Table 3.3-1
Global Warming Potential for Various Greenhouse Gases

Pollutant	Lifetime (Years)	Global Warming Potential (20-Year)	Global Warming Potential (100-Year)
Carbon Dioxide (CO_2)	--	1	1
Methane (CH_4)	12	21	25
Nitrous Oxide (N_2O)	114	310	298
Nitrogen Trifluoride	740	Unknown	17,200
Sulfur Hexafluoride (SF_6)	3,200	23,900	22,800
Perfluorocarbons (PFCs)	2,600-50,000	6,500-9,200	7,390-12,200
Hydrofluorocarbons (HFCs)	1-270	140-11,700	124-14,800

/a/ Lifetime refers to the approximate amount of time it would take for the anthropogenic increment to an atmospheric pollutant concentration to return to its natural level as a result of either being converted to another chemical compound or being taken out of the atmosphere via a sink.

/b/ The United States primarily uses the 100-year GWP as a measure of the relative impact of different GHGs. However, the scientific community has developed a number of other metrics that could be used for comparing one GHG to another. These metrics may differ based on timeframe, the climate endpoint measured, or the method of calculation. For example, the 20-year GWP is sometimes used as an alternative to the 100-year GWP. Just like the 100-year GWP is based on the energy absorbed by a gas over 100 years, the 20-year GWP is based on the energy absorbed over 20 years. This 20-year GWP prioritizes gases with shorter lifetimes, because it does not consider impacts that happen more than 20 years after the emissions occur. Because all GWPs are calculated relative to CO_2, GWPs based on a shorter timeframe will be larger for gases with lifetimes shorter than that of CO_2, and smaller for gases with lifetimes longer than CO_2.

Source: CARB n.d.

State

The primary effect of rising global concentrations of atmospheric GHGs is an increase in the average global temperature of approximately 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using 2000 emission rates shows that further warming is likely to occur over the next century given the expected increase in global atmospheric GHG concentrations from innumerable sources of GHG emissions worldwide (including from economically developed and developing countries and deforestation (USEPA 2009).

Adverse impacts from global climate change worldwide and in California could include:

Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor due atures (USEPA 2009);

Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets (Intergovernmental Panel on Climate Change 2013);

Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones (Intergovernmental Panel on Climate Change 2013);

Table 3.3-2
California Greenhouse Gas Emissions Inventory Trend

Sector	CO_2e Emissions (Million Metric Tons)									
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Electricity Generation (In State)	55	54	47	41	51	50	52	50	42	39
Electricity Generation (Imports)	66	48	44	47	45	40	37	34	26	24
Transportation	182	175	170	167	166	166	167	171	173	174
Industrial	100	98	102	101	102	104	105	103	101	101
Commercial	18	19	20	21	21	22	21	22	23	23
Residential	31	31	32	33	31	32	27	28	29	30

3.3.2 Regulatory Setting

There are many federal, state, regional, and local regulations and policies related to climate change and GHG emissions. The following list is not designed to be a comprehensive list of regulations and policies, and is focused on select regulations and policies that are pertinent to CSULB and the proposed project.

Federal

Supreme Court Ruling

The U.S. Supreme Court ruled in *Massachusetts vs. Environmental Protection Agency, 127 S. Ct. 1438 (2007)*, that CO_2 and other GHGs are pollutants under the Clean Air Act (CAA), which

State

Energy Efficiency Standards for Residential and Nonresidential Buildings

Located in Title 24, Part 6 of the California Code of Regulations and commonly referred to as Title in 1978 in response to a legislative

allow consideration and possible incorporation of new energy efficiency technologies and methods (California Energy Commission 2015). The California Energy Commission adopted the 2008 changes to the Building Energy Efficiency Standards to respond to the mandates of Assembly Bill (AB) 32 and to pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs. The most recent update to Title 24 is the 2016 Standards which improve upon the 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2016 Standards went into effect on January 1, 2017. The Standards are updated on an approximately three-year cycle.

Senate Bill 1078, Senate Bill 107, and Executive Order S-14-08 (Renewables Portfolio Standard)

Signed on September 12, 2002, Senate Bill (SB) 1078 required California to generate 20 percent of its electricity from renewable energy by 2017. SB 107, signed on September 26, 2006, changed the due date for this goal from 2017 to 2010, which was achieved by the state. Signed on November 17, 2008, Executive Order (E.O.) S-14-08 established a Renewables Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020.

Executive Order S-3-05

On June 1, 2005, E.O. S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

E.O. S-3-05 calls for the Secretary of California Environmental Protection Agency to be responsible for coordination of state agencies and progress reporting. A recent California Energy Commission report concludes, however, that the primary strategies to achieve this target should of electricity supplies and fuels, and major improvements in energy efficiency (California Energy Commission 2011).

In response to E.O. S-3-05, the Secretary of California Environmental Protection Agency created the Climate Action Team cG [(t)-4(he)3( )-254(C)5(l1)-3(esp)350 0 g 0 q 0.000 0 g 4.73T /F1 11.04 Tf 1 0

Assembly Bill 32 (California Global Warming Solutions Act of 2006)

In September 2006, the California Global Warming Solutions Act of 2006, also known as AB 32, was signed into law. AB

Adopting and implementing measures to reduce transportation sector emissions.

CARB adopted the First Update to the AB 32 Scoping Plan in 2014 (CARB 2014). The Update describes progress made to meet the near-term objectives of AB
climate change priorities and activities for the next several years. It also frames activities and issues facing the state as it develops an integrated framework for achieving both air quality and climate goals in California beyond 2020. Specifically, the Update covers the following:

An update of the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants.

A review of progress-to-date, including an update of Scoping Plan measures and other state, federal, and local efforts to reduce GHG emissions in California.

Potential technologically feasible and cost-effective actions to further reduce GHG emissions by 2020.

Recommendations for establishing a mid-
long-term goal of an emissions limit 80 percent below 1990 levels by 2050.

Sector-specific discussions covering issues, technologies, needs, and ongoing state

As discussed above, in December 2007, CARB approved a total statewide GHG 1990 emissions level and 2020 emissions limit of 427 $MMTCO_2e$. As part of the Update, CARB revised the 2020 statewide limit to 431 $MMTCO_2e$, an approximately 1 percent increase from the original estimate. The revised estimate includes incorporation of the Pavley standards (AB 1493, Clean Car Standards) in the business-as-usual forecast. The 2020 business-as-usual forecast in the Update is 509 $MMTCO_2e$. The state would need to reduce those emissions by 15 percent to meet the 431 $MMTCO_2e$ 2020 limit.

Senate Bill 375 (Sustainable Communities and Climate Protection Act of 2008)

SB 375, adopted in September 30, 2008, provides a means for achieving AB 32 goals through the reduction in emissions by cars and light trucks. SB 375 requires Regional Transportation Plans (RTPs) prepared by Metropolitan Planning Organizations (MPOs) to include Sustainable Communities Strategies (SCSs). In adopting SB 375, the Legislature found that improved coordination between land use planning and transportation planning is needed in order to achieve the GHG emissions reduction target of AB 32. Furthermore, the staff analysis for the bill prepared

Senate Bill 743

SB 743, adopted September 27, 2013, encourages land use and transportation planning decisions and investments that reduce vehicle miles traveled (VMT), which contribute to GHG emissions, as required by AB 32. Key provisions of SB 743 include reforming aesthetics and parking CEQA analysis for certain urban infill projects and eliminating the measurement of auto

and

only as much energy as they can generate from renewable energy sources such as solar photovoltaic systems. Specifically, in 2016, CSULB President Conoley signed the Climate Commitment to integrate carbon neutrality with climate resilience and established the Presid Commission on Sustainability in 2018, with the mission of integrating sustainability--defined as the intentional and simultaneous focus on environmental, social, and economic health--into all aspects of the university (CSULB 2016).

In December 2014, the CSULB Climate Action Plan was released (CSULB 2014). The plan sets

emission reduction strategies are broken out into four categories (transportation, energy

Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

3.3.3.3 Impact Analysis

GHG-1: Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant. Implementation of the proposed project would generate both direct and indirect GHG emissions; however, the magnitude of emissions would be minimized through the incorporation of robust project design and sustainability features that enhance energy efficiency and reduce resource consumption. Temporary direct GHG emissions would be generated from the use of off-road equipment and truck/worker vehicle trips during construction activities. Mandatory compliance with SCAQMD regulations that restrict vehicle idling and ensure optimal equipment operating conditions would prevent the occurrence of excessive GHG emissions from these sources. The SCAQMD recommends that temporary GHG emissions associated with construction of CEQA projects be amortized over the operational life of the project to reflect the cumulative nature of climate change implications, which for this project is assumed to be 30 years. The amortized construction emissions are estimated at 20.6 metric tons of CO_2e per year, which is well below the threshold of 3,500 metric tons of CO_2e per year, as shown in Table 3.3-4

Table 3.3-4
Estimated Annual GHG Emissions

Scenario and Emission Source	Carbon Dioxide Equivalent (Metric Tons per Year)
Construction Emissions (Buildings) Amortized (Direct) /a/	9.5
Construction Emissions (Roadway) Amortized (Direct) /a/	3.5
Area Source Emissions (Direct)	<0.1
Energy Source Emissions (Indirect)	0.0
Mobile Source Emissions (Direct)	0.0
Waste Disposal Emissions (Indirect)	5.1
Water Distribution Emissions (Indirect)	2.5
TOTAL	**20.6**

Utilize construction materials that are vetted for compliance with the Red List, prohibiting the use of any materials which may have chemicals of concern. In addition, wood materials will be certified by the Forest Stewardship Council.

Use a lighting strategy that includes specifying 75 percent of the total connected lighting load as indirect fixtures, which supports an ambient lighting design. Additionally, utilize materials with high reflectivity to allow light to reflect naturally throughout the space.

Utilize materials with low to no volatile organic compounds.

Test materials for presence of particulate matter, formaldehyde, smoke, volatile organic compounds and other chemicals of concern prior to occupancy.

Use enhanced filtration media at all mechanical systems to enhance air quality throughout occupancy.

As previously discussed, there are a number of plans GHG reduction plans, policies, and regulations relevant to the proposed project. Importantly, the CSULB Climate Action Plan and related Sustainability Policy applies sustainable principles across all areas of university operations, including facility sustainability improvements, energy and water efficiency retrofits, and incorporation of green building practices into new facility design. In addition, current CSU policy requires all new construction and major renovations to achieve the equivalent of a silver level of certification under the LEED rating system (CSULB 2016). The proposed project would

Commitment. Importantly, the proposed project would seek to achieve a LEED Platinum Rating and the NZE design would supply 100 percent of energy needs on a net annual basis by on-site renewables. These two features ensure that the proposed project would not interfere with the CSULB Climate Action Plan and Sustainability Policy. In addition, Tables 3.3-5 and 3.3-6 SCS and State Scoping Plan GHG Reduction Strategies. Finally, the proposed project would not impede the attainment of the GHG reduction goals for 2030 or 2050 identified in E.O. S-03-05 and SB 32, or the carbon neutrality goal for 2045 identified in E.O. B-55-18. As discussed in Section 3.3.2 above, E.O. S-03-

Table 3.3-5
Project Consistency with the SCAG 2016 RTP/SCS

RTP/SCS Measure	Project Consistency
Preserve the Transportation System We Already Have	Does not apply. The project would not inhibit SCAG from preserving the existing transportation system.
Expand Our Regional Transit System to Give People More Alternatives to Driving Alone	Does not apply. The project would not inhibit SCAG from expanding the regional transportation system.
Expand Passenger Rail	Does not apply. The project would not inhibit SCAG from expanding the passenger rail system.
Improve Highway and Arterial Capacity	

Table 3.3-6
Project Consistency with Scoping Plan GHG Reduction Strategies

RTP/SCS Measure	Measure Number	Project Consistency
40% reduction in methane and hydrofluorocarbon (HFC) emissions	Proposed	Not applicable. The project would not prevent CARB from implementing this measure.
50% reduction in black carbon emissions	Proposed	Not applicable. The project would not prevent CARB from implementing this measure.
Agriculture Sector		
Methane Capture at Large Diaries	A-1	Not applicable. The project would not prevent CARB from implementing this measure.

Source: CARB 2008; 2017.

3.3.4 Mitigation Measures

No mitigation measures are required.

3.3.5 Level of Significance after Mitigation

No mitigation measures are required. The proposed project