

Power Alert II

New York's Persisting Energy Crisis



NYISO NEW YORK
INDEPENDENT
SYSTEM OPERATOR

***Report by
The New York Independent System Operator
March 27, 2002***

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FOREWORD

Electricity is essential. Without it, life as we know it would not be possible. Electricity drives our economy, enhances our communications, and enriches our lives. Today's modern electric system has such a high level of reliability we generally take for granted that electricity will always be there. Unfortunately, in New York State, during the past decade, the rise in demand for electricity has outpaced the development of new supplies. Last year, *Power Alert: New York's Energy Crossroads*, examined the need for new electric generating capacity and warned of the consequences of not acting. A year later, in *Power Alert II: New York's Persisting Energy Crisis*, the findings of the original report are reaffirmed. Fortunately, the marketplace is responding with a host of proposals to add generating plants, and to establish price-sensitive load and customer choice programs. Only additional supply, coupled with an aggressive demand-side load management program can guarantee the reliable energy supply needed to make New York an even better place to live and do business and fulfill the promise of electric restructuring.



ELECTRICITY

*Every minute,
every day,
every year,
electricity works invisibly
improving our lives,
enhancing virtually everything we do.*

EXECUTIVE SUMMARY

Despite the economic downturn and ill-advised suggestions that the need for more power has subsided, the New York Independent System Operator stands by its strong recommendation that the state must add significant amounts of new electric generating capacity by 2005 to ensure a reliable, competitive and efficient energy market, and improved air quality for New York's residents.

When the NYISO released its first *Power Alert* on March 15, 2001, it concluded New York State should approve and build 8,600 megawatts of new electric generating supply by 2005 to avoid impending shortages, improve competition, lower prices, and improve the environment. Since then, the NYISO has reexamined its findings and developed new forecasts regarding New York State's electric power supply, taking into account the developments of the past year. *Power Alert II* confirms last year's overall findings and outlines appropriate changes to recommended actions.

In preparing this report, the NYISO also examined operation of New York's electric system during the week of August 6-10, when a major summer heat wave struck the Northeast, causing record-setting demand for electrical power in New York and neighboring systems. The events of that week, detailed in an appendix to this report, tested the power system's and the market's ability to maintain a reliable supply of energy - especially while power reserves remain dangerously close to minimum levels - and highlighted the critical role that can be played by an effective demand response program.

The NYISO's reexamination of the State's power needs yields the following conclusions and recommendations:

- The loss of the World Trade Center and adjacent buildings on September 11 resulted in an immediate gross reduction of about 140 MW of summer peak load, but a permanent loss of only 90 MW in New York City. Some early reports had estimated that the gross loss could be five times greater;
- Even with the downturn in the economy and the effects of September 11, New York State still needs an additional capacity of 7,100 MW by 2005 - of which 2,000 to 3,000 MW must be located in New York City;
- Recent progress by the New York State Board on Electric Generation Siting (the Siting Board) in approving 4,427 MW of new capacity is encouraging. To meet New York State's electric supply needs and prepare for a rebounding economy, approvals for an additional 3,000 MW of new capacity are needed by spring 2002. Long Island alone requires 750-1,000 MW approved as soon as possible to alleviate severe reliability risks and high prices;
- For summer 2002, statewide electricity supplies are expected to be adequate under normal weather conditions, but Long Island will be at risk because of a tight supply situation and limited transmission capacity. New York City should have adequate supply, but a repeat of last year's heat wave could place the city at risk, as well;
- More power plants would improve air quality, lower prices, and ensure adequate generation in the event of attacks on generators, or severe droughts;
- The Legislature should renew the Article X electric power plant siting law - scheduled to expire December 31, 2002 - to maintain the Siting Board's momentum. If any changes are made to Article X in the renewal process, the changes should be focused on shortening the approval time frame;
- While this report emphasizes the importance of certifying new plants through the Article X process, such approvals do not necessarily mean that these plants will be financed and built. As they develop energy policy, legislators

and regulators should be mindful of the changing investment climate brought on by the collapse of Enron. It is vital the state send a strong affirmation to potential developers that new projects are needed and welcome;



From the food we grow, prepare, preserve and eat . . .

- Additional supply, outstanding performance of generation and transmission, Demand Response Measures (DRM), and a measure of good luck all played important roles in maintaining New York's electric reliability during summer 2001;

- The peak week of August 6-10 demonstrates the impact that Demand Response Measures (DRM) can have on New York State electric reliability. (Please refer to the appendix for charts and more information about that week's events.) In those five days, the New York State electricity grid established three records for peak loads, culminating on August 9, when a peak hourly demand of 30,983 MW was measured, eclipsing by 672 MW the previous record of 30,311 MW set on July 6, 1999. Given that DRM were estimated to have reduced load by about 1,500 MW and that the NYISO experienced a shortage in reserves, there is no doubt that DRM played a significant role in maintaining New York's electric reliability. Accordingly, the NYISO makes the following recommendations regarding DRM:

- ✗ Continue developing and refining DRM at the wholesale level;
- ✗ Eliminate barriers to real-time pricing at the retail level;
- ✗ Encourage the development of "smart metering" to empower consumers to assist in DRM;
- ✗ Develop real-time residential and commercial rates;



- ✗ Continue education efforts on the benefits of DRM.
- The NYISO, the New York State Public Service Commission (PSC) and market participants must redouble their efforts to increase customer participation in all load management programs as an essential tool for ensuring reliability during extreme weather and other adverse operating conditions. In particular, the NYISO recommends that:
 - ✗ New York State take steps to allow real-time electricity pricing to become the default service classification for retail customers;
 - ✗ Load Serving Entities (LSE, former utility companies) more fully participate in efforts to develop and install advanced metering technologies to facilitate real-time pricing;
 - ✗ While already available for customers using more than 100 kilowatts, the PSC should establish real-time retail tariff schedules for smaller customers; and
 - ✗ The NYISO, the PSC, the New York State Energy Research Development Authority (NYSERDA), and New York's LSE continue to develop educational programs that explain the value of real-time pricing and the benefits of demand response programs to all customer segments.

The NYISO also has confirmed that its long-range recommendations made in *Power Alert* remain valid. These include:

- Transmission infrastructure upgrades and expansions, and distributed generation, should be encouraged through market design enhancements. At the request of New York State, the NYISO is preparing an assessment of the State's transmission system, which will identify potential high-value transmission infrastructure projects

that could increase reliability and market efficiency. This assessment will be completed by the end of 2002;

- The State must consider fuel diversity and the economics and adequacy of energy supply as part of its energy policy; and
- The State must examine the expansion of its natural gas transmission infrastructure to facilitate the development of additional natural gas-fired combined cycle plants.

The NYISO has taken steps to implement this recommendation by jointly undertaking a study with NYSERDA to examine the impact of increased demand for natural gas on the State's electric system and natural gas infrastructure.



OVERVIEW

A. *Power Alert II* Background

The NYISO is a not-for-profit corporation established in 1999 to facilitate the restructuring of New York State's electricity industry. In addition to administering the State's wholesale energy markets, the NYISO operates the State's high-voltage electric transmission system. One of the NYISO's highest priorities is ensuring an adequate level of electric capacity to meet the demands of the State's economy and consumers.



... to the products we manufacture and the communications connecting our modern economy.

Last year, the NYISO conducted a study of the State's electric supply needs. The study examined options for meeting these needs by accelerating the pace of building power generators and developing and promoting enhanced consumer energy conservation measures. The NYISO released the results of this study in a report entitled "*Power Alert: New York's Energy Crossroads.*" The NYISO concluded that New York State faced a growing and troubling disparity between electric demand and in-State supply.

In preparing *Power Alert*, the NYISO reviewed two scenarios: one in which generating capacity was added, one in which it was not. The comparison demonstrated that to avoid a replication of California's "market meltdown," with its attendant price increases and rolling blackouts, New York must address its growing supply and demand imbalance.

Among the specific conclusions presented in *Power Alert* were:

- New York State needed to approve a substantial amount of new generation

in the range of 4,000-5,000 MW during 2001;

- New York State should approve approximately 1,000 MW of generating capacity each year for the next three to four years, with more than 50 percent of it located in New York City and on Long Island;
- New York City, because it is both a major consumer of electrical power and also a "load pocket" (with limited ability to import power from outside the city over existing transmission lines), must have 2,000-3,000 MW of this additional capacity approved within its own borders;
- To further enhance a competitive wholesale electricity market in New York, demand response and price-sensitive load initiatives should be developed on an expedited basis; and
- Significant economic and environmental benefits would be gained by the addition of 8,600 MW of new generation by 2005.

Other recommendations presented in *Power Alert* included:

- Transmission upgrades and expansions and distributed generation should be encouraged through market design improvements;
- As part of its energy policy, the State must consider matters of fuel diversity in addition to the issues of economics and adequacy of energy supply; and
- To facilitate the development of additional, modern gas-fired combined cycle plants, the State must expand its natural gas transmission infrastructure.

If an additional 8,600 MW of supply were added to the system by 2005 as



recommended in *Power Alert*, the NYISO projected that wholesale electricity prices could be reduced more than 25 percent compared to no price reduction if no new capacity were added. As a result, the State could save \$1.4 billion annually. Significant environmental benefits also could be achieved, reducing sulfur dioxide and nitrogen oxide emissions by 28 percent and 43 percent, respectively, due to the displacement of older, less efficient plants by newer, cleaner plants.

B. Changing Circumstances

Since the release of *Power Alert*, significant changes have taken place, including:

- The events of September 11 had an impact on New York City's economy and its electricity demand;
- The economies of the United States and New York State entered, and now appear to be recovering from, a recession;
- On August 9, 2001, New York State set a new all-time integrated peak demand record of 30,983 MW. This record does not include an estimated 1,500-megawatt load reduction that was achieved through significant efforts that day;
- The New York State Siting Board has approved seven new power plants and repowerings representing total net supply of 4,427 MW. Most of this capacity is projected to be online by 2005.
- The New York Power Authority installed 440 MW of combustion turbines in New York City and Long Island in 2001 on an emergency basis; and
- The New York Control Area load will be reduced by 435 MW in the summer of 2002 due to the transfer of New Jersey load currently served by New York to the area administered by the Pennsylvania, New Jersey, Maryland Interconnection (PJM), the independent system operator

in the mid-Atlantic States.

The NYISO has determined that these changes are material and justified a re-evaluation of *Power Alert*.

C. Purpose and Structure of *Power Alert II*

The purpose of *Power Alert II* is to update the status of New York's electric supply needs previously described. *Power Alert II* contains two sections and an appendix:

- I. Revised electricity demand and supply projections accounting for changes in circumstances that have occurred since *Power Alert*.
- II. A review of approved, in-state power projects and those pending before the Siting Board; and recommendations regarding renewal of New York Article X electric power plant siting law, which expires on December 31, 2002.

Appendix - A review of peak loads experienced on August 6-10, 2001, to identify what lessons the NYISO learned from this experience and how to preserve system reliability under such extreme conditions. One of these lessons, the importance of Demand Response Measures, is discussed in detail.

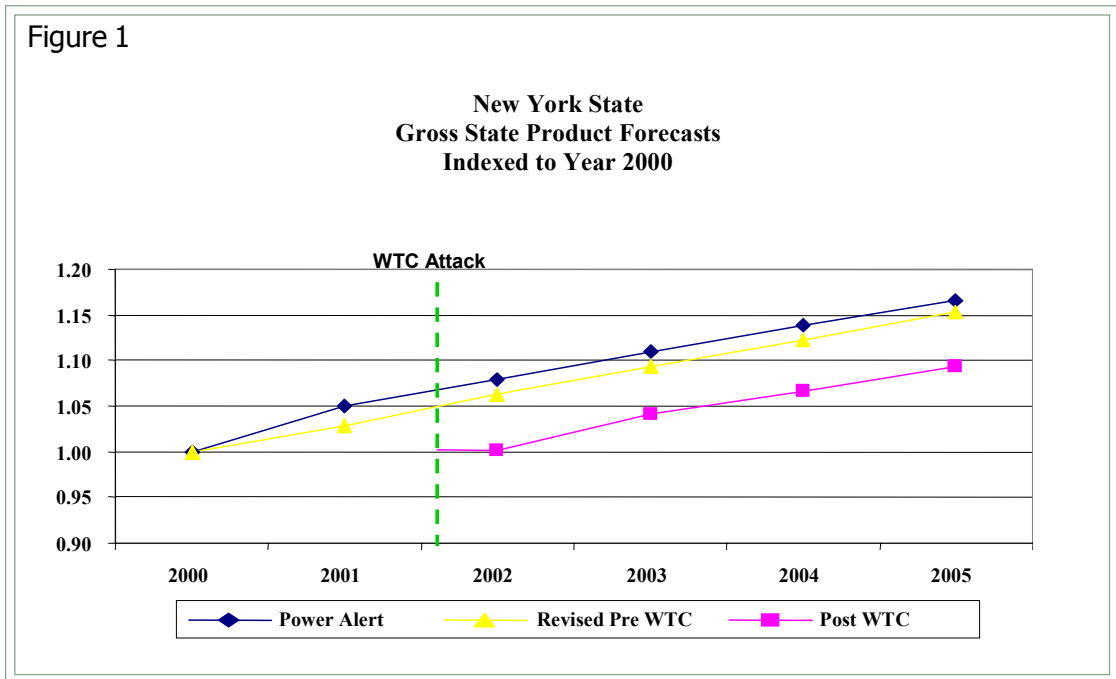




Electricity keeps us warm in the winter, cool in the summer and entertained in the evening.



Figure 1



I. Revised Demand/Supply Projections

A. Economic Outlook

The short-term economic outlook for New York State has changed substantially since the release of *Power Alert*. This is due to a national recession, which began at the end of first quarter 2001, the effects of which were compounded by the September 11 terrorist attacks. Economists remain skeptical about the strength of the economy, despite signs of recovery this year.

Figure 1 shows how the forecast of the State's economy has fared as a result of these events. (Gross Product is a measure of total economic output.) A forecast from *Economy.com*, the NYISO's economic forecasting consultant, made before the September 11 attacks (pre-WTC) already predicted lower economic growth than the one

used in *Power Alert*. *Economy.com*'s post September 11 forecast (post-WTC) shows a more dramatic reduction. Post-WTC forecasts that New York State's economy will grow approximately 44 percent less through 2005 than shown in the *Power Alert* forecast.

New York City's employment is predicted to dip slightly below 2000's level next year and remain below the pre-WTC forecast through 2005. Long Island, on the other hand experiences only slightly lower growth next year and winds up in 2005 actually slightly ahead of its pre-WTC forecast. Enough jobs are forecast to move from New York City to Long Island to offset the more pessimistic economic scenario underlying the post-WTC projections.

Figures 2 and 3 (next page) illustrate how New York City's and Long Island's employment outlooks have changed relative to each other. Figure 4 shows how the rest of the State has fared.

Figure 2

New York City
Employment Growth Forecasts
Indexed to Year 2000

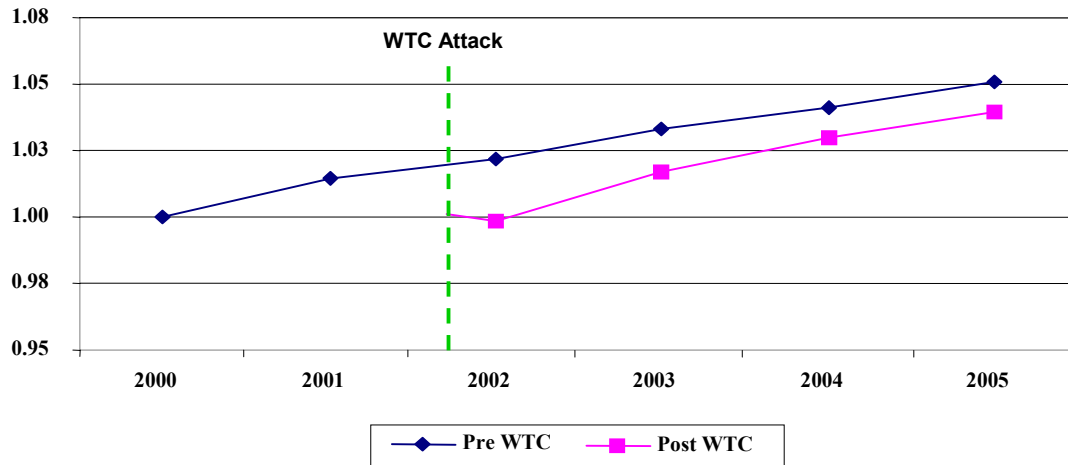
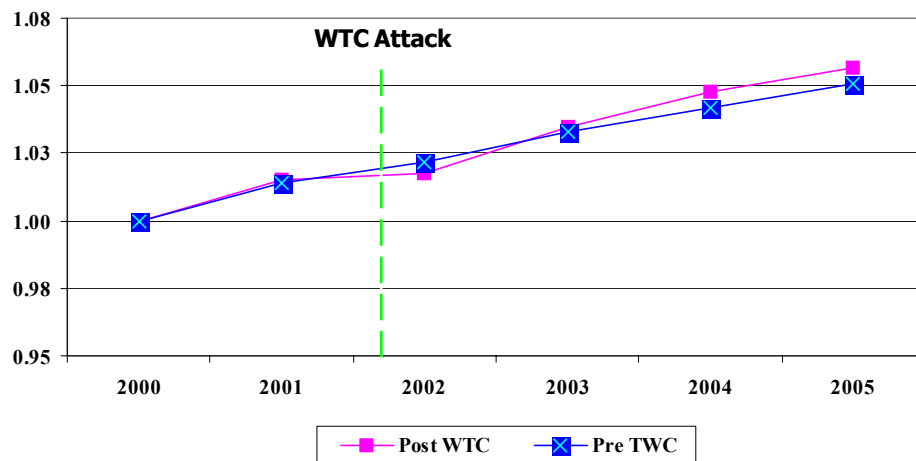


Figure 3

Long Island
Employment Growth Forecasts
Indexed to Year 2000



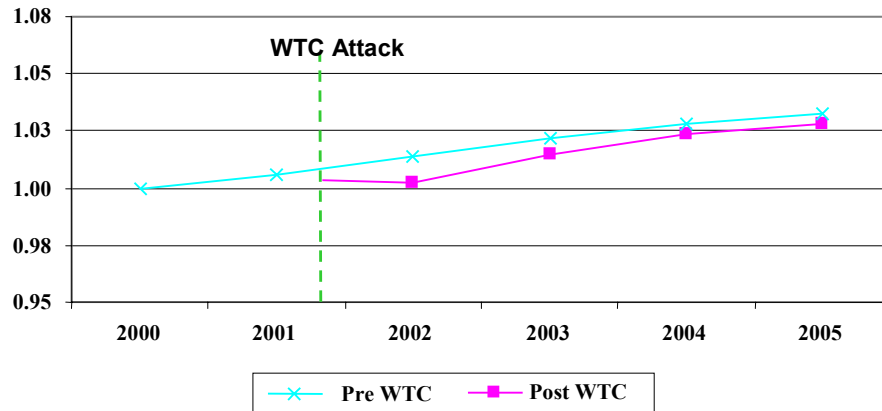


It helps us diagnose disease, monitor our condition and dispense care.



Figure 4

**New York State excluding NYC & LI
Employment Growth Forecasts**



Outside of New York City and Long Island, the effects of the September 11 attack were minimal except immediately thereafter. Employment in the post-WTC forecast is expected to shrink in 2002. But by 2005, employment will almost recover to pre-WTC levels.

Contrasting impacts of the attack can be seen by looking at employment forecasts for the most critical load areas in the State: New York City and Long Island. Figure 2 shows that the employment forecast for the city has been reduced as a result of the attack.

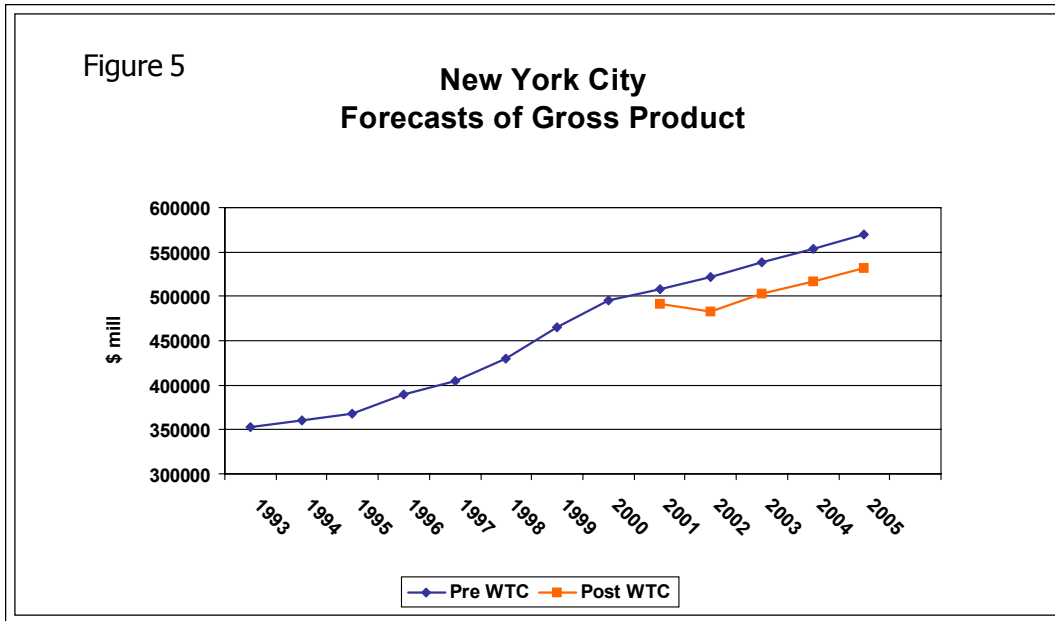
In Figure 5, New York City's economy, measured by the Gross Product, suffers an actual decline through 2002. In the post-WTC scenario, it takes until 2004 to get back to the level of economic activity predicted for 2002 in the pre-WTC scenario. In Figure 6, Long Island, on the other hand, suffers only a slow-down, not a decline, in growth.

B. Peak Demand Forecast

The *Power Alert II* peak demand forecast reflects this altered economic environment. Tables 1-3 show the summer peak forecasts for the New York Control Area and its critical load areas for the *Power Alert* and *Power Alert II* forecasts. The figures were recalibrated to reflect the actual number of megawatts used in 2001.

In Table 1, state figures reflect estimated changes after Rockland Electric shifts a part of its New Jersey load now served by New York to the area managed by PJM Interconnection. Table 2 shows the impact of the World Trade Center attack on New York City, whereas Long Island, in Table 3, had no such effects. As the tables show, New York City and Long Island continue to be NYCA's critical load centers. Their share of the state's total peak continues to grow.

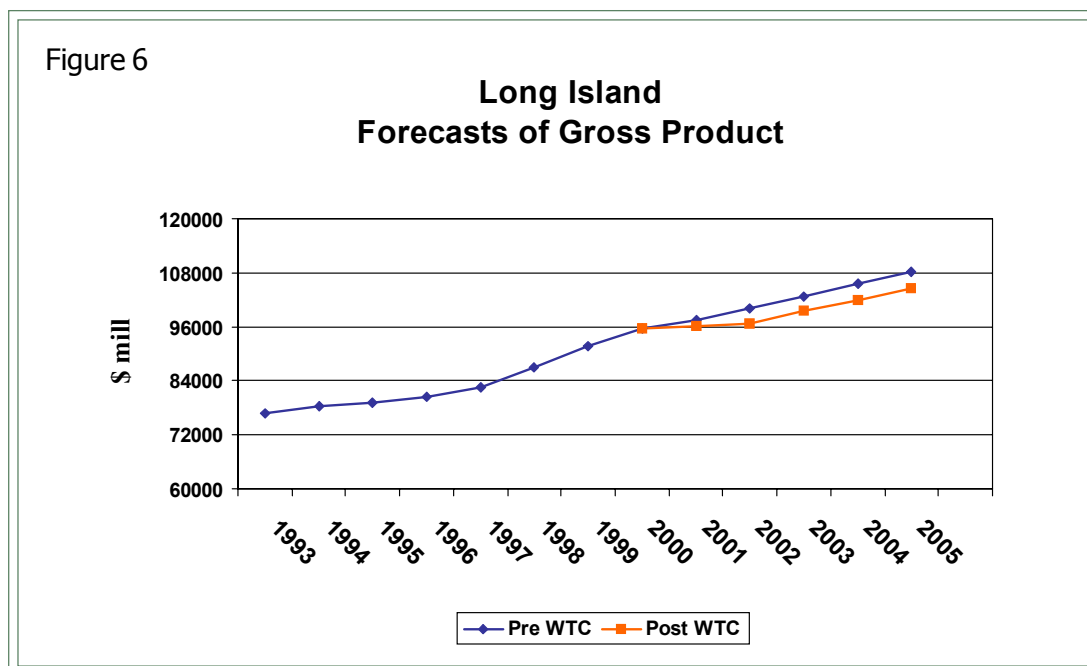
As a result of the new economic outlook, 2002 is expected to show statewide load growth of 0.4 percent on a weather-adjusted basis. Figure 7 also reflects a slight decline in demand as the result of



the 435 MW load shift to PJM Interconnection. New York City's peak is predicted to be 25 MW lower in 2005, while Long Island's increases by 137 MW. The overall statewide peak is now projected to be 985 MW lower in 2005 than had been forecast in March 2001.

C. Summer 2002 Outlook

New York State will require 36,474 MW this summer to meet forecasted demand, but current supply falls short of that number by 421 MW. In Table 4, the NYISO projects a demand of 30,910 MW, plus 18 percent, or an additional 5,564 MW,



LONG RANGE DEMAND FORECASTS					
Table 1					
NYCA (Figures in Megawatts)					
	Power Alert	2001 Recalibration	Change in economic forecast	Rockland Electric	Power Alert II
2001	30,620	160	-	-	30,780
2002	31,120	140	(350)	(435)	30,475
2003	31,573	110	(185)	(445)	31,053
2004	31,993	70	(205)	(450)	31,408
2005	32,372	20	(182)	(455)	31,755

which is required by reliability rules to be kept in reserve. Currently, only 36,053 MW are available statewide. When the estimated changes from Rockland Electric's load shift to PJM Interconnection (see Table 1) are factored in, these numbers become: a forecasted demand of 30,475 MW, plus a reserve of 5,486 MW for a total requirement of 35,961 MW. State supply exceeds this amount by a mere 92 MW.

Table 2					
In-City (Figures in Megawatts)					
	Power Alert	2001 Recalibration	Change in economic forecast	World Trade Center (net loss)	Power Alert II
2001	10,807	132	-	-	10,675
2002	10,840	116	(251)	(40)	10,665
2003	10,990	91	(131)	(20)	10,930
2004	11,140	58	(93)	-	11,105
2005	11,270	17	(42)	-	11,245

D. Loss of World Trade Center Load

The loss of the World Trade Center and damage to adjacent buildings on September 11 accounted for an immediate gross reduction of about 140 MW of in-city load. This is substantially less than some early-published reports, which had estimated load reductions up to five times greater. Moreover, customers representing a portion of this load re-located to other parts of the city, and ongoing construction also will create new load. About 90 MW of the immediate gross loss came from destroyed buildings. Most of the damaged buildings will return to service by summer 2002.

Table 3				
Long Island (Figures in Megawatts)				
	Power Alert	2001 Recalibration	Change in economic forecast	Power Alert II
2001	4,733	(20)	-	4,713
2002	4,805	(18)	-	4,777
2003	4,873	-	66	4,939
2004	4,936	-	78	5,014
2005	4,993	-	97	5,090

E. What The Revised Projections Mean To Power Alert Recommendations

As stated in *Power Alert*, to achieve a cost savings of 20-25 percent and significant reductions in sulfur dioxide and nitrogen oxides, a projected 8,600 MW of new capacity statewide would be needed. Given the reductions in demand caused by the downturn in the economy and the loss of load from the events of September 11, this number is revised downward by 15 percent for a total addition of 7,100 MW by 2005. New York City still requires 2,000 to 3,000 MW of that total by 2005.

Table 4		
NYCA Load and Capacity Outlook Summer 2002		
Statewide	Total NYCA	less Rockland Electric
Forecast Demand	30,910 MW	30,475 MW
Reserve Req.	5,564 MW	5,486 MW
Total Req.	36,474 MW	35,961 MW
NYCA Available Supply	36,053 MW	36,053 MW
Need from external sources or SCR	(421)MW	None



It helps land our planes, direct our traffic and print our papers.



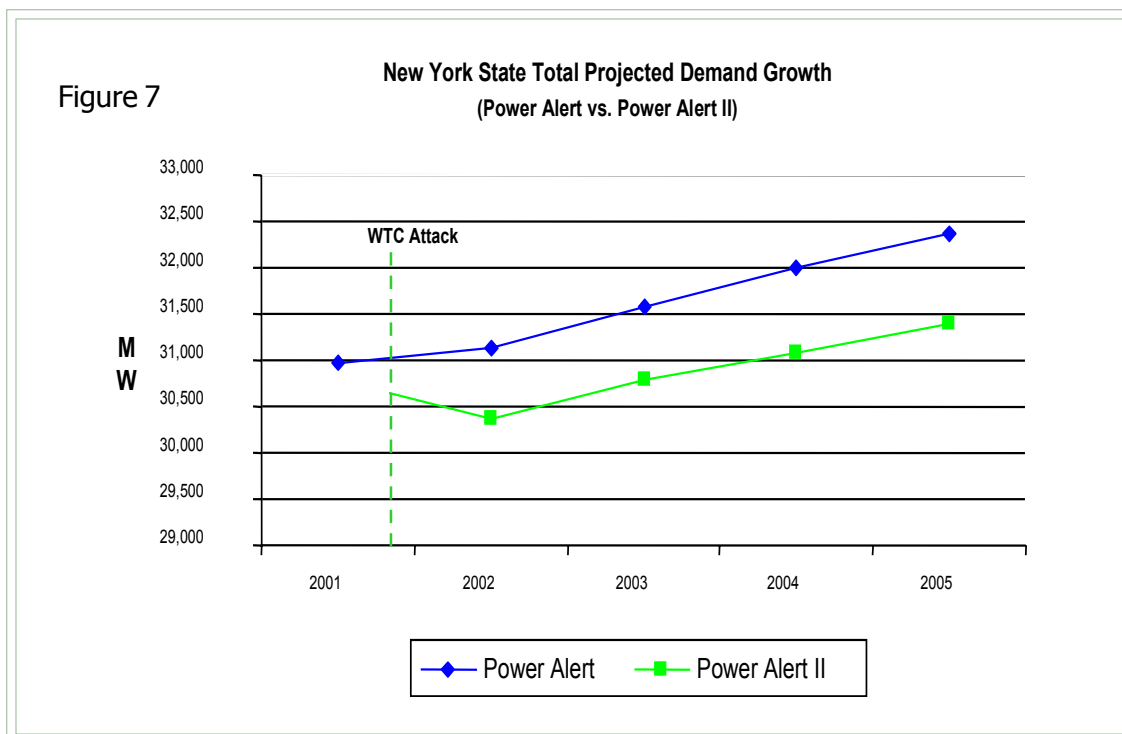
This revision does not suggest that there should be any slowing in the pace of building new electric power plants from what was called for in *Power Alert*. This is particularly true in the New York City and Long Island areas where the need for new capacity is greatest and very few new projects have been approved. It is important to remember that the construction time for a new major electric power plant is 24-36 months after approval. This means projects approved this year may not even be on-line until 2005. Indeed, the benefits from new plants that have received siting approval will not be realized this summer, so Demand Response Measures should be utilized again.

Furthermore, when the State's and the City's economies rebound from the current recession, there will be a need for additional power. Waiting to build new plants until the rebound is well in progress will be too late. Building plants now could actually help spur economic activity by bringing less expensive energy to the market sooner.

F. Water Use in Power Generation

Recent climate conditions have led to an unforeseen issue with power generators that use water to process energy. By the beginning of this year, precipitation was below average, and the National Weather Service had issued drought warnings for most of New York State and the Northeast. Water provides the mechanical power to turn a hydro-turbine and can be the energy transport medium -as steam- in a thermal electric generator. State-of-the-art generators use water to improve efficiency, or in cooling processes. Low reservoir levels and river flows might reduce hydroelectric and fossil fuel generating capacity and availability.

More new power plants would boost the minimal power reserve margin the State maintains for emergency situations and would lessen the impact droughts would have on power generators, while providing the underlying economic and environmental benefits.



II. Article X

A. Status of Projects

Before March 2001, when *Power Alert* was issued, no major electric power plant or expansion (>80 MW) was approved under the 10-year-old Article X permitting process. But in the last year, the New York State Siting Board has approved construction of seven major power plants or repowerings, representing a combined 4,427 MW in potential added capacity. The New York Power Authority also added 440 MW of new combustion turbines in New York City and on Long Island. The approval figure meets the 4,000-5,000 MW of additional capacity that *Power Alert* recommended be approved in 2001, though it should be noted that more than half of this

approved new capacity is located in the upstate area-and only one project is actually under construction.

Despite the improving effectiveness of Article X, some plants will not be built even after they have been certified. The changing investment climate - due in large part to the "ripple effect" of the Enron collapse-might be having an impact on proposed projects in New York as well. The Torne Valley Station Project in Rockland County recently was cancelled, and the Orion Astoria project in Queens, which had its application accepted and certification pending, is postponed because of current conditions in the capital markets. Two other projects in New England, Sithe Energy's Medway project, and Mirant's Cape Cod Canal repowering, also were cancelled recently, indicating that this is a growing trend throughout the Northeast.



It pumps the water we drink, cleans the carpets we walk on, and lights our way.



APPROVED PROJECTS			
Project Name	Company	MW	Expected in
New York City			
East River Repowering	Con Ed	360 (gross)/197 (net increase)	2Q 2003
Ravenswood	KeySpan	250	2003
Astoria Energy	SCS Energy	1,000	3Q 2004
Long Island			
No major power plants or expansions approved to date			
Upstate			
Athens Generating	Athens Gen. Co.	1,080	3Q 2003
Bethlehem Energy	PSEG Pwr.	750 total, 350 net incr.	2003
Bowline	Mirant	750	on hold
Heritage	Heritage Gen.	800	4Q 2004
TOTAL		4,990 (gross) / 4,427 (net) MW	
* Project status source: New York State Public Service Commission			

B. The Future of Article X

On December 31, 2002, New York State's 10-year-old Article X electric power plant siting law will be phased out unless legislators renew it. This deadline raises several questions:

- whether Article X should be renewed "as is" or revised by the State Legislature and Governor;
- whether it should be discarded in favor of the more basic State Environmental Quality Review Act (SEQRA) process; and
- whether a new regulatory scheme should be developed to replace the Article X approach.

Although Article X was in place for six years before it was tested by its first application -the Athens Generating project in Greene County - and required legislative amendments in 1999, the NYISO believes that Article X is a good law and that the administrative process by which it is implemented is showing steady improvement. Certainly, recent plant approvals are an encouraging sign, despite the fact that the underlying applications had been in the permission process for a number of years. As the New York State Departments of Public Service, Health, Environmental Conservation and Economic Development all gain experience dealing with this process,

Article X is being implemented more effectively.

To lose momentum in siting approvals now, when New York so critically needs new sources of electric supply, could be devastating to the reliability of the State's electric system and the health of its economy. Accordingly, given the improving trend of the Article X certification process, and the underlying soundness of the law itself, the NYISO believes renewing Article X in largely the same form as it now exists makes the most sense. Nevertheless, Article X can and should be improved. The NYISO recommends that the following steps be taken:

- Once an application has been determined to be complete, shorten the timeframe for approval from 12 months to 6 months or less. Many states have 6-month or shorter approval periods. New York must be competitive with the surrounding States or it will suffer economically.
- Further streamline the process for power plant developers building on acceptable "brownfields" (existing industrial use sites) while remaining aware of the need to continue developing "greenfield" sites. Last year, the State Legislature took a positive step in reducing the timeframe for power plant developers who showed substantial reductions in emissions and water use. A similar timeframe should be provided for brownfield sites that are appropriate for power plants. Such a provision will provide greater incentive to redevelop "fallow" sites that have fallen from the tax rolls and possibly expedite new development as well.

Projects with Accepted Applications and Certification Pending			
Project Name	Company	MW	Possible Certification Date
New York City			
Astoria	Reliant	562 (increase)	on hold
Poletti	NYPA	500	2Q 2002
Long Island			
Brookhaven	Brook. Enter.	580	3Q 2002
Upstate			
Ramapo Energy Project	American National Power	1100	N/A
Wawayanda	Calpine Construction Finance Corp.	540	4Q 2002
TOTAL		3,282	



APPENDIX

Record Peak Loads: August 6 - 10, 2001

A. Operating Conditions



During the week of August 6, 2001, New York experienced a very serious supply situation that underscores the importance of developing additional generation resources within the New York Control Area. During that week, hot and humid weather blanketed the Northeast and Eastern Canada, forcing the NYISO and its neighboring control area operators to implement numerous emergency procedures to meet demand and avoid power outages. Although the NYISO was able to avoid a disaster by implementing a number of emergency response protocols, this close call serves as a warning regarding the need for continued development of new generation and demand response programs in New York State.

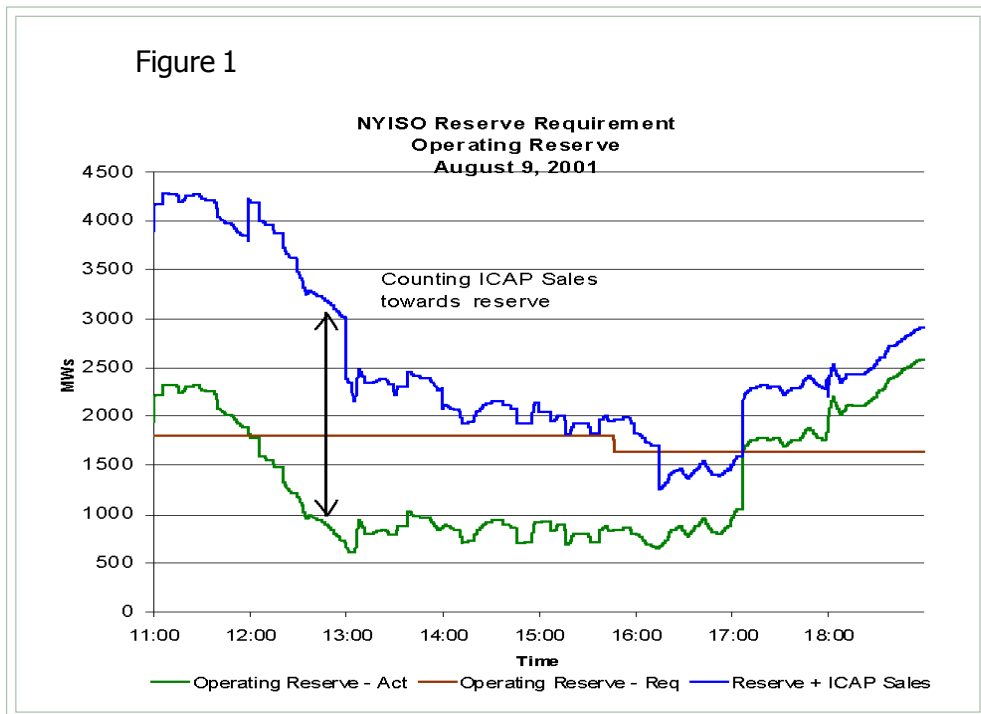
It serves us from the moment we're born to the instant we die.



Based on weather forecasts and other system conditions, the NYISO anticipated high demand during the week of August 6. The NYISO began the week by coordinating closely with its neighboring control area operators and by surveying its options for meeting the expected demand. By Tuesday, the NYISO was required to employ Demand Response Measures (DRM), calling upon its Emergency Demand Response Program (EDRP) and Special Case Resource (SCR) customers to alleviate a shortfall in generation. Peak load reached an all-time high of 30,509 MW on Tuesday, August 7, even after calling upon roughly 720 MW of DRM.

Wednesday (Aug. 8)

August 8 was similar to the previous day, with EDRP and SCR programs activated at 1:00 p.m. and extended to 7:00 p.m. The NYISO entered a state of emergency due to the shortage of reserve and implemented other procedures, including: curtailing non-essential commercial and industrial loads under applicable tariffs; instituting manual voltage reduction; asking for voluntary curtailment of large



industrial and commercial customers; and conducting public appeals for energy conservation through radio and television announcements. The NYISO set a new peak load record of 30,665 MW while accounting for approximately 1,000 MW through DRM programs at the peak.

Thursday (Aug. 9)

On August 9 temperatures in New York City reached 103 degrees Fahrenheit. The Long Island Power Authority (LIPA) initiated a power alert for Long Island. The EDRP and SCR programs were activated from 11:00 a.m. to 7:00 p.m. Additional load reduction was achieved when Governor Pataki closed State government offices at 2:00 p.m. The NYISO set its peak load record of 30,983 MW while saving about 1,500 MW through DRM at peak demand. The red line on Figure 1 shows the amount of reserve the state is required to hold during the day. Due to extreme demand on Aug. 9, that reserve level fell below requirement (green line) for a short period of time.

The NYISO Assists PJM

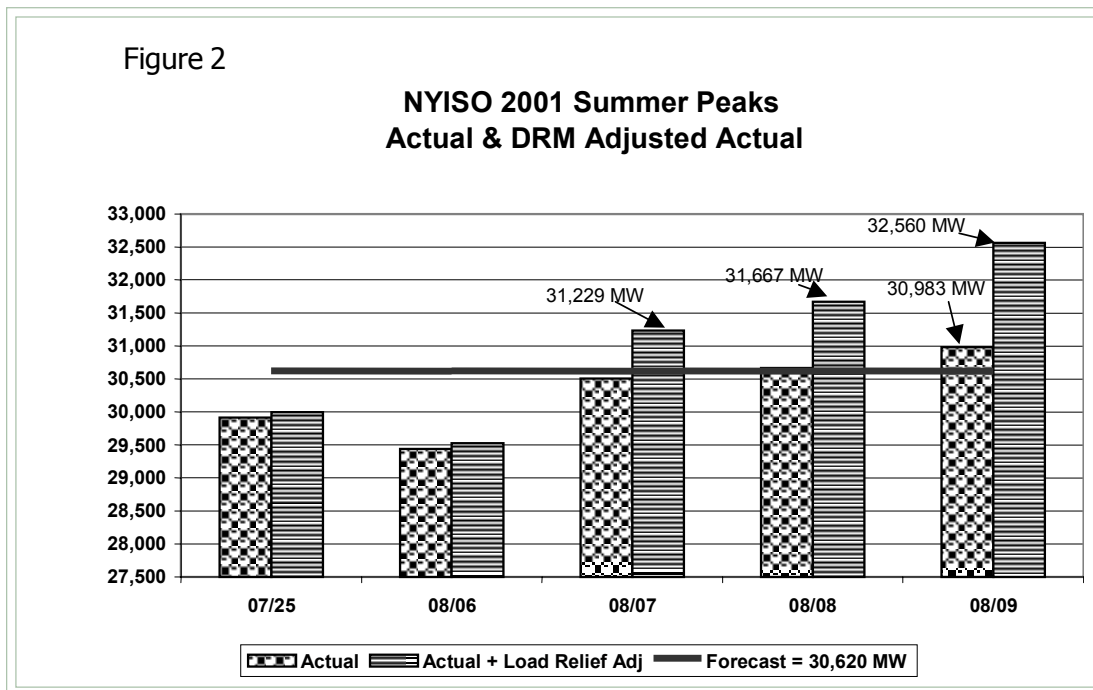
From noon until 2:00 p.m. on Thursday, August 9, NYISO deliveries to PJM increased by 930 MW. At 2:46 p.m., PJM ordered a 5 percent quick

response voltage reduction in their eastern system due to critical shortages of supplies. At 3:10 p.m., the NYISO voluntarily went into a 5 percent voltage reduction to help PJM. PJM West went into 5 percent quick response voltage reduction system-wide at 3:12 p.m.

In summary, New York's bulk power system performed well during this period with very few outages of generators or transmission facilities. New York's system maintained close coordination with neighboring electric power systems in the Midwest and Northeast. It is also clear that load management relief played a pivotal role in maintaining the reliability of the system during extreme conditions.

B. Contributions of Demand Response and Other Measures to NYISO Operations

The contribution of Demand Response Measures to NYISO operations during the week of August 6 helped to prevent a difficult situation from becoming an unmanageable one. The peaks for the critical days of that week and the peak on July 25, the year's other significant high load day, are shown in Figure 2.



The system peak occurred on August 9, at 30,983 MW. DRM reduced this peak by approximately 1,500 MW. Therefore, without DRM, the NYISO would have experienced a new peak of approximately 32,500 MW.

As can be seen in Figure 2, without DRM, the ISO would have experienced three consecutive days of 31,000+ MW loads during the week of August 6, with the load on August 9 more than 32,500 MW.

On July 25 and August 6, weather conditions were actually less extreme than expected, resulting in upward weather-normalizations to those days' peaks.

The composition of DRM in effect on August 9 is shown in Figure 3.

NYISO staff estimated about 1,500 MW of DRM to be in effect. This estimate derives from load forecasting models and weather normalization

methodologies. An independent estimate was obtained by adding transmission owner (TO) estimates of voltage reduction, voluntary appeals, incentive programs, etc., to the NYISO's Special Case Resource, Emergency Demand Response Program and Day Ahead Demand Response Program (DADRP) estimates. The sum then was grossed up 8 percent to account for losses. The result, 1,536 MW, supports NYISO conclusions.

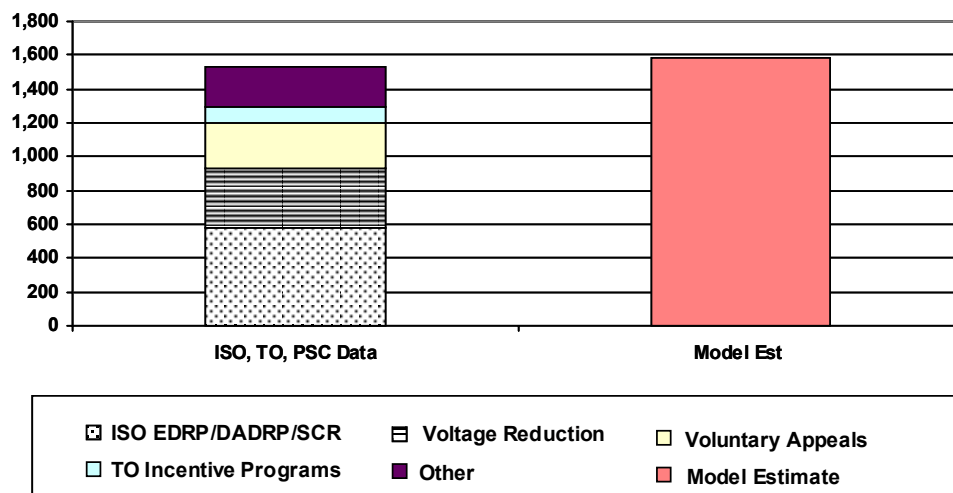
It is worth noting that in their first year of availability, the NYISO's demand reduction programs and DADRP programs (approx. 580 MW) contributed more load relief than any other category. Voltage reductions (350 MW) and voluntary appeals (270 MW) also were major contributors. Transmission owner incentive programs (90 MW) were crucial, because their contributions were concentrated in the most capacity-constrained zones of the State. Prominent in the "other" category are the early State government offices shutdown decisions by Governor Pataki (220 MW) and local governments on Long



*Always
there.
Always
ready.
Always on.*



Figure 3 **Composition of August 9, 2001
DRM**



Island (40 MW), which generally provided relief where it was most needed.

C. NYISO 2001 Demand Response Program Performance Summary

To facilitate demand side response programs for the wholesale market, the NYISO Business Issues Committee in August 2000 created the Price-Responsive Load Working Group (PRLWG). The working group created two programs that expand the role of demand side resources in the day-ahead energy market and during system emergency conditions:

- ◆ An Emergency Demand Response Program, and
- ◆ A Day-Ahead Demand Response Program.

Both demand response programs were implemented in time for the summer 2001 peak load season. The Emergency Demand Response Program began accepting registrations in mid-May. As of the end of August, a total of 24 Curtailment Service Providers (CSP) had regis-

tered for the program, bringing a total of 290 end-use resources to the program. Facilitating all of these demand side offerings are several programs sponsored by the New York State Energy Research and Development Authority. Of particular note are two programs (The Peak Load Reduction Program- PON620 and the Enabling Technologies for Price Sensitive Load Management Program- PON585) designed to upgrade the necessary infrastructure needed for participating in demand response programs. The end use resources that registered, classified by zone and demand reduction type, are shown in the Table 1.

In Table 1, resources are categorized according to the type of load reduction provided: either interruptible load, on-site generation, or a combination of interruptible load and on-site generation. Noteworthy in this table is the fact that NYC (Zone J) had only 8.7 MW of EDRP. This is primarily because New York City is unique in that it has very little industrial load, which is the primary source of demand reduction.

Table 1 - EDRP Resources Registered in 2001				
Zone	Total MW	Type of Participant		
		Interruptible Load	On-site Generation	Load + Generation
All (A-K)	679.1	520.6	120.5	38
A	295.3	294.8	0.5	0
B	12.7	12.2	0.5	0
C	77.2	68.9	3.9	4.4
D	0.7	0.5	0	0.2
E	41.2	37.3	3.9	0
F	98.9	76.3	3.9	18.7
G	25.4	18.7	6.4	0.3
H	6.8	1.8	5	0
I	12.4	1.4	6.3	4.7
J	83.3	8.7	65.4	9.2
K	25.3	0	24.8	0.5

During the week of August 6, 2001, the New York Control Area experienced a heat wave that resulted in record demand levels on three consecutive days. From August 7-9, the New York electricity grid established new historical peak loads, culminating on August 9, when a peak hourly demand of 30,983 MW was measured, eclipsing the previous, 1999 record of 30,311 MW. Figures 4 and 5 summarize the verified load reduction provided through the EDRP program on each of the four days it was activated. Total payments to Curtailment Service Providers for this period are approximately \$4.2 million.



most cases, participants were large (5-100 MW) industrial loads. Figure 2 plots the daily MW/hr scheduled through DADRP; Figure 6 shows the peak coincident megawatts scheduled through the day-ahead program. Of the 24 program registrants, fewer than half were actively submitting bids in the day-ahead market from July through September. Participation might have been affected by many factors, including program complexity, insufficient time to market the program at the retail level, and generally low wholesale energy prices seen during the period.



The Day-Ahead Demand Response Program became operative in mid-July with a total of 24 participants sponsored by Load Serving Entities. In

*Electricity
is
essential.*



Figure 4

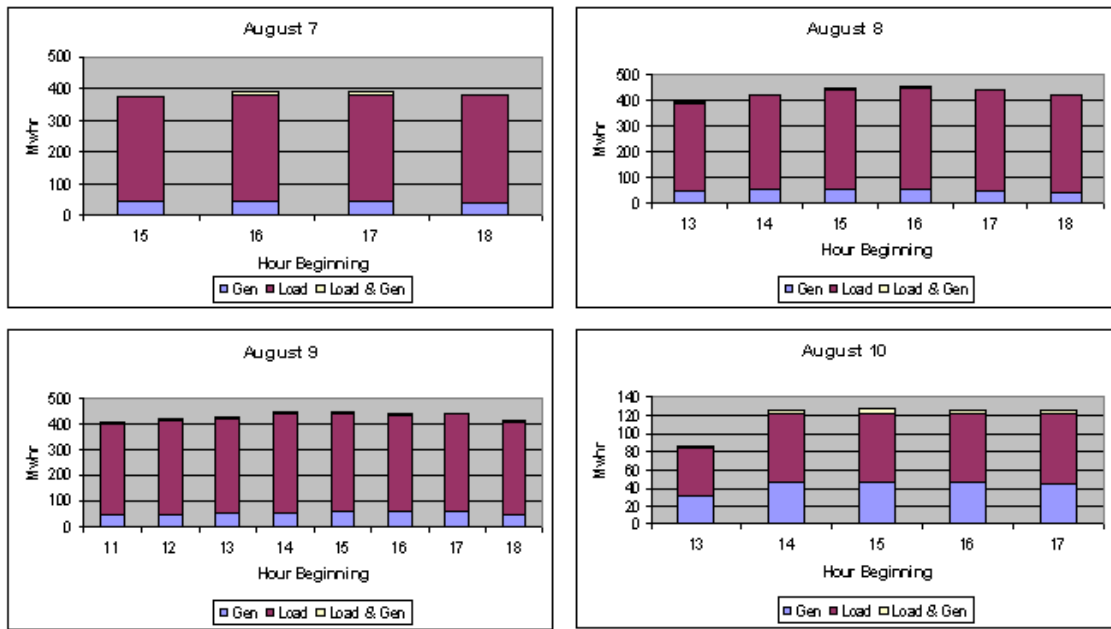


Figure 5 - Demand Side Resource Energy Scheduled

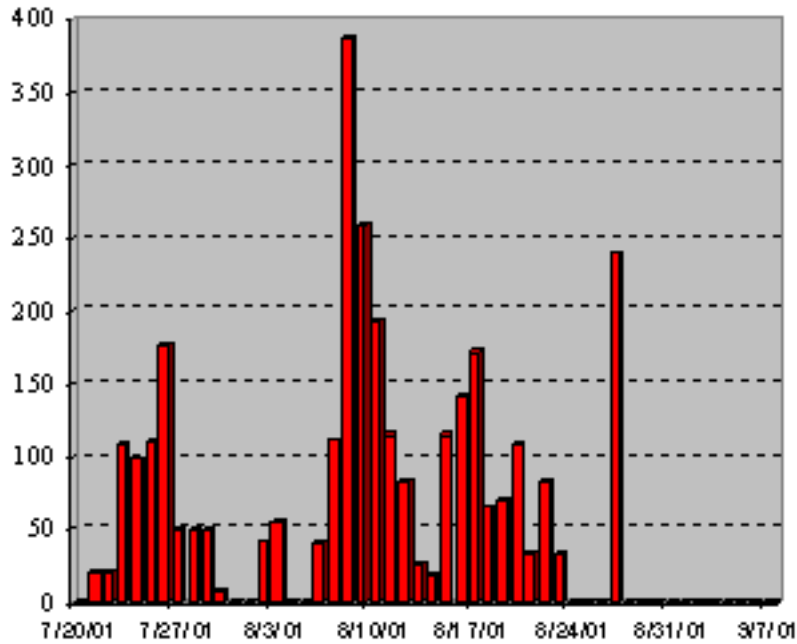


Figure 6 - Demand Side Resource Coincident

