

A. INTRODUCTION

This chapter describes the potential effects of the proposed actions on the use and conservation of energy. As stated in the *City Environmental Quality Review (CEQR) Technical Manual* (January 2012 edition), the demand caused by most projects results in incremental supply, and consequently, an individual project's energy consumption would not create a significant impact on energy supply. A detailed assessment of energy impacts would be limited to projects that could significantly affect the transmission or generation of energy (such as a new roadway that could lead to a substantial increase in the number of vehicle miles traveled, and thus, fuel consumed in the City). Because all new structures requiring heating and cooling must conform to the *New York City Energy Conservation Code*, which reflects state and City energy policy, actions resulting in new construction would not create significant energy impacts, and would not require a detailed energy assessment. Therefore, this chapter simply discloses the proposed actions' energy consumption as recommended by the *CEQR Technical Manual*.

PRINCIPAL CONCLUSIONS

The proposed actions would not have a significant adverse impact on energy systems and services. Although the proposed actions would increase demand on electricity, this increase in demand would be insignificant relative to the capacity of these systems and the current levels of service in the Con Edison service area. Upon completion, development pursuant to the proposed actions would comply with the *New York City Energy Conservation Code*. In compliance with the code, the basic designs of all buildings would incorporate the required energy conservation measures, including meeting the code's requirements relative to energy efficiency and combined thermal transmittance.

Through a Request for Proposals (RFP) process, the City would look favorably upon proposals that enhance the energy-efficiency of buildings, use fewer raw materials, make the best of natural light where appropriate, improve indoor air quality, and decrease the total impact on the natural and human environment. These designs could include features aimed at reducing energy consumption and greenhouse gas (GHG) emissions.

In addition, housing developments on all sites are expected to be certified under the Enterprise Green Communities Program, or meet equivalent sustainability measures. Therefore, no significant adverse energy impacts would result from the proposed actions.

B. ENERGY SUPPLY

ENERGY PROVIDER

Electricity within Manhattan is distributed by Con Edison. The electrical energy is supplied from a variety of sources that originate both within and outside New York City. These include non-

renewable sources, such as oil, natural gas, coal fuel, and uranium; 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 Manhattan. In addition, Con Edison maintains a district steam system in Manhattan. 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 in 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 2010 (the latest year for which data are available), annual electricity usage totaled approximately 59 billion kilowatt-hours (KWH), or 200 trillion British Thermal Units (BTUs) in Con Edison's delivery area. In addition, Con Edison supplied approximately 124 trillion BTUs of natural gas and approximately 23 billion pounds of steam, which is equivalent to approximately 23 trillion BTUs. Overall, approximately 347 trillion BTUs of energy are consumed annually within its New York City and Westchester County service area.¹

RECENT ENERGY CONSERVATION DIRECTIVES

In 2001, New York State began implementing measures to address the increasing electrical power capacity needs of the New York City region. 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 other utilities have implemented programs to encourage businesses to reduce energy usage and increase energy efficiency.

For 2011-2012, the independent, non-profit New York State Reliability Council (NYSRC) has determined that a minimum of 81 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

¹ Con Edison of New York, *Annual Report*, year ended December 31, 2010.

meet this 81 percent local energy generation requirement.¹ However, as the energy demand increases over time, additional in-city generation would be needed to satisfy this requirement.

The New York Independent System Operator (NYISO), which manages the safety and reliability of the state's electric transmission system, reported in September 2010 that the state's wholesale electric power system will continue to meet accepted reliability standards through 2020. The accepted reliability standards set forth in NYISO's *2010 Reliability Needs Assessment* will be met because there are two new proposed generating plants totaling 1,060 MW and because there is lower energy demand forecasted since a) the 2009 recession reduced the peak demand forecast for 2012 by 1,218 MW, and has reduced the projections of peak load in subsequent years; and b) statewide energy efficiency programs seeking to lower energy consumption on the electric system by 15 percent are projected to result in energy savings of 13,040 GWh by 2018 and 13,684 GWh by 2020.² Because of the existing supply and the addition of the proposed NYISO generating plants and the State's planning process to identify potential shortfalls years before they would materialize, it is expected that an adequate generating capacity, which would exceed projected demands, would be available in the New York City metropolitan area through the proposed actions' 2022 build year.

C. EXISTING CONDITIONS

Rates provided in the *CEQR Technical Manual* were used to estimate the existing annual energy consumption on the project site. The measure of energy used in the analysis is BTUs per year. One BTU is the quantity of heat required to raise the temperature of one pound of water one Fahrenheit degree. According to the *CEQR Technical Manual*, this unit of measure can be used to compare consumption of energy from different sources (e.g., gasoline, hydroelectric power, etc.), taking into consideration how efficiently those sources are converted to energy. Use of this methodology avoids the confusion inherent in comparing different measures of output (e.g., horsepower, kilowatt hours, etc.) and consumption (e.g., tons per day, cubic feet per minute, etc.). As shown in **Table 12-1**, the project site currently uses an estimated 12.5 billion BTUs per year for heating, cooling, and electric power.

Table 12-1
Estimated Existing Energy Consumption

Use	Consumption Rates Thousand BTU (MBTU)/sf/yr	SF	Annual Energy Use (million BTUs)
Commercial	216.3	28,130	6,085
Institutional	250.7	19,312	4,842
Large Residential (> 4 family)	126.7	12,500	1,584
Total Energy Consumption			12,511
Source: Consumption rates are from the <i>CEQR Technical Manual</i> (January 2012 edition), Table 15-1, "Average Annual Whole-Building Energy Use in New York City."			

¹ New York State Reliability Council, New York Control Area Installed Capacity Requirements for the Period May 2011 through April 2012, December 10, 2010.

² New York Independent System Operator, *2010 Reliability Needs Assessment*, September 2010.

D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

In the future without the proposed actions, it is expected that the proposed development parcels would continue in their current use and configuration. Energy consumption in the future without the proposed actions would not be expected to change relative to existing conditions.

E. PROBABLE IMPACTS OF THE PROPOSED ACTIONS

The proposed actions would result in increased energy demands on the project site. As shown in **Table 12-2**, full development pursuant to the proposed actions would create a total demand for 285.9 billion BTUs per year. Compared with the approximate 347 trillion BTUs of energy consumed within Con Edison's New York City and Westchester County service area, the increase that would result from the proposed actions would be considered a negligible increment. 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.

Table 12-2
Estimated Future Energy Consumption

Use	Consumption Rates (Thousand BTU (MBTU)/sf/yr)	Size (GSF)	Annual Energy Use (million BTUs)
Commercial	216.3	632,255	136,757
Community Facility ¹	250.7	114,000	28,580
Large Residential (> 4 family)	126.7	951,182	120,515
Total Energy Consumption			285,852
Note: Energy consumption for the community facility space assumes the institutional energy consumption rate. Source: Consumption rates are from the <i>CEQR Technical Manual</i> (January 2012 edition), Table 15-1, "Average Annual Whole-Building Energy Use in New York City."			

Upon completion, development pursuant to the proposed actions would comply with the *New York City Energy Conservation Code*. In compliance with this code, the buildings to be constructed on Sites 1-6 and 8-10 must incorporate the required energy conservation measures, including meeting code requirements relating to energy efficiency and combined thermal transmittance.

Through an RFP process, the City would look favorably upon proposals that enhance the energy-efficiency of buildings, use fewer raw materials, make the best of natural light where appropriate, improve indoor air quality, and decrease the total impact on the natural and human environment. These designs could include features aimed at reducing energy consumption and GHG emissions such as:

- Energy efficient building envelopes to reduce cooling and heating;
- High-efficiency HVAC systems, incinerators and/or generators;
- Window glazing to optimize daylighting and solar heat gain and reduce heat loss; and
- Fuel from renewable sources or less GHG-intense fuels, such as natural gas, co-firing of biomass or use of biofuels or bioheat for heating fuel or in vehicles/equipment.

Housing developments on all sites are expected to be certified under the Enterprise Green Communities Program. Mandatory energy efficiency measures required by the Enterprise Green Communities program include:

- Heating and cooling systems must be sized according to the Air Conditioning Contractors of America (ACCA) Manuals, Parts J, S, and D, or ASHRAE handbooks;
- If provided, clothes washers, dishwashers, and refrigerators must be Energy Star-labeled;
- Interior lighting should be either Energy Star Advanced Lighting Package (ALP) or lighting specified in EPA's Multi-Family High-Rise (MFHR) program;
- For common areas and for emergency lighting, lighting specified in EPA's MFHR program should be installed;
- For exterior lighting, either Energy Star compact fluorescents or LEDs, or lighting specified in EPA's MFHR program should be installed;
- All dwelling units must be equipped with individual or sub-metered electric meters; and
- Installation of water-conserving fixtures in all units and any common facilities per minimum requirements.

If a housing development cannot be certified under the Enterprise Green Communities Program because American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2007 does not apply to its construction methodology, the development would be designed and constructed to reduce construction and demolition waste and to incorporate sustainable design features that reduce energy consumption and greenhouse gas emissions in an amount equivalent to that which would be necessary to achieve certification under the Enterprise Green Communities Program. For housing developments on City-owned sites that are managed by ~~the New York City Economic Development Corporation (NYCEDC)~~ and cannot comply with the Enterprise Green Communities Program because ASHRAE Standard 90.1-2007 does not apply to their construction methodology, consultation with the Mayor's Office of Environmental Coordination would be required to ensure that sustainability measures equivalent to that which would be necessary to achieve certification under the Enterprise Green Communities program are implemented. For sites that may be under the jurisdiction of the City of New York Department of Housing Preservation & Development (HPD), the Land Disposition Agreement (LDA) between HPD and the developer(s) would require a commitment to certification under the Enterprise Green Communities program or to the incorporation of equivalent sustainability measures. For housing developments on City-owned sites that are managed by the New York City Economic Development Corporation (NYCEDC), this commitment to certification under the Enterprise Green Communities program or to the incorporation of equivalent sustainability measures would be required through the provisions of a contract of sale or long-term lease or other legally binding agreement between NYCEDC and the developer(s).

Therefore, as previously stated, no significant adverse energy impacts would result from the proposed actions. *