Appendix D9:
Energy Supplemental Information

Contents

Appendix D. Energy Supplemental Information

D.1 ENERGY

This section describes the existing energy consumption trends within New York State and discusses the regulations that require a review of any changes in energy needs due to the Project. In addition, projected year (2040) energy consumption estimates are presented, and mitigation measures are identified. Section 4.18, "Construction Effects," describes the construction-related effects to energy consumption. Table D-1 summarizes the energy effect findings.

Table D-1. Summary of Project Energy Effects

Alternative	Permanent Effects
No Build Alternative	No adverse effects
LRT Build Alternative	No adverse effects LRT Build Alternative operations and patronage benefits energy effects through a reduction in energy consumption
BRT Build Alternative	BRT Build Alternative operations would result in a net increase in direct energy consumption

D.1.1 Regulatory Context and Methodology

Under the CEQ regulations for implementing the NEPA,[1] consideration of energy efficiency is specifically required. Under Section 1502.16(e) regarding the requirements for analyzing and documenting environmental consequences, agencies are required to discuss "energy requirements and conservation potential of various alternatives and mitigation measures." Section 1502.16(f) requires agencies to consider the "natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures."

Energy efficiency and conservation concepts may also be interpreted as a necessary consideration in addressing the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources as required by the CEQ regulations (Section 1502.16).

Several executive orders and policies have been promulgated over the years that require or promote the consideration of energy efficiency in Federal actions, including the following:

- Executive Order 13221, Energy Efficient Standby Power Devices (Signed 2001)
- Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use (Signed 2001)

1 Available at https://ceq.doe.gov/

Energy is commonly measured in terms of British thermal units (Btu), which is the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit. For transportation projects, the amount of fuel used predominantly influences energy usage. The average Btu content of fuels is the heat value (or energy content) per quantity of fuel, as determined from tests of fuel samples.

This energy analysis considers the Project's direct energy effects, which are a result of operational changes between the No Build Alternative and the LRT Build Alternative and the BRT Build Alternative and the construction of the LRT Build Alternative and the BRT Build Alternative. Direct energy use from vehicles using the roadway network was estimated by applying emission factors from FTA's Capital Investment Grants Policy Guidance[2] to forecasted changes in vehicle miles traveled (VMT) for each Build Alternative based on the number of transit riders that no longer drive an automobile for the same trip.

Direct energy also includes the energy needed to construct the Project as well as the energy that results from producing the electricity that would be required to power the LRT Build Alternative and other Project-related facilities. Energy consumption associated with the operation of new transit vehicles and stations under the Build Alternatives were estimated using the Federal Transit Administration's (FTA's) energy consumption tool that estimates the partial-lifecycle energy used in the construction, operation, and maintenance phases of a project across select transit modes.

Accurate indirect energy costs are extremely difficult to estimate given the uncertainty of field variables in this phase of analysis. As such, indirect energy is qualitatively discussed in this section.

D.1.2 Affected Environment

Transportation accounts for a major portion of the energy consumed in the United States. As reported by the United States Energy Information Administration (EIA), in 2019 transportation accounted for approximately 28 percent of energy consumption in the United States. Transportation was the second-largest consumer of energy in the United States after the industrial sector, which accounted for 33 percent of energy consumption in the United States in 2019. The residential and commercial sectors accounted for 21 percent and 18 percent, respectively, of energy consumption in the United States in 2019.[3]

Transportation also accounts for a major portion of the energy consumed in New York State, at approximately 31 percent. The commercial sector accounted for 30 percent of energy consumption in New York State in 2019, and the residential sector accounted for 30 percent.

2 2 Federal Transit Administration (FTA), Capital Investment Grants Policy Guidance. December 2024. https://www.transit.dot.gov/sites/fta.dot.gov/files/2024-12/CIG-Policy-Guidance-December-2024.pdf

3 U. S. Energy Information Administration (EIA). State Energy Data System: 1960-2020 (complete), State Profiles and Energy Estimates, Table C.1. Accessed July 24, 2019. https://www.eia.gov/state/seds/seds-data-complete.php?sid=US

The industrial sector was the smallest consumer of energy in New York State in 2019, at 10 percent.[4]

New York State ranks number four of the 50 states in terms of transportation energy consumption, with 1,211 trillion Btu of transportation energy consumed in the year 2019.[5] In comparison, the State of Texas ranked number one with the consumption of approximately 3,334 trillion Btu of transportation energy in 2019.

4 U. S. Energy Information Administration (EIA). State Energy Data System: 1960-2020 (complete), State Profiles and Energy Estimates, Table C.1. Accessed July 24, 2019. https://www.eia.gov/state/seds/seds-data-complete.php?sid=US

5 Ibid.