5.16 ENERGY CONSERVATION

INTRODUCTION

This section evaluates effects the Project may have to energy consumption. Information in this section is primarily drawn from the *Energy Report* prepared for the Project (see **Appendix J** of this Draft Environmental Impact Report (EIR)), which analyzed the Project's construction–period and operational energy consumption.

Scoping Issues Addressed

No public or agency comments related to energy conservation were received during the public scoping period for this Draft EIR.

REGULATORY SETTING

Federal

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it has been regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

Energy Policy Act of 2005

The Energy Policy Act of 2005 sets equipment energy efficiency standards, seeks to reduce reliance on non-renewable energy resources, and provides incentives to reduce current demand on these resources.

Energy and Independence Security Act of 2007

The Energy and Independence Security Act of 2007 amended the National Energy Conservation Policy Act to reinforce the energy reduction goals for federal agencies, including a mandatory reduction in petroleum consumption. This reduction is achieved in part through increased fuel efficiency requirements for passenger vehicles, commonly referred to as Corporate Average Fuel Economy (or CAFE) standards. Other critical regulatory and voluntary programs under this Act include renewable fuel standards, biofuels infrastructure, and carbon capture and sequestration.[1]

[1] US EPA, 2018. Available at: https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act

State

Assembly Bill 32 and Senate Bill 32

California's major initiative for reducing greenhouse gas (GHG) emissions is outlined in Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires the California Air Resources Board (CARB) to prepare a Scoping Plan that outlines strategies for the State to reduce GHGs to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. AB 32 expands the use of renewable energy resources, while improving energy efficiency and mitigating risks associated with climate change. Reduced energy consumption is one important aspect of GHG reduction efforts, particularly as it relates to fossil fuel consumption.

In September 2016, the Governor signed into legislation Senate Bill 32 (SB 32), which builds on AB 32 and requires the state to cut GHG emissions to 40 percent below 1990 levels by 2030. With SB 32, the Legislature also passed Assembly Bill 197 (AB 197), which provides additional direction for updating the Scoping Plan to meet the 2030 GHG reduction target codified in SB 32. CARB published the final 2017 Scoping Plan in November 2017.

2008 California Energy Action Plan Update

The 2008 Energy Action Plan Update provides a status update to the 2005 Energy Action Plan II, which is the state's principal energy planning and policy document. The plan continues the goals of the original Energy Action Plan and describes a coordinated implementation plan for state energy policies. The update identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. To reduce the growing energy demand in California, the update includes actions to address energy efficiency, the increased use of renewable sources of power, and reduction of customer demand on electricity during peak periods.

Senate Bill 1078 and 107; Executive Order S-14-08, S-21-09, SB 2X, SB 350, and SB 100

Senate Bill 1078 requires retail sellers of electricity to provide at least 20 percent of their supply from renewable sources by 2017. Senate Bill 107 changed the target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard (RPS) to 33 percent renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the RPS by signing Executive Order S-21-09, which directs CARB under its AB 32 authority to enact regulations to help the state meet its RPS goal of 33 percent renewable energy by 2020. In April 2011, Governor Brown signed Senate Bill 2X, which legislated the prior Executive Order S-14-08 renewable standard.

Governor Brown also signed Senate Bill 350 (SB 350) in October 2015, which requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030. Senate Bill 100 (SB 100), signed in 2018, took effect in January 2019 and increases the RPS to 60 percent by 2030 and requires all of the state's electricity to come from carbon-free resources by 2045.

Local

City of Dublin

City of Dublin General Plan

Dublin's General Plan includes policies to reduce energy consumption. The Community Design and Sustainability Element guides development within Dublin by encouraging alternative modes of transportation and sustainable design. The Energy Conservation Element promotes energy efficiency and energy conservation at every level. The following policies are relevant to the Project:

Policy 10.9.3.F Encourage alternative modes of transportation by providing priority parking for carpool and alternative energy vehicles, bicycle racks/lockers, showers for employees, and easy access to adjacent regional trails and transit stops.

Policy 13.3.2.B.2 New development projects shall install LED streetlights in compliance with the City's LED light standard.

Eastern Dublin Specific Plan

The Eastern Dublin Specific Plan (EDSP) plans for a multi-modal transportation and circulation system which maximizes transportation efficiency and reduces vehicle miles travelled (VMT). By reducing VMT associated with new development, EDSP development will contribute to energy reductions in the regional transportation network. The following policies and programs are relevant to the Project:

Policy 5-2 Require all development to provide a balanced orientation toward pedestrian, bicycle, and automobile circulation.

Policy 5-17 Establish a bicycle circulation system which helps to serve the need for non-motorized transportation and recreation in eastern Dublin that is consistent with the Dublin Bicycle and Pedestrian Master Plan.

Dublin Climate Action Plan

The Dublin Climate Action Plan codifies Dublin's goal of reducing community-wide GHG emissions by 20 percent below business-as-usual GHG emissions by 2020. The Dublin Climate Action Plan employs the Bay Area Air Quality Management District's GHG efficiency threshold of 6.6 metric tons of carbon dioxide equivalent (MT CO_2E)[2] per service population per year as evidence of Dublin's intent to meet AB 32 standards to reduce statewide GHG emissions to 1990 levels by 2020. The Dublin Climate Action Plan includes GHG emission reduction policies and measures for transportation and land use. The Dublin Climate Action Plan also features guidelines for monitoring and verification of the Dublin Climate Action Plan in order to achieve the GHG reduction target. The following communitywide measures are relevant to the Project:

[2] Carbon dioxide equivalency is a unit used to describe the global warming potential of a given mixture and amount of greenhouse gas. The measure of MT CO2 provides the equivalent amount of CO2 that would have the same global warming potential when measured over a specified timescale, generally 100 years.

Measure A.1.5 The goals of the streetscape master plan are to better coordinate streetscape design throughout the community, clearly delineate public and private responsibilities for improving aesthetics, and provide a mechanism for promoting capital improvement projects with built-in streetscape improvements. Additionally, the Zoning Ordinance has requirements for planting trees in parking lots (minimum of one tree for every four parking spaces).

Measure A.1.6 The multi-modal map is a comprehensive tool to relay transportation opportunities within a specific location. The function of the multi-modal map is to show the various methods of transportation within the City, including pedestrian, vehicle, and bicycle trips as well as connections to other cities.

Measure A.3.1 The Construction and Debris Ordinance requires 100% of asphalt and concrete debris be recycled during demolition and construction. In addition, a minimum of 50% of all other materials must be recycled.

Alameda County

Alameda County General Plan, Conservation Element

The Conservation Element of the Alameda County General Plan addresses energy conservation and general efforts to conserve natural resources such as water and air quality. The following policies and programs are relevant to the Project:

Goal E To insure measures which conserve energy.

Objective E4 To investigate and implement measures to conserve energy.

Alameda County General Plan, Community Climate Action Plan

The County's Community Climate Action Plan was approved and adopted as an element of the Alameda County General Plan in 2014. The Community Climate Action Plan aims to reduce community-wide GHG emissions generated in the unincorporated areas of the County. The following transportation strategy relevant to the Project:

T-2 Develop appropriate bicycle infrastructure for high traffic intersections and corridors

City of Livermore

City of Livermore General Plan

Energy Conservation is addressed in the Open Space and Conservation Element of the Livermore General Plan. The General Plan focuses on energy conservation through a reduction in electricity usage and VMT reductions, and by encouraging the use and development of alternative sources of energy. The following goals, objectives, and policies are relevant to the Project:

Goal OSC-7	Minimize Livermore's energy consumption
Objective OSC-7.1	Promote a variety of approaches to energy conservation in the public and private realms

Livermore Climate Action Plan

The Livermore Climate Action Plan was adopted in 2012 and outlines strategies and activities Livermore will take to reduce GHG emissions produced within their jurisdiction. The Livermore Climate Action Plan implements policies from the Climate Change Element of Livermore's General Plan, with a target of reducing GHG emissions to 15 percent below 2008 levels by 2020. The Livermore Climate Action Plan also supports the state's effort to reduce GHG emissions to California's 1990 levels by 2020.

EXISTING CONDITIONS

This section presents information on energy provision and supply in the study area. The study area for this topic includes the Project site, as well as the jurisdictions of Dublin and Livermore, and the service areas of energy providers.

Energy Use and Supply

In 2016, total energy use per person in California was 199 million British thermal units (BTU).[3] This is one of the lowest energy consumption rates per-capita in the nation. In 2016, California's total energy supply was approximately 2,431 trillion BTU, which represents 2.9 percent of the national supply.[4] Electricity and natural gas in California are generally consumed by stationary uses such as residences, commercial, and industrial facilities, whereas petroleum consumption is generally accounted for transportation-related energy use, which is typical of the nation overall.[5] Of California's total energy usage, the transportation sector represents 39.8 percent of the total energy consumed in the state. Nationally, energy consumed in transportation accounts for 28.6 percent of all energy consumption. In 2016, Californians consumed 15.1 billion gallons of gasoline and three billion gallons of diesel fuel.[6]

According to the 2016 American Community Survey, there are approximately 54,523 residents in the Dublin and 80,968 residents in Livermore. This would equate to approximately 26,962 billion BTU's of energy consumption per year in the Dublin/Livermore area.[7] On-road automotive fuel and

[3] http://www.eia.gov/state/rankings/?sid=CA#series/12

[4] EIA (US Energy Information Administration), 2018. California Total Energy Production. Available: California Total Energy Production. Accessed: December 5, 2018.

[5] EIA (US Energy Information Administration), 2018. California State Profile and Energy Estimates. Available: http://www.eia.gov/state/data.cfm?sid=CA#ConsumptionExpenditures. and https://www.eia.gov/state /seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_te.html&sid=US&sid=CA, Accessed: December 5, 2018.

[6] California State Board of Equalization (BOE), 2018a. Net Taxable Gasoline Gallons. Available: http://www.cdtfa.ca.gov/taxes-and-fees/MVF_10_Year_Report.pdf. Accessed: December 5, 2018.

[7] 199 MBTU *135,491 = 26,962,709 billion BTU

heavy-duty diesel fuel consumption throughout the County, including municipalities, has remained steady since 2009.[8]

Energy Providers

Pacific Gas and Electric (PG&E)'s distribution system has historically provided electricity directly to residential and commercial consumers within the study area. Effective June 1 2018, commercial, industrial, and public recipients of PG&E service began receiving electricity from East Bay Clean Energy (EBCE). As of November 2018, residential customers have begun receiving services from EBCE and are able to opt out and continue to receive service from PG&E. EBCE offers three energy options: Bright Choice, Brilliant 100, and Renewable 100.

The PG&E 2017 power mix is as follows:[9]

- 20 percent natural gas
- 27 percent nuclear
- 33 percent renewables
- 18 percent large hydroelectric
- 2 percent unspecified

The EBCE power mix for the three energy options are as follows:[10]

- Bright Choice: at least 38 percent renewable and an additional 47 percent carbon-free
- Brilliant 100: at least 40 percent renewable and an additional 60 percent carbon-free
- Renewable 100: is 100 percent renewable and carbon-free

Natural gas is a fossil fuel which is composed of decomposed plant and animal material. PG&E is the regional retailer for natural gas, which is delivered directly to residential and commercial consumers via their network of transmission and distribution pipelines. Gasoline and diesel fuel for vehicle use is provided at local gas stations throughout the study area.

[8] California State Board of Equalization (BOE), 2018b. Taxable Diesel Gallons 10-year Report. Available: http://www.cdtfa.ca.gov/taxes-and-fees/Diesel_10_Year_Report.pdf. Accessed: December 5, 2018.
[9] PG&E, 2018. Exploring Clean Energy Solutions. Available: https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page. Accessed: November 29, 2018.
[10] EBCE, 2018. Power Mix. Available: https://ebce.org/power-mix/. Accessed: November 29, 2018.

IMPACTS AND MITIGATION MEASURES

Significance Criteria

Based upon the criteria derived from Appendix G of the State California Environmental Quality Act (CEQA) Guidelines, the Project would result in a significant impact related to energy conservation if it would:

A. Result in the inefficient, wasteful or unnecessary consumption of energy during project construction or operation

Methodology

This section analyzes the Project's direct energy consumption[11] and indirect energy consumption[12] from three energy sources: electricity, natural gas, and transportation fuel. Fuel includes operational vehicle trips as well as the fuel necessary for Project construction.

Traffic information used in this energy analysis was provided in the *Transportation Impact Analysis* (TIA) prepared by Kittelson & Associates in August 2018 (see **Appendix D** of this Draft EIR). For operational analysis, petroleum fuel consumption factors were provided by the most current mobile source emissions inventory modeling available (EMFAC2017) and Caltrans guidelines were used in tandem with peak and off-peak traffic data for existing (2017) and cumulative (2040) traffic volumes to calculate energy consumption.[13] To capture the net increase in energy consumption attributable to the Project, existing conditions (2017) are compared with projected energy consumption in 2040 without the Project (2040 No Project) and against 2040 energy consumption with Project implementation (2040 Plus Project). Consumption factors used for this analysis are listed in the *Energy Report* for the Project (see **Appendix J** of this Draft EIR).

Energy consumption required for construction was estimated using the input-output method. This method uses construction cost to estimate energy consumption by multiplying the cost of the Project by a million British thermal units (MBTU)/1977 ratio provided by Caltrans. This ratio is based on the cost of construction in 1977. In order to accurately apply this ratio, the Caltrans construction cost index[14] was used to relate current construction cost to 1977 construction cost. Other sources of indirect energy consumption were determined by multiplying the roadway length by a MBTU/mile ratio which was provided by Caltrans.

[11] Direct Energy is defined as the amount of fuel consumed by vehicles over a period of time. Factors that influence fuel consumption include but are not limited to; speed, grade, intersection delay time, traffic density and changing fuel economy due to newer more fuel efficient vehicles on the road.
[12] Indirect energy is defined as the remaining energy consumed to construct, operate and maintain the Project. Indirect energy also includes the manufacture and maintenance of vehicles using the roadway.
[13] Energy and Transportation Systems, Caltrans Transportation Laboratory, Sacramento, CA, July 1983
[14] California Department of Transportation, 2014. Price Index for Selected Highway Construction Items. Available: http://www.dot.ca.gov/hq/esc/oe/cost_index/historical_reports/CCI_1QTR_2014.pdf. Accessed" November 29, 2018.

Impact Analysis

No Impact Summary

There are no "no impact" determinations for this topic.

Impacts of the Project

A. Result in the inefficient, wasteful or unnecessary consumption of energy during project construction or operation

Construction

Construction of the Project would require electricity usage, diesel fuel consumption from on-road hauling trips and off-road construction diesel equipment, and gasoline consumption from on-road work commute and vendor trips. **Table 5.16-1** presents the existing and projected energy consumption for Project construction and compares this energy consumption to baseline energy consumption that would occur in the Dublin and Livermore area without the Project. This allows for a contextualized comparison of construction-period energy consumption needed for the Project. Dublin and Livermore energy consumption was used without including unincorporated areas of the County or the County as a whole, as including the entirety of the County would dilute the Project's energy consumption, potentially underrepresenting the Project's effect, while comparing the Project to unincorporated areas that are dedicated to low-intensity uses such as resource management would not be an accurate context for Project energy consumption.

Table 5.16-1 Projected Construction Energy Consumption

Description	Existing (billion BTU)	2040 No Project (billion BTU)	2040 Plus Project (billion BTU)
Vehicles Maintenance	1,977	2,141	2,141
Road Maintenance	40	40	40
Road Construction	--	--	308
Vehicle Manufacturing	1,367	2,139	2,139
Total Indirect Energy	3,384	4,320	4,628

Source: Illingworth & Rodkin, 2018

Although construction of the Project would require the consumption of 308 billion BTU of energy, the Project's non-recoverable use of energy associated with construction would represent approximately 1 percent of the Dublin and Livermore area's annual indirect energy demand.[15] Construction of the Project would not consume a greater amount of energy than other roadway projects of a similar type and size, as Project construction methods, materials, and duration is typical and comparable with other roadway projects. In accordance with the goals and intent of

[15] Annual Dublin/Livermore area energy consumption divided by the Project's construction period energy consumption: 29,640,055,000,000 MBTU's ÷ 307,694,691,935 MBTU's = 1 percent

Dublin's Green Building Practices, appropriate measures to incorporate energy efficiency measures during construction, such as energy-efficient construction equipment, would be determined by Dublin and included in the construction bid package. Based on discussions between Dublin and the County to-date, it is anticipated that energy efficiency for construction equipment in County areas would be coordinated. Based on the forgoing, construction of the Project would not result in the inefficient, wasteful or unnecessary consumption of energy. This impact would be **less than significant**.

Operation

Once operational, electricity needed to power the Project would be generally limited to traffic signals and street lighting, and would be adequately supplied by the existing PG&E and EBCE electric power mix, as described in more detail in **Section 5.15, Utilities**. As described in **Chapter 3.0, Project Description**, the Project would include high-efficiency streetlights in Dublin. The Project would help reduce wasteful energy consumption by improving traffic operations in the study area and contributing to an overall reduction in energy consumption through locally reduced VMT.

Table 5.16-2 compares future energy consumption on the regional roadway network in 2025 (the Project opening year) and 2040 (cumulative year) against existing conditions (2017). Overall, energy consumption is projected to decrease over time, as fuel efficiency improves. As described in **Chapter 7.0, Other CEQA Considerations**, the Project would result in minimal change to VMT at a regional level. Given the relatively small size of the Project (1.5 miles in length) within the overall network and the type of project (a local roadway), it is understandable that the Project would not result in notable changes to regional VMT. Taking into consideration the expected margin of error from the Countywide model used to predict VMT and expert professional judgement, it is determined that the VMT reductions and increases of 0.0-0.1 percent are negligible and would not represent an increase in VMT as a result of the Project. Therefore, the minor decrease in energy consumption shown in the 2025 Plus Project scenario (0.01 percent) and minor increase in the 2040 Plus Project scenario (0.02 percent) resulting from this shift in VMT are considered to be negligible.

Travel forecasts for the Project show a local decrease in VMT with implementation of the Project in 2040. The local decrease in VMT results from shorter trips between Dublin and Livermore, when local travelers can use the Project roadway extension instead of completing a longer trip on Interstate 580 (I-580) or local/frontage roads south of I-580. This local VMT reduction equates to a decrease of approximately 1.2 billion BTUs per day and 436 billion BTUs annually. Therefore, operation of the Project would not result in the inefficient, wasteful or unnecessary consumption of energy, and this impact would be **less than significant.**

Table 5.16-2 Annual Projected Direct Energy Consumption - Regional

Energy Consumption Type	Annual VMT				
	Existing 2017	**2025 No Project**	**2040 No Project**	**2025 Plus Project**	**2040 Plus Project**
	1,197,741,358	1,349,057,818	1,528,944,016	1,348,999,732	1,529,387,024
Percentage of Travel					
Gas Travel	94%	90%	90%	90%	90%
Diesel Travel	6%	7%	7%	7%	7%
Electric Travel	0%	3%	3%	3%	3%
Fuel Efficiency (gal/mi, kW/mi)					
Gas Travel	21.5	29.1	36.6	29.1	36.6
Diesel Travel	7.8	10.6	13.1	10.6	13.1
Electric Travel	3.3	3.3	3.3	3.3	3.3
Energy Usage (MBTU)					
Gas Travel	6,270,877,784	5,038,561,125	4,528,133,577	5,038,344,182	4,529,445,594
Diesel Travel	1,132,765,714	1,089,512,157	1,001,364,985	1,089,465,247	1,001,655,129
Electric Travel		38,835,098	44,013,451	38,833,426	44,026,204
Total	**7,403,643,498**	**6,166,908,379**	**5,573,512,014**	**6,166,642,855**	**5,575,126,927**
Total over 2017		(1,236,735,119)	(1,830,131,485)	(1,237,000,644)	(1,828,516,571)
Percentage Change over Existing		-16.70%	-24.72%	-16.71%	-24.70%

Source: Illingworth & Rodkin, 2018
Note: 1 gallon of gasoline = 120,476 Btu
1 gallon of diesel fuel = 137,452 Btu
30 kW·h/100 mi = 3.3 mi/kW
1 kW = 3,412 Btu

CUMULATIVE IMPACTS

Cumulative impacts arise due to the linking of impacts from past, present, and foreseeable future projects in the region. Other projects in the area include past and present planned residential, commercial, and infrastructure development projects (see **Chapter 4.0, Introduction to Environmental Analysis**). The cumulative year is 2040, and includes growth projections from Plan Bay Area and General Plans, in addition to specific projects determined to be reasonably foreseeable by each jurisdiction. Future development activities in Dublin, Livermore, and elsewhere around the study area would impact the same energy resources that would be affected by the Project.

As described above, the Project would extend Dublin Boulevard eastward and would provide physical access for future development of planned land uses in Dublin, as outlined in Dublin's General Plan. The Project involves no direct use of natural resources beyond fuel and energy needed during construction activities. Electricity required to power streetlights and intersection traffic signals during Project operation would be consistent with typical energy consumption for roadway projects. The energy consumed through vehicle fuel during Project operation would be minimal, as generally the Project would not generate new trips but would provide a local alternative route, locally reducing VMT and related energy consumption. When balancing energy used during construction and operation against energy saved by relieving traffic congestion and other transportation efficiencies, the Project would not result in the wasteful use of energy.

As discussed in **Chapter 3.0, Project Description**, and **Chapter 7.0, Other CEQA Considerations**, planned population growth and the resulting increases in energy consumption in each jurisdiction has been fully evaluated in the applicable CEQA clearances for applicable General Plans and individual development projects. The Project would indirectly support development of planned uses and associated planned growth in eastern Dublin, consistent with local and regional planning documents, and would not indirectly result in wasteful or inefficient energy consumption in any jurisdiction. Future developments in Dublin, the County, and Livermore would be subject to mitigation from prior EIRs such as the Dublin General Plan EIR, EDSP EIR, Fallon Village Supplemental EIR, Alameda County General Plan, and the City of Livermore General Plan. Future development in Livermore would be subject to General Plan consistency and mitigation from the General Plan EIR. Therefore, no cumulative impact would occur. The Project would result in a less than cumulatively considerable contribution to any significant cumulative impact.

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