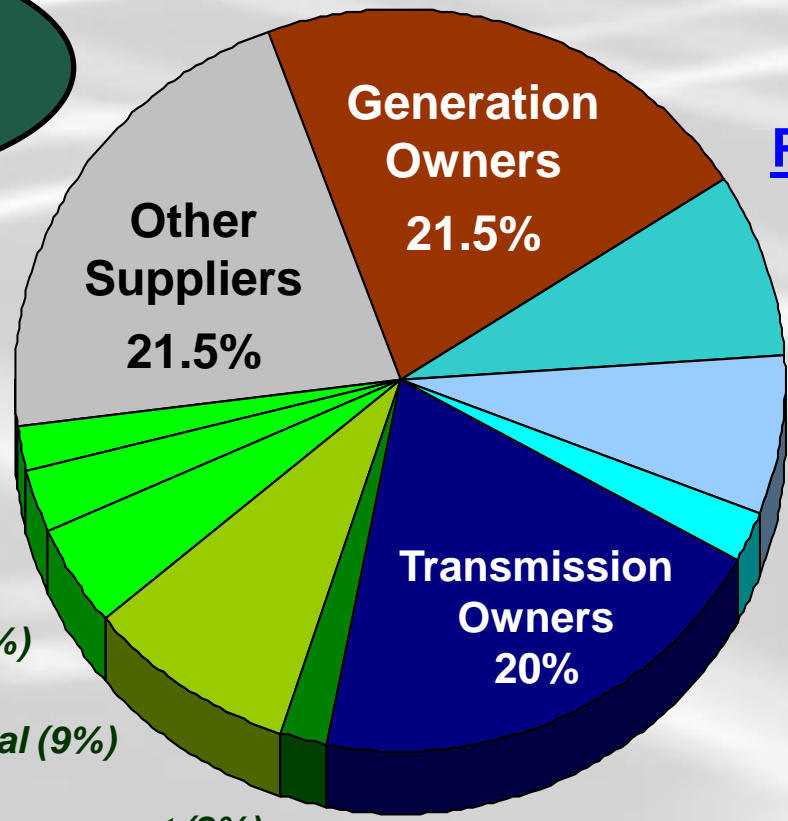
Government Advocate & Retail Aggregators (1.8%)

State-wide Advocate (2.7%)

Small Consumers (4.5%)

Large Consumers - Industrial (9%)

Large Consumers - Government (2%)



Public Power 17%

Power Authorities – NYPA & LIPA (8%)

Municipals & Co-ops (7%)

Environmental Parties (2%)

Government Regulation



Federal Energy Regulatory Commission (FERC)

- *Jurisdiction over transmission service and wholesale power sales*
- *Regulates the NYISO and other ISO/RTOs in the United States*

New York State Public Service Commission (PSC)

- *Regulates the NYISO as an “electric corporation”*
- *Jurisdiction over generation, transmission siting, resource adequacy, compliance with NYSRC rules, and local electric distribution within New York*



Reliability Regulation



North American Electric Reliability Corporation (NERC)

- *Independent, not-for-profit organization with mission to improve the reliability and security of the bulk power system in the U.S., Canada and part of Mexico*
- *Established in response to the 1965 blackout*
- *Compliance with NERC Reliability Standards became mandatory and enforceable in the U.S. in 2007*

Northeast Power Coordinating Council (NPCC)

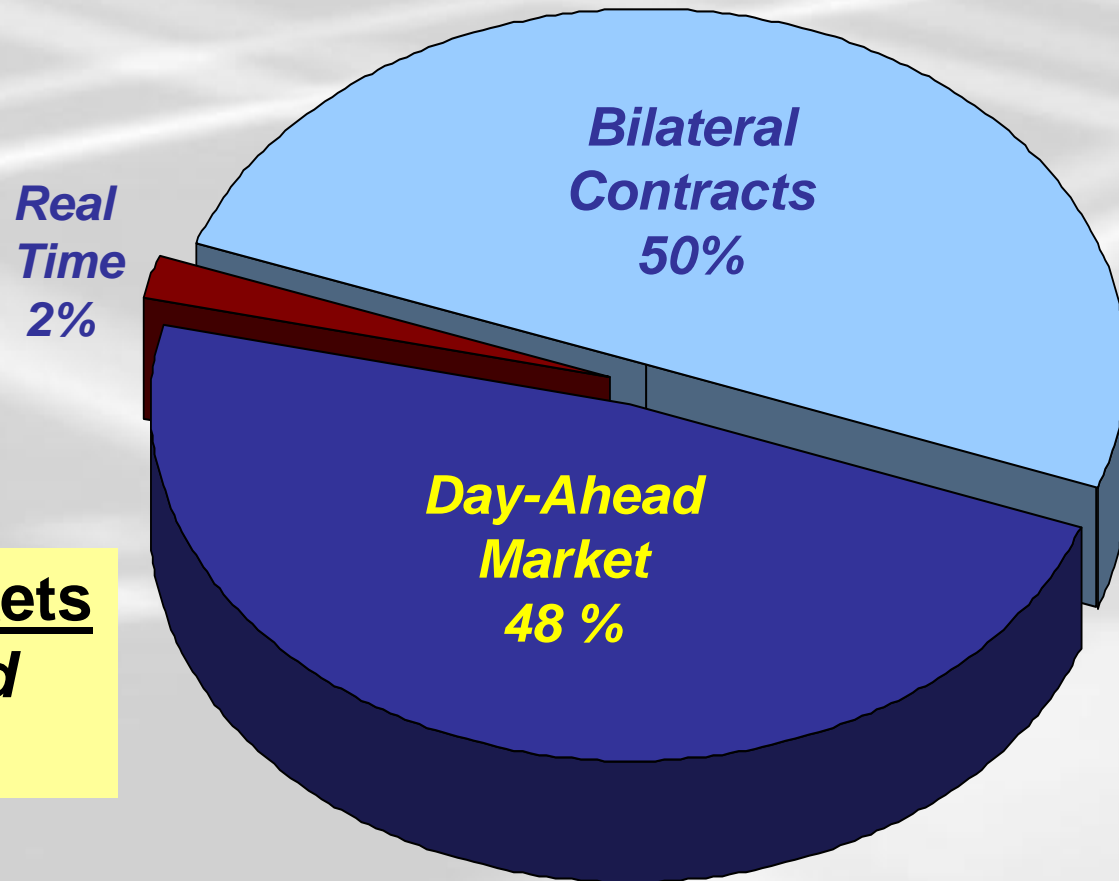
- *Includes New York, New England, Ontario, Québec, and the Maritimes*
- *Formed as voluntary, not-for-profit, regional reliability organization in 1966*
- *Restructured in 2007*

New York State Reliability Council (NYSRC)

- *Not-for-profit organization established in 1999*
- *Responsible for Reliability Rules specific to the New York State Power System*
- *U.S. law authorizes New York State to impose more stringent reliability standards*

NYISO Markets

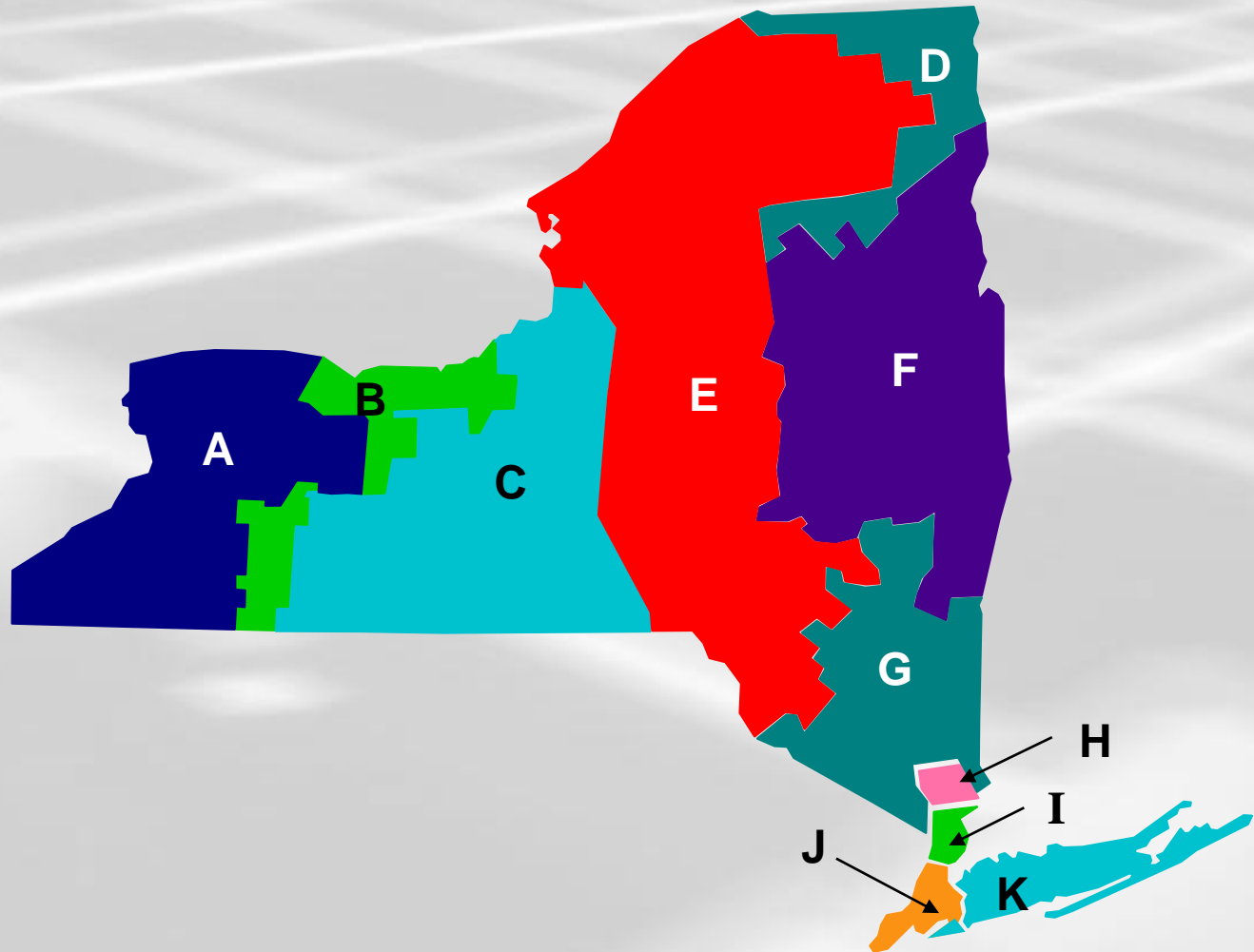
NY's Wholesale Electricity Markets



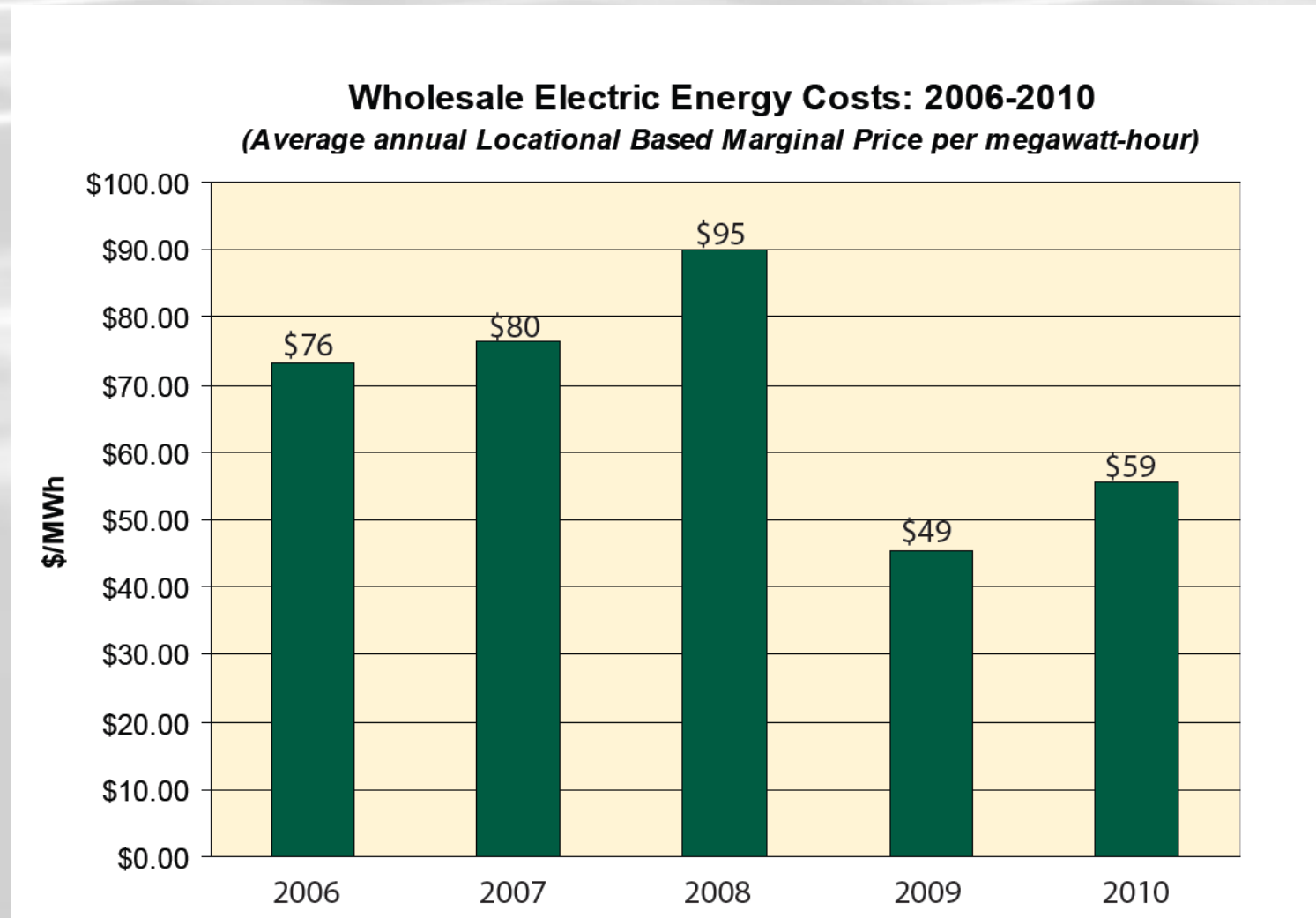
NYISO Markets

- *Day-Ahead*
- *Real Time*

NYISO Load Zones



Wholesale Energy Costs



Ancillary Services

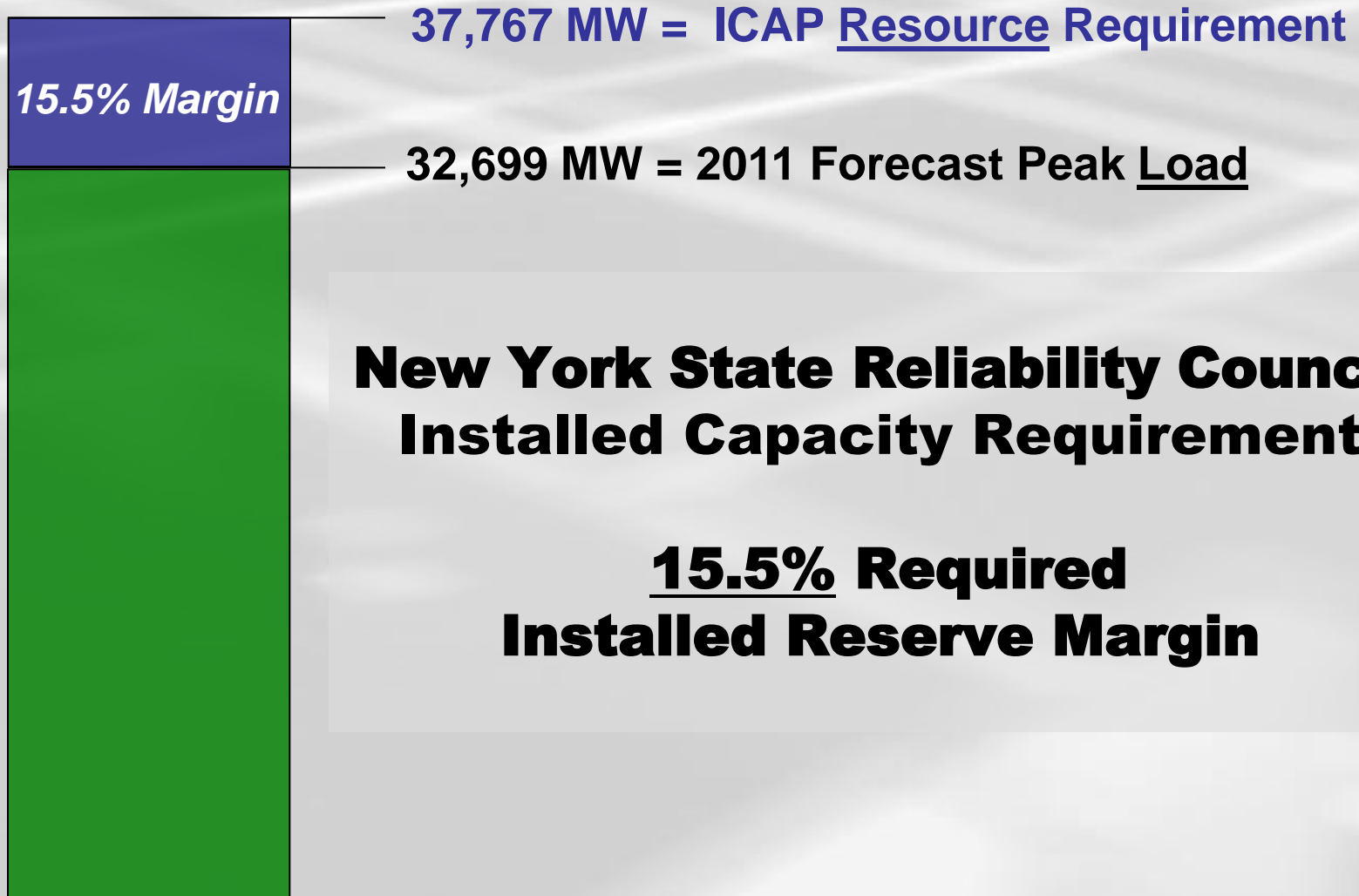
- **Some Ancillary Services are Provided at Market-Based Prices**
 - *Regulation & Frequency Response*
 - *Operating Reserve*
 - *Energy Imbalance*
- **Some Ancillary Services are Provided at Cost-Based Prices**
 - *Scheduling, System Control, and Dispatch (S, SC, & D)*
 - *Voltage Support (VSS)*
 - *Black Start Capability (BSS)*

Historic Peak Loads



<u>Year</u>	<u>Peak Load</u>
1998	28,166 MW
1999	30,311 MW
2000	28,136 MW
2001	30,983 MW
2002	30,664 MW
2003	30,333 MW
2004	28,433 MW
2005	32,075 MW
2006	33,939 MW
2007	32,139 MW
2008	32,432 MW
2009	30,844 MW
2010	33,452 MW
2011	32,699 MW (Forecast)

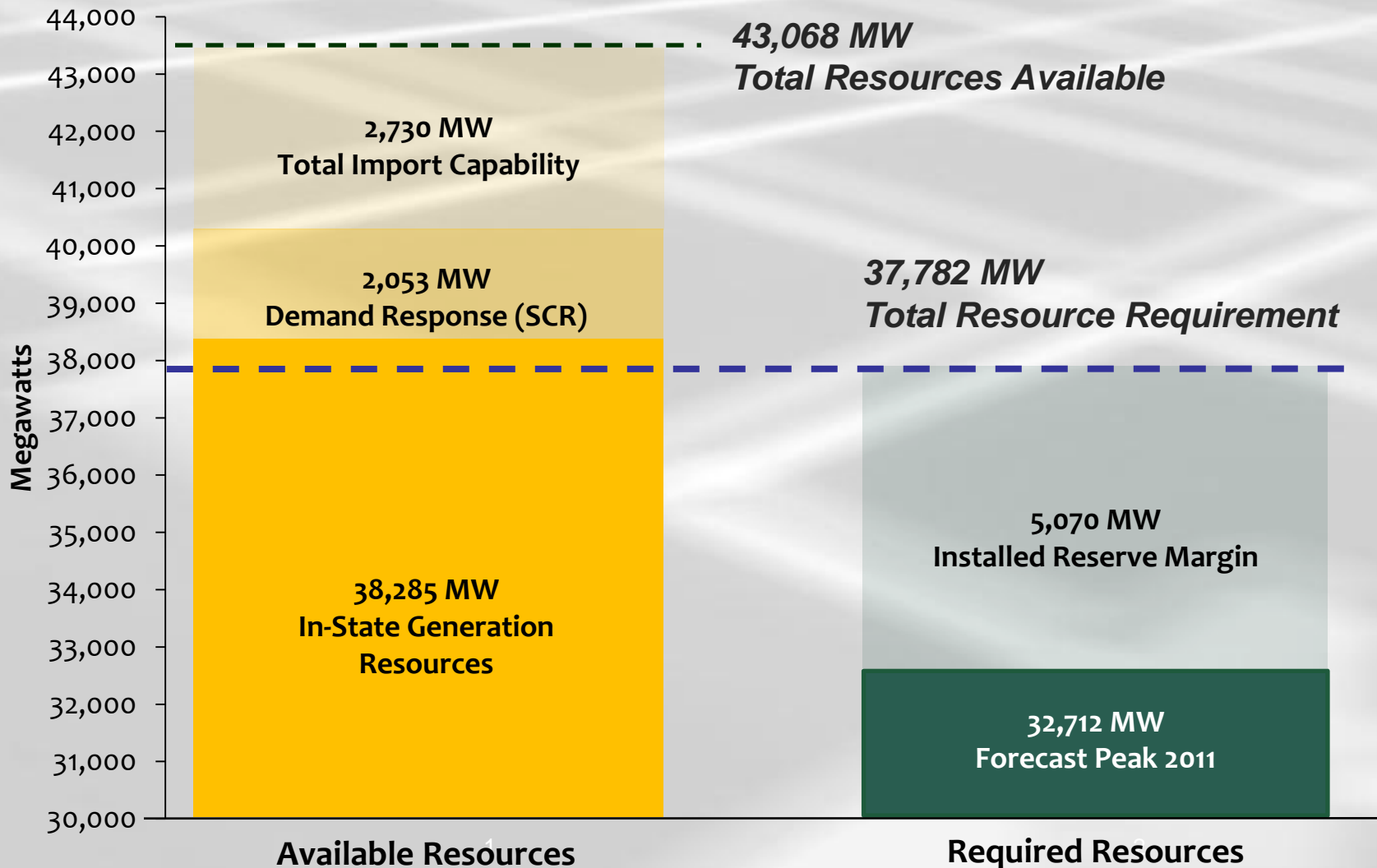
Installed Capacity Requirement



Building Reliability

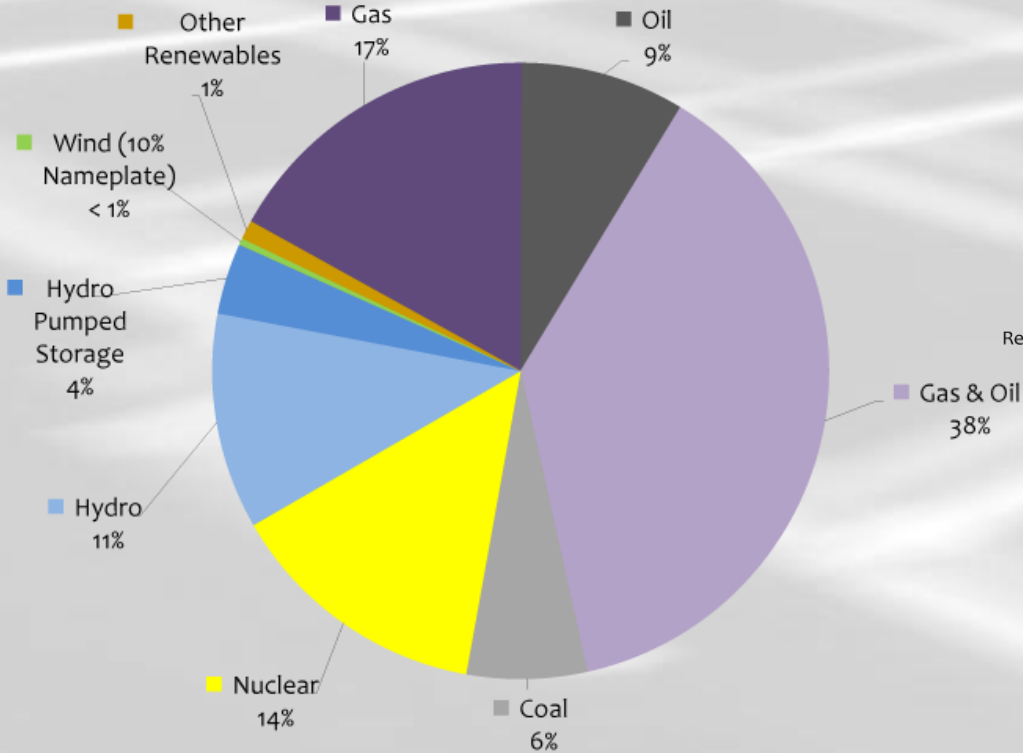
Resource Availability

Summer 2011

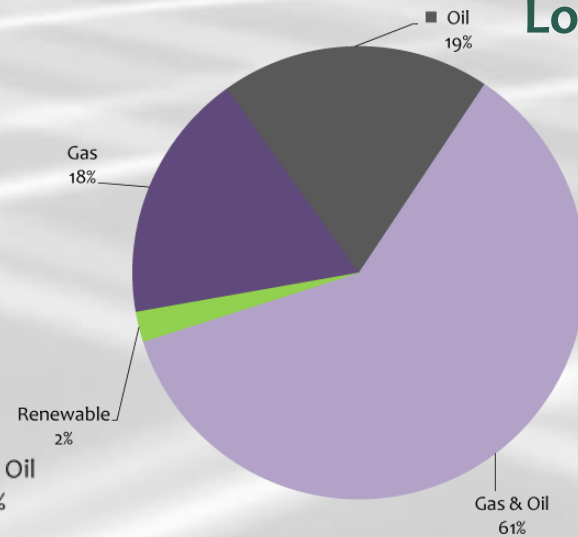


New York Fuel Mix

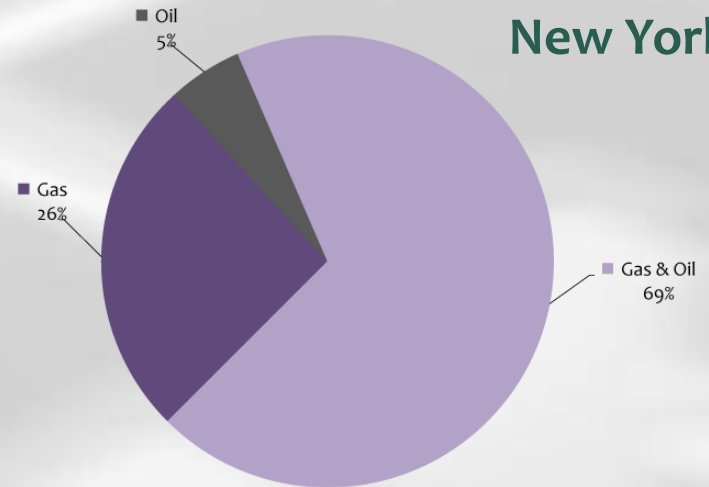
Statewide



Long Island



New York City



Fossil-Fueled Generating Capacity

- **Statewide – 70%**
- **Long Island – 98%**
- **NY City – 100%**

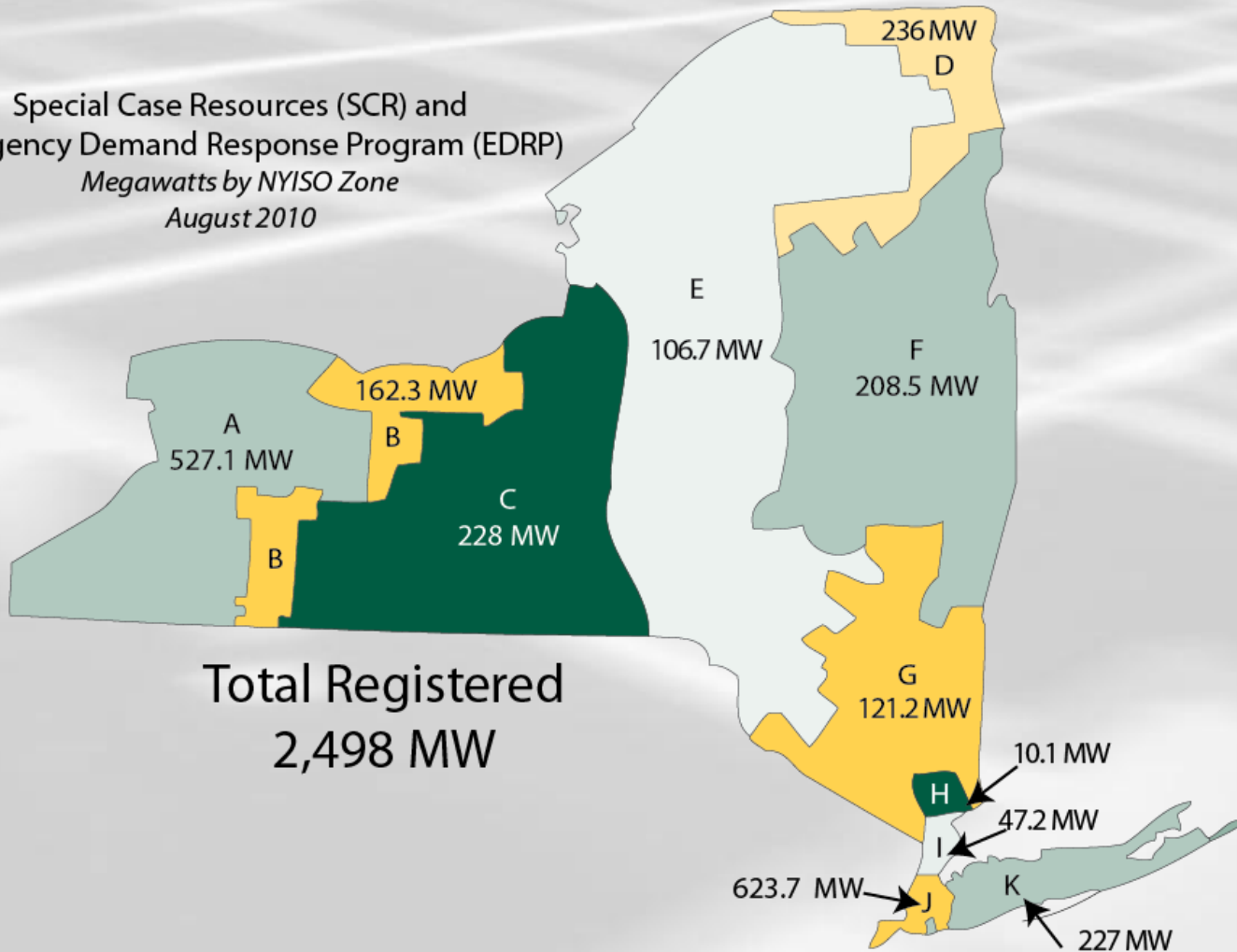
Building Reliability

Since 2000, New York has added:

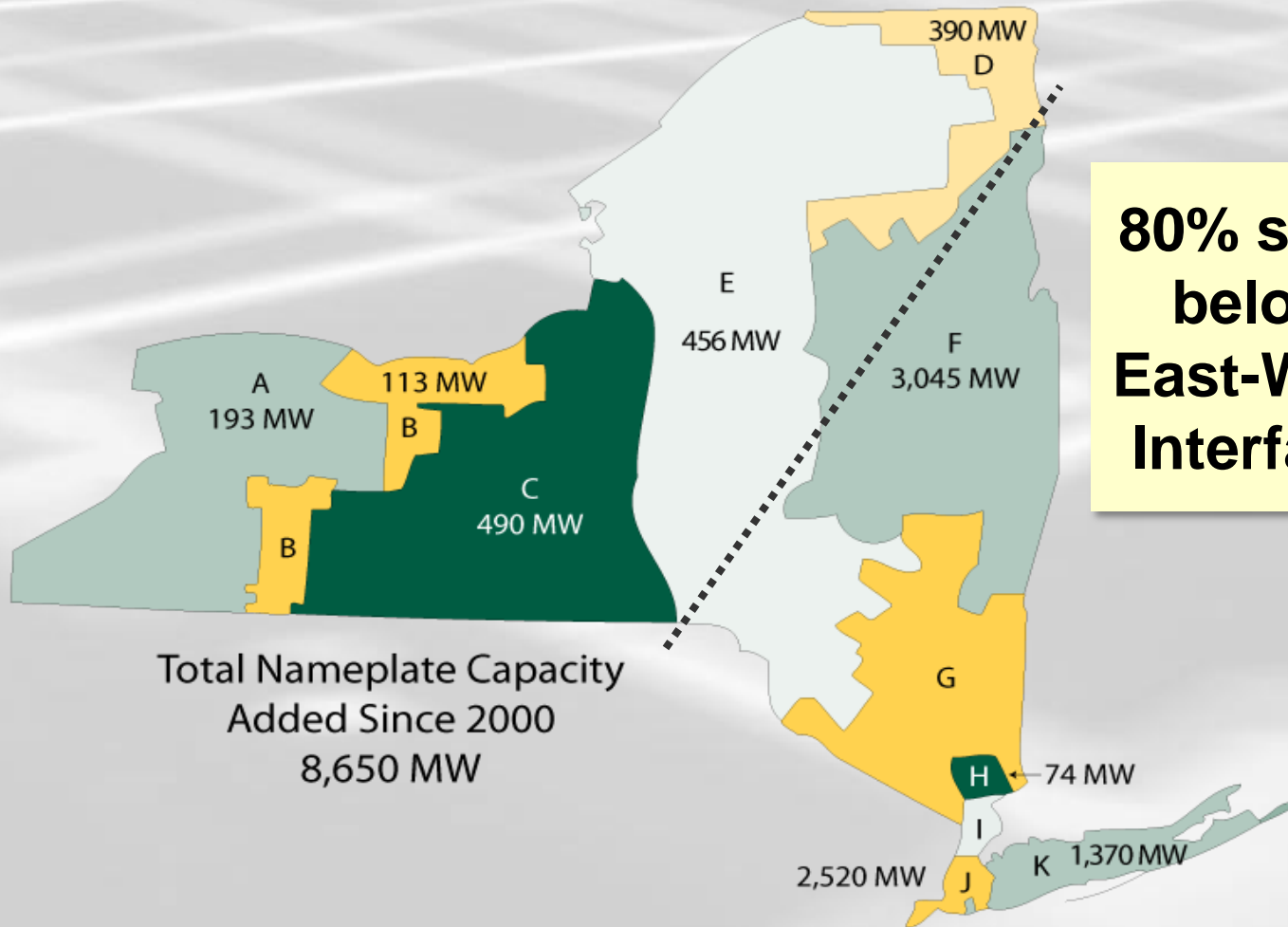
- Nearly 2,500 MW of demand response*
- Over 8,600 MW of new generation*
- Nearly 1,300 MW of new transmission*

Demand Response

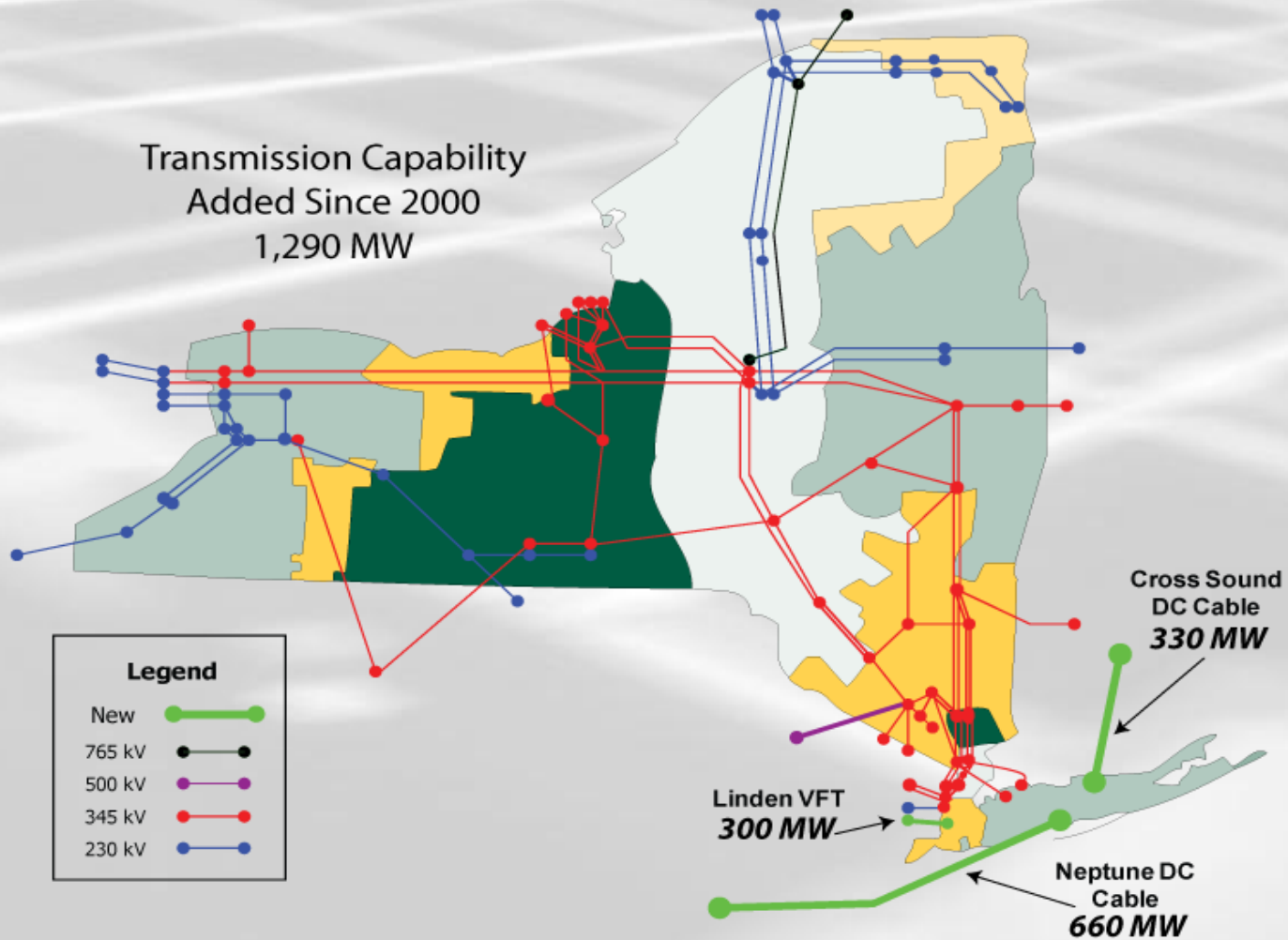
Special Case Resources (SCR) and
Emergency Demand Response Program (EDRP)
Megawatts by NYISO Zone
August 2010



New Generation



New Transmission



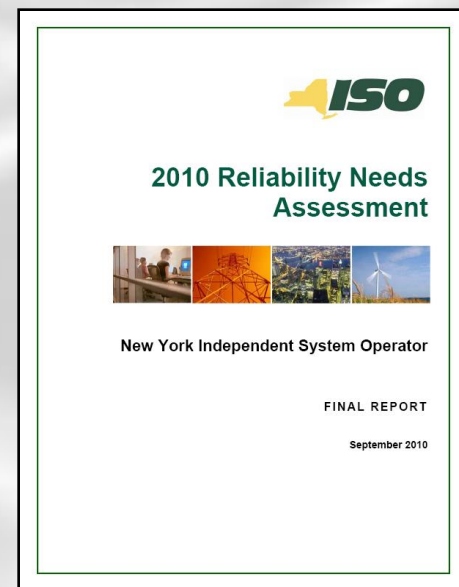
Emerging Trends

Emerging Trends

- **Reliability Needs**
- **Renewable Integration**
- **Regional Collaboration**
- **Smart Grid**

Reliability Needs

- **NYISO 2010 Reliability Needs Assessment**
 - *New York's power resources are expected to meet the state's electricity reliability needs through 2020*
 - *Includes generation, transmission and demand response resources*
 - *Assumes energy efficiency programs and planned resource additions proceed as scheduled*
 - *Assumes no significant facilities are retired from service*
 - *Reviews reliability risk scenarios (such as Indian Point Energy Center's future, cumulative impact of environmental regulations, etc.)*



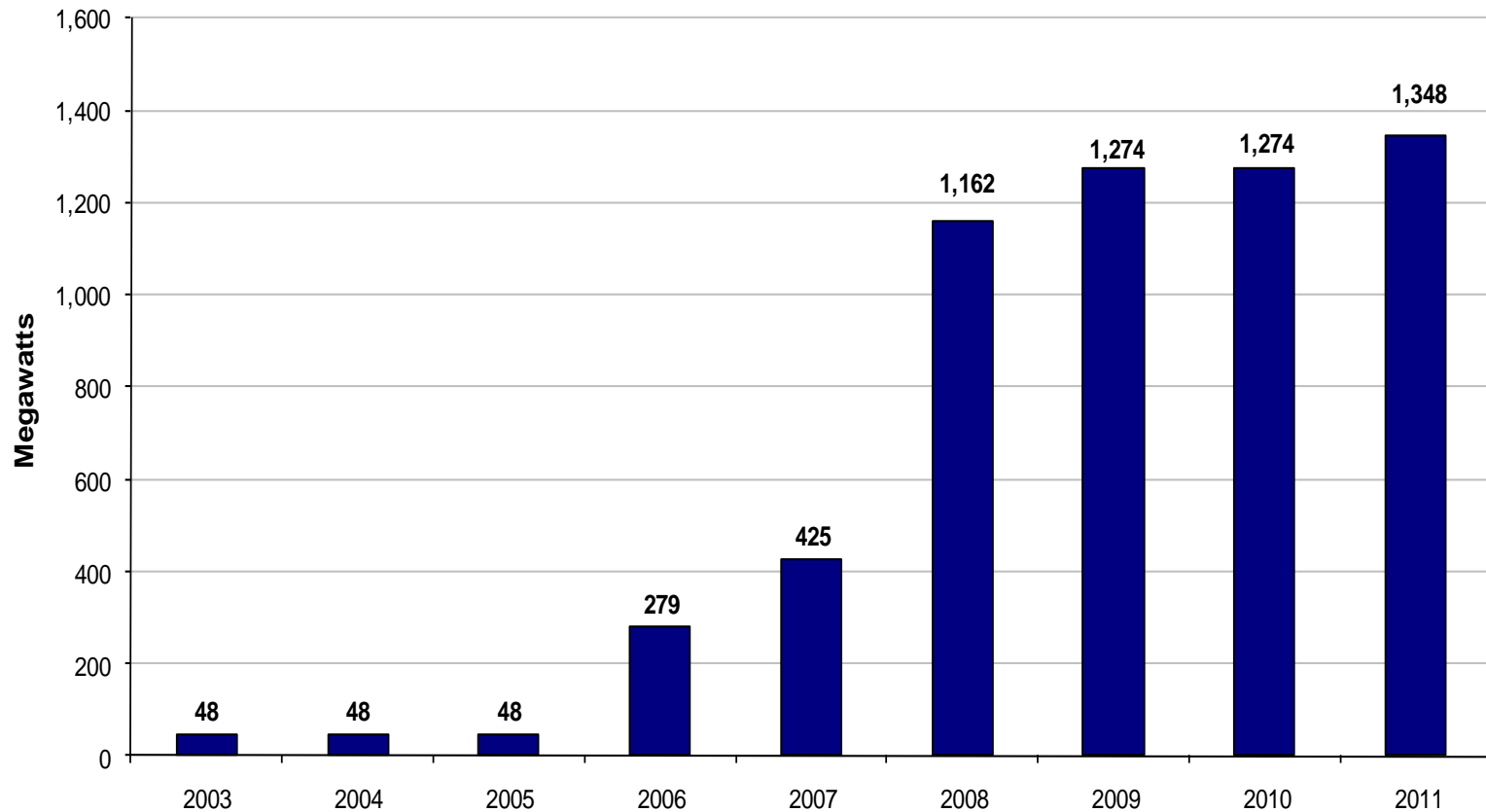
Renewable Integration

- **NYISO renewable resource integration initiatives**
 - *Implemented state-of-the-art centralized wind forecasting*
 - *First ISO/RTO to integrate wind in economic dispatch*
 - *Initiated first-of-its-kind energy storage market design*



Wind Power in New York

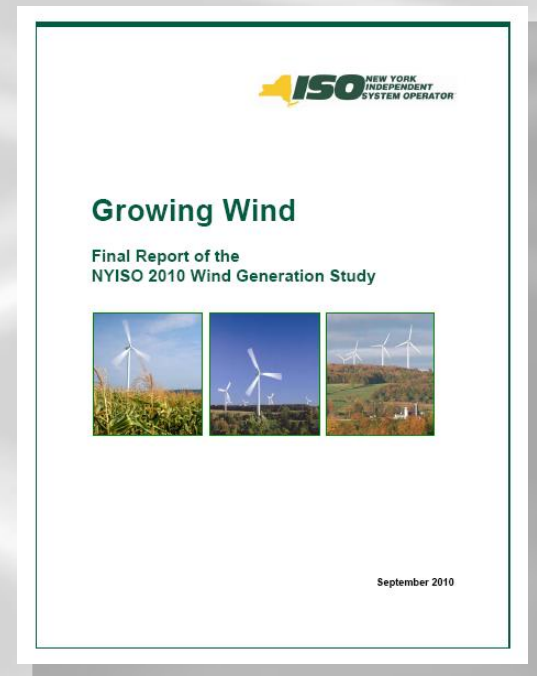
Installed Wind Capacity in New York State
(Nameplate Rating - MW)



SOURCE: 2011 Load & Capacity Data Report, New York Independent System Operator, April 2011

Planning for More Wind

- NYISO study examined expansion of windpower from current 1,275 MW to as much as 8,000 MW by 2018
- The study found that:
 - *NYISO systems and procedures could allow the integration of the additional wind generation without adverse reliability impacts*
 - *Less than 10% of the potential wind energy production from Northern New York would be not deliverable because of local transmission limitations*



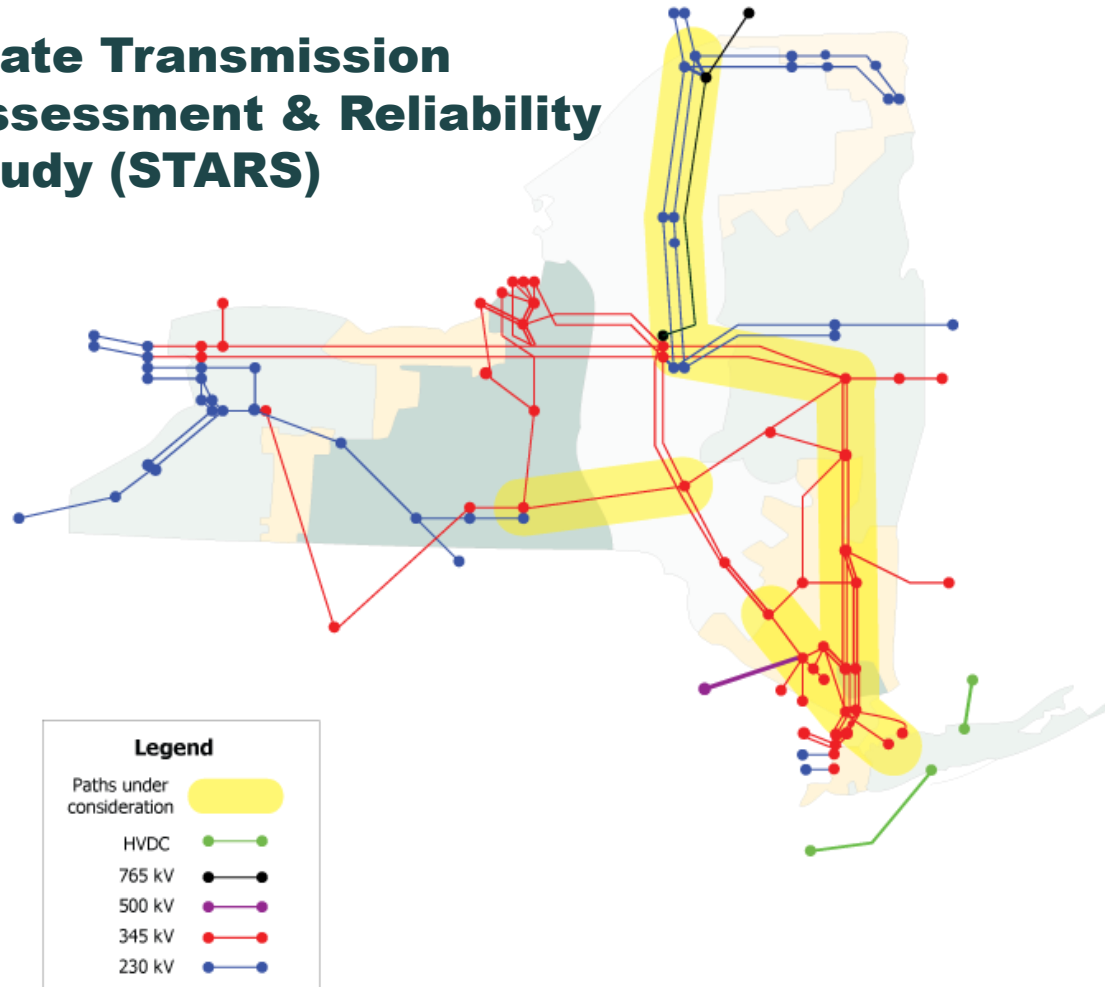
Congestion Planning

**NYISO
CARIS
process
identified
major
congested
corridors in
New York
Control
Area**



Transmission Upgrades

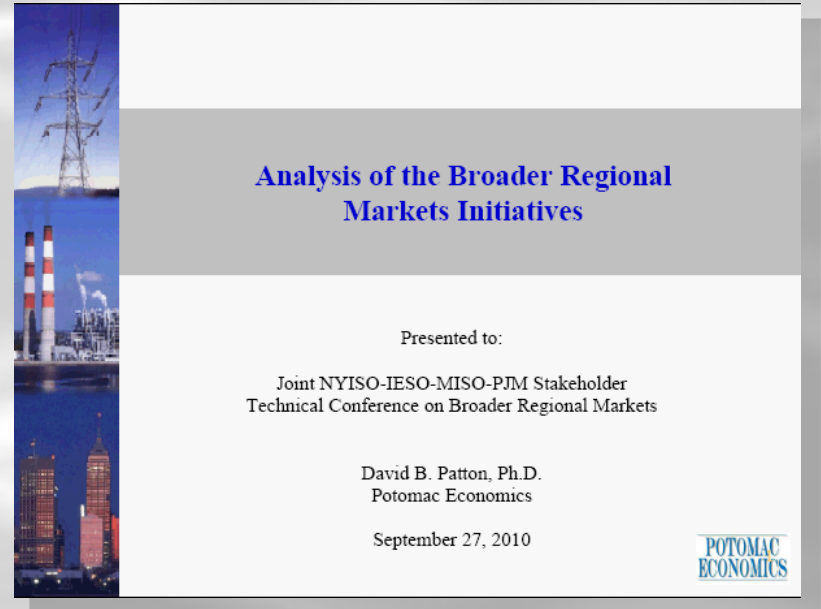
State Transmission Assessment & Reliability Study (STARS)



- New York Transmission Owners studying synergies of transmission replacement and expansion along existing Rights-of-Way
- Evaluating cost effectiveness of upgrading / expanding / modernizing vs. basic rehabilitation

Broader Regional Markets

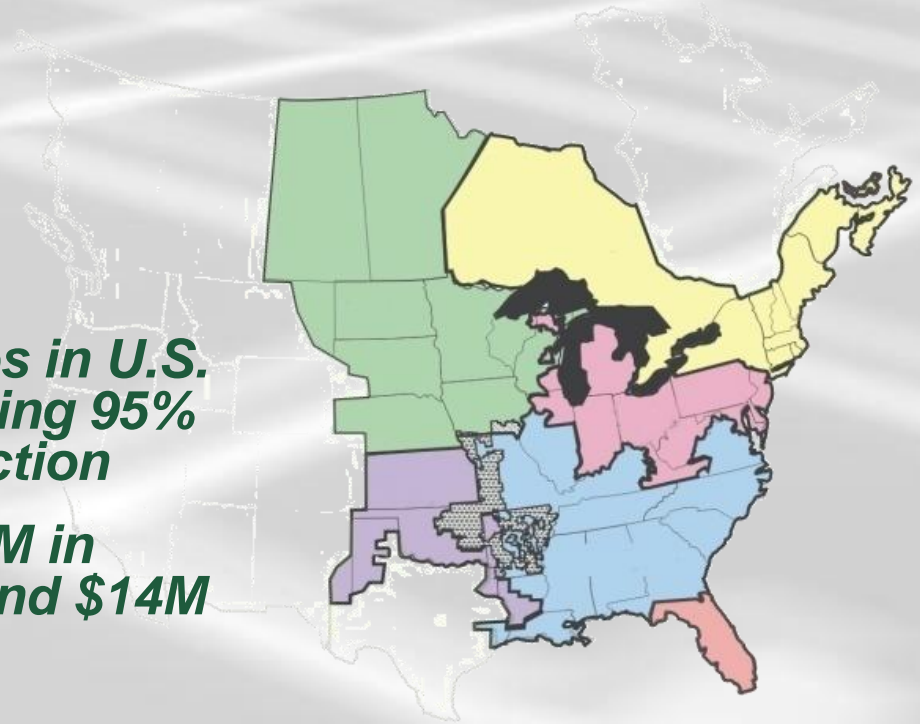
- Estimated annual production cost savings:
 - \$362 million throughout region
 - \$193 million associated with NY



Interregional Planning

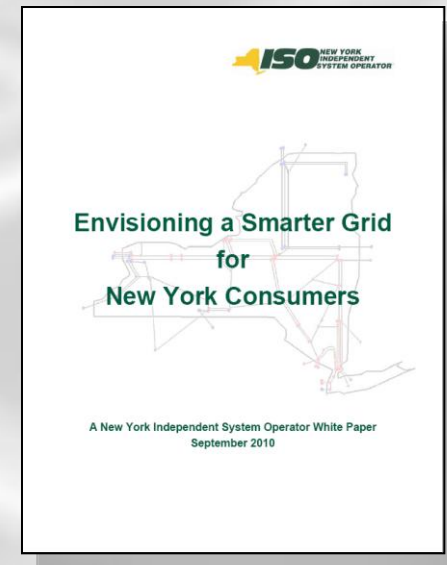
- **Eastern Interconnection Planning Collaborative**

- *25 Planning Authorities in U.S. and Canada representing 95% of Eastern Interconnection*
- *U.S.DOE awarded \$16M in funding for the EIPC and \$14M to the related EISPC*



Smart Grid Vision

- In NYS PSC Smart Grid proceeding, NYISO comments focus on need for Smart Grid to:
 - *Lower costs and expand consumers' understanding and control of their electricity use*
 - *Enhance the reliability and efficiency of the power system by improving grid operators' situational awareness and control*
 - *Assist the growth of renewable resources and complementary energy storage resources*



NYISO SGIG Project

- **Smart Grid Investment Grant (SGIG)**
 - *NYISO and New York Transmission Owners*
 - *Three-Year project -- \$75.7 Million*
 - ◆ DOE funding -- \$37.4 Million to cover 50% of project cost
- **Project components**
 - *Creation of a statewide Phasor Measurement Network*
 - *Installation of Capacitor Banks throughout the state*
- **Enhanced reliability**
 - *PMU Installation among DOE recommendations from 2003 blackout study endorsed by FERC and NERC*

Control Center Project



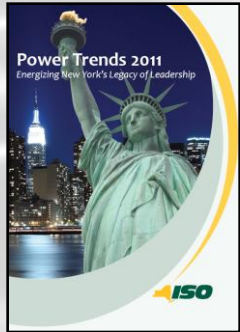
In August, the NYISO will break ground on a control center project providing state-of-the-art facilities to sustain and enhance reliability

NYISO Showcases New York



More than 1200 visitors from over 65 nations have come to the NYISO to learn about reliable grid operations and competitive electricity markets

Authoritative Source



Power Trends

The NYISO's annual study of energy trends and their impact on New York's bulk electricity grid and the state's competitive wholesale electricity markets.

Conferences & Symposium

In 2011, the NYISO will co-host a symposium, "Energy Synergy: Competition & Innovation," with ISO-New England. Previous NYISO-sponsored events have addressed smart grid, energy efficiency, wind power, and demand response.



Reports, Reviews & Analysis

The NYISO publishes a wide array of information, including the Annual Report, the Comprehensive System Planning Process documents, the Load & Capacity "Gold Book," white papers, and other research reports.



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.

www.nyiso.com