

**A. INTRODUCTION**

This chapter describes the effects of the Proposed Project 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 2020 *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 Proposed Project is a comprehensive redevelopment initiative centered around Penn Station, which, in the reasonable worst-case development scenario, would result in the development of approximately 20 million square feet (sf) of new, primarily office development, as well as retail and hotel space, on eight development sites, in addition to the reconstruction and expansion of Penn Station. For analysis purposes, this Environmental Impact Statement (EIS) assesses an interim analysis year (Phase 1) of 2028 and a final analysis year (Phase 2) of 2038.

As stated in the *CEQR Technical Manual*, in lieu of a detailed assessment, which is generally limited to projects 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 Project is disclosed in this chapter.

**PRINCIPAL CONCLUSIONS**

This analysis finds that neither Phase 1 nor Phase 2 of the Proposed Project would result in a significant adverse impact related to energy. As presented in this analysis, the energy demand for each phase of the Proposed Project represents the total incremental increase in energy consumption between the Future without the Proposed Project (the No Action condition) and the Future with the Proposed Project (the With Action condition) in the applicable analysis year.

In the 2028 Phase 1 analysis year, the Proposed Project is expected to result in a decrease in energy demand of approximately 147,956 thousand British thermal units (MBTUs) of energy per year in the 2028 analysis year. Therefore, Phase 1 of the Proposed Project would not result in a significant adverse impact related to energy.

With the completion of the Proposed Project in 2038, the Proposed Project is projected to result in an incremental increase in demand of approximately 2,220,826 MBTUs of energy per year by the 2038 analysis year. This represents approximately 0.001 percent of the City's forecasted annual energy requirement of 189 trillion BTU.

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In addition, the Proposed Project would be required to comply with the NYCECC, which governs performance requirements of heating, ventilation, and air conditioning (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. Therefore, Phase 2 of the Proposed Project would not result in a significant adverse impact related to energy.

### **B. METHODOLOGY**

To assess the potential impact of the Proposed Project 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 Project for 2028 and 2038, using energy consumption rates for typical land uses provided in Table 15-1 of the *CEQR Technical Manual*; and
- Assesses the effects of this incremental energy demand on the local distribution system and regional energy supplies.

This chapter calculates the annual energy consumption of the development sites under existing, No Action, and With Action conditions and the net change in energy consumption for each analysis year, which represents the Proposed Project's anticipated energy use. In accordance with *CEQR Technical Manual* methodology, this chapter uses the *CEQR Technical Manual's* Table 15-1 to estimate annual energy consumption as a result of the Proposed Project. The measure of energy used in this chapter is BTU per square foot of building floor area per year. The assumptions utilized in calculating energy consumption for the existing conditions were also applied to the development sites under the No Action and With Action conditions.

### **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. Most of the electricity that Con Ed Delivers to MTA in New York City currently is generated by the New York Power Authority (NYPA), a New York State public-benefit corporation. 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 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 2019, Con Edison's distribution system had a transformer capacity of 32,812 mega volt ampere (MVA), with 37,059 miles of overhead distribution lines and 97,844 miles of underground distribution lines.<sup>1</sup> The underground distribution lines represent the longest underground electric delivery system in the country. In 2019, the total capacity of energy generating resources in Zone J of Con Edison's service area (which includes New York City) was 9,591.6 megawatts (MW), and annual electricity usage in the area totaled approximately 52,003 GigaWatt hours (GWh), or 177 trillion BTUs.<sup>2</sup>

### **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 landlords 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 will oversee 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 of heating, ventilation, and air conditioning (HVAC) systems, as well as the exterior building envelope of new buildings.

### **EXISTING ENERGY CONSUMPTION ON THE DEVELOPMENT SITES**

As described in Chapter 1, "Project Description," the development sites are currently developed with 4,048,290 gross square feet (gsf) of commercial space, 190,710 gsf of community facility space, and 82,518 gsf of residential space. For analysis purposes, the retail uses are assumed to consume energy at the commercial building type rate (216,300 BTUs/sf/year); the community facility uses are assumed to consume energy at the institutional building type rate (250,700 BTUs/sf/year); and the residential uses are assumed to consume energy at the large residential (>4 family) building type rate (126,700 BTUs/sf/year), as defined in Table 15-1 of the *CEQR*

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<sup>1</sup> Con Edison 2019 Annual Report.

<sup>2</sup> New York Independent System Operator (NYISO) *Load and Capacity Data Gold Book*, 2020. Table I-2: *Baseline Annual Energy, Historical & Forecast* and Table III-3a: *Existing Summer Capability by Zone and Type*.

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*Technical Manual*. Therefore, as detailed in **Table 13-1**, the existing energy consumption on the development sites is approximately 933,911 MBTUs per year.

**Table 13-1**  
**Existing Annual Energy Consumption for the Development Sites**

Use	Size (gsf)	Average Annual Energy Rate (MBTUs/sf)	Energy Consumption (MBTUs/Year)
Commercial	4,048,290	216.3	875,645
Community Facility	190,710	250.7	47,811
Large Residential (>4 family)	82,518	126.7	10,455
<b>Total Energy Consumption</b>			<b>933,911</b>
<b>Notes:</b> sf = square feet. Totals may not sum due to rounding. MBTU = Thousand BTU <b>Source:</b> 2020 <i>CEQR Technical Manual</i> , Table 15-1, "Average Annual Whole-Building Energy Use in New York City."			

**D. FUTURE WITHOUT THE PROPOSED PROJECT 2028**

For the future without the Proposed Project (the No Action condition) in 2028, it is assumed that development will occur on Site 7. Development on Sites 1 through 6 and 8 is not anticipated by 2028, and it is assumed that existing conditions on these sites will remain in the No Action condition. New development on Site 7 will result in the demolition of the existing Hotel Pennsylvania and construction of an approximately 1.6 million-gsf building containing office and retail space. The other development sites are expected to remain in their existing condition. **Table 13-2** presents the land uses anticipated in the 2028 No Action condition and their associated annual energy demands. As shown, it is estimated that energy demand from the development sites would be 909,686 MBTUs per year.

**Table 13-2**  
**No Action Annual Energy Consumption for Development Sites 2028**

Use	Size (gsf)	Average Annual Energy Rate (MBTUs/sf)	Energy Consumption (MBTUs/Year)
Commercial	3,936,290	216.3	851,420
Community Facility	190,710	250.7	47,811
Large Residential (>4 family)	82,518	126.7	10,455
<b>Total Energy Consumption</b>			<b>909,686</b>
<b>Notes:</b> sf = square feet. Totals may not sum due to rounding. MBTU = Thousand BTU <b>Source:</b> 2020 <i>CEQR Technical Manual</i> , Table 15-1, "Average Annual Whole-Building Energy Use in New York City."			

*The Long-Range Transmission Plan: 2018–2028*, issued by Con Edison in October 2018, lays out the plan for the Con Edison transmission system, based on a detailed evaluation of transmission load areas over a ten-year period. As outlined in *The Long-Range Transmission Plan: 2018–2028*, Con Edison anticipated coincident peak demand in the New York City and Westchester County service area to increase to approximately 13,270 MW by 2022 (a 0.2 percent decrease compared to the 2018 estimated peak demand of 13,300 MW) and to increase to 13,540 MW by 2028 (a 1.8 percent increase over the 2018 estimated peak demand).

According to the NYISO 2020 *Load and Capacity Data* report, annual energy requirements for the 2028 analysis year are forecast to be approximately 148,783 GWh (or 508 trillion BTU). Of

this forecast annual energy demand, 48,777 GWh (or 166 trillion BTU) is expected to come from Zone J, which includes New York City.<sup>3</sup> The anticipated 909,686 MBTU use in annual energy consumption due to anticipated development on the projected development sites under the No Action condition represents approximately 0.0005 percent of New York City's forecast future total annual energy demand.

## E. FUTURE WITH THE PROPOSED PROJECT 2028

In the With Action condition in 2028, Site 7 would be redeveloped, the proposed below-grade expansion of Penn Station on Sites 1, 2, and 3 would be completed, and the reconstruction of the existing Penn Station would be completed. Site 7 would be redeveloped with an approximately 2.6 million-gsf building with office space, retail, and accessory parking spaces. A deck would be constructed over the proposed 265,000-sf below-grade expansion of Penn Station on Sites 1, 2, and 3, and the tracks and train platforms would be in use. In addition, a new Penn Station service building is assumed to be completed on Site 2. Besides the new service building for Penn Station, above-grade structures would be cleared from Sites 1, 2, and 3 to allow for construction of the below-grade expansion of Penn Station. Sites 4 through 6 and 8 would remain in their existing conditions.

Electrical service to the Proposed Project's new building on Site 7 would be delivered by Con Edison. To receive electrical service, the future developer of Site 7 would need to submit an electrical load letter to Con Edison, and Con Edison would determine if the electric distribution system in the adjacent streets can serve the proposed demand. If necessary, Con Edison would upgrade the local distribution grid to meet the increased electrical demand.

**Table 13-3** presents the land uses anticipated in the 2028 With Action condition and their associated annual energy demands. As shown, it is estimated that energy demand from the development sites would be 761,730 MBTUs per year. The total incremental energy use between the No Action condition and the With Action condition would be a reduction of 147,956 MBTUs per year. Therefore, Phase 1 of the Proposed Project would not result in a significant adverse impact related to energy.

In addition to the energy demand presented in **Table 13-3**, the potential expansion of Penn Station would also generate energy demand for increased train service and related energy use for the catenary power supply, train hotel power, lighting, and other activities. At this time, the detailed designs and operational plans necessary to estimate energy demand for the potential Penn Station expansion have not been developed.

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<sup>3</sup> These forecasts reflect NYISO's perspective on future energy demand as of April 10, 2020, at the outset of the COVID-19 pandemic.

Table 13-3

**With Action Annual Energy Consumption for the Development Sites 2028**

Use	Size (gsf)	Average Annual Energy Rate (MBTUs/sf)	Energy Consumption (MBTUs/Year)
Commercial	3,256,636	216.3	704,410
Community Facility	0	250.7	0
Large Residential (>4 family)	0	126.7	0
Penn Station Expansion	265,000	216.3	57,312
<b>Total Energy Consumption</b>			<b>761,730</b>
<b>2028 Incremental Energy Consumption</b>			<b>-147,956</b>
<b>Notes:</b> sf = square feet. Totals may not sum due to rounding. MBTU = Thousand BTU <b>Source:</b> 2020 <i>CEQR Technical Manual</i> , Table 15-1, "Average Annual Whole-Building Energy Use in New York City."			

**F. FUTURE WITHOUT THE PROPOSED PROJECT 2038**

For the future without the Proposed Project (the No Action condition) in 2038, it is assumed that Sites 4 and 5 will be redeveloped, in addition to the development of Site 7 in the 2028 No Action condition. Site 4 will be redeveloped with a 1.1 million-gsf mixed-use building with hotel, residential, and retail space, and Site 5 will be redeveloped with an approximately 250,000-gsf office building with ground-floor retail space. As described above, Site 7 will be redeveloped with a 1.6 million-gsf office building with ground-floor retail space. Existing conditions are assumed to continue on the remaining development sites. **Table 13-4** presents the land uses anticipated in the 2038 No Action condition and their associated annual energy demands. As shown, it is estimated that energy demand from the development sites would total 1,256,757 MBTUs per year.

According to the NYISO 2020 *Load and Capacity Data* report, annual energy requirements for the 2038 analysis year are forecast to be approximately 164,444 GWh (or 561 trillion BTU). Of this forecast annual energy demand, 55,502 GWh (or 189 trillion BTU) is expected to come from Zone J, which includes New York City.<sup>4</sup> The anticipated 1,256,757 MBTU use in annual energy consumption due to anticipated development on the projected development sites under the No Action condition represents approximately 0.0007 percent of New York City’s forecast future total annual energy demand.

<sup>4</sup> These forecasts reflect NYISO’s perspective on future energy demand as of April 10, 2020, at the outset of the COVID-19 pandemic.

**Table 13-4**

**No Action Annual Energy Consumption for the Development Sites 2038**

Use	Size (gsf)	Average Annual Energy Rate (MBTUs/sf)	Energy Consumption (MBTUs/Year)
Commercial	4,495,691	216.3	972,418
Community Facility	190,710	250.7	105,711
Large Residential (>4 family)	712,518	126.7	178,628
<b>Total Energy Consumption</b>			<b>1,256,757</b>
<b>Notes:</b> sf = square feet. Totals may not sum due to rounding. MBTU = Thousand BTU <b>Source:</b> 2020 <i>CEQR Technical Manual</i> , Table 15-1, "Average Annual Whole-Building Energy Use in New York City."			

## G. FUTURE WITH THE PROPOSED PROJECT 2038

In the With Action condition in 2038, all components of the Proposed Project are assumed to be complete and operational, including all development sites, all public transportation and public realm improvements, and the reconstruction and expansion of Penn Station. In addition to the development completed by 2028, development between 2028 and 2038 would include Sites 1, 2, 3, 4, 5, 6, and 8 and their associated public transportation and public realm improvements, including a new, approximately 30,800-sf public plaza on Site 2. The development sites would be redeveloped with high-density commercial buildings containing mainly office and ground-floor retail uses, as well as hotel uses on Sites 1 and 4. **Table 13-5** presents the land uses anticipated in the 2038 With Action condition, and their associated annual energy demands. As shown, it is estimated that energy demand from the development sites would total 3,477,583 MBTUs per year. The total incremental energy use between the No Action condition and the With Action condition would be 2,220,826 MBTUs per year. This represents approximately 0.001 percent of the City's forecasted annual energy requirement of 189 trillion BTU.

As noted above, electrical service to the Proposed Project's new buildings would be delivered by Con Edison. To receive electrical service, the future developer of each building would need to submit an electrical load letter to Con Edison, and Con Edison would determine if the electric distribution system in the adjacent streets can serve the proposed demand. If necessary, Con Edison would upgrade the local distribution grid to meet the increased electrical demand.

**Table 13-5**

**With Action Annual Energy Consumption for the Development Sites 2038**

Use	Size (gsf)	Average Annual Energy Rate (MBTUs/sf)	Energy Consumption (MBTUs/Year)
Commercial	15,812,592	216.3	3,420,264
Community Facility	0	250.7	0
Large Residential (>4 family)	0	126.7	0
Penn Station Expansion	265,000	216.3	57,312
<b>Total Energy Consumption</b>			<b>3,477,583</b>
<b>2038 Incremental Energy Consumption</b>			<b>2,220,826</b>
<b>Notes:</b> sf = square feet. Totals may not sum due to rounding. MBTU = Thousand BTU <b>Source:</b> 2020 <i>CEQR Technical Manual</i> , Table 15-1, "Average Annual Whole-Building Energy Use in New York City."			

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As noted above, 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. As discussed in Chapter 16, “Greenhouse Gas Emissions,” ESD would require developers to comply with the applicable requirements of the Climate Mobilization Act that are in effect at the time of construction of the proposed developments.

In addition, the Proposed Project 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. The requirements of the NYCECC regulate energy consumption to align with the City’s reduction goals for GHG emissions, and the development sites would be subject to the City’s stringent building energy codes adopted in 2020, which substantially increased the energy efficiency required. 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 development sites, there would then be a reduction in the forecast energy demand shown in **Table 13-5**.

Therefore, based on the above information, completion of the Proposed Project would not result in a significant adverse impact related to energy. \*