Chapter 12: Energy

12.1 Introduction

This chapter describes the effects of the Proposed Actions on energy consumption. New building and alteration projects are subject to the New York City Energy Conservation Code (NYCECC), which comprises the 2020 Energy Conservation Construction Codes of New York State (ECCCNYS), in addition to a series of local laws. Therefore, according to the 2021 *City Environmental Quality Review (CEQR) Technical Manual*, a detailed assessment of energy impacts would be limited to projects that may significantly affect the transmission or generation of energy. Most actions resulting in new construction would not create significant energy impacts, and, as such, do not require a detailed energy assessment. However, a proposed action's operational energy consumption should be estimated.

As described in Chapter 1, "Project Description," the New York City Department of City Planning (NYCDCP) is proposing a series of land use actions (collectively, the "Proposed Actions"), including zoning map amendments, zoning text amendments (including mapping a special zoning district and designating Mandatory Inclusionary Housing), and changes to the City Map that would facilitate the implementation of a multi-year planning process conducted in the Parkchester, Van Nest, and Morris Park neighborhoods of the Bronx in partnership with local stakeholders, City agencies, and the Metropolitan Transportation Authority (MTA). Per the Reasonable Worst-Case Development Scenario (RWCDS), the Proposed Actions are expected to result in an incremental development (compared to No-Action conditions) of 7,474 dwelling units (DUs), 1,231,973 gross square feet (gsf) of commercial uses, and 1,290,628 gsf of community facility uses, and a decrease of 405,096 gsf of industrial uses on the 60 projected development sites.

As stated in the *CEQR Technical Manual*, in lieu of a detailed assessment, which is generally limited to actions that may significantly affect the transmission or generation of energy, the amount of energy that would be consumed annually as a result of the day-to-day operation of the buildings and uses resulting from the Proposed Actions is disclosed in this chapter.

12.2 Principal Conclusions

The Proposed Actions would not result in a significant adverse impact related to energy systems. Development assumed in the future with the Proposed Actions (the With-Action condition), would result in increased demand of approximately 1,259 billion British Thermal Units (BTUs) of energy per year as compared with future conditions without the Proposed Actions (the No-Action condition). This incremental increase in annual energy demand would represent approximately 0.72 percent of the City's

forecasted annual energy requirement of 176 trillion BTUs for 2033. The Proposed Actions would generate an incremental increase in energy demand that would be considered negligible when compared with the overall demand within Consolidated Edison's (Con Edison's) New York City and Westchester County service area; therefore, the Proposed Actions are not expected to result in a significant adverse impact on energy systems.

Any new development resulting from the Proposed Actions would be required to comply with the NYCECC, which governs performance requirements of heating, ventilation, and air condition systems, as well as the exterior building envelope of new buildings. In compliance with this code, new development must meet standards for energy conservation, which include requirements related to energy efficiency and combined thermal transmittance. In addition, should there be a voluntary utilization of higher performance standard designs on the projected development sites, there would then be a reduction in the forecast energy load, detailed below. Therefore, no significant adverse impacts related to energy are expected to occur.

12.3 Methodology

To assess the Proposed Actions' 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 without and with the Proposed Actions for the analysis year of 2033, using energy consumption 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 the regional energy supplies.

This chapter calculates the annual energy consumption of the 60 projected development sites identified in the RWCDS for the Proposed Actions under existing, No-Action, and With-Action conditions and the net change in energy consumption, which represents the Proposed Actions' anticipated energy use. Because the calculation of energy demand is a density-based analysis, only anticipated development on the 60 projected development sites forms the basis for this assessment of energy demand.

According to the *CEQR Technical Manual*, if a project such as the Proposed Actions would rezone an area where projected development would occur on development sites not controlled by the applicant, detailed energy modeling would likely not be possible. For such projects, it is appropriate to estimate the project's energy consumption based on Table 15-1 of the *CEQR Technical Manual*, which provides the average annual energy consumption rates in New York City for various land uses. Therefore, this chapter uses the *CEQR Technical Manual*'s Table 15-1 to estimate annual energy consumption as a result of the Proposed Actions. The measure of energy use in this chapter is BTUs per square foot (sf) of building floor area per

year.[1] The assumptions utilized in calculating energy consumption for the existing conditions were also applied to the projected development sites under the No-Action and With-Action conditions.

12.4 Existing Conditions

ENERGY SUPPLY AND TRANSMISSION

Within New York City, electricity is generated and delivered to most users by Con Edison as well as a number of independent power companies. Electrical energy in New York City is drawn 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 (including hydroelectricity and—to a much lesser extent—biomass fuels, solar power, and wind power). Electricity consumed in New York City is generated in various locations, including sites within New York City, locations across the Northeast, and Canada.

Con Edison distributes power throughout New York City and Westchester County, for a total service area of approximately 660 square miles, serving a population of over nine million people. 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 the street "grid." Within the grid, voltage is further reduced for delivery to customers. Each substation serves one or more distinct geographic areas, called networks, which are isolated from the rest of the local distribution system. If service is lost at a specific substation or substations, the network functions to isolate any problems from other parts of the City. Substations are also designed to have sufficient capacity for the network to grow.

Con Edison currently owns 63 area distribution substations and various distribution facilities located throughout New York City and Westchester County. As of the end of 2022, Con Edison's distribution system had a transformer capacity of 33,703 mega volt ampere (MVA), with 37,489 miles of overhead distribution lines and 98,434 miles of underground distribution lines.[2] The underground distribution lines represent the longest underground electric delivery system in the country. In 2022, annual electricity usage in Con Edison's service area totaled approximately 53,020 million kilowatt hours (KWH), or 180.9 trillion BTUs. In addition, Con Edison supplied approximately 166,516 thousand dekatherms (MDt), the equivalent of 166.5 trillion BTUs, of natural gas, and approximately 17,427 million pounds (MMlb), the equivalent of 20.8 trillion BTUs, of steam in 2022.[3] Overall, approximately 368.2 trillion BTUs of energy was consumed in 2022 within Con Edison's New York City and Westchester County service area. Con Edison is required by North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC), and New York State Reliability Council (NYSRC) rules to maintain its

[1] One BTU is the quantity of heat required to raise one pound of water by one degree Fahrenheit.
[2] Con Edison, *2022 Annual Report.*
[3] Ibid

transmission system so as to achieve the following: survive the two worst (non-simultaneous) contingencies that will not result in equipment loading exceeding the designated emergency rating of that equipment, will not result in the loss of any customer service, and— following corrective actions—will not result in equipment loading that exceeds the designated normal rating of that equipment.

RECENT ENERGY CONSERVATION DIRECTIVES

In December 2009, the City Council passed four laws, collectively known as the Greener, Greater Buildings Plan (GGBP), that required energy efficiency upgrades and energy transparency in large existing buildings. Specifically, these laws call for annual benchmarking, energy audits, retro-commissioning, lighting upgrades, and sub-metering of commercial tenant space. Three out of these four laws only affect the City's 16,000 largest properties, both public and private, that comprise half of the built area in the City. Through the enactment of one of those laws, beginning in 2011, privately owned buildings over 50,000 sf were required to submit reports of energy performance measurements in a process called "benchmarking." Though buildings of this size represent just two percent of the total number of buildings in the City, they are responsible for approximately 45 percent of total energy consumption, making this law both targeted and high impact.

In 2018, Local Law 32 was introduced to amend the administrative code of New York City in relation to requiring periodic recommendations on adoption of more stringent energy efficiency requirements for certain buildings. Local Law 32 mandates that the City amend the NYCECC to align it with the latest version of the New York Stretch Energy Code developed by the New York State Energy Research and Development Authority (NYSERDA). In 2020, Local Law 48 of 2020 was adopted with the goal to bring the NYCECC up to date with the 2020 ECCNYS, which is based on the 2018 edition of the International Energy Conversation Code and ASHRAE Standard 90.1-2016, and also aligns with the NYSERDA NYStretch Energy Code-2020 as required by Local Law 32 of 2018. Local Law 48 of 2020 continues to ensure that the construction of new buildings, additions and alterations will meet the 80 percent greenhouse gas reduction goal by 2050.

As discussed in Chapter 2, "Land Use, Zoning, and Public Policy," the Affected Area is subject to the goals of OneNYC. OneNYC is the Mayor's plan to promote growth, sustainability, resiliency, and equity as the City seeks to address the challenges of climate change with a multifaceted approach. In order to make New York City one of the most sustainable big cities in the world, one of the stated goals of OneNYC, NYCDCP is working to reduce New York City's energy consumption and its contribution to climate change. One of the most ambitious goals of OneNYC is to reduce greenhouse gas emissions by 80 percent by 2050, which includes requiring substantial shifts in the City's power generation system and reduction of the carbon footprint of buildings.

EXISTING DEMAND

In estimating the existing annual energy consumption at the projected development sites, the rates provided in Table 15-1 of the *CEQR Technical Manual* were utilized. As presented in Table 12-1, "Annual

Existing Energy Consumption – Projected Development Sites," current annual energy use on the 60 projected development sites is estimated to be approximately 434.7 billion BTUs for all heating, cooling, and electric power. This is equivalent to less than 0.12 percent of the total annual energy consumption in 2022 within Con Edison's New York City and Westchester County service area.

Table 12-1: Annual Existing Energy Consumption – Projected Development Sites

Land Use	Floor Area (sf)	Average Annual Energy Use Rate (Thousand BTU (MBTU)/sf/yr)[1]	Existing Annual Energy Use (MBTU)
Commercial[2]	946,520	216.3	204,732,276
Industrial[3]	389,967	554.3	216,158,708
Institutional[4]	26,840	250.7	6,728,788
Small Residential (1-4 Family)	19,889	94	1,869,566
Large Residential (>4 Family)	41,225	126.7	5,223,208
		TOTAL MBTU	**434,712,546**
		(billion BTUs)	***434.7***

Notes:

[1] From Table 15-1, "*Average Annual Whole-Building Energy Use in New York City*" of the 2021 *CEQR Technical Manual.*

[2] Includes local retail, office, garage, and self storage uses.

[3] Includes manufacturing, auto-related, and warehouse uses.

[4] Includes all community facility uses (educational, medical office, house of worship).

Source: 2021 *CEQR Technical Manual* .

12.5 The Future without the Proposed Actions (No-Action Condition)

Energy consumption under the No-Action condition would increase compared to existing conditions. Annual energy consumption estimates for each use under No-Action conditions are provided in Table 12-2, "No-Action Annual Energy Consumption – Projected Development Sites." As shown in the table, energy demand from the 60 projected development sites is estimated to be approximately 581.2 billion BTUs of energy annually under the No-Action condition.

Table 12-2: No-Action Annual Energy Consumption – Projected Development Sites

Land Use	Floor Area (sf)	Average Annual Energy Use Rate (Thousand BTU (MBTU)/sf/yr)[1]	Existing Annual Energy Use (MBTU)
Commercial[2]	1,243,250	216.3	268,915,077
Industrial[3]	405,096	554.3	224,544,974
Institutional[4]	229,777	250.7	57,605,079
Small Residential (1-4 Family)	22,099	94	2,077,296
Large Residential (>4 Family)	221,789	126.7	28,100,611
		TOTAL MBTU	**581,243,036**
		(billion BTU)	***581.2***

Notes:

[1] From Table 15-1, "*Average Annual Whole-Building Energy Use in New York City*" of the 2021 *CEQR Technical Manual.*

[2] Includes local retail, office, garage, and self storage uses.

[3] Includes manufacturing, auto-related, and warehouse uses.

[4] Includes all community facility uses (medical office, house of worship).

Source: 2021 *CEQR Technical Manual*.

According to the New York Independent Systems Operator's (NYISO) 2022 Load and Capacity Data report, annual energy requirements for the 2033 Analysis Year are forecast to be approximately 157,910 gigawatt hours (GWh). Of this forecast annual energy demand, 51,572 GWh (or approximately 176 trillion BTUs) is expected to come from Zone J, which includes New York City. The anticipated 581.2 billion BTUs of annual energy consumption due to anticipated development on the projected developments sites under the 2033 No-Action condition therefore represents approximately 0.33 percent of New York City's forecasted future total annual energy demand.

12.6 The Future with the Proposed Actions (With-Action Condition)

Table 12-3, "No-Action Annual Energy Consumption – Projected Development Sites," presents the land uses as anticipated under With-Action condition on the 60 projected development sites under the RWCDS, as well as their associated annual energy demands. As indicated in Table 12-3, "No-Action Annual Energy Consumption – Projected Development Sites," it is estimated that energy demand from the 60 projected development sites would total approximately 1,840.4 billion BTUs of energy annually. This represents an increase of approximately 1,259 billion BTUs over the No-Action condition. This incremental increase in annual energy demand would represent approximately 0.72 percent of the City's forecasted annual energy requirement of 176 trillion BTUs for 2033; therefore, the Proposed Actions are not expected to result in a significant adverse impact on energy systems.

Table 12-3: No-Action Annual Energy Consumption – Projected Development Sites

Land Use	Floor Area (sf)	Average Annual Energy Use Rate (Thousand BTU (MBTU)/sf/yr)[1]	Existing Annual Energy Use (MBTU)
Commercial[2]	2,475,223	216.3	535,390,642
Industrial[3]	0	554.3	0
Institutional[4]	1,520,405	250.7	381,165,443
Small Residential (1-4 Family)	0	94	0
Large Residential (>4 Family)	7,291,654	126.7	923,852,562
		TOTAL MBTU	**1,840,408,647**
		(billion BTU)	***1,840.4***

Notes:

[1] From Table 15-1, "*Average Annual Whole-Building Energy Use in New York City* " of the 2021 *CEQR Technical Manual.*

[2] Includes local retail, office, and life sciences uses.

[3] Includes manufacturing, auto-related, and warehouse uses.

[4] Includes all community facility uses (medical office, house of worship, education).

Source: 2021 *CEQR Technical Manual* .

Any new developments resulting from the Proposed Actions would be required to comply with the NYCECC, 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, new development must meet standards for energy conservation, which include requirements relating to energy efficiency and combined thermal transmittance. In addition, should there be a voluntary utilization of higher performance standard designs on the projected development sites, there would then be a reduction in the forecast energy load as shown in Table 12-3, “No-Action Annual Energy Consumption – Projected Development Sites.”

Based on the above information, no significant adverse energy impacts would result from the Proposed Actions.