Chapter 12: Energy

A. INTRODUCTION

According to the 2012 *CEQR Technical Manual*, because all new structures requiring heating and cooling are subject to the *New York State Energy Conservation Code*, which reflects state and city energy policy, actions resulting in new construction would not create significant energy impacts, and as such do not require a detailed energy assessment. For CEQR purposes, energy impact analysis focuses on an action's consumption of energy. Therefore, this chapter includes a qualitative assessment of the Proposed Action's effects on energy, including an estimate of the additional energy consumption associated with the Proposed Action's anticipated development on the projected development sites, including an estimate of the demand load on electricity, gas, and other energy sources, and an assessment of available supply.

PRINCIPAL CONCLUSIONS

The Proposed Action would not result in a significant adverse impact on energy systems. The Proposed Action would create an increased demand on energy systems including electricity and gas. However, relative to the current and future capacity of these systems within New York City and the city's energy requirements, this increase in energy demand would be minor.

B. METHODOLOGY

To assess the Proposed Action's potential impacts on energy, this chapter:

- Presents data on the existing energy distribution system and estimated energy usage for existing conditions;
- Determines future energy demands with the Proposed Action for 2022, using energy consumption rates for typical land uses provided in the *CEQR Technical Manual* and other available literature sources; and
- Assesses the effects of this incremental energy demand on the local distribution system and regional energy supplies.

ANALYSIS APPROACH

As energy demand is a density-based technical analysis, only the anticipated development on the projected development sites form the basis for this impact assessment. As discussed in Chapter 1, "Project Description," since the Proposed Action would permit a range of different types of development within the Rezoning Area, two reasonable worst-case development scenarios (RWCDS) have been developed to represent potential development scenarios that could result from the Proposed Action. Under RWCDS 1, it is assumed that the maximum permitted residential development would occur on each of the development sites. Under RWCDS 2, it is assumed that community facility uses with sleeping accommodations (i.e., dormitories), rather

than residential buildings, would be developed on two of the projected development sites. Based on the energy demand rates provided in the *CEQR Technical Manual*, RWCDS 2 would be expected to consume slightly more energy than RWCDS 1. Therefore, for the purposes of the energy analysis, RWCDS 2 provides the basis for the impact assessment.

C. EXISTING CONDITIONS

ENERGY PROVIDERS

Con Edison delivers electricity to all of New York City (except the Rockaway area in Queens) and almost all of Westchester County. The electricity is generated by Con Edison, as well as a number of independent power companies. In 2009 (the latest year for which data are available), annual electricity usage totaled approximately 57 billion kilowatt hours (KWH), or 194 trillion British Thermal Units (BTUs), in Con Edison's delivery area. In addition, Con Edison supplied approximately 125 trillion BTUs of natural gas and approximately 23 billion pounds of steam, which is equivalent to approximately 27 trillion BTUs. Overall, approximately 346 trillion BTUs of energy are consumed within Con Edison's New York City and Westchester County service area.[1]

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. The New York Independent System Operator (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. 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 New York Power Authority (NYPA) constructed 11 new 44-megawatt (MW), natural gas-fired, simple cycle turbine generating units, 10 of which are located within New York City, for emergency power generation.

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 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, reported in September 2010 that the State's wholesale electric power system will continue to meet accepted reliability standards through 2020. A number of market solutions and Transmission Owners' plans were submitted in response to previous requests for solutions.

[1] Con Edison of New York, *Annual Report, 2009*.

Currently, 2,115 MW of solutions are either in-service or are still being reported to the NYISO as moving forward with the development of their projects; in addition, a number of renewable power projects are moving forward with interconnection to the grid. According to the NYISO's *2010 Reliability Needs Assessment Final Report* (September 2010), assuming that all modeled transmission and generation facilities remain in service from 2010 through 2020, there are currently no reliability needs during the next 10 years. This determination was based upon the combined effect of lower energy forecasts, generator additions, and additional Special Case Resource program participation. The NYISO will continue to monitor these developments and will conduct appropriate reliability studies as necessary. Because of the existing supply and the addition of these projects, 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 Action's analysis year of 2022.

EXISTING DEMANDS

In estimating the existing annual energy consumption at the projected development sites, the rates provided in **Table 12-1** 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 one Fahrenheit degree. According to CEQR, 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.). In general, 1 kilowatt hour (KWH) is equivalent to 3,412 BTUs.

Table 12-1
Existing Estimated Annual Energy Consumption on Projected Development Sites

Use	Existing	
	Area (sf)	Annual Energy Use (million BTUs)[1,2]
Retail[3]	62,063	13,424
Office	678,053	146,663
Hotel	0	0
Other Commercial[4]	152,390	32,962
Community Facility	0	0
Residential	20,583	2,608
Total		**195,657**

Notes:
1. Based on rates provided in the *CEQR Technical Manual*, Table 15-1.
2. 1 KWH is equivalent to 3,412 BTUs.
3. Based on DCP's definition of retail as defined by DCP's MapPLUTO 10v1 (2010) data.
4. Includes garage, storage, and church uses, based on MapPLUTO data.
5. Any energy demand associated with parking is assumed to be negligible.

As shown in **Table 12-1**, current annual energy use on the projected development sites is estimated to be approximately 195,657 million BTUs (or 57.3 million KWH) for all heating, cooling, and electric power.

D. THE FUTURE WITHOUT THE PROPOSED ACTION

As described in Chapter 1, "Project Description," the future without the Proposed Action (No-Action condition) consists of currently planned or ongoing development projects within the Rezoning Area, as well as the development that is expected to occur on certain sites controlled

by the Applicant by 2022. Absent the Proposed Action, it is expected that the projected development sites will contain 1,783,929 gsf of commercial space. In total, there will be an approximate increase of 891,422 gsf of commercial space (retail, office, hotel, and other) on the projected development sites over existing conditions. In addition, in the No-Action condition the projected development sites would include 29 dwelling units, the same as in the existing condition. Therefore, overall, as discussed below, energy generated by the projected development sites will increase in the No-Action condition.

Table 12-2 summarizes the annual energy consumption for each use in the existing and No-Action conditions. The assumptions utilized in calculating energy consumption for the existing condition were also applied on the projected development sites in the No-Action condition. As shown in **Table 12-2**, it is estimated that the projected development sites would use 388,472 million BTUs (or 114 million KWH) of energy annually in the No-Action condition.

Table 12-2
No-Action Condition: Estimated Annual Energy Consumption on Projected Development Sites

	Existing		No-Action Condition	
Use	Area (sf)	Annual Energy Use (million BTUs)[1,2]	Area (sf)	Annual Energy Use (million BTUs)[1,2]
Retail	62,063	13,424	125,583	27,164
Office	678,053	146,663	537,165	116,189
Hotel	0	0	739,170	159,882
Other Commercial[3]	152,390	32,962	382,010	82,629
Community Facility	0	0	0	0
Residential	20,583	2,608	20,583	2,608
Total		**195,657**	**N/A**	**388,472**

Notes:
1. Based on rates provided in the *CEQR Technical Manual* (Table 15-1).
2. 1 KWH is equivalent to 3,412 BTUs.
3. Includes garage, storage, and church uses in existing conditions, based on MapPLUTO data. Assumed to include other commercial uses such as trade schools, banquet halls, or dance studios in No-Action condition.
4. Any energy demand associated with parking is assumed to be negligible.

No major changes to the energy supply or infrastructure are expected to occur in the No-Action condition. 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. The NYSRC has determined that energy reserves of 118 percent in excess of the New York Control Area's (NYCA) summer peak demand forecast is deemed adequate. The total resource capability in the NYCA for 2010 is 41,841 MW, greater than 118 percent of the 2020 projected summer peak demand of 35,334 MW (2010-2020 is the latest 10-year period for which data are available), according to the NYISO 2010 Load & Capacity Data report. The annual energy requirements for 2020 are forecasted at approximately 173,332 gigawatt hours (GWh) (or 173,332 million KWH). Proposed generation and transmission projects in the NYISO interconnection process are expected to provide 2,251 MW of capacity for the NYISO in 2010 and thereafter, an increase of 315 MW from 2009. In addition, other "Proposed Resource Changes," if constructed, would help to maintain installed capacity well above 118 percent of projected peak load through the year 2020.

E. THE FUTURE WITH THE PROPOSED ACTION

Under the future with the Proposed Action (With-Action condition), it is anticipated that new development occurring on the projected development sites would consist of 3,006 residential units and 901,417 gsf of commercial space (retail, office, and other), in addition to 329,896 gsf of community facility space. As compared with the development anticipated in the No-Action condition, the Proposed Action would result in a net increase of 2,977 residential units and a net decrease of 882,511 gross square feet (gsf) of commercial space (including a net increase of 99,086 gsf of retail space and 139,583 gsf of office space, and a net decrease of 739,170 gsf of hotel use and 382,010 gsf of other commercial space). In addition, the Proposed Action would result in a net increase of 329,896 gsf of community facility space, including a 75,000-gsf school and 254,896 gsf of dormitory use.

The assumptions utilized for calculating energy demands for the existing and No-Action conditions were also used in calculating energy demand for the With-Action condition. **Table 12-3** shows the energy expected to be consumed by the projected development sites in the With-Action condition under RWCDS 2. It is estimated that the projected development sites would use approximately 604,030 million BTUs (or 177 million KWH) of energy annually in the With-Action condition, an incremental increase of approximately 215,558 million BTUs (or 63 million KWH [63 GWh]) when compared with the No-Action condition. This annual increase in demand would represent a negligible amount (approximately 0.0004 percent) of the city's forecasted annual energy requirements for 2020, and therefore is not expected to result in a significant impact on energy systems.

Table 12-3
With-Action Condition: Estimated Energy Consumption on Projected Development Sites

	No-Action Condition		With-Action Condition		Energy Use Increment (million BTUs)[2]
Use	Area (sf)	Annual Energy Use (million BTUs)[1,2]	Area (sf)	Annual Energy Use (million BTUs)[2]	
Retail	125,583	27,164	224,669	48,596	21,432
Office	537,165	116,189	676,748	146,381	30,192
Hotel	739,170	159,882	0	0	-159,882
Other Commercial[3]	382,010	82,629	0	0	-82,629
Community Facility	0	0	329,896	82,705	82,705
Residential	20,583	2,608	2,575,757	326,348	323,740
Total		**388,472**	**N/A**	**604,030**	**215,558**

Notes:
1. Based on rates provided in the *CEQR Technical Manual* (Table 15-1).
2. 1 KWH is equivalent to 3,412 BTUs.
3. Includes garage, storage, and church uses in existing conditions, based on MapPLUTO data. Assumed to include other commercial uses such as trade schools, banquet halls, or dance studios in No-Action condition.
4. Any energy demand associated with parking is assumed to be negligible.

Any new 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 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.

F. CONCLUSION

The Proposed Action would create an increased demand on energy systems including electricity and gas. However, relative to the capacity of these systems and the current levels of service within New York City, this increased energy demand would be minor. Moreover, the annual increase in demand expected to result from the Proposed Action would represent a negligible amount of the city's forecasted annual energy requirements for 2020. Electrical and gas connections are readily available in the local streets. Any new development under the Proposed Action would be required to comply with the *New York State Conservation Construction Code*.

For these reasons, the Proposed Action would not result in a significant adverse impact on energy systems. ✷