Chapter 7: Energy

A. INTRODUCTION

The 2012 *City Environmental Quality Review (CEQR) Technical Manual* recommends a detailed analysis of energy impacts for projects that could significantly affect the transmission or generation of energy or that cause substantial new consumption of energy. Because the proposed project would not result in any of these conditions, a detailed assessment of energy impacts is not necessary. Nevertheless, the *CEQR Technical Manual* recommends that a project's energy consumption be calculated and disclosed. Therefore, this chapter projects the amount of energy consumption required by the proposed project.

PRINCIPAL CONCLUSIONS

The proposed project is projected to generate demand for 87,200 million British Thermal Units (BTUs) of energy per year. Because the existing Armory structure would remain substantially vacant in the future without the proposed project, and thus would generate negligible demand for energy, this energy demand represents the total incremental increase in energy consumption that would be generated by the proposed project. As explained in the *CEQR Technical Manual*, the incremental demand produced by most individual projects would not create a significant impact on energy capacity, and detailed assessments are only recommended for projects that may significantly affect the transmission or generation of energy. The proposed project would generate an incremental increase in energy demand that would be negligible when compared to the overall demand within Consolidated Edison's (Con Edison) New York City and Westchester County service area. Therefore, the proposed project would not result in a significant adverse impact on energy.

B. EXISTING CONDITIONS

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, 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 the City and Westchester County. 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 in the city. Substations are also designed to have sufficient capacity for the network to grow. Con Edison also provides natural gas and steam utilities to the boroughs of the Bronx and Manhattan.

In 2012 approximately 57 billion kilowatt hours (KWH), or 194 trillion BTUs of electrical energy were delivered in Con Edison's service area. In addition, Con Edison supplied approximately 116 trillion BTUs of natural gas and approximately 20 billion pounds of steam, which is equivalent to approximately 24 trillion BTUs.[1] Overall, approximately 334 trillion BTUs of energy are consumed within Con Edison's New York City and Westchester County service area annually.

Currently, the project site is substantially vacant apart from the storage of graffiti removal trucks and therefore consumes a negligible amount of energy.

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

As mentioned previously, in the future without the proposed project the Armory structure is anticipated to remain substantially vacant and would consume a negligible amount of energy.

D. PROBABLE IMPACTS OF THE PROPOSED PROJECT

As described in Chapter 1, "Project Description," the proposed project would renovate and reuse the Kingsbridge Armory. The proposed project would introduce multiple new uses to the Armory, including ice skating rinks and related program space; food and beverage, concession, and retail space; and community facility space, which is assumed to include fitness and recreation facilities, multipurpose rooms, child care, business incubator space, and meeting rooms; as well as parking in the Armory's cellar levels. The proposed ice rinks would occasionally be utilized for a variety of events with a maximum attendance of 5,000 spectators; however, it is not expected that the proposed project's energy consumption would be substantially different during event conditions than during typical daily activities.

The proposed project is expected to achieve Leadership in Energy and Environmental Design (LEED) Silver certification at a minimum, and as such would incorporate measures to reduce or offset the proposed project's energy demand. In particular, the proposed project would include solar panels on the proposed project's rooftop to offset the project's energy demand. Other sustainability measures may include heat recovery (from the ice and comfort chillers), condensing boilers, low flow plumbing fixtures, lighting controls, and an air-water economizer. The proposed project may also include a cogeneration system, which can achieve more efficient energy use by capturing the heat by-product of electricity production and reusing it for heating and cooling. Such a system would reduce the proposed project's demand for grid electricity generated by Con Edison. The proposed project's sustainability measures are discussed in more detail in Chapter 10, "Greenhouse Gas Emissions."

Energy consumption for the proposed project was estimated by M-E Engineers and accounts for the unique energy demands of the ice rink facility (see **Appendix A**). Specifically, the ice rink facility would require electricity primarily for refrigeration (i.e., making and maintaining the ice surfaces), lighting, and ventilation. The energy consumption estimate also accounts for energy demand of the other uses in the proposed project, such as the community facility uses. Overall,

[1] Consolidated Edison Annual Report, 2012.

the proposed project would generate an estimated total energy demand of 87,200 million BTUs of energy per year.[1] This estimate assumes code compliant systems and does not account for potential reductions in energy demand due to the sustainability measures discussed above. This estimate also conservatively assumes that the refrigeration/ice chiller system would operate using grid electricity, although they could utilize natural gas depending on the final system design. Con Edison would provide electricity, gas, or steam to heat, cool, and light the proposed project.

Because the existing structure would remain substantially vacant in the future without the proposed project, the 87,200 million (or 0.0872 trillion) BTUs of energy projected to be used by the proposed project represent the total increment over the future without the proposed project. Compared with the approximately 334 trillion BTUs of energy consumed annually within Con Edison's New York City and Westchester County service area, this incremental increase would be considered a negligible change.

In summary, the proposed project would not have a significant adverse impact on energy. ✷

[1] Based on an estimate of approximately 25.6 million Kilowatt hours (kWh)/year and conversion to BTUs assuming 1 kWh equals 3,412 BTUs.
http://www.eia.gov/energyexplained/index.cfm?page=about_energy_conversion_calculator