Section 3.5
Energy Conservation

SECTION SUMMARY

This section satisfies Appendix F of the State CEQA Guidelines which states, "the goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include the following: decreasing overall per capita consumption; decreasing reliance on fossil fuels such as coal, natural gas and oil, and increasing the reliance on renewable energy sources." In addition, Appendix F further states that EIRs must "include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy." (Public Resources Code section 2100(b)(3)).

This analysis has been prepared to address energy consumption and conservation related to the proposed Project consistent with the guidance in Appendix F.

Section 3.5, Energy Conservation, covers the following:

- project description;
- the environmental setting associated with energy in the harbor area;
- consumption rates for diesel and natural gas in California and the United States;
- summary of regulations and policies associated with energy conservation;
- the methodology used to determine the amount of fuel/energy consumed as part of the Project;
- an impact analysis of the proposed Project (fuel used during construction and operations); and
- mitigation measures proposed to reduce any potential impacts, as applicable.

Key Points of Section 3.5:

The main objective of the proposed Project is to construct a MOTEMS-compliant wharf and mooring system for the Shell Marine Oil Terminal. The current wooden wharf will be replaced with a more seismically sound concrete wharf as required by California state law.

Diesel fuel and small amounts of gasoline would be used during construction of the proposed Project. These fuels would be used for or construction equipment, trucks, worker commute vehicles, and marine craft. Energy expenditures during construction would occur off and on over six years of the 30-year lease. Construction would be consistent with the policies in the Port of Los Angeles' Sustainable Construction Guidelines, which guide the content of bid specifications. Use of fuel during construction and operation of the proposed Project were quantified as part of this section.

Operation of the proposed Project includes the continued receipt of petroleum-based products via ocean going vessels (OGVs), specifically tankers and barges. Based on information regarding the activity and characteristics of proposed operational emission sources obtained primarily from LAHD and Shell staff,

this EIR assumes two percent annual increase in throughput starting in 2016 relative to the 2011 – 2015 baseline average and a future vessel mix of 50 percent tankers and 50 percent ITBs/barges.

All fuels unloaded from vessels are stored in on-site, permitted aboveground tanks and ultimately, transported via underground pipeline to various customers. None of the product is delivered to customers via truck. No new employees are expected to be added over the next 30 years. No new office buildings, truck rack or other significant structures will be built as part of the proposed Project.

Currently, the facility does not load fuels back onto vessels (ie. export). As part of the proposed Project, the facility plans to both unload and export fuels. Exporting fuels requires the use of a propane-powered vapor destruction unit (VDU) which is required by both the SCAQMD and the USCG. The VDU system includes two new propane 1,000-gallon propane tanks. Propane will be delivered from a supplier about 40 miles away to the facility up to 2 times per week to refill the tanks.

Therefore, energy consumption at the facility is primarily in the form of diesel fuel which is used to transit the OGVs to the site. While there are vessel operations at the facility currently (baseline conditions), fuel usage from the estimated future increases in the number of vessels (tankers and barges) calling on the Shell terminal was quantified as part of this section. Other operational fuel usage includes delivery of propane for use in the VDU and combustion of propane in that device. A summary of all propane usage expected during project operations is also included in this section. The delivery trucks are assumed to be diesel fueled. That diesel is also included in the operational energy usage section below. Since the facility does not currently have a VDU, no propane use is part of the baseline conditions (the average of actual operations from 2011-2015). Propane use in the baseline is zero. Permit restrictions on the VDU allow specific annual hours of operation. As such, propane usage will remain constant over the life of the proposed Project.

Greenhouse gas emissions (especially, CO_2 emissions) result directly from fuel combustion. As such, CO_2 from both construction and operational activities (which are summarized and included in Section 3.4, Greenhouse Gas Emissions and Climate Change) were used to calculate total fuel usage from the proposed Project. Fuel usage was calculated for the baseline (2011-2015 average). It was also calculated for the identical study years used throughout this DEIR (2019 – the first full year of operation overlapping with construction, 2031- the interim year and 2048 - the highest throughput and final year of the lease).

Annual fuel estimates were then divided by throughput (barrels per year) to determine a ratio of energy consumption per barrel processed. Annual operational fuel usage was also compared to California and the United States' annual consumption of both diesel and propane to provide another ratio or comparison of product usage versus overall consumption.

The analysis demonstrates that slight increased energy usage at the site (primarily in the form of fuel combustion in the vessels) over time, would not result in the wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources. In fact, the goal of the proposed Project is to increase safety and seismic standards at an existing marine oil terminal which supplies petroleum products for use in California. No significant adverse energy usage impacts are expected to result as part of the proposed Project. Therefore, no mitigation measures are required.

However, one of the air quality mitigation measures (MM-AQ 5 – Vessel Speed Reduction Program) will have the additional benefit of resulting in slightly less diesel usage in the vessels transiting to Shell. Although intended primarily as an emission reduction measure, potential diesel fuel savings during vessel transit from VSRP has been quantified in Tables 3.5-4 below.

3.5.1 Introduction

Appendix F of the State CEQA Guidelines states that "the goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include the following: decreasing overall per capita consumption; decreasing reliance on fossil fuels such as coal, natural gas and oil; and increasing the reliance on renewable energy sources."

Appendix F further states that EIRs must "include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy." This analysis has been prepared to address energy consumption and conservation related to the proposed Project consistent with the guidance in Appendix F.

Appendix F states that "[p]otentially significant energy implications of a project shall be considered in an EIR to the extent relevant and applicable to the project," and suggests content for the project description, environmental setting, and impact analysis portions of the EIR.

With respect to the project description, CEQA Guidelines Appendix F suggests that the EIR include the following items:

1. Energy consuming equipment which will be used during construction and operation of the project, including, as appropriate, the energy intensiveness of materials and equipment required for the project.
2. Total energy requirements of the project by fuel type and end use.
3. Energy conservation equipment and design features.
4. Identification of energy supplies that would serve the project.

3.5.2 Project Description

The primary goal of the proposed Project is to comply with Chapter 31.F Marine Oil Terminal Engineering & Maintenance Standards (MOTEMS) of the State of California Building Code. MOTEMS is a comprehensive set of codes and standards for the analysis, design, inspection/maintenance, and operation of existing and new marine oil terminals in the State of California. The proposed Project would construct a new MOTEMS compliant wharf and mooring system for the Shell Marine Oil Terminal at Berths 167-169, which would replace the current timber wharf.

Other Project elements include piping and related foundation support, and topside equipment replacement. The tenant, Shell Oil Company (hereafter referred to as Shell), has also applied to the Port for a new 30-year lease through the year 2048 to allow continued operations of its existing marine oil terminal. The new lease would contain provisions for further minimizing the potential release of petroleum products, beyond existing controls and measures, through the implementation of Shell's Source Control Program (SCP) Plan which requires upgrades to secondary containment around some of the above ground storage tanks.

3.5.2.1 Energy Consuming Equipment and Processes

Sources of energy consumption during construction include heavy duty off-road construction equipment, marine vessels, on-road trucks, and worker vehicles.

Construction-related energy consumption associated with construction sources is quantified below in Table 3.5-2.

Sources of energy consumption during operation of the Project include marine vessels during transit, anchorage and hoteling, a propane-operated VDU, and propane delivery trucks used to supply the VDU.

Fuel consumption from these activities (diesel gasoline and propane) has been quantified for the project baseline and future projected operations.

As mentioned above, Shell does not currently export fuels onto vessels, so there is no VDU currently in use. That is the only new device associated with the proposed Project. Its propane tanks will be serviced by propane deliveries from approximately 40 miles away. For worst-case calculations, it is assumed that the propane delivery trucks will run on diesel fuel.

3.5.3 Environmental Setting

Appendix F states that the environmental setting "may include existing energy supplies and energy use patterns in the region and locality."

Energy consumption analysed as part of this chapter includes fuel usage during construction and operation. Operations include primarily vessels (double-hulled tankers and barges) delivering petroleum products. AppendixB4 - Energy highlights air quality calculations, methodology and assumptions, which includes energy consumption in order to complete the calculations. Fuel usage associated with both construction and operation of the proposed Project is summarized in Tables 3.5-2 through 3.5-4 below.

3.5.4 Applicable Regulations

There are several potentially applicable air quality and climate change policies. They include, but not limited to:

- Green Building Policy;
- Port Climate Action Plan (2007);
- Green LA;
- Sustainable City PLAn;
- Executive Directive 10; and
- LAHD Sustainable Construction Guidelines.

Green Building Policy (2007)

In August 2007, the Board or Harbor Commissioners adopted the Green Building Policy requiring Leadership in Energy and Environmental Design (LEED) Gold Rating as the minimum standard for new construction of most buildings of at least 7,500 square feet as well as the incorporation of solar power and best available technology for energy and water efficiency for all new Port buildings.

Port Climate Action Plan (2007)

The 2007 Green LA Plan directed the Port to develop an individual Climate Action Plan, consistent with the goals of Green LA, to explore opportunities to reduce GHG emissions from municipal operations (such as Port buildings and Port workforce operations). The

Climate Action Plan outlines specific steps that LAHD has taken and will take on global climate change. These steps include specific actions for energy audits, green building policies, onsite photovoltaic solar energy, green energy procurement, tree planting, water conservation, alternative fuel vehicles, increased recycling, and green procurement. The Port Climate Action Plan also outlines San Pedro Bay Ports Clean Air Action Plan measures that have significant GHG reduction co-benefits, such as Vessel Speed Reduction (VSR) and Alternative Marine Power (AMP). GHG reduction needs from Port's tenant activities are recognized in the Port Climate Action Plan, but are deferred to the CAAP, which addresses tenant operations.

Green LA

The City of Los Angeles released its climate action plan, Green LA: An Action Plan to Lead the Nation in Fighting Global Warming, in May 2007 (City of Los Angeles, 2007). The Green LA plan is a voluntary program that sets a goal of reducing the City's GHG emissions to 35 percent below 1990 level by 2030.

ClimateLA is the implementation framework that contains the details of the more than 50 action items that are included in Green LA. The majority of the actions described in the Green LA Plan are not project-specific and include City-wide actions. Some of the measures the City of Los Angeles will take to achieve the 35 percent reduction goal include the following:

- Increasing the amount of renewable energy provided by LADWP;
- Improving the energy efficiency of all City departments and City-owned buildings;
- Converting City fleet vehicles, refuse collection trucks, street sweepers, and buses to alternative fuel vehicles;
- Providing incentives and assistance to existing LADWP customers in becoming more energy efficient;
- Changing transportation and land use patterns to reduce dependence on automobiles;
- Decreasing per capita water use;
- "Greening" the Port of Los Angeles and the airports operated by the City (including Los Angeles International Airport); and
- Promoting expansion of the "green economy" throughout the City.

The LA Green Plan calls for the following Port-specific actions:

- Heavy-duty vehicles: By the end of 2011, all trucks calling at the ports will meet or exceed the EPA's 2007 heavy-duty vehicle on-road emissions standards for particulate matter.
- Cargo-handling equipment: All yard tractors will meet at a minimum the EPA 2007 on-road or Tier IV engine emission standards.
- Railroad locomotives: For Pacific Harbor Line switch engines, Tier II engines and emulsified or other equivalently clean alternative diesel fuels available will be used. Diesel-powered Class 1 locomotives entering port facilities will be 90 percent controlled for particulate matter and NOX.
- A strategic plan for the Port will be completed and will include sustainable and green growth options.
- An economic development plan for the Port will be completed and will identify opportunities to link the Port's investment in green growth to new economic opportunities in the green sector.

The Sustainable City pLAn (pLAn)

In April 2015, the City of Los Angeles developed the Sustainable City pLAn (pLAn) as a roadmap through 2035. The pLAn contains strategies to address current and future climate change impacts and reduce air quality emissions. The pLAn sets aspirations for 14 target areas. Of these, the following are related to port activities: energy-efficient buildings, carbon and climate leadership, mobility and transit. In particular, the pLAn projects the increase of port-related goods movement trips that use zero-emissions technology to 15 percent by 2025 and to 25 percent by 2035 (LA, 2015).

Executive Directive No. 10

Executive Directive No. 10 was issued in 2007 regarding environmental stewardship practices. Consistent with the goal specified in Green LA, Executive Directive No. 10 requires that City departments create a "Statement of Sustainable Building Policies" including sustainable design, energy and atmosphere, materials and resources, water efficiency, landscaping and transportation resources. City departments are required to submit annual sustainability reports to the Mayor for review.

LAHD Sustainable Construction Guidelines

In February 2008, the LAHD Board of Harbor Commissioners adopted the Los Angeles Harbor Department Sustainable Construction Guidelines for Reducing Air Emissions (LAHD Construction Guidelines). The LAHD Construction Guidelines reinforce and require sustainability measures during performance of the contracts, balancing the need to protect the environment, be socially responsible, and provide for the economic development of the Port. The LAHD Construction Guidelines, Specific Applicable Measures, address a variety of emission sources that operate at the Port during construction, such as ships and barges used to deliver construction-related materials, harbor craft, dredging equipment, haul and delivery trucks used during construction, and off-road construction equipment. In addition, the LAHD Construction Guidelines include BMPs, based largely on CARB-verified BACT, designed to reduce air emissions from construction sources.

3.5.5 Potential Environmental Impacts and Mitigation Measures

3.5.5.1 Methodology

Appendix F of the state CEQA Guidelines requires that project-level assessments "…include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy."

Construction and operational emission calculations are presented in Appendix B1. Appendix B4 summarizes potential energy usage with both construction and operation of this facility.

Sources contributing to GHG emissions (and utilizing fuels) during proposed Project construction consist of:

- harbor craft;
- off-road construction equipment;
- on-road construction vehicles; and

- worker vehicles.

Sources contributing to GHG emissions (and utilizing fuels) during proposed Project operation consist of:

- tanker ships (transit, anchoring, and hoteling);
- integrated barges (transit, anchoring and hoteling);
- tugboats assisting ships during harbor transit, turning, and docking; and
- product loading and unloading.

Sources of energy consumption during construction include heavy duty off-road construction equipment, marine vessels, on-road trucks, and worker vehicles. Construction-related energy consumption associated with construction sources is quantified below in Table 3.5-2.

Sources of energy consumption during operation of the Project include marine vessels during transit, anchorage and hoteling, electrically powered equipment and lights, a propane-operated VDU, and propane delivery trucks used to supply the VDU.

Fuel consumption from these activities (diesel, gasoline and propane) have been quantified for project baseline and future projected operations.

Shell does not currently export fuels onto vessels, so there is no VDU required to be used. That is the only new device associated with the proposed Project. Its propane tanks will be serviced by propane deliveries from approximately 40 miles away. For worst-case calculations, it is assumed that the propane delivery trucks will run on diesel fuel.

As described in the project description, implementation of the proposed Project would not result in a significant change in the energy consumed to transport each barrel of product, nor would the Project lead to a quantifiable increase in electrical consumption or number of workers at the terminal. No additional workers will be necessary as part of the proposed Project. Thus, operational energy consumption associated with OGVs delivering product to Shell, the new VDU, and its required propane deliveries are quantified below.

Energy consumption is quantified in different ways depending on the type of equipment being analyzed. For equipment which consumes fuel which is combusted to generate power, fuel consumption per time is not an appropriate measure as intensity of activity may change fuel consumption rates over time. Instead, consistent with guidance established by the International Panel of Climate Change (IPCC) and approved by CARB, fuel emissions for combustion sources is calculated from total CO_2 emissions associated with the operation of the combustion equipment (IPCC, 2006). Factors for the conversion of CO_2 emissions to fuel consumption, based on fuel type, are established by the U.S. Energy Information Administration (USEIA). This methodology is applicable to both construction and operational source of emissions for the proposed Project.

Sources of energy consumption during construction include heavy duty off-road construction equipment, marine vessels, on-road trucks, and worker vehicles. Appendix F of the state CEQA Guidelines requires that project-level assessments must "…include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy." For construction, a baseline of no work is assumed; therefore, construction inherently causes a temporary increase in energy consumption. As a result, all construction energy consumption associated with construction sources is quantified below.

CO_2 emissions are directly a result of fuel combustion. As such, total CO_2 from both construction and operational activities were used to calculate total fuel usage from the proposed Project. Annual fuel estimates were then divided by throughput (barrels per year) to determine a ratio of energy consumption per barrel processed.

For energy consumption calculations, the amount of fuel (gallons of diesel, gasoline and or cubic feet of natural gas) used during both construction and operations was calculated. This energy usage was then divided by facility throughput. For the proposed Project, the unit of throughput is barrels of oil/petroleum product (bbl). This metric is helpful in analysing the project's impacts on operational energy efficiency as it is quantifiable and evident.

When analysing operational energy efficiency, the most common metric is gallons of fuel used per unit of throughput. In the case of the proposed Project, the unit of throughput is bbl (barrel of oil). This metric is helpful in analysing the project's impacts on operational energy efficiency as it quantifiable and evident. But it requires that fuel types be analysed individually. Another metric of analysing operational energy efficiency is the total CO_2 emissions per unit of throughput. Because fuel use can be directly converted to and from CO_2 emissions, this metric allows for the calculation and comparison of total terminal efficiency across all fuel types. For the purposes of construction efficiency, because there is no metric analogous to throughput, only total fuel consumption was quantified and disclosed herein. No comparison to barrel throughput was made for construction activities.

3.5.5.2 CEQA Baseline

Section 15125 of the CEQA Guidelines requires EIRs to include a description of the physical environmental conditions in the vicinity of a project that exist at the time of the Revised NOP. Shell experienced wide fluctuations in throughput during the past several years (due to supply and demand changes for petroleum products and other unforeseen business changes such as refinery restrictions, etc.). For example, this terminal unloaded 10.2 million barrels in 2014 and 20.6 million barrels in 2015. In order to best represent and evaluate "existing" conditions, five years' worth of data was used. The CEQA baseline for the proposed Project was a five-year average (January 2011 through December 2015). Table 3.5-1 shows volumes of commodities and number of vessel calls from 2011 to 2015.

Table 3.5-1: Throughput Volume and Vessel Calls by Year

Year	Throughput (barrels)*	Annual Vessel Calls
2011	12,244,870	90
2012	11,539,497	77
2013	11,716,522	78
2014	10,170,144	65
2015	20,584,414	121
2011-2015 Average	13,251,089	86

*Throughput volumes are for all commodities (which include gasoline, diesel, ethanol and jet refined petroleum products)

Source: Shell Inc., 2016

In addition, the energy consumed to transport each barrel of product in the baseline period would not change as a result of the proposed Project because it would not change the berth depths, and would therefore not result in a change in the size of the vessels that can call at the terminal irrespective of wharf replacement.

3.5.5.3 Thresholds of Significance

According to Appendix F, the analysis of impacts may include the following issues:

1. Energy requirements and energy use efficiency by amount and fuel type for construction and operation;
2. The effects of the project on local and regional energy supplies and requirements for additional capacity;
3. The effects of the project on peak and base period demands for electricity;
4. Compliance with energy standards;
5. Effects of the project on energy resources; and
6. The project's projected transportation energy use requirements and overall use of efficient transportation alternatives.

Issues 2-5 are not entirely applicable to the proposed Project because the Project is required to extend the current lease by 30 years and to rebuild the wharfs to meet seismic standards. To address the more applicable issues above (issue numbers 1 and 6), a single significance threshold was developed based on Appendix F guidance. A significant impact would occur if:

- The proposed Project would result in the wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation.

3.5.5.4 Impact Determination

The proposed Project would not result in the wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation, and would not result in significant energy efficiency impacts.

Project Equipment

Sources contributing to GHG emissions (and utilizing fuels) during proposed Project construction consist of:

- harbor craft;
- off-road construction equipment;
- on-road construction vehicles; and
- worker vehicles.

Sources contributing to GHG emissions (and utilizing fuels) during proposed Project operation consist of:

- tanker ships (transit, anchoring, and hoteling);
- integrated barges (transit, anchoring and hoteling);
- tugboats assisting ships during harbor transit, turning, and docking; and
- product loading and unloading.

Energy usage from all of these activities is summarized in this chapter and back-up calculations and assumptions can be found in Appendix B4 (Energy Requirements and Energy Use by Amount and Fuel Type)

Construction

Energy (primarily as diesel fuel, but including minor amounts of gasoline) would be used during construction of the proposed Project. Project construction activities and elements for which energy consumption was calculated include: (a) off-road diesel-powered construction equipment; (b) on-road diesel-powered delivery and haul trucks; (c) worker commute vehicles, assumed to be gasoline; and d) marine sources (e.g. assisting harbor craft, etc.). Construction of the proposed Project would consume approximately 270,000 gallons of diesel and 17,500 gallons of gasoline fuel (Table 3.5-2). Table 3.5-2 uses the GHG emission generated by various categories of construction activities and converts them to energy consumed. Energy expenditures during construction would be temporary, lasting approximately up to six years over the 30-year lease term.

Construction would not result in substantial waste or inefficient use of energy because the construction contractor would be required to use the cleanest tier equipment in compliance with the LAHD Sustainable Construction Guidelines.

Table 3.5-2: Proposed Project (Mitigated) Construction Energy Consumption

Category	Year	Fuel	GHG Emissions (Metric Tons)	Fuel Consumed (Gallons)
Off-road Construction Equipment	2018	Diesel	169.79	16,711
Marine Sources / Equipment	2018	Diesel	38.63	3,802
On-road Construction Vehicles	2018	Diesel	31.04	3,055
Worker Vehicles	2018	Gasoline	44.45	5,000
Off-road Construction Equipment	2019	Diesel	382.81	37,677
Marine Sources / Equipment	2019	Diesel	453.77	44,660
On-road Construction Vehicles	2019	Diesel	171.27	16,857
Worker Vehicles	2019	Gasoline	50.17	5,643
Off-road Construction Equipment	2020	Diesel	309.39	30,451
Marine Sources / Equipment	2020	Diesel	294.40	28,975
On-road Construction Vehicles	2020	Diesel	64.98	6,396
Worker Vehicles	2020	Gasoline	29.53	3,321
Off-road Construction Equipment	2021	Diesel	207.21	20,393
Marine Sources / Equipment	2021	Diesel	219.43	21,596
On-road Construction Vehicles	2021	Diesel	142.52	14,027
Worker Vehicles	2021	Gasoline	19.97	2,246
Off-road Construction Equipment	2022	Diesel	79.20	7,795
Marine Sources / Equipment[1]	2022	Diesel	124.07	12,211
On-road Construction Vehicles	2022	Diesel	13.30	1,309

Table 3.5-2: Proposed Project (Mitigated) Construction Energy Consumption

Category	Year	Fuel	GHG Emissions (Metric Tons)	Fuel Consumed (Gallons)
Worker Vehicles	2022	Gasoline	10.61	1,193
Off-road Construction Equipment	2023	Diesel	35.86	3,530
Marine Sources / Equipment	2023	Diesel	0.00	0
On-road Construction Vehicles	2023	Diesel	2.16	212
Worker Vehicles	2023	Gasoline	0.00	0
Total Construction - Diesel	**ALL**	**Diesel**	**-**	**269,655**
Total Construction - Gasoline	**ALL**	**Gasoline**	**-**	**17,403**

Notes:1) Marine sources/equipment include barges, tugboats and work boats (harbor craft).
2) Emissions are calculated as far as the California state boundary.
3) Figures are for the proposed Project with all construction mitigation measures.

Energy Requirements and Energy Use by Amount and Fuel Type Operation

During the operational phase, the proposed Project would consume energy (i.e., fuel) primarily for the purpose of transporting product via marine vessels. In addition, small amounts of electricity for pumping product, fossil fuels for propane delivery trucks, and propane consumption from use of the vapor destruction unit (VDU) would also be part of the proposed Project.

The proposed Project terminal upgrades would not result in increased marine oil terminal throughput capacity compared to baseline throughput capacity of the Shell Marine Oil Terminal, and would not result in changes to how petroleum products are transported to the terminal. Thus, energy efficiency in terms of energy per bbl transported would remain unchanged for marine sources irrespective of project implementation. Similarly, the proposed Project would not result in changes to how petroleum products are pumped inland, and thus the energy efficiency in terms of electricity per bbl pumped would remain unchanged irrespective of project implementation.

However, the proposed Project would result in the installation of a new VDU at the terminal to support loading of petroleum products onto vessels that call at the terminal (although Shell has not previously performed loading of vessels at the terminal, loading is authorized in the terminal's air permit). Operation of the VDU would combust propane to eliminate fugitive volatile organic compounds from vessel holding tanks during the ship loading process. New sources of energy consumption associated with the VDU would include combustion of propane as well as vehicle emissions from propane delivery trucks. As described in Chapter 2, up to two vessels would be loaded per month. Overall, the proposed Project would consume an average of 2,567 gallons more diesel fuel and 181,384 gallons more propane fuel in a given year relative to baseline conditions from operation of the VDU. Unmitigated operational energy usage under the proposed Project is presented in Table 3.5-3.

Compliance with MM AQ-5 – Vessel Speed Reduction Program (VSRP) is a project requirement. This measure requires that 95 percent of all tankers calling at Shell's Marine Oil Terminal will comply with the expanded VSRP requirements of slowing down to 12 knots between 40 nm from Point Fermin and the Precautionary Areas. Although this mitigation measure is required primarily to reduce criteria pollutant emissions, it has an additional benefit of resulting in less diesel fuel being required to transport OGVs. Therefore, energy usage under the mitigated scenario has been calculated and summarized in Table 3.5-4 below.

Table 3.5-3: Unmitigated Operational Energy Consumption

Operational Category	Year	Fuel Type	Fuel Consumed (gal/yr) unmitigated	Terminal Throughput (bbls)	Gallons of Fuel Consumed During the Project per bbls of Throughput
Trucks Delivering Propane*	2011-2015 (Baseline)	Diesel	0	13,251,089	
Loading (VDU)*		Propane	0		
Ships – Transit and Anchorage		Diesel	829,939		
Ships – Hoteling		Diesel	245,515		
Tugs		Diesel	28,344		
Vessel Fuel Usage Total		Diesel	1,103,798		0.0832
Trucks Delivering Propane	2019	Diesel	2,555	14,343,405	0.000178
Loading (VDU)		Propane	73,961		0.0051
Ships – Transit and Anchorage		Diesel	891,866		
Ships – Hoteling		Diesel	261,542		
Tugs		Diesel	30,416		
Vessel Fuel Usage Total		Diesel	1,198,699		0.0835
Trucks Delivering Propane	2031	Diesel	2,555	18,190,906	0.000130
Loading (VDU)		Propane	73,961		0.0040
Ships – Transit and Anchorage		Diesel	1,154,123		
Ships – Hoteling		Diesel	525,243		
Tugs		Diesel	48,129		
Vessel Fuel Usage Total		Diesel	1,741,264		0.0957
Trucks Delivering Propane	2048	Diesel	2,555	25,471,660	0.000103
Loading (VDU)		Propane	73,961		0.00290
Ships – Transit and Anchorage		Diesel	1,623,596		
Ships – Hoteling		Diesel	738,901		
Tugs		Diesel	67,707		
Vessel Fuel Usage Total		Diesel	2,445,079		0.0972

Notes:* Not used in the Baseline scenario.

- Emissions are calculated as far as to CA state boundary.
- Only sources for which fuel consumption changed were quantified.

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Table 3.5-4: Mitigated Operational Energy Consumption

Operational Category	Year	Fuel Type	Fuel Consumed (gal/yr) mitigated	Terminal Throughput (bbls)	Gallons of Fuel Consumed During the Project per bbls of Throughput
Trucks Delivering Propane*	2011-2015 (Baseline)	Diesel	0	13,251,089	
Loading (VDU)*		Propane	0		
Ships – Transit and Anchorage		Diesel	829,939		
Ships – Hoteling		Diesel	245,515		
Tugs		Diesel	28,344		
Vessel Fuel Usage Total		Diesel	1,103,798		0.0832
Trucks Delivering Propane	2019	Diesel	2,555	14,343,405	0.000179
Loading (VDU)		Propane	73,961		0.0051
Ships – Transit and Anchorage		Diesel	891,360		
Ships – Hoteling		Diesel	261,542		
Tugs		Diesel	30,416		
Vessel Fuel Usage Total		Diesel	1,198,193		0.0825
Trucks Delivering Propane	2031	Diesel	2,555	18,190,906	0.000130
Loading (VDU)		Propane	73,961		0.0040
Ships – Transit and Anchorage		Diesel	1,153,017		
Ships – Hoteling		Diesel	525,243		
Tugs		Diesel	48,129		
Vessel Fuel Usage Total		Diesel	1,741,264		0.0878
Trucks Delivering Propane	2048	Diesel	2,555	25,471,660	0.00010
Loading (VDU)		Propane	73,961		0.00290
Ships – Transit and Anchorage		Diesel	1,622,041		
Ships – Hoteling		Diesel	738,901		
Tugs		Diesel	67,707		
Vessel Fuel Usage Total		Diesel	2,443,524		0.095

Notes: * Not used in the Baseline scenario.

- Compliance with the Vessel Speed Reduction Program (VSRP) mitigation measure results in slightly less fuel usage during transit.

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As discussed in Section 3.5.4.1, when considering multiple fuel types and looking at total terminal efficiency, the metric of total emissions of GHGs per unit of throughput (bbls) is used. Another metric of analysing operational energy efficiency is the total CO_2 emissions per unit of throughput. Because fuel use can be directly converted to and from CO_2 emissions, this metric allows for the calculation and comparison of total terminal efficiency across all fuel types.

Energy Conservation Features

The proposed Project involves reconstructing two existing wharfs. No new employees will be needed. No new permanent physical structures (office buildings, etc.) will be needed. All petroleum products leave the facility via pipeline. No truck racks are installed or used here. One new device (required by SCAQMD and the USCG), the VDU system will be installed. Energy usage (in the form of propane combustion) from the VDU is included in the operational tables above.

Therefore, without new equipment, there are no design features specifically to energy conservation. However, as mentioned above, implementation of MM AQ-5, Vessel Speed Reduction Program will result in a reduction of diesel combustion from the vessels. These are quantified in the table above.

Energy Supplies

Natural Gas and Electricity Infrastructure

Diesel, gasoline and propane consumption in California and the United States is summarized in Tables 3.5-5 and 3.5-6 below.

Electrical power within the City of Los Angeles is supplied by the Los Angeles Department of Water and Power (LADWP), which serves approximately 3.8 million people. LADWP obtains electricity from various generating sources that utilize coal, natural gas, hydroelectric and renewable resources to generate power. LADWP is committed to increasing the share of renewable energy and promoting increased energy efficiency and conservation by its customers. Diversification of LADWP's energy portfolio, increasing electricity through renewable energy and new customer energy efficiency measures will all help meet the City needs.

LADWP has adopted a number of initiatives to increase its use of renewable energy resources to support the goal of reducing GHG emissions, reducing reliance on fossil fuels and meeting state mandates requiring all utilities to provide 33 percent of their energy from renewable resources by 2020.

Effects of the Project on Local and Regional Energy Supplies

The proposed Project is not expected to have a significant negative impact on regional supplies of diesel fuel, gasoline, natural gas, or electricity. To the contrary, the existing terminal is part of the fuel supply chain that serves Southern California, and the proposed Project would allow for the terminal's continuation of that role. Future terminal operations would be subject to the Port of Los Angeles' conservation and sustainability goals, standards, and initiatives, as set forth in the Sustainability Assessment and Plan Formulation (LAHD, 2008). These include a number of programs under the CAAP, various greenhouse gas reduction and zero-emissions programs, recycling and other sustainability programs, and the Port Leasing Policy.

The Port Complex is a primary point of entry for goods and fuel coming into the Southern California region. Within the Port, there are currently seven marine oil

terminals operating under separate leases. These are Kinder Morgan (Berths 118-119), Phillip 66 (Berths 148-151), Nustar/Shore Terminal (Berth 163), Valero/Ultramar (Berth 164), Shell (Berths 167-169), Vopak (Berths 187-191) and PBF Energy (Berths 238-239). There are also six major refineries in the region (Chevron-El Segundo, PBF Energy Torrance, Phillip 66-Wilmington, Tesoro-Carson, Tesoro-Wilmington, and Valero-Wilmington). According to the California Energy Commission, conventional petroleum fuels will be the main source of transportation energy for the foreseeable future.

The Effects of the Proposed Project on Peak and Base Period Demands for Electricity and Other Forms of Energy

The LADWP is charged with maintaining sufficient capability to provide its customers with a reliable supply of power, and will continue to do so with proper planning and development of facilities in accordance with the City Charter, using such mechanisms as the Power Integrated Resources Plan (IRP). Based on the LADWP Power IRP, electricity resources and reserves at LADWP will adequately provide electricity for all of its customers, including the proposed Project, through the current Power IRP planning horizon of 2040 (LADWP, 2017). In fact, LADWP does not forecast that peak demand will reach capacity through 2040.

Impact Determination

As discussed above, energy used during construction would primarily be in the form of diesel and gasoline combustion. That fuel usage is quantified above in Table 3.5-2. Primary construction activities associated with wharf replacements are expected to take about three years. After that, implementation of the Source Control Plan which requires upgrades to tank secondary containment would be completed as needed over the term of the lease. That fuel usage is compared to fuel consumption for gasoline and diesel in California and in the United States. Fuel consumption during construction of Shell's MOTEMS project is very negligible as compared to total usage of each fuel.

The stated objectives of the proposed Project would not substantially adversely affect fuel consumption per bbls handled by the Terminal, which equates to no meaningful change in energy efficiency. The proposed Project incurs construction impacts related to energy use, but those impacts would be short-term.

Because fuel would not be used in a wasteful manner during construction, and the increase in fuel consumption associated with the VDU is negligible, the proposed Project's impacts on energy resources during both construction and operation would be less than significant. In addition, one of the air quality mitigation measures has been determined to also reduce operational diesel fuel consumption.

It should be noted that vessel transportation will become more efficient over time as technology improvements are implemented. This increasing efficiency in existing technologies would further reduce the per-unit fuel consumption and GHG emissions of the transportation elements throughout the lifetime of the proposed Project.

Table 3.5-5: Project (Mitigated) Construction Energy Consumption (as compared to California and United States)

Year	Fuel Type	Project Fuel Usage (million gal/yr)	California Fuel Usage[1] (million gal/yr)	Project as a % of California	US Fuel Usage[1] (million gal/yr)	Project as a % of US
2018	Diesel	0.024	4,126	0.00058	61,247	0.000039
	Gasoline	0.005	13,984	0.00004	131,134	0.000004
2019	Diesel	0.099	4,126	0.00240	61,247	0.000162
	Gasoline	0.006	13,984	0.00004	131,134	0.000005
2020	Diesel	0.066	4,126	0.00160	61,247	0.000108
	Gasoline	0.003	13,984	0.00002	131,134	0.000002
2021	Diesel	0.056	4,126	0.00136	61,247	0.000091
	Gasoline	0.002	13,984	0.00001	131,134	0.000002
2022	Diesel	0.021	4,126	0.00051	61,247	0.000034
	Gasoline	0.001	13,984	0.00001	131,134	0.000001
2023	Diesel	0.004	4,126	0.00010	61,247	0.000007
	Gasoline	0	13,984	0	131,134	0

Note: [1]2015 Fuel Usage Data/Numbers

Table 3.5-6: Mitigated Operational Energy Consumption Minus Baseline (as compared to California and the United States)

Year	Fuel Type	Project Fuel Usage (million gal/yr)	California Fuel Usage[1] (million gal/yr)	Project as a % of California Fuel Usage	US Fuel Usage[1] (million gal/yr)	Project as a % of US Fuel Usage
2019	Diesel	0.10	4,126	0.002	61,247	0.0002
	Propane	0.07	580	0.013	37,623	0.0002
2031	Diesel	0.64	4,126	0.016	61,247	0.0010
	Propane	0.07	580	0.013	37,623	0.0002
2048	Diesel	1.43	4,126	0.033	61,247	0.0022
	Propane	0.07	580	0.013	37,623	0.0002

Note:[1]2015 Fuel Usage Data/Numbers

Other Environmental Impact Considerations

Potential energy usage from the Project is summarized in the tables above. When compared to both the metric of barrels of throughput and as compared to fuel combustion in California and the United States, the proposed Project would not pose a significant

adverse impact to energy usage nor does it result in the wasteful, unnecessary or inefficient consumption of energy. The proposed modifications to the Shell Marine Oil Terminal would achieve these objectives.

Because there would be no significant impacts related to energy supplies (the terminal is a part of the fuel supply chain for Southern California), there would also be no unavoidable adverse effects, an irreversible commitment of resources, or growth-inducing effects created or exacerbated by the Project.

Mitigation Measures

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

3.5.5.5 Summary of Impact Determinations

Table 3.5-7 summarizes the impact determinations of the proposed Project related to total energy usage in California and in the United States. The only specific Energy Conservation measure proposed for the proposed Project is compliance with the VSRP (MM AQ-5). For the impact threshold, the table describes the impact, notes the impact determination, describes any applicable mitigation measures, and notes the residual impacts (i.e., the impact remaining after mitigation).

Table 3.5-7: Summary Matrix of Potential Impacts and Mitigation Measures for Energy Conservation Associated with the Proposed Project

Environmental Impacts	Impact Determination	Mitigation Measures	Impacts after Mitigation
The proposed Project would not result in the wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation, and would not result in significant energy efficiency impacts	Less than significant	No mitigation is required.	Less than significant

3.5.5.6 Mitigation Monitoring

The proposed Project is not expected to result in significant impacts on Energy usage and consumption. Therefore, no mitigation measures are required. However, as mentioned above, MM AQ-5 – Vessel Speed Reduction Program has an added benefit of reducing the amount of diesel used in OGVs during transit.

3.5.6 Significant Unavoidable Impacts

The evaluation of Energy Conservation determined that the minor amount of increase in energy use associated with the addition of a VDU and the use of vessels during the operational phase of the Project would not result in a substantial impact.