3.14 ENERGY

INTRODUCTION

The proposed action would not result in significant adverse energy impacts.

This chapter describes the effects that the proposed action may have on energy consumption. Although present uses at the projected development sites create some demand for energy, development resulting from the proposed action would place an increased overall demand on energy services. As discussed in this chapter, the proposed action would create new demands on energy, but the additional demand would not be large enough to constitute significant adverse impacts on these services.

As discussed in Chapter 2.0, "Project Description," a reasonable worst-case development scenario (RWCDS) for development associated with the proposed action at the 26 projected development sites by 2017 has been identified. The RWCDS results in net increases of 2,328 DUs, including 498 units of affordable housing; 208,586 sf of retail commercial space; 436,015 sf of office commercial space; 11,672 sf of hotel space (total net increment of commercial space is 552,314 sf); and net decreases of 110,985 sf of community facility space; 26,824 sf of storage and manufacturing space; and 110,406 sf of parking/auto related uses.

3.14.1 EXISTING CONDITIONS

The Energy System

Consolidated Edison (Con Edison), along with other transmission companies, delivers electricity to New York City and almost all of Westchester County. The electricity is generated by Con Edison as well as a number of independent power companies, including Keyspan Energy. In Manhattan, Con Edison supplies electricity and natural gas.

The New York Power Authority (NYPA) is the governing authority responsible for overseeing power distribution across the state. The recent deregulation of the energy market across New York State has led to the transition of formerly government-regulated utilities to independently owned energy generators. Con Edison has sold many of its power generating facilities and is now primarily involved in energy distribution.

Electrical energy is created from non-renewable sources such as oil, natural gas, coal, nuclear fuel, and renewable sources like hydroelectric, biomass fuels, solar, and wind. New York City's energy is produced within the City, from across the Northeast US, and from locations as far as Canada. Once electrical energy is generated in the form of high voltage electrical power, a transmission grid provides high voltage electrical power to and within New York City. The interconnected power grid, extending across New York State and the Northeast, allows for power to be imported from other regions as the demand requires. Substations located throughout New York City convert high-voltage electrical to low-voltage electrical power for distribution to end users.

According to the New York Independent System Operator (NYISO) *2006 Load & Capacity Data* report, the peak electrical demand for New York City in Summer 2006 was 11,300 Megawatts (MW), and the peak demand for Summer 2007 is forecasted at 11,780 MW.[1] Typically the electricity generated within the City is sufficient to satisfy the demand. However, during the peak summer demand period, needed electricity must be supplemented by the transmission grid across the Northeast. Con Edison's distribution grid has a finite capacity, and during heavy demand periods, the transmission grid is strained. There is an ongoing service and distribution improvement program for Con Edison infrastructure which upgrades localized areas that are continually high demand zones. Electricity required for these local "hot" zones are supplied by other regions of New York City or from sources elsewhere within the larger grid, if necessary.

Con Edison provides the electrical power transmission system for the City through a series of substations. Transmission substations receive electricity from the generating stations through the transmission system and reduce the voltage to a level that can be delivered to area substations. Area substations receive electricity from a transmission substation and reduce the voltage to a level that can be delivered into the distribution system or "grid" in the streets. In the distribution system, the electricity's voltage is reduced further to be delivered 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 would 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.

A number of power plants are located in the five boroughs, providing electric generation resources to New York City. According to NYISO's *Revised Locational Installed Capacity Requirements Study* for the 2006-2007 capability year, New York City has an existing installed capacity of 9,054 MW (not including Special Case Resources).[2]

Recent Energy Conservation Directives

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), introduced in June of 2001, directed 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

[1] New York Independent System Operator *2006 Load & Capacity Data*, revised 05/03/06 – www.nyiso.com/public/services/planning/index.jsp
[2] NYISO *Revised Locational Installed Capacity Requirements Study Covering the New York Control Area for the 2006-2007 Capability Year*, March 28, 2006. According to the Study, Special Case Resources (SCRs) are "loads capable of being interrupted, and distributed generators, rated at 100 kW or higher, that are not directly telemetered."

with their responsibilities. The NYSERDA and other utilities have implemented programs to encourage businesses to reduce energy usage and increase energy efficiency. The NYPA has purchased and constructed 11 new 44-MW, natural gas-fired, simple cycle turbine generating units (10 of which are located within New York City). Additionally, NYPA has focused on reducing energy consumption at public facilities throughout New York City.

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. As the energy demand increases over time, additional in-city generation would be needed to satisfy this requirement.

The NYISO, which manages the safety and reliability of the state's electric transmission system, developed and implemented an annual review of New York State's energy reliability and needs in December 2005. In the first Reliability Needs Assessment (RNA), NYISO determined that additional resources would be needed over a 10-year study period in order for the New York Control Area (NYCA) to comply with all applicable reliability criteria. After evaluation, NYISO determined that sufficient resource additions to the NYCA are planned or under development to ensure reliability through 2014. The RNA outlines additional solutions that will be sought to continue to provide reliability after 2014.[3]

Existing Demand

In estimating the existing annual energy consumption at the 26 projected development sites, the rates provided in Table 3N-1 of the *CEQR Technical Manual* were utilized. The measure of energy used in the analysis is BTUs per year. One BTU, or British Thermal Unit, 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. Its use 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.). In general 1 kilowatt (KW) is equivalent to 3,413 BTUs per hour. As shown in Table 3.14-1, current annual energy use on the 26 projected development sites is estimated to be approximately 40.68 billion BTUs for all heating, cooling, and electric power.

[3] NYISO *The Comprehensive Reliability Plan 2005: A Long-term Reliability Assessment of New York's Power System*, August 22, 2006.

Table 3.14-1
Estimated Annual Energy Consumption on
Projected Development Sites Under Existing Conditions

Use	Consumption Rates*	EXISTING	
		SF	Annual Energy Use (million BTUs*)
Storage/Manufacturing	44,100 BTUs/sf/y	40,788	1,799
Parking/Auto	27,400 BTUs/sf/y	126,908	3,477
Vacant	0 BTUs/sf/y	239,570	0
Community Facility	76,400 BTUs/sf/y	80,058	6,116
Residential	145,500 BTUs/sf/y	1,800	262
Office/Commercial	77,900 BTUs/sf/y	115,605	9,006
Retail	55,800 BTUs/sf/y	336,641	18,785
Hotel	145,500 BTUs/sf/y	8,512	1,238
TOTAL			40,683

*Based on the following assumptions:
Storage/Manufacturing: rate for "warehouse and storage" *CEQR Technical Manual* Table 3N-1.
Parking/Auto: rate for "parking garage" *CEQR Technical Manual* Table 3N-1.
Community Facility: rate for "education" *CEQR Technical Manual* Table 3N-1.
Residential: rate for "lodging" *CEQR Technical Manual* Table 3N-1. Assume 900 sf/DU average size of existing dwelling unit.
Office/Commercial: rate for "office" *CEQR Technical Manual* Table 3N-1.
Retail: rate for "mercantile and service" *CEQR Technical Manual* Table 3N-1.
Hotel: rate for "lodging" *CEQR Technical Manual* Table 3N-1.

3.14.2 FUTURE WITHOUT THE PROPOSED ACTION

In the future without the proposed action, the existing zoning controls would remain in place. It is expected that the rezoning area would experience some growth in commercial and residential uses. In the future without the proposed action (No-Build), as-of-right development would be expected to occur on some of the 26 projected development sites. With new development in the proposed action area, the Future No-Action Scenario is expected to result in higher energy consumption on the projected development sites than under existing conditions.

The NYISO *2007 Load & Capacity Data* report forecasts energy requirements through 2017 and expects the summer peak load for New York City to be 13,360 MW in 2017. The 2017 annual energy requirements are forecasted at approximately 63,977 gigawatt hours (GWH).[4]

In the future without the proposed action, the existing zoning controls would remain in place. It is expected that the rezoning area would experience some growth in commercial and residential uses. In the future without the proposed action (No-Build), as-of-right development would be expected to occur on 14 of the 26 projected development sites identified by DCP in the rezoning area. Development on the projected development sites is expected to consist of 304 dwelling

[4] New York Independent System Operator *2007 Load & Capacity Data*, revised 04/01/07 – www.nyiso.com/public/services/planning/index.jsp

units (DUs); 635,337 sf of retail; 512,305 sf of office space; 8,512 sf of hotel space (together the retail, office, and hotel space would comprise a total of 1,156,154 sf of commercial space); 26,824 sf of storage/manufacturing uses; 112,404 sf of parking/auto related uses; 182,493 sf of community facility space; and 20,586 sf of institutional conversion space.

It is expected that the incremental difference between the existing conditions and the No-Action scenario would total 302 dwelling units (DUs); 298,685 sf of retail; 396,700 sf of office space; (together retail and office space would comprise a total difference of 695,385 sf of commercial space); 102,435 sf of community facility space (including 20,586 sf of institutional conversion space), and a reduction of 13,964 sf of storage/manufacturing uses and 14,504 sf of parking/auto related uses.

Table 3.14-2 summarizes the annual energy consumption for each use under No-Action conditions. The same assumptions utilized for existing conditions were applied in calculating energy consumption on the 26 projected development sites in the future without the proposed action. As shown in Table 3.14-2, it is estimated that as-of-right development on 14 of the 26 projected development sites would use approximately 136.19 billion BTUs of energy annually in 2017 without the proposed action.

Table 3.14-2
Estimated Annual Energy Consumption on Projected Development Sites Under 2017 No-Action Conditions

Use	Consumption Rates*	NO-ACTION	
		SF	Annual Energy Use (million BTUs*)
Storage/Manufacturing	44,100 BTUs/sf/y	26,824	1,183
Parking/Auto	27,400 BTUs/sf/y	112,404	3,080
Vacant	0 BTUs/sf/y		0
Community Facility (1)	76,400 BTUs/sf/y	203,079	15,515
Residential	145,500 BTUs/sf/y	273,600	39,809
Office/Commercial	77,900 BTUs/sf/y	512,305	39,909
Retail	55,800 BTUs/sf/y	635,337	35,452
Hotel	145,500 BTUs/sf/y	8,512	1,238
TOTAL			136,186

*Refer to Table 3.14-1 for consumption rate assumptions.
(1) No-Action community facility energy consumption includes 20,586 sf of institutional conversion.

3.14.3 FUTURE WITH THE PROPOSED ACTION

As described in Chapter 2.0, "Project Description," it is expected that under With-Action conditions, the projected development sites would consist of 2,632 DUs (498 of which would be affordable housing units); 843,923 sf of commercial retail space; 948,319 sf of commercial office space; 20,184 sf of hotel space (total retail, office and hotel commercial space is 1,812,426

sf); 92,094 sf of community facility space (including 20,586 sf of institutional conversion space); and 1,998 sf of parking/auto related uses.

It therefore follows that under With-Action conditions, the projected development sites would consist of a net increase of 2,328 DUs (498 of which would be affordable housing units); 208,586 sf of commercial retail space; 436,015 sf of commercial office space; 11,672 sf of hotel space (total retail, office and hotel commercial space is 656,273 sf); 110,985 sf of community facility space; a decrease of 26,824 sf of storage and manufacturing space; and a decrease of 110,406 sf of parking/auto related uses. The incremental difference between the With-Action and No-Action energy demand serves as the basis for the impact analyses.

Projected development resulting from the proposed action 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 the Code, the buildings to be constructed on the projected development sites would incorporate all required energy conservation measures, including meeting the Code's requirements relating to energy efficiency and combined thermal transmittance.

The same assumptions utilized for the various uses under No-Action conditions were applied in calculating estimated annual energy consumption on the 26 projected development sites in the future with the proposed action. Table 3.14-3 shows the energy expected to be consumed by the projected development sites in the future with the proposed action, comparing it to the future without the proposed action, and identifying the incremental change in energy consumption associated with the proposed action.

Table 3.14-3
Estimated Annual Energy Consumption on Projected Development Sites Under 2017 With-Action Conditions, Compared to No-Action Conditions, With Incremental Change Associated with Proposed Action

	NO-ACTION		WITH-ACTION		INCREMENTAL
Use	SF	Annual Energy Use (million BTUs)	SF	Annual Energy Use (million BTUs)	Annual Energy Use (million BTUs)
Storage/Manufacturing	26,824	1,183	0	0	-1,183
Parking/Auto	112,404	3,080	1,998	55	-3,025
Vacant		0		0	0
Community Facility	203,079	15,515	92,094	7,036	-8,479
Residential	273,600	39,809	2,368,800	344,660	304,851
Office/Commercial	512,305	39,909	948,319	73,874	33,965
Retail	635,337	35,452	843,923	47,091	11,639
Hotel	8,512	1,238	20,184	2,937	1,699
TOTAL		136,186		475,653	339,467

Refer to Tables 3.14-1 and 3.14-2 for notes.

Based on the above assumptions, it is estimated that the 26 projected development sites would use approximately 475.65 billion BTUs of energy annually in the future with the proposed action. Therefore, the proposed action would result in an incremental increase of approximately 339.47 billion BTUs in annual energy use compared to No-Action conditions. This annual incremental demand on an hourly basis would represent a small fraction of the City's forecasted peak summer load of 13,360 MW in 2017, and an infinitesimal amount of the City's forecasted annual energy requirements for 2017, and is therefore not expected to be a significant additional load. As such, the operational energy demand from the proposed action would not have significant adverse impacts.

CONCLUSION

The proposed action is not anticipated to result in significant adverse energy impacts. Consumption of electrical energy on the projected development sites would experience a net increase of approximately 339.47 billion BTUs in annual energy use compared to No-Action conditions. This annual incremental demand on an hourly basis would represent a small fraction of the City's forecasted peak summer load of 13,360 MW in 2017, and an infinitesimal amount of the City's forecasted annual energy requirements for 2017. This relatively small incremental demand is not large enough to significantly impact the ability of the City's energy system to deliver electricity.