Chapter 16: Energy

A. INTRODUCTION

The Willets Point Development Plan would generate new demands on energy services provided in the Willets Point Development District. In accordance with the approach outlined in Chapter 2, "Procedural and Analytical Framework," this chapter analyzes the cumulative impact of both the Willets Point Development Plan and the anticipated development on Lot B, and considers the net incremental impact between the continuation of the existing on-site uses in the future without the proposed Plan, and the proposed Plan and the anticipated development on Lot B in the 2017 analysis year. The cumulative impact is also assessed for the No Convention Center Scenario, as discussed in Chapter 2.

PRINCIPAL CONCLUSIONS

The proposed Plan and the anticipated development on Lot B 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, these increases in demand would be insignificant. Improvements would be made to the local electric and gas distribution grids that would ensure proper service to the Willets Point Development District. Therefore, the cumulative demands of the proposed Plan and the anticipated development on Lot B would not result in a significant adverse impact on the supplies of electricity and gas in the region or the City as a whole, and with the future improvements to the distribution network, no impact would occur locally with respect to electrical or gas utilities. The No Convention Center Scenario would result in marginally greater energy demand, due to a greater portion of residential uses, but would also not result in a significant adverse impact.

B. METHODOLOGY

As discussed below, this chapter:

- Presents data on the existing energy distribution system and estimated energy usage for existing conditions;
- Determines future energy demands with the proposed Plan and anticipated development on Lot B for 2017, using energy consumption rates for typical land uses provided in the *City Environmental Quality Review (CEQR) Technical Manual* and other available literature sources;
- Assesses the effects of this incremental energy demand on the local distribution system and regional energy supplies; and
- Describes sustainable features that may be incorporated into the project design for the purposes of minimizing project demands on energy infrastructure and services.

C. EXISTING CONDITIONS

ENERGY PROVIDERS

Electricity within New York City is generated by Consolidated Edison (Con Edison), as well as a number of independent power companies, including KeySpan Energy[1].

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, 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 kilowatt hours (kwh) or 170.75 trillion British Thermal Units (BTUs) of electricity are consumed in the City annually.

According to the New York Independent System Operator (NYISO) *2007 Load & Capacity Data* report, the peak electrical demand for New York City in summer 2006 was 11,350 megawatts (mw).[2] 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 that 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.[3]

---

[1] Although KeySpan was acquired by National Grid, it continues to operate under the KeySpan name.

[2] 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 (July 25,2007)

[3] 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)

KeySpan Energy 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 electrical generating plants on Long Island and within New York City, with a total generating capacity of more than 6,600 mw.[1]

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 State Power Authorities (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.

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.[2]

EXISTING WILLETS POINT DEVELOPMENT DISTRICT DEMAND

In estimating the existing annual energy consumption in the Willets Point Development District, the rates provided in Table 3N-1 of the *CEQR Technical Manual* were utilized. One measure of energy is the BTU. One BTU is the quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit. This unit of measurement is often used to compare consumption of energy from different sources, taking into account 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, kwh, etc.) and consumption rates (e.g., tons per day, cubic feet per minute, etc.). One kilowatt (kw) is the equivalent of 3,413 BTUs per hour. Based on the rates of the *CEQR Technical Manual*, current annual energy use in the Willets Point Development District is estimated to be approximately 47,417 million BTUs, as shown in Table 16-1.

[1] KeySpan Energy Web site: http://www.keyspanenergy.com/corpinfo/about/facts_all.jsp (July 25, 2007)

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

Table 16-1
Existing Energy Consumption in the Willets Point Development District

Existing Use	Square Feet (sf)	BTUs/sf/year	Million BTUs/year
Office	59,389	77,900	4,626
Industrial[1]	337,949	44,100	14,904
Retail	39,230	55,800	2,189
Garage	220,062	27,400	6,030
Other[2]	135,178	145,500	19,668
Total			**47,417**

Notes:
[1] Industrial use includes storage, recycling uses, non-retail auto uses, transportation, construction, distribution and manufacturing
[2] The use group labeled as other includes miscellaneous auto uses, a residence, a deli and a private club.
Sources: 3N-1 Table in the *CEQR Technical Manual* for energy demand rates.
New York City Department of Finance Real Property Assessment Database (RPAD) 2005 and business information provided by the New York City Economic Development Corporation for the floor area by use group.

D. FUTURE WITHOUT THE PROPOSED PLAN

In 2017, in the future without the proposed Plan, it is conservatively assumed that the uses currently in the Willets Point Development District would remain, although it is possible that some properties that are currently vacant would be reused and that some limited development could occur. However, the growth and development would occur mostly in the neighboring communities, such as College Point. In the future without the proposed Plan in 2017, the existing energy demands at the Willets Point Development District are not assumed to change. The peak demand in 2017 for New York City is projected to be 13,360 mw[1]. It is expected that measures will be taken to provide adequate electrical capacity to the New York City metropolitan area through this analysis year. It is also assumed that Con Edison would continue with its electrical distribution improvement programs in the Queens area. In the future, the existing trend toward sustainability, as evidenced by the incorporation of green design by both the public and private sector, would lead to greater energy efficiency in the City. The effects of green design initiatives on energy demand in the District were conservatively not accounted for in the assessment of the District with or without the proposed Plan.

E. PROBABLE IMPACTS OF THE PROPOSED PLAN

To provide the needed energy service to the District, upgrades to electrical and gas transmission lines, and additional facilities serving the District would be needed. Within the Willets Point Development District and adjoining streets, gas mains, service lines, and metering would need to be reconstructed as part of the proposed Plan. Improvements to the local distribution grid may also be required, such as an electrical substation and primary feeder cables. A discussion of the cumulative energy demand for the proposed Plan and Lot B with and without the convention center is presented below.

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

As described in Chapter 1, "Project Description," the Willets Point Development Plan has been accepted as a pilot Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND) project by the United States Green Building Council (USGBC). Based on preliminary designs, it is likely that the New York City Economic Development Corporation (NYCEDC) would encourage any future development in the District to achieve LEED-ND certification.

As part of this effort, the lead agency and NYCEDC are exploring the potential for the integration of several sustainable site planning features that would lead to energy savings. These include solar-oriented blocks and building massings that would decrease energy consumption through daylighting, solar heating, and natural ventilation; and sustainable energy infrastructure and management practices (e.g., direct energy generation, supply and demand site management, sustainable energy technologies, and building space requirements), which would decrease the District's overall energy consumption and carbon footprint. In addition, the proposed school would be built according to the New York City Green Schools Guide, published by the New York City School Construction Authority in March 2007, which guides the sustainable design, construction, and operation of new schools, modernization projects, and school renovations in New York City.

Although the planning for the proposed Plan considered sustainability and also compatibility with the PlaNYC[1] initiatives, sustainable features that would lead to energy savings were conservatively not accounted for in the calculation of energy demand.

PROPOSED PLAN

The proposed Plan and the anticipated development on Lot B would result in added energy demand, as shown in Table 16-2. The total energy consumption estimate for the probable impacts of the proposed Plan was based on the cumulative development scenario floor area for each use group and the *CEQR Technical Manual* Table 3N-1 energy consumption rates. No energy efficiency or green design measures that would be implemented in the District were accounted for in this conservative estimate. The annual energy demand for the District and Lot B in the future with the proposed Plan would be approximately 1.2×10^6 million BTUs. The average power load increase associated with this conservative estimate of future energy consumption is about 38 mw. This would constitute less than 0.3 percent of the total peak energy demand for New York City in 2017, and is not considered to be significant.

NO CONVENTION CENTER SCENARIO

Under the No Convention Center Scenario, 350,000 square feet (sf) of additional residential use and 50,000 sf of ground floor retail use would replace the proposed convention center use, as discussed in Chapter 2. The No Convention Center Scenario cumulative annual energy demand with Lot B and average power load would be approximately 4 percent higher than the corresponding demand and load under the proposed Plan with Lot B. Slightly more energy would be required for the No Convention Center Scenario because instead of a convention center, additional residential uses would be built, and residential uses generally require more energy per unit of floor area, as reflected in the energy consumption rates tabulated in Table 3N-1 of the *CEQR Technical Manual*.

[1] http://www.nyc.gov/html/planyc2030/html/home/home.shtml

Table 16-2
Energy Consumption for the Proposed Development Plan and Lot B in 2017

Future Use	Size gsf	BTUs/sf/year	Million BTUs/year
Residential	5,500,000	145,500	800,250
Retail	1,884,500	55,800	105,155
Office	780,000	77,900	60,762
Convention Center[1]	400,000	81,300	32,520
Hotel	560,000	145,500	81,480
Community/Cultural Use[2]	150,000	65,300	9,795
Primary School	130,000	76,400	9,932
Parking	7,670 spaces[3]	27,400	71,454
Total			**1,171,348**

Notes:
[1] The energy demand for the proposed convention center was based on the projected energy demand increase for the expansion of the Jacob Javits convention center, reported in the No. 7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS and scaled to adjust for the size of the proposed convention center.

[2] The CEQR Technical Manual energy demand for public assembly was used.

[3] Conservatively assuming that proposed parking facilities would average 340 sf per parking spot.

Sources: Table 3N-1 of the *CEQR Technical Manual.*

The improvements in local connections that are necessary to provide these services to the proposed Plan under either scenario would not adversely impact the local system. Therefore, the proposed Plan and the anticipated development on Lot B would not have any significant adverse impacts on energy systems. In addition, as described above, the proposed Plan may include a number of energy conservation measures, which would decrease overall energy demand in the District. ✷