OUTLOOK

# electricity

## a matter of urgency

New York City's Electric Supply Needs

New York Building Congress
Association for a Better New York
Building and Construction Trades Council of Greater New York
New York City Partnership and Chamber of Commerce
Real Estate Board of New York

# A Matter of Urgency:
# New York City's Electric Supply Needs

## A Policy Framework

**by**

**The Energy Committee of the**

**New York Building Congress**

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# 1. Introduction

The rapid run-up in electricity prices experienced by electric customers in New York City during the summer of 2000, and the even higher prices and power outages being experienced by regions of California, have abruptly focused public attention on the fledgling process of electricity deregulation in the United States, and have raised concerns for the adequacy of supply and the stability of electricity prices.

These concerns are now a matter of urgency for New York City, as growing demand for electricity has absorbed most of the available supply of In-City generation, while the process involved in approving new generating facilities is imposing considerable delay in starting construction and delivery of new supply.

Electricity is vital to New Yorkers and to New York City, which is the financial, corporate and communications capital of the United States and a leading world destination for business and tourist visitors. Electricity makes possible the daily functioning of the city's vast underground mass transit system and commuter rail terminals.

New York City has been experiencing an economic boom and population growth since the early 1990s that has created more businesses and jobs, and more demand for offices, homes and hotels.

This higher level of growth, and the increasing intensity of electricity usage by both businesses and residents, has increased demand for electricity by 1400 MW over the past decade without being matched by any significant increase in generating capacity. The result, when combined with the newly deregulated, competitive wholesale market for electricity, has been the rise in wholesale electricity prices and price volatility during periods of peak demand such as those experienced in June of 2000.

This report has been prepared out of concern for New York City's electricity needs by the Energy Committee of the New York Building Congress, co-sponsored by the Association for a Better New York, the Building and Construction Trades Council of Greater New York, the New York City Partnership, and the Real Estate Board of New York.

The purpose of this report is to share these concerns and our understanding of the issue with the political leadership and with the business and residential public of New York City, and to urge the adoption of those longer-term public and private solutions that will assure the adequate supply and price stability of electricity necessary to maintain the city's economic preeminence and quality of life through the early years of the 21st century.

The report provides a brief overview of the supply deficit that has emerged in New York City's electricity industry; describes the structure of the recently deregulated wholesale electricity

industry in New York State; and offers suggestions for promoting more supply of power and more efficient usage of electricity.

## Executive Summary

**New York City is facing a critical deficiency of 2000-3000 megawatts (MW) of electricity over the next five years that threatens to affect the City's residents and businesses alike. The decisions of businesses to expand or relocate to the City – and thus the health of the City's economy - will largely be determined by the sufficient supply and price of electricity. Unless immediate action is taken to provide additional supply, New Yorkers could well experience routine spikes in the price of electricity, brownouts, and even blackouts.**

**The years 2001-2002 are considered to be the most critical. The level of new supply needed for market stability and reliability, and to accommodate the projected increase in demand, is estimated to be 1000 MW in 2001, growing to almost 1500 MW by 2002.**

**The only immediate potential for additional supply appears to be from the plans by the New York Power Authority (NYPA) to site several small generating units in New York City. If fully implemented by the summer of 2001, these units could produce up to 450 MW. While this represents much needed short-term supply, it is urgent that permanent, larger, new generating facilities be approved and that construction be started without delay.**

**We urge the leaders of New York State and New York City to take the actions necessary to accelerate the process of siting permanent, new electric generating capacity in the City, and to encourage conservation and increased use of alternative energy technologies.**

Three very important developments over the last several years now present immediate challenges to New York City's electricity supply.

**1. Strong Growth in Demand:** New York City's economy has experienced significant growth, with rapid increases in businesses and jobs and in personal and corporate incomes. The City's population has increased by over 100,000 in the past decade. As a result, business and residential consumption of electricity has soared; the 'peak load demand', or maximum need, for electricity has increased by approximately 170 MW per year since the mid-1990s and by a total of 1400 MW over the past ten years.

In recent years, little progress has been made in reducing demand through conservation measures, as many government supported conservation programs have been scaled back. Nor are there

adequate incentives in the electricity tariff rates for either businesses or consumers to encourage reducing demand during peak load conditions.

**2. Deficit in New Supply:** The excess supply of electricity that existed in New York City in the early 1990s has been gradually absorbed by the strengthened economy, while during the past decade there has been only a slight addition of new generating capacity. At this time, there are no new generating facilities under construction. Importing of power is limited, as transmission capacity into the City is fixed at approximately 5,000 MW.

When the peak load summer season of 2001 begins, we estimate that New York City will need approximately 1000 MW to accommodate continued growth in demand, to assure market stability, and to meet the 80 percent In-City generation requirement, which is estimated to be deficient by approximately 318 MW.

**3. Deregulation of Electricity Industry:** As of 1998, the electric industry in New York State has been restructured to eliminate most government regulation of the supply -- but not the delivery -- of electricity. The regulated supply of electricity has been replaced with a market-based system that is driven by supply and demand.

**Resulting Volatility in Prices**

During June of 2000, with tight supply and demand conditions in New York City, electricity prices increased sharply in the short-term pricing market, pushing up July's average household costs by 40 percent.

Price volatility in New York City eased during the remaining summer months due to cooler temperatures, but similar price hikes in the next five years can be expected unless sufficient additional generating capacity is achieved.

**Projected Electricity Needs in the Next Five Years**

Our estimate, based on discussions with the industry, is that between 2000-3000 MW of new generating capacity will be needed in New York City during the next five years. This amount results from:

- the need for an immediate 800-1200 MW **to assure market stability**, critical in a deregulated industry where scarcity of supply can engender high bid prices in the short-term pricing market;

- the need for between 700-900 MW over the next five years to accommodate **the increase in demand** for electricity based on projections for economic growth in the City and heightened use of electricity by businesses and residences; and,

- the need for between 500-900 MW of capacity **to replace aging plant** and equipment. This will also bring significant environmental benefits since new plants would use more efficient technology and reduce overall air emissions for the same amount of generation.

**Potential Solutions**

**We conclude that the strongest of the potential solutions to fill the bulk of projected electricity needs for New York City in the next five years, is to add new generating capacity. Active political leadership is needed to speed up the process of siting facilities for this needed supply.**

To date several plants totaling over 5,500 MW of capacity have been proposed by a number of energy generators for the New York City area. However, at this time only one proposal has reached the approved application stage. The formal siting process in New York State, called "Article X", involves at least 12 months for each application after reaching this stage, before construction can begin.

Complementing the primary need to site new capacity, other potential solutions include **encouraging new technologies,**[1] and implementing more widespread and effective **conservation incentives and mechanisms that would allow consumers to respond to price changes.** It is estimated that accelerated conservation measures could save as much as 500 MW of projected generation need.[2]

- Accelerated programs to encourage energy efficiency in public buildings and consumer purchases of energy-efficient appliances could help offset growth in demand.

- Peak load demand could be reduced if clearer price signals and time-of-day pricing were available to both business and residential consumers.

Investment in **new transmission capacity** might enable increased imports of electricity into New York City from energy surplus regions such as upstate New York, although during times of peak load demand, other regions adjacent to the City could also be under similar supply constraints, which would reduce the import potential.

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[1] Recent and prospective breakthroughs in **new technologies** offer some prospect for small, efficient generation units. These units, called **distributed generation**, would provide small and medium-sized businesses, as well as residential users, with their own electricity generation at times of high prices caused by peak load or energy shortage situations. However, most of these new technologies, including **fuel cells**, are not yet commercially available, or expected to be cost-competitive in the near term, so that the extent of their contribution in the next five years is expected to be minimal.

[2] Estimate by National Resources Defense Council, based on experience of similar Con Edison programs conducted in the early 1990s.

- Transmission system investments are expensive, subject to difficult siting problems and significantly longer construction times, and thus are not likely to be available in the next five years. Additionally, in the newly deregulated environment, it is no longer clear who has the responsibility for investment in transmission capacity, or what return can be expected from the investment.

**New generating capacity** must then be added to fill the bulk of projected need for electricity in New York City over the next five years.

## Recommended Actions

**The Committee believes it is important to bring the need for electricity generation in New York City to the forefront of public discussion. Public officials and business leaders must strongly convey the message now to all New Yorkers that, without new electricity generation, the City could be faced with higher electricity prices and threatened by brownouts and blackouts in the very near future.**

**This Committee calls upon the Governor and the Mayor to help forge this common agenda, and makes the following recommendations:**

**I. Take actions necessary to ensure that the responsible state and local agencies expedite siting of new generating facilities in New York City.**

- At least 1500 MW of additional supply is necessary for the critical deficiency expected in years 2001-2002, and there is a total estimated need of between 2000-3000 MW over the next five years.

**II. Accelerate measures that could save at least 500 MW of electricity, such as**:

- more widespread use of **price-responsive programs** that would encourage major business users to curtail or shut down operations during periods of peak load emergency, or high electricity prices;

- initiation of programs to enable small businesses and apartment buildings to invest in **new distributed generation units**, or use existing standby generation, to provide additional power supplies during similar periods; and,

- use of public funds to accelerate **conservation measures and public information campaigns,** that would provide incentives to both business and residential customers to use energy-efficient appliances.

**Economic Impact of Not Acting**

Meeting the electricity needs of New York City is now a matter of urgency. The City's present and future economic growth and prosperity depends on an ample and reliable supply of competitively priced electricity.

# 2. Background

## The Crisis in Electricity Prices, Summer of 2000

### *High Electricity Bills in New York City*

June 2000 electricity bills in New York City jumped 43 percent higher than in the previous year. For Con Edison customers using a typical 300 kilowatt-hours of electricity in June, an average household was billed $73.55 compared with $51.59 for June 1999. A portion of the higher wholesale prices of electricity can be attributed to increased fuel costs. The cost of fuels that In-City power plants are permitted to burn because of environmental restrictions, such as natural gas and low sulfur-content oil, have gone up substantially in price over the past year. The other major contributor to higher electricity prices is the scarcity of sufficient generating capacity within New York City to meet growing demand and to provide market stability.

The New York Independent System Operator (NYISO) estimates that New York City began the 2000 summer peak load season with a deficit of 315 MW below its requirement of 80 percent minimum In-City generating capacity. The deficiency in supplies of generation within New York City and the surrounding area left the city's electricity market exposed to short term pricing pressure in the price-setting mechanism of the NYISO marketplace.


The Price Volatility diagram for June 27th, 2000 illustrates the huge swings that can occur in the hourly or 'real time' price market.

As can be seen on the accompanying chart, the real time price volatility for this day was very high, as prices bid for the peak hours of early afternoon when the load demand is at its highest, increased 18 times over the bid price established for earlier or later hours of that day.

This high volatility was the result of short supply commanding high price on a fixed demand, as well as issues involved in the short-term pricing market.[3]

[3] See *Interim Pricing Report on New York State's Independent System Operator*, by New York State Department of Public Service, released December 14, 2000

High prices set in the real time market can become embedded in the day-ahead market if the supply situation is known to be in constraint. New York City was spared further incidents of price volatility by the cooler temperatures that prevailed during July and August (with not one day over 90F), which eased the upward pressure on average prices.

### *Price Spikes and Blackouts in California*

California is encountering major problems with electricity supply and pricing caused by policies and procedures adopted over the past ten years, which have resulted in insufficient capacity to meet increased demand for electricity.

During the summer of 2000, California experienced both electricity price volatility, exemplified by huge increases in wholesale and retail electric prices in San Diego (where wholesale prices for electricity increased by 270 percent over the previous year); and supply and delivery system instability, which culminated in unprecedented blackouts in the San Francisco Bay Area.

California's insufficient capacity was compounded by hot weather, aging power plant and transmission infrastructure, and dysfunctional bidding behavior in the wholesale power markets, all of which combined to drive up prices and to create inadequate electricity supplies in the Bay Area. During a heat wave in June, Pacific Gas & Electric was forced to cut power to over 100,000 of its customers in the Bay area to prevent more widespread problems over a larger region.

With the Bay Area blackouts, the run up in prices in the wholesale electricity markets, and the spike in retail electricity prices in San Diego, California Gov. Gray Davis declared that " no competitive market exists" in the state of California for electricity.

As similar problems resurfaced and intensified throughout December 2000, Gov. Davis proposed strong measures in his January 2001 address to the State Legislature, calling California's two-year experiment with electricity deregulation "a colossal and dangerous failure".[4]

One major difference between California's circumstances and the situation in New York City is that during the summer of 2000 the city was spared the normally hot weather that tends to drive electricity demand to high levels. California, in contrast, had a very hot summer, as well as a cold December.

These serious but thus far isolated examples represent a precursor of what could lie ahead for New York City over the next few years.

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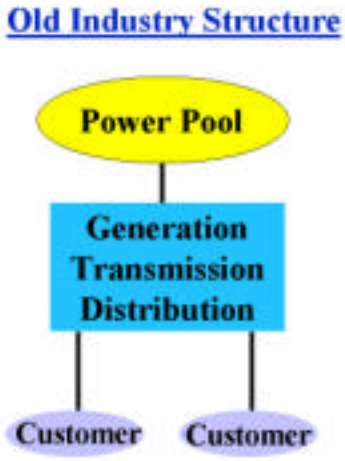
[4] *New York Times*, Jan. 9, 2001. Among other measures, Gov. Davis recommended the creation of a state energy authority to buy existing generating plants, or build new plants; co-generation for state university buildings; and proposed a $250 million energy conservation program to offer rebates for consumer purchases of energy-efficient appliances.

## The Restructured Electric Industry

There are three distinct components to the electricity industry: generation, transmission, and distribution.

Once electricity is generated, whether by burning fossil fuels, harnessing wind, solar, hydro energy, or through nuclear fission, it is sent through high voltage transmission lines to the local regions in which the electricity will be consumed. When the electricity arrives in the local region it is converted to lower voltages and sent through local distribution wires to end-use consumers. In New York City, Con Edison had traditionally provided all three of these vertically integrated sectors.




Following the "Northeast Blackout of 1965", New York's eight largest electric utilities joined to create the New York Power Pool (NYPP). The NYPP combined the eight members, knowledge and technical resources in power generation and transmission in order to reduce the probability of another major power interruption.

For more than thirty years, the NYPP coordinated the statewide-interconnected transmission system, designed and operated a state-of the-art control center, and trained NYPP and member system personnel. An economic dispatch program developed by the NYPP and its members provided New York State electric customers with reliable power at the lowest cost available. If one member utility's generator could generate power cheaper for another member utility, then that power was generated and the difference in costs would be shared evenly between the two utilities. The NYPP economically dispatched generation in the most efficient way possible for the ratepayers of all the utilities, while still maintaining high levels of reliability.

## Deregulation of Con Edison Generation

In the mid-1990s the Federal Energy Regulatory Commission (FERC) and the New York State Department of Public Service introduced new policies to redefine the rules by which electricity could be generated, dispatched, transmitted, purchased and sold. The new policies were initiated to promote a competitive electricity market as a means of creating long-term economic efficiencies in the generation and pricing of electricity. FERC's requirement was that the State should provide nondiscriminatory open access of its transmission system.

As a result, Con Edison and other New York State electric utilities were directed to sell their electric generating stations to third parties. The transmission system would be controlled by a separate entity while still being owned by Con Edison and the other utilities in the state. The electric distribution system in New York City continues to be owned and operated by Con Edison while being regulated by the New York State Public Service Commission (PSC) on prices that it can charge for delivering the power through both its transmission and distribution systems.

## The Independent System Operator

The New York Independent System Operator (NYISO) was created within New York State in 1998 as a not-for-profit organization to be a key part of the restructuring of the State's electric utility industry.


The NYISO, which began operation in November of 1999, is charged with overseeing the reliability of the bulk power system in the State, including New York City, and to provide a marketplace for the coordination of the state's new competitive electricity wholesale market. Its mission is to ensure the reliable, safe, and efficient operation of New York's major transmission system and to administer for the State an open, competitive and non-discriminatory wholesale electricity market.

## Power Supplies for New York City in a Deregulated Generation Market

As a result of deregulation, most electric customers have a choice of which Energy Services Company **(ESCO)** to pick as their provider of electricity. In all cases, Con Edison has the responsibility to maintain the wires that deliver energy to the customer, and is paid by the ESCOs or by the New York Power Authority for the usage of its wires. In New York City, the ESCO companies include, among others, Con Ed Solutions, Orion Energy Sources, SmartEnergy.com, and the 1st Rochdale Cooperative.

**The New York Power Authority** (NYPA), created in 1931 as a non-profit, public benefit energy corporation, provides 25 percent of New York State's electricity with its operation of generating facilities and more than 1400 miles of transmission lines. NYPA provides approximately 16 percent of the total load responsibility in New York City, through the operation of the over 800 MW Poletti Plant in Queens and additionally by the transmission of power from its upstate plants. NYPA's lower cost power is used in the city by the transit system, by state and municipal facilities, and by major corporate users per specific economic development programs.

**Con Edison** does not buy all its needed electricity from NYISO due to existing contracts with Non-Utility Generators (NUGs), some bilateral contracts, and some retained generation used in conjunction with its steam system. Con Edison has existing NUG contracts that were obligated as part of the 1978 PURPA initiative of the federal government.

Bilateral contracts represent electricity purchased by Con Edison's energy trading group from external generators, such as Hydro Quebec. A significant number of these bilateral contracts have been in place for several years, while others are established as the opportunity arises. These contracts generally offer more favorable terms and prices than would be currently purchased through the NYISO. However, most of the long-term bilateral contracts are due to expire within the next few years.

## How Prices are Set Under Deregulation

The NYISO utilizes a bid process for electricity and transmission usage, which enables the state's power plant owners and other market participants such as generators located outside New York State to offer electricity at competitive prices, rather than at regulated rates. Con Edison and other New York State electric utilities now go to the NYISO to purchase power and pay the competitive rates established by the marketplace.

The NYISO has a two-settlement market. One market price, known as the Day Ahead Market (DAM), finds buyers and sellers of electricity and matches their willingness to sell and purchase at the DAM price on an hourly basis. This DAM settles at 5 a.m. on the day before the actual day of operation. The NYISO selects the lowest cost suppliers, but the price paid to all successful bidders of any hour is determined by the highest offering price of any one generator that is accepted by the NYISO to meet the load for that hour.

A second market is held an hour and one-half before the power will be used, and this market, called the 'Real Time Market' (RTM) determines the actual price that will be paid to bidders for the electricity that they bid available into that real time market. The NYISO notes that this is the most volatile of the two markets, "influenced by weather events and transmission and unit outages".

While this Real Time Market accounts for less than 5 percent of the required energy for the entire day, this is the market that attracts the most attention, and is the focus for the debate over 'market power'. This is defined as the situation where too-few suppliers can charge high prices in the immediate situation of necessary short-term demand. Unlike other commodities, the fact that electricity can not be stored gives exceptional market power potential to the seller with immediately available supply.

The NYISO has the authority to mitigate bidding behavior "when instances of improper bidding may be identified".[5]

However, over the intermediate to long term, this ballooning in the costs of generation can only be deflated through two methods: a decrease in demand through customers using less electricity, and by an increase in supply, either from increased In-City generation capacity or through increased transmission to permit more imports (if neighboring areas have excess generation to sell).

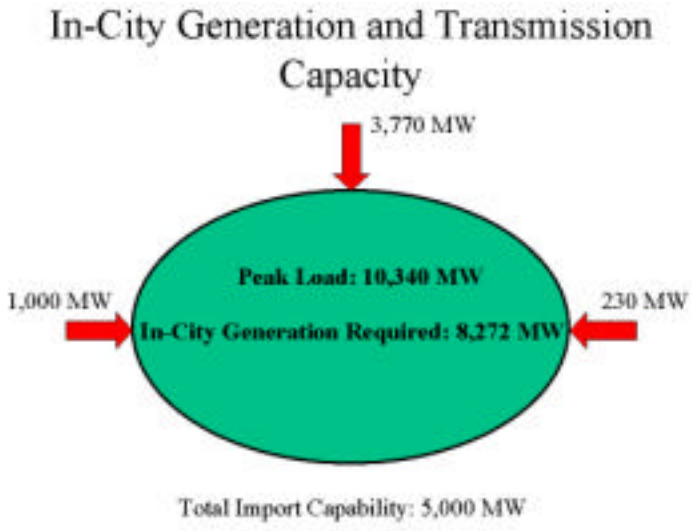
## Profile of Electricity Market in New York City

**Demand:** During the summer of 2000, the average peak load demand per day was approximately 10,340 MW.

**Supply:** This is presently sourced (at full operation) as per the following estimate:

| | | | |
|---|---|---|---|
| **In-City Generation**: | Con Edison Generation | 557 MW | 7.0% |
| | NUG Contracts | 938 MW | 11.8% |
| | NYPA | 973 MW | 12.2% |
| | Other In-City Generators | 5,489 MW | 69.0% |
| | **Total In-City Generation:** | **7,957 MW** | **100.0%** |

**Imports**: **Maximum transmission capacity is 5,000 MW**, of which NYPA imports from its upstate plants account for approximately one-third.




[5] The NYS PSC report of December 14, 2000 found "significant problems with the NYISO's day-ahead, hour-ahead, and real-time operations", and recommended multiple changes to NYISO operations.

The above figure indicates the present level of demand at peak load and the amount to be generated within New York City (green oval), and the maximum transmission capacity for importing electricity (red arrows).

# 3. Critical Issues in Supply and Demand of Electricity

The increasing demands for electricity, the lack of new supply, and the resultant consequence of market instability and degraded reliability, are all now critical issues for New York City.

## Growing Demand in New York City

New York City, with its dense concentration of financial, corporate and communications businesses, and served by one of the world's largest underground mass transit systems, is critically dependent on a reliable and plentiful supply of electricity.

New York City is experiencing an economic boom that has created more businesses and jobs and has increased the demand for more offices, homes and hotels. Job levels in New York City have risen by approximately 370,000 or 11 percent between 1995 and 2000, a rate of growth of 2.2 percent per year. Personal and corporate incomes have risen sharply.

With the strengthened economy, New York City's population has increased by at least 100,000 during the decade, creating a demand for new housing and appliances. Residential construction is expected to add over 16,000 units in 2000, more than three times the number added in 1995. Non-residential construction in New York City was expected to exceed 14 million square feet in 2000, up from 5.4 million in 1995.[6]

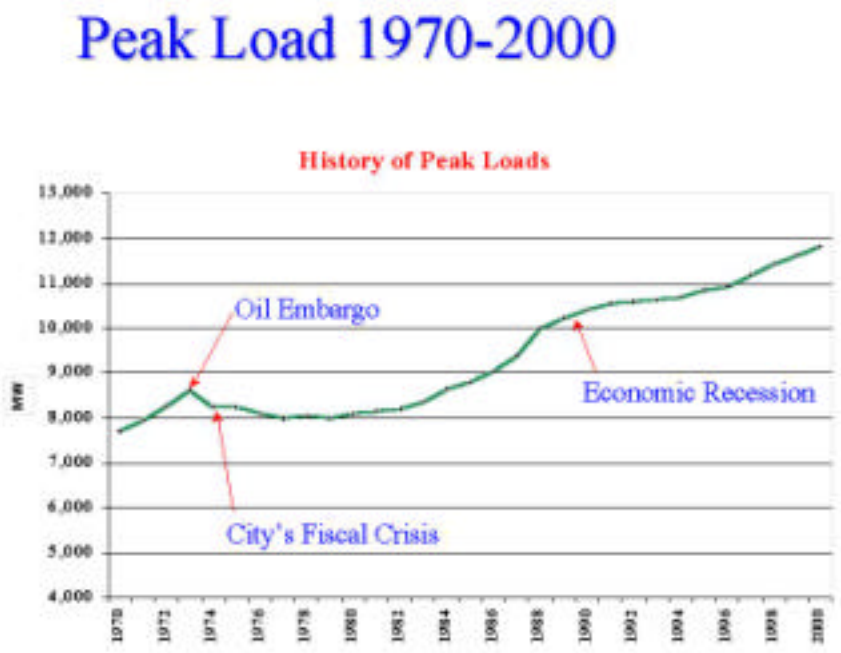
As a result of this resurgence in the city's economic and population growth, there has been an increase in the need for more public and private infrastructure such as roads, schools, mass transportation, government services and utilities.

Of major concern is the rising demand for electricity, which has been even stronger than the increase in job or population levels, reflecting the increased intensity of electrical use by businesses and consumers.[7] (However, New York City is highly energy efficient, when all forms of energy consumption including electricity are considered).

[6] Urbanomics, in New York Building Congress, "Outlook for New York City Construction", Fall 2000

[7] Testimony at a hearing of the U.S. House of Representatives in February 2000 suggested that 13 percent of the energy supply used today is probably used by computer-based equipment. For New York City, with its high concentration of computer-based industries, that percent is likely higher.

For the last three decades, peak load electricity growth in New York City increased on average by 1.2 percent per year, but during the last five years demand has increased by an annual average of 1.7 percent, a growth of over 170 MW per year in the five-year period.[8]




This figure shows Con Edison's load growth since the 1970's for its entire service territory. New York City accounts for 87.6 percent of Con Edison's total load, and has grown consistently with the total Con Edison load growth.

## Shortcomings in Supply and Transmission Capacity

The NYISO noted recently that "electric supplies in this State have been marginally adequate to meet consumer demand this summer (of 2000), and projections for next year indicate significant new supply requirements, especially in the New York City area". [9]

### *Supply deficiency*

Almost no new generating capacity has been built in New York City during the past decade. The York natural gas cogeneration project in the Brooklyn Navy Yard, which supplies approximately 315 MW, was completed in the late 1990s. Prior to this, the last major project to provide

[8]For example, this is about double the peak load for the World Trade Center complex, which is approximately 80 MW.

[9] Testimony of NYISO CEO to New York State Assembly Committees, August 2, 2000

generating capacity for New York City was the NUG plant in Linden, NJ, completed in the early 1990s.

The NYISO reported that, by the summer of 2000, New York City was 315 MW below its 80 percent In-City generation requirement, and further noted that "the failure of supply to keep pace with demand is reflected in higher wholesale prices in New York City".[10]

### *Transmission System and the "Load Pocket"*

The increased demand for electricity, without the additional capability of producing this electricity, places additional burdens on the transmission system that is already being used to transport up to 5000 MW of power into the city from upstate and neighboring states.

The system is designed to tolerate a certain level of disturbance while maintaining a specified acceptable level of performance. In general, as the stress on the system increases, its ability to achieve acceptable performance is reduced. As the demand goes up without the corresponding increase in generating capacity, the stress on the power system increases.

The NYISO notes that New York's transmission system reliability "is better than the national average, but stress on the system is growing and there is little relief in sight".

With this increased stress on the transmission system, a disturbance such as a loss of a particular transmission line will be more likely to result in unacceptable performance of the remaining system, resulting in brownouts and/or blackouts.[11]

The flows of electricity into New York City from major transmission interfaces have continued to increase. New York City, like San Francisco on the West Coast, is considered to be a 'load pocket', a situation where the capability of satisfying the growth in load demand in a region is constrained by the original design specifications.

Together with the critical importance of the New York City economy, this heightens the need for reliability whether for transmission of imports into the city, for In-City generation capacity, or for the distribution network within the city.

Reliability is only one issue when it comes to a deficiency in generation in the New York City service area. Congestion on the transmission system can also pose serious constraints

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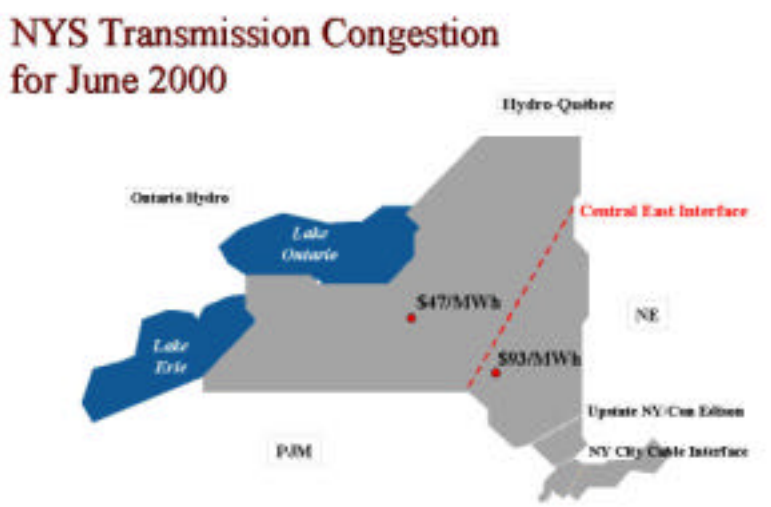
[10] ibid

[11] Such increases can result in the vulnerability of the entire city to a voltage collapse similar to what occurred in Tokyo in 1987, when the city's demand for air conditioning load in the middle of the day was beyond the capability of in-city generation, resulting in an entire loss of the in-city power system.

For example, despite the availability of lower-cost generating capacity in the upper Western region of New York State, the transmission limitations in New York State reduce the amount of surplus capacity that is available to the New York City area.

In this figure, the map of New York State is divided at the Central East Interface, near Albany, which separates a significant amount of generation capacity located to the north and west in New York State. This interface presents difficulty, or congestion, in transmitting electricity to the downstate area.




As can be seen from the map, in June 2000 the electric power to the west of the Central East transmission interface was substantially more economical than electricity to the east, which was twice the cost.

The NYISO, in its summary of actions to be taken to assure reliability, includes the need for incentives to construct transmission capacity, but also notes that the siting process for transmission projects is "controversial and time consuming", with the process regularly requiring 6 to 10 years.[12]

## Reliability and the 80 Percent Load Requirement in New York City

Based on the present electrical transmission system, and combined with the inherent characteristics of an intensive load density in New York City, the NYISO has mandated that a certain amount of generating capacity be available within the city to maintain a minimum level of reliability in providing electricity to consumers.

[12] However, it should be noted that additional transmission installed to link New York City to Westchester would not result in additional electrons flowing into the city because there is also a deficiency in generation in the lower Hudson Valley.

This minimum level of reliability has been determined to be equivalent to 80 percent of the peak In-City load. Without this level of In-City generation, there is the increased probability of not satisfying all the demand for electricity within the City, which means brownouts or blackouts.

## Demand Response ('Inelastic demand')

Another major hurdle in the supply and demand situation of electricity in New York City is 'inelastic demand', which is the lack of demand response by customers to the price of electricity.

Most electricity pricing has yet to be gauged to the time-of-day usage, as currently exists with telecommunications price structure, leaving the customer with little incentive to reduce peak-hour usage.

The customer, particularly the residential customer, pays well after the fact for electricity consumed, and pays an average cost for the total amount consumed. What is more, the customer, and particularly the major business user, is blind to the NYISO's hourly price signals on the immediate cost of electricity.

If the price signals were readily available and a process established for customers to respond to these real time electricity prices (as well as to time-of-day usage), this might ease the intense peaking of demand, or even mitigate the recent volatile price spikes of this past summer.

## Inadequate Conservation Measures

In addition to the all-important price signals that could more effectively guide business and consumer demand to short term increases in wholesale and retail prices of electricity, governments at the federal and state level have in recent years reduced expenditures for conservation programs as well as for exploration of new technologies.

Expenditures by New York State for conservation programs have fallen by half since the early 1990s to an estimated level of $110 million in each of the past three years. On a per capita basis, this translates to $9.83 in New York State, well under the levels of $32 to $33 per capita in Connecticut or Massachusetts, or $29 per capita in New Jersey. [13]

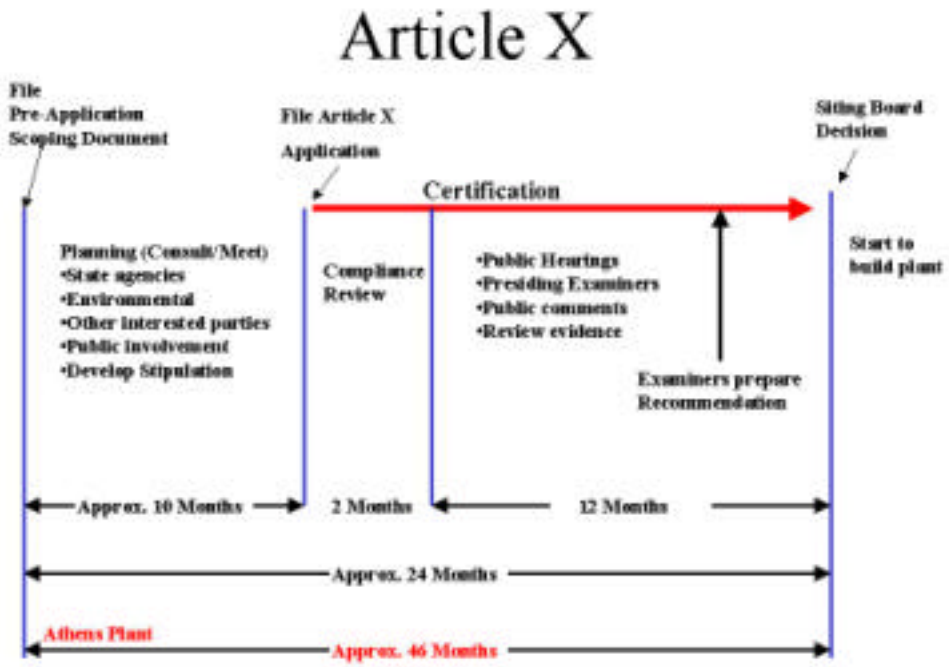
With rising prices during the summer of 2000, there is now renewed interest in "load curtailment programs", as exemplified by the new Peak Load Management program recently instituted by NYPA and similar programs offered by Con Edison. Under these programs, major business users

[13] *New York Times*, September 26, 2000, quoting data from Natural Resources Defense Council and New York State Energy Research and Development Authority

are offered payment to reduce peak load usage during periods of high demand and price volatility.[14]

## The Lengthy Process In Siting New Generating Facilities

The process used in New York State for siting new electricity generating facilities is one of the major hurdles for new power supply generators looking to enter the New York City market. The recent example of the process involved in the siting application for the new Athens, N.Y. generating plant offers some insight to the difficulties that could be encountered in a densely populated area such as New York City.




As can be seen in this figure, the Article X process, which is used by the New York State Siting Board in determining the need and qualifications to building new generation in New York State, was envisioned to take two years for a plant to receive approval.

[14] "NYPA Program Eases Strain on City Electricity Supply", New York Power Authority Press Release, August 3, 2000

The Athens generating plant, which will be located in upstate New York, is taking much longer than was expected – almost four years – partly because of community opposition. (As of late December 2000, the Athens plant still did not have approval of all of the necessary permits needed to start construction).

## 4. Projected Demand and Supply for Electricity in New York City, Next Five Years

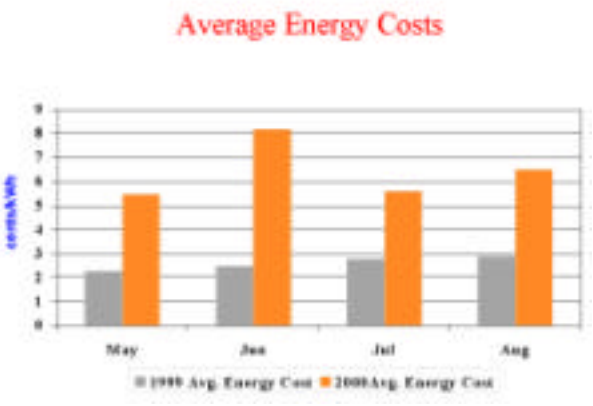
**In summary, our estimate is that a total of between 2000-3000 MW in new generating capacity is needed in New York City in the next five years**:

* first, and most immediate, **to assure market stability** will require an estimated 800-1200 MW over the next five years;

* second, **to satisfy growth needs** of the New York City economy will require an estimated 700-900 MW over the next five years;

* third, **to replace aging plant and equipment** will require a range of 500-900 MW in this five-year period. That replacement will bring significant environmental benefits, since new plants would use more efficient technologies and reduce overall air emissions for the same amount of generation.

### New Supply Needed for Market Stability




As can be seen in this figure, average wholesale prices to purchase electricity from the NYISO were significantly higher for the summer 2000 period. Although prices for fuel went up significantly, this does not fully explain why the corresponding electricity prices rose as high as occurred in New York City. This market instability was a direct result of 'market power' that emanated from the inefficiency in the electricity marketplace due to insufficient generation capacity.

With the inability for any demand response, the lack of storage capabilities for electricity, and the shortage of available generation within the region, generating companies have the advantage to raise electricity prices.

The NYS PSC in its December 14, 2000 report has determined that the NYISO's market is currently not fully competitive during all periods and that it is imperative to implement corrective measures for the near term, such as strengthened market monitoring, or adopting a 'circuit breaker' mechanism. Beyond these short-term measures, for the intermediate and longer term, new generation is needed to stimulate a competitive market.

We estimate that 800-1200 MW of additional generating capacity is required in the next five years just to assure market stability and prevent recurrences of price volatility.

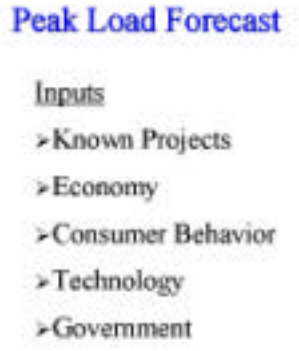
## New Supply Needed for Projected Demand

The official projections being prepared for the New York Metropolitan Transportation Coordinating Council by Urbanomics indicate continued economic growth in New York City in the next five years, although the pace of growth is expected to ease somewhat from the rapid rates experienced in the 1995-2000 period.

In New York City, jobs are expected to grow by almost 165,000, a gain of 4 percent or 0.8 percent per year over the next five years. These projections correspond with those of Con Edison, which foresee an annual average employment growth of 1.1 percent per year in New York City over the same period.

Peak load demand in New York City is expected to continue increasing over the next decade, at a somewhat slower rate of 1.2 percent per year compared to the 1.7 percent rate of the past five years. However, just to accommodate this level of demand will require an average of approximately 150 MW per year, or a total addition of between 700-900 MW in the next five years.

This forecast reflects expected improvements in appliance efficiencies and building codes, resulting from market demands for lower costs and higher efficiencies as well as from the implementation of federal and state standards for improved efficiency.




Several factors underlie the forecasting of peak load growth:

Two economic indicators, employment, specifically private non-manufacturing employment, and Gross Domestic Product (GDP), are the key economic drivers for load and energy growth.

Consumer response to hot weather, particularly for air conditioning usage, is the main factor that drives peak load higher on a hot summer afternoon.

Improvements in equipment efficiency and fuel switching projects are the major technology drivers, and government usage is also closely monitored to determine its impact on the city's peak load growth.

In addition, in the last decade there has been an increase in the electricity intensity of office usage. For example, while a typical office building uses between 7-10 watts per square foot, the most intensive users, i.e. internet service providers, demand as much as much as 100 watts per square foot.

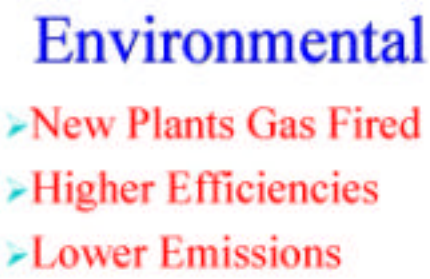
## Replacement Needed for Aging Generating Plants

Based on data from NYISO, some plants in New York City are nearing or beyond their life expectancy:

*Gas Turbines (total of 1800 MW) – Average age 30 years

*Independent Generating Stations (total of 4500 MW) – Average age 34 years

*Generation owned by Con Edison as part of it steam production (total of 463MW) - Average age 40 years

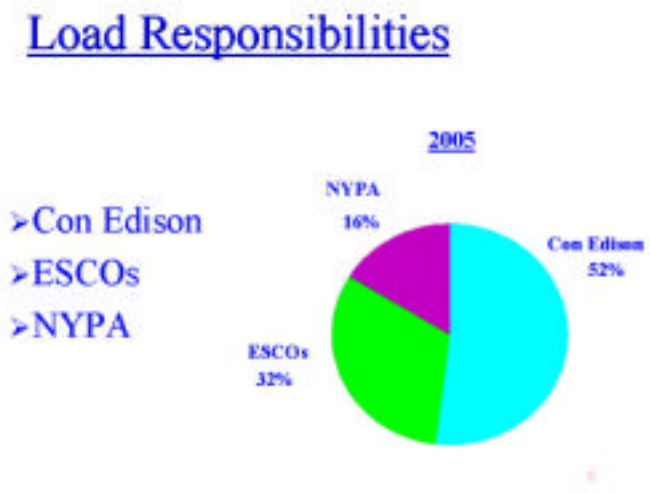



It is estimated that between 500-900 MW of new generation capacity will be needed in New York City over the next five years just to replace aging generating plant and equipment.

The existing plants within the city have higher emissions compared to new power plants that have the latest in technology and burn clean natural gas. With the addition of cleaner, more efficient generating capacity, older plants will become uneconomical to run and will be taken out of service, thus reducing the amount of emissions.

## Load Responsibilities in 2005

The accompanying figure shows the percentage of customers that are projected to use Con Edison, ESCOs or the New York Power Authority (NYPA) as their energy provider in 2005. Con Edison will retain the responsibility for most of the transmission and all of the delivery system in New York City.

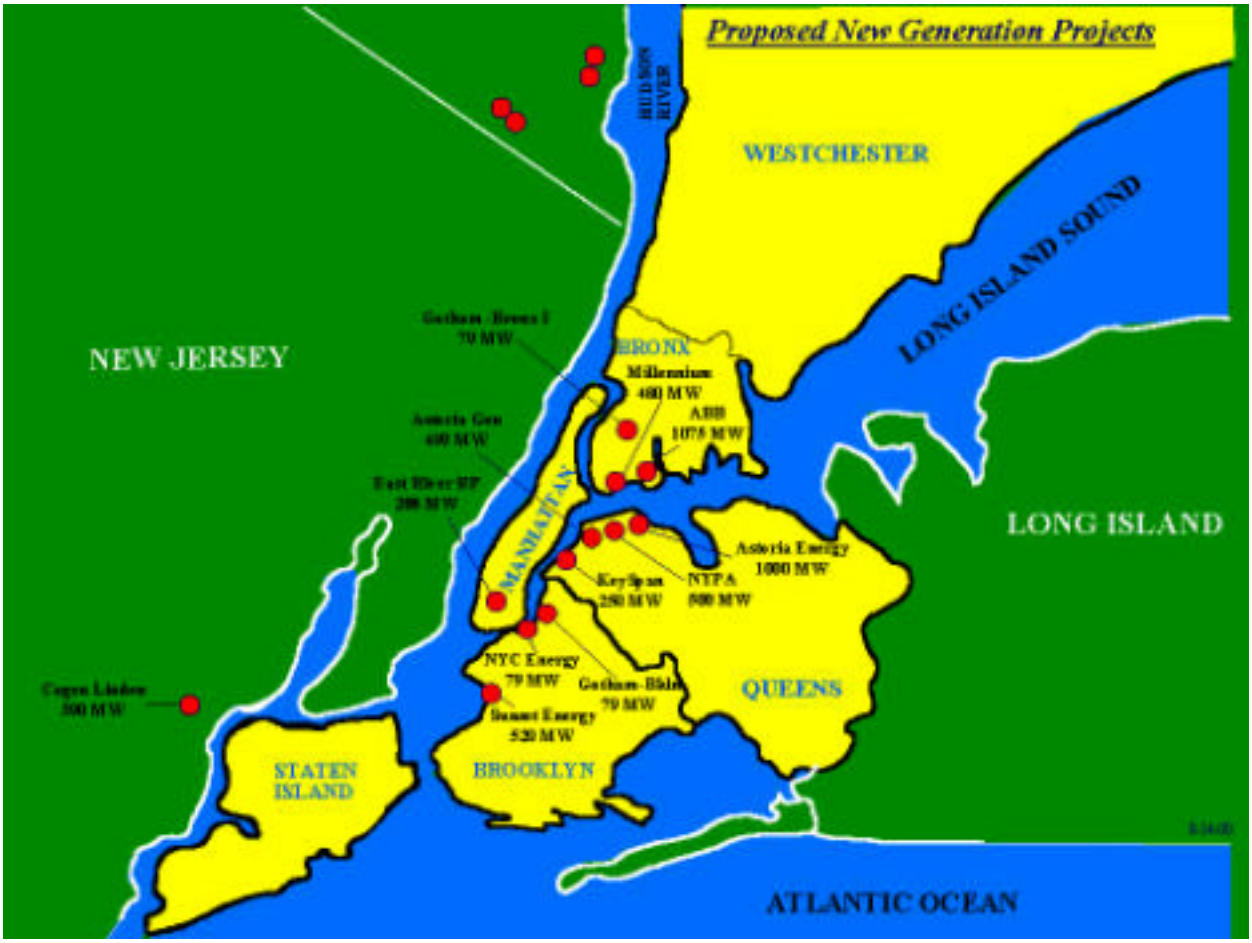



## Proposed Supply

Presently there are no generating plants under construction in New York City. Only one application,[15] which would provide an additional 288 MW, has been accepted through the pre-application approval phase of the Article X siting process. The earliest date when this capacity could be available is 2002.

However, over 5,500 MW of new generating capacity is being proposed for New York City by a number of independent generators (see this figure, and Appendix A).[16]

[15] For expansion of the Con Edison East River Plant.
[16] This figure does not include the proposed NYPA gas turbines, which would total 450 MW.




*Most of these proposed plants would be designed to burn clean natural gas and their operation would result in the retiring of older plants that are less reliable and less energy efficient. If some or all of these plants were built today, New York City would have the one of the cleanest and most competitive electricity systems in the nation.*

A Task Force on Pricing and Reliability, recently established by the PSC, has the objective of obtaining statewide the equivalent of 750 MW or more of power by 2001 and another 600 MW by 2002, either through additional generation or through reduced load. Of this, the estimate is that 500 MW should be located in New York City by 2001, and at least 200 MW in 2002.[17]

Currently, the most proximate source of acquiring new generating capacity in New York City rests with the decision by NYPA to site up to 10 gas turbines by June 1, 2001. With each turbine having a capacity of 44 MW, (for a total capacity of approximately 450 MW), it will not be necessary to undergo the Article X siting process, although environmental approval by the NYS Department of Environmental Conservation (DEC) will be necessary. [18]

[17] Electric Price and Reliability Task Force: Workplans, New York State PSC, Sept. 5, 2000
[18] NYPA Press Release, "N.Y.Power Authority Announces Sites for Small, Clean Gas Turbines in New York City" November 22, 2000

If successfully installed by the summer of 2001, these plants would provide some of the critical need for that peak load summer season, but would still leave a deficiency in the amount of needed long-term supply.[19] And while NYPA has stated that these would be "the cleanest generators in New York City", the overall environmental benefits will clearly be less than what would be derived from large, new, technologically efficient, and permanent plants.

# 5. Conclusion and Recommendations

**We conclude that within the next five years, New York City is facing a critical deficiency in the supply of electricity that will affect residents and businesses alike. New Yorkers could well experience routine spikes in the price of electricity, brownouts, and even blackouts unless immediate action is taken to provide additional supply.**

In recent months, several solutions have been recommended (by the NYISO, by Sen. Charles Schumer,[20] the PSC, and others) to address both the short-term price volatility and the longer-term electricity needs of New York City businesses and consumers. These solutions have included:

- Instituting new or improved methods to conserve energy usage and manage peak load demand.
- Increasing the capacity to import power by either building new transmission lines or by boosting the capacity of existing lines.
- Siting new generation capacity in New York City.
- Encouraging more locally generated distributed generation to ease pressure on the grid.
- Improving New York State's system of electricity deregulation.

This Committee has considered the following potential solutions:

## Conserve Energy and Manage Peak Load Demand

One complementary solution to building all of the proposed new electricity generation is to encourage energy efficiency and other forms of load management, which could save an estimated 500 MW of projected generating need.[21]

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[19] In this release, NYPA cites an October 12 letter from the state Dept. of Public Service "that it is prudent and highly desirable" for still more capacity to be installed in New York City to assure system reliability.

[20] "New Yorkers Need Boost in Energy, Fast", *The Daily News*, Views and Opinions, Sept. 27, 2000

[21] National Resources Defense Council estimate, based on similar Con Edison programs in the early 1990s. During that period, Con Edison spent more than $630 million on its energy conservation program, known as 'Enlightened Energy', to encourage its residential, commercial and industrial customers to use energy efficient appliances and to

### *Accelerate Conservation Programs*

The New York State Energy Research and Development Agency (NYSERDA), a statewide public benefit agency, has been assigned the responsibility for administering the New York Energy $mart program. This program results from the PSC-created 'Systems Benefit Charge' of .01 cents of every dollar from electric bills, to be used towards energy efficiency programs and energy and environmental research and development.
This effort, however, has not lowered the overall demand for electricity, and New York State has also recently drawn criticism for reducing its overall spending on energy conservation programs.[22] Accelerated conservation efforts could include public information campaigns or tax credits e.g. sales tax holidays, to encourage consumer purchases of energy-efficient appliances. Also, NYPA has indicated that it will aggressively pursue its energy conservation programs with government entities.[23]

### *Improve Demand Response Management Programs*

The inelastic nature of demand for electricity, and the lack of time-of-day pricing for either businesses or residential consumers that could modify peak demand use, serve as real barriers to effecting demand response to electricity prices.

Under deregulation, the technology for real-time price notification and response by consumers is not yet available and not likely to be available for a number of years. Recently the NYISO has been directed by the PSC to look into promoting demand-side responsiveness by providing a means for customers of the NYISO to participate in the NYISO market through load reduction.

Other attempts at demand management, such as the accepted pattern of "interruptibility", or newer programs such as those introduced recently in Wisconsin where major industrial consumers were offered payment to curtail or shut down operations for several hours[24], or proposed by NYPA in its new Peak Load Management Incentive Program,[25] can help to ease peak load demand during a weather crisis but do not solve the longer term problem of inadequate supply and rising demand.

### *Institute Price Signals to Encourage Consumer Response*

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install energy efficiency measures. This resulted in efficiency improvements of about 750 MW or a savings of 6 percent of the existing load.
[22] *New York Times,* September 26, 2000
[23] Discussion with NYPA Senior Executives, January 200l. Last year, NYPA invested over $90 million in energy efficiency programs, and expects to make the same investment, or more, in 2001
[24] *New York Times,* July 17, 2000
[25] NYPA Press Release "NYPA Program Eases Strain on City Electricity Supply", Aug. 3, 2000

The last, largely untapped source of potential efficiency gains in the electricity industry may lie on the consumer side in the form of curtailing demand based on either time-of-day pricing or to short-term fluctuations in 'real time' electricity prices. Consumers, both business and residential, have had little opportunity to respond to price fluctuations, and instead have paid a flat rate that reflects the average cost over months or years.

Because consumers do not see prices that fluctuate with changes in the short-term interaction of supply and demand, they cannot readily respond when there is a scarcity (such as on a very hot summer afternoon) by reducing their consumption (such as by lowering their air conditioners), and receive savings that reflect the high cost of the power saved by curtailing demand.

There are many hurdles that need to be overcome in order to provide the circumstances where demand responds to real-time electricity prices. The NYISO, where price signals originate, could take the initiative to provide information on these price signals to consumers.

## Provide Additional Transmission Capacity

Additional imports of power from elsewhere in U.S. could be made available to New York City with additional transmission capacity. Similar to the situation with generation supply, there have been no recent additions to the transmission systems that transport electricity over long distances. The only new proposed system in recent years is the CSC Interconnector, a buried submarine high-voltage cable under Long Island Sound, to be built for the Long Island Power Authority.[26]

Recently, three northeast Independent System Operators (New York, New England, and Ontario in Canada) jointly issued a Request for Proposal for a feasibility study of a regional day-ahead electric market.[27] This closely integrated market would require ample and reliable transmission systems.

But it is unclear under the present NYISO marketplace rules as to who should pay for transmission expansions. Much work still needs to be done in providing the needed price signals to make transmission construction a sound investment choice for market participants.

Siting issues and high costs of construction also serve as short term or intermediate term barriers to providing additional transmission capacity to New York. And in reality, the mandate for 80 percent In-City generation capacity for reliability serves as a longer-term limit on transmission as a solution to the city's electricity supply needs.

## Expedite Siting Process to Provide More Generating Capacity

[26] Communique, Hydro Quebec, Aug.25, 2000
[27] Press Release, NYISO, Aug. 28, 2000

Our estimate is that New York City will need approximately 2000-3000 MW of new generating capacity in the next five years to meet increased demand, to assure market stability and to maintain the 80 percent reliability mandate, and also to replace the existing aging plants. (Additional pipeline capacity for natural gas may also be needed to accommodate this volume of generating capacity, which also will require early attention).

Presently, the earliest that any of this capacity could be expected to pass the formal siting process, or Article X, which is handled at the state level, would be at least two years with even minimum delays (or based on the Athens plant experience, closer to four years). The siting process can be further complicated at the local level by neighborhood or citywide concerns over the location of power plants.

Therefore, it is critically important to expedite the siting process for at least some portion of the over 5,500 MW of new In-City generation capacity that has been proposed by several generators (see Appendix A), so that this capacity could be ready within the next five years.

## Encourage Use of Distributed Generation ('Micropower')

Encouraging the installation of distributed generation could fortify the city's existing electricity infrastructure. Co-generation units using existing technologies can be financially viable solutions for medium to large-scale industrial and commercial users.

Small, efficient generation devices ('micropower') that can provide individual businesses and apartment buildings with supplemental as well as standby generation in times of power emergencies are now becoming commercially available. New technologies for these devices are reported to be less polluting than older systems for standby generation, but, (pending full environmental review), would appear to be still less environmentally favorable than large new plants.

New breakthroughs are occurring in fuel cell technologies and in other devices for storage of electricity, which will vastly improve the potential for distributed generation.[28] While these can be important breakthroughs for the small business or residential user, as well as be environmentally friendly, most are not yet commercially viable and their overall contribution to providing electricity needs in New York City in the next five years will be very limited.

It is therefore necessary that new generating facilities must be approved and put into construction without delay in New York City to resolve the critical deficiency of 1500 MW electricity for 2001-2002, and to assure that the total needed supply of 2000-3000 MW will be available within the next five years.

[28] See *The Economist*, cover story, week of September 9, 2000

# Appendix A

## Proposed New In-City Generation Projects

| Project | MW | Location |
|---|---|---|
| East Coast Power | 390 | Linden/Gowanus |
| New York City Energy | 79 | Feeder 2123 |
| Gotham Power | 79 | Bronx |
| Gotham Power | 79 | Brooklyn |
| Sunset Energy Fleet | 520 | Gowanus |
| KeySpan | 250 | Ravenswood |
| East River | 288* | E13th/East S/S |
| Millennium Power | 480 | Hell Gate/Bruckner |
| Oak Point (ABB) | 1075 | Hell Gate |
| Astoria Energy (SCS) | 1000 | Astoria East |
| Astoria Gen.Co.(Orion) | 800 | Astoria East |
| NYPA | 500 | Astoria East |
| **Total MW**** | **5,500** | |

* Net capability with planned retirement of Waterside would be 125 MW

** Does not include proposed NYPA gas turbines of 450 MW

New York Building Congress

The New York Building Congress is a membership association celebrating its 80th year that is committed to promoting the growth and success of the construction industry in New York City. On behalf of 350 constituent organizations representing more than 150,000 skilled trades people and professionals, the Building Congress supports sound public policy, promotes productive capital spending, encourages public/private partnerships, and evaluates the implementation of major government projects.

**ABNY**

Association for a Better New York

The Association for a Better New York (ABNY) was founded in 1970-71 by a group of business leaders with the goal to maintain and promote New York City's position as the corporate, financial, cultural and communications capital of the world. Many of ABNY's activities and programs over the past 25 years focus on creating opportunities for improved dialogue between the non-profit, business, labor and government sectors.

Building and Construction Trades Council of Greater New York

In existence since before the turn of the century and formally chartered in 1938, the Building and Construction Trades Council of Greater New York represents more than 100,000 members from 60 affiliated unions in the five boroughs. Members of the Building and Construction trades reflect the diversity of New York City, and these members have built many of the landmarks that have shaped the City's skyline in the 20th century including the Empire State Building, the World Trade Center, the Verrazano Narrows Bridge and Yankee Stadium. Today, the Building and Construction Trades Council can proudly point to full employment and impressive annual incomes for members, as well as pension and benefit funds that have invested well over $1 billion in the City's economy.

New York City Partnership and Chamber of Commerce

The New York City Partnership and Chamber of Commerce is New York's preeminent business and civic organization dedicated to improving the City's economy and making it a better place in which to live, work and conduct business. David Rockefeller founded the Partnership in 1979 as a vehicle for New York City's business and government leaders to work together to promote the City's economy and quality of life. Today the Partnership consists of the country's more prominent corporations in the fields of telecommunications, finance, real estate, insurance, energy, publishing, manufacturing, and entertainment, among others. It operates highly successful programs that combine public and private resources to increase affordable housing, improve public education, provide job opportunities for the underemployed, and improve transportation in New York City.

REBNY.

Real Estate Board of New York

Through the Real Estate Board of New York, New York City's most talented, energetic and influential real estate professionals work with the City's political establishment to promote public policies that expand New York's economy, encourage the development and renovation of commercial and residential real property, enhance the City's appeal to investors as a business location and as a place to live, and facilitate property management.

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**electricity OUTLOOK: a matter of urgency** was prepared by the Energy Committee of the New York Building Congress with the assistance of Rosemary Scanlon, Economic Consultant, in collaboration with the Association for a Better New York, Building and Construction Trades Council of Greater New York, New York City Partnership and Chamber of Commerce, and the Real Estate Board of New York.



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