2.L ENERGY

INTRODUCTION

An energy analysis focuses on a project's consumption of energy and, where relevant, potential effects on the transmission of energy that may result from the project. The assessment is of the energy sources typically used in a project's operation (HVAC, lighting, etc.) and includes electricity, fossil fuels, nuclear power, hydroelectric power, and, occasionally, other fuels like wood, solid waste, or other combustible materials.

According to the *CEQR Technical Manual*, an EIS must include a discussion of the effects of the proposed project on the use and conservation of energy, if applicable and significant. In most cases, a project does not need a detailed energy assessment, as such an assessment is limited to projects that may significantly affect the transmission or generation of energy (or that result in substantial indirect consumption of energy, such as a new roadway). For other projects, in lieu of a detailed assessment, the *CEQR Technical Manual* recommends disclosure of the estimated amount of energy that would be consumed annually as a result of the day-to-day operation of the buildings and uses resulting from an action.

PRINCIPAL CONCLUSIONS

The Proposed Action would not have a significant adverse impact on energy consumption. All new buildings constructed within the proposed rezoning area would be subject to the New York City Energy Conservation Code and any other applicable regulations regarding energy conservation measures. The Proposed Action would increase the area's annual energy consumption by an estimated 211.36 billion BTUs, which is insignificant in the context of the City's energy use as a whole.

METHODOLOGY

This section has been prepared following the guidance of the *CEQR Technical Manual*, which requires detailed energy assessments for projects that may significantly affect the transmission or generation of energy. As a residential and commercial development project, the Proposed Action would not require a detailed assessment. This chapter therefore calculates the annual energy of the properties that are anticipated to be affected by the proposed rezoning (i.e. the projected Development Sites) under existing conditions, future analysis year conditions without the Proposed Action, and future analysis year conditions with the Proposed Action, and the net change in energy consumption (which represents the Proposed Action's anticipated effect on energy use).

Under the reasonable worst case development scenario (RWCDS) identified in Chapter 1: Project Description, the proposed rezoning area would generate 2,745,527 square feet of residential floor area, 131,869 square feet of commercial space, and 11,888 square feet of community facility (day care) space. All industrial uses on the projected Development Sites would be displaced (a decrease over existing conditions of 392,523 square feet of floor area). These floor areas were used as the basis of the future action condition analysis (see Table L-6). The existing conditions analysis is based on floor areas, by land use, as identified in the RWCDS in Chapter 1: Project Description. Energy use was calculated separately for the Development Sites controlled by the applicant (broken down between the Large Scale General Development Sites and the non-LSGD Sites) and for the non-applicant controlled Development Sites.

The measure of energy use in this chapter is British Thermal Units, or BTUs, per square foot of build floor area per year. One BTU is the quantity of heat required to raise one pound of water by one degree Fahrenheit. Operational energy is calculated in BTUs for each project element. The floor area numbers

are taken from the Department of City Planning's Primary Land Use Tax Lot Output (PLUTO) database and building uses were verified by field survey and information that the applicant provided about its properties.

The *CEQR Technical Manual* identifies several different methods for calculating energy use of existing and proposed buildings. If feasible, based on knowledge of a project's site design and the applicant's control over the Development Site(s), energy consumption should be estimated by the project engineers or by using an energy modeling tool such as eQuest, Trace, HAP, or DOE-2. Such programs calculate a building's energy use by analyzing energy requirements of various building systems. If a project would rezone an area where projected development would occur on Development Sites not controlled by the applicant, detailed energy modeling would not likely be possible. For Development Sites not controlled by the applicant, or for proposed buildings that are not far enough along in the design stage to provide enough details for energy modeling, it is appropriate to estimate the project's energy consumption based on Table 15-1 in the *CEQR Technical Manual.* Table 15-1 provides the average annual energy consumption rates for various land uses.

The Proposed Action is a rezoning of an area that is not entirely controlled by the applicant. In addition, information available on the buildings projected for the applicant's Development Sites is not sufficiently detailed to utilize energy modeling software to project energy use on these properties. Therefore, this chapter uses the *CEQR Technical Manual*'s Table 15-1 to estimate annual energy consumption.

EXISTING CONDITIONS

The total floor areas by land use for all existing, occupied buildings on projected Development Sites within the proposed rezoning area are presented in Table L-1. As Table L-2 shows, the current annual energy use within the proposed rezoning area is about 168 billion BTUs.

Table L-1: Floor Area: Existing Conditions

	Floor Area (sf)			
	Commercial	Industrial	Institutional	Large Residential
Applicant Sites:				
LSGD Sites	0	83,407	0	0
Non-LSGD Sites	0	42,500	0	0
Subtotal, Applicant Sites	0	125,907	0	0
Non-Applicant Sites:	15,000	170,113	0	5,271
Grand Total, All Sites	15,000	296,020	0	5,271

Table L-2: Annual Energy Consumption: Existing Conditions

	Estimated Annual BTU Usage				
	Commercial	Industrial	Institutional	Large Residential	Total
Applicant Sites:					
LSGD Sites	0	46,232,500,100	0	0	**46,232,500,100**
Non-LSGD Sites	0	23,557,750,000	0	0	**23,557,750,000**
Subtotal, Applicant Sites	0	69,790,250,100	0	0	**69,790,250,100**
Non-Applicant Sites:	3,244,500,000	94,293,635,900	0	667,835,700	**98,205,971,600**
Grand Total, All Sites	3,244,500,000	164,083,886,000	0	667,835,700	**167,996,221,700**

Source for estimated BTU usage by land use: CEQR Technical Manual *Table 15-1*

FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION

If the Proposed Action is not taken, it is anticipated that only one Development Site, Site 9C, at the northern edge of the rezoning area would be redeveloped and that a new accessory building would be constructed on one other Development Site. The new accessory building would be a 4,960 square foot contractor's shed on Site 6B. On Site 9C, a new building with approximately 134,000 square feet of residential floor area and 39,000 square feet of ground floor retail space would replace the hotel, 40,390 square feet that was classified as industrial for purposes of the existing conditions computation, and a surface parking lot accessory to the hotel. As is shown in Table L-4, annual energy use is expected to increase to increase to approximately 193 billion BTUs in the future without the Proposed Action, a net increase of 24.89 billion BTUs over the existing condition.

Table L-3: Floor Area: Future Conditions without the Proposed Action

	Floor Area (sf)			
	Commercial	Industrial	Institutional	Large Residential
Applicant Sites:				
LSGD Sites	0	83,407	0	0
Non-LSGD Sites	0	42,500	0	0
Subtotal, Applicant Sites	0	125,907	0	0
Non-Applicant Sites:	38,928	176,073	0	139,183
Grand Total, All Sites	38,928	301,980	0	139,183

Table L-4: Annual Energy Consumption: Future Conditions without the Proposed Action

	Estimated Annual BTU Usage				
	Commercial	Industrial	Institutional	Large Residential	Total
Applicant Sites:					
LSGD Sites	0	46,232,500,100	0	0	**46,232,500,100**
Non-LSGD Sites	0	23,557,750,000	0	0	**23,557,750,000**
Subtotal, Applicant Sites	0	69,790,250,100	0	0	**69,790,250,100**
Non-Applicant Sites:	8,420,126,400	97,597,263,900	0	17,634,526,644	**123,651,916,944**
Grand Total, All Sites	8,420,126,400	167,387,514,000	0	17,634,526,644	**193,442,167,044**

Source for estimated BTU usage by land use: CEQR Technical Manual *Table 15-1*

FUTURE CONDITIONS WITH THE PROPOSED ACTION

If the Proposed Action is taken, considerable redevelopment would be expected to occur, with new residential and mixed residential and retail buildings replacing many of the existing industrial and automotive uses. On Site 9C, which would be developed under future no-action conditions, a larger building would be constructed in the future with the Proposed Action. The industrial accessory building identified under the no-action scenario would not be constructed, as it is located on a projected Development Site that would be cleared and redeveloped as-of-right under the proposed rezoning. Under the reasonable worst case development scenario (RWCDS) identified in Chapter 1: Project Description, the proposed rezoning area would generate 2,745,527 square feet of residential floor area, 131,869 square feet of commercial space, and 11,888 square feet of community facility (day care) space. All industrial uses on the projected Development Sites would be displaced (a decrease over existing conditions of 392,523 square feet of floor area). As Table L-6 shows, annual energy use would increase to

approximately 379.3 billion BTUs. Of this, 177.1 billion BTUs of energy would be used by the applicant-controlled Development Sites (116.7 billion BTUs on the Large Scale General Development Sites and 60.34 billion BTUs on the applicant's other Development Sites). An additional 202.2 billion BTUs would be used by the projected Development Sites that are not controlled by the applicant.

The net effect of the Proposed Action would therefore be an increase of approximately 211.36 billion BTUs a year in operational energy consumption over future no-action conditions. In the context of New York City's overall energy consumption, the increase would not be significant. The annual incremental demand on an hourly basis would represent a tiny fraction of the city's forecasted 12,510MW peak summer electricity load in 2020[1] and a very small fraction (0.19 percent) of the city's forecasted 2020 annual energy demand of 57,385 GWh (195,805,748,000,000 BTUs)[2]. (Projections for the Proposed Action's analysis year of 2022 were not available at the time of this writing.)

Table L-5: Floor Area: Future Action Conditions

	Floor Area (sf)			
	Commercial	Industrial	Institutional	Large Residential
Applicant Sites:				
LSGD Sites	18,493	0	11,888	866,514
Non-LSGD Sites	27,540	0	0	429,300
Subtotal, Applicant Sites	46,033	0	11,888	1,295,814
Non-Applicant Sites:	85,836	0	0	1,449,713
Grand Total, All Sites	131,869	0	11,888	2,745,527

Table L-6: Annual Energy Consumption: Future Action Conditions

	Estimated Annual BTU Usage				
	Commercial	Industrial	Institutional	Large Residential	Total
Applicant Sites:					
LSGD Sites	4,000,035,900	0	2,980,321,600	109,787,323,800	**116,767,681,300**
Non-LSGD Sites	5,956,902,000	0	0	54,392,310,000	**60,349,212,000**
Subtotal, Applicant Sites	9,956,937,900	0	2,980,321,600	164,179,633,800	**177,116,893,300**
Non-Applicant Sites:	18,566,326,800	0	0	183,678,662,440	**202,244,989,240**
Grand Total, All Sites	28,523,264,700	0	2,980,321,600	347,858,296,240	**379,361,882,540**

Source for estimated BTU usage by land use: CEQR Technical Manual *Table 15-1*

Any development constructed as a result of the Proposed Action would comply with the New York State Energy Conservation Construction Code. This code governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope. The current code, promulgated on January 1, 2008, pursuant to Article 11 of the Energy Law of the State of New York, requires that new and recycled buildings (both public and private) be designed to ensure adequate thermal resistance to heat loss and infiltration. In addition, the code provides requirements for the design and selection of mechanical, electrical, and illumination systems. In compliance with the code, any building constructed would incorporate all required energy conservation measures, including meeting the code's requirements relating to energy efficiency and combined thermal transmittance.

[1] NYISO Comprehensive Reliability Planning Process (CRPP) 2010 Reliability Needs Assessment Report, September, 2010, p. C-12.
[2] *Ibid.*, p. C-4

Additionally, as described in Chapter 2O, "Greenhouse Gas Emissions," the Proposed Project (i.e., the Development Sites controlled by the applicant) would include a number of measures aimed at reducing energy consumption.

CONCLUSIONS

The Proposed Action would result in considerable redevelopment within the proposed rezoning area, with more than 2.5 million square feet of new residential space as well as new commercial space anticipated, and this would increase the area's annual energy consumption by an estimated 211.36 billion BTUs over the future no-action condition. In the context of the city's overall energy use, the increase would not be considered significant. Moreover, all new buildings would comply with the requirements of the New York State Energy Conservation Code, incorporating all required energy conservation measures and meeting the Code's energy efficiency and thermal transmittance requirements. Therefore, the Proposed Action would not have a significant adverse impact on energy use or availability.