New York Independent System Operator

POWER TRENDS 2007

NEW YORK INDEPENDENT SYSTEM OPERATOR

CONTENTS

I. Executive Summary

The New York bulk electricity grid will have adequate resources — in the form of in-state generation, imported energy and capacity, and demand-side resources — to meet forecasted summer demand for 2007. Looking beyond this summer, the New York Independent System Operator (NYISO) has found that the current condition of the bulk electricity grid is also adequate to meet near-term reliability requirements through 2010. However, significant infrastructure additions will be needed in southeastern New York beginning in 2011 and on a statewide basis in 2012 in order to maintain the adequacy and reliability of the grid.

The NYISO and Power Trends

The New York Independent System Operator (NYISO) is a not-for-profit corporation that is responsible for operating the state's bulk electricity grid, providing non-discriminatory access to transmission services and administering wholesale markets for electricity and transmission products. The NYISO is governed by an independent Board of Directors and by committees comprised of its customers and other stakeholders. It began operations in December 1999 as the successor to the New York Power Pool.

In its role as grid operator and market administrator, the NYISO has become a repository for information about the bulk electricity grid in the state and the northeast region. Drawing on this data, the NYISO can offer insights into trends that have an impact on important features of the electric system, most notably the price of electricity and the reliability of the bulk electricity grid.

In this issue of Power Trends, the sixth report of its kind, the NYISO provides an assessment of the grid as it exists today and calls attention to the challenges facing the electric industry in New York.

ACHIEVEMENTS

Over the past 12 months, 1,250 megawatts (MW) of new capacity has been added to the bulk electricity grid – with 179 MW of these additions coming in the form of new wind power development. Also, more than 800 MW of new transmission capability has been added. In addition, there has been a 12.5 percent increase over the past year in the number of megawatts that can be made available to the grid through the use of the Demand Response Programs. This year, retail customers are expected to curtail a little more than 1,000 MW of energy if called upon to do so by the NYISO, and an additional 500 MW of voluntary curtailment could be available when system operating conditions are tight.

The summer of 2006 brought heat waves and some power outages at the distribution level in New York. However, New York's bulk electricity grid performed with consistent reliability despite the fact that electric demand in the state set record peaks three times over a three week period in July and August.

The performance of New York power plants, as measured by their availability to sell energy into the state's wholesale electricity markets, continues to change for the better, and has made a significant contribution to the reliability of the New York bulk electricity grid. The availability of the state's power plants is a critical factor in determining how much excess generating capacity (the installed reserve margin) is needed in order to protect the continuity of electric service from unscheduled facility outages.

As discussed in this report, the improvement in plant availability was a major factor in making possible the New York State Reliability Council's decision to reduce the required installed reserve margin from 18 percent to 16.5 percent. The reduction will translate into real savings in the cost of wholesale power, and it will slightly defer the need for additional power plants.

CONCERNS

While the current state of the bulk electricity grid is good, indications are that this positive outlook will change for the worse in the next three to four years if certain conditions are not addressed quickly. A recent analysis by the NYISO shows a need for significant infrastructure (generation, transmission and demand response) additions to meet capacity requirements in southeastern New York beginning in the year 2011, and on a statewide basis in 2012. Load growth in excess of two percent per year in southeastern New York – the Lower Hudson Valley, New York City and Long Island – and barely adequate transmission capability into that region of the state will lead to violations of reliability criteria by the year 2011.

The analysis was conducted during the first phase of the NYISO's planning process, which consisted of an assessment of the state's electric reliability needs. A NYISO solicitation for market-based and regulated solutions to these needs – the second phase of the planning process – is underway. If market-based solutions are not adequate or timely, regulatory "backstop" proposals may be called upon. The proposed market and regulatory options will be known by the middle of this year. It remains to be seen, however, how many of these solutions can be in place within the relevant time frame given existing procedures for permitting and siting large generation and transmission projects in the state.

CHALLENGES

Other factors, discussed below, will present challenges to New York's ability to meet its future reliability needs. In addition, new environmental initiatives will challenge the NYISO, the power sector and regulators to find solutions that accommodate continued strong grid reliability, existing electric market structures and the long-term certainty and transparency needed to promote equipment retrofit and additional power plant construction in New York.

First, it can take more than five years for a private developer to permit, site and build a new generating plant in New York. The state once had a streamlined siting process for large power plants but that law (Article X of the Public Service Law) expired at the end of 2002. The state Legislature has failed either to renew that law or enact a new one in its place, thus leaving power

plant development to the vagaries of local zoning. The absence of a streamlined, more predictable permitting process also adds to the financial risks that prospective developers must anticipate when contemplating projects in the state, and thus represents a barrier to the development of needed generation projects. The development process for new transmission lines can be even longer and more replete with difficulties, given the often fierce local community opposition to these facilities.

Second, but just as important, economic and environmental factors have combined to limit the addition of new fossil-fueled power plants to those built to run entirely or primarily on natural gas. Although this type of generating plant is relatively clean and can be built quickly, these factors have exacerbated the power sector's reliance on a single fuel, thereby exposing consumers to all of the attendant price and supply risks. Moreover, the existing gas pipeline infrastructure has already imposed supply difficulties in neighboring systems and is a concern in New York. Natural gas, which was formerly considered a North American resource, will increasingly have to be imported in the form of liquefied natural gas (LNG).

LNG is transported in ocean tankers, and thus requires facilities to receive the tankers, transfer the product and then vaporize it, so that it can be transported by pipeline and burned in power plants or elsewhere. The siting of such facilities is controversial and therefore unpredictable. The source of the LNG is, for the most part, found in troubled parts of the world and subject to international political factors similar to those for oil supply. Nevertheless, such facilities should be developed in the United States so that New York does not experience serious fuel supply difficulties for its power plants.

Adding to the challenges ahead are a number of environmental initiatives that will require close cooperation and creative approaches to find implementation designs that also maintain grid reliability and economic viability in the power sector. Perhaps the best known among these is the Regional Greenhouse Gas Initiative (RGGI) – a cooperative effort by nine Northeastern and Mid-Atlantic states to reduce carbon dioxide (CO_2) emissions from power plants through a "cap-and-trade" program of emission allowances. Good auction design is crucial to the success of this program.

Beyond RGGI, there are a series of additional federal and state environmental compliance programs that may affect power plant cost and operations in the near future, including a stringent requirement to reduce daily nitrogen oxides (NOx) emissions that could impact over 4,000 MW of New York City generation. Environmental regulators, power plant representatives and the NYISO need to work together to develop compliance programs that work within the existing

electric market structure while maintaining electric reliability and providing the transparency and long-term certainty needed for future power sector investment.

ISSUES

Challenges to the electric power supply sector in New York raise a number of important policy issues that must be addressed quickly, and with an eye toward finding practical solutions at a statewide level. Among the more pressing are:

- The absence of a streamlined siting and permitting process for major power plants causes unnecessary risk, expense and uncertainty for potential investors at a time when the state needs that investment;
- The capabilities of the existing wholesale electric market structure to attract the capital needed to develop large, baseload power plants and merchant transmission facilities must continue to be strengthened;
- The power generation sector is highly dependent on natural gas, leaving the state's electricity market vulnerable to price volatility and the security of supply systems, whether domestic or international;
- The combined effect of several imminent environmental initiatives require collaboration among regulators, the power sector and the NYISO to find solutions that also maintain grid reliability, work within the existing electric market structure and provide the transparency and certainty needed for future investment; and
- A recently enacted law that denies the power of condemnation to certain developers of new transmission facilities represents a deterrent to the development of new transmission.

II. The New York State Power System

Background

The NYISO is responsible for operating the state's bulk electricity grid in accordance with reliability standards and criteria that are set by the North American Electric Reliability Corporation (NERC), the Northeast Power Coordinating Council (NPCC) and the New York State Reliability Council (NYSRC). NERC also serves as the Electric Reliability Organization, a new authority created by the Energy Policy Act of 2005. These standards and criteria, mandatory under federal law, determine the amount of generation capacity and transmission capability that must be available to meet expected demands for electricity. They also form the basis for the NYISO's secure operation of the bulk electricity grid, which means that at all times the grid must be able to withstand the loss of some resources and still meet the demand for electricity.

The standard for resource adequacy in New York State is met when the probability that electricity use will be involuntarily curtailed due to insufficient transmission and/or generation is not greater than one occurrence in 10 years. The standard is used to determine the amount of installed capacity – over and above the amount that would meet forecasted peak demand – that the New York system is required to have in order to provide for planned and unplanned facility outages. This amount, the installed reserve margin (IRM), is determined annually by the NYSRC; the IRM is set at 16.5 percent for the Summer 2007 Capability Period. This is a recent change from the previous IRM of 18 percent. The reasons for and the implications of that change, accepted by both the Federal Energy Regulatory Commission (FERC) and the New York State Public Service Commission (PSC), are discussed later in this report.

Due to the capability of the state's transmission system and the distribution of demand across the state, there are three distinct locational installed capacity requirements for: 1) New York City; 2) Long Island; and 3) Rest-of-State, which excludes New York City and Long Island.

Supply and Demand: Past, Present, Future

Summer 2007. The supply of electricity for the Summer 2007 Capability Period is expected to be adequate, based on the NYISO's assumptions and the conditions contained in its February 2007 short-term load forecast.

Table 1 shows the resources that are expected to be available statewide, and within the locational capacity zones of New York City and Long Island. The NYISO has estimated the available Special Case Resources megawatts based on the total registered participants and the results of last year's installed capacity auctions; the final amount will not be known until this

summer's installed capacity (ICAP) auction is held. The 2,921 MW of available ICAP import capability is the maximum amount that may be offered into the NYISO's market to meet capacity requirements. In the recent past, the full capability has been purchased, but again, the final amount will not be known until the capacity auctions are complete.

TABLE 1

2007 Available Resources by Region (MW)

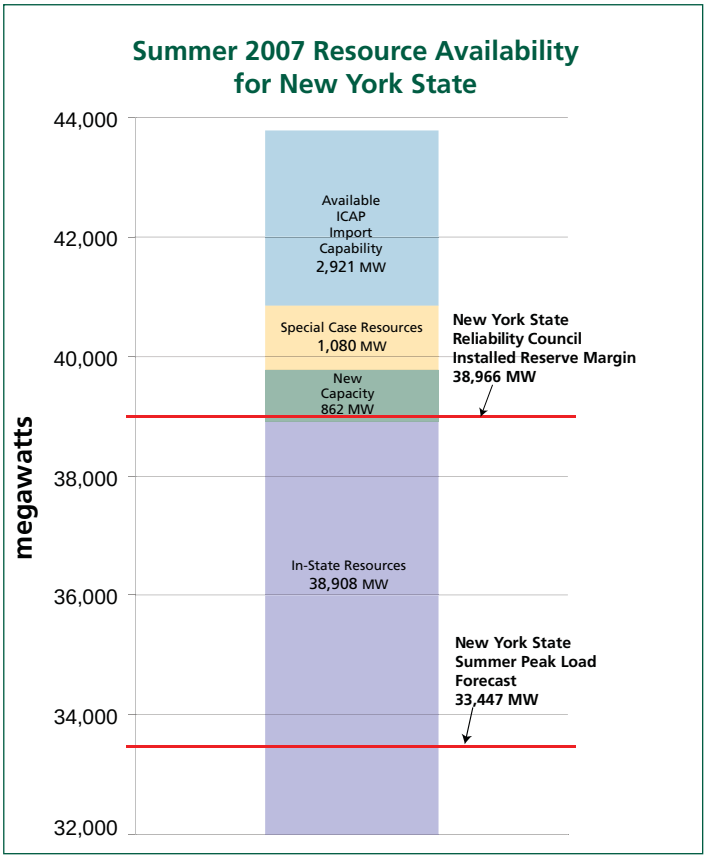
Region	Reliability Requirement	Available Generation	Special Case Resources	New Capacity	Available ICAP Import Capability	Total	Surplus (Total minus Requirements)
Statewide	38,966	38,908	1,080	862	2,921	43,771	4,785
NY City	9,424	10,018	325			10,343	919
Long Island	5,368	5,610	150	660		6,420	1,052

Table 2 shows a forecasted peak load for New York State of 33,447 MW for summer 2007. The state's installed capacity requirement is 38,966 MW, which meets a 16.5 percent IRM. The total capability available to the state is anticipated to be 43,771 MW, which includes 39,770 MW of in-state generation (available generation plus new capacity), 1,080 MW of Special Case Resources and 2,921 MW of capacity in nearby states that can be committed to New York.

For summer 2007, New York City has a forecasted peak demand of 11,780 MW, with a locational installed capacity requirement of 9,424 MW, or 80 percent of the city's forecasted peak. Long Island's forecasted peak demand is 5,422 MW for summer 2007; its locational installed capacity requirement is 5,368 MW, or 99 percent of Long Island's forecasted peak. New York City and Long Island are subject to locational installed capacity requirements because of the transmission transfer limits into those regions of the state and the demand profiles of those regions. A high percentage of the generating capacity that is committed to meet the New York City and Long Island peak demand must be physically located in those regions.

Beyond 2007, growth in peak demand is projected to average less than one percent (0.9 percent) per year for the state as a whole over the 10 year forecast horizon. However, peak demand in southeastern New York (the area from the Lower Hudson Valley into New York City and Long Island), has increased by more than two percent per year in the past several years and a higher rate of growth in that region is anticipated to continue.

TABLE 2



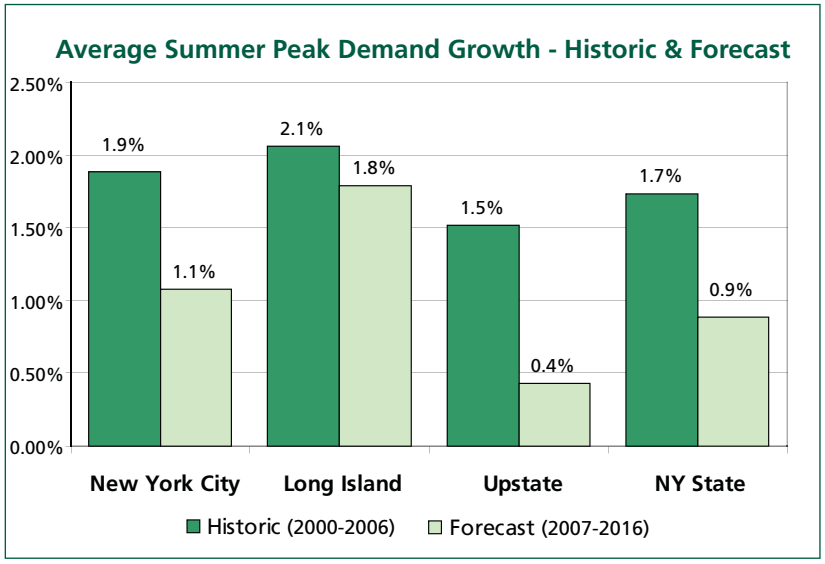
Demand growth in southeastern New York. Over 58 percent of all electricity produced and imported into New York State is consumed in southeastern New York — the Lower Hudson Valley, New York City and Long Island.

On a weather normalized basis, peak loads in New York City and Long Island have risen substantially in the past seven years, from a peak demand of 10,100 MW in New York City in 2000 to 11,300 MW in 2006, an average growth rate of 1.9 percent annually. On Long Island, peak demand was 4,600 MW in 2000 and 5,200 MW in 2006, an average growth rate of 2.1 percent per year. During this same time, the state's peak demand grew from 29,500 MW in 2000 to 32,700 MW in 2006, for an average annual growth rate of 1.7 percent.

Peak demand on Long Island is forecasted to grow by 1.8 percent each year between 2007 and 2016, the largest growth rate of any region in the state during that period. Over the same forecast horizon, peak demand in New York City is expected to grow by 1.1 percent per year.

Demand growth statewide. Compared to the historic period, peak demand growth is forecast to slow down across the state during the forecast period, as shown in Table 3. A variety of factors contribute to this trend; among them are renewed efforts at energy conservation programs on Long Island and in New York City, efficiency improvements in air conditioning appliances and changing demographics translating to a slower rate of growth in peak demand. Economic activity in upstate New York (from Albany west to Buffalo) fares poorly in comparison to the rest of the state; incomes are lower and the growth in general economic activity is slower. These economic factors account for the differences in peak demand growth between the upstate region and other regions of the state.

TABLE 3



New bulk electricity grid resources. Additions to the bulk electricity grid that are expected to be in-service during the Summer 2007 Capability Period include the Maple Ridge Wind Farm Phase 2 (100 MW) and Prattsburgh Wind Farm (79 MW). The 660 MW Neptune high-voltage direct current (HVDC) cable, which links PJM's grid in New Jersey with New York, is scheduled to begin operating in July. The Long Island Power Authority (LIPA) purchased the import rights to the Neptune line to support its contracts to meet Long Island's locational capacity requirement.

Gas pipeline infrastructure. In December 2006, the FERC approved the $1 billion Northeast-07 interstate gas pipeline – a 260-mile series of interconnected lines and facilities upgrades that will deliver more than 525,400 dekatherms of Canadian and domestic natural gas per day to New York and the Northeast. The project is expected to be online by November 2008.

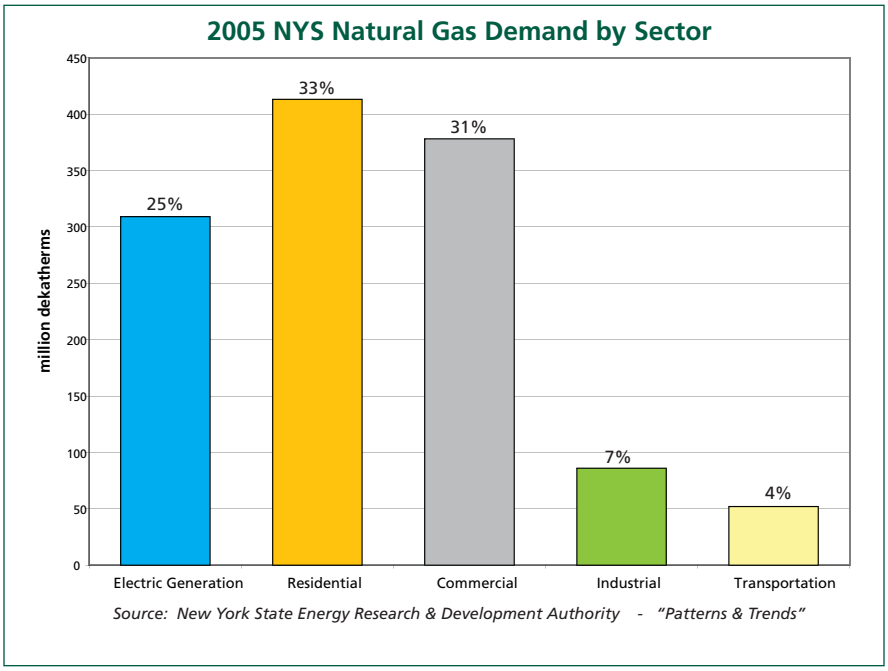
The Millennium Pipeline Co. has FERC approval to build and operate 182 miles of pipeline from Corning (Steuben County) to Ramapo (Rockland County). The line, expected to cost $664 million, will allow local gas supply and distribution companies to serve several counties in and around New York City.

Algonquin Gas Transmission LLC, Empire State Pipeline, and Iroquois Gas Transmission Systems LP are planning to expand existing facilities. Algonquin will be able to transport up to 325,000 additional dekatherms of gas per day to the New York City area using new pipeline and gas compressor construction upgrades estimated to cost $192 million.

Empire will build 78 miles of new pipeline from Victor (Ontario County) to Corning (Steuben County) at an anticipated cost of $144 million; when operational the pipeline will deliver up to 250,000 dekatherms of gas per day.

However, all of this increase in pipeline capacity may not be available to the generation sector due to competition for supplies of natural gas from the commercial, industrial and residential sectors of the economy, as shown in Table 4.

TABLE 4



Innovation in Market-Based Demand-Side Programs

The NYISO's Demand Response Programs have given rise to some innovative business models that offer megawatts to the NYISO for bulk electricity grid relief. Both the Emergency Demand Response Program (EDRP) and the ICAP Special Case Resource (SCR) program allow third-party aggregators to operate as intermediaries between the NYISO and end-use customers. The NYISO was the first ISO/RTO to permit this type of business model.

Today, 21 of the 37 organizations participating in these programs are aggregators. More than 50 percent of the megawatts and more than 90 percent of the total customers registered in the SCR program participate through aggregators. Aggregators allow small customers to reap the benefits of the program while bringing megawatts to the NYISO that may have otherwise been unavailable.

The actions taken by participating customers cover a wide spectrum of demand responses. Sophisticated control systems have been installed by several of the largest manufacturers to reduce or shut down individual processes when an alert from the NYISO is received. Perhaps the most imaginative strategy involved an aggregator who would partially reduce load at a senior citizen's facility by paying for tickets and transportation to movie theaters. The NYISO's Demand Response Programs have prompted many New York businesses to look more closely at what they can do to reduce load on peak days.

Demand Response Programs. Demand Response Programs pay customers for agreeing to reduce energy consumption when requested by the NYISO. The NYISO markets include three Demand Response Programs: the Installed Capacity Special Case Resource Program; the Emergency Demand Response Program; and the Day-Ahead Demand Response Program. Special Case Resources are also eligible to participate in the NYISO's Installed Capacity Market. Table 5 demonstrates the dramatic rate of growth in the number of megawatts that are made available to the NYISO through these programs – from approximately 500 MW during summer 2001 to almost 1,700 MW in summer 2006.

The NYISO's Demand Response Programs played an important role in stabilizing power usage during peak demand periods in summer 2006, relieving stress from the state's bulk electricity grid. The NYISO called on its Special Case Resources and Emergency Demand Response Program participants in downstate areas on record-breaking days in July and August 2006 to maintain grid operations within reliability criteria.

As shown in Table 6, peak load would have climbed to over 35,000 MW during the afternoon of August 2nd without these Demand Response Programs. Program participants in New York City and Long Island responded to the NYISO's instructions that day, cutting consumption and keeping the load on the system from rising above 34,000 MW.

This year, more than 2,500 end-use customers, accounting for 1,996 MW, are registered to participate in the three Demand Response Programs.

TABLE 5

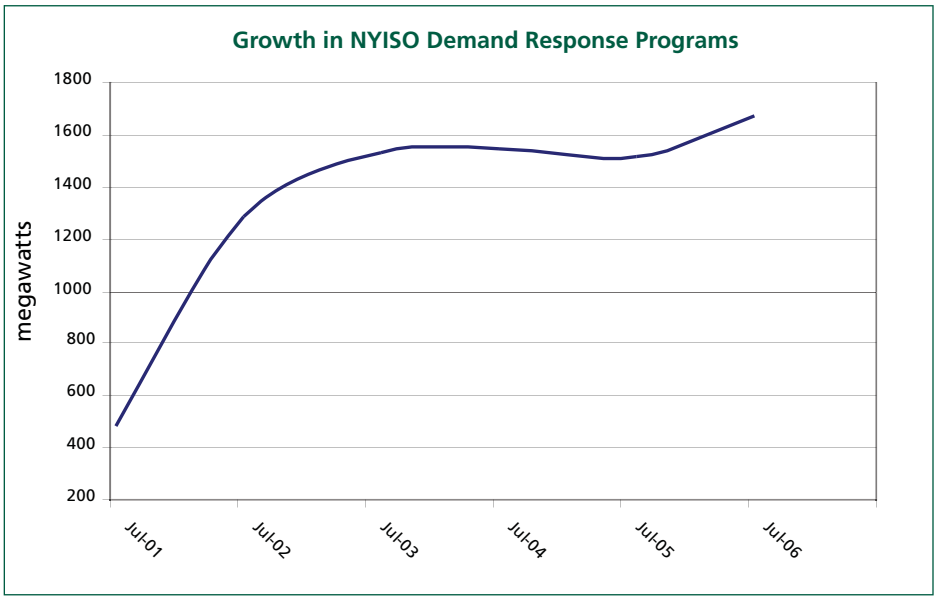
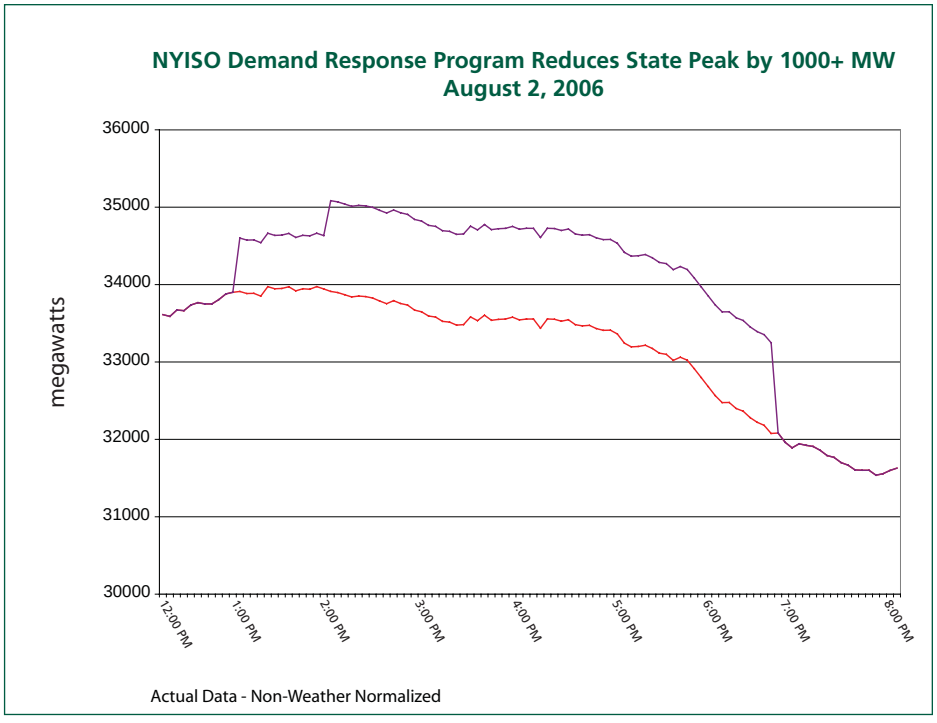
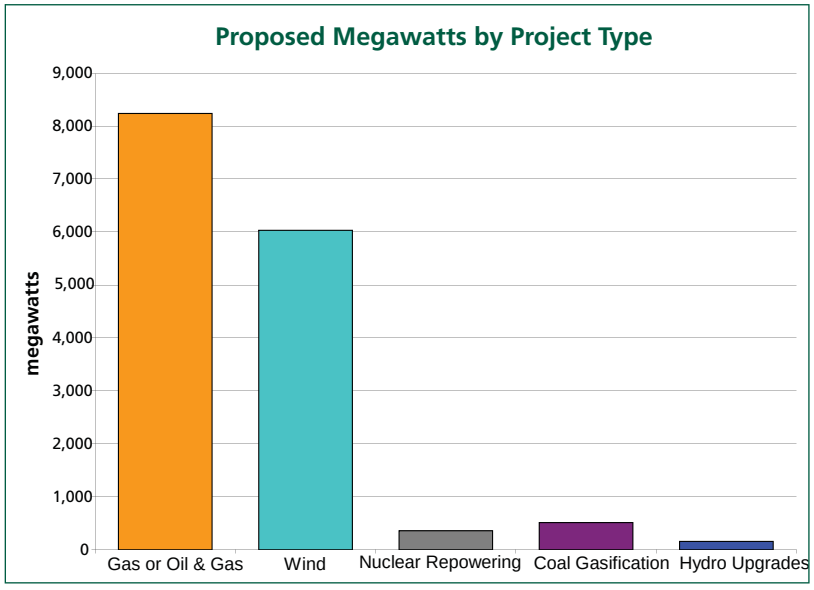


TABLE 6



The NYISO's Interconnection Process. The NYISO manages the grid interconnection process for qualified generation and transmission developers. Proposals for new facilities reach the NYISO's interconnection queue at various stages of project development. While it is not possible to know the outcome of individual project proposals, collectively the interconnection requests provide insight into prospects for infrastructure investment and potential changes in the fuel diversity of the state's power plants in the near term. Table 7 illustrates that of all the non-renewable sources of power generation, natural gas will continue to dominate the state's electric generation development.

TABLE 7



Currently there are 102 projects in the interconnection queue. Eleven of these are for reinforcements or upgrades to existing components of the transmission grid; five proposals are for new transmission lines. The remaining 86 proposals are distributed as follows: 24 are for gas-fired or dual-fuel generation (8,238 MW), 54 are wind-powered projects (6,031 MW), four are repowerings of existing nuclear units (360 MW), one coal fired proposal (536 MW), two hydro upgrades (160 MW) and the remaining proposal will connect a large new manufacturing center to the grid. The NYISO received 27 of these interconnection requests in 2006.

Benefits of Improved Power Plant Availability

The restructuring of New York's wholesale electricity markets has yielded significant benefits, according to a study by the Analysis Group, a Boston-based economic consulting firm.

The study was commissioned by the NYISO to determine if restructuring has produced efficiency gains and cost savings beyond the NYISO's costs.The report lists these gains attributable to restructuring:

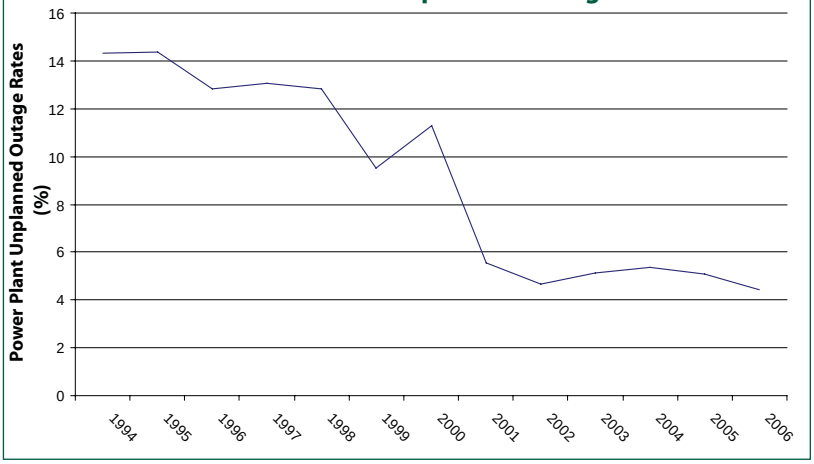
- *An improvement in the availability of fossil fuel-run electric generating units (forced outage rates), from 9.5 percent in 1999 to 5.5 percent in 2005, a benefit of $49 million in 2006;*
- *An 11 percent increase in nuclear power output, yielding a cost benefit of $254 million in 2006; and*
- *A conservative estimate of 2006 net production cost savings of $225 million, from the consolidation of commitment areas and more efficient dispatch of energy and reserves through the NYISO markets.*

Reduction in Installed Reserve Margin

The New York State Reliability Council (NYSRC) is responsible for setting the statewide Installed Reserve Margin based on the generally accepted resource adequacy standard that a system-wide loss of load will not occur more frequently than one day in 10 years. The Installed Reserve Margin is determined in large measure by the availability of individual generation units in the state, as shown in Table 8. The improved availability of the state's power plants contributed to the NYSRC is finding that the statewide resource adequacy criterion could be met with an Installed Reserve Margin of 16.5 percent, a reduction from the 18 percent margin previously required. A reduction in the Installed Reserve Margin means that less reserve capacity must be available at all times to cover shortfalls. Better availability from existing power plants can also defer the need to add new resources to meet requirements.

TABLE 8

Power Plants Available to Run More Often Due to Fewer Unplanned Outages

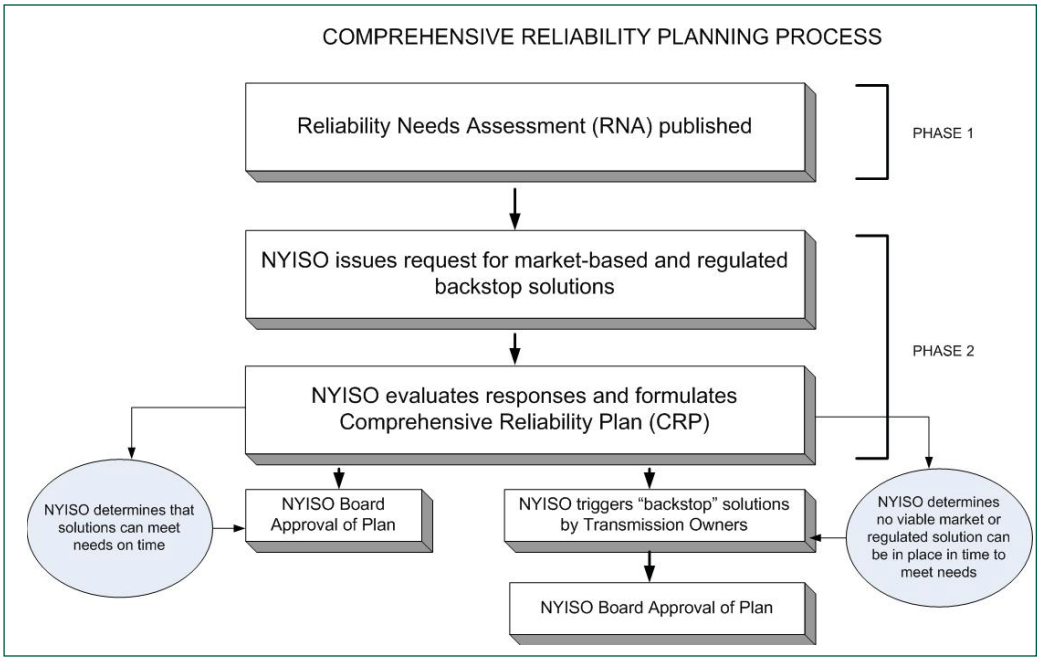


III. The Comprehensive Reliability Planning Process

Overview

To understand and address the reliability needs of the New York State bulk electricity grid, the NYISO and its stakeholders developed a procedure that is undertaken jointly every year. The procedure, known as the Comprehensive Reliability Planning Process (CRPP), is made up of two distinct phases, each culminating in a final report that is subject to stakeholder committee review and approval by the NYISO Board of Directors. Table 9 is a flow chart of the CRPP steps.

TABLE 9



The first phase involves a thorough assessment of the adequacy and reliability of the bulk electricity grid over a 10-year planning horizon. The report for this phase is the Reliability Needs Assessment (RNA), which identifies potential power generation and transmission needs in New York State, based upon established reliability criteria. The RNA also provides information about the amount and location of resources that could satisfy those needs.

The second phase of the process begins immediately after the approval of the RNA and is usually concluded within six months. This phase elicits potential solutions in the form of market-based and regulated backstop proposals to meet the identified reliability needs.

Generation, transmission and demand response proposals can be considered as legitimate solutions to meet these needs. The outcome is reported in the Comprehensive Reliability Plan (CRP).

The NYISO published the 2007 RNA in March. It concluded that generation and transmission resources are expected to be adequate through 2010. Power deficiencies, primarily in the state's southeastern region, could occur by 2011 and become acute by 2016 if expected demand isn't addressed by then.

Southeastern New York

The reliability need in 2011 is driven primarily by load growth, generator retirements and voltage-driven transmission constraints in the Lower Hudson Valley into New York City and Long Island. By 2011, about two-thirds of the state's total load will be located in southeastern New York; 52 percent of that will be in New York City and on Long Island.

The retirement of several generation units – 1,675 MW are slated for shutdown between 2007 and 2009 – is a contributing factor to the reliability need in 2011, even though 1,204 MW of new generation is expected to be added by that date.

The RNA indicates that the addition of 250 MW of resources in New York City, or 500 MW of resources in the Hudson Valley – below the upstate and southeastern transmission interface – would meet reliability needs in 2011. This need can also be met by resources located outside of the downstate region combined with additional transfer capability into the region.

To meet statewide reliability needs between 2012 and 2016, the equivalent of 1,750 to 2,000 MW of resources should be added to the bulk electricity grid. A portion of that generation would need to be located in New York City.

According to its tariff authority, the NYISO has designated certain responsible Transmission Owners in southeastern New York to identify regulatory backstop solutions to these reliability needs which may be called upon if no timely market-based solutions are available.

Statewide

Based upon continuing load growth throughout the state from 2012 to 2016, if left unaddressed the RNA determines that the system adequacy criterion will be violated statewide in these years as well. The reliability needs during this period can be characterized as statewide resource adequacy needs. That is, there are multiple combinations of generation, transmission and demand-side resources that could satisfy those needs during this period. Consequently, all of the state's privately owned transmission companies, as well as the Long Island Power Authority (LIPA), will be required to identify regulatory backstop solutions for the reliability needs from 2012 to 2016. The New York Power Authority (NYPA) has agreed to work with the other Transmission Owners on this effort.

Sensitivities and Scenarios

The RNA includes the results of two sensitivity analyses which demonstrate that:

- The reliability need in 2011 could be deferred to 2012 if the voltage constraints in the Lower Hudson Valley were to be resolved; and
- While an unlimited transmission system capability would improve statewide reliability, the first year of a statewide reliability need would still be 2012.

The following alternative scenarios and their results are also discussed in the 2007 RNA:

- A high demand growth scenario in southeastern New York shows the reliability need in 2011 advances to 2009;
- If increasingly stringent environmental controls were to force the retirement of all of the coal-based generation in New York except for the two most modern units, the reliability needs in some zones in New York would move up to 2009 or 2010;
- If the retirement of the NYPA Charles Poletti unit is deferred until the end of 2009, both statewide and downstate reliability would improve;
- If non-utility generators that have older, regulatory power purchase agreements retire in the years when their contracts expire, the statewide need date would advance to 2009 and would increase dramatically in 2010;
- If NYPA proceeds with its agreement to purchase 500 MW from New Jersey to serve its customers in New York City across a new transmission tie, the first year of need would be deferred until 2013; and

- If NYPA proceeds with a 680 MW clean coal facility near Buffalo in 2013, there would still be a statewide reliability need in that year.

Proposed Solutions

The second phase of the planning process is now underway; this is when the NYISO elicits market-based and regulated backstop solutions to the needs identified in the 2007 RNA. Proposals, due by May 1st, can be in the form of large or small generation projects, including distributed generation, demand response programs, transmission projects, market rule changes, operating procedure changes, and other actions to meet needs identified in the RNA. The process that led to the 2005 RNA and companion 2006 CRP did yield sufficient proposals that were found to be timely responses to the needs identified in the 2005 RNA. The 2007 CRP, which will contain the NYISO staff analysis of proposed solutions, is scheduled to be reviewed and acted upon by the NYISO Board of Directors in late summer 2007.

IV. Ongoing Challenges and Opportunities

Meeting future electricity requirements in a time of increasing demands, new environmental initiatives and ever-changing fuel supply and price conditions presents many challenges to public policymakers, those who operate the bulk electricity grid and those who participate in wholesale electricity markets. These challenges are compounded in a densely populated, northeastern state like New York that lacks indigenous fuel resources (except for almost fully developed hydropower) and is highly dependent upon fuel supplies from other states and nations.

This section of the report discusses some of the conditions that contribute to the more pressing challenges confronting the state's bulk electricity grid over the next few years.

Environmental Factors

A host of federal and state environmental initiatives will affect the generating facilities of the state's bulk electricity grid. The search for viable solutions will be most intense over the next several years.

Some of these programs, such as the state's Renewable Portfolio Standard, have already encouraged the development of new resources, particularly wind-powered generation, improving the fuel diversity of the state's generation mix. Others, like the Regional Greenhouse Gas Initiative (RGGI) and new rules to bring the state into compliance with ozone standards, will go into effect two years from now.

The challenge of these initiatives is to improve air and water quality while maintaining electric grid reliability. Complicating this challenge is New York's growing need for additional electricity supply. Investors in pollution control retrofits, repowered existing facilities and new power plants need an environmental regulatory scheme that is transparent, works with the existing electric market structure and provides long-term certainty. The four programs that most directly impact the power sector are described below.

New York State Renewable Portfolio Standard. In 2004, the Public Service Commission established the state's Renewable Portfolio Standard (RPS), which requires that 25 percent of the state's electric energy requirements be met by renewable resources by 2013. Currently, hydropower is the most significant renewable resource in the state's energy mix. However, wind-powered generation has the potential to make a large contribution in the future thanks to the requirements of the RPS and incentives contained in the Energy Policy Act of 2005.

Currently, 350 MW of wind-powered generation is operational in the state and more than 50 wind projects that could add another 6,000 MW have been proposed.

Local gas distribution infrastructure a limiting factor for NYC dual-fueled generators.

A dual-fueled generator operating in a competitive wholesale electricity market might choose to burn natural gas or oil depending on the cost of those fuels or on emission requirements. But, for a select number of dual-fueled generators in New York City, the decision is often made based on a reliability rule that seeks to protect the City against interruptions to its electric service due to a loss of gas supply.

This rule, known as the "minimum oil burn requirement," requires these generators to co-burn a minimum amount of alternative fuels (typically oil) and natural gas even if the cost of the alternative is higher than the cost of natural gas. The rule was developed to address the lack of redundancy in the local gas distribution system. It is designed to avoid the risk that the lights will go out in New York City if the gas supply is interrupted.

This rule has implications for the wholesale electricity markets which are currently being reviewed by the NYISO and its market participants. This rule needs to be taken into account in the implementation of Phase 1 of the NOx emission reduction program of the Ozone Transport Commission.

Here, constraints at the local level in the delivery systems for natural gas can be seen affecting electricity price, air quality issues and grid reliability.

As an intermittent resource, wind-powered generation has unique electrical characteristics that create challenges in the planning and operation of the bulk electricity grid. Recognizing these issues, the NYISO has made necessary and appropriate adjustments to its wholesale market rules to level the operational playing field for wind-powered generation. A 2005 study sponsored by the New York State Energy Research and Development Authority (NYSERDA) concluded that the New York bulk electricity grid should be able to reliably integrate about 3,300 MW of wind-powered generation.

NOx Emission Reduction Requirements of the Ozone Transport Commission. At this time, New York State does not meet federal ozone ambient air quality standards. Emissions of nitrogen oxides (NOx) from power plants and mobile sources, such as cars, create ground level ozone smog in the presence of sunlight and humidity. New York as a member of the Ozone Transport Commission, which consists of 12 states and the District of Columbia, participates in a multi-state effort to achieve compliance with ozone air quality standards. New York is considering how to implement a two-phase plan to bring it into compliance.

Phase I will require a reduction of 50 tons per day of NOx emissions on High Electric Demand Days (HEDD) beginning May 2009. This is equivalent to a 27 percent reduction in NOx emissions from electric generators that operate during periods of peak demand. This requirement may affect generators capable of producing more than 4,000 MW (approximately 40 percent of the in-city generation) of electricity during the summer in New York City. Further details about the generating units affected by Phase I will be known by June 2007 – after which the operational and reliability implications for southeastern New York can be studied in greater detail.

Implementation of these NOx emission reductions is complicated by minimum oil burn requirements for generators operating in New York City on HEDDs. These requirements mandate certain generating units to burn natural gas in combination with an alternative fuel, usually oil, when electric loads exceed a certain level. The rules are made necessary by the limited flexibility of the natural gas delivery system in New York City and Long Island and the attendant risk to reliable electric service. Minimum oil burn requirements are typically implemented on HEDDs.

Phase II, scheduled to go into effect in 2015, may require daily reductions on the order of 70 to 80 percent – a requirement that cannot be met through retrofit technologies that are available at this time.

New York State Consent Orders. Seven coal-fired generating plants totalling more than 2,104 MW of capacity in New York are subject to consent decrees which require the owners of these plants to take a number of actions to reduce emissions. Among the options identified in the agreements are the installation of specific pollution control technologies by certain dates, fuel switching, reduced operation or unit retirements. Affected plants totaling 921 MW have announced retirements; another three facilities, which account for 813 MW, have already installed the required controls or are planning to do so. The owners of the power plants that make up the balance of the affected megawatts have not announced their intentions.

Regional Greenhouse Gas Initiative. RGGI is a cooperative program of northeastern states designed to control greenhouse gas emissions from power plants. The Northeast regional group consists of New York, New Jersey, Delaware and the six New England states. The program will place a region-wide cap on CO_2 emissions beginning in 2009 by defining the maximum number of tons of CO_2 that may be emitted by the regulated power plants in the region that year.

Each of the participating states will receive a share of the region's allowances and may make these available to its regulated power plants as it sees fit. Power plants will be required to acquire carbon allowances equal to the tons of carbon emitted every year. Planned reductions in available allowances starting in 2015 are intended to reduce carbon emissions 10 percent by 2018.

After the initial sale of allowances through auctions, these allowances may be traded in bilateral sales. The price of allowances will raise the price of electricity, but a well-designed auction will provide the most efficient allowance price possible.

Fuel Diversity

New York's electric sector has become increasingly dependent on natural gas – and this trend shows no signs of abating – raising concerns about the continued availability of natural gas and the impact on the price of electricity.

Natural gas was once considered an abundant and secure North American resource. Its popularity for industrial, domestic and now electric generating purposes, however, has strained domestic supply and the underlying delivery infrastructure. Major new supplies of natural gas will be in the form of liquefied natural gas (LNG) from abroad.

The sources of imported LNG are largely from politically unstable parts of the world, making its continuity of supply questionable and its price subject to international political concerns. While it is unrealistic and probably undesirable to rule out LNG as a future fuel source, the supply and price problems associated with its use can be somewhat ameliorated by fuel diversification in the state's next generation of power plants.

In a companion report to the 2007 RNA, the NYISO notes that many of the oil- and gas-fired power plants in New York City and Long Island have interruptible gas supply and delivery contracts. Consequently, there is a potential for a natural gas shortage for electric generation use in New York due to curtailments that may occur during periods of high demand for, or tight supplies of, natural gas. Shortages could raise reliability concerns if these lead to curtailments of natural-gas fired units. Similarly, fuel-switching in dual-fueled units to compensate for natural-gas shortages would likely complicate operational as well as environmental compliance issues, particularly for New York City generators. The pie charts (Tables 10, 11 and 12) clearly illustrate the heavy reliance on natural gas in the states electric generation sector, especially in New York City and Long Island.

TABLE 10
2007 Capacity by Fuel Type

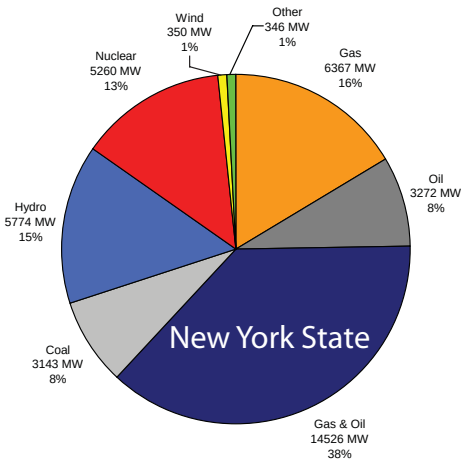


TABLE 11
2007 Capacity by Fuel Type

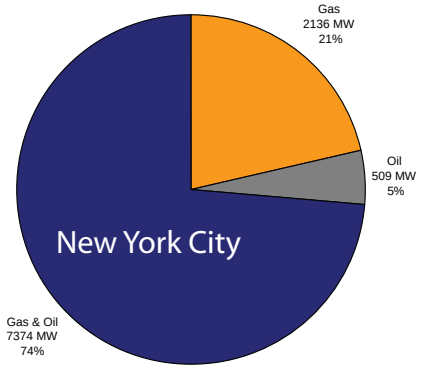
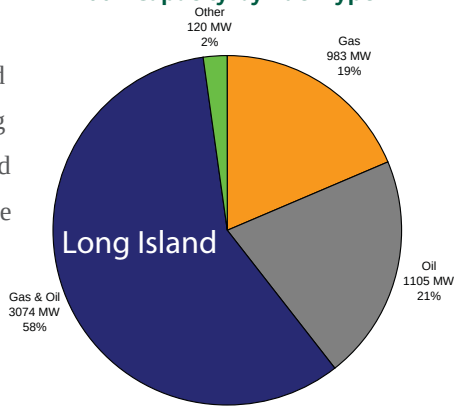


TABLE 12
2007 Capacity by Fuel Type



Siting Power Plants and Transmission Lines

Power Plant Siting. For 10 years New York had a streamlined process — codified in Article X of the Public Service Law — for granting permits to power plants 80 MW and over. The law provided a one-stop permitting process that helped developers secure approvals in approximately 12 months and incorporated what would have otherwise been local permitting issues. Article X expired at the end of 2002 and annual efforts to pass similar legislation have failed. Today, permits for large new generation facilities must be obtained through the State Environmental Quality Review Act (SEQR) process, which is more complicated and lengthy than the one that existed under Article X. The requirement for local permits often results in delays, additional expense and may be used to block locally unpopular projects. This additional uncertainty can make New York State a riskier, and therefore less attractive, option for potential investors.

Eminent Domain. In October 2006, a New York State law placed new limitations on companies that seek to use eminent domain to acquire property and rights-of-way for merchant transmission lines and gas pipelines. The law has added another layer of complexity to the already difficult process of developing these essential elements of the state's energy infrastructure.

Limitations of Existing Transmission Lines

The existing transmission capability into southeastern New York has effectively decreased over the past few years because the grid operators are forced to limit the amount of electricity that can move over these lines due to voltage constraints in that region.

Secure operation of the bulk electricity grid requires all electricity flows on transmission lines to be limited by one of three criteria: thermal, voltage and stability. The north-to-south transmission lines could carry more electricity – amounts that would reach the "thermal capability" of these lines – but for a degradation in the voltage performance of the transmission system in the southeastern region. During peak demand conditions, the transfer capability of the transmission system has been limited below the full capability of the lines because of the risk of voltage instability.

The transmission system transfer capability continues to be eroded by voltage problems in southeastern New York. As the 2007 RNA points out, the state's bulk electricity grid stands to lose hundreds of megawatts of transfer capability by 2011 if the voltage issues are not successfully resolved.

The decline in the voltage performance of the system is occurring because of demand growth, retirements of power plants and the lack of new power plants or transmission resources that are located below the constrained north-to-south transmission interfaces. The voltage performance of the system can be improved by adding new "reactive resources" such as new generating capacity, static Volt Ampere Reactive (VAr) compensators and new capacitor banks in select locations in the transmission and distribution system.

In addition to the voltage concerns in southeastern New York, increasing electricity usage places greater demand on the existing transmission infrastructure. This can result in the need for more frequent maintenance and potential failures. This problem is especially acute for underground cables where the ability to quickly detect and cure a problem is more difficult than overhead facilities.

Investment Concerns

Private companies that seek to raise capital to develop energy infrastructure projects must satisfy prospective lenders as to the financial soundness of the proposed project. The restructuring of the wholesale electric industry from a rate-of-return regulatory structure to one of organized competitive wholesale markets rested, in part, on the premise that these markets would be able to attract capital investment for necessary infrastructure.

To date, New York's competitive wholesale electricity markets have successfully attracted private investment in a discrete set of energy resources beginning with the successful divestiture of the power plants formerly owned by the state's utilities, to new combined-cycle power generation technologies, and wind-powered generation.

However, substantial investments in the high-voltage transmission systems and in large power plants are not on the horizon. Given the outlook for energy infrastructure needs over the next 10 years, this is cause for concern.

A fresh look at components of the state's wholesale electricity market that could support – or, are currently hindering – these investments is necessary. The compatibility of long-term contracts with the wholesale market structure should be examined. The effect of longer-term, bid-based capacity markets (beyond the six months currently available through the NYISO-administered market) should be studied. The development of forward markets for any or all of the products traded in the state's wholesale electricity markets should be investigated.

V. Federal Initiatives

The Energy Policy Act of 2005 is the most significant federal statute affecting the electric power sector to have emerged in more than 70 years. It is a sweeping piece of legislation that touches on matters related to electricity, fossil fuels, nuclear power, renewable resources and energy efficiency standards and technologies, and the energy infrastructure needs of the country.

From the NYISO's perspective, one of the most important aspects of the legislation addresses the need for, and barriers to, investment in transmission lines. The Act assigned to the U.S. Department of Energy (DOE) the task of identifying and designating as National Interest Electric Transmission Corridors (NIETC) – those geographic areas of the country that experience transmission congestion and constraints to the detriment of consumers. The Act gives the Federal Energy Regulatory Commission the power to permit construction of specific transmission projects within a NIETC-designated corridor if the affected states are unable or unwilling to grant these permits.

The DOE issued the first National Electric Transmission Congestion Study in August 2006, which designated the Atlantic coastal area from metropolitan New York southward through Northern Virginia as one of two "Critical Congestion Areas." In the words of the report, this is an area "of the country where it is critically important to remedy existing or growing congestion problems because the current and/or projected effects of the congestion are severe." The DOE has not yet made a NIETC designation based on its findings or in response to any of the 13 requests for such a designation that were submitted in March 2006.

The federal "backstop" siting authority given to the FERC is intended to complement the efforts of state authorities that desire to strengthen transmission infrastructure in affected areas of the country. It remains to be seen how these new authorities will be used by the federal agencies and what the local reaction will be to their use.

FERC Order 890. FERC issued Order 890 in February 2007 which requires all transmission providers, including the ISOs and RTOs, to adopt a formal planning process that includes both reliability and economic planning components. The NYISO's Comprehensive Reliability Planning Process, described in an earlier section of this report, meets the FERC requirement with respect to reliability planning. Now, the NYISO is working with its stakeholders, including state agencies, to address the economic planning component of Order 890. One element that is under consideration is a process that will allow wholesale electricity customers to request congestion studies of value to them. In addition, the FERC rule provides for additional studies to identify upgrades to integrate new generation resources on a regional basis.

The NYISO expects that its expanded planning role will bring additional valuable information to the marketplace and to state and federal policymakers who make decisions that affect the New York bulk electricity grid, and by extension, the state's energy, environmental and economic development objectives.

VI. Conclusions

The New York bulk electricity grid will have adequate resources to meet forecasted peak demand during the summer of 2007. The near-term outlook, through 2010, also shows sufficient resources to meet expected demand, although, as discussed in the body of this report, that outlook could change.

Some combination of new power plants, transmission capability or demand-side resources will be needed in significant quantities in order to maintain the adequacy and reliability of the bulk electricity grid. In southeastern New York this need date is 2011, on a statewide basis the need date is 2012.

As described in the 2007 Reliability Needs Assessment, there are a number of factors that could either advance or defer those need dates by as long as two years. Whether the need date is 2009 or 2013, there are a number of challenges which must be addressed soon if new resources are to be available within that time horizon. The following issues emerge as the more significant challenges confronting the state's bulk electricity grid:

- The absence of a streamlined siting and permitting process for major power plants;
- The need for additional market-based mechanisms designed to support the financing of energy infrastructure projects;
- The heavy reliance on natural gas in the power generation sector and the attendant price and supply risks associated with that dependence;
- The challenge to find solutions to several environmental initiatives that also maintain electric grid reliability, work within existing electric market structures and provide the transparency and long term certainty needed for future power sector investment; and
- A recently enacted law denies the power of condemnation to certain developers of new transmission facilities and this represents a deterrent to the development of new transmission.

VII. Glossary

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.

Aggregator: An entity that buys or brokers electricity in bulk for a group of retail customers to increase their buying power.

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 by which electricity flows from suppliers to local distribution systems that serve customers. New York's bulk electricity grid includes all electric 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.

Comprehensive Reliability Plan (CRP): An annual 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 by that point. It is the second step in the Comprehensive Reliability Planning Process (CRPP).

Comprehensive Reliability Planning Process (CRPP): The annual 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 CRPP consists of two studies: a Reliability Needs Assessment (RNA), which identifies potential problems, and the Comprehensive Reliability Plan (CRP), which evaluates specific solutions to those problems.

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.

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. the day before the day these products are bought and sold, based on generation and energy transaction bids offered in advance to the NYISO. More than 90 percent 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, or "megawatts", into the Day-Ahead energy market, as generators do.

Deliverability: In the context of natural gas, the volume of gas that a pipeline or distribution system can deliver in a measurable period of time.

Demand Response Programs: A series of innovative programs designed by the NYISO to maintain the reliability of the bulk electrical 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 the 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 Policy Act of 2005 (EPAct): An extensive energy statute approved by President George W. Bush in August 2005 that requires the adoption of mandatory electric reliability standards and gave the 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 within the U.S. Department of Energy that approves the NYISO's tariffs and regulates its operation of the bulk electricity grid, wholesale power markets, and planning and interconnection processes.

Forced Outage: An unanticipated loss of capacity, due to the breakdown of a power plant or transmission line. It can also mean the intentional shutdown of a generating unit or transmission line for emergency reasons.

Fuel Capacity: The amount, or percentage, of fuel available for use to produce electricity.

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 (NOx) emissions that can be greater than two times their average levels. Days of high electrical use often coincide with days with high ozone levels.

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

Installed Reserve Margin (IRM): The amount of installed electric generation capacity above 100 percent of the forecasted peak electric consumption that is required to meet New York State Reliability Council (NYSRC) resource adequacy criteria. Most planners consider a 15-20 percent reserve margin essential for good reliability.

Interconnection Queue: A queue of merchant transmission and generation projects (greater than 20 MW) 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.

Liquefied Natural Gas (LNG): A liquefied product derived from natural gas (primarily methane) that is reduced to minus 259 degrees Fahrenheit. The colorless, odorless, non-toxic liquid can be stored under low temperature and high pressure to reduce volume for shipping and storage.

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

Locational Installed Capacity Requirement: A NYISO determination of that portion of the statewide installed capacity (ICAP) 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): LOLE establishes 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 an LOLE that is not greater than one occurrence of an involuntary load disconnection in 10 years, expressed mathematically as 0.1 days per year.

Lower Hudson Valley: The southeastern section of New York, comprising New York Control Area Load Zones G, H and I. Greene, Ulster, Orange Dutchess, Putnam, Rockland and Westchester counties are located in those Load Zones.

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 (RNA). Those solutions can include generation, transmission and Demand Response Programs. Market-based solutions are preferred by the NYISO's Comprehensive Reliability Planning Process (CRPP). The NYISO is responsible for evaluating all solutions to determine if they will meet the identified reliability needs in a timely manner.

Minimum Oil Burn: Requirements that apply to certain dual-fuel generators in New York City and on Long Island as called for in NYSRC's Local Reliability Rule I-R3. The identified generators are required to burn oil when electric consumption in New York City approaches peak demand levels during summer and winter capability periods, based upon limitations in the gas supply infrastructure, to reduce the risk of loss of electric generators during these periods due to loss of gas supply.

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, the NYISO is a not-for-profit organization that manages New York's bulk electricity grid – a 10,775-mile network of high voltage lines that carry electricity throughout the state. The NYISO also oversees the state's wholesale electricity markets. 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, and is divided into 11 zones.

National Interest Electric Transmission Corridor (NIETC): Areas of the country designated by the Secretary of Energy as experiencing "electric energy transmission capacity constraints or congestion that adversely affects customers." The designations are based on congestion studies that consider economics, reliability, fuel diversity, national energy policy and national security. The federal Department of Energy has is charged with the responsibility of designating NIETCs, through authority granted under the Energy Policy Act of 2005.

New York Power Pool (NYPP): The predecessor to the NYISO. The New York Power Pool, at the time of the establishment of the NYISO, consisted of the state's six investor-owned utilities plus New York's two power authorities. The NYPP was established July 21, 1966, in response to the Northeast Blackout of 1965.

Order 890: Adopted by FERC in February 2007, Order 890 is a change to FERC's 1996 open access regulations (established in Orders 888 and 889). Order 890 is intended to provide for more effective competition, transparency and planning in wholesale electricity markets and transmission grid operations, as well as to strengthen the Open Access Transmission Tariff (OATT) with regard to non-discriminatory transmission service. Order 890 requires transmission providers – including the NYISO – have a formal planning process that provides for a coordinated transmission planning process, including reliability and economic planning studies.

Outage: Removal of generating capacity or transmission line from service, either forced or scheduled.

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

Reactive Resources: Facilities such as generators, high voltage transmission lines, synchronous condensers, capacitor banks, and static VAr compensators that provide reactive power. Reactive power is the portion of electric power that establishes and sustains the electric and magnetic fields of alternating-current equipment. Reactive power is usually expressed as kilovolt-amperes reactive (kVAr) or megavolt-ampere reactive (MVAr).

Regulated Backstop Solutions: Proposals required of certain Transmission Owners to meet reliability needs as outlined in the Reliability Needs Assessment (RNA). 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): An annual report that evaluates resource adequacy and transmission system security over a 10-year planning horizon, and identifies future needs of the New York electric grid. It is the first step in the NYISO's Comprehensive Reliability Planning Process (CRPP).

Security: The ability of the power system to withstand the loss of one or more elements without involuntarily disconnecting firm load.

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.

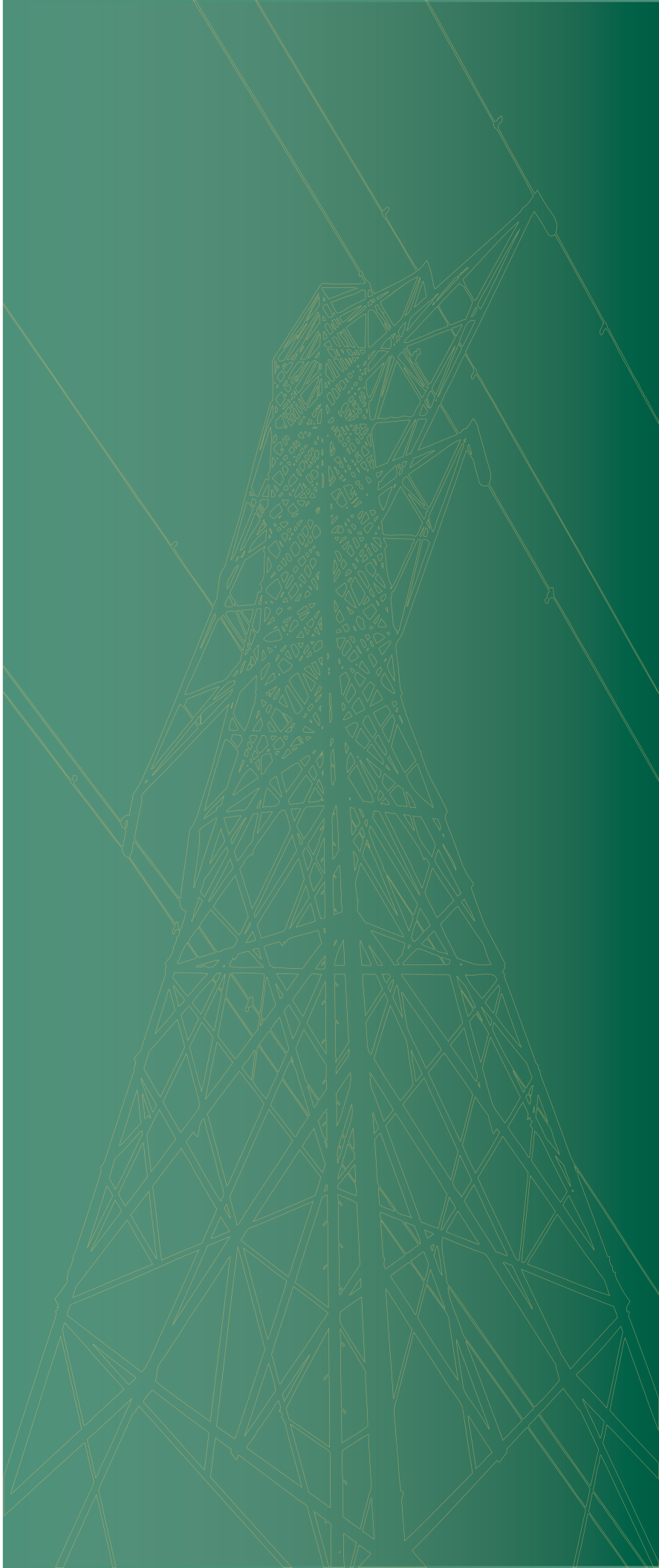
Transfer Capability: The amount of electricity that can flow on a transmission line at any given instant, respecting facility rating and reliability rules.

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

Upstate: The New York Control Area (NYCA) north of the upstate New York and southeast New York Interface, or UPNY – SENY Interface.

Volt Ampere Reactive (VAr): A measure of reactive power.

Weather Normalized: Adjustments made to remove fluctuation due to weather changes when making energy and peak demand forecasts. Using historical weather data, energy analysts can account for the influence of extreme weather conditions and adjust actual energy use and peak demand to estimate what would have happened if the hottest day or the coldest day had been the typical, or "normal," weather conditions. Normal is usually calculated by taking the average of the previous 30 years of weather data.



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