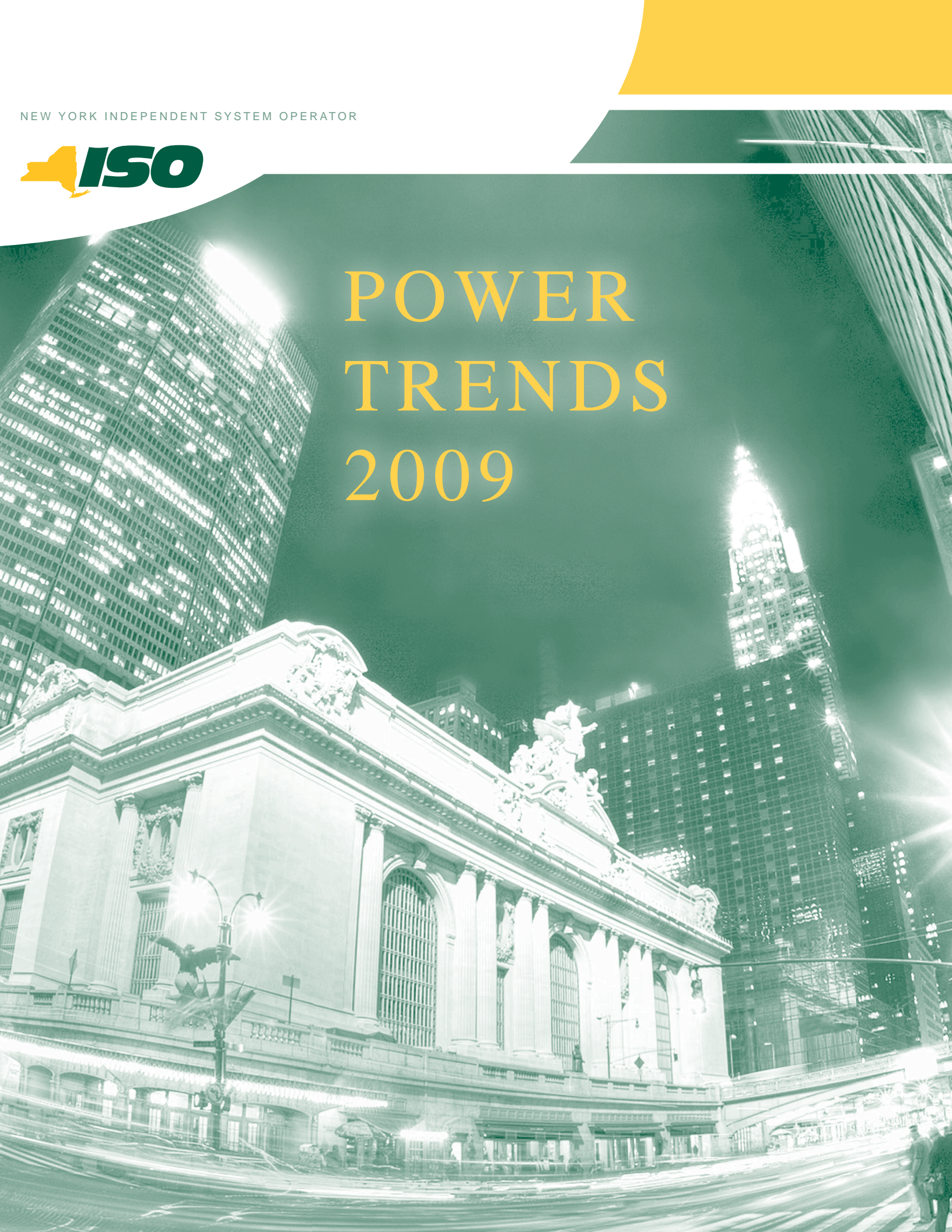


NEW YORK INDEPENDENT SYSTEM OPERATOR



# POWER TRENDS 2009



## The NYISO and Its Roles

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

The NYISO is regulated by the Federal Energy Regulatory Commission (FERC). It is governed by an independent 10-member Board of Directors whose members come from environmental organizations, the power industry, and the fields of finance, academia, technology, and communications. The members of the Board, as well as all NYISO employees, have no business, financial, operating, or other direct relationship to any Market Participant or stakeholder. The NYISO does not own power plants or transmission lines.

This level of independence means that its actions and decisions are not based on profit motives, but on how best to enhance the reliability and efficiency of the power system and safeguard the transparency and fairness of the markets.

The mission of the NYISO is to serve the public interest by:

- *Maintaining and enhancing regional reliability*
- *Promoting and operating a fair and competitive electric wholesale market*
- *Providing quality customer service*
- *Achieving these objectives in a cost-effective manner*

As the administrator of the competitive wholesale markets, the NYISO conducts auctions that match the buyers and sellers of power. The NYISO also manages the efficient flow of power on over 10,000 miles of electric transmission lines on a minute-to-minute basis, 24 hours-a-day, seven days-a-week.

In addition, the NYISO has an expanding and increasingly important planning function. This involves the assessment New York's electricity needs and the evaluation of the proposals to meet those needs. This process involves stakeholders, regulators, public officials, consumer representatives, and energy experts who provide vital information and input from a variety of viewpoints.

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## Executive Summary

The past year was an extraordinary period for New York's electric power industry. Wild swings in global oil and natural gas prices, the crash of the financial markets, a creeping worldwide economic downturn, and the tug-of-war between stricter environmental standards and calls for lower electricity prices have added layers of complexity to the task of maintaining a reliable supply of electricity to serve the needs of the people of New York State.

Electricity is the lifeblood of our economy. The grid and markets act as the cardiovascular system, providing the essential pathways for a sustainable, prosperous future for New York State.

New York's power grid operated without interruption throughout 2008, and its competitive wholesale electricity markets optimized available resources to provide cost effective, reliable electric power for all New Yorkers. However, *Power Trends 2009* looks at an uncertain energy future for New York.

This report provides an overview of the current state of the New York competitive wholesale electricity markets, assesses the known risks to maintaining a reliable energy supply, and outlines the steps needed to provide an efficient, environmentally sound electric system in the years ahead.

### *Where We Stand*

In a short period of time, the state's competitive wholesale electricity markets have attracted a significant amount of private investment in electric resources that are providing reliable, efficient, competitively priced electricity for consumers.

New power plants are producing fewer emissions and renewable energy projects represent the majority of new power projects proposed for connection to the grid. In addition, demand-management programs and energy efficiency programs are helping to reduce the rate of growth in electricity consumption.

New "Smart Grid" technologies are being developed that will improve power grid operations and empower consumers to better manage their electricity consumption.

Most importantly, when the impacts of fuel costs are taken out of the equation, wholesale electricity prices were lower in 2008 than they were in 2000, when competitive wholesale electricity markets were established in New York State.

This combination of factors has resulted in a more reliable, environmentally enhanced, and efficient power grid for New York consumers.

## *The Road Ahead*

Based on current NYISO projections, the state's wholesale electric power system will continue to meet accepted reliability standards through 2018. However, there are several foreseeable risks to future system reliability:

- *The long-term need for new resources at a time when the global financial crisis is slowing private investment.*
- *The short-term dampening of demand for electricity during the current recession may mask the need to address expected future growth.*
- *The potentially competing effects of new environmental standards and the desire for lower electricity prices.*
- *The state's dependence on oil and natural gas to produce electricity, making it vulnerable to fuel price spikes and potentially threatening system reliability in the event of supply curtailments.*
- *An aging fleet of power plants and transmission lines, causing reliability, environmental, and price concerns.*

## *How We Will Get There*

Meeting New York's future electricity needs will require an ongoing collaborative effort to balance a complex array of economic, environmental, and energy challenges.

The NYISO is committed to pursuing solutions to New York's energy challenges and will take action to:

- *Reduce the Growth in Electricity Use*
  - ♦ Assist with the implementation of the state's "45 x15" program, which calls for reducing electricity use by 15% while increasing the Renewable Portfolio Standard to 30% by 2015.
  - ♦ Promote demand response programs and other market-based incentives to expand conservation.
  - ♦ Support the advancement of Smart Grid technologies, such as advanced metering, which will allow consumers to manage their electricity use in response to price signals.

- *Facilitate investment in power system infrastructure*
  - ♦ Identify upgrades to improve the overall reliability and efficiency of New York's high-voltage transmission network.
  - ♦ Advocate renewal of the power generating facility siting law.
- *Encourage renewable development to diversify power system resources*
  - ♦ Work collaboratively with regulators and stakeholders to determine where to site and how best to finance the construction of new transmission lines to bring the benefits of renewable resources to all consumers in the state.
  - ♦ Continue to implement wind management programs to foster the full integration of wind power into the daily operation of the wholesale power system.
- *Foster the development and deployment of Smart Grid technology*
  - ♦ Collaborate with state and federal agencies, national and state research and development entities, and other Independent System Operators and Regional Transmission Organizations (ISO/RTOs) to establish Smart Grid standards and protocols to improve the efficiency and reliability of the grid.
  - ♦ Support the New York State Public Service Commission's Advanced Metering Infrastructure program to more accurately measure and manage electricity use.
- *Implement market enhancements to attract investment*
  - ♦ Evaluate and implement a Forward Capacity Market to help ensure future development of resources and demand-side management programs.
  - ♦ Continue market design improvements to enable full use of New York's wind power potential.
  - ♦ Evolve the market to accommodate new technologies such as flywheels, battery storage systems, and distributed renewable generation.
  - ♦ Further enhance demand-side market components and program standards.

## I. Where We Stand

***Market-based innovations and cost-effective solutions are making today's competitive wholesale electric system more efficient and more responsive to the needs of New York consumers.***

Over the past decade, the electric power industry in New York has undergone a remarkable transformation. A system once dominated by vertical electric utility monopolies has been transformed into a competitive marketplace in which more than 300 suppliers vie to sell power over an open access bulk electricity grid.

Competition in the electric power industry has resulted in a significantly more reliable and efficient power system. This has provided consumers with cleaner, competitively priced electricity and created opportunities for the development of renewable energy, increased levels of demand-side resources, and the deployment of advanced technologies.

A snapshot of the New York system today shows that competitive markets have:

- *Resulted in lower wholesale electricity prices when the effects of volatile natural gas and oil markets are taken into account, reducing costs by billions of dollars.*
- *Increased electricity supply by attracting substantial private investment in much-needed power generation and transmission facilities.*
- *Facilitated the development of low-emission power plants and new renewable energy projects and promoted expansion of energy conservation/demand-management programs.*
- *Prompted companies to operate their plants more efficiently, resulting in their increased availability, which provides additional power without costly investments in new construction.*
- *Produced an enhanced climate for transmission investments to improve the efficient flow of power throughout the state.*
- *Created a platform that will support "Smart Grid" technologies to improve power grid operations and better manage electricity use.*



### *Private Investment to Meet Public Needs*

New York's competitive power markets have attracted as much as \$5.5 billion of private investment in new energy projects, increasing available supply by more than 6,000 megawatts (MW) – enough to power six million typical households. In addition, more than \$800 million has been invested in transmission facilities, increasing the capacity connecting New York and neighboring markets by nearly 1,000 MW.

Most new power plants have been built in New York City, Long Island, and the lower Hudson Valley where electricity use is greatest – and wholesale prices are highest. These projects are confirmation that transparent prices, available only through the competitive markets, are directing investment to areas that need it most. Siting power generating facilities closer to areas of high consumer demand will improve the efficiency of the bulk electricity grid and alleviate price pressures caused by congested power lines.

What's more, private investors – rather than rate paying consumers – assume the financial risk for these plants. Under a regulated regime, consumers were ultimately responsible for paying for these plants, including a guaranteed rate of return for the utilities building them. Consumers also bore the costs of any associated financial risks if the projects failed.

Transmission improvements, including the addition of the Cross Sound Cable from Long Island to Connecticut in 2005 and the Neptune Cable between Long Island and New Jersey in July 2007, have increased New York's access to resources in neighboring markets by nearly 1,000 MW. Several proposals to lay transmission cables under the Hudson River, connecting New Jersey and New York City, and a new 345 kilovolt (kV) cable from Westchester to the Bronx are moving forward. The NYISO's comprehensive planning process will continue to identify where investment is needed to maintain reliability, address congestion issues, and keep pace with growing demand.

Figure 1

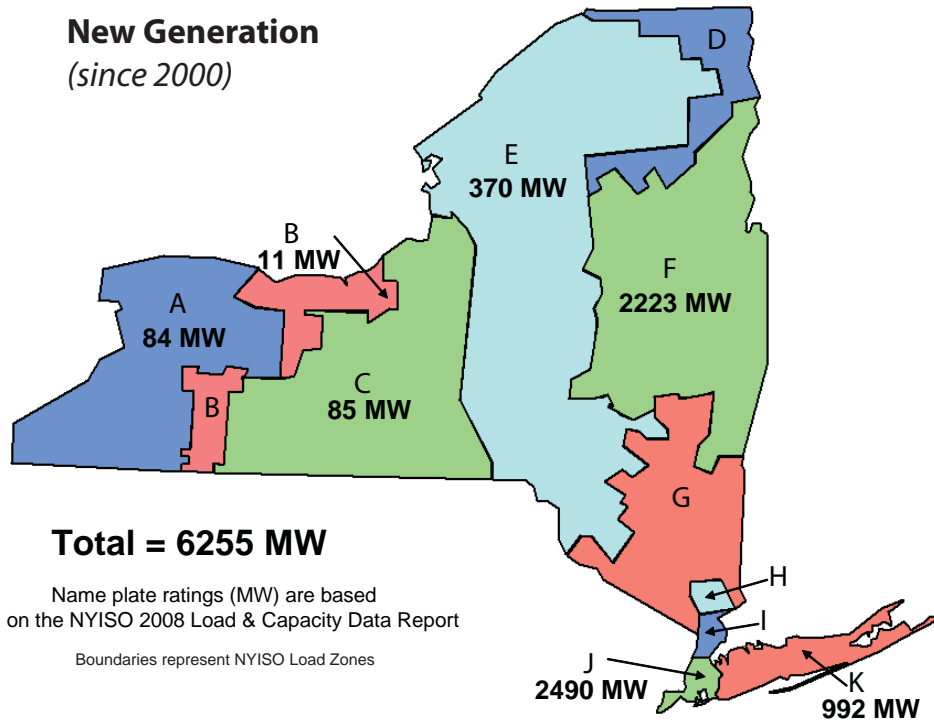
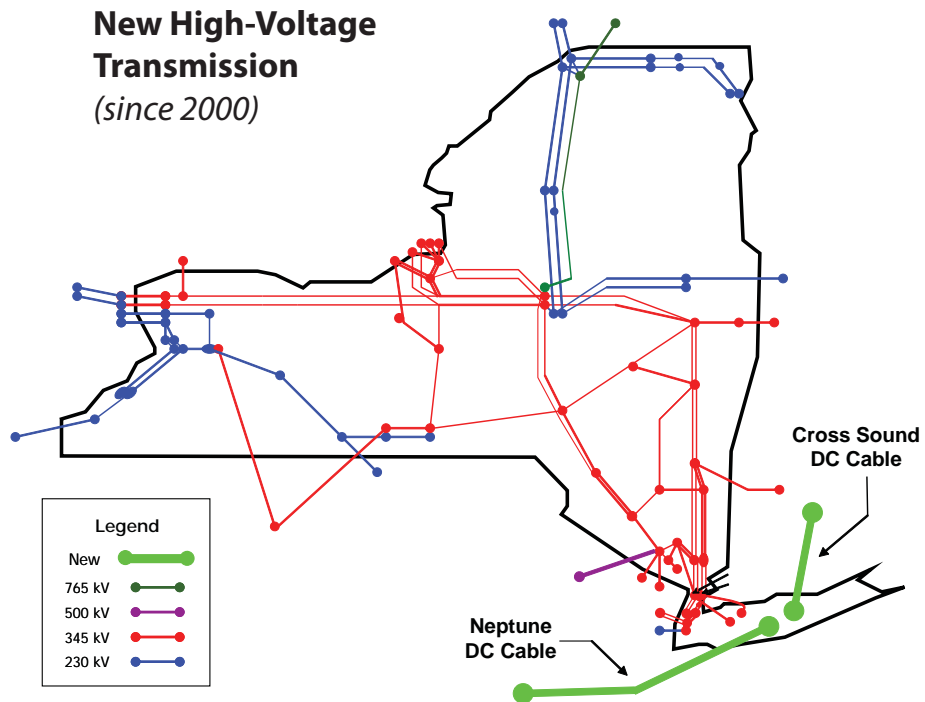


Figure 2



## *Electricity and Environmental Quality*

Competitive markets have resulted in a more efficient, environmentally sound power system. The NYISO's ability to optimize all system resources, the addition of cleaner, more efficient power plants, aggressive energy efficiency programs, the development of renewable energy, and improved demand-side management have combined to "green the grid."

Since 2000, power plants with generating capacity totaling 2,069 MW have retired. Of that total, 2,060 MW were powered by fossil fuels, including 987 MW of coal-fired generation. The new power plants built since the inception of electricity markets in New York run primarily on cleaner-burning natural gas, which is helping to reduce emissions that contribute to global climate change. In addition, New York has seen an increase in output from nuclear plants, which are virtually emission-free. The production of cleaner power is an important component in the state's efforts to meet newly enacted environmental standards.

Open access to the state's electricity grid has also increased the number of existing and planned projects powered by renewable resources, which are more protective of the environment than are traditional fossil-fueled plants. Commercial power production from renewable resources, predominantly hydroelectric power projects, currently totals more than 5,600 MW of electricity. Nearly two dozen private sector energy service companies now offer customers the option to purchase green power. More than 1,000 MW of windpower has been added in recent years and over 8,000 MW of additional windpower projects are proposed for development in the state.

The NYISO has taken steps that, according to FERC, "will benefit, and encourage, wind and other intermittent generators." Those steps include a centralized wind-forecasting initiative, unique market rules for wind projects, and proposals to enhance the dispatch of wind power on New York's bulk electricity grid.

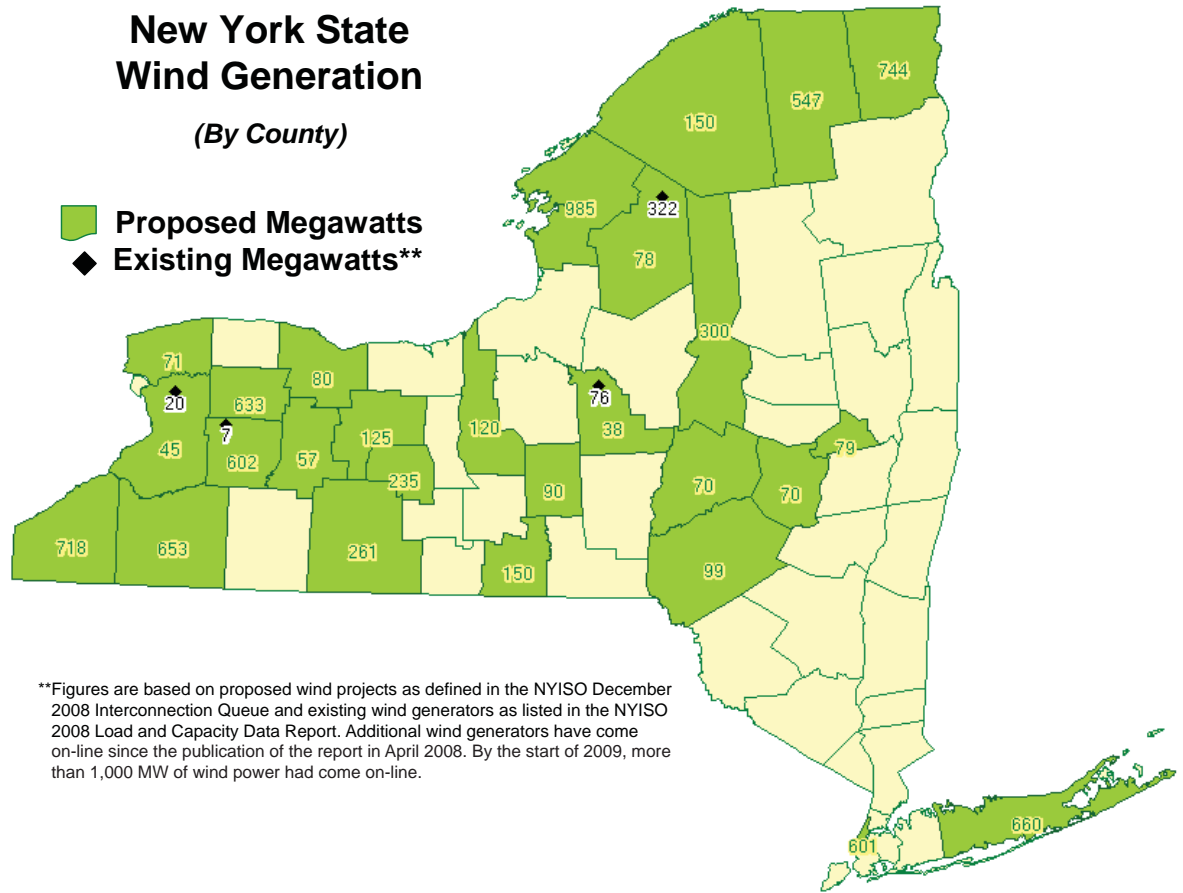
New York State Governor David Paterson and the Legislature are vigorously pursuing conservation and energy efficiency programs to control the growth in power consumption. These programs contribute to better power management, particularly during extreme weather conditions when electricity use is highest. They also help to lower consumer costs.

The NYISO has implemented innovative demand response programs, which provide incentives for electricity customers to reduce their power use during times of peak demand. Although these

energy conservation mechanisms were created to help ensure a sufficient supply for all consumers, they also can mitigate price volatility while diminishing the need to operate older, higher-emission power generating units. The program has grown to nearly 3,000 participants including large manufacturing facilities, educational institutions, and other power consumers aggregated by energy services companies. The potential electricity savings that can be realized from the programs have increased markedly to about 2,100 MW – an amount equal to four medium-sized power plants.

The NYISO is currently reviewing possible mechanisms to integrate more demand response resources into the state's wholesale markets, where they would compete with traditional power generating facilities to meet consumer power needs.

Figure 3



### Improved Plant Efficiency

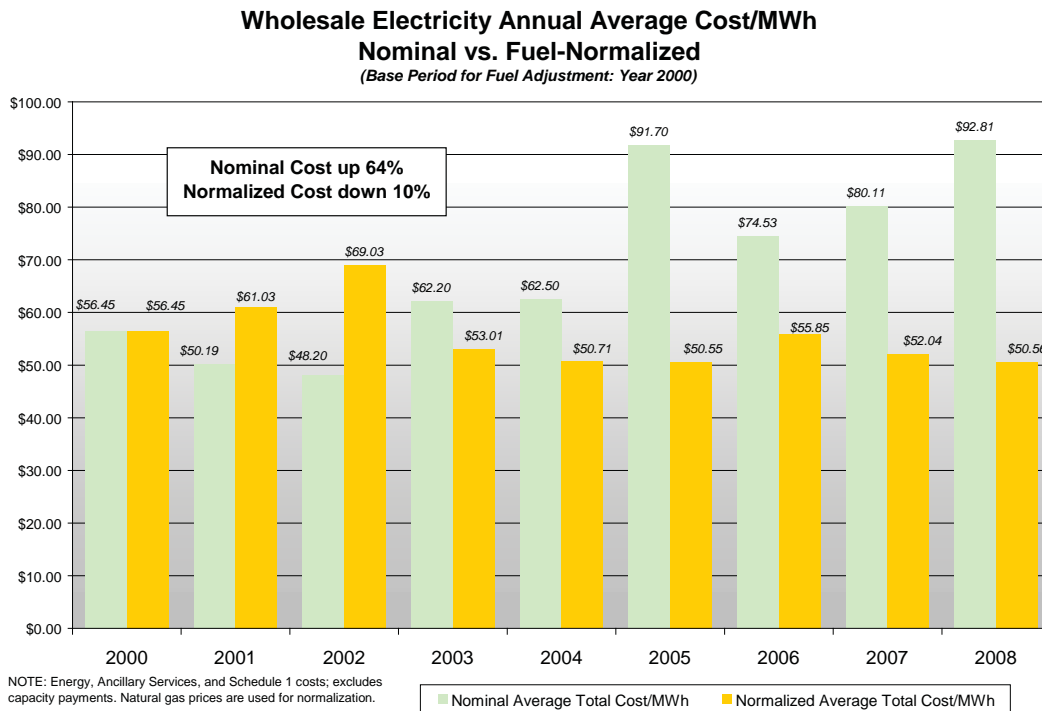
In the competitive electricity markets, power plants do not earn revenues unless they are generating power. This has prompted plant owners to operate plants more efficiently, leading to increased average plant availability – from 87.5% (1992–1999) to 94.4% (2001–2007). This improvement in plant availability is equivalent to adding 2,400 MW of generation. Annual figures for plant availability can fluctuate significantly. In the past year, for example, plant availability lessened. Yet, it remains better than experienced prior to the inception of wholesale electricity markets in New York.

### Lower Wholesale Prices

Between January 2000 and August 2008, fuel-adjusted wholesale electricity costs decreased by 11%. This amounts to annual cost reductions of approximately \$1.2 billion in today's dollars.

However, the volatile costs of fuels, especially fossil fuels, have had a significant effect on wholesale prices, particularly over the past year. During periods of increased usage, relatively more

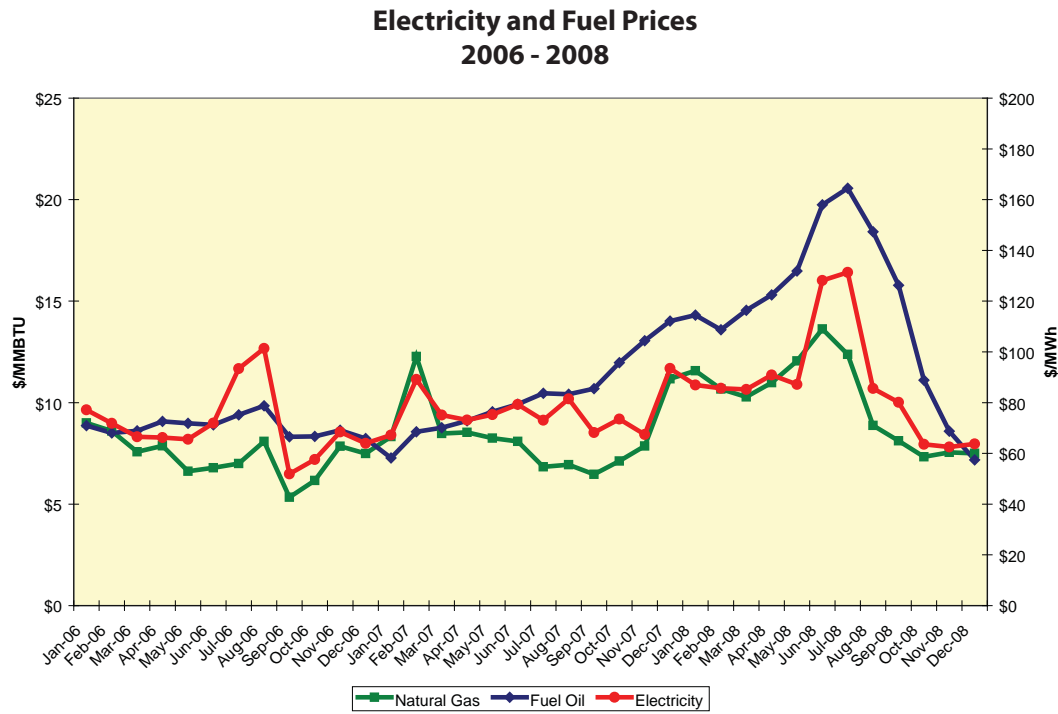
Figure 4



expensive units are often called upon to meet the increased demand. Nearly 70% of the time, these generating units are fueled by natural gas or oil. As long as the state remains so heavily reliant on natural gas and oil to produce power, wholesale electricity prices will be tied to the price of these fuels.

Recent price trends highlight this connection. Between the summer of 2007 and the summer of 2008, while natural gas prices rose by 60%, wholesale power prices increased by 48%. More recently, between June 2008 and November 2008 as natural gas prices decreased by 45%, wholesale electricity prices in New York declined by 54%. Given this correlation, based on current oil and gas price forecasts by the U.S. Energy Information Administration and other independent analyses, New York consumers should see lower electricity prices in 2009.

Figure 5



## II. The Road Ahead

***A number of important factors – global financial instability, environmental initiatives, volatile fuel prices, and others – pose risks for electric power grid reliability.***

Based on current projections, New York's bulk electric power system will continue to meet accepted federal and state reliability standards through 2018. The system achieved this level because of steps taken in recent years to add new power-generating facilities, construct and upgrade transmission lines, and develop energy conservation and efficiency programs. But, difficult realities will continue to challenge the system.

Most recent of these is the global financial crisis. This issue has spread uncertainty regarding the ability of generating companies and utilities to finance major infrastructure projects. In addition, a delicate balancing act will be required to meet environmental goals while achieving a diverse resource mix and maintaining competitive prices. The NYISO is working to address these challenges and capitalize on opportunities to further strengthen New York's electric power grid.

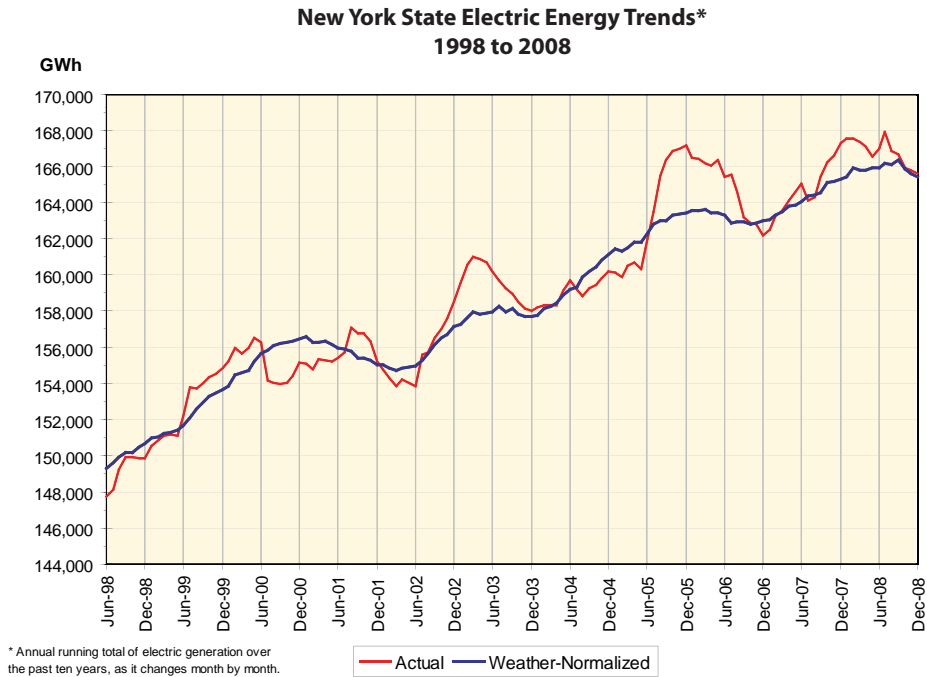
The main challenges can be broken down into five categories:

- *Impact of Growing Demand*
- *Fuel Diversity*
- *Aging Infrastructure*
- *Impact of New Environmental Standards*
- *Global Financial Uncertainty*

### ***Impact of Growing Demand***

Overall consumer demand for power has been trending steadily upward for the more than a decade. Annual electricity use in New York grew from 147,000 gigawatt-hours (GWh) in 1998 to 168,000 GWh in mid-2008, a 12.5% increase. Air conditioning, large-screen TVs, computers, and an array of other consumer electronics and information-technology products have combined to add new demand to the New York electric power grid. The effect of these increases is particularly noticeable during times of extreme summer heat when energy use is at its peak.

Figure 6



In the short term, several factors may mitigate growth in demand. A slowing economy is expected to reduce consumer power demand and New York State is aggressively pursuing public policies aimed at improving energy efficiency as it implements Governor David Paterson's "45 X 15" program, which includes reducing future electricity use by 15% of forecasted levels by 2015.

By the end of 2008, the effects of the economic downturn were becoming evident in patterns of electricity demand. New York State's 12-month average of actual electrical energy usage decreased at a rate of -1.03%. While New York City had modest growth (0.16%), Long Island (-1.28%) and Upstate (-1.69%) experienced declining energy use.

Figure 7

<b>Annual Electric Energy Use</b>			
	<b>2007 GWh</b>	<b>2008 GWh</b>	<b>Change %</b>
<b>New York State</b>	<b>167,337</b>	<b>165,613</b>	<b>-1.03%</b>
<i>New York City</i>	<i>54,750</i>	<i>54,835</i>	<i>0.16%</i>
<i>Long Island</i>	<i>22,752</i>	<i>22,461</i>	<i>-1.28%</i>
<i>Upstate</i>	<i>89,834</i>	<i>88,316</i>	<i>-1.69%</i>



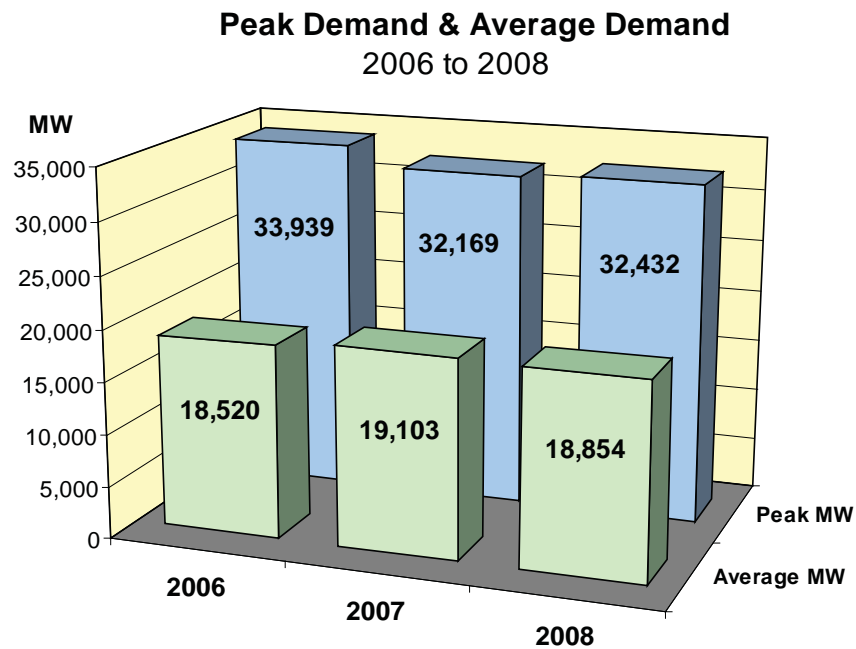
In the long term, as the economy emerges from the current recession, the factors that caused a double-digit increase in electricity use over the past 10 years are expected to again raise electricity consumption. This will require a sustained focus on maintaining adequate power supplies.

In addition, electricity needs increase sharply during times of extreme summer weather conditions. It is common for the state's summer peak demand to spike nearly 40% above the average level of electricity use. During extreme conditions, the difference can be substantially greater. In 2006, summer heat waves produced a record peak demand of 33,939 MW, 80% higher than the average hourly demand of 18,520 MW.

Peak demand during heat waves reflects the increased use and availability of air conditioning and cooling systems. The power system must have adequate capacity to meet this load. The additional 15,000 MW of demand during such peaks equates to adding approximately 30 power plants (of 500 MW capacity) to supply the electricity needs of New Yorkers on the hottest days of the year.

The challenge for the NYISO is to foster an adequate power supply to meet those times of peak demand – even though they may occur for only a few days each year – while working to hold down wholesale electricity costs throughout the year.

Figure 8

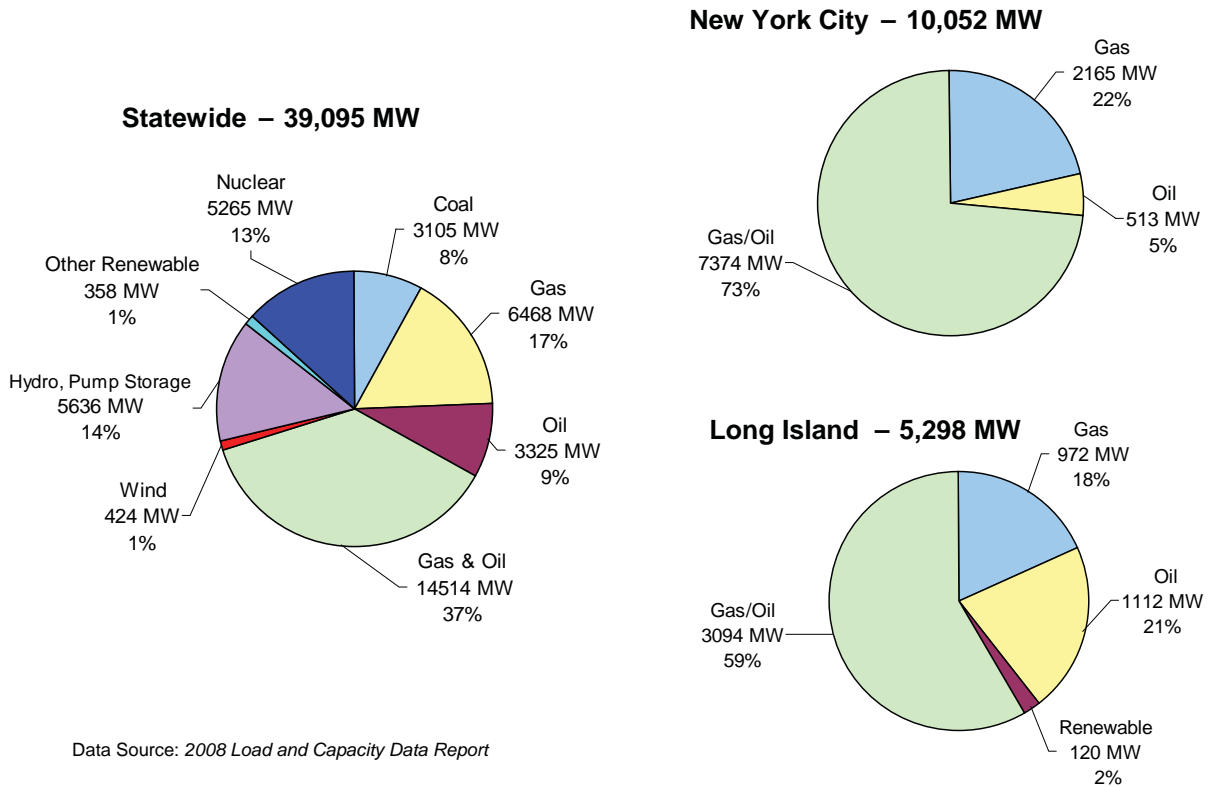


### Fuel Diversity

As noted, electricity prices rose significantly in the first half of 2008. While some observers pointed to the competitive electricity marketplace, the real culprit was the high cost of fuel used to produce power. Currently, over half of available power-generating capacity statewide is fueled by oil and/or natural gas. The New York City and Long Island areas are even more reliant on electricity produced by fossil fuels. This imbalance unduly ties consumer electricity costs to highly volatile and unpredictable prices set by the global commodity markets. In addition, the production of large portions of the world's petroleum supply is controlled by nations with economic and political interests that may be contrary to those of the United States, which creates energy security concerns.

Figure 9

## Electric Generation Capacity by Fuel Type: 2008



## *Aging Infrastructure*

As in most states, New York's fleet of power plants and its transmission system are aging.

Nearly half of the state's generating capacity is over 30 years old, and a full 17% (6,608 MW) of the state's generating capacity comes from power plants that began operating in the 1960s or earlier. Existing power plants totaling more than 1,200 MW of generating capacity are projected for retirement over the next decade.

Over 2,600 MW of planned new market-based projects are currently moving through the planning and permitting phases of development, and – if approved – will help keep pace with long-term trends. In addition, more than 8,000 MW of proposed renewable power projects are now being studied for interconnection to the grid.

However, there remains a need for reestablishing a power plant siting law that balances state and local interests and provides for a time-certain, streamlined permitting and approval process such as the Article X law that expired in 2002. The absence of such a process has resulted in all new power-generating proposals being required to undergo lengthy planning, design, government permitting and construction processes that take years to complete, and through which parochial concerns may nullify important state interests. In light of that, early and accurate planning to meet the state's power needs remains an ongoing NYISO priority.

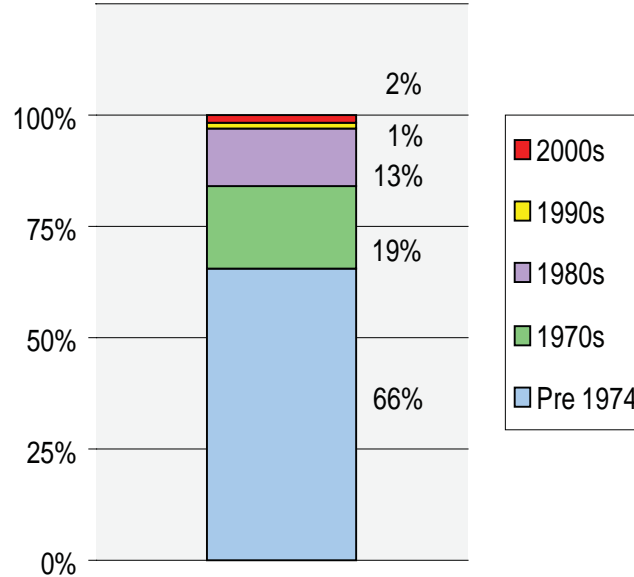
Two-thirds of New York's high-voltage transmission system was built before 1974. While new transmission connecting New York to other systems has been developed in recent years, the last major intrastate transmission line, the Marcy-South project, was completed in the late 1980s.

A renaissance in cleaner generating technologies, built in locations remote from the population centers of the state that demand the most electricity, is among the developments placing additional stress on our existing transmission system.

Many areas of the transmission system currently experience congestion due to changing patterns of electricity usage. These congestion points inhibit the flow of electricity from available power supplies to areas of acute power demand, resulting in higher electricity prices.

Figure 10

**Age of New York State High Voltage Transmission Lines**  
 (% of Circuit Miles, 230 kV and Above)



*Impact of New Environmental Standards*

New environmental standards to control greenhouse gas emissions combined with state and federal efforts to increase requirements for renewable resources will have the most significant impact on the future development of the power grid.

- **New York State Renewable Portfolio Standard (RPS)**

*Established by the New York State Public Service Commission (NYS PSC) in 2004, the Renewable Portfolio Standard (RPS) requires that 25% of the state's electricity be generated from renewable resources by 2013. Policy benefits include 1) a more diverse mix of fuels used for power generation, which will improve energy security and independence, and 2) an improved environment from reduced power plant air emissions.*

*In February 2008, New York State's Renewable Energy Task Force, led by then-Lt. Governor David Paterson, found that "Current RPS funding of \$782 million is not sufficient to meet New York's goal to obtain 25% of its electricity from renewable sources by 2013 and the timeline for the RPS program is not consistent with the State's long-term goals." The Task*

*Force recommended an evaluation of increasing the goal. In October 2008, the NYS PSC initiated a proceeding to increase the RPS goal to 30% and extend the target date to 2015. Governor David Paterson made it a component of the "45 X 15" Plan he proposed in his 2009 State of the State Message.*

*Two primary challenges must be addressed if the state is to realize the full potential of the RPS initiative:*

- ♦ **Fully integrating wind-produced electricity into the bulk electricity system.**

Because of the intermittent nature of wind speed and the energy it produces, managing the availability of bulk wind-generated electricity to meet consumer demands is difficult. The NYISO has embarked on an innovative wind-forecasting program to overcome this hurdle and make wind power an important contributor to meeting consumer electricity needs.

- ♦ **Transporting power from renewable resources to consumers.** This is a serious issue that requires capital investment in transmission system infrastructure. Most wind and hydropower projects are located in remote areas far from the population centers where electricity is needed most. The NYISO is analyzing the feasibility of options to mitigate transmission constraints and facilitate the flow of renewable energy to high-demand areas. The groundwork for such efforts will be laid by studies of long-range transmission needs and the initiation of NYISO's economic planning process in 2009.

- **National Renewable Portfolio Standard**

*In recent years, various legislative proposals have sought to establish a national RPS as New York State, 28 other states, and the District of Columbia have each adopted renewable energy requirements. President Obama and the leadership of the 111th Congress have signaled their interest in a national RPS. Deliberations on the federal initiative require the attention of New York State to ensure consistency between the provision of a federal RPS and New York State's renewable energy goals.*

- **Regional Greenhouse Gas Initiative (RGGI)**

*This initiative is a compact of ten eastern states, including New York, seeking to restrict carbon dioxide emissions from power plants. It is a market-based effort to reduce greenhouse gas emissions that contribute to global climate change. RGGI is designed to make clean*

*power generating resources and conservation more economically competitive with fossil-fuel power plants. The program's first three-year compliance period began January 1, 2009.*

*The availability of RGGI emission allowances can become a crucial factor in the dynamics of the power system.*

*Retirement of a major plant in certain key locations – for example, if the operating licenses of one or both of the Indian Point nuclear power units were not extended – could cause a severe shortage of electricity resources and create a strain on the availability of emission allowances.*

*The NYISO continues to closely monitor the electric power grid to ascertain the impact of RGGI and other programs on system reliability.*

- **Federal Cap and Trade Legislation**

*President Obama has said that his administration's priorities include a national cap and trade program that would reduce U.S. greenhouse gas emissions to 1990 levels by 2020 and reduce emissions by 80% by 2050. A number of legislative proposals for national cap and trade systems have been introduced in recent sessions of the U.S. Congress, some of which focus on power plant emissions, while others address emissions by all sectors of the economy.*

- **Ozone Compliance**

*Ground level ozone is the product of hydrocarbons (HC) and nitrogen oxide (NOx) emissions – from oil, coal and other fossil fuel power plants as well as cars and other transportation vehicles – reacting with sunlight to create ground-level smog. In 2005, the U.S. Environmental Protection Agency (EPA) announced the Clean Air Interstate Rule (CAIR) covering 28 eastern states and created the Ozone Transport Commission (OTC).*

*New York's proposed implementation plan is under review by the EPA. However, in 2008 federal courts first vacated and then temporarily reinstated the CAIR, resulting in great uncertainty about the timing and direction of federal and state efforts to limit NOx emissions*

*The NYISO is working under the expectation that rigorous NOx emission control requirements will emerge from the regulatory process. The highest NOx emitters in the state are old "peaking" generators, which are located primarily in southeastern New York and operate on extremely hot and cold days when consumer power demand is at its highest. The NYISO is assisting, with its technical expertise, New York State's efforts to develop an efficient, cost-*

*effective approach to reduce NOx emissions while maintaining the reliability of the bulk power system.*

- **Energy Efficiency Portfolio Standard**

*In June 2008, the NYS PSC issued a decision establishing the state's Energy Efficiency Portfolio Standard (EEPS) to address the goal of reducing electricity use by 15% from forecasted levels by the year 2015 by various means, including:*

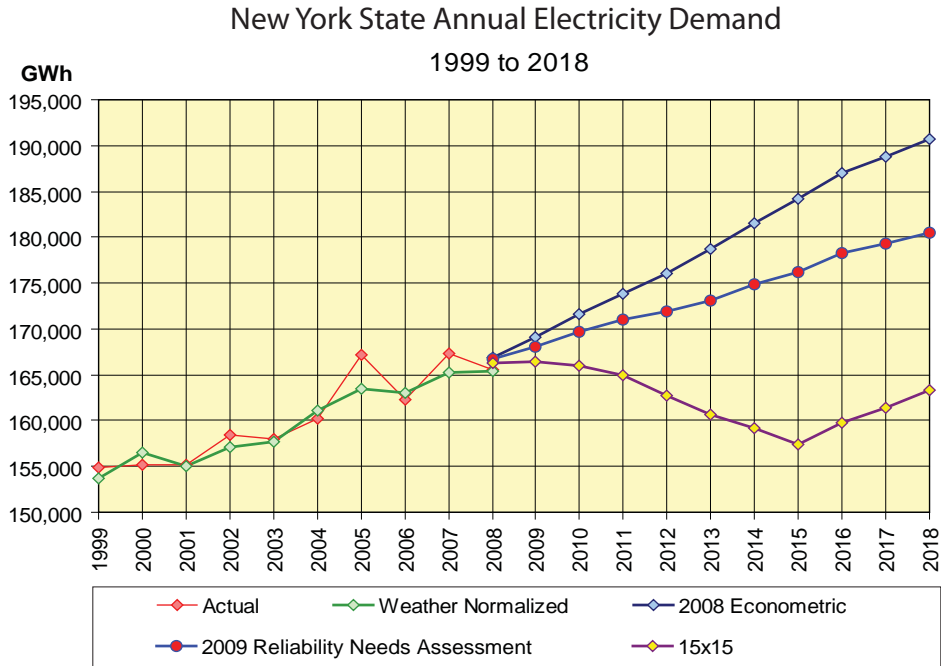
- ♦ *Stimulating investment in energy efficiency using available technologies such as compact fluorescent bulbs, solar hot-water heaters, and insulating wraps for hot-water tanks.*
- ♦ *Implementing new energy efficient building codes and construction design standards.*
- ♦ *Providing incentives to encourage the purchase of energy efficient appliances – boilers, furnaces, air conditioners, washers/dryers, etc.*
- ♦ *Providing weatherization services for low-income households and energy retrofits for small businesses.*

*The NYS PSC has established interim targets and funding through the year 2011, including an initial fund of \$330 million a year for energy efficiency programs. Under the plan, the state's utilities are required to develop efficiency programs and submit them for Commission approval.*

*Total investment in New York State energy efficiency initiatives needed to achieve this goal is expected to be \$6 billion. Thus the EEPS initiative could substantially change the state's electric power system. The 15% reduction target is equivalent to a 7.5% drop in current power usage. Over the last ten years, New York's average annual growth rate of electric energy consumption was 1.23%. The NYISO's 2009 Reliability Needs Assessment anticipates that electric energy consumption will increase by less than 1% (0.80%) annually from 2009 through 2018, based on the assumption that usage will be reduced by the currently approved funding levels for New York's energy efficiency initiatives. In the absence of those programs, energy consumption could grow by 1.31% annually.*

*The NYISO is closely monitoring EEPS implementation to provide assurance that the resulting reductions in electric usage are both quantifiable and sustainable. In addition, the impact of the state's electricity reduction initiative on private investment in new generating facilities to meet future consumer power demand requires close attention.*

Figure 11



### Global Financial Uncertainty

As with most business sectors, the electric power industry in New York continues to be affected by the global financial crisis.

Disruptions in the credit markets have resulted in loan defaults and other circumstances that are limiting or delaying investment in energy infrastructure projects. These disruptions are occurring at a time when new environmental mandates require substantial power production and transmission company investments in new plant technologies to limit air emissions and in renewable energy projects.

Business consolidation, mergers, and acquisitions within the energy sector could impact the dynamics of wholesale electricity markets if the number and array of market participants is significantly diminished.

The NYISO is keeping a close watch on developments in the credit markets to assess the impact on proposed supply and transmission projects. It will reevaluate current supply projections and reliability assessments and will take immediate steps to notify regulators and decision makers of impending problems to provide sufficient time to address them with comprehensive solutions.



### III. How We Will Get There

***New York's wholesale power markets have made great strides in meeting the electricity needs of consumers. However, more must be done to address and balance energy costs and environmental requirements to ensure power grid reliability.***

#### *Sound Planning*

The NYISO employs comprehensive planning, in collaboration with its stakeholders, to sustain and support the development of a highly reliable electric power system for New York. This solid framework has successfully identified the state's electricity needs, which have been met to date by competitive market-based solutions.

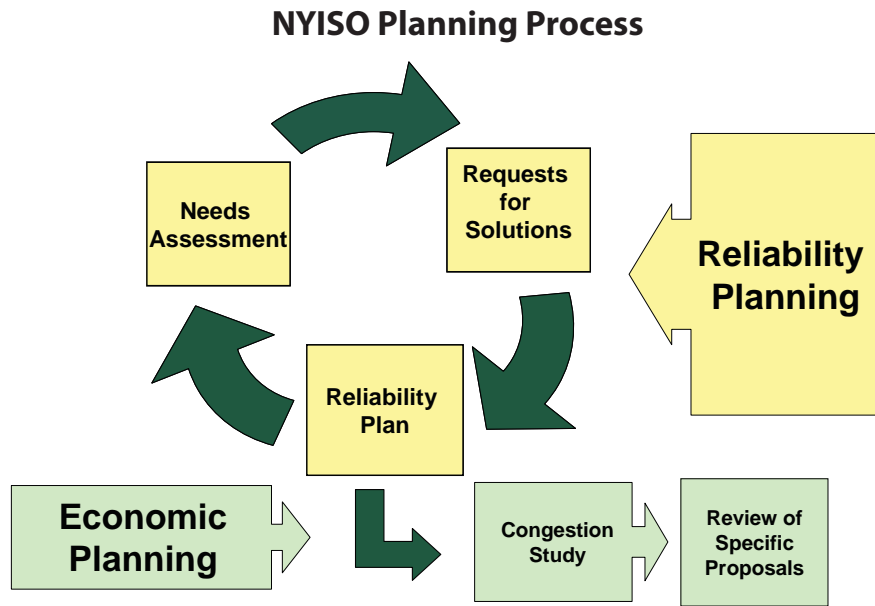
With system reliability as its perpetual goal, the NYISO employs a multi-phased planning process to 1) evaluate future consumer demand for electricity and 2) verify that an adequate, reliable power supply is available to meet that demand. This comprehensive planning process forecasts the state's electricity needs over a 10-year period as well as the electric power grid's ability to reliably meet those needs.

Phase One involves a thorough assessment of New York's anticipated electricity needs ("demand") and the resources currently available to meet them. The ensuing report, the *Reliability Needs Assessment*, identifies any expected shortfalls in supply long before they could potentially affect system reliability.

In Phase Two, the NYISO solicits solutions that could meet the identified reliability needs. The proposed solutions may include new power generation and transmission to boost the availability of supply, along with demand-side resources and conservation proposals to reduce electricity use. Competitive market-based solutions are given first priority because of their cost efficiency and reduced risk to the consumer. The NYISO evaluates the feasibility of the proposed projects, but does not have the authority to determine which of them will be built. Those decisions are made by project developers, whose proposals must undergo a rigorous governmental siting and permitting process. If market-based solutions are not available when needed, the NYISO will ask the responsible Transmission Owner to invoke a regulated backstop solution to maintain reliability.

This second phase concludes with the publication of the *Comprehensive Reliability Plan*, which identifies the proposed solutions that the NYISO has found will satisfy the power needs identified in the Needs Assessment report.

Figure 12



In 2009, the NYISO will begin an important new economic planning process to identify existing and future power transmission constraints and analyze the costs and benefits of possible solutions to alleviate them. These economic studies will provide the marketplace important information that should help improve the economic efficiency of the power system by 1) alleviating current and projected bottlenecks and 2) enhancing electricity flow to facilitate bringing renewable energy to population centers where the need for power is greatest.

The NYISO has also been collaborating with the state's new Energy Planning Board, established by Governor David Paterson in April 2008, to create a comprehensive State Energy Plan to ensure adequate power supplies, reduce dependence on imported oil and gas, and stimulate economic growth. The final plan should play an important role in guiding the development of consistent, balanced policies and regulations affecting the state's economy, environment, and power system. The State Energy Plan is scheduled to be finalized by October 15, 2009.

## *Transmission*

Maintaining the integrity of New York's high-power transmission network must be a primary focus of efforts to sustain and enhance overall power grid reliability.

In October 2008, FERC approved the NYISO's Comprehensive System Planning Process (CSPP), which incorporates the existing reliability planning process as well as a new economic planning process called the Congestion Analysis and Resource Integration Study (CARIS). In this new process, the NYISO will perform forward-looking economic analyses to provide information to New York market participants, regulators, public policymakers, and other stakeholders. It will identify potential solutions to reduce the cost of congestion on the bulk power system and provide an estimate of the potential economic savings both on a statewide basis and for the affected electricity consumers. Transmission developers will have the ability to propose an economic project for cost recovery under the NYISO tariff, if it meets the applicable benefit/cost requirements. An additional requirement is approval by 80% of the parties that benefit from the proposed project. The NYISO plans to begin the first CARIS analysis in June 2009.

In addition, New York transmission companies have initiated a State Transmission Assessment and Reliability Study (STARS) project, which will assess the condition of the state's electric transmission infrastructure and identify needed improvements to sustain a robust and reliable electric supply system for the future. Initial study findings are expected in 2009.

Beyond New York's borders, studies and proposals are being discussed to create a national transmission grid to support the development of a federal renewable portfolio standard.

There is little doubt that new and upgraded high-voltage transmission lines are needed to strengthen the state's bulk power grid and facilitate the integration of more renewable sources. Planned improvements should be designed to help ease transmission system bottlenecks, permitting wider access to lower-cost wholesale electricity while reducing the overall cost of power.

Several previously proposed transmission projects have met with strong opposition based on environmental, health and aesthetic concerns. Collaborative planning among New York stakeholders to explore innovative solutions – such as replacing older, low capacity transmission lines with new higher capacity lines within existing rights-of-way – is needed to strike an appropriate balance between addressing realistic concerns and progressing toward a more stable energy future.

### *Diverse Resources*

Over-reliance on natural gas and oil influences wholesale prices and may impact system reliability. Disruptions in the supply of oil and natural gas – particularly in the winter when the need for those fuels for home heating peaks – could impact the operation of the power grid. The NYISO is working with state leaders to encourage the development of a more diverse supply.

### *Renewable Resources*

Open access to the grid and competitive wholesale electric markets have facilitated the increased development of renewable energy projects. Moving the electricity they produce to areas of high consumer demand will require substantial investment in the state's transmission infrastructure.

Decisions on where to locate new lines and how to pay for them will be crucial to the future growth of renewable energy and will have an impact on whether the state meets its environmental goals. Also, continued progress on the NYISO's innovative wind-forecasting program will facilitate the integration of many new and planned wind power projects into the wholesale market system.

### *Energy Efficiency*

The environmental and cost-saving benefits of programs to reduce electricity use are playing an increasingly important role in the state's electric power picture. Participation in the NYISO's demand reduction programs and the electric service companies' own demand-side management efforts is growing. The Energy Efficiency Portfolio Standard calls for drastic reductions in energy use and will infuse hundreds of millions of dollars into energy efficiency assistance for consumers. Implementation of the program bears close monitoring to determine its potentially far-reaching impact on the power supply and energy infrastructure investment.

### *Streamlined Siting*

The current permitting process requires proposals to undergo lengthy, sometimes separate reviews by numerous government agencies. A one-stop, technology-neutral review process – similar to Article X that expired in 2002 – would bring more time-certainty to project development and electric system reliability planning without compromising the extensive regulatory review of environmental impacts and other factors.

### *Continued Market Development*

Sustaining proven, existing programs and instituting innovative new Smart Grid strategies will give consumers more direct control over their energy use and the price they pay for electricity. Reaching that goal while maintaining system reliability requires ongoing collaboration between the NYISO, its many stakeholders, and state policy makers.

Continued enhancements of demand response programs and the evaluation of a Forward Capacity Market (FCM) should help to address the need for an adequate power supply to meet future consumer needs. Under FCM, annual auctions would be held to purchase the resources required to meet multi-year capacity needs, and the parties involved in each transaction would enter into firm agreements to provide power.

The severe disruptions in the nation's financial markets have chilled private investment in new electric generating projects, signaling the possible need to provide the development community with sufficient revenue certainty via multi-year power agreements. An FCM has been used in neighboring regional power markets (New England and the Mid-Atlantic) to facilitate an adequate future or "forward" electric supply for those areas. In close collaboration with numerous stakeholders, the NYISO anticipates issuing an FCM plan for stakeholder review and discussion in 2009.

Among the recent market design improvements implemented by the NYISO are specific steps taken to enhance the integration of wind power, including a centralized wind-forecasting system to better predict the output of wind projects in the NYISO's system dispatch. To optimize wind plant output, the NYISO will further evolve its market design to be among the first power system operators in the world to fully integrate wind resources within its market-based economic dispatch process.

The NYISO is also working with developers of other advanced energy technologies, such as flywheels and battery storage systems, seeking to enter the NYISO markets to provide services on a competitive basis. Energy storage technologies can offer new alternatives to address the integration of intermittent resources such as wind.

NYISO market design has attracted significant development of demand response programs, with participation in those programs growing to 2,084 MW in 2008. The scope of the demand response programs was also expanded in 2008 to allow demand-side resources to compete to supply

operating reserves and regulation services in the day-ahead and real-time markets. The NYISO, in conjunction with other ISO/RTOs, has proposed standards for the measurement and verification of demand response to the North American Energy Standards Board (NAESB) to increase the transparency, accountability, and consistency of demand response programs. Automation of NYISO demand response programs is scheduled for 2009.

### *Smart Grid*

The cost of power fluctuates – generally increasing during peak hours of the day and decreasing at night, when power demand is lower. Smart meters measure electricity in minuscule increments, enabling consumers to track their usage continuously in real time and, with the appropriate rate structures in place, to be charged “time of use” rates. This information will enable consumers to manage their electricity use more efficiently and thereby better manage their electricity expenditures.

With the goals of increasing conservation and reducing energy expenses, the NYISO is working with the NYS PSC to upgrade the bulk electricity grid’s metering systems to achieve more accurate invoicing. The NYISO is also engaged in the Advanced Metering Infrastructure proceeding to explore the benefits and possible use of “smart” meters, which use advanced technology to more accurately measure electricity use.

In 2008, several investor-owned public utilities in New York began installing real-time metering with the goal of shifting some industrial and residential energy use to less-expensive off-peak hours. This will boost energy efficiency, improve electric system reliability, and help defer the need for new energy infrastructure.

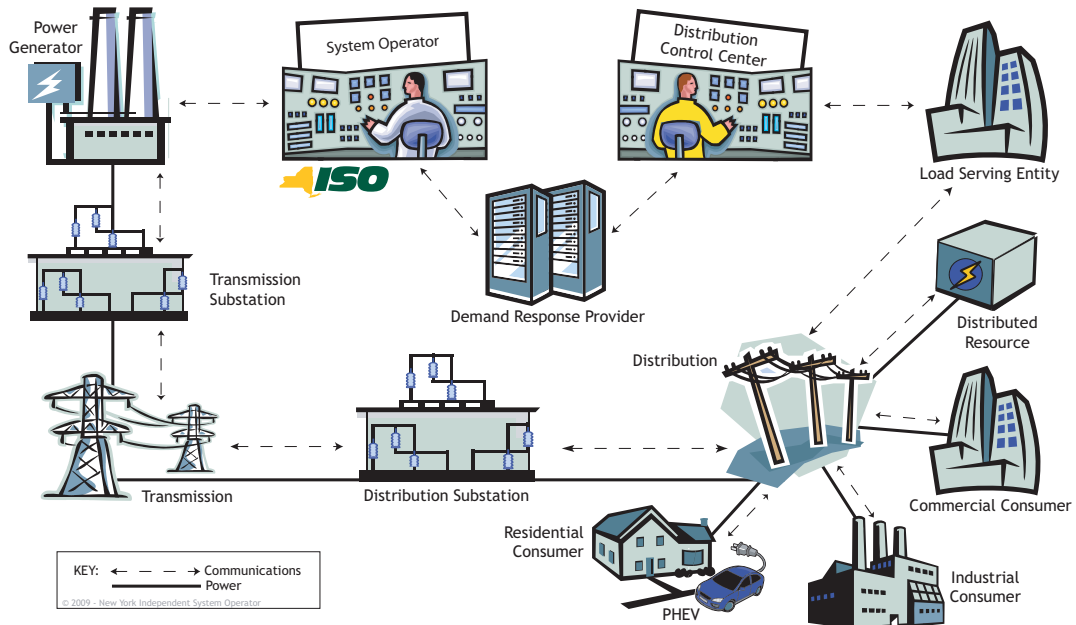
As part of its administration of the wholesale electricity markets, the NYISO provides all market participants with pricing information. At the core of the NYISO’s Smart Grid goals, is the development and implementation of the infrastructure to eventually make transparent pricing accessible to all consumers.

The NYISO is working toward creating the infrastructure necessary to making the Smart Grid a reality. Among its efforts is work on advanced technology platforms that provide a robust and flexible architecture to support continuous evolution of the grid. The NYISO has deployed a rule-based settlements engine to enhance data availability for more efficient markets, a settlements

data exchange application to accommodate the expanded data points provided by the Smart Grid, and virtualized data centers to provide significant processing capabilities. In addition, the NYISO is using flexible enterprise modeling tools that detect power system errors and anomalies and identify corrective actions. The NYISO will continue to collaborate with other ISO/RTOs on standards, protocols, and best practices for the Smart Grid.

Figure 13

### Smart Grid Components



### *Advanced Technologies*

By far, the biggest source of greenhouse gas emissions is transportation – cars, trucks, and other vehicles. New energy technologies currently under development hold great promise for reducing those emissions, particularly carbon dioxide. Among the most promising is plug-in hybrid electric vehicle (PHEV) technology, which major auto manufacturers are racing to perfect. PHEVs produce no tailpipe emissions when running in full-electric mode. It is expected that, as real-time pricing is made available to consumers, most PHEV owners would recharge their batteries at night or other off-peak hours, when lower-cost power plants are setting the price.

When needed, during times of peak electricity demand or emergencies, the electric energy stored in PHEV batteries could reenter the power grid for use, ultimately, by consumers. This “vehicle-to-grid” concept could enhance power grid reliability, hold down electricity costs, reduce air emissions, and potentially help defer the need for new power plants.

Plug-in hybrid electric vehicles, battery storage, and other technologies could significantly change how electricity is used in New York State. Close collaboration between the NYISO and its many stakeholders is crucial to selecting and integrating the best technologies available to enhance power grid reliability.

### *Collaborative Approach*

This document has outlined an array of challenges and presented a number of important goals. Meeting these challenges and accomplishing these goals will require a concerted, collaborative effort among political, regulatory and market forces. The NYISO will continue to work with all sectors of market participants, as well as state and federal policymakers and regulators, in the effort to address the energy challenges facing New York, the Northeast, and the nation.



## Glossary

**“45 X 15”:** An energy policy initiative announced by New York Governor David Paterson in his 2009 *State of the State Address*, the “45 X 15” plan establishes the goal of New York State meeting 45% of its electricity needs through improved energy efficiency and clean renewable energy by 2015. The plan includes increasing the state’s Renewable Portfolio Standard (See “Renewable Portfolio Standard”) to 30% and decreasing electricity usage by 15% (See “Energy Efficiency Portfolio Standard”).

**Adequate:** A system is considered adequate if the probability of having sufficient transmission and generation resources to meet expected demand is greater than the minimum standard to avoid a blackout. A system has adequate resources under the standard if the probability of an involuntary loss of service is no greater than one occurrence in 10 years. This is known as the loss of load expectation (LOLE), which forms the basis of New York’s installed capacity (ICAP) requirement.

**Advanced Metering Infrastructure (AMI):** Also known as “smart metering,” AMI consists of two separate and distinct elements: (1) meters that use technology to capture the energy use information of a utility’s customer, and (2) communication systems that capture and transmit such information in real time. Smart meters are capable of measuring and recording usage data in time differentiated registers, including hourly or such interval as is specified by regulatory authorities. They also allow electricity consumers, suppliers and service providers to participate in all types of price-based demand response programs.

**Article X:** New York’s siting process (Article X of the state Public Service Law) for new large power plants which expired Dec. 31, 2002. Article X provided a streamlined process to review, approve, and locate new generation facilities in the state.

**Bulk Electricity Grid:** The transmission network via which electricity flows from suppliers to local distribution systems that serve customers. New York’s bulk electricity grid includes all electricity generating plants, high-voltage transmission lines and interconnections with neighboring electric systems located in the New York Control Area (NYCA).

**Capability Period:** The Summer Capability Period lasts six months, from May 1 through October 31. The Winter Capability Period runs from November 1 through April 30 of the following year.

**Cap and Trade:** An environmental regulation mechanism that sets an overall limit on the emissions of a certain pollutant (such as CO<sub>2</sub>) but allows emission sources to trade their individual emission allowances. In theory, “cap-and-trade” systems use the marketplace to reduce emissions in a cost-effective and flexible manner. In practice, a cap is established that limits emissions from a designated group of polluters to some level

below their current emissions. The emissions allowed under the new cap are then divided into individual permits – usually equal to one ton of pollution – that represent the right to emit that amount. The permits can be bought and sold bilaterally or through an auction mechanism.

**Comprehensive Reliability Plan (CRP):** A study undertaken by the NYISO that evaluates projects offered to meet New York's future electric power needs, as identified in the *Reliability Needs Assessment (RNA)*. The CRP may trigger electric utilities to pursue regulated solutions to meet reliability needs if market-based solutions will not be available to supply needed resources. It is the second step in the NYISO's planning process.

**Comprehensive System Planning Process (CSPP):** The NYISO's ongoing process that evaluates resource adequacy and transmission system security of the state's bulk electricity grid over a 10-year period and evaluates solutions to meet those needs. The CSPP contains three major components; local transmission planning, reliability planning, and economic planning. Each two-year planning cycle begins with the Local Transmission Plans (LTPs) of the New York transmission owners, followed by NYISO's Reliability Needs Assessment (RNA) and CRP. Finally, economic planning is conducted through the Congestion Analysis and Resource Integration Study (CARIS).

**Congestion:** Transmission paths that are constrained, which may limit power transactions because of insufficient capacity. Congestion can be relieved by increasing generation or by reducing load.

**Congestion Analysis and Resource Integration Study (CARIS):** Part of the NYISO's Comprehensive System Planning Process (CSPP), CARIS evaluates the economic impact of proposed system changes. It consists of three congestion studies developed with market participant input as well as additional studies that individual market participants may request and fund. The CARIS is based on the most recently approved CRP.

**Constraint:** A transmission system restriction that limits the ability to transmit power.

**Day-Ahead Market (DAM):** A NYISO-administered wholesale electricity market in which capacity, electricity, and/or ancillary services are auctioned and scheduled one day prior to use. The DAM sets prices as of 11 a.m. preceeding the day these products are bought and sold, based on generation and energy transaction bids offered in advance to the NYISO. More than 90% of energy transactions occur in the DAM.

**Day-Ahead Demand Response Program (DADRP):** A NYISO demand response program to allow energy users to bid their load reductions into the day-ahead energy market, as generators do.

**Demand Response Programs:** A series of programs designed by the NYISO to maintain the reliability of the bulk electricity grid by calling on electricity users to reduce consumption, usually in capacity shortage

situations. The NYISO has three demand response programs: Day-Ahead Demand Response Program (DADRP), Emergency Demand Response Program (EDRP), and Special Case Resources (SCR).

***Distributed Generation:*** A small generator, typically 10 megawatts or smaller, attached to the distribution grid. Distributed generation can serve as a primary or backup energy source, and can use various technologies, including wind generators, combustion turbines, reciprocating engines, and fuel cells.

***Electric Reliability Organization (ERO):*** Under the Energy Policy Act of 2005, the Federal Energy Regulatory Commission (FERC) is required to identify an ERO to establish, implement and enforce mandatory electric reliability standards that apply to bulk electricity grid operators, generators and transmission owners in North America. In July 2006, the FERC certified the North American Electric Reliability Corporation (NERC) as America's ERO.

***Emergency Demand Response Program (EDRP):*** A NYISO demand response program designed to reduce power usage through voluntary electricity consumption reduction by businesses and large power users. The companies are paid by the NYISO for reducing energy consumption upon NYISO request.

***Energy Efficiency Portfolio Standard (EPS):*** A proceeding initiated on May 16, 2007 by the New York State Public Service Commission (NY PSC) to establish targets for energy efficiency, similar to the existing Renewable Portfolio Standard (RPS), and other programs intended to reverse the pattern of increasing energy use in New York. The NY PSC determined that New York possesses sufficient potential energy efficiency resources to reduce electricity usage by 15% of projected levels by 2015.

***Energy Independence and Security Act of 2007:*** An extensive energy statute approved in December 2007. The stated purposes of the act are "to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government, and other purposes."

***Energy Policy Act of 2005 (EPAct):*** An extensive energy statute approved in August 2005 that requires the adoption of mandatory electricity reliability standards and gave the Federal Energy Regulatory Commission (FERC) the authority to site major transmission lines under certain circumstances in National Interest Electric Transmission Corridors (NIETC) identified by the U.S. Department of Energy. The EPAct also made major changes to federal energy law concerning wholesale electricity markets, fuels, renewable resources, electricity reliability, and the energy infrastructure needs of the nation.

**Federal Energy Regulatory Commission (FERC):** The federal energy regulatory agency that approves the NYISO's tariffs and regulates its operation of the bulk electricity grid, wholesale power markets, and planning and interconnection processes.

**High Electric Demand Days (HEDD):** Days of high electricity demand, which can dramatically increase ozone-forming air pollution from electric generation, often resulting in nitrogen oxide (NO<sub>x</sub>) emissions that can be greater than two times their average levels. Days of high electricity use often coincide with days with high ozone levels.

**Installed Capacity (ICAP):** A generator or load facility that can supply and/or reduce demand and qualifies as installed capacity in the New York Control Area (NYCA).

**Installed Reserve Margin (IRM):** The amount of installed electric generation capacity above 100% of the forecasted peak electricity consumption that is required to meet New York State Reliability Council (NYSRC) resource adequacy criteria.

**Interconnection Queue:** A queue of merchant transmission and generation projects that have submitted an Interconnection Request to the NYISO to be interconnected to the state's bulk electricity grid. All projects must undergo three studies – a Feasibility Study (unless parties agree to forgo it), a System Reliability Impact Study (SRIS), and a Facilities Study – before interconnecting to the grid.

**Load:** A consumer of energy (an end-use device or customer) or the amount of energy (megawatt-hour - MWh) or demand (megawatt - MW) consumed.

**Locational Installed Capacity Requirement:** A NYISO determination of that portion of the statewide installed capacity requirement that must be located electrically within a locality to provide that sufficient capacity is available there to meet the reliability standards.

**Loss of Load Expectation (LOLE):** The amount of generation and demand-side resources needed, subject to the level of the availability of those resources, load uncertainty, available transmission system transfer capability and emergency operating procedures, to minimize the probability of an involuntary loss of firm electric load on the bulk electricity grid. The state's bulk electricity grid is designed to meet LOLE that is not greater than one occurrence of an involuntary load disconnection in 10 years, expressed mathematically as 0.1 days per year.

**Market-Based Solutions:** Investor-proposed projects that are driven by market needs to meet future reliability requirements of the bulk electricity grid as outlined in the *Reliability Needs Assessment*. Those solutions

can include generation, transmission and demand response programs. Market-based solutions are preferred by the NYISO's planning process. The NYISO is responsible for evaluating all solutions to determine if they will meet the identified reliability needs in a timely manner.

**Megawatt (MW):** A measure of electricity that is the equivalent of 1 million watts.

**New York Independent System Operator (NYISO):** Formed in 1997 and commencing operations in 1999, a not-for-profit organization that manages New York's bulk electricity grid, administers the state's competitive wholesale electricity markets and provides system and resource planning for the state's bulk power system. The organization is governed by an independent Board of Directors and a governance structure made up of committees with market participants and stakeholders as members.

**New York Control Area (NYCA):** The area under the electrical control of the NYISO. It includes the entire state of New York, divided into 11 load zones.

**New York Power Pool (NYPP):** Established July 21, 1966 in response to the Northeast Blackout of 1965, a voluntary collaboration of the state's six investor-owned utilities plus New York's two power authorities created to coordinate the operations of the New York State power grid. The NYISO assumed this responsibility in 1999.

**Peak Demand:** The maximum instantaneous power demand averaged over any designated interval of time and measured in megawatt hours (MWh). Peak demand, also known as peak load, is usually measured hourly.

**Peaking:** Description referring to power plants that generally run only when there is the highest consumption of, or peak demand for, electricity (See "Peak Demand.")

**Regulated Backstop Solutions:** Proposals required of certain Transmission Owners to meet reliability needs as outlined in the *Reliability Needs Assessment*. Those solutions can include generation, transmission, or demand response. Non-Transmission Owner developers may also submit regulated solutions. The NYISO may call for a gap solution if neither market-based nor regulated backstop solutions meet reliability needs in a timely manner. To the extent possible, the gap solution should be temporary and strive to ensure that market-based solutions will not be economically harmed. The NYISO is responsible for evaluating all solutions to determine if they will meet identified reliability needs in a timely manner.

**Reliability Needs Assessment (RNA):** A report that evaluates resource adequacy and transmission system security over a 10-year planning horizon, and identifies future needs of the New York electricity grid. It is the first step in the NYISO's planning process.

**Renewable Portfolio Standard (RPS):** The New York State Public Service Commission (NY PSC), in September 2004, issued its "Order Approving Renewable Portfolio Standard Policy" that calls for an increase in renewable energy used in New York State from the then current level of approximately 19% to 25% by the year 2013. In October 2008, the NYS PSC initiated a proceeding to increase the RPS goal to 30% and extend the target date to 2015.

**Special Case Resources (SCR):** A NYISO demand response program designed to reduce power usage by businesses and large power users qualified to participate in the NYISO's installed capacity (ICAP) market. Companies that sign up as SCRs are paid in advance for agreeing to cut power upon NYISO request during periods of system stress.

**Transfer Capability:** The amount of electricity that can flow on a transmission line at any given instant, respecting facility rating and reliability rules.

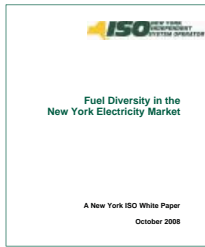
**Transmission Constraints:** Limitations on the ability of a transmission facility to transfer electricity during normal or emergency system conditions.

## Other NYISO Publications



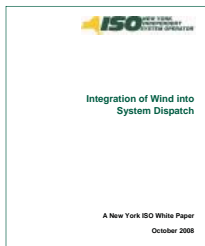
### Reliability Summary 2009 - 2018

Each year the NYISO conducts a study examining system reliability for the upcoming 10-year period. The analysis is compiled in a report called the *Reliability Needs Assessment (RNA)*. The *Reliability Summary 2009-2018* provides an overview of the key components of the *2009 RNA* focusing on the outlook for 2018 in light of anticipated changes in usage, supply, energy efficiency, and demand response.



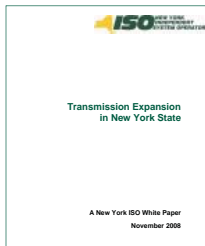
### Fuel Diversity in the New York Electricity Market

Fuel diversity is a crucial component of the reliable and efficient operation of wholesale electricity systems. This NYISO white paper, developed with assistance from the Analysis Group, explores the significance of fuel diversity and its impact on the New York electricity market.



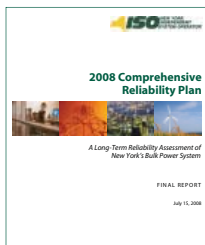
### Integration of Wind into System Dispatch

Incorporating significant wind powered generation is a key to achieving the goals of New York State's renewable portfolio standard (RPS). The NYISO has introduced system and operating changes to better utilize New York State's existing wind resources and pave the way for their continued growth. Those efforts and proposals for further enhancements are detailed in the NYISO white paper.



### Transmission Expansion in New York State

Since 2000, more than 6,500 MW of new generation has been developed, predominantly in the regions of New York State with the greatest demand for power, and nearly 1,000 MW of transmission capacity has been added to bring more power into those regions. However, there has not been a major high-voltage transmission addition within the state for over 20 years. The NYISO white paper, prepared with assistance from Energy Security Analysis, Inc. (ESAI), reviews transmission planning processes and investment activity in New York State and neighboring regions.



### 2008 Comprehensive Reliability Plan

The NYISO's *2008 Comprehensive Reliability Plan (CRP)* is the product of an ongoing, multistage planning process that provides a blueprint for meeting the reliability needs of New York State's bulk electricity grid over a 10-year horizon. After identifying reliability needs, the NYISO solicited and received proposals for market-based and regulated solutions. The *2008 CRP* finds that market-based proposals, totaling 3,380 megawatts (MW), together with implementation of planned upgrades to the bulk power system, meet or exceed reliability requirements through 2017.



### True Grid: Smart Metering and Advanced Technologies

A two-day symposium and technology expo on the future evolution of the grid was conducted by the NYISO on May 8-9 in Albany, NY. The proceedings of the event, including remarks and presentations provided to the NYISO, are available to download from [www.nyiso.com](http://www.nyiso.com).

*Copies of all NYISO Publications are available for download at [www.nyiso.com](http://www.nyiso.com)*

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