ENERGY

CHAPTER 15

SEQR regulations 6 NYCRR 617.9(b)(5), and consequently CEQR, require that EISs 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, but its operational energy consumption is often calculated. However, regardless of whether an assessment is needed, every project proponent is encouraged to examine the benefit of energy efficiency measures and the feasibility of co-generation, tri-generation, or on-site renewable generation.

100. DEFINITIONS

Analysis of energy 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 (oil, coal, gas, *etc.*), nuclear power, hydroelectric power, and occasionally, miscellaneous fuels like wood, solid waste, or other combustible materials.

200. DETERMINING WHETHER AN ENERGY ASSESSMENT IS APPROPRIATE

All new structures requiring heating and cooling are subject to the New York City Energy Conservation Code, which reflects state and city energy policy. Electricity used in New York City is generated both within and outside the city and is delivered to most New York City users by Con Edison, with a small number of users in the Rockaways receiving power from the Long Island Power Authority. Projected generation and transmission requirements are forecasted by both the New York State Independent System Operator (NYISO) and Con Edison, ensuring that the City's power supply and transmission systems have the capacity to meet expected future demand. The incremental demand caused by most projects results in incremental supply, and consequently, an individual project's energy consumption often would not create a significant impact on energy supply. Consequently, a detailed assessment of energy impacts would be limited to projects that may significantly affect the transmission or generation of energy. For energy intensive facilities that may significantly affect the transmission or generation of energy, consideration of clean on-site generation alternatives is recommended.

Although significant adverse energy impacts are not anticipated for the great majority of projects analyzed under CEQR, it is recommended that the projected amount of energy consumption during long-term operation be disclosed in the environmental assessment.

210. RELATIONSHIP TO THE GREENHOUSE GAS EMISSIONS (GHG) ASSESSMENT

The calculation of operational energy consumption is the first step in a GHG assessment (see Chapter 18, "Greenhouse Gas Emissions"). A project subject to the GHG assessment should estimate its operational energy consumption using energy modeling or estimates from the project's architect or engineer. The methods for estimating this energy consumption are presented below in Section 310.

300. ASSESSMENT METHODS

Disclosing energy consumed by a proposed project begins with an analysis of operational energy, or the amount of energy that would be consumed annually after the project is operational. Usually, this encompasses the energy for the operation of the building: heating, cooling, lighting, pumps, fans, domestic hot water, plug loads, and elevators.

In order to most accurately present the effect on energy supply that would result from the project, its net increase in energy consumption should be calculated. Often, this is the same as the amount of energy that would be consumed by the project. However, in some instances, a project would result in removal of sources of energy consumption and, therefore, the loss of that source's energy consumption should be subtracted from the projected annual energy use to determine the net increase. Similarly, a project that results in the removal of sources of energy generation should take that removal into account as well.

The measure of energy used in the analysis is British Thermal Units (BTUs) per year. One BTU is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit. This unit of measure may be used to compare consumption of energy from different sources (*e.g.*, gasoline, hydroelectric power, *etc.*), taking into consideration how efficiently those sources are converted to energy. Its use avoids the confusion inherent in comparing different measures of output (*e.g.*, horsepower, kilowatt hours, *etc.*) and consumption (*e.g.*, tons per day, cubic feet per minute, *etc.*). Several standard reference documents provide tables that list the factors for converting various energy measures to BTUs. The U.S. Energy Information Administration has also developed an energy conversion calculator, available here.

310. OPERATIONAL ENERGY CONSUMPTION

Operational energy use is calculated in BTUs for each project element. The energy requirements of the different uses that would result from a project are sometimes available through energy modeling or from the project architect or engineer. If feasible, based upon knowledge of a project's site design and the project proponent's control over the site, this energy consumption should be estimated, either using estimates from project engineers or an energy modeling tool in order to most accurately reflect a project's energy consumption. Energy consumption may be modeled through programs such as Trace, HAP, DOE-2, and eQuest to determine a building's energy use, to which calculated energy requirements of other systems, such as domestic hot water, are added to obtain the final values. The specific energy modeling program to use depends on the level of detail known to the project proponent at the time of modeling. For instance, the eQuest Schematic Design Wizard model is designed to support the earliest design phase when information is limited. Most often, energy modeling is only appropriate for those projects requiring a GHG assessment in Chapter 18, Greenhouse Gas Emissions."

Projects subject to this GHG assessment in Chapter 18, "Greenhouse Gas Emissions," should estimate energy consumption using energy modeling, information from a project architect or engineer, or energy use information compiled for comparable buildings. If sufficient information regarding the project is not available to model its probable operational energy consumption or provide specific project energy consumption estimates, the lead agency, within its discretion, may determine it is most appropriate to use the standard reference table below to estimate energy usage. The standard reference table will often be used to estimate energy consumption on those sites not controlled by the applicant, as is often the case in a rezoning action.

For example, if the project would rezone an area where projected development would occur on sites not controlled by the applicant, the lead agency likely could not calculate lot-by-lot building operation consumption through energy modeling or engineer estimates. However, for any projected development on a site within the rezoned area that is controlled by the applicant, whether a private applicant or the City, the annual projected energy consumption should be estimated using the tools above. For those sites either with insufficient information to model their energy usage or that are under the control of an entity other than the applicant, it is appropriate for the lead agency to estimate the project's energy consumption using Table 15-1, below. This table represents the average energy consumption in New York City for each building type below.

Table 15-1
Average Annual Whole-Building Energy Use in New York City

Building Type	Source energy (Thousand Btu (MBtu)/sq ft)
Commercial	216.3
Industrial	554.3
Institutional	250.7
Large Residential (>4 family)	126.7
Small Residential (1-4 family)	94

Source energy accounts for energy consumed on site in addition to energy consumed during the generation and transmission of energy supplied to the site. This table was developed by the Mayor's Office of Long Term Planning and Sustainability and lists New York City-specific energy- and carbon-intensity values for various building types. Building energy intensity (measured by thousand Btu per square foot (MBtu/sq. ft)) is calculated from data compiled for calendar year 2008 for the Inventory of New York City Greenhouse Gas Emissions: September 2009. These values have been normalized for weather using the National Oceanographic and Atmospheric Administration (NOAA) Typical Meteorological Year (TMY) data, which are derived from 1976-2005 historical weather data.

Data sources: City of New York, *Inventory of New York City Greenhouse Gas Emissions* (2009); New York City Department of Finance; U.S. Department of Energy National Renewable Energy Laboratory.

For certain projects, such as energy-intensive facilities like data centers or web hosting facilities, a project-specific analysis may be more appropriate. Such figures are not available for manufacturing uses because energy demands vary widely for those uses and depend on building requirements and the manufacturing activity proposed. Such information is obtained from the manufacturer.

If more than one building would be constructed as a result of the proposed project, each building should be separately assessed, if practicable. A lead agency may also calculate a project average. For some projects, such as a rezoning, the lead agency, within its discretion, may determine it is more appropriate to estimate the project's total projected energy consumption and not present a lot-by-lot calculation of energy use.

Once the net energy consumption has been determined, it may be appropriate to consult with the appropriate energy supplier and request confirmation that there would be no problem in providing the additional load and making service connections.

400. REGULATIONS AND COORDINATION

410. REGULATIONS AND STANDARDS

The New York City Energy Conservation Code, which became effective in December 2009, sets minimum energy standards for the design and construction of all new buildings and substantial renovation of existing buildings within New York City. There is also a State Energy Plan, published every three years, available from the New York State Energy Research and Development Authority (NYSERDA).

420. COORDINATION

Consultation with energy suppliers is typically appropriate to determine if a proposed project would require extension or upgrading of energy transmission facilities. NYSERDA provides information about loans and incentives to assist businesses with initial costs associated with installing energy-efficient equipment. Questions regarding energy policy in the City should be directed to the Mayor's Office of Environmental Coordination.

430. LOCATION OF INFORMATION

- New York City Economic Development Corporation

Energy Division
110 William Street
New York, NY 10038
(212) 312- 3762

- NYS Energy Research & Development Authority

  17 Columbia Circle
  Albany, NY 12203-6399
  (866) NYSERDA (Toll-Free)
  (518) 862-1090

- NYS Energy Research & Development Authority – New York City Office

  485 Seventh Avenue – Suite 1006
  New York, NY 10018
  (212) 971-5342