Chapter 13: Energy

A. INTRODUCTION

According to the *City Environmental Quality Review (CEQR) Technical Manual*, CEQR regulations require that EISs include a discussion of the effects of a proposed project on the use and conservation of energy, if applicable and significant. In most cases, a project does not need a detailed energy assessment, but its operational energy consumption is often calculated. Analysis of energy focuses on a project's consumption of energy and, where relevant, potential effects on the transmission of energy. Therefore, this chapter discloses the proposed projects' energy consumption.

Additional information regarding energy consumption, emissions, and energy conservation measures is presented in Chapter 16, "Greenhouse Gas Emissions."

PRINCIPAL CONCLUSIONS

The total energy demand for the East Site is projected at 65,010 million BTU per year. Since the East Site is assumed for the purposes of this EIS to remain vacant in the future without the proposed projects, all of this demand would be incremental. The total energy demand for the Center for Comprehensive Care would be 28,007 million BTU. Due to improved energy efficiency, the incremental change for the O'Toole Building Site would be a reduction of approximately 1,401 million BTU per year compared to conditions without the proposed projects. Energy consumed by the proposed open space on the Triangle Site would be insignificant. Overall, the total energy demand would be 93,017 million BTU per year, of which 63,610 million BTU per year would be the incremental increase compared to conditions in the future without the proposed projects.

As noted in the *CEQR Technical Manual*, the incremental demand caused by most projects would not create a significant impact on energy supply. Consequently, a detailed assessment of energy impacts is limited to those projects that may significantly affect the transmission or generation of energy. The proposed projects' energy demand is expected to be modest compared to the overall demand within Con Edison's New York City and Westchester County service area, and would be considered a negligible increment. The proposed projects would not be energy intensive facilities that would significantly affect the transmission or generation of energy.

The proposed projects would comply with the New York City Energy Conservation Code (NYCECC) and Energy Conservation Construction Code of New York State (ECCCNYS), incorporating all measures relating to energy efficiency and combined thermal transmittance. As described in greater detail in Chapter 16, "Greenhouse Gas Emissions," the proposed projects would also incorporate a number of additional measures intended to reduce energy consumption.

Overall, the proposed projects would not have a significant adverse impact on energy.

B. ENERGY SUPPLY

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 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.

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.

Con Edison provides natural gas service to the boroughs of the Bronx and Manhattan. In addition, Con Edison maintains steam utilities. High-pressure steam is generated in cogeneration plants and conventional plants, and is distributed through an interconnected piping network (with pipe sizes up to 30 inches in diameter) to approximately 1,800 customers throughout Manhattan for heating, hot water, and air conditioning. Gas mains ranging from 4 to 24 inches supply natural gas for heating and cooking uses within the study area. Typically, these gas lines are located between 2 and 4 feet below the street.

In 2008 annual electricity usage totaled approximately 59 billion KWH, or 201 trillion BTUs, in Con Edison's delivery area. In addition, Con Edison supplied approximately 108 trillion BTUs of natural gas and approximately 24 billion pounds of steam, which is equivalent to approximately 24 trillion BTUs. Overall, approximately 333 trillion BTUs of energy are consumed within Con Edison's New York City and Westchester County service area. (*Consolidated Edison Annual Report, 2008)*

C. OPERATIONAL ENERGY CONSUMPTION

Following the guidance of the *CEQR Technical Manual*, conservative estimates of project-specific energy demand by energy source were developed by the mechanical engineers for the proposed projects. These estimates, shown in **Table 13-1**, were used to determine the overall energy demand for the proposed projects and the incremental energy demand for the proposed projects, considering that the O'Toole Building would be reused in the future without the proposed projects. Energy modeling of proposed buildings was not performed for the purposes of this environmental review, as the detailed design information required for building energy modeling have not been finalized. The publicly accessible open space on the Triangle Site is not included because its energy demand would be minimal.

Table 13-1
Estimated Operational Energy Demand
(million BTU per year)

	Future without the Proposed Projects	Proposed Projects	Incremental Energy Demand
East Site	0*	65,010	65,010
O'Toole Building Site	29,408	28,007	-1,401
Total	29,408	93,017	63,610
Notes:	* The East Site is assumed to be vacant in the future without the proposed projects and energy demand would be negligible.		

As described in greater detail in Chapter 16, "Greenhouse Gas Emissions," the East Site electricity consumption is projected to be approximately 21,885 million BTU (6,412 megawatt hours) per year. Assuming that oil would be used, it is projected that 43,126 million BTU (308,040 gallons of No. 2 fuel oil) would be needed per year for the East Site heat, hot water, and emergency generators. Therefore, the total energy demand (electricity and No. 2 oil) for the East Site is projected at 65,010 million BTU per year. Since the East Site is assumed for the purposes of this EIS to remain vacant in the future without the proposed projects, all of this demand would be incremental.

For the Center for Comprehensive Care, it is projected that approximately 16,803 million BTU (14.3 million pounds of steam) per year would be needed to meet the heating demand. Electricity demand is projected to be 11,092 million BTU (3,250 megawatt hours) per year. In addition, approximately 112 million BTU (800 gallons of No. 2 fuel oil) would be used for annual emergency generator testing and maintenance. Therefore, the total energy demand for the Center for Comprehensive Care would be 28,007 million BTU. This estimate includes anticipated improvements to the O'Toole Building that would improve energy efficiency and reduce the energy consumption by approximately 5 percent. As such, the incremental change for the O'Toole Building Site would be a reduction of approximately 1,401 million BTU per year compared to conditions without the proposed projects.

As a whole, the total energy demand for the proposed projects would be 93,017 million BTU per year. The incremental energy demand for the proposed projects would be 63,610 million BTU per year, considering that the O'Toole Building would be developed absent the proposed projects and taking into account the energy efficiency improvements that would be made as part of the proposed projects.

The proposed projects' energy demand is expected to be modest compared to the approximately 333 trillion BTUs of energy consumed within Con Edison's New York City and Westchester County service area, and would be considered a negligible increment. The proposed projects would not be an energy intensive facility that would significantly affect the transmission or generation of energy.

The proposed projects would comply with the latest state energy code (ECCCNYS) and City energy code (NYCECC). The state code governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope. The current code, which became effective on December 28, 2010, requires that new and altered buildings

(both public and private) be designed to ensure adequate thermal resistance to heat loss and infiltration. In addition, the code provides requirements for the design and selection of mechanical, electrical, and illumination systems. In compliance with the code, the building's basic designs would incorporate all required energy conservation measures, including meeting the code's requirements relating to energy efficiency and combined thermal transmittance.

To meet the City's goal of reducing greenhouse emissions by 30 percent by 2030, the NYCECC sets energy-efficiency standards for new construction and alterations to existing buildings. All new building and alteration applications filed on or after July 1, 2010 must comply with NYCECC.

Additionally, as described in Chapter 16, "Greenhouse Gas Emissions," the proposed projects would include a number of measures aimed at reducing energy consumption. At this time, the proposed projects are intended to meet the requirements for the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Silver certification. As such, specific measures would need to be incorporated into the design of the proposed projects to qualify for the LEED rating, which would include energy efficiency.

The buildings on the East Site will be designed with an energy efficient building envelope and will incorporate window glazing to optimize daylighting (new buildings only, with some enlargement of openings for existing facades), heat loss, and solar heat gain. High-efficiency heating, ventilation, and air conditioning (HVAC) systems will be selected. The energy consumption of the Center for Comprehensive Care will be at least 5 percent lower than that of the O'Toole Building. As part of the LEED process, third-party fundamental building energy systems commissioning would be conducted to ensure energy performance.

Overall, the proposed projects would not have a significant adverse impact on energy. ✷