Harris & Associates

ENERGY TECHNICAL MEMORANDUM

To: Megan Hamilton, Senior Planner, San Diego Unified Port District
From: Sharon Toland, Senior Technical Specialist, Harris & Associates
RE: **Energy Technical Memorandum for East Harbor Island Redevelopment/Topgolf and Waterfront Park Project**
Date: April 29, 2026
CC: Ryan Binns, Vice President, and Kelsey Hawkins, Project Manager, Harris & Associates
Att: 1, Fuel Use Calculations

Introduction

This memorandum provides the results of Harris & Associates' analysis of energy consumption during construction and operation of the East Harbor Island Redevelopment/Topgolf and Waterfront Park Project (Project). The Project would redevelop portions of East Harbor Island. The Project area is approximately 38 acres of land generally bounded to the north by North Harbor Drive, to the west by Harbor Island Drive, to the south by Liberator Way and the Harbor Island East Basin portion of San Diego Bay, and to the east by the Convair Lagoon portion of San Diego Bay. A portion of the Project area is planned for redevelopment (East Harbor Island redevelopment area). The Project area is currently occupied by the San Diego Harbor Police headquarters; The Hertz Corporation, Enterprise Mobility (operated by National Car Rental), and Avis Rent A Car System, LLC, rental car facilities; and San Diego International Airport temporary construction staging facilities. Existing structures include several one- and two-story buildings, various small structures, surface parking lots, fencing, and limited ornamental vegetation. Much of the Project area shoreline is covered with a combination of riprap and concrete and asphalt sloped pavement. Topographically, the East Harbor Island redevelopment area is relatively level with a gentle gradient down to San Diego Bay.

Project components include demolition and removal of existing structures and improvements, realignment of Liberator Way, redevelopment of approximately 9.8 acres for the Topgolf visitor-serving attraction and development of a new waterfront park and promenade. The existing San Diego Harbor Police headquarters on the western side of East Harbor Island would remain in place. A Port Master Plan Amendment would be required to add the Project to the Port Master Plan's (PMP's) Project List for Planning District 2 per Section 30711 of the California Coastal Act and to change the land use designation of the Project area from Industrial Business Park, Open Space, and Harbor Services to Commercial Recreation, Park/Plaza, Street, and Specialized Berthing.

The purpose of this memorandum is to quantify and assess the consumption of energy associated with implementation of the Project. This analysis addresses if the Project would result in wasteful, inefficient, or unnecessary consumption of energy and would comply with applicable local plans for energy efficiency. The addition of the Topgolf visitor-serving attraction, waterfront park and promenade, realignment of Liberator Way, and associated vehicle traffic on East Harbor Island are addressed below. Future redevelopment of adjacent parcels is not included in this Project-level analysis.

Regulatory Setting

San Diego Unified Port District Port Master Plan

The PMP guides the physical development of the lands within the District's jurisdiction and also serves as the District's coastal program for the California Coastal Act. The District's jurisdiction includes the Public Trust lands (i.e., tidelands) bayward of the mean high-tide line, submerged lands generally to the U.S. pierhead line, and other upland properties as acquired by the District. The District manages these lands in trust for the people of the State of California. Amendments to the PMP require a two-thirds vote by the Board of Port Commissioners and certification by the California Coastal Commission. The PMP establishes specific goals, objectives, policies, and standards to direct future development, facilitate a diverse range of uses and activities, and provide a broad range of proposed public improvements. The PMP's goals, objectives, policies, and standards were developed in accordance with the California Coastal Act, Public Trust Doctrine, and San Diego Unified Port District Act, which are the foundation for the plan's legislative framework (District 2020). Efficient energy use is listed as a goal of PMP efforts to promote the efficient movement of people and goods.

Port Master Plan Update

The Port Master Plan Update (PMPU) is a comprehensive update to the PMP. The PMPU EIR was certified in February 2024; however, the PMPU is not formally certified by the Coastal Commission and is, therefore, not yet the governing land use document of the District. Similar to the PMP, the PMPU provides the official goals and planning policies, as well as water and land uses, for development and conservation of the San Diego Unified Port District (District) lands, tidelands, and submerged lands that compose the PMPU area. With buildout expected to occur by 2050, the proposed PMPU would implement the approximately 30-year planning vision by identifying allowable water and land uses and providing policies to address six PMPU elements: Water and Land Uses, Ecology, Environmental Justice, Mobility, Safety and Resiliency, and Economics (District 2024).

The following planning goal and policies listed in the PMPU aim to reduce energy consumption in the District (District 2024):

- **Safety and Resiliency Goal 3:** Climate and Coastal Resilient Tidelands
  - **SR Objective 3.1:** Reduce GHG emissions and support pathways toward carbon neutrality throughout Tidelands

Existing Energy Use

The existing site currently includes fuel use (i.e., motor gasoline) from vehicles to and from the car rental facilities (The Hertz Corporation; Enterprise Mobility; and Avis Rent A Car System, LLC), electricity use from lighting and heating, ventilation, and air conditioning systems for existing buildings, and natural gas use from heating. Energy use for the existing site was estimated using existing utility bills provided by the District, existing vehicle trip data from Chen Ryan Associates (CRA 2024), and per-gallon conversion factors from the U.S. Environmental Protection Agency (USEPA) (2023) for motor gasoline. Table 1, Existing Energy Use on Site, shows the existing energy use on site.

Table 1. Existing Energy Use on Site

Energy/Fuel Type	Amount
Electricity	557,532 kWh/yr
Natural Gas	3,978,579 KBTU/yr
Fossil Fuel	161,173 gallons

Sources: CAPCOA 2022; USEPA 2023 (conversion factors).
Notes: KBTU/yr = kilo British thermal unit per year; kWh/yr = kilowatt-hour per year
Includes fuel use from construction equipment, haul truck trips, vendor truck trips, and worker vehicle trips. Assumes a conversion factor of 10.21 kilograms per carbon dioxide (kg/CO_2) per gallon for diesel fuel and 8.78 kg/CO_2 per gallon for motor gasoline. Detailed calculations are provided in Attachment 1, Fuel Use Calculations.

Proposed Energy Use

Construction

Construction of the Project would require a temporary increase in energy demand. Construction energy impacts involve the one-time, non-recoverable energy costs associated with construction of structures, parking lots, and a roadway. 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 lighting and other sources. Construction of the Project would require demolition of existing facilities and improvements, grading, utility installation, building construction, paving, architectural coatings, and landscaping installation over a total of 28 months. Demolition would occur first and take approximately 6 to 12 months. After demolition, all construction phases would overlap and continue over the remainder of the construction duration. Shoreline improvements may require the use of a tugboat to position a derrick at the beginning of construction and to remove the derrick at the end of construction. It is assumed that approximately 3 hours of tugboat operation would be required. Project construction would be typical for the region and building type. The Project does not include circumstances that would require unusually high energy use for construction, such as helicopter delivery or other specialized equipment.

Fuel consumption from construction of the Project was calculated using the California Emissions Estimator Model (CalEEMod) annual carbon dioxide equivalent (CO_2e) emissions output prepared for the Project and the kilograms per carbon dioxide (kg/CO_2) conversion factors from USEPA (2023) for diesel fuel and motor gasoline. Total diesel fuel use and motor gasoline consumption from operation of construction equipment, tugboat use, haul truck trips, vendor truck trips, and worker vehicle trips is summarized in Table 2, Construction Diesel Fuel and Gasoline Use. Electricity use during construction was estimated for electrical-powered equipment using CalEEMod and summarized in Table 2. When not in use, electrical-powered equipment would be powered off to avoid unnecessary energy consumption. Natural gas is not anticipated to be used during construction.

Table 2. Construction Energy Use

Fuel Type	Amount
Electricity	255.3 kWh
Diesel Fuel	925,588 gallons
Motor Gasoline	72,506 gallons

Sources: CAPCOA 2022; USEPA 2023 (conversion factors).
Notes: kWh = kilowatt-hour
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 purposes such as building heating and cooling, refrigeration, lighting, and electricity. Table 3, Existing and Project Electricity Use, includes annual 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 Project was estimated using utility bills from an existing Topgolf facility (provided by Topgolf, USA [Topgolf]), CalEEMod modeling prepared for the Project, and the kg/CO_2 conversion factors from USEPA (2023) for diesel fuel and motor gasoline.

Operation of the Project would consume electrical energy for several purposes, including but not limited to recreational and commercial lighting and equipment operation. Energy use for the Topgolf visitor-serving attraction would be offset by sustainability features, including a solar canopy over the surface parking lot. These features were not accounted for in the CalEEMod output; therefore, the results presented below are considered conservative. Table 3 shows existing annual electricity use on site compared with the Project.

Table 3. Existing and Project Electricity Use

Scenario	kWh/yr
Existing	557,532
Project	2,284,671

Source: CAPCOA 2022.
Notes: kWh/yr = kilowatt-hour per year

Operation of the Project could consume natural gas for use of the commercial kitchen. Table 4, Existing and Project Natural Gas Use, shows existing natural gas use on site compared with the Project.

Table 4. Existing and Project Natural Gas Use

Scenario	KBTU/yr
Existing	3,978,579
Project	7,200,000

Source: CAPCOA 2022.
Notes: KBTU/yr = kilo British thermal unit per year

Vehicle trips to and from the Project area would result in fuel consumption. Table 5, Existing and Project Vehicle Fuel Use, shows the fuel use from implementation of the Project compared with existing conditions.

Table 5. Existing and Project Vehicle Fuel Use

Scenario	Gallons
Existing	161,173
Project	449,089

Sources: CAPCOA 2022; USEPA 2023 (conversion factors).
Notes: Assumes a conversion factor of 8.78 kg/CO_2 for motor gasoline. Detailed calculations are provided in Attachment 1.

Impact Analysis

The Project would be considered to result in inefficient, wasteful, or unnecessary energy use if it resulted in energy use above typical use for the proposed land use types or conflicted with District policies related to energy use. As demonstrated above, the Project would result in new electricity, natural gas, and fossil fuel use. However, energy use from the Project would not result in a wasteful, inefficient, or unnecessary consumption of energy. Existing buildings would be demolished and replaced with a new Topgolf visitor-serving attraction that would meet current, more stringent building standards. Compliance with applicable building standards, such as Title 24, would ensure energy-efficient building design.

The PMP does not include any specific policies related to energy use. However, the Project would not interfere with the movement of people or goods as outlined in the PMP. Additionally, the Project would comply with the PMPU SR Policy 3.1.3 aimed at conserving and reducing energy use, which would include deploying a solar panel canopy to improve energy reliability. In addition, the Project would optimize energy performance through the use of highly efficient glazing systems with low-E insulated glass, high R-value walls/roof assemblies, and increased lighting controls to take advantage of daylight being brought into the complex via fenestrations or skylights consistent with SR Policy 3.1.6 and SR Policy 3.1.7. The proposed Topgolf visitor-serving attraction aims to be all-electric, with the exception of kitchen operations. However, the buildout would include infrastructure for all-electric-ready kitchen operations in the future, as equipment would require replacement. The Project design team and San Diego Gas & Electric have confirmed that the Topgolf visitor-serving attraction would be within the electrical capacity of the site's existing infrastructure to support demand for electric vehicle (EV) chargers and all-electric development (except commercial cooking equipment), including electric outdoor heaters. Compliance with applicable building standards, such as Title 24, would ensure energy-efficient building design. The Project would redevelop an existing developed area rather than requiring the extension of services. Appendix D, Local Actions, of the 2022 Scoping Plan includes state goals for land development related to energy use that emphasize renewable energy production and reduced reliance on natural gas. The Project is generally consistent with these goals by installing solar panels and reducing natural gas use beyond current building code requirements (electric heating systems) (CARB 2022). Therefore, the

Project would not result in a wasteful, inefficient, or unnecessary consumption of energy or 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). 2022. California Emissions Estimator Model (CalEEMod). Version 2022.1.1.22. Accessed April 2026. https://www.caleemod.com/.

CARB (California Air Resources Board). 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. November 16. Accessed April 2026. https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.

CRA (Chen Ryan Associates). 2024. East Harbor Island Redevelopment/Topgolf Project, Vehicle Miles Traveled Assessment.

District (San Diego Unified Port District). 2020. Port Master Plan. September. Accessed April 2026. https://www.portofsandiego.org/waterfront-development/port-master-plan-update.

District. 2024. Port Master Plan Update. Final Draft. San Diego Unified Port District Document No. 76469. Approved by the Board of Port Commissioners on February 28. Filed at the Office of the District Clerk on May 29. Accessed April 2026. https://www.portofsandiego.org/waterfront-development/port-master-plan-update.

USEPA (U.S. Environmental Protection Agency). 2023. Emissions Factors for Greenhouse Gas Inventories. Last modified September 12. Accessed April 2026. https://www.epa.gov/system/files/documents/2023-03/ghg_emission_factors_hub.pdf.

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Attachment 1. Fuel Use Calculations

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Construction	Construction Activity	Source	CalEEMod CO2e (MT)	Fuel Type	Factor (kg CO2/gallon)	Gallons
Project Construction	Demolition	Offroad Equipment	463	Diesel	10.21	45,348
		Hauling	636	Diesel	10.21	62,292
		Vendor	13.1	Diesel	10.21	1,283
		Worker	23	Motor Gasoline	8.78	2,620
	Site Preparation	Offroad Equipment	64.3	Diesel	10.21	6,298
		Hauling	0	Diesel	10.21	-
		Vendor	0	Diesel	10.21	-
		Worker	2.18	Motor Gasoline	8.78	248
	Grading	Offroad Equipment	1581	Diesel	10.21	154,848
		Hauling	1616	Diesel	10.21	158,276
		Vendor	39.6	Diesel	10.21	3,879
		Worker	34.7	Motor Gasoline	8.78	3,952
	Paving	Offroad Equipment	500	Diesel	10.21	48,972
		Vendor	11	Diesel	10.21	1,077
		Hauling	116	Diesel	10.21	11,361
		Worker	19.2	Motor Gasoline	8.78	2,187
	Building Construction	Offroad Equipment	2045	Diesel	10.21	200,294
		Hauling	2280	Diesel	10.21	223,310
		Vendor	79.3	Diesel	10.21	7,767
		Worker	556	Motor Gasoline	8.78	63,326
	Architectural Coating	Offroad Equipment	3.95	Diesel	10.21	387
		Hauling	0	Diesel	10.21	-
		Vendor	0	Diesel	10.21	-
		Worker	1.52	Motor Gasoline	8.78	173

Total Project Construction Fuel Use

	CO2e Emissions	Gallons
Diesel	9450.25	925,588
Motor Gasoline	637	72,506

Source for conversion factor: U.S. Environmental Protection Agency. "Emissions Factors for Greenhouse Gas Inventories". Last Modified September 12, 2023.
1 MT = 1,000 kg

Tug Boat Use

CO2e (MT)	Fuel Type	Factor (kg CO2/gallon)	Gallons
2	Diesel	10.21	196

CO2e Vehicle Emissions from GHG Reduction Strategy

Source for conversion factor: U.S. Environmental Protection Agency. "Emissions Factors for Greenhouse Gas Inventories". Last Modified September 12, 2023.

Scenario	GHG Emissions CO2e (MT/year)	Fuel Type	Factor (kg CO2/gallon)	Gallons
Existing	1,415.1	Motor Gasoline	8.78	161,173
Proposed	3,943.0	Motor Gasoline	8.78	449,089