

A. 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 is usually limited to projects that may significantly affect the transmission or generation of energy. Most projects resulting in new construction would not create significant energy impacts, and, as such, do not require a detailed energy assessment. However, a proposed project's operational energy consumption should be estimated.

As described in Chapter 1, "Project Description," the Applicant is seeking discretionary approvals to facilitate the development of the Western Rail Yard (Block 676, Lots 1 and 5) in the Hudson Yards neighborhood of Manhattan (the "WRY Site" or the "Development Site") with approximately 6.2 million gross square feet of new mixed use development including a gaming facility and hotel resort complex and residential, commercial, and community facility space, as well as new public open space (the "Proposed Project"). The Applicant is also presenting for environmental analysis purposes an Alternative Scenario without the gaming facility that reflects a similar density and the same open space configuration as the Proposed Project. The scenario that would result in the more conservative analysis is analyzed for each technical area. For this assessment of energy, the Proposed Project is analyzed because this scenario is estimated to consume more energy in the 2031 analysis year than the Alternative Scenario. 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 Project is disclosed in this chapter.

The development resulting from the Proposed Actions would be subject to New York City's energy efficiency and carbon intensity regulations and is anticipated to result in more energy efficient buildings. The commitment for buildings to use fully electric heating, ventilation, and air conditioning (HVAC) and hot water systems would result in estimated energy consumption being reduced substantially when compared to the City's energy consumption factors for buildings that utilize fossil fuel-fired systems. In addition, the development resulting from the Proposed Actions, as well as the No Action development, would be required to comply with the NYCECC, which imposes performance requirements for HVAC 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.

PRINCIPAL CONCLUSIONS

This analysis finds that the annual energy consumption for the With Action condition would not result in a significant adverse impact related to energy. In the 2031 analysis year, the Proposed Project is expected to result in an energy demand of approximately 660,718 million British thermal units (MMBTUs) of energy per year (approximately 0.003 percent of New York City's forecast future total annual energy demand). This represents an increase of approximately 403,439 MMBTUs compared with the No Action condition. The Proposed Project 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. In addition, in the future without or with the Proposed Actions, a new 45,000-gsf LIRR electrical facility would be developed on the WRY Site, to feed remote LIRR buildings, lighting and ventilation under the WRY platform, as well as ancillary systems. This electrical facility, as well as the existing LIRR electrical facility on the Eastern Rail Yard (ERY) site directly east of the Development Site, would meet LIRR's energy needs in the project area. Therefore, the Proposed Actions would not result in a significant adverse impact related to energy.

B. METHODOLOGY

To assess the potential impact of the Proposed Actions on energy, this chapter calculates the annual energy consumption of the Development Site under existing and With Action conditions as well as the net change in energy consumption, which represents the anticipated energy use in the future with the Proposed Actions. More particularly, this chapter:

- Presents data on the existing energy distribution system;
- Determines future thermal demands for the Proposed Project in 2031. Thermal demand is conservatively based on an estimate of energy consumption rates for typical buildings using fossil fuel fired HVAC and hot water systems within the New York City region reported in the latest energy consumption information collected by the US Energy Information Administration (EIA) for residential¹ and commercial² buildings;
- Determine the future electrical consumption with the fully electric Proposed Project for 2031. Electrical consumption is based on the estimated thermal demands and minimum performance ratings for a fully electric system; and
- Assesses the effects of this energy demand on the local distribution system and regional energy supplies.

As discussed in Chapter 16, "Greenhouse Gas Emissions and Climate Change," the Applicant would also comply with the applicable requirements of New York City's Climate Mobilization Act that are in effect at the time of construction of the With Action condition.

¹ EIA. *2020 Residential Energy Consumption Survey (RECS) Data*.
<https://www.eia.gov/consumption/residential/data/2020/>

² EIA. *2018 Commercial Building Energy Consumption Survey (CBECS) Data*.
<https://www.eia.gov/consumption/commercial/data/2018/>

Because the Applicant would exclusively use electric HVAC and hot water systems at the Development Site, the energy consumption factors specified in Table 15-1 of the *CEQR Technical Manual*, which are derived from typical New York City building data compiled for calendar year 2008 for the *2009 Inventory of New York City Greenhouse Gas Emissions*, would not be representative of Proposed Project buildings. Therefore, energy consumption for the With Action condition was estimated using federal building energy consumption information in place of the *CEQR Technical Manual*.

To estimate the annual energy consumption associated with the HVAC and hot water systems in the With Action condition, the thermal demand requirements of typical New York City buildings by use was estimated based on annual fuel consumption records for existing buildings with HVAC and hot water systems primarily using natural gas (as a more conservative estimate). The analysis assumed the systems would have a 98 percent efficiency factor to estimate conservatively high energy requirements to provide the buildings with the estimated thermal demand. Consequently, buildings were estimated to require a thermal demand between 25 to 49 kBTU per square foot of development dependent on the use.

New York State's Climate Action Council (CAC) has identified several pathways for building electrification that would include wide adoption of heat pump technology and has identified the use of air-source heat pumps (ASHPs) as the most feasible technology for buildings to use. Therefore, the electrical energy consumed to provide heating and hot water services was estimated assuming the use of electrical-powered air source heat pumps (ASHPs) that would meet federal performance standards for heat pumps with a minimum coefficient of performance (COP) for heating of 2.4. Estimates of electrical consumption associated with other uses (including air conditioning, lighting, appliances, etc.) were also included in the total energy consumption rates.

C. EXISTING CONDITIONS

ENERGY GENERATION

Within New York City, electricity is generated and delivered to most users by Con Edison, although some of the electricity delivered by Con Edison is generated by independent power producers. 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 and natural gas) and renewable sources (such as 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 places as far away as Canada.

Con Edison distributes power throughout New York City and Westchester County, for a total service area of approximately 600 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

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problems from other parts of the city. Substations are also designed to have sufficient capacity for the network to grow.

Con Edison currently has 62 area distribution substations and various distribution facilities located throughout New York City and Westchester County. As of the end of 2018, Con Edison's distribution system had a transformer capacity of 32,872 mega volt ampere (MVA), with 34,399 miles of overhead distribution lines and 96,307 miles of underground distribution lines. The underground distribution lines represent the longest underground electric delivery system in the country. As of 2022, the total Con Edison New York City generation capacity was 9,593 megawatts (MW),³ and annual electricity usage in Zone J of Con Edison's service area (which includes New York City) totaled approximately 54,142 GigaWatt hours (GWh), or 185 trillion BTU. 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 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 2019, the New York City Council enacted the Climate Mobilization Act—a legislative package targeting increased energy efficiency, utilization of roof space for installation of solar energy sources/green roofing, and reductions in GHG emissions associated with building energy use in order to meet the City's climate change goals. The legislation aims to reduce buildings' greenhouse gas emissions, which currently account for approximately 70 percent of the citywide total, by 40 percent in 2030 and 80 percent by 2050 by compelling building owners to retrofit existing buildings and developers to design new buildings that are more energy efficient or be subject to prescribed financial penalties. The Climate Mobilization Act also established the Office of Building Energy and Emissions Performance at the New York City Department of Buildings (DOB), which oversees implementation of the law, the creation of a method to assess building energy use, and development of a set of rules for establishing emissions limits.

Furthermore, in 2020, the City brought the NYCECC up to date by adopting the 2020 ECCCNY, which substantially increased the stringency of the building energy efficiency requirements and adopted the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) 90.1-2016 standard as a benchmark, and aligns with NYStretch Energy Code 2020 developed by New York State Energy Research and Development Authority (NYSERDA). The NYCECC governs performance requirements for HVAC systems, as well as the exterior building envelope of new buildings.

EXISTING ENERGY CONSUMPTION ON THE DEVELOPMENT SITE

The Development Site currently contains a Long Island Rail Road (LIRR) train yard and other LIRR facilities that support the daily operation of LIRR. The current uses of the Development Site require electric power for rail traction power, signal and

³ New York Independent System Operator (NYISO) *Load and Capacity Data* Gold Book, 2022.

communications systems, nighttime yard lighting, and operation of buildings and maintenance operations within the yard. A LIRR electrical facility in the ERY currently feeds traction and signal power and maintenance of equipment, as well as lighting under the ERY platform and ventilation fans in the ERY.

The rail yard is currently open to ambient conditions; as a result, there are no mechanical cooling or ventilation requirements within the rail yard excluding the various service buildings. Other facilities located on the Development Site consume minor amounts of electricity, primarily for exterior and interior lighting.

D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

In the No Action condition, it is anticipated that new mixed-use buildings containing residential, commercial, and community facility space will be constructed on the Development Site. **Table 13-1** presents the land uses anticipated in the No Action condition and their associated annual energy demands. As shown in **Table 13-1**, it is estimated that energy demand from the Development Site will be 257,279, MMBTUs/year in the No Action condition. In the No Action condition, a new LIRR electrical facility would be constructed on the Development Site. The LIRR electrical facility will feed the remote buildings and the lighting and ventilation under the WRY platform, as well as some ancillary systems.

Table 13-1
No Action Annual Energy Consumption for the Development Site

Use	Size (gsf)	Average Annual Energy Rate (kBTUs/sf)	Energy Consumption (MMBTUs/Year)
Residential	2,514,225	27.1	68,135
Community Facility – School	120,000	70.9	8,508
Community Facility – Day Care	10,000	70.9	709
Cultural Space	16,000	21.6	345
Office	2,185,000	77.8	169,993
Retail	164,500	54.5	8,965
Parking	39,250	15.9	624
Total Energy Consumption			257,279,

Notes: sf = square feet
Totals may not sum due to rounding.
kBTU = Thousand BTU
MMBTU = Million BTU
Sources:
2020 *Residential Energy Consumption Survey (RECS) Data*. EIA
2018 *Commercial Building Energy Consumption Survey (CBECS) Data*. EIA
2021 *CEQR Technical Manual*, Table 15-1, "Average Annual Whole-Building Energy Use in New York City."

E. THE FUTURE WITH THE PROPOSED ACTIONS

In the With Action condition, new mixed use buildings containing a hotel resort with gaming and residential, commercial, and community facility space would be constructed on the Development Site. Electrical service to the new buildings would be delivered by Con Edison. **Table 13-2** presents the land uses anticipated in the With Action condition and their associated annual energy demands. As shown, it is estimated that energy

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demand from the Development Site would be 660,718 MMBTUs/year in the With Action condition.

In the With Action condition (either scenario), as in the No Action condition, a new LIRR electrical facility would be constructed on the Development Site. The LIRR electrical facility will feed the remote buildings and the lighting and ventilation under the WRY platform, as well as some ancillary systems.

Table 13-2
With Action Annual Energy Consumption for the Development Site

Use	Size (gsf)	Average Annual Energy Rate (kBTUs/sf)	Energy Consumption (MMBTUs/Year)
Residential	1,208,623	27.1	32,753
Community Facility – School	120,000	70.9	8,508
Community Facility – Day Care	10,000	70.9	709
Cultural Space	16,000	21.6	345
Office	2,179,899	77.8	169,596
Retail – Non-Resort	24,638	54.5	1,342
Hotel Resort with Gaming	2,667,400	167	445,455
Parking	126,432	15.9	2,010
Total Energy Consumption			660,718

Notes: sf = square feet
Totals may not sum due to rounding.
kBTU = Thousand BTU
MMBTU = Million BTU

Sources:
2020 Residential Energy Consumption Survey (RECS) Data. EIA
2018 Commercial Building Energy Consumption Survey (CBECS) Data. EIA
2021 CEQR Technical Manual, Table 15-1, "Average Annual Whole-Building Energy Use in New York City."
2024 Wynn Resorts, Average Annual Energy Rate at Encore Boston Harbor

According to the New York Independent Systems Operator’s (NYISO) 2022 *Load and Capacity Data* report,⁴ annual energy requirements for the 2031 build year are forecast to be approximately 180,640 GWh (or 616 trillion BTU). Of this forecasted annual energy demand, 59,344 GWh (or 202 trillion BTU) is expected to come from Zone J, which includes New York City. The anticipated 660,718 MMBTU use in annual electrical energy consumption under the With Action condition represents approximately 0.003 percent of New York City’s forecast future total annual energy demand. Therefore, the Proposed Actions would not result in a significant adverse impact related to energy. *

⁴ NYISO’s 2022 Load and Capacity Data report forecast annual energy requirements up until 2026, four years before the proposed Build Year (2031) of the Proposed Actions. The forecast energy requirements for 2026 were used as the basis of the With Action conditions.