Chapter 15: Energy

A. INTRODUCTION

While present uses on the projected development sites create some demand for energy, new development resulting from the proposed actions would place an increased overall demand on energy services. This chapter provides a detailed analysis of that added demand. As discussed in greater detail in this chapter, although the development of the projected development sites and the mapped amusement park would create substantial new energy demands, this increase is not large enough to result in significant adverse impacts on energy systems.

B. METHODOLOGY

This chapter presents data on the existing energy distribution system and estimated energy usage for existing conditions; determines future energy demands with the proposed actions for 2019 using energy usage rates for typical land uses provided in the *CEQR Technical Manual*; and assesses the effects of this incremental energy demand on the local distribution system and regional energy supplies.

C. EXISTING CONDITIONS

ENERGY PROVIDERS

Consolidated Edison (Con Ed), along with other transmission companies, delivers electricity to New York City and almost all of Westchester County. The electricity is generated by Con Ed as well as a number of independent power companies, including National Grid (formerly called KeySpan Energy Delivery).

Electrical energy in New York City is supplied from a variety of sources both within and outside the City. These sources include non-renewable sources such as oil, natural gas, and coal fuel, and renewable sources such as hydroelectric, and, to a much lesser extent, biomass fuels, solar, and wind power. New York City's energy is produced within the city, locations across the Northeast, and from places as far away as Canada. Once electrical energy is generated in the form of high voltage electrical power, a transmission grid conveys high voltage electrical 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 kilowatt hours or 170.75 trillion British Thermal Units (BTUs) of electricity are consumed in the City annually.

According to the New York Independent System Operator's (NYISO's) *2007 Load & Capacity Data* report, the peak electrical demand for New York City in the summer of 2006 was 11,350

megawatts (MW).[1] Typically, electricity generated within the city is sufficient to satisfy the demand. However, during the peak summer demand period, this electricity must be supplemented by the Northeast transmission grid. As a result, there is an ongoing service and distribution improvement program for Con Ed infrastructure that upgrades localized areas that are continually high demand zones. Electricity required for these zones is supplied by other regions of New York City or from sources elsewhere within the larger grid if necessary.

Con Ed 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 into 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 that if one substation goes out of service, the problem can be localized to that network area and would 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 annual generating capacity of 10,364 MW.[2]

National Grid provides natural gas service to more than 1.1 million customers and operates more than 4,000 miles of gas mains in New York City. The company also owns and operates generating plants on Long Island and within New York City with a total capacity of 6,650 MW.[3]

ENERGY INITIATIVES

In 2001, New York State began taking measures to address the increasing capacity needs of the metropolitan New York City region. The 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 of 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. The NYSERDA and other 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 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 generation.

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[1] New York Independent System Operator 2007 Load & Capacity Data, www.nyiso.com/public/webdocs/services/planning/planning_data_reference_documents/2007_GoldBook_PUBLIC.pdf, Historic Summer Non-Coincident Peak Demand by Zone (October 14, 2008)

[2] NYISO Revised Locational Installed Capacity Requirements Study Covering the New York Control Area for the 2006-2007 Capability Year, March 28, 2006 (October 14, 2008)

[3] Source: National Grid website: http://www.nationalgridus.com/energy/index.asp and http://www.nationalgrid.com/corporate / about+us/

The independent, non-profit 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, as energy demand increases over time, additional in-City generation would be needed to satisfy this requirement.

EXISTING DEMANDS

In estimating the existing annual energy consumption at the projected development sites and the area to be mapped as an amusement park, the rates provided on Table 3N-1 of the *CEQR Technical Manual* were utilized. 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 by one Fahrenheit degree. This unit of measurement 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 BTUs allows for a common unit of measurement for different energy sources (e.g., horsepower, kilowatt hours, etc.) and consumption rates (e.g., tons per day, cubic feet per minute, etc.). In general, 1 kilowatt (KW) is the equivalent of 3,413 BTUs per hour. As shown in **Table 15-1**, current annual energy use on the projected development sites is estimated to be approximately 21,931 million BTUs (or 6,426 MW) for all heating, cooling, and electric power. (This estimate does not assume that Astroland is closed, because existing conditions data was collected prior to the park's closure at the end of Summer 2008.)

Table 15-1
Existing Estimated Annual Energy Consumption on Projected Development Sites

Use	Consumption Rates (BTUs/sf/yr)[1]	Existing	
		Area (sf)	Annual Energy Use (million BTUs)[2]
Residential	145,500	14,529 (15 DUs)	2,114
Retail/Commercial	55,800	171,117	9,548
Eating/Drinking	113,800	4,756	541
Amusements	102,500[3]	94,907	9,728
		Total	**21,931**

Notes:
1 Based on rates provided in the *CEQR Technical Manual* Table 3N-1.
2 1 KW is equivalent to 3,413 BTUs per hour, and 1 MW is equivalent to 3,413,000 BTUs per hour.
3 Utilized rate for "Public Order & Safety" in *CEQR Technical Manual* Table 3N-1. The *CEQR Technical Manual* notes on page 3N-1 that usage rates "are not available for manufacturing uses, because energy demands vary widely for those uses, depending on building requirements and the manufacturing activity proposed. Such information is obtained from the manufacturer." The *CEQR Technical Manual* also does not provide energy usage rates for amusement facilities, which would have varying energy demands. Specific energy demands would come from the manufacturers of such attractions. In the absence of such information, an estimate of energy demand for the existing amusements was based on the rate for "Public Order & Safety" in *CEQR Technical Manual* Table 3N-1. This category was chosen because of its relatively high demand.

D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

In the future without the proposed actions, the projected development sites and the area to be mapped as an amusement park are assumed to either remain unchanged from existing conditions, or become occupied by uses that are as-of-right under existing zoning. As discussed in Chapter 1, "Project Description," DCP has identified development that would occur on these sites in the future without the proposed actions, as part of the reasonable worst-case development scenario (RWCDS),

including new dwelling units (DUs), additional commercial space, and new community facility space.

As discussed below, energy consumption on the projected development sites would increase in the future without the proposed actions. It is expected that the projected development sites would contain 627 residential units, 263,468 square feet (sf) of commercial space, 71,946 sf of community facility space, 4,756 sf of eating and drinking establishments, and 94,907 sf of amusements. **Table 15-2** summarizes the annual energy consumption for each use in the existing and No Build conditions. The same assumptions utilized for existing conditions were applied in calculating energy consumption on the projected development sites in the future without the proposed actions. As shown in **Table 15-2**, it is estimated that the projected development sites would use 130,399 million BTUs (or 38,206 MW) of energy annually in the future without the proposed actions. (While Astroland Amusement Park will be closed in the No Build condition, this estimate allows for the possibility that similar uses could be located on the park site in the future without the proposed actions.)

Table 15-2
Future Without the Proposed Actions: Estimated Annual Energy Consumption on Projected Development Sites (No Build)

Use	Consumption Rates (BTUs/sf/yr)[1]	Existing		No Build	
		Area (sf)	Annual Energy Use (million BTUs)[2]	Area (sf)	Annual Energy Use (million BTUs)[2]
Residential	145,500	14,529 (15 DUs)	2,114	627,469 (627 DUs)	91,298
Retail/Commercial	55,800	171,117	9,548	263,468	14,702
Eating/Drinking	113,800	4,756	541	4,756	541
Amusements	102,500[3]	94,907	9,728	94,907	9,728
Community Facility	196,400	—	—	71,946	14,130
		Total	**21,931**		**130,399**

Notes:
1 Based on rates provided in the *CEQR Technical Manual* Table 3N-1.
2 1 KW is equivalent to 3,413 BTUs per hour, and 1 MW is equivalent to 3,413,000 BTUs per hour.
3 Utilized rate for "Public Order & Safety" in *CEQR Technical Manual* Table 3N-1. The *CEQR Technical Manual* notes on page 3N-1 that usage rates "are not available for manufacturing uses, because energy demands vary widely for those uses, depending on building requirements and the manufacturing activity proposed. Such information is obtained from the manufacturer." The *CEQR Technical Manual* also does not provide energy usage rates for amusement facilities, which would have varying energy demands. Specific energy demands would come from the manufacturers of such attractions. In the absence of such information, an estimate of energy demand in the future without the proposed actions for amusement uses was based on the rate for "Public Order & Assembly" in *CEQR Technical Manual* Table 3N-1. This category was chosen because of its relatively high demand.

No major changes to the energy supply or infrastructure are expected to occur in the future without the proposed actions. Standard upgrades and/or reinforcements of the system are expected to be undertaken as necessary by the various energy suppliers and Con Ed with respect to in-city distribution. Although the NYISO does not yet have a long-term forecast for the analysis year of 2019, the peak demand for New York City in 2017—according to the NYISO *2007 Load & Capacity Data* report—is projected to be 13,360 MW, which represents a 17 percent increase (or slightly less than an annual 2 percent increase) over the peak demand in the summer of 2006.

E. PROBABLE IMPACTS OF THE PROPOSED ACTIONS

As discussed in Chapter 1, "Project Description," the proposed actions are expected to result in development of new residential, retail, hotel, amusement, and enhancing uses on the projected development sites, as well as the development of a new mapped amusement park. Overall, the RWCDS for the proposed actions would result in a net increase of 2,408 residential units, 320,951 sf of retail space, 606 hotel rooms, 251,411 sf of amusement uses, and 333,253 sf of enhancing uses over the future without the proposed actions' RWCDS. In addition, the active portion of the mapped amusement park would be 261,300 sf.

The same assumptions were applied to anticipated uses on the projected development sites in the future without and with the proposed actions. **Table 15-3** shows the energy expected to be consumed by the projected development sites and the active portion of the mapped amusement park in the future with the proposed actions. Based on the above assumptions, it is estimated that the net development on the projected development sites and in the mapped amusement park would use approximately 530,670 million BTUs (or 155,485 MW) of energy annually in the future with the proposed actions. This annual net consumption would be small, compared with the existing energy demands of New York City (170.75 trillion BTUs annually), the total peak energy demand in 2017 (13,360 MWs), the latest year for which forecasts are available, and a total peak energy demand in the 2019 analysis year (13,899 MW), based on a continued 2 percent annual increase in demand.

The proposed actions would increase demands on electricity and gas. However, any new development resulting from the proposed actions would be required to comply with the New York State Conservation Construction Code, which governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope of new buildings. In compliance with this code, the buildings to be constructed on all development sites must incorporate the required energy conservation measures, including meeting code requirements relating to energy efficiency and combined thermal transmittance. In addition, the New York City Economic Development Corporation (NYCEDC) and the New York City Department of City Planning (DCP) will coordinate with Con Ed to determine if any service upgrades are needed to better serve the Coney Island community in light of the growth expected under the proposed actions. Details of any needed upgrades will be included in the FEIS.

Table 13-3
Future With the Proposed Actions: Estimated Energy Consumption on Projected Development Sites (Build)

Use	Consumption Rates (BTUs/sf/yr)[1]	No Build		Build Net Increment	
		Area (sf)	Annual Energy Use (million BTUs)[2]	Area (sf)	Annual Energy Use (million BTUs)[2]
Residential	145,500	627,469 (627 DUs)	91,298	2,407,941 (2,408 DUs)	350,355
Retail/Commercial	55,800	263,468	14,702	320,951	17,909
Hotel	145,500	—	—	494,359 (606 rooms)	71,929
Eating/Drinking	113,800	4,756	541	—[3]	—
Amusements	102,500[4]	94,907	9,728	251,411	25,770
Enhancing Uses	113,800[5]	—	—	333,253	37,924
Community Facilities	196,400	71,946	14,130	—	—
Amusement Park (Active)[6]	102,500[4]	—	—	261,300	26,783
Total			**130,399**		**530,670**

Notes:
1 Based on rates provided in the *CEQR Technical Manual* Table 3N-1.
2 1 KW is equivalent to 3,413 BTUs per hour, and 1 MW is equivalent to 3,413,000 BTUs per hour.
3 In the RWCDS for the proposed actions, eating and drinking establishments are included in the enhancing uses.
4 Utilized rate for "Public Order & Assembly" in *CEQR Technical Manual* Table 3N-1. The *CEQR Technical Manual* notes on page 3N-1 that usage rates "are not available for manufacturing uses, because energy demands vary widely for those uses, depending on building requirements and the manufacturing activity proposed. Such information is obtained from the manufacturer." The *CEQR Technical Manual* also does not provide energy usage rates for amusement facilities, which would have varying energy demands. Specific energy demands would come from the manufacturers of such attractions. In the absence of such information, an estimate of future energy demand for the amusement uses on the projected development sites and the active portion of the mapped amusement park was based on the rate for "Public Order & Assembly" in *CEQR Technical Manual* Table 3N-1. This category was chosen because of its relatively high demand.
5 Utilized rate for "Food Service" in *CEQR Technical Manual* Table 3N-1. Enhancing uses include retail and service, food service, and public assembly uses.
6 The active amusement park is not located on a projected development site but is within the Coney East subdistrict.

F. CONCLUSIONS

The proposed actions would not have a significant adverse impact on energy systems and services. The proposed actions would increase demands on electricity and gas; however, relative to the capacity of these systems and the current levels of service within New York City, the increases in demand would be insignificant. In addition, as determined by NYCEDC and DCP in consultation with Con Ed, local improvements in electricity and gas distribution infrastructure would be made where necessary to accommodate new demand. It is therefore concluded that the demands of the proposed actions would not result in significant adverse impacts on the supplies of electricity and gas in the City or the region as a whole. ✷