Power Alert III

New York's Energy Future

Generation

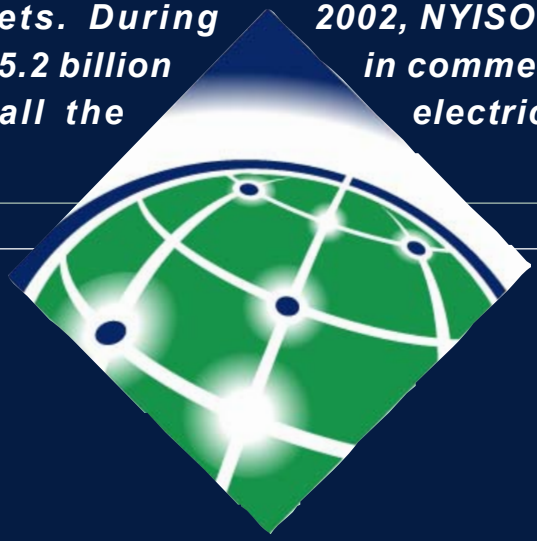
Transmission

Demand Response

Report by: The New York Independent System Operator - May 2003

NYISO
NEW YORK INDEPENDENT SYSTEM OPERATOR
BUILDING THE ENERGY MARKETS OF TOMORROW...TODAY

The New York Independent System Operator (NYISO) was formed on December 1, 1999 as part of the restructuring of the electric power industry in New York State and assumed grid management duties formerly relegated to the New York Power Pool. In addition to overseeing New York's bulk power transmission system, the NYISO is responsible for administering New York's wholesale electricity markets. During 2002, NYISO energy and ancillary markets did $5.2 billion in commerce, representing roughly half of all the electricity sold in NewYork.



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The central question
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POWER ALERT III

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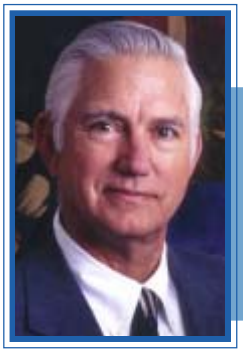
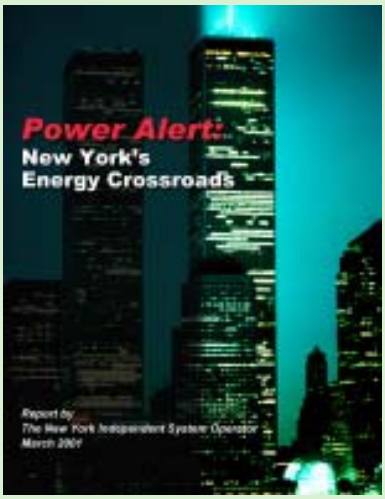


I. Introduction

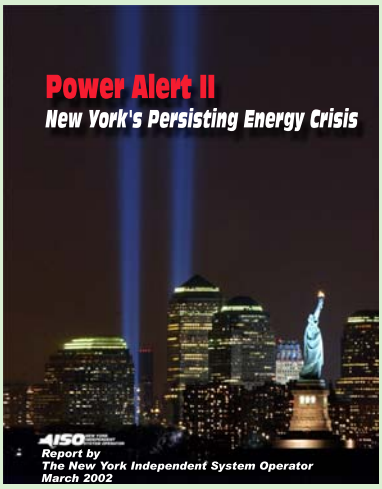
William J. Museler, President & CEO

In 2001, in the wake of the California energy crisis, the New York Independent System Operator (NYISO) prepared a report on the status of electricity supply in New York State. ***Power Alert I: New York's Energy Crossroads,*** was published to much attention. It outlined a looming energy problem for New York State and particularly New York City; and proposed realistic solutions.



Following the 9/11 tragedy, NYISO revisited ***Power Alert I***, with consideration given to infrastructure damage and further potential down-turn in New York's economy created by the terrorist attacks. ***Power Alert II:*** **New York's Persisting Energy Crisis,** was published in March 2002 with the major finding that, although some power plants had finally been approved, New York continued to be in serious need of new electric generating plants.

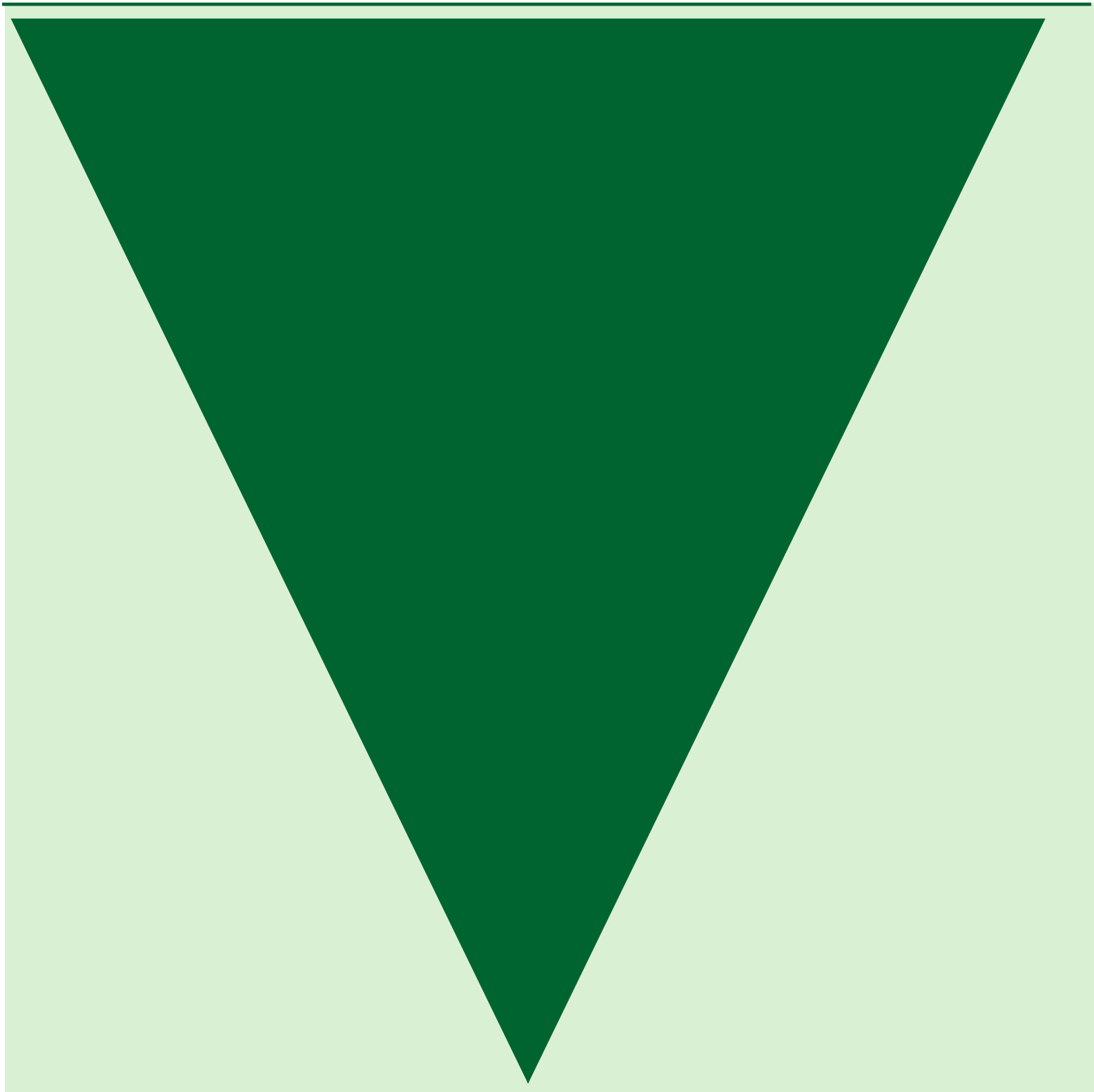
Power Alert III (PA3) follows in the tradition of these two previous documents while offering additional perspectives based upon the NYISO's experience and market feedback from the past two years. PA3 breaks down the future of New York's bulk power system into three components we call the three "legs" of the energy system stool: 1) supply, 2) transmission and distribution (T&D), and 3) demand response and conservation.



PA3 tackles each of these legs from the standpoint of "Where are we now?" and "Where should we be going?" Each question is answered in terms of assuring reliability, increasing consumer savings and environmental attributes, and advancing the evolution of the markets. In the "Call to Action" section, PA3 distills the answers to these questions into a series of public policy recommendations for legislators, regulators and the NYISO itself.

Because of the unique national and regional vantage points, the NYISO enjoys as the wholesale market operator and reliability coordinator for New York State, we believe we have identified a number of important recommendations that will require the active involvement of Market Participants, State and Federal regulators, and our neighboring electric system operators.

We hope you will join us as we work to make New York's electric system among the best in the world for the 21st Century.



II. Executive Summary

Overview

This report is the third "Power Alert" to be issued by the NYISO since it commenced operation in December of 1999. It shows that much progress has been made in establishing fair, efficient and competitive wholesale markets in New York, but that much remains to be done in order to create an environment that can attract badly needed investment in energy facilities.

Since the issuance of the original Power Alert, the State's short-term needs continue to be met only by a combination of emergency actions by the Governor, the New York Power Authority (adding a total of 440 MW of small combustion turbines in New York City and Long Island); the Long Island Power Authority (adding 400-plus MW of small combustion turbines on Long Island); the temporary restoration of two old retired units and the implementation of a Demand Response Program (DRP). Although a few new merchant generators were finally licensed in this period, the prospect for a steady addition of plants to meet long-term needs has gotten significantly worse.

Power Alerts I and II were optimistic as to the ability of the fledgling New York wholesale markets to attract investment in power facilities within the State. The disclosure surrounding the demise of Enron and the crumbling finances of many merchant generating companies have combined to discourage investment in power facilities in New York as well as elsewhere. The NYISO and its market participants have adopted several measures intended to make the State's wholesale markets more attractive to investors, but it is not at all clear that these measures will provide adequate incentive to attract investment.

The earlier reports also focused on the need to streamline the licensing process for power plants under the State's Article X Siting Law. The State acted to streamline the Article X process and 5,000 MW of new generation was approved; but that problem has now been exacerbated by the fact that the State Legislature has permitted Article X to expire entirely, leaving it unclear whether additional power plants can be built in the State even if the investment climate were to change for the better.

In addition, transmission expansion remains stalled due to the evolving market and regulatory uncertainties regarding recovery of transmission investments. Thus, while the NYISO and its participants have achieved considerable success in adding liquidity to the State's wholesale energy markets, national events and the failure to renew the State's one-stop siting law for power plants have combined to render the State less attractive to potential investors in sorely needed generating facilities.

"Since Power Alert I, much as been done to create fair and efficient wholesale electricity markets . . . much remains to be done to attract badly needed investment in energy facilities."

Summer 2003 – The Short-Term Outlook

New York State and New York City's electricity supply will be in marginal compliance with reliability requirements this summer, but more generating capacity is needed if the citizens of the State are to be protected by robust competition from price excursions. As a result of some "just-in-time" new generation, and an ongoing successful Demand Response Program, supplies should be marginally adequate for "normal" summer

NYS Summer 2003 In-State System Load and Generating Capacity *					
Region	**Requirement (Load + Reserve or Locational Requirement)**	**Generation Available**	**Margin** (as of April 2003)	**New Generation & SCRs Summer 2003**	**Projected Margin Summer 2003**
NY State	37,087	36,527	**- 560**	891	+ 331
NY City	8,816	8,749	**- 67**	118	+ 51
LI	4,607	4,983	**+ 376**	107	+ 483
**In-state supplies only as of 3/2003. Does not include out-of-state firm exports or contracts of 303 MW. Up to 1,500 MW of capacity from out-of-state resources has been available in the past. SCRs (a Demand Response Program) also assist in meeting demand in NY.*					

weather. A repeat of the 2002 summer heat waves, or increased generation and/or transmission outages could quickly make the situation worse.

New York State and New York City supplies should meet reliability criteria for this summer. Although reliability criteria are designed to mitigate the risk of occurrence of extreme conditions (e.g. 2002 type summer heat waves), when they do occur the risk to the system increases significantly - i.e., blackouts are more likely. The question then becomes; does the 1960's era developed reliability criteria of one day in ten years loss of load expectation provide sufficient margin for today's digital economy?

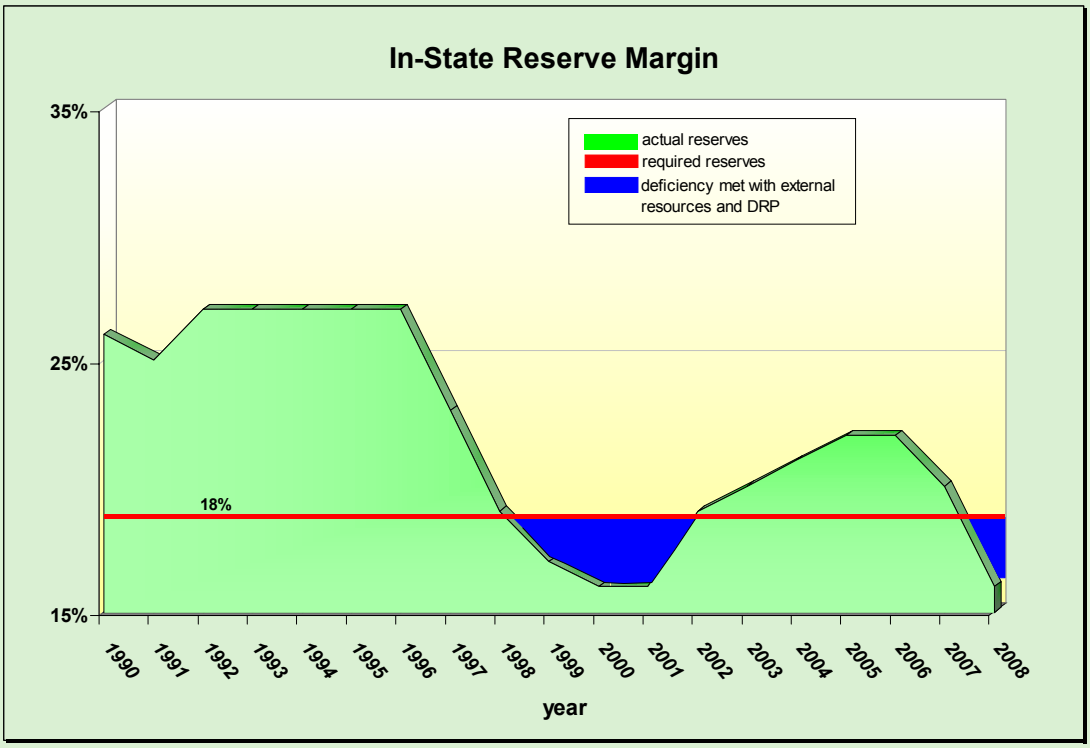
New York's reliability requirements stem from the national reaction to the 1965 Northeast Blackout and the New York City (NYC) 1977 Blackout. There has been no comprehensive review of those requirements since that time. The NYISO will be working with the appropriate State, Federal, and industry groups to re-examine these requirements to assure their continuing applicabilitity and that they provide adequate public safety -- including terrorism considerations and economic benefit -- in today's more energy and information dependent society.

Generation – Problem for the Long Haul

New York has enjoyed abundant generation resources for many years, as the graph illustrates. This surplus ended in 1999. While we are in marginal compliance with our own near-term reliability requirements[1], we need to take more steps to maintain that compliance in the longer term by establishing a workably competitive environment to support the more permanent needs of the State's economy.

The future outlook for adequate, efficient and environmentally friendly generation is bleak. After the current construction "bubble" of 2,500 - 3,500 MW is completed, there is little evidence that serious consideration is being given to additional new generation in

[1]The amount of installed capacity available above the peak load forecast. Currrently the reserve requirement for New York is 18 percent.



New York State, New York City, or on Long Island. This dim outlook is due to a confluence of factors, which combine to produce market uncertainty and paralysis. The major negative drivers are:

- The expiration of New York's Article X Siting Law.
- Market rule uncertainty (typical of evolving wholesale markets) does inhibit investment. Opposition to the Federal Energy Regulatory Commission (FERC) Standard Market Design (SMD) Order and pending federal energy legislation are adding considerably to market uncertainty.
- The ENRON disclosures and the subsequent severe financial problems of merchant generation companies, effectively eliminating near-term financing of new merchant projects, including those that hold siting permits.
- Problems in New York (and the region's) wholesale capacity markets and the institutional difficulties of entering into long-term power supply contracts further restrict generation developers' and end use suppliers' options.
- Up until now, the New York wholesale electricity markets, in particular, the real-time wholesale energy markets, have not provided adequate or consistent price signals during periods of scarcity[2] when short supply should be accompanied by appropriately higher prices.
- New state emissions standards may cause the retirement of existing generating facilities.

[2]Scarcity Pricing is wholesale electricity prices during shortages that reflect the true value of energy during these periods.

Prior to the adoption of the predecessor to Article X of the Public Service Law (the State's "one stop" siting law), power plant licensing was governed primarily by local zoning restrictions. Those restrictions had made it increasingly difficult to locate facilities in many parts of the State. Since that time, the State adopted Article X as a means of expediting the siting process. The "one stop" process, while not without difficulties, was intended to ease regulatory hurdles while protecting both the State's natural environment and the legitimate interests of local residents. Shortly after the issuance of the original "Power Alert," the State successfully concentrated on eliminating administrative obstacles to the functioning of the regulatory scheme. However, the law expired on December 31, 2002, and if New York's Article X Siting Law is not renewed, projects may not be available even when funding markets revive. The NYISO believes the statute should be renewed promptly.

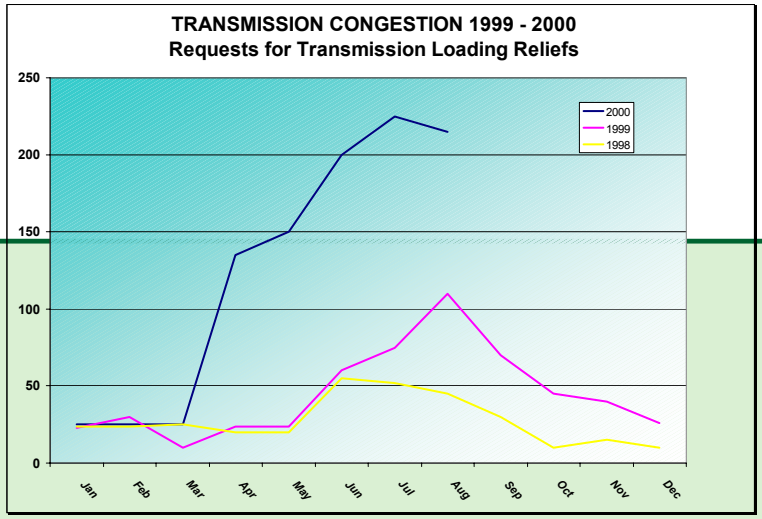
With regard to the financial woes of the electricity industry generally, some of the problems and uncertainties will ultimately be resolved by asset write-downs, consolidations, and bankruptcies. Recovery, however, will require New York to present real and reliable opportunities for generation investment. These "signals" must include strong and effective action on the other issues outlined in this section, and must provide for a predictable stream of future revenues to investors, subject only to the risks of a competitive marketplace.

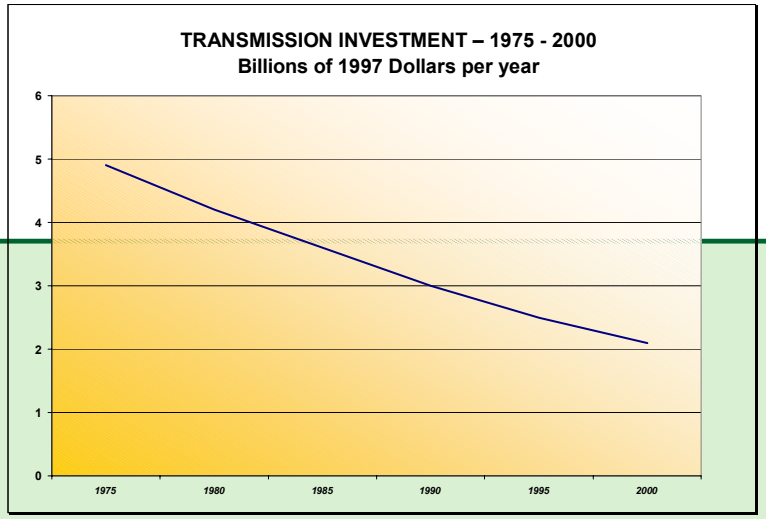
Because, for the most part[3], there is no means of storing electricity for subsequent sale, suppliers must have the capacity to generate electricity whenever customers choose to use it. This operating reality gave rise to the notion that electricity should be paid for in two parts—the energy itself and the capacity (the availability of the unit to generate "on demand") to produce it. Thus, a plant would be built and the owner would "sell" some or all of the capacity to the recipient, and the energy from the facility would be sold separately. Traditionally, the owner would recover at least some of his fixed costs through the sale of capacity and any balance plus his variable costs through the sale of the energy and ancillary services such as reserves and regulation. When the New York wholesale markets were established, provision was made for the sale of capacity (ICAP) via auctions. The NYISO and its market participants have been working towards improvements in the ICAP markets intended to send better pricing signals to investors, allowing greater predictability of the anticipated revenue stream. A similar result can be achieved by creating the pre-conditions necessary for generators to enter into long-term supply contracts with distributors. The NYISO plans to explore these matters with the New York Public Service Commission, and then with FERC, in the near future.

Finally, New York's wholesale electricity markets, already the most sophisticated in the United States, must improve their price signals during scarcity conditions. The NYISO and its consultants identified this problem, and the NYISO is taking action to improve it, but additional changes are likely to be required to instill confidence in generators, developers and investors.

[3]The major exception to this rule is pumped storage hydro-electricity, whereby water is pumped up a hill during slack demand periods and allowed to fall back down, turning a turbine generator, during periods of peak demand.

Transmission Congestion vs. Transmission Investment in the U.S.

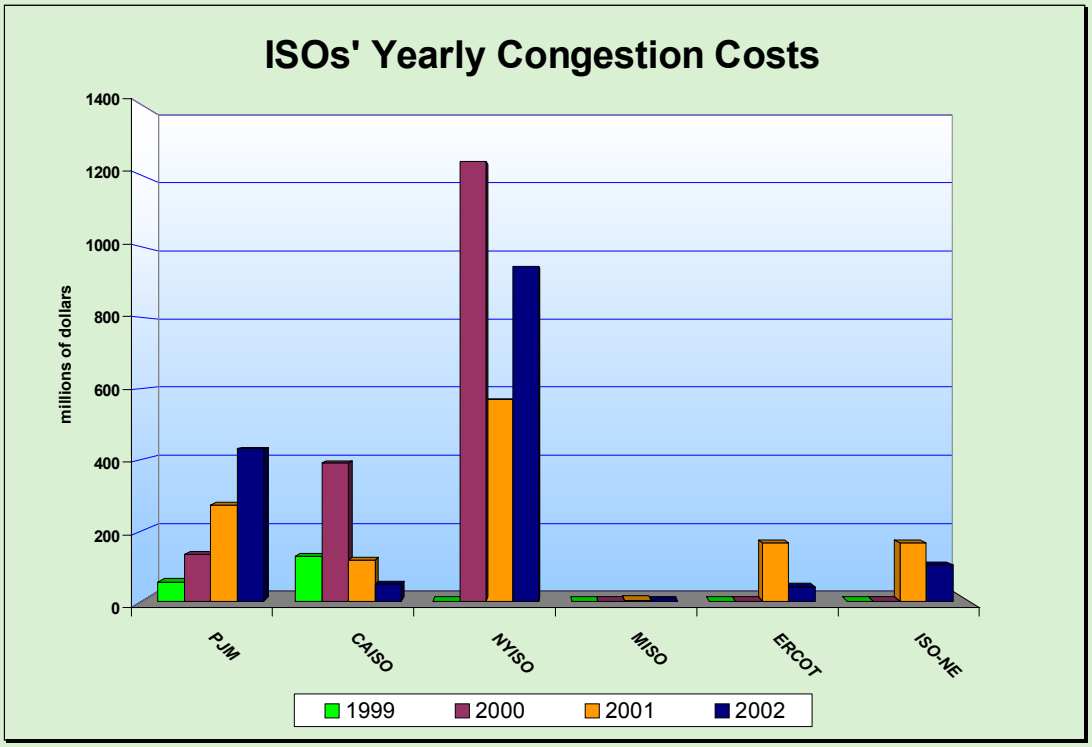




Transmission – Energy Super Highway or Short Circuit?

A necessary ingredient of competitive wholesale markets is an efficient transportation system. Competition can only take place if electricity can move efficiently from potential sellers to potential buyers. This requires a power grid that is able to permit such commerce. A free-flowing system with a minimum of constraints does not exist today in New York. As a result, transmission congestion and its costs to consumers continues to increase, while investment in this vital component of market infrastructure continue to stagnate. As the following charts show, system congestion is increasing rapidly while investment in transmission expansion continues to decrease in the U.S.

In New York State alone, the costs of transmission bottlenecks have averaged approximately **$900 million per year** for the past three years, as the chart below illustrates. In addition to cost, lack of transmission investment could well result in reliability problems in



the not-too-distant future. Improvements in this situation are available only with several institutional changes. These include:

- adequate financial incentives that compensate builders for the risks that their investment could lose some or all of its value as a result of generation construction, while considering the potential impacts on existing generators; and
- a regional planning process that facilitates needed transmission construction.

Demand Response – The Missing Link

Lack of adequate demand response has been cited by FERC as a major impediment to full-functioning, efficient wholesale electricity markets. In response to the need for greater demand-side participation, the NYISO developed three programs to allow demand resources to respond to reliability-driven events as well as through day-ahead market signals:

- Emergency Demand Response Program (EDRP);
- ICAP Special Case Resources (SCR); and
- Day-Ahead Demand Response Program (DADRP).

The reliability-driven programs (EDRP and SCR) have achieved great success over the past two years, growing to a combined registration of 1,800 MW and providing critical load relief on eight occasions.

On the other hand, participation in DADRP, the only truly market-based demand elasticity program, continues with only a small group of participants. New York has been a leader in developing wholesale demand response programs, working closely with the New York State Public Service Commission and the New York State Energy Research and Development Authority, but true market-based demand response remains elusive.

Looking to the future, it is important to continue to expand and improve upon these programs, and to encourage greater opportunities for demand response at the retail level. In the near-term, demand resources participating in the NYISO's EDRP and SCR programs will be capable of setting marginal price when these resources are needed to relieve a reserve deficiency. Prices that reflect scarcity conditions will encourage long-term resource development by providing correct pricing signals.

The DADRP program will be expanded to allow third-party providers of demand response, in addition to load serving entities (LSE), beginning in July 2003. This will allow customers more choices in providers and should increase the number of demand reduction offers submitted to the day-ahead market, where loads provide the greatest leverage and see the most benefit.

In the longer term, the greatest source of demand response will occur when retail customers see and are able to react to wholesale spot market prices. A significant portion of the State's load must be a part of the program to achieve demand response elasticity. Twenty percent of load subscribed to real-time pricing programs would capture a majority of the reliability and price benefits from demand-side response. The NYISO will work with the New York PSC to implement effective programs to establish an effective demand response to the New York markets' price signals.

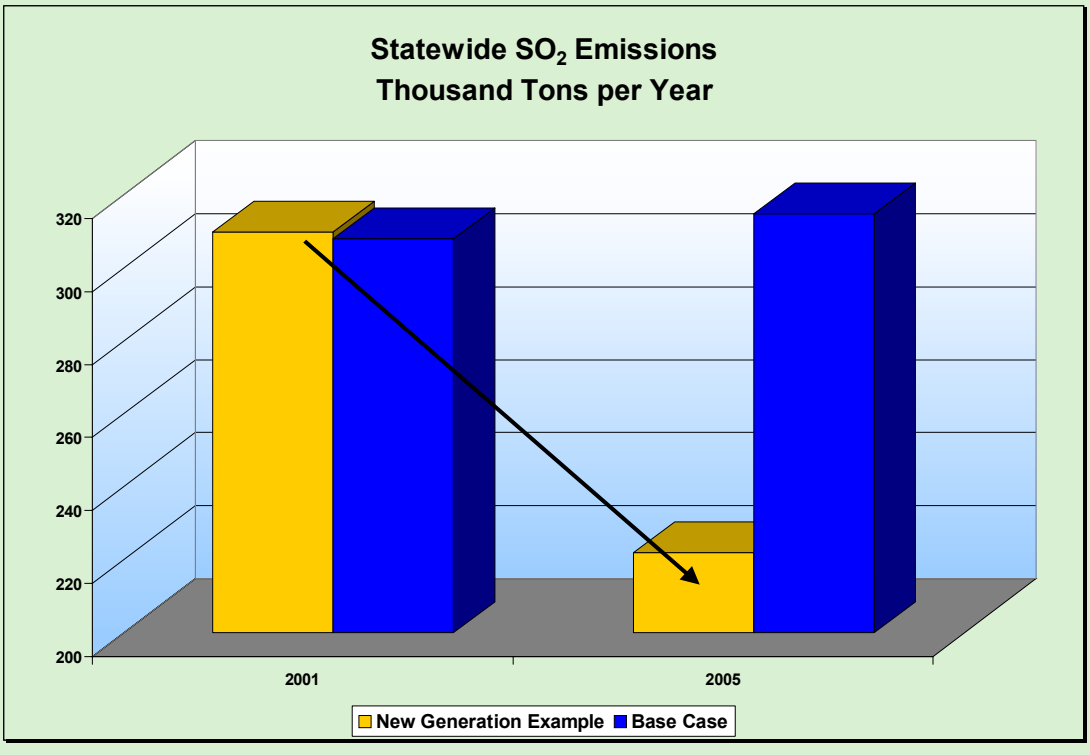
"In the longer term, the greatest source of demand response will occur when retail customers see and are able to react to wholesale spot market prices."

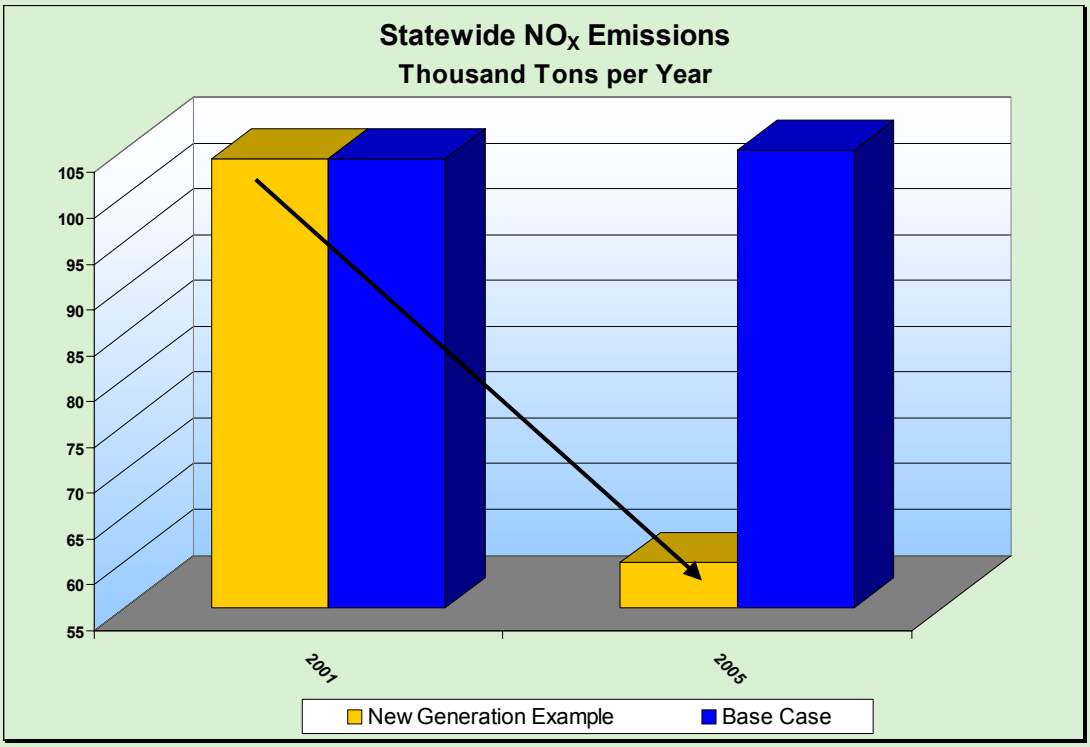
What Does This All Mean to New York's Environment?

The electric power generation sector has been identified as a major contributor to urban and rural air emissions. This phenomenon is exacerbated by the age of a facility; older plants, by and large, emit more pollutants than newer technologies utilizing the same fuels. New York's generation base, particularly in New York City, has a capacity-weighted age of over 31 years. While New York's generating facilities comply with all environmental requirements, their sheer age means that, when they operate, they produce significantly more pollution than would a portfolio that included newer facilities.

The siting of new electric generation, as is proposed in this report, will improve New York's air quality. This has been demonstrated by the small, clean power plants that the New York Power Authority (NYPA) installed in six locations in New York City in 2001. During 2002, these plants emitted less than one-tenth of a pound of NOx per megawatt hour - close to a 99 percent reduction compared with typical small older units in the City. Even when compared with relatively efficient larger power plants in the City, the NYPA plants provided a 94 percent reduction in NOx emitted per megawatt hour. Because they are fueled only by natural gas, the small NYPA plants produce virtually no SO_2. New facilities lead to cleaner air as well as greater fuel efficiencies.

The following graphs taken from Power Alert I in 2001 show the dramatic improvement possible if substantial new generation is added to New York's energy portfolio.





Conclusions and Recommendations – A Call to Action!

While the reliability of New York's electrical supply is not at immediate risk, adequate provision has not been made for its future. It is problematic that plants can be built in the parts of the State that need them most without a siting law. It is also unlikely that investors in urgently needed generation and transmission facilities can be attracted to the New York market without an opportunity to anticipate a stable and adequate stream of future revenue to support investment.

Accordingly, the following are the NYISO's recommendations for improvements in future reliability and enhanced wholesale markets.

HIGHEST PRIORITY

1. **Get New Supply Built**
   New York must set a goal of bringing an additional 5,000 - 7,000 additional MW online by 2008 to enhance reliabilty, increase competition and deliver environmental benefits. Approximately 2,500 MW is under construction today but only another 1,000 MW is realistically on the horizon.

2. **Re-authorize New York's Article X Siting Law ASAP**
   The New York State Legislature should immediately re-authorize Article X in essentially its present form.

3. **Re-examine New York's Three Decades Old Reliability Criteria**
   In light of the needs of today's high tech society, and new security considerations, the NYISO should lead a comprehensive review of the overall reliability requirements for New York State, and particularly New York City and Long Island. This study must involve the recognized reliability organizations, New York State Reliability Council (NYSRC), Northeast Power Coordinating Council (NPCC), and North American Electric Reliability Council (NERC), as well as industry experts and state and federal regulators.

4. **New York Needs an Effective Planning Process**
   The NYISO and its market participants should initiate an open and transparent planning process for its electricity infrastructure (generation, transmission, demand response, and distributed generation) as soon as possible, and in advance of FERC's final order on Standard Market Design. New York is the only one of the three Northeast ISOs not to have a planning process that can result, in the end, in needed actions being taken.

5. **Consider Moving Ahead With "High-Consumer-Value" Transmission Projects – Pick the Low Hanging Fruit**
   The New York State Public Service Commission (NYPSC) and the NYISO should work with the NYS energy industry and other stakeholders to address transmission cost allocation and recovery issues for transmission facilities to materially reduce transmission congestion costs to consumers where appropriate. A different cost recovery paradigm will be required, but this can still be accomplished under the PSC's current authority. The effort should consider market-based solutions and/or a combination of market and regulated solutions. The NYISO's recommendations in the Transmission section of this report can serve as a starting point for deliberation, and the NYISO will fully support this effort with technical expertise and economic and reliability evaluations.

6. **Take Demand Response to the Next Level**
   At the core of an effective and efficient market is the need for relevant customers to be exposed to real-time electricity prices and alter their behavior accordingly. Some load serving entities have established real-time pricing programs for larger industrial and commercial customers (National Grid has approximately 170 customers who pay the NYISO's day-ahead prices). In addition, on April 30, 2003, the NYPSC issued an order instituting proceedings to evaluate changes to utilities' real-time pricing tariffs. The NYISO strongly supports this proceeding moving forward in an expeditious manner.

   Simple, affordable metering technologies need to be developed and installed, and real-time electricity rate tariffs need to be put in place. Consumers need to under-

stand that real-time pricing can give them greater control over their electricity bills and more competitive choices. By inhibiting short-term price spikes, demand response programs represent an important component of an effective deregulated electricity market.

7. **Additionally**
   A series of other needed improvements involving long-term contracts, market design, and environmental labeling of energy are contained in the body of this report.

Summary

New York has stayed just ahead of potential reliability problems for the past three years by utilizing some stopgap measures and by driving the existing electrical infrastructure harder and harder.

If New York is to have a truly economical and reliable electrical infrastructure for the 21st Century, the recommendations contained in this report must be embraced and implemented by the State, New York's energy industry, and the financial marketplace.

III. THE REPORT

The Three-Legged Stool of the Power System:

Supply | Transmission | Demand Response

SUPPLY

A. NEW YORK ELECTRICITY SUPPLY - The First Leg of the Stool

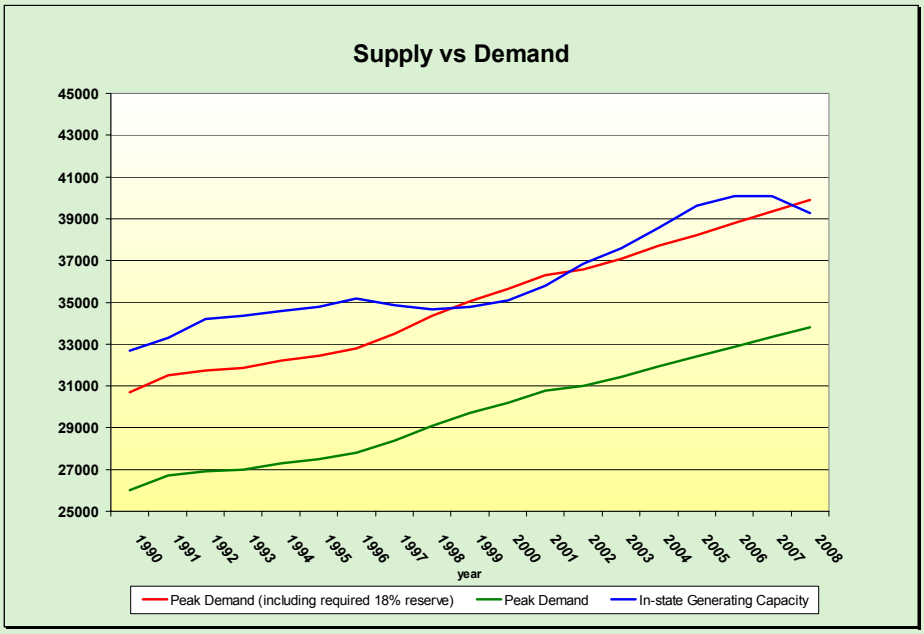
Increasing Demand

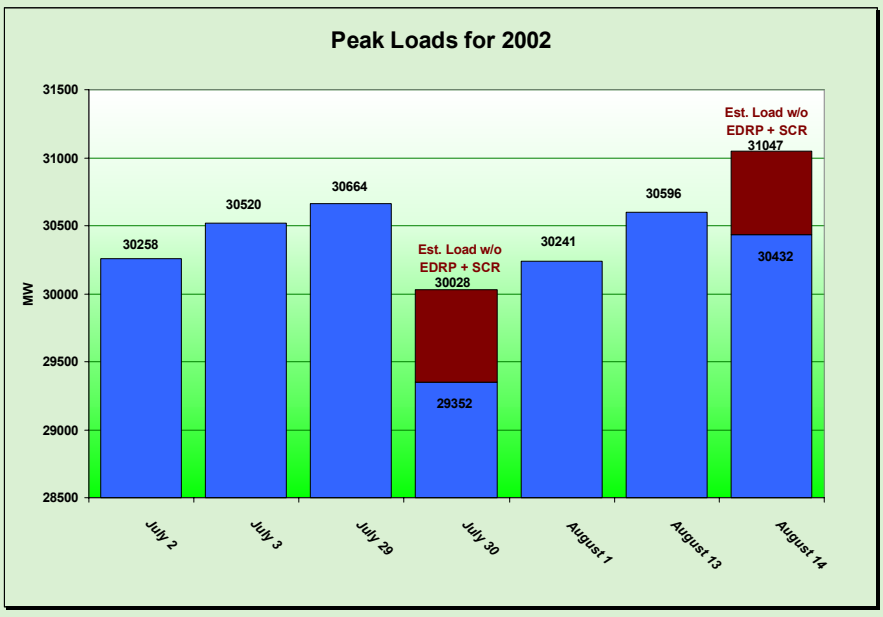
Demand is on a collision course with supply –

The ability to add new supply is a major challenge for the New York electric system. Loads are continuing to increase while in-state reserve margins have been generally declining for more than two decades.

As the home to the financial, communications, and international relations capitals of the world, this is a pressing issue for New York. The increased reliance by New Yorkers on electricity as their primary source of energy means the integrity of the system and the efficiency with which it operates is more critical than ever before. New York has evolved into an information-driven economy and thus relies all that more heavily on its electric system.

Despite the events of 9/11 and economic softness throughout the nation, New York's consumption of power has not abated appreciably. New York City and Long Island have both set all-time peak consumption records during the past two summers.





Statewide too, summer peaks are rising. The state's all-time peak electricity consumption record of 30,983 MW set on August 9, 2001 shattered the previous record of 30,311 MW on July 3, 1999 by 672 MW, even while demand response programs reduced the peak load by an estimated 1,500 MW.

The summer of 2002 boasted 18 of the 25 all-time peak days. System conditions were so tight during 2002 that the NYISO was forced to call the Emergency Demand Response Program on two occasions.

This Summer in New York –

With increasing loads and very little new generation since last year, the coming summer of 2003 promises to be almost as tight as the past two summers. The NYISO's projections (see table below) see a need for 560 MW from additional resources such as sales from neighboring control areas and Special Case Resources (NYISO Demand Response).

Athens Generating Plant — the very first project through the State's Article X process—is projected to be online in sufficient capacity by this summer to help alleviate some of the resource availability concerns during extreme heat periods. However, Athens is located in zone F where portions of its capacity will be constrained from reaching downstate and the City. And as can be seen in the chart entitled **New York Control Area (NYCA) Locality Load and Capacity Outlook for Summer 2003,** barely 150 MW are slated to come online in and around the City this summer.

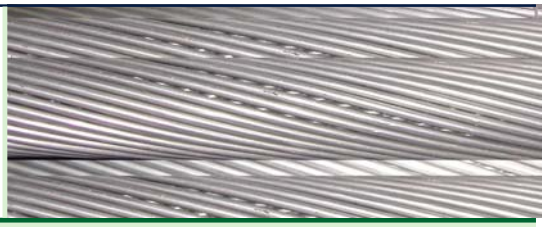
With a Summer 2003 forecast demand for New York City 250 MW higher than last year's weather adjusted peak, it is clear that New York City is the place most needing new supply right away.

These high summer peak days when New York's electric system is stretched to its ultimate capability are occuring with increasing frequency. In recent years the State has been lucky to avoid serious major contingencies when these peak days were occurring. However, probability suggests New York is stretching its luck by not making sure there are more than adequate in-state supplies available in the coming years.

New York Control Area (NYCA) & Locality Load and Capacity Outlook For Summer 2003

	MWs
Statewide Summer Forecast Demand	31,430
Reserve Requirement	5,657
Total Requirement	37,087
NYCA Available Supply [1,2 3]	36,527
Statewide Deficiency	(560)
External supply and SCRs	891
Surplus	**331**
New York City Forecast Demand	11,020
In-City Requirements (80%)	8,816
Available Supply[2]	8,749
In-City Deficiency	(67)
SCRs	118
Surplus	**51**
Long Island Forecast Demand	4,849
On-Island Requirements (95%[3])	4,607
Available Supply[2]	4,983
New Generation and SCRs	107
Surplus	**483**

1. This is the NYCA available less external firm sales of 303 MW.
2. These numbers do not include the proposed units tentatively coming on-line this summer nor external resources.
3. The requirement was increased from 93 percent by an Operating Committee vote on 2/12/03.



New System Considerations: "Targets" -

In the post-9/11,world of "Orange" and "Red Alerts" for homeland security, the electric industry as a whole has responded with new systems and processes to minimize the likelihood of any serious disruptions in electric supply.

Going forward, it is essential to continue to evaluate how outside forces might try to sabotage New York's electric system and take appropriate preventative steps.

Also, there is an additional consideration for those areas that may be considered critical "targets" which justifies the need for a higher level of reserves to address that risk. This may be essential to maintaining "reliable service" in large metropolitan areas such as New York City.

Fuel Diversity -

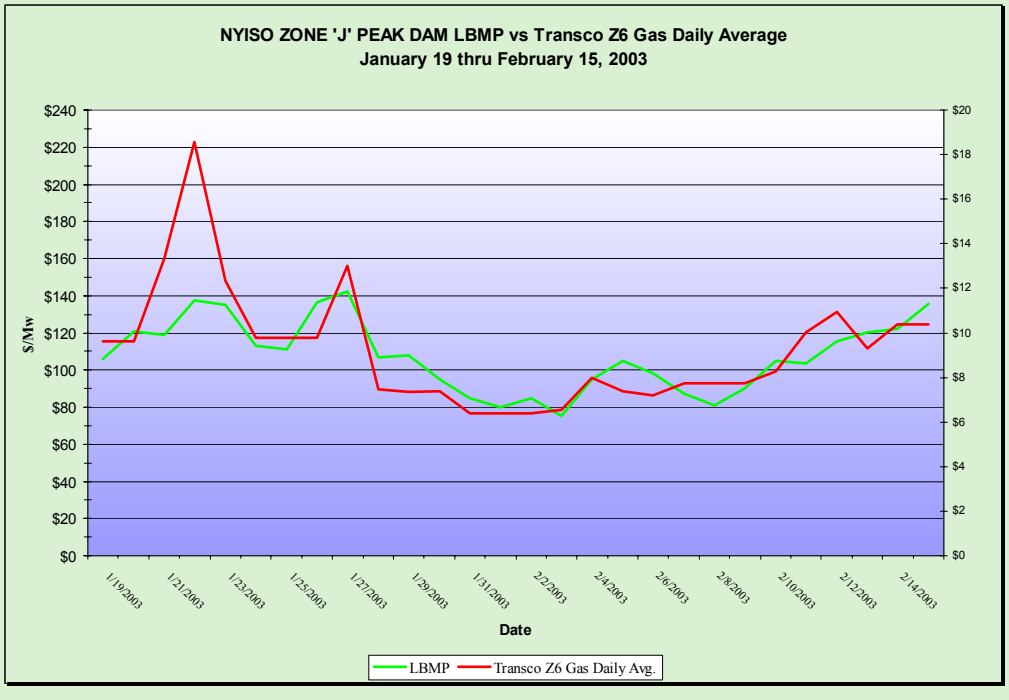
Because of air quality factors, New York has become more reliant upon natural gas supplies for electricity production. And this reliance shows no sign of subsiding. Over the decade, New York has seen a significant reduction in its fuel diversity.

Virtually every new generation project currently proposed in New York State, with the exception of some wind projects, is slated to be natural gas-fired because of its environmental qualities. As a result of this trend toward gas as the preferred fuel of choice for electricity generation, New York finds itself exposed to operational and financial supply risks.

Because of the inability of generators to store natural gas supplies on-site, an interruption in the gas supply could potentially render portions of New York's generating fleet unable to generate. This could increase the likelihood of a blackout.

Fuel price changes have an impact on electricity prices. Gas volatility is primarily transmitted into peak hour electricity prices, although the spikes are often tempered by dual-fuel units.

Many generating units have dual-fuel (gas and oil) capability so they can switch over to stored oil supplies should their gas supplies be curtailed for any reason. This report suggests that going forward, dual-fuel capability should be encouraged in the project approval



process so that new supply will address this problem.This should be considered in conjunction with re-authorization of the State's power plant siting law.

However, this is not the only solution since changes in natural gas prices often track in tandem with oil prices, limiting the moderating effect of dual-fuel capability.

Expanded gas delivery infrastructure would help mitigate the price pass-through and would increase reliability. Further examination should be performed to determine whether it would be economic to mitigate price pass-through and increase reliability by expanding the gas delivery infrastructure.

In addition, proposals such as those to shut down the Indian Point nuclear units or further restrict coal-fired generation should be examined from the perspective of how it might significantly reduce fuel diversity. Going forward with new security considerations, this is an important aspect of reliability and may be as important a parameter as cost.

Longer Term Projections -

Between 2003 – 2008, the NYISO projects that statewide load is expected to increase from about 31,450 MW to 33,800 MW.

This means, just to stay in pace with our current supply to demand ratio, we will need 2,360 MW of additional capacity. To deliver price and environmental benefits and replace less efficient and retiring units, the NYISO projects that New York needs to add significant new capacity to its electric system in the range of 5,000 to 7,000 MW over the next five years.

The Bottom Line -

New York State needs at least 5,000-plus MW of additional capacity developed in the next five years to enhance reliability and security, keep prices competitive, and benefit the environment. A majority of these 5,000-plus MW should be built in the downstate and Long Island areas.

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Supply Side

Additions To New York's Generation Fleet

With a couple of exceptions, development of new generation remains stalled. Of the 15 projects that have filed applications under Article X, five are under construction, five are certified but not currently being pursued, and five are still in the process. Moreover, some of this new supply is being offset by retirements of existing facilities, such as with the New York Power Authority's Poletti Station.

Despite a host of power plant development projects in the queue, actual shovel-in-the-ground development is largely stalled in New York for lack of financing.

Generation Projects Subject to Article X *Top of the Queue:*						
Project Name	Owner/Developer	Size (MW)	Connecting Utility	Date of NYISO Application	Status of Article X	Proposed In-Service
Athens Gen	Athens Gen Co./ PG&E	1080	NM-NG	04/27/98	Certified 6/15/00	2003
Bethlehem Energy Center	PSEG Power NY	350	NM-NG	04/27/98	Certified 2/28/02	2004
East River Repowering	Consolidated Edison of NY	288	CONED	08/10/99	Certified 8/30/01	2004
Poletti Expansion	NYPA	500	CONED	04/30/99	Certified 10/02/02	2005
KeySpan Ravenswood	KeySpan Energy, Inc.	270	CONED	04/21/99	Certified 9/07/01	2004
	Under Construction - TOTAL	2488				
Brookhaven Energy	American National Power	580	LIPA	11/22/99	Certified 8/14/02	?
Bowline Point Unit 3	Mirant	750	CONED	10/13/99	Certified 3/25/02	?
Astoria Energy	SCS Energy, LLC	1000	CONED	11/16/99	Certified 11/21/01	?
Spagnoli Road CC Unit	KeySpan Energy, Inc.	250	LIPA	05/17/99	Appl accepted 3/28/02	?
Wawayanda Energy Center	Calpine Eastern Corporation	500	NYPA	06/10/99	Appl accepted 10/23/01	?
	Projects Approved - TOTAL	3080				
PPL Kings Park	PP&L Global, Inc.	300	LIPA	02/01/00	Appl accepted 3/22/02	cancelled
Empire State Newsprint	Besicorp/Empire State	660	NM-NG	07/14/00	Appl accepted 5/28/02	?
Glenville Energy Park	Glenville Energy Park, LLC	540	NM-NG	11/30/99	Appl accepted 4/9/02	?
Astoria Repowering-Phase 1	Reliant Energy	499	CONED	07/13/99	Appl accepted 12/28/01	?
Astoria Repowering-Phase 2	Reliant Energy	800	CONED	08/18/00	Appl accepted 12/28/01	?
Projects with Applications Pending - TOTAL		2799				
GRAND TOTAL MW Proposed Projects		8367				

under construction approved application pending

Risk and Uncertainty Deter Investment

The fallout from the failure of Enron Corporation, California's deregulation problems and the accounting confidence crisis in the industry made funding for New York power projects dry up in an instant. This, combined with reduced spark spreads[1] resulting from higher fuel prices and the growing pains of market development, has hit the generation sector hard over the past 18 months and slowed the wheels of development to a stand-still.

Many existing assets are struggling to stay out of bankruptcy. A recent study by Standard and Poors reports that nationally, merchant energy companies will see about $90 billion in asset loans come due for refinancing over the next three years.

While all this may sound gloomy, the upside is that New York's wholesale markets have weathered the Enron storm thus far. The NYISO is now among the leaders in market development with an ambitious two-year project to create the next generation of

[1] A spark spread is the difference between the market price of energy from a power plant and the market price of fuel to produce it.

real-time scheduling software while making its nearly compliant wholesale markets fully standard market design compliant.

However, in order to successfully navigate through this crisis of financial confidence, it is essential the energy industry work closely with the investment community to build back confidence in the energy capital markets.

Likewise, Wall Street must show confidence in New York's wholesale markets and start providing the infrastructure capital that will benefit New York down the road. Wall Street generally follows the regulatory processes and knows how well New York's wholesale markets are doing relative to the rest of the country. However, more can be done, both by those with investment capital and those who must tell the success story New York's wholesale electricity markets are quietly growing into.

For capital markets to become more comfortable with how New York wholesale electricity markets are evolving, there needs to be a reliable and supportive regulatory framework in place. From the perspective of the New York wholesale markets, there are three key regulatory initiatives that can solidify the environment for capital investment.

Supply Recommendations:

- On the State level, it is essential that the New York State Legislature focus on and address the expired Article X electric power plant siting legislation as soon as possible. The way the future looks from a siting law standpoint will have a tremendous impact on valuing investment today. If investors cannot determine what the future might look like from a siting law standpoint, they are going to be reluctant to invest now. Article X represented perhaps the most stringent electric power plant siting laws in the nation, and it contained very strict (but appropriate) environmental requirements. This must be a top priority for the Legislature now.
- To reduce the risk of long-term contracts to load serving entities, the NYISO, the NYPSC, and NYSERDA should work together to reduce institutional barriers to long-term contracts if enhancements to the capacity markets do not produce the anticipated results.
- On the Federal level, standard market design will improve "the rules of the road" for the national electric system, connecting various regions together much like the interstate highway system did in the 1950s. The key areas standard market design solidifies are open access to the transmission system, a means for valuing and trading transmission rights, a locational pricing system for supplies, and general rules for a system operator. FERC is planning to issue its final order late this year; but legislative opposition in the Congress threatens to derail this key market stabilization initiative.

Development of Renewable and Low Emission Supplies -

Wind Power Development

Wind Power Projects

Project Name	Owner/Developer	Size (MW)	Connecting Utility	Date of NYISO Application	Status of Article X	Proposed In-Service
	New Projects In-Service					
Madison County	PG&E Generating	11.55	NM-NG			in service
Wethersfield, Wyoming County	CHI Energy	6.6	NM-NG			in service
Fenner Wind Power Project	CHI Energy	30	NM-NG			in service
	New Projects In-Service - TOTAL	**48.15**				
	NYISO SRIS Completed					
Flat Rock Windpower	Flat Rock Windpower, LLC	100	NM-NG	03/21/00	N/A	2003/11
	NYISO SRIS Completed - TOTAL	100				
	SRIS In Progress					
Prattsburgh Wind Park	Global Winds Harvest, Inc.	75	NYSEG	04/22/02	N/A	2003/12
Cherry Valley Wind Park	Global Winds Harvest, Inc.	40.5	NYSEG	04/22/02	N/A	2003/12
	SRIS In Progress - TOTAL	**115.5**				
SRIS Pending or Inactive						
Prattsburgh Wind Farm	ECOGEN, LLC	79.5	NYSEG	05/20/02	N/A	2003/12
Prattsburgh Wind Park II	Global Winds Harvest, Inc.	75	NYSEG	05/15/02	N/A	2004/12
Springwater Wind Farm	ECOGEN, LLC	79.5	NYSEG	05/20/02	N/A	2004/12
Mill Creek Wind Plant	Mill Creek Wind Plant, LLC	50	NM-NG	09/08/00	N/A	*None*
	SRIS Pending or Inactive - TOTAL	**284**				

In-Service **Completed** **In Progress** **Pending or Inactive**

Despite their relatively small contribution to the overall capacity of the system, wind projects are making exciting progress in New York State with significant capacity sited during the past five years. The NYISO supported the development of wind power through first-in-the-country tariff changes made to accommodate intermittent resources such as wind. Wind power producers are exempted from some of the scheduling requirements to which other generators are subject. The idea is for the grid to use wind power whenever it is available, and so far it is working well.

Renewable Portfolio Standard

In his 2003 State of the State address, Governor Pataki set the goal that the State of New York acquire 25 percent of its electricity from renewable resources within 10 years. Subsequently, the New York State Public Service Commission created a proceeding to establish renewable portfolio standards. The NYISO is a party to this proceeding.

In support of the State's renewable portfolio standard the NYISO is focusing its efforts in two primary areas. The first is to pursue the development of an information system to better support environmental disclosure through environmental labeling of generation. The second is to review the wholesale electricity market rules to determine how they impact the competitiveness of renewable resources, in particular, wind generation. For instance, the market rules currently limit the amount of intermittent generation, which is exempt from balancing requirements to 500 MW.

The State Energy Plan suggest that there is as much as 5,000 MW of wind potential in the State. Integrating this level of intermittent wind generation poses significant technical challenges. The NYISO recommends that the NYSERDA, the NYPSC, and the NYISO work together to develop a strategy for ensuring that market tools, operating procedures and transmission resources are available to accomodate this new development.

Distributed Generation

A discussion of generation in New York would not be complete without some reference to distributed generation (DG). While technically, the size of most DG puts it well below the NYISO's one megawatt radar screen. As a "load modifier", DG resources represent a sizeable potential for load modification and can be helpful in maintaining the reliability of the grid. There are some innovative and unique DG projects underway throughout New York involving small turbines, fuel cells and other technology, and the NYISO encourages their efforts as a potentially important contribution to New York's overall energy needs in the future.

TRANSMISSION

B. TRANSMISSION - The Second Leg of the Stool

Overview –

The second leg of the three-legged energy stool is an adequate and well-functioning electric transmission system.

A robust transmission system is the superhighway where the engine of competition can be accelerated to deliver consumers the savings from free wholesale electricity markets.

Unfortunately, development of new bulk electric transmission facilities in New York State right now has decelerated to a glacial crawl. New York's transmission grid was built to transfer remotely-sited energy to the load centers. As the upstate load grew and new generation was located closer to the load centers, reliability could be maintained with only minor modification to the bulk transmission system.

Of the last two major bulk power lines built in New York, the Marcy South line running from the Utica area down to the Southern Tier and into downstate, was justified on the basis of the transfer of economic power, instead of reliability concerns. However, this line was completed in 1988, more than 15 years ago. The only other project was NYPA's Y-49 Sprainbrook-East Garden City Cable Project, completed in the early 1990s.

Of 10 transmission projects proposed for New York State during the past five years, only one has been built, the Cross Sound Cable (from New Haven, CT to Shoreham, NY) and that still has not been energized because of political wrangling and technical problems.

The move to competitive wholesale markets has resulted in using the transmission system in ways not considered when it was built. This has led to an increase in congestion.

System congestion is like heavy highway traffic. During peak traffic times when large amounts of bulk power need to be moved across the system, congestion develops and not all the power can get through. With rush hour traffic, congestion costs people time. With electric system congestion, it costs people money, real money.

From 2000 until 2003, electric system congestion has cost New Yorkers some $2.75 billion dollars.

The challenge in siting new transmission facilities, is not just navigating the regulatory process—New York has a functioning electric transmission facility siting law (Article VII)—but also developing a mechanism that works in the new "restructured" environment so that developers can be assured of a reasonable rate of return on their initial investment.

To tackle the challenge of improving the transmission system, the NYISO has been working on the national, regional and state fronts to come up with solutions for reducing electric system congestion costs paid by consumers.

On the national front, the NYISO has worked closely with the U.S. Department of Energy (DOE) in completing the Transmission Bottleneck Project Report which identifies the nature, extent and worst problem areas or "bottlenecks" on the national transmission system.

In this chapter, the NYISO outlines some of the highlights of this work with DOE, then offers a series of policy positions/recommendations intended to encourage the development of needed new transmission facilities and upgrades.

In addition, the NYISO outlines illustrative reinforcements to existing transmission facilities that could pay for themselves and deliver long-term savings to consumers by reducing system congestion costs.

National Transmission Grid Study

On May 2, 2002, Secretary Abraham submitted the Department of Energy's study of the nation's transmission system to the President. The study describes how the U.S. electricity transmission system was formed over the past 100-plus years by vertically integrated utilities that produced and transmitted electricity for their local customer demand. In addition, the utilities built transmission lines and facilities, that created interconnections between neighboring utilities allowing them to increase reliability and share excess generation. As a result of these expanded facilities the transmission system has become an extensive, interconnected network of high-voltage power lines that can transport a limited amount of electricity from remote generators to consumers.

As a result of the introduction of competition at the wholesale level, the transmission system now acts as an interstate highway system for wholesale electricity commerce. Due to this unplanned use, it has become evident that the U.S. transmission system is in urgent need of modernization and expansion. As shown in the graphs below, the system has become congested because growth in electricity demand and investment in new generation facilities have not been matched by investment in new transmission facilities.

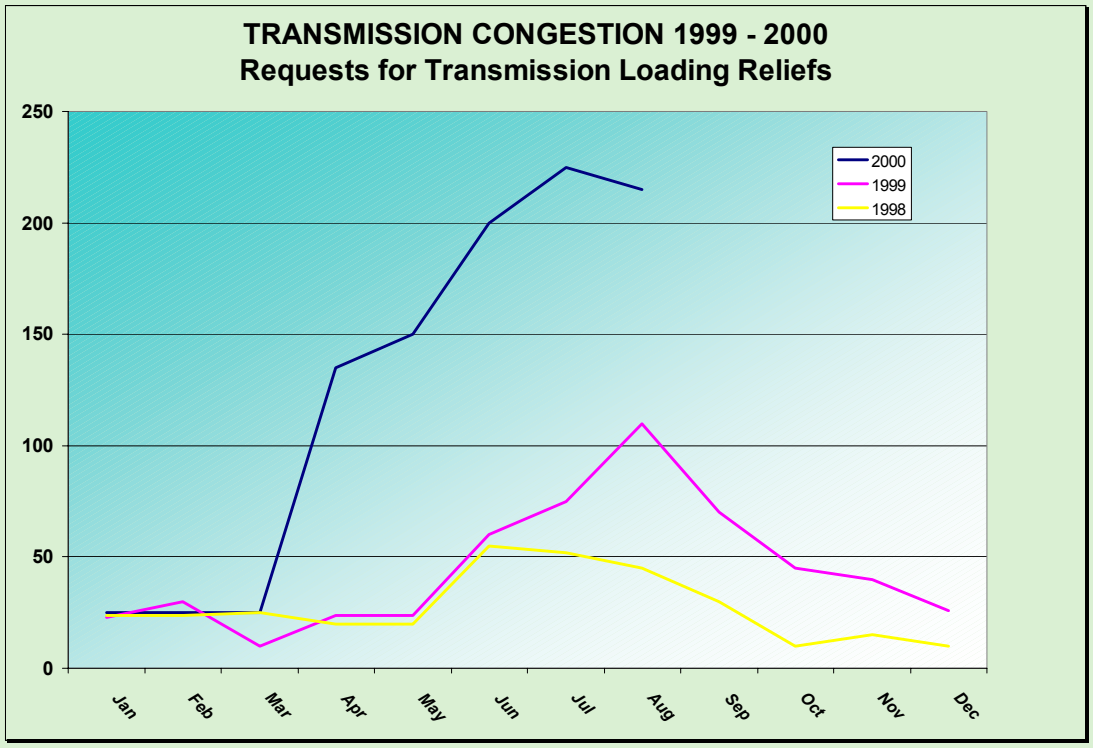
Transmission problems have been compounded by the incomplete transition to fair and efficient competitive wholesale electricity markets. Because the existing transmission system was not designed to meet present demand, daily transmission constraints or "bottlenecks" increase electricity costs to consumers and increase the risk of blackouts.

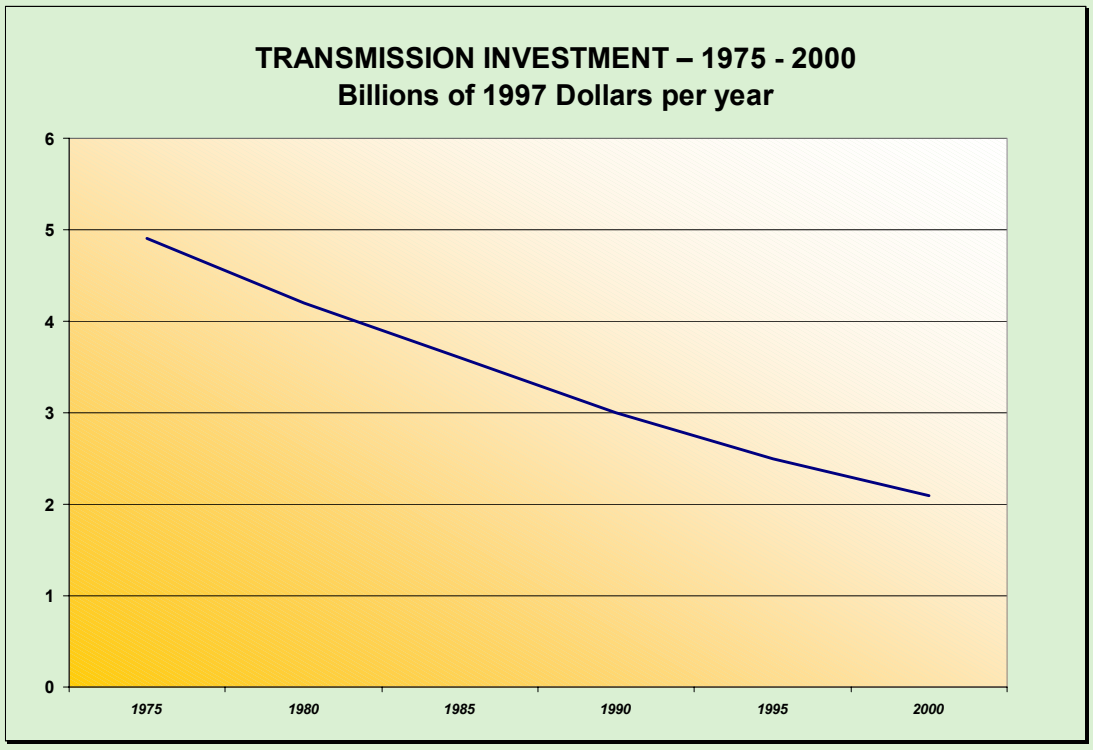
The DOE study indicates that reducing transmission constraints or bottlenecks is essential to ensuring reliable and affordable electricity now and in the future. DOE conducted an independent assessment of the U.S. electricity transmission system and validated what energy experts in New York had long believed: that New York's Central-East transmission constraint is one of the dozen worst bottleneck sites in the nation.[1]

"The DOE national study shows New York's Central-East transmission constraint is among the worst in the nation."

[1]The DOE Transmission Report can be obtained at http://tis.eh.doe.gov/ntgs/reports.html

Transmission Congestion vs. Transmission Investment in the U.S.





NYISO Policy Positions For Encouraging Siting of New Transmission –

In general, new transmission facilities—which often create siting impacts over long distances and multiple jurisdictions— are much more difficult to site than new generation facilities. While generation resources can be a substitute for transmission resources in many situations, in some parts of the country including New York, congestion costs were found to be on the increase as needed expansion of the transmission infrastructure was not taking place in keeping with the pace of the new wholesale electric marketplace. FERC has been an active advocate for the need for additional transmission infrastructure, but does not have the unilateral authority to make it happen. In addition, the capital markets were focused on the needs of the expanding unregulated generation industry, while the rate of return on investment in regulated transmission facilities was less attractive and encountered new risks.

To help break the logjam hindering new transmission development, the NYISO is taking the following steps and supports the following policy initiatives.

A. THE NYISO SUPPORTS THE OBJECTIVES OF FERC'S PROPOSED INCENTIVE PRICING POLICY

The FERC has recently proposed a pricing policy that would provide significant incentives for transmission owners who have turned over operational control or their assets to an independent entity and who agree to construct needed transmission facilities determined to be needed as a result of an independent transmission providers' regional planning process. Independent transmission providers are in the best position to determine these system needs on a non-discriminatory basis. The NYISO fully supports the Commission's goal of creating a robust infrastructure for the future by providing for such incentives and calls upon the Public Service Commission to consider providing similar retail rate incentives for new investment in needed transmission facilities. Given the assurance of cost recovery along with the appropriate incentives from both their federal and state regulators, transmission owners should be willing to provide such expansion.

B. NYISO IS TAKING STEPS TO ENCOURAGE THE DEVELOPMENT OF NEW TRANSMISSION FACILITIES

While the NYISO does not have the authority under its tariffs to order the construction of new transmission facilities, there are several initiatives that the NYISO has undertaken which should prove helpful to facilitate the development and interconnection of such new infrastructure. These include the following:

I. THE NYISO'S INTERCONNECTION PROCEDURES PROVIDE COMPARABLE TREATMENT FOR BOTH GENERATION AND TRANSMISSION INTERCONNECTION PROJECTS

Unlike procedures in other areas, the NYISO has intentionally structured its interconnection study procedures as well as its interconnection cost allocation procedures to be applicable to both generation and transmission interconnection projects. This ensures comparable and non-discriminatory treatment for both types of interconnection facilities through an open process with stakeholder participation. To date, there have been several merchant transmission projects whose SRIS[1] analyses have been approved.

II. UNFORCED CAPACITY DELIVERABILITY RIGHTS

The NYISO received conditional FERC approval in January 2003 for a unique transmission product called "Unforced Capacity Deliverability Rights" ("UDRs"). These rights which are associated with new incremental controllable transmission projects that provide a transmission interface to a New York Control Area (NYCA) locality (i.e. – an area that has locational installed capacity requirements, such as NYC and Long Island). When combined with Unforced Capacity located outside the subject NYCA locality, UDRs allow such capacity to be treated as if it were located within that locality. There are several controllable transmission projects which have proposed to interconnect with Long Island and New York City which can be facilitated through the availability of UDRs.

III. THE NYISO IS IN THE PROCESS OF ESTABLISHING A COMPREHENSIVE PLANNING PROCESS FOR ITS REGION

The NYISO has engaged its Market Participants in collaborative processes twice in the past two years in an attempt to achieve consensus on a comprehensive planning process for the NYISO region. In 2001, consensus was achieved, and the Plan was filed with FERC as part of the NYISO's initial RTO compliance filing. Unfortunately this plan was not accepted by the Commission. Last year, the NYISO and ISO-NE developed a comprehensive planning process for the Northeast Regional Transmission Organization (NERTO) proposal, which was subsequently withdrawn. Early in 2003, the NYISO approached its Market Participants again with a proposal to build off the NERTO planning process in order to develop and implement the initial phases of a comprehensive planning process for NY during the second half of the year. Subsequently, the full process would be developed for filing with FERC following the issuance of the final SMD Rulemaking Order. This initiative is important for the development of needed

[1]SRIS - System Reliability Impact Study: an assessment by the NYISO of (i) the adequacy of the NYS transmission system to accomodate a request to build facilities in order to create incremental transfer capability, resulting in incremental TCCs, in connection with a request for either firm point-to-point transmission service or network information transmission service; and (ii) the additional costs to be incurred in order to provide the incremental transfer capability.

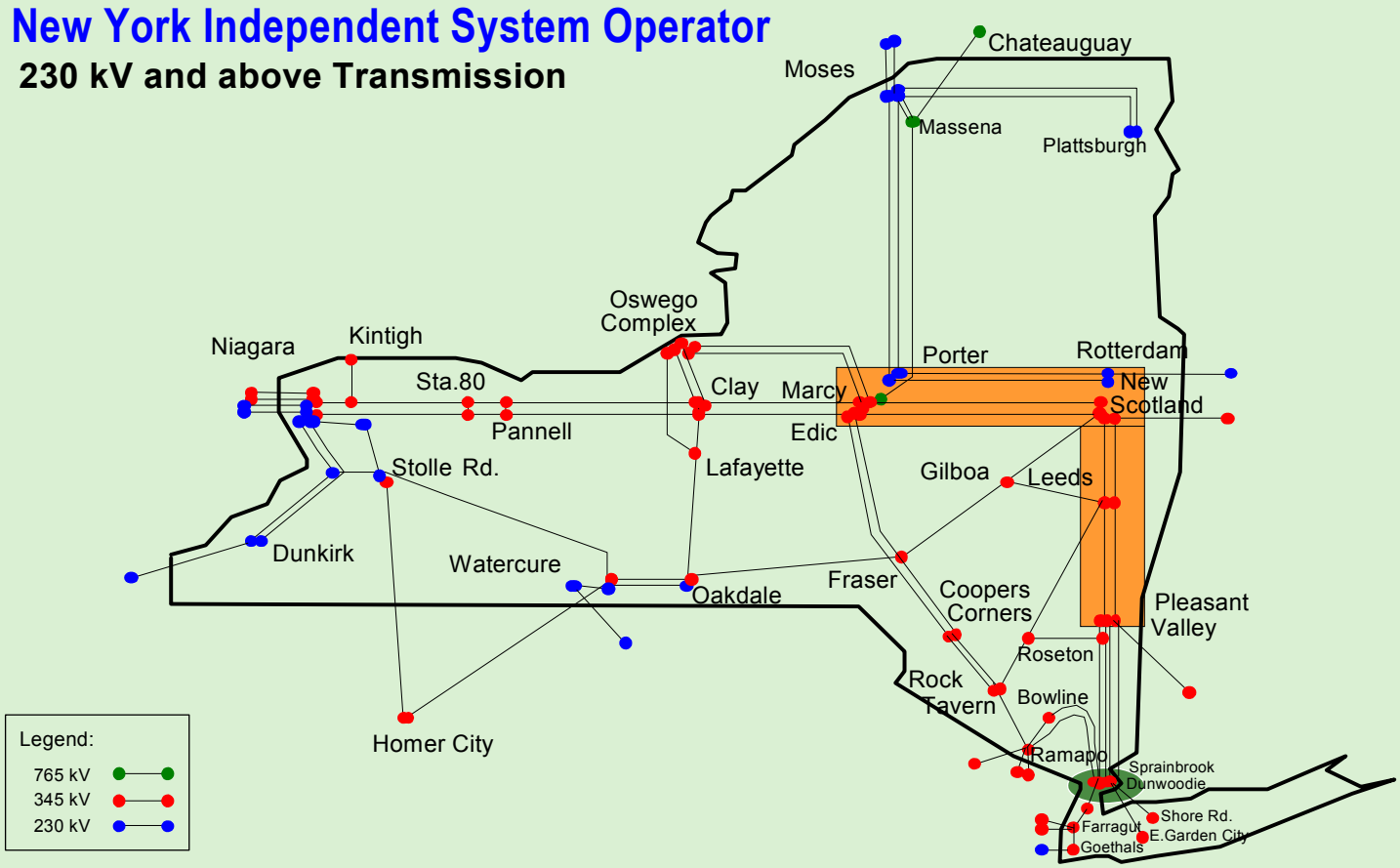
infrastructure, since it will begin with a formalized "needs assessment" for the NYCA which will provide a detailed assessment to the marketplace on the need for new facilities based upon both reliability and economic indices.

IV. *THE NYISO HAS INITIATED ESTABLISHMENT OF A COORDINATED INTER-REGIONAL PLANNING WITH ITS ADJACENT CONTROL AREAS*

Early in 2003, the NYISO initiated contact with adjacent control areas in both the United States and Canada to begin the process of better coordinating interregional planning efforts. Participants representing PJM, ISO-NE, the NYISO, the IMO, New Brunswick and Hydro Quebec met in early February and agreed to pursue the development of a protocol for coordinated interregional planning for the Northeast. The initial focus will be on the coordination of the databases utilized in planning models, including key input assumptions and the timing of studies. These efforts will result in greater efficiency in interregional planning efforts that will provide benefits to consumers throughout the region.

Illustrative New York Transmission Enhancements

Since operations of NY wholesale electricity markets began in December 1999, the NY market has incurred $2.75 billion dollars in congestion cost. Internal NYISO analysis has shown that slightly over half of this cost results from transmission congestion in the corridor between Marcy, NY near Utica and Pleasant Valley, NY near Poughkeepsie (the orange shaded corridor on the transmission map) while the majority of the balance can be assigned to the cable interface in Westchester, NY (the green shaded area on the transmission map).



This level of congestion indicates there is significant potential to reduce system congestion cost by increasing the transfer capability between Marcy and Pleasant Valley and into the New York City and Long Island load pockets. However, the addition of new high efficiency combined cycle generating units downstream of the transmission constraints or in the load pockets will result in some reduction of system congestion cost.

Therefore, generation and transmission not only complement each other but, also, can be competitors or substitutes in many circumstances. In fact, all alternatives to reduce congestion costs (i.e., improve market efficiency) require significant investment and are in competition with one another.

Concerned about the mounting costs of congestion, the NYISO used the General Electric MAPS (Multi-Area Production Simulation) to evaluate the potential for system expansion to reduce congestion cost and improve market efficiency. Three scenarios were evaluated:

1. The **base case** included approximately 8,275 MW of new generation with approximately 2,675 MW of retirements for a net gain of generating capacity of 5,600 MW through 2010. The base case also included a new tie line (The Cross Sound Cable) between New York and New England that increased transfer capability between the two control areas by 20 percent. All the generation additions were constructed east of "total east" or in the congested zones as well as the new HVDC tie into the congested Long Island zone. The base case scenario results in close to a 60 percent reduction or over $400 million annually in estimated congestion costs between 2003 and 2010. The major observation is that generation development, which is attempting to respond to the locational market prices, is locating in areas where the capacity additions have a positive impact on congestion costs.

2. The **second scenario** to be evaluated was the "merchant transmission scenario." In addition to the HVDC tie included in the base case, the NYISO interconnection queue contains two proposals which are included in this scenario. The two proposals are HVDC tie lines between NY and PJM resulting in a total increase in tie capability between the two control areas of 1,260 MW. This represents an increase of almost 50 percent in the transfer capability between NY and PJM or an almost 20 percent increase in the total east interface. The two merchant transmission projects are the Neptune and Harbor Cable projects. The Neptune project is proposed to connect a substation at Sayerville, NJ to a New York City substation at 49th St. in the borough of Manhattan. This project is a 1,200 MW bipolar (with 600 MW being delivered to New York City) HVDC facility. A future phase of this project, which was not modeled in this scenario, would be a 600 MW tie from the NJ location to the Newbridge Road substation in west central Long Island. The Harbor Cable project proposes a 660 MW bipolar (330 MW on each line or pole) HVDC facility between a substation at Linden, NJ and a New York City substation at Rainey in the borough of Queens. These system expansions were evaluated against the base case and provide annual additional reductions in congestion cost which range between $30 million dollars and $167 million dollars annually. The range depends on the level of new generation

development in the congested New York City zone. The major observation is that generation and transmission not only complement each other but are also competitors in terms of reducing congestion cost.

3. The **third scenario** to be evaluated was a set of upgrades to the existing AC transmission network of the regulated grid[1]. This scenario was evaluated with the base generation scenario. The focus of these upgrades is the transmission corridor between Marcy, NY and Pleasant Valley, NY. The facilities in this corridor are elements that span the Central East and Upstate New York and Southeast New York (UPNY-SENY) interfaces. This is the orange shaded area on the map and accounts for a significant amount of the congestion cost since the NY market began operation. These transmission upgrades were evaluated as additions to the base case. These upgrades were as follows:
    - The first system upgrade facility to be evaluated is the reconductoring of the Leeds – PV circuit. Reconductoring increases thermal capability and hence the transfer capability across a corridor. The estimated cost of this particular upgrade is $40 million dollars and increases the thermal capability by 25 percent. This upgrade provides additional reduction in annual estimated congestion costs which range between $48 million and $98 million annually. Again, the reductions in estimated congestion costs that result from the transmission upgrade are a function of how much generation development occurs downstream of the transmission upgrade.
    - The second upgrade to be evaluated in this corridor (which also includes the upgrade described above) converts the 345 kV circuit from Marcy to New Scotland from single to double circuit operation. This involves the construction of a new substation at New Scotland, including the addition of a 900 MVAR static-var-compensator (SVC) for voltage support. This would raise the Central East transfer capability by 600 MW. This transmission upgrade has essentially a zero impact or slightly negative impact on estimated congestion costs. The major observation is that relieving one congested flow gate or constraint can provide no reduction in congestion costs if constraints between the transmission upgrade and the congested area remain.
    - The final upgrade evaluated is the rebuilding of one of the 115 kV circuits between New Scotland and Leeds to 345 kV as well as rebuilding one of the 115 kV circuits between Leeds and Pleasant Valley to 345 kV operations. These rebuilds in conjunction with Marcy to New Scotland conversion to double circuit creates another 345 kV circuit between Marcy and Pleasant

[1] Modeling and cost information for the AC network upgrades provided by National Grid USA. National Grid is preparing an engineering analysis of these upgrades which should be available the first quarter of 2003.

Valley and increases transfer capability across the Total East Interface by 1,100 MW. This upgrade provides annual reduction in estimated congestion costs which range between $57 million and $150 million. This upgrade emphasizes the importance of the need to address all the constraints that exist in a transmission corridor.

The analysis demonstrates that the NY wholesale electricity market has incurred significant congestion costs since beginning operation in late 1999. The analysis presented in the report demonstrates that a substantial amount of future potential congestion costs could be eliminated by the construction of new high efficiency combined cycle generation in the congested load zones, and that the potential also exists for the expansion of the transmission system to reduce congestion costs further or reduce congestion costs in the event the development of new generation facilities lags. Also, without the development of transmission infrastructure, wholesale electricity markets will remain balkanized.

The overall economic benefit derived from transmission system expansion is a function of the amount and location of new generation additions. The more new high efficiency combined cycle generation that is constructed in the congested zones, the less potential there is for transmission expansion to reduce congestion costs. However, it should be recognized that transmission expansion provides other benefits. It complements the generation development by increasing the likelihood that the wholesale markets will remain competitive in the event of loss of facilities due to contingencies occurring on the system and provides for a more secure system. Transmission expansion is necessary to ensure robust competitive wholesale electricity markets and to provide improved system reliability. The real challenge will be recognizing the value transmission expansion provides to the market and developing fair and equitable cost recovery mechanisms.

"Transmission expansion is necessary to ensure robust, competitive markets and improve system reliability."

Recommendations:

Based on the analysis above, the NYISO sees the following as high priority issues for the NY market:

1. The NYISO, its Market Participants, and the PSC should investigate expanding transfer capability between Marcy and Pleasant Valley or, at a minimum, Leeds and Pleasant Valley as high customer value / relatively low-cost ways to reduce congestion costs to consumers.
2. Besides generation expansion, increased demand response and energy efficiency measures, increased transmission capability, likely in the form of HVDC, needs to be encouraged in the congested New York City and Long Island zones, as well as upgrades of the AC networks within those zones.

3. New York must implement a transmission expansion planning process through the NYISO governance process to facilitate the expansion of the NY transmission grid. It should pursue joint planning analysis with adjacent regions to study increasing the transmission capability between adjoining markets.
4. The barriers to transmission expansion, such as the development of appropriate cost allocation formulas and cost recovery mechanisms, need to be addressed in the appropriate forums.

Additional Considerations:

As a result of electric industry restructuring and the resulting "open access" to the system, the bulk transmission system is running at higher utilization levels than ever before. In addition, the post-9/11 environment in which we find ourselves also suggests that the system must be prepared for contingencies not otherwise considered.

As with the supply side of the equation, these two factors suggest that it may be appropriate to re-examine the engineering assumptions from which the "resource adequacy" or system reliability" requirements are derived and determine if they are adequate for the new "restructured" world of electricity and security in which we find ourselves.

Conclusions:

New York transmission system development is just as critical as the development of new electric supplies in the overall reliability and efficiency with which the system is run.

With almost one billion dollars per year in congestion costs and one of the worst transmission bottlenecks in the country, New York needs to focus on creating an environment where transmission development can move forward. This will require clear market rules to allocate and incent merchant transmission development; mechanisms at the state level for incumbent utilities to recover the costs of transmission upgrades; and a well-established regional transmission planning process to look at the entire Northeast from a regional perspective.

We must also look to new, innovative ideas and developing technologies to help us solve these problems.

In addition, as this chapter illustrates, there are several potential transmission upgrades in New York that could pay for themselves over a short timeframe, reduce system congestion, and deliver savings to consumers for years to come. These projects should be encouraged at every level for the benefits they promise, and the NYISO, and the NYPSC have an obligation to determine whether it is in the public interest to move aggressively to ensure development of these projects.

DEMAND RESPONSE

C. DEMAND RESPONSE - The Third Leg of the Stool

The Role of Demand Response in the NYISO's Wholesale Markets

The NYISO has been active in expanding existing wholesale markets to permit loads to participate in both economic and reliability-based markets. Lack of adequate demand response has been cited by FERC as a major impediment to full-functioning, efficient wholesale electricity markets. Since 2000, the NYISO has worked with market participants to develop what many regard as the most advanced market for demand resources in the U.S. Attesting to the programs' success, the NYISO, along with NYSERDA and the NYPSC, received the 2002 award for best ISO demand response programs from the Peak Load Management Alliance.

Currently the NYISO offers three demand response programs:

- ICAP Special Case Resources (SCR)
- Emergency Demand Response Program (EDRP)
- Day-Ahead Demand Response Program (DADRP)

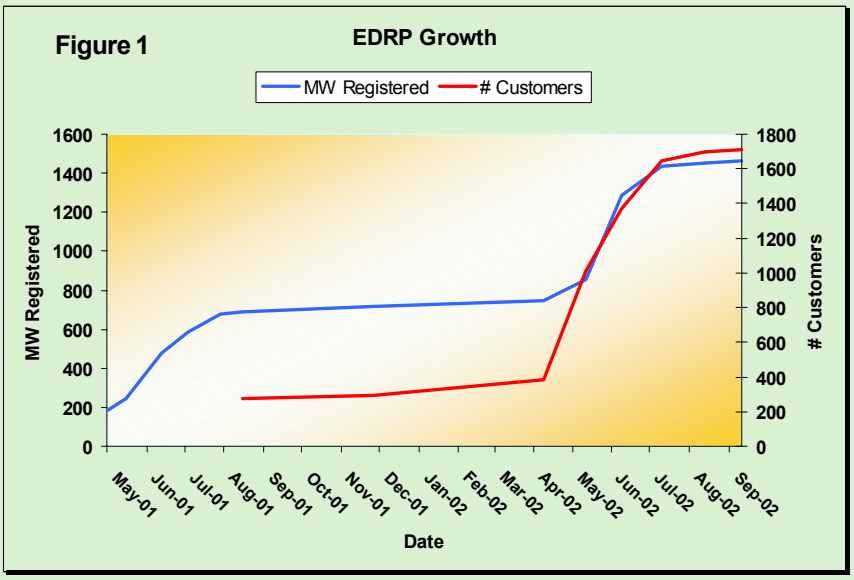
The ICAP Special Case Resources program pays retail electricity customers to provide their load reduction capability for a specified contract period. Program participants receive payments in advance for an agreement to curtail usage during times when the electric grid could be in jeopardy. Based upon system condition forecasts, participants are notified to curtail this claimed "capacity", either through the use of on-site generation and/or reducing electricity consumption to a firm power level.

EDRP allows participants to be paid for reducing their energy consumption upon notice from the NYISO that an operating reserves deficiency or major emergency exists. The program is open to interruptible loads or local "behind-the-fence" generation greater than or equal to 100 kW per zone. Loads register for the program through Curtailment Service Providers (CSPs); when called upon, CSPs will be paid for verified load reduction at the rate of $500/MWhr or real-time zonal locational-based marginal price (LBMP), whichever is greater.

DADRP allows loads, through their load serving entity, to bid load reduction into the day-ahead energy market. Load reduction bids are evaluated along with generation supplier bids as part of the NYISO's Security Constrained Unit Commitment (SCUC) program. If scheduled through SCUC, loads are paid day-ahead LBMP for the scheduled demand reduction, and are also paid an incentive (at the day-ahead LBMP) for any additional load reduction provided in real time.

In developing these programs, the NYISO has been cognizant of their environmental impact, particularly as they relate to the use of emergency backup generators. The NYISO's Day-Ahead Demand Response Program (DADRP) prohibits diesel units from participating in economic energy wholesale markets. For 2002 and 2003, through a protocol developed in coordination with the New York State Department of Environmental Conservation (NYSDEC), New York Department of Public Service (NYDPS), NYSERDA and the Governor's Office, EDRP requires that participating generators register with the NYSDEC.

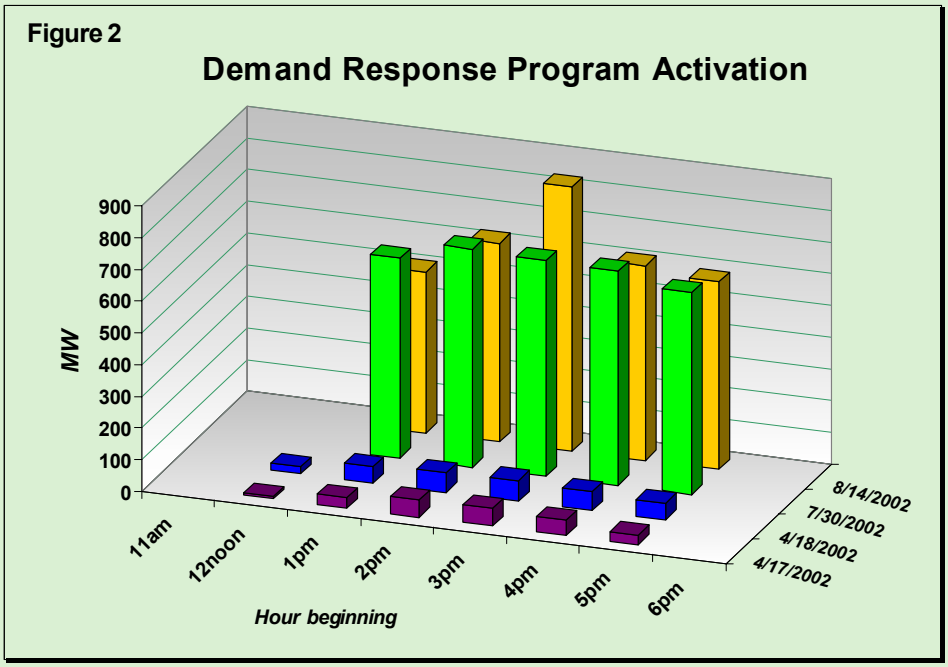
As an indicator of success, Figure 1 illustrates the growth in EDRP registration from May 2001 to the end of 2002; total MW enrolled has increased 700 percent since May 2001, with the total number of customers increasing by 520 percent.



2002 Program Experience

In 2002, the NYISO activated the SCR and EDRP programs a total of four times: twice in April (17 & 18), July 30, and August 14. Figure 2 plots the total demand response by hour for the four events.

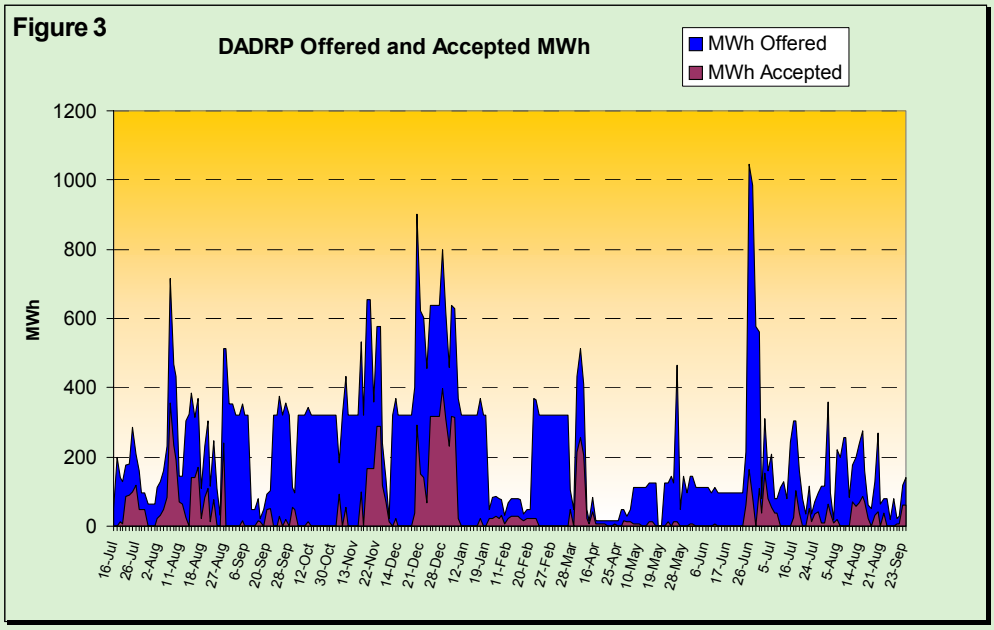
The April events were called in response to unusually high temperatures during the spring maintenance period, resulting in capacity shortages in southeastern NY. SCR and EDRP participants were asked to provide immediate load reduction from noon to 6 p.m. on both days; the resulting response reflects both the short lead time and the unusual time of year for these conditions.



events in July and August were precipitated by high load periods during extreme heat. Day-ahead advisory notices were provided to program participants, which helped to increase response when the programs were subsequently activated. For both days, an average of roughly 650 MW of verified load reduction was obtained.

Participation in DADRP continued with a small but active group of participants. Figure 3 shows the daily load reduction offers made and accepted since the program's inception in July 2001.

Figure 3



A number of factors have been identified that in combination contribute to the relatively low participation rates in the DADRP. These factors include:

- many customers' belief that operational or business constraints severely limit their ability to shift or curtail loads;
- customer perception that the potential benefits are inadequate to compensate for the perceived risks and initial costs;
- customer information and knowledge gaps related to development of effective load curtailment and bidding strategies; and
- customer perception that additional benefits of installing demand response enabling technologies are limited.

All of the above factors point to the complexities of integrating price-responsive demand into wholesale market design, and signals the need for greater outreach and education for interested customers.

The Benefits of Demand Response in New York

What are the economic benefits provided by demand response? A study[1] commissioned by the NYISO to assess the 2002 demand response program performance identified program costs, market price impacts (both spot market and longer term), and reliability benefits.

EDRP load curtailments in 2002 are estimated to have caused a reduction in real-time LBMPs ranging from 4.4 percent in the Hudson River region to just over 25 percent in the Western, NY region. Average price reductions for weekdays for the summer 2002 EDRP events range between $0.04–to 0.15/MW downstate and slightly higher upstate, $0.20/MW, which translates to total savings of about $370,000. Assuming an average outage cost of $5,000/MWh and that 5 percent of the load was at risk due to a reserve shortfall, the reliability benefits were estimated to range between $1.697 million and $16.9 million.

Demand Response – The Future

In October 2002, the NYISO stakeholders and the NYISO Board approved revisions to the EDRP and SCR programs that would allow for scarcity pricing conditions when these resources are needed. Allowing EDRP and SCR resources to set locational marginal price will have the most far-reaching impact of all the 2003 demand response program changes. The NYISO's Independent Market Advisor[2] identified that existing pricing rules and operating procedures have hindered efficient pricing during shortage conditions. Inefficient pricing (in this case, prices that do not reflect scarcity conditions) can hinder long-term resource development by providing incorrect pricing signals. The decision to allow demand resources to set marginal price will help to restore proper pricing during those few hours where reserve shortages are corrected by load reduction.

In 2003, DADRP will be expanded to allow third-party providers of demand response, in addition to load serving entities. This will allow customers more choices in DADRP providers and should increase the number of offers submitted to the day-ahead market by demand response providers.

Beyond 2003, we look to build upon the existing demand response programs under the framework of FERC's Standard Market Design. The existing reliability-based programs (EDRP and SCR) have proven their worth during critical peak periods, and have served as additional resources when supplies are tight. As load reduction providers become more accustomed to participating in these programs, they will be in a better position to consider enrolling in DADRP. Scheduling demand reductions in the day-ahead market provides the greatest leverage and benefit to all loads.

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[1] "How and Why Customers Respond to Electricity Price Variability: A Study of NYISO and NYSERDA 2002 PRL Program Performance", report prepared by Neenan Associates, Lawrence Berkeley National Lab and Pacific Northwest National Lab, February 17, 2003.

[2] NYISO Independent Market Advisor Review of Summer 2002, available at www.nyiso.com.

Energy efficiency will play an important role in addressing New York's supply situation. New technologies in building heating, ventilation and air conditioning systems and lighting control can reduce energy usage by 20 to 25 percent in some facilities while minimizing the impact on occupant comfort.

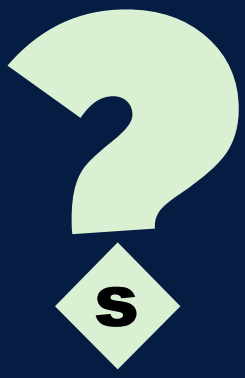
The Need for Real-Time Pricing

Demand response programs at the wholesale level provide an effective means of impacting marginal prices in the day-ahead market; rather than acting as price-takers, loads can participate in price-setting along with supply resources. These programs recognize that not all loads are in a position to actively participate in the wholesale market. Ultimately, the greatest source of demand response will occur when relevant retail customers, particularly large ones, see and are able to react to wholesale spot market prices.

Real-time pricing is a complex issue that requires significant coordination among state regulators, load serving entities and interested customers. Rate design should consider the impact of demand charges on customer motivation to shift energy usage – customers should not be penalized through demand charges for shifting energy from peak to off-peak periods.

Not all customers need to be enrolled in real-time pricing programs to achieve the benefits of real-time pricing. The NYISO's evaluation of the supply side impacts of price-responsive load programs over the past two years suggest that 20 percent of load subscribed to real-time pricing programs would capture a large percentage of the reliability and price impacts (savings) from demand response.

- A major contribution to successful real-time pricing would be the introduction of affordable metering/communication technologies that can provide consumers with real-time price and consumption information and automated mechanisms to react to prices.



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