Appendix D. Energy Memo

TECHNICAL MEMORANDUM

To: Amanda Acuna, Senior Planner, City of Gardena
From: Sharon Toland, Project Manager, Harris & Associates
Subject: Hitco Project – Energy Impact Analysis
Date: June 6, 2022
CC: William Halligan, Esq., Senior Director/Senior Environmental Counsel, Harris & Associates
Att: 1, Fuel Use Calculations

Dear Ms. Acuna,

The following presents the results of Harris & Associates' analysis of the potential impacts related to energy use from implementation of the Hitco Project (Project). The project site is located at 1600 W. 135th Street, between Western Avenue and Normandie Avenue, in the City of Gardena (City). The property consists of two parcels (Assessor's Parcel Numbers 6102-013-026 and 6102-013-027) and is composed of 8.46 acres. The proposed project involves the demolition of all existing on-site buildings, parking lots, and associated improvements and consists of a new 190,860-square-foot tilt-up concrete industrial building. This building would accommodate up to two tenants with a wide variety of uses, including light assembly, manufacturing, e-commerce, and warehousing/distribution. Project implementation requires a site plan review, lot line adjustment, and conditional use permit to allow for warehousing uses. Energy use estimates in this analysis are obtained from the greenhouse gas (GHG) emissions analysis also prepared for the Project by Harris & Associates.

Existing Energy Use

The existing site currently includes fuel use (i.e., motor gasoline) from vehicles to and from the existing businesses, electricity use from lighting the existing buildings, and natural gas use from water heating. Energy use for the existing site was estimated using the CalEEMod model (Version 2020.4.0) as part of the greenhouse gas (GHG) emissions modeling for the project. Vehicle fuel use was calculated by the California Emissions Estimator Model (CalEEMod) output, based on traffic data from the project's Transportation Impact Analysis (Gibson 2022), and kilogram/carbon dioxide (kg/CO_2) per gallon conversion factors from the U.S. Environmental Protection Agency (USEPA) (2021) for motor gasoline. Table 1, Existing Energy Use, shows the existing energy use on site. A quantification of existing energy use compared with proposed energy use is discussed below.

Table 1. Existing Energy Use

Energy/Fuel Type	GHG Emissions (MT CO_2e)	Amount
Electricity	342	1,921,152 kWh/yr
Natural Gas	192	3,575,859 KBTU/yr
Fossil Fuel	1,594	180,220 gallons

Sources: CalEEMod Version 2040.4.0, USEPA 2021
Notes: GHG = greenhouse gas; KBTU/yr = kilo British thermal unit per year; kWh/yr = kilowatt-hour per year; MT CO_2e = metric tons of carbon dioxide equivalent
Assumes a conversion factor of 10.21 kg/CO_2 for diesel fuel and 8.78 kg/CO_2 for motor gasoline. Detailed calculations are provided in Attachment 1, Fuel Use Calculations.

Proposed Energy Use

Construction

Construction of the Project would require temporary energy demand. Construction energy impacts involve the one-time, non-recoverable energy costs associated with construction of structures and associated site features. During construction, the Project would result in an increase in energy consumption through the combustion of fossil fuels in construction vehicles, worker commute vehicles, and construction equipment and the use of electricity for small tools and other sources. Construction of the Project would require demolition, grading, building construction, paving, and landscaping installation. All construction would be typical for the region and building type. The Proposed Project does not include unusual circumstances that would require unusually high energy use for construction, such as helicopter delivery or highly specialized construction waste disposal requirements.

Fuel consumption from construction of the Project was calculated using the CalEEMod annual carbon dioxide equivalent (CO_2e) emissions output prepared for the Project GHG emissions analysis and the kg/CO_2 conversion factors from the USEPA (2021) for diesel fuel and motor gasoline. Total diesel fuel use and motor gasoline consumption from operation of construction equipment, haul truck trips, vendor truck trips, and worker vehicle trips is in Table 2, Construction Diesel Fuel and Gasoline Use. When not in use, electric equipment would be powered off to avoid unnecessary energy consumption. Natural gas is not anticipated to be used during construction.

Table 2. Construction Diesel Fuel and Gasoline Use

Fuel Type	GHG Emissions (MT CO_2e)	Gallons
Diesel Fuel	537	52,637
Motor Gasoline	171	19,445

Sources: CalEEMod 2020.4.0; USEPA 2021 (conversion factors).
Notes: GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent
Includes fuel use from construction equipment, haul truck trips, vendor truck trips, and worker vehicle trips. Assumes a conversion factor of 10.21 kg/CO_2 for diesel fuel and 8.78 kg/CO_2 for motor gasoline. Detailed calculations are provided in Attachment 1.

Operation

Operation of the Project would consume energy for but not limited to water heating, refrigeration, lighting, and electricity. The following includes energy use estimates for electricity, natural gas, and vehicle fuel (fossils fuels) from implementation of the Project. Similar to existing energy use, energy use associated with the Proposed Project was obtained from the project GHG analysis and was calculated using the CalEEMod output and the kg/CO_2 conversion factors from the USEPA (2021) for diesel fuel and motor gasoline. Electricity, natural gas, and fuel use from the Project are separately compared to existing conditions below.

Operation of the Proposed Project would consume electrical energy for several purposes, including but not limited to lighting and equipment operation. Table 3, Existing and Project Electricity Use, shows existing electricity use on site compared with the Project.

Table 3. Existing and Project Electricity Use

Scenario	GHG Emissions (MT CO_2e)	kWh/yr
Existing	342	1,921,152
Proposed Project	302	1,692,813
Net Electricity Use	**(40)**	**(228,339)**

Sources: CalEEMod 2040.4.0
Notes: GHG = greenhouse gas; kWh/yr = kilowatt-hour per year; MT CO_2 = metric tons of carbon dioxide equivalent

Operation of the Project would consume natural gas for several purposes, including but not limited to water heating. Table 4, Existing and Project Natural Gas Use, shows existing natural gas use on site compared with the Proposed Project.

Table 4. Existing and Project Natural Gas Use

Scenario	GHG Emissions (MT CO_2e)	KBTU/yr
Existing	192	3,575,859
Proposed Project	206	3,754,650
Net Natural Gas Use	**14**	**178,791**

Sources: CalEEMod 2040.4.0
Notes: GHG = greenhouse gas; KBTU/yr = kilo British thermal unit per year; MT CO_2 = metric tons of carbon dioxide equivalent

Vehicles trips to and from the Project Site would result in fuel consumption. Table 5, Existing and Project Vehicle Fuel Use, shows the net fuel use from implementation of the Project compared with existing conditions. Vehicle trip data was obtained from the project's Transportation Impact Analysis (Gibson 2022). This estimate is conservative because it assumes that the project would be developed as a manufacturing facility, which would result in a reduction of 178 daily trips compared to existing conditions. If the project operates as a warehousing use, it is anticipated to result in a reduction of 728 daily trips compared to existing conditions. If the Project is developed as a high-cube distribution center, it is anticipated to result in a reduction of 784 daily trips.

Table 5. Existing and Proposed Project Vehicle Fuel Use

Scenario	GHG Emissions (MT CO_2e)	Gallons
Existing	1,594	180,220
Proposed Project	1,399	158,268
Net Fuel Use	**(194)**	**(21,952)**

Sources: CalEEMod output 2020.4.0; USEPA 2021 (conversion factors).
Notes: GHG = greenhouse gas; MT CO_2 = metric tons of carbon dioxide equivalent
Assumes a conversion factor of 10.21 kg/CO_2 for diesel fuel and 8.78 kg/CO_2 for motor gasoline. Detailed calculations are provided in Attachment 1.

Impact Analysis

The Project would result in a net decrease in electricity and fossil fuel use compared to existing conditions. The Project would result in a net increase natural gas use. However, the Project does not include any features that would result in or encourage the wasteful, inefficient, or unnecessary consumption of energy. The net increase in natural gas would likely be less than demonstrated in Table 4 because the CalEEMod modeling does not take into account that the Project would be subject to more stringent Title 24 Building Energy Efficiency Standards compared to the existing buildings. Consistency with energy-related regulations would be required to be demonstrated to obtain necessary building permits. Through compliance with existing energy regulations, the Project would be consistent with CN Goal 4 of the City's General Plan Community Resources Element, which encourages energy conservation through Title 24 compliance and energy efficient building design and appliance installation. The Project also supports Measures EE:C4 and EE:D1 of the City's Climate Action Plan, which are to upgrade older commercial buildings and require new buildings to achieve or exceed Title 24 standards. Therefore, the Project would not result in a wasteful, inefficient, or unnecessary consumption of natural gas; would decrease electricity and fossil fuel use; and would not conflict with a state or local plan for renewable energy or energy efficiency. Impacts would be less than significant.

References

CAPCOA (California Air Pollution Control Officers Association). 2020. California Emissions Estimator Model. Version 2020.4.0.

City of Gardena. 2006. City of Gardena General Plan 2006. April 25.

City of Gardena. 2017. City of Gardena Climate Action Plan. Prepared by South Bay Cities Council of Governments. December.

Gibson Transportation Consulting, Inc. 2022. Transportation Assessment for the 1600 W. 135th Street Project, Gardena, California. April 15.

USEPA (U.S. Environmental Protection Agency). 2021. “Emissions Factors for Greenhouse Gas Inventories.” Last modified April 1. Accessed January 2022. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf.

Attachment 1. Fuel Use Calculations

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Construction	Construction Activity	Source	CalEEMod CO2e (MT/year)	Fuel Type	Factor (kg CO2/gallon)	Gallons
oject Constructi	Demolition	Offroad Equipment	34.23	Diesel	10.21	3,353
		Hauling	32.1129	Diesel	10.21	3,145
		Vendor	0	Diesel	10.21	-
		Worker	1.3358	Motor Gasoline	8.78	152
	Site Preparation	Offroad Equipment	16.8606	Diesel	10.21	1,651
		Hauling	0	Diesel	10.21	-
		Vendor	0	Diesel	10.21	-
		Worker	0.0002	Motor Gasoline	8.78	0
	Grading	Offroad Equipment	26.2713	Diesel	10.21	2,573
		Hauling	0	Diesel	10.21	-
		Vendor	0	Diesel	10.21	-
		Worker	1.3358	Motor Gasoline	8.78	152
	Paving	Offroad Equipment	20.1884	Diesel	10.21	1,977
		Vendor	0	Diesel	10.21	-
		Hauling	0	Diesel	10.21	-
		Worker	1.3078	Motor Gasoline	8.78	149
	Building Construction	Offroad Equipment	268.1642	Diesel	10.21	26,265
		Hualing	0	Diesel	10.21	-
		Vendor	130.7724	Diesel	10.21	12,808
		Worker	157.4239	Motor Gasoline	8.78	17,930
	Architectural Coating	Offroad Equipment	8.8211	Diesel	10.21	864
		Hauling	0	Diesel	10.21	-
		Vendor	0	Diesel	10.21	-
		Worker	9.3244	Motor Gasoline	8.78	1,062
Total						**72,082**

Total Project Construction Fuel Use

	CO2e Emissions	Gallons
Diesel	537.4209	52,637
Motor Gasoline	171	19,445

Source for conversion factor: U.S. Environmental Protection Agency. "Emissions Factors for Greenhouse Gas Inventories". Last Modified April 1, 2021.
1 MT = 1,000 kg

CO2e Vehicle Emissions from GHG Reduction Strategy

Source for conversion factor: U.S. Environmental Protection Agency. "Emissions Factors for Greenhouse Gas Inventories". Last Modified April 1, 2021.

Scenario	Total GHG Emissions CO2e (MT/year)	Fuel Type	% of Fleet Mix	Factor (kg CO2/gallon)	Gallons
Existing	1,593.5	Motor Gasoline	0.95	8.78	172,416
		Diesel	0.05	10.21	7,804
Proposed	1,399.4	Motor Gasoline	0.95	8.78	151,415
		Diesel	0.05	10.21	6,853
Net Fuel Use	-194.1				(21,952)