Chapter 16: Energy

A. INTRODUCTION

The *New York City Environmental Quality Review (CEQR) Technical Manual* recommends a detailed assessment of energy impacts only for actions that could significantly affect the transmission or generation of energy or that generate substantial indirect consumption of energy.

Because the proposed project would not exceed these CEQR thresholds, this chapter only discloses the proposed project's anticipated energy consumption. This analysis concludes that because the proposed project would not significantly affect the transmission or generation of energy there would be no potential for significant adverse impacts on energy.

PRINCIPAL CONCLUSIONS

Compared with the project site's energy demand in the future without the proposed project (the "No Action" condition), the proposed project would result in a net increase in energy demand of approximately 376,000 million British Thermal Units (BTUs) (110 million kilowatt hours [kWh]) per year. The additional consumption would be very small compared with the existing energy demands of New York City. This additional demand is not expected to overburden the energy generation, transmission, and distribution system and would not result in a significant adverse energy impact.

As described in Chapter 23, "Mitigation," the New York City School Construction Authority (SCA) may locate an approximately 100,000-square-foot public elementary and intermediate school within the community facility space in the Refinery complex. A school use would have a slightly higher energy demand than the other community facility uses analyzed, but would not result in a significant adverse impact on energy.

B. EXISTING CONDITIONS

ENERGY PROVIDERS

Electricity within New York City is generated by Consolidated Edison (Con Edison), as well as by a number of independent power companies, including National Grid, which recently acquired KeySpan Energy.

Electrical energy in New York City is supplied from a variety of sources that originate both within and outside the city. These include non-renewable sources, such as oil, natural gas, and coal fuel; and renewable sources, such as hydroelectricity and, to a much lesser extent, biomass fuels, solar power, and wind power. New York City's electrical demands are met by a combination of sources, including electricity generated within New York City, at locations across the Northeast, and from places as far away as Canada. For the more distant sources, once electrical energy is generated as high voltage electrical power, a transmission grid conveys this power to New York City for distribution. An interconnected high voltage power grid extending

across New York State and the Northeast allows for power to be imported from other regions as demand requires. A total of an estimated 50 billion kWh or 170.75 trillion BTUs of electricity are consumed in the city annually.

According to the New York Independent System Operator (NYISO) *2009 Load & Capacity Data* report, the peak electrical demand for New York City in summer 2008 was 10,979 megawatts (mw).[1] Typically, electricity generated within the city is sufficient to satisfy demand. However, during the summer peak demand period, this electricity is often supplemented by the Northeast transmission grid. As a result, there is an ongoing service and distribution improvement program for infrastructure, which upgrades localized areas that are continually high demand zones. Electricity required for these zones is supplied by other zones in New York City, or from sources elsewhere within the larger grid, if necessary.

Con Edison distributes power throughout the city. Transmission substations receive electricity from the regional high voltage transmission system and reduce the voltage to a level that can be delivered to area substations. Area substations further reduce the voltage to a level that can be delivered to the distribution system, or street "grid." Within the grid, voltage is further reduced for delivery to customers. Each area substation serves one or more distinct geographic areas, called networks, which are isolated from the rest of the local distribution system. The purpose of the networks is if one substation goes out of service, the problem can be isolated to that network and not spread to other parts of the city. Substations are designed to have sufficient capacity for the network to grow.

Power plants in the five boroughs generate electricity for New York City. According to NYISO's Revised Locational Installed Capacity Requirements Study for the 2006-2007 period, New York City has an existing installed generating capacity of 10,364 mw.[2]

National Grid provides natural gas to the project site and surrounding area. National Grid is the largest distributor of natural gas in the northeastern United States, delivering gas to 3.4 million customers in New York, Massachusetts, New Hampshire, and Rhode Island.

ENERGY INITIATIVES

In 2001, New York State began taking measures to address the increasing capacity needs of the metropolitan New York City region. NYISO implemented the Emergency Demand Response and the Day-Ahead Demand Bidding programs to reduce utility electrical power demand during peak load periods. New York State Governor's Executive Order No. 111 (EO 111) was introduced in June 2001, directing state agencies, state authorities, and other affected entities to address energy efficiency, renewable energy, green building practices, and alternate fuel vehicles. EO 111 identified the New York State Energy Research and Development Authority (NYSERDA) as the organization responsible for coordinating and assisting agencies and other affected entities with their responsibilities. NYSERDA and the utilities have implemented programs to encourage businesses to reduce energy usage and increase energy efficiency. In addition to the energy conservation techniques, in accordance with the EO 111, the New York Power Authority (NYPA) constructed 11 new 44-mw, natural-gas-fired, simple-cycle turbine-generating units, 10 of which are located within New York City, for emergency power

[1] New York Independent System Operator 2009 Load & Capacity Data.

[2] NYISO Revised Locational Installed Capacity Requirements Study Covering the New York Control Area for the 2006-2007 Capability Year, March 28, 2006 (July 25, 2007)

generation, including the NYPA facility located near the project site on River Street between Grand and North 1st Streets.

The independent, nonprofit New York State Reliability Council (NYSRC) has determined that a minimum of 80 percent of the city's peak load must be provided by generating sources within the city to maintain compliance with the criteria established by the regional and national reliability councils. Presently, there is sufficient capacity within the city to meet this 80 percent local energy generation requirement. However, if energy demand increases over time, additional in-city generation would be needed to satisfy this requirement.[3]

In December 2004, the New York State Energy Planning Board released the Draft New York State Energy Plan and Draft Environmental Impact Statement. This plan sets out the New York State policies and objectives for the subsequent five years. The plan's policy objectives are to support safe, secure, and reliable operation of the energy and transportation systems; to stimulate sustainable economic growth through competitive market development; to increase energy diversity; to promote a cleaner and healthier environment; and to ensure fairness, equity, and consumer protection. These objectives continue the policies developed in earlier energy plans. Therefore, no large-scale changes in energy generation and consumption policies are foreseen. In the future, Con Edison and other energy providers are expected to continue to deliver energy throughout New York City.

EXISTING ENERGY DEMAND

The existing buildings on the project site are vacant, with the exception of a small security office. Therefore, the on-site energy demand is currently negligible.

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

Absent the proposed project, the project site would be developed as-of-right with approximately 106,300 square feet (sf) of industrial distribution space, approximately 60,000 sf of storage space, 40,000 sf of catering hall/restaurant space, and 61,000 sf of land used for building materials storage (as well as 5,000 sf of office space for this use) (see Chapter 2, "Analytical Framework"). As shown in Table 16-1, the No Action condition on the project site would generate a demand of approximately 12,275 million BTUs per year.

Table 16-1
Project Site Energy Usage in the No Action Condition

Use	Size (gsf)	Usage Rate (BTUs/sf/year)	Usage Rate (kWh/sf/year)	Energy Usage (million BTUs per year)	Equivalent kWh
Industrial distribution space	106,300	44,100	12.9	4,688	1,371,270
Building materials storage (office building)	5,000	77,900	22.8	390	114,000
Storage space	60,000	44,100	12.9	2,646	774,000
Catering hall/restaurant	40,000	113,800	33.3	4,552	1,332,000
Totals				**12,275**	**3,591,270**

Note: gsf=gross square feet.
Source: *CEQR Technical Manual*.

[3] NYISO Comprehensive Reliability Planning Process (CRPP) 2008 Reliability Needs Assessment (December 10, 2007).

D. THE FUTURE WITH THE PROPOSED PROJECT

This section discloses the anticipated future demand for energy of the proposed project for the 2020 build year. The energy assessment applies *CEQR Technical Manual* methodology, using square footage figures as outlined in Table 1-1 of Chapter 1, "Project Description." As described in Chapter 1, "Project Description," the proposed project would introduce a total of 2.44 million gross square feet (gsf) of residential use, up to 146,451 gsf of community facility use, up to 127,537 gsf of retail use, and up to 98,738 gsf of commercial office space. Approximately 307,000 gsf would be used as a parking garage. The proposed project would also include publicly accessible open space, which is not included in the energy analysis because the demand for energy generated from this use would be minimal.

All buildings would comply with the New York State Energy Conservation Construction Code Act. This code governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope. The code, promulgated on January 1, 1979, pursuant to Article 11 of the Energy Law of the State of New York, requires that new and recycled buildings (both public and private) be designed to ensure adequate thermal resistance to heat loss and infiltration. In addition, it provides requirements for the design and selection of mechanical, electrical, and illumination systems. In compliance with the code, the proposed project would incorporate all required energy conservation measures, including meeting the code's requirements relating to energy efficiency and combined thermal transmittance.

Energy demand for the buildings consists of loads for heating, ventilation, air conditioning, lighting, and auxiliary equipment, such as elevators and pumps. Annual energy consumption is calculated applying factors from the Association of Energy Engineers, 1997. It is estimated that the proposed project would generate a demand of approximately 388,139 million BTUs per year, which is approximately equivalent to 113,638,240 kWh (see Table 16-2).

Table 16-2
Energy Usage for the Proposed Project

Use	Size (gsf)	Usage Rate (BTUs/sf/year)	Usage Rate (kWh/sf/year)	Energy Usage (million BTUs per year)	Equivalent kWh
Residential	2,442,305	145,500	42.6	355,355	104,042,193
Retail	127,537	55,800	16.4	7,117	2,091,607
Community Facility	146,451	65,300	19.1	9,563	2,797,214
Office	98,738	77,900	22.8	7,692	2,251,226
Parking	307,000	27,400	8.0	8,412	2,456,000
			Totals	**388,139**	**113,638,240**

Source: *City Environmental Quality Review (CEQR) Technical Manual*.

Compared with the project site's energy demand in the No Action condition, as shown in Table 16-1, the proposed project would result in a net increase in energy demand of approximately 376,000 million BTUs (110 million kWh) per year. The additional consumption would be very small compared with the existing energy demands of New York City. This additional demand is not expected to overburden the energy generation, transmission, and distribution system and would not result in a significant adverse energy impact.

Electricity and natural gas are available energy sources at the project site. Electricity could be used for lighting, and gas could possibly be used to provide heating and cooling to the buildings on the parcels. However, unless specified as part of the Restrictive Declaration, the applicant

would make the choice of energy sources for individual buildings at the time of development, based on system capacity, energy source, cost, and compatibility with the development.

Additionally, as described in Chapter 1, "Project Description," the applicant is considering a variety of sustainable design features to optimize the performance of the proposed buildings and their relationship to the environment. Individual lighting controls would be provided for 90 percent of the proposed project's occupants, with building lighting and site lighting linked to building management systems to minimize energy consumption when not in use. Operable windows would be provided to all living spaces, allowing inhabitants full control over their fresh air and heating and cooling. Additional features could include energy conservation measures such as high-efficiency lighting design and Energy Star appliances that would reduce the project's overall energy demand.

PUBLIC SCHOOL OPTION

As described in Chapter 23, "Mitigation," SCA may locate an approximately 100,000-square-foot public elementary and intermediate school within the community facility space in the Refinery complex. Based on energy use rates in the *CEQR Technical Manual* (Table 3N-1), educational uses have a slightly higher energy demand (76,400 BTUs/sf/year) compared to the other community facility uses analyzed above (65,300 BTUs/sf/year). The additional consumption of a school use would be very small compared with the existing energy demands of New York City. This additional demand would not overburden the energy generation, transmission, and distribution system and would not result in a significant adverse energy impact. ✷