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## 4.3 Greenhouse Gas Emissions

### 4.3.1 Introduction

This greenhouse gas (GHG) analysis examines GHG and global climate change (GCC) impacts that would result from construction and operational activities associated with the proposed project. This section describes applicable Federal, State, and local regulations that address GHG emissions and GCC in California and the City of Los Angeles; existing climate conditions and influences on GCC are also described. The analysis accounts for energy and resource conservation measures that have been incorporated into the proposed project, as well as pertinent State-mandated GHG emission reduction measures.<sup>163</sup> The analysis also assesses cumulative and project-related contributions to GCC that would result from the proposed project. Air quality effects associated with criteria pollutant (ambient air pollutant) emissions are discussed in Section 4.1, *Air Quality and Human Health Risk*, of this EIR. GHG emission calculations prepared for the proposed project are provided in Appendix B of this Draft EIR.

#### 4.3.1.1 Global Climate Change

Briefly stated, GCC is a change in the average climatic conditions of the earth, as characterized by changes in wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. Many of the recent concerns over GCC use these data to extrapolate a level of statistical significance, specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) developed several emission projections of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC predicted that the global mean temperature change from 2005 to 2100, given six ambient carbon dioxide (CO<sub>2</sub>) scenarios, could range from 1.5 to 4.8 degrees Celsius (C). Regardless of analytical methodology, global average temperature and mean sea level are expected to rise under all scenarios.<sup>164</sup>

Climate models applied to California's conditions project that, under different scenarios, temperatures in California are expected to increase by 2.1 to 8.6 degrees Fahrenheit (F). Almost all climate scenarios include a continuing trend of warming through the end of the century given the substantial amounts of GHGs already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. According to the 2012 Report from the California Climate Change Center, the following climate change effects are predicted in California over the course of the next century.<sup>165</sup>

- A diminishing Sierra snowpack threatens the State's water supply, reduces generation of hydroelectric power, and increases the probability of wildfires along electrical transmission line corridors.
- Increasing temperatures, as noted above, of up to approximately 9 degrees F under the higher emission scenarios, leading to increases in the number of days when ozone pollution levels are exceeded in most urban areas.

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<sup>163</sup> See Section 6.5, *Energy Impacts and Conservation*, in Chapter 6, *Other Environmental Considerations*, of this EIR for discussion of energy efficiency measures.

<sup>164</sup> Intergovernmental Panel on Climate Change, *Climate Change 2014 – Mitigation of Climate Change, Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2014, p. 439. Available: [http://ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc\\_wg3\\_ar5\\_chapter6.pdf](http://ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter6.pdf).

<sup>165</sup> California Climate Change Center, *Our Changing Climate 2012 - Vulnerability & Adaptation to the Increasing Risks from Climate Change in California*. Available: <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>.

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- Coastal erosion along the length of California and sea water intrusion into the Sacramento-San Joaquin River Delta from rise in sea level. This would exacerbate flooding in already vulnerable regions.
- Increased vulnerability of forests due to pest infestation and increased temperatures.
- Increased challenges for the State’s important agricultural industry from water shortages, increasing temperatures, and saltwater intrusion into the Sacramento-San Joaquin River Delta.
- Increased electricity demand, particularly in the hot summer months.

As such, temperature increases would lead to adverse environmental impacts in a wide variety of areas, including: sea level rise, reduced snowpack resulting in changes to existing water resources, increased risk of wildfires, and public health hazards associated with higher peak temperatures, heat waves, and decreased air quality.

### 4.3.1.2 Greenhouse Gases

Parts of the Earth’s atmosphere act as an insulating blanket, trapping sufficient solar energy to keep the global average temperature in a suitable range. The blanket is a collection of atmospheric gases called GHGs. These gases – primarily water vapor, CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), ozone, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>) – all act as effective global insulators, reflecting back to earth visible light and infrared radiation. Human activities, such as producing electricity and driving vehicles, have elevated the concentrations of these gases in the atmosphere. Many scientists believe that these elevated levels, in turn, are causing the earth’s temperature to rise. A warmer earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Climate change is driven by “forcings” and “feedbacks.” Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. A feedback is “an internal climate process that amplifies or dampens the climate response to a specific forcing.”<sup>166</sup> The global warming potential (GWP) is “a measure of the total energy that a gas absorbs over a particular period of time (usually 100 years), compared to carbon dioxide” Individual GHG species have varying GWP and atmospheric lifetimes.<sup>167</sup> The carbon dioxide equivalent (CO<sub>2</sub>e) – the mass emissions of an individual GHG multiplied by its GWP – is a consistent methodology for comparing GHG emissions because it normalizes various GHG emissions to a consistent metric. The reference gas for GWP is CO<sub>2</sub>, which has a GWP of 1. Compared to CH<sub>4</sub>’s GWP of 25, CH<sub>4</sub> has a greater global warming effect than CO<sub>2</sub> on a molecule-per-molecule basis. **Table 4.3-1** identifies the GWP of several select GHGs.

In estimating GHG emissions, the *GHG Protocol Corporate Accounting and Reporting Standard* (GHG Protocol), developed by the World Business Council for Sustainable Development and World Resources Institute, provides standards and guidance for preparing a GHG emissions inventory.<sup>168</sup> The standard is written primarily from the perspective of a business developing a GHG inventory. The GHG Protocol provides the accounting framework for nearly every GHG standard and program in the world, from the International Standards Organization to the European Union Emissions Trading Scheme to The Climate Registry (Registry), as well as hundreds of GHG inventories prepared by individual companies.

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<sup>166</sup> National Research Council of the National Academies, *Radiative Forcing of Climate Change: Expanding the Concept and Addressing Uncertainties*, 2005.

<sup>167</sup> U.S. Environmental Protection Agency, *Glossary of Climate Change Terms*. Available: [https://19january2017snapshot.epa.gov/climatechange/glossary-climate-change-terms\\_.html](https://19january2017snapshot.epa.gov/climatechange/glossary-climate-change-terms_.html), accessed November 21, 2017.

<sup>168</sup> World Business Council for Sustainable Development and World Resources Institute, *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition*, March 2004. Available: <http://ghgprotocol.org/sites/default/files/ghgp/standards/ghg-protocol-revised.pdf>.

**Table 4.3-1**  
**Global Warming Potentials and Atmospheric Lifetimes of Select Greenhouse Gases**

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100 Year Time Horizon)
Carbon Dioxide	50-200	1
Methane	15	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Perfluoromethane (CF <sub>4</sub> )	50,000	7,390
PFC: Perfluoroethane (C <sub>2</sub> F <sub>6</sub> )	10,000	12,200
Sulfur Hexafluoride (SF <sub>6</sub> )	3,200	22,800

Source: Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: *Changes in Atmospheric Constituents and in Radiative Forcing*. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.<sup>169</sup>

Prepared By: CDM Smith, March 2018.

The GHG Protocol divides GHG emissions into three source types of “scopes,” ranging from GHGs produced directly by the business to more indirect sources of GHG emissions, such as employee travel and commuting. Direct and indirect emissions can be generally separated into three broad scopes as follows:

- Scope 1. All direct GHG emissions.
- Scope 2. Indirect GHG emissions from consumption of purchased electricity, heat, or steam (i.e., GHG emissions generated at the power plant that provides electricity at the demand of the site/facility).
- Scope 3. Other indirect (optional) GHG emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses) not covered in Scope 2, outsourced activities, waste disposal, and construction.

The Airports Council International (ACI) has an Airport Carbon Accreditation (ACA) program that evaluates an airport’s GHG emissions according to similar principles.

### 4.3.2 Methodology

The assumptions used to estimate GHG emissions from construction and operational sources are the same as those discussed in Section 4.1, *Air Quality and Human Health Risk* (see Section 4.1.1.2, *Methodology* for the air quality analysis). The discussion below provides a description of methodology elements that are specific to analyzing GHG emissions.

GHG impacts are treated as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective. In its notice of proposed amendments to the CEQA Guidelines

<sup>169</sup> Global Warming Potential values have been updated in IPCC’s subsequent assessment report, the Fifth Assessment Report. However, in accordance with international and U.S. convention to maintain the value of the carbon dioxide “currency,” GHG emission inventories are calculated using the GWPs from the IPCC Fourth Assessment Report.

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pertaining to GHG, the California Natural Resources Agency (CNRA) noted that the impacts of GHG emissions should be considered in the context of a cumulative impact, rather than a project impact. The public notice states:

“While the Proposed Amendments do not foreclose the possibility that a single project may result in greenhouse gas emissions with a direct impact on the environment, the evidence before [CNRA] indicates that in most cases, the impact will be cumulative. Therefore, the Proposed Amendments emphasize that the analysis of greenhouse gas emissions should center on whether a project’s incremental contribution of greenhouse gas emissions is cumulatively considerable.”<sup>170</sup>

It is the accumulation of GHGs in the atmosphere that may result in global climate change. Climate change impacts are cumulative in nature, and thus no typical single project would result in emission of such a magnitude that it, in and of itself, would be significant on a project basis. A typical single project’s GHG emission will be small relative to total global or even statewide GHG emissions. Thus, the analysis of significance of potential impacts from GHG emissions related to a single project is already representative of the long-term impacts on a cumulative basis. As such, the assessment of significance is based on a determination of whether the GHG emissions from the proposed project represent a cumulatively considerable contribution to GCC impacts.

A number of methodologies and significance thresholds have been proposed to analyze the impacts of GHG emissions on GCC. However, at the time of this analysis, no definitive thresholds or methodologies that are applicable to the proposed project have been formally adopted for determining the significance of the project’s cumulative contribution to GCC in CEQA documents.

Various guidance documents, such as The Climate Registry General Reporting Protocol (version 2.1, January 2016);<sup>171</sup> the joint California Air Resources Board (CARB), California Climate Action Registry (CCAR), and International Council for Local Environmental Initiatives (ICLEI) Local Government Operations Protocol (LGOP) (version 1.1, May 2010);<sup>172</sup> the Association of Environmental Professionals (AEP) Community-wide GHG Emissions Protocol;<sup>173</sup> and the ACI ACA program propose generally consistent methodologies for preparing GHG inventories.<sup>174</sup> These methodologies were developed for varying purposes, and not specifically for CEQA. Relying on these guidance documents, this analysis addresses both direct and indirect GHG emissions, which are defined as follows:

- Direct Emissions: Direct sources of GHG emissions from the proposed project include on-airport stationary sources, including heating/cooling; operational changes to surface traffic activity and surface traffic flows within the airport area; construction and operation equipment; construction haul trips; and construction worker commute trips.
- Indirect Emissions: Indirect sources of GHG emissions related to the proposed project include the consumption of purchased electricity, solid waste disposal, water usage, and wastewater treatment.

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<sup>170</sup> California Natural Resources Agency, *Notice of Public Hearings and Notice of Proposed Amendment of Regulations Implementing the California Environmental Quality Act*, 2009.

<sup>171</sup> The Climate Registry, *General Reporting Protocol, version 2.1*, January 2016. Available: <https://www.theclimateregistry.org/tools-resources/reporting-protocols/general-reporting-protocol/>.

<sup>172</sup> California Air Resources Board, *Local Government Operations Protocol, Version 1.1*. Available: [https://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo\\_protocol\\_v1\\_1\\_2010-05-03.pdf](https://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf).

<sup>173</sup> Association of Environmental Professionals (AEP), *Forecasting Community-Wide Greenhouse Gas Emissions and Setting Reduction Targets*, Draft: May 2012. Available: [https://www.califaep.org/images/climate-change/Forecasting\\_and\\_Target\\_Setting.pdf](https://www.califaep.org/images/climate-change/Forecasting_and_Target_Setting.pdf).

<sup>174</sup> Airport Carbon Accreditation, *Greenhouse Gas Protocol*. Available: <http://www.airportcarbonaccredited.org/airport/4-levels-of-accreditation/ghg-protocol.html>.

CARB believes that consideration of so-called indirect emissions provides a more complete picture of the GHG footprint of a facility: “As facilities consider changes that would affect their emissions – addition of a cogeneration unit to boost overall efficiency even as it increases direct emissions, for example – the relative impact on total (direct plus indirect) emissions by the facility should be monitored. Annually reported indirect energy usage also aids the conservation awareness of the facility and provides information” to CARB to be considered for future strategies by the industrial sector.<sup>175</sup> For these reasons, CARB requires the calculation of direct and indirect GHG emissions as part of the Assembly Bill (AB 32) reporting requirements. Additionally, the Governor’s Office of Planning and Research (OPR) guidance for lead agencies conducting GCC analyses in CEQA documents indicates that lead agencies should “make a good-faith effort, based on available information, to calculate, model, or estimate ... GHG emissions from a project, including the emissions associated with vehicular traffic, energy consumption, water usage and construction activities.”<sup>176</sup> Therefore, direct and indirect emissions have been calculated for the proposed project. Because potential impacts from GHG emissions are long-term, GHG emissions are calculated on an annual basis.

The analysis considers only those GHG emissions resulting from the proposed project that would lead to a net change (increase or decrease) in incremental emissions compared to future conditions without the proposed project. The proposed project would not change the number of airline passengers traveling to/through the airport, or the number of aircraft operations. The only notable change in aircraft operations associated with the proposed project would be the change in the routes and distances of aircraft that are taxiing or being towed on the ground between the passenger terminal gates and the aircraft maintenance areas. Consolidation of UAL’s west hangar maintenance operations into the east hangar complex would reduce aircraft taxiing/towing distances and, consequently, would reduce GHG emissions, as compared to those under baseline conditions. Operational stationary sources, including natural gas boilers and water heaters, a diesel-operated emergency generator, and a maintenance-related spray booth, would be installed as part of the proposed project. These sources would replace existing equipment and would service similar capacities to existing sources. UAL operates a Title V facility at LAX; therefore, the replacement equipment would be subject to review and approval by the South Coast Air Quality Management District (SCAQMD) under new source review and other regulations. Where required, the project equipment would meet Best Available Control Technology (BACT). Thus, GHG emissions from new stationary operational sources would be the same as, or lower than, emissions under baseline conditions.

As described in Chapter 2, *Project Description*, the proposed project would be designed as a “Pad-of-the-Future,” with dual 400 hertz (Hz) electric power for all aircraft parking positions, either through stationary or portable ground power units (GPUs), stationary or portable pre-conditioned air (PCA) units, and electrification of GSE maintenance activities. Although the proposed project would provide infrastructure for electric equipment, the GSE fleet would not change as a result of the proposed project. The portable GPUs and PCA units to be used at the facility would include existing diesel, gasoline, and electric-powered units.

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<sup>175</sup> California Environmental Protection Agency, Air Resources Board, Planning and Technical Support Division Emission Inventory Branch, *Staff Report: Initial Statement of Reasons for Rulemaking, Proposed Regulation for Mandatory Reporting of Greenhouse Gas Emissions Pursuant to the California Global Warming Solutions Act of 2006 (Assembly Bill 32)*, October 19, 2007.

<sup>176</sup> State of California, Office of Planning and Research, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review, June 19, 2008, p. 5. Available: <http://opr.ca.gov/docs/june08-ceqa.pdf>.

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### 4.3.2.1 Construction

GHG emissions associated with construction of the proposed project were calculated based on methodologies provided in The Climate Registry *General Reporting Protocol (GRP) Version 2.1*.<sup>177</sup> The GRP is the guidance document that LAWA and other members of The Climate Registry must use to prepare annual GHG inventories for the Registry. Therefore, for consistency, the GRP also was used in this impact analysis. However, to adapt the GRP for CEQA purposes, the following refinement to the GRP operational and geographical boundaries was necessary. The GRP requires all direct and indirect emissions owned or controlled by the reporting entity to be reported; under CEQA, only emission sources that would materially change as part of the proposed project in a manner and to an extent that may result in a significant impact on the environment are required to be analyzed. Indirect emissions associated with construction activities, such as related to purchased electricity, solid waste disposal, water usage, and wastewater disposal, would be speculative and negligible compared to the direct emissions. Analysis of these indirect emissions would not alter the significance conclusions reached in this analysis, and would not increase the severity of a significant impact. Therefore, these emissions, which would normally be included in an inventory prepared pursuant to the GRP for purposes of The Climate Registry, were not included in this analysis.

In accordance with guidance from SCAQMD, GHG emissions from construction have been amortized over the 30-year lifetime of the proposed project to enable comparison to SCAQMD and City of Los Angeles CEQA thresholds of significance (i.e., total construction GHG emissions were divided by 30) and then added to annual operational emissions estimated to occur with project implementation.<sup>178</sup>

The proposed project construction-related sources for which GHG emissions were calculated include:

- Off-road construction equipment;
- On-road equipment and delivery/haul trucks;
- Construction worker trips;
- Incremental operational worker trips during construction; and
- Increased aircraft GPU usage during construction.

A description of the off-road construction equipment, on-road construction equipment, delivery/haul truck trips, and construction worker trips associated with construction of the proposed project is provided in Section 4.1, *Air Quality and Human Health Risk*, Section 4.1.1.2. The parameters used to develop construction GHG emissions for these sources, including construction schedule, equipment usage, and load factors, are the same as those outlined for the construction criteria air pollutant emissions analysis, and are also presented in Section 4.1.1.2, with supporting information presented in Appendix B.1 of this Draft EIR. With respect to incremental operational worker trips during construction, as described in Section 4.1, during construction, some of the activities that currently occur at the East Maintenance Facility, including administration and GSE maintenance, would be conducted at the West Maintenance Facility. Employees whose work would be conducted at the West Maintenance Facility during construction would park in existing UAL parking lots at the West Maintenance Facility. The majority of employees at LAX live in areas that are located east of the airport.<sup>179</sup> Therefore, the relocation of maintenance activities to the west side of the airport would increase vehicle miles traveled (VMT) by maintenance employees from their places of residence to the worksite during construction. Also, as described in Section 4.1, some

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<sup>177</sup> The Climate Registry, *General Reporting Protocol, Version 2.1*, January 2016. Available: <https://www.theclimateregistry.org/tools-resources/reporting-protocols/general-reporting-protocol/>.

<sup>178</sup> South Coast Air Quality Management District, *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold*, October 2008, p. 3-9.

<sup>179</sup> Los Angeles World Airports Security Badge Office, 2015.

of the existing electrified aircraft parking spaces at the East Maintenance Facility would be unavailable during construction. Aircraft that previously would have used these electrified aircraft parking spaces would use diesel GPUs instead. As a result, off-road GPU activity is expected to temporarily increase during construction. The methodologies and assumptions pertaining to the increase in portable GPUs during construction are described in Section 4.1.

### 4.3.2.2 Operations

As indicated above, the only anticipated change in aircraft operations associated with implementation of the proposed project is the reduction in aircraft taxiing/towing distances between the passenger terminal gates and the maintenance hangar area. This change, in turn, would result in a reduction in overall GHG emissions. Similarly, overall building square footage related to UAL's operations would be reduced as a result of the project, thus operational GHG emissions associated with electrical demand for heating/cooling and lighting of the UAL maintenance building area would also decrease (see Chapter 6, *Other Environmental Considerations*, of this EIR).<sup>180</sup> The proposed project would also be designed and constructed in accordance with LAWA's Sustainable Design and Construction Policy, which requires that the new building be designed to achieve the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED®) Silver certification, which would reduce energy demands compared with the existing facility.

As mentioned above and discussed in Section 4.1, *Air Quality and Human Health Risk*, stationary sources being replaced as part of the proposed project would service a similar capacity as existing sources and be subject to BACT, resulting in operational GHG emissions that would be similar to, or less than, existing conditions.<sup>181</sup>

During project operations, all employees would be located at the East Maintenance Facility. This would involve relocation of employees who currently work at the West Maintenance Facility. As noted above, the majority of employees at LAX live in areas that are located east of the airport. Therefore, the consolidation of maintenance activities on the east side of the airport would reduce VMT by maintenance employees from their places of residence to the worksite. In addition, consolidation of UAL's maintenance activities into a single facility would eliminate vehicle trips between the two maintenance facilities that occur under baseline conditions. These reductions in VMT would result in reduced GHG emissions, which would be a beneficial impact of the proposed project.<sup>182</sup>

### 4.3.3 Existing Conditions

#### 4.3.3.1 Regulatory Setting

##### 4.3.3.1.1 International Plans and Policies

#### International Governmental Panel on Climate Change

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess "the scientific, technical and socioeconomic information relevant to understanding the scientific basis of

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<sup>180</sup> The expected reduction in GHG emissions associated with the reduction in building area was not quantified in the analysis; no credit is taken for this reduction. Potential impacts associated with the combined energy consumption from proposed improvements to the East Maintenance Facility, in conjunction with the reasonably foreseeable future use of the West Maintenance Facility, are addressed in the discussion of cumulative energy impacts in Chapter 6, *Other Environmental Considerations*, of this EIR.

<sup>181</sup> The expected reduction in GHG emissions associated with operational stationary sources was not quantified in the analysis; no credit is taken for this reduction.

<sup>182</sup> The reduction in GHG emissions associated with the reduced VMT associated with worker trips and trips between the two existing maintenance facilities was not quantified in the analysis; no credit is taken for this reduction.

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risk of human-induced climate change, its potential impacts, and options for adaption and mitigation.” Since its inception, the IPCC has delivered five comprehensive scientific reports about climate change, with the latest (the Fifth Assessment Report) released in four parts between September 2013 and November 2014.<sup>183</sup>

### United Nations Framework Convention on Climate Change

On March 21, 1994, the U.S. joined other countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.<sup>184</sup>

### Kyoto Protocol

The Kyoto Protocol is a treaty made under the UNFCCC. More than 160 countries, accounting for 55 percent of global emissions, have signed the protocol, under which they commit to reduce their emissions of GHGs or engage in emissions trading. The U.S. symbolically signed the Kyoto Protocol in 1998, however, the U.S. Senate has not ratified the protocol. The original GHG reduction commitments made under the Kyoto Protocol expired at the end of 2012. An extension of the commitment period to December 31, 2020 was agreed to at the Doha, Qatar, meeting held December 8, 2012.<sup>185</sup>

### Paris Agreement

Negotiations held to discuss measures to be taken after the end of the Kyoto Protocol commitment period resulted in the 2015 adoption of the Paris Agreement.<sup>186</sup> The U.S. formally entered the Paris Agreement in September 2016 through an executive order, however, the agreement was not submitted to Congress for approval. In June 2017, the U.S. announced its intent to withdraw from the agreement. The earliest effective date of a withdrawal by the U.S. is November 2020.

#### 4.3.3.1.2 Federal Plans, Policies, and Regulations

##### USEPA Endangerment Findings

In 2010, the U.S. Environmental Protection Agency (USEPA) adopted an endangerment finding for GHGs under Clean Air Act (CAA) Section 202(a) under which the Administrator determined that (1) six GHGs, taken in combination, endanger both the public health and welfare of current and future generations, and (2) the combined emissions of GHGs from new motor vehicles contribute to this GHG air pollution.<sup>187</sup> These findings themselves did not impose any requirements on industry or other entities. However, this

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<sup>183</sup> Intergovernmental Panel on Climate Change, History. Available: [https://www.ipcc.ch/organization/organization\\_history.shtml](https://www.ipcc.ch/organization/organization_history.shtml), accessed November 8, 2017.

<sup>184</sup> United Nations, *United Nations Framework Convention on Climate Change*, 1992. Available: <https://unfccc.int/resource/docs/convkp/conveng.pdf>, accessed November 21, 2017.

<sup>185</sup> United Nations, *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. Available: [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php), accessed November 21, 2017.

<sup>186</sup> United Nations, *Paris Agreement*, 2015. Available: [http://unfccc.int/files/essential\\_background/convention/application/pdf/english\\_paris\\_agreement.pdf](http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf); United Nations, *Framework Convention on Climate Change - Adoption of the Paris Agreement*, December 12, 2015. Available: <https://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>.

<sup>187</sup> U.S. Environmental Protection Agency, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, Final Rule*, Federal Register, Vol. 74, No. 239, December 15, 2009, pp. 66496 - 66546. Available: [https://www.epa.gov/sites/production/files/2016-08/documents/federal\\_register-epa-hq-oar-2009-0171-dec.15-09.pdf](https://www.epa.gov/sites/production/files/2016-08/documents/federal_register-epa-hq-oar-2009-0171-dec.15-09.pdf).

action was a prerequisite for implementing GHG emissions standards for vehicles. On July 25, 2016, USEPA finalized the first steps toward addressing GHG emissions from aircraft engines by determining that GHGs emitted from certain classes of engines used in certain aircraft contribute to the air pollution that endangers public health and welfare.<sup>188</sup> USEPA has not proposed rules for aircraft engine GHG emissions standards.

### GHG and Fuel Efficiency Standards for Passengers Cars and Light-Duty Trucks

In April 2010, the USEPA and National Highway Traffic Safety Administration (NHTSA) finalized GHG standards for new (model year 2012 through 2016) passenger cars, light-duty trucks, and medium-duty passenger vehicles that would decrease CO<sub>2</sub> emission limits for a combined fleet of cars and light trucks. If all of the necessary emission reductions were made from fuel economy improvements, the standards would correspond to a combined fuel economy of 30.1 miles per gallon (mpg) in 2012 and 35.5 mpg in 2016.<sup>189</sup> The agencies issued a joint Final Rule for a coordinated National Program for model years 2017 to 2025 light-duty vehicles on August 28, 2012, that would correspond to a combined fuel economy of 36.6 mpg in 2017 and 54.5 mpg in 2025.

### GHG and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles

In October 2010, the USEPA and NHTSA announced a program to reduce GHG emissions and to improve fuel efficiency for medium- and heavy-duty-vehicles (model years 2014 through 2018). These standards were signed into law on August 9, 2011.<sup>190</sup> In October 2016, USEPA and NHTSA adopted Phase 2 GHG and fuel efficiency standards for medium- and heavy-duty engines and vehicles. The standards are expected to lower CO<sub>2</sub> emissions by approximately 1.1 billion metric tons and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program.<sup>191</sup>

### Fuel Efficiency Standards for Construction Equipment

The federal government sets fuel efficiency standards for nonroad diesel engines that are used in construction equipment. The regulations, contained in 40 CFR Parts 1039, 1065, and 1068, include multiple tiers of emission standards. Most recently, EPA adopted a comprehensive national program to reduce emissions from nonroad diesel engines by integrating engine and fuel controls as a system to gain the greatest emission reductions. To meet these Tier 4 emission standards, engine manufacturers will produce new engines with advanced emission control technologies.<sup>192</sup>

#### 4.3.3.1.3 State Plans, Policies, and Regulations

The legal framework for GHG emission reduction in California has come about through Executive Orders, legislation, and regulation. The major components of California's climate change initiatives are reviewed below.

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<sup>188</sup> U.S. Environmental Protection Agency, Regulatory Announcement, *EPA Finalizes First Steps to Address Greenhouse Gas Emissions from Aircraft Engines*, July 2016. Available: <https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100P1UN.TXT>.

<sup>189</sup> U.S. Environmental Protection Agency, *Regulatory Announcement: EPA and NHTSA Finalize Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks*, April 2010. Available: <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100AKHW.PDF?Dockey=P100AKHW.PDF>.

<sup>190</sup> U.S. Environmental Protection Agency, Regulatory Announcement, *EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles*, August 2011. Available: <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100BOT1.PDF?Dockey=P100BOT1.PDF>.

<sup>191</sup> U.S. Environmental Protection Agency, *Final Rule for Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2*. Available: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-greenhouse-gas-emissions-and-fuel-efficiency#rule-history>, accessed March 1, 2018.

<sup>192</sup> U.S. Environmental Protection Agency, *Regulations for Emissions from Vehicles and Engines-Regulations for Emissions from Heavy Equipment with Compression-Ignition (Diesel) Engines*. Available: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-emissions-heavy-equipment-compression>, accessed April 18, 2018.

## 4.3 Greenhouse Gas Emissions

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### California Environmental Quality Act (CEQA)

CEQA requires lead agencies to consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to raise sea levels, affect rainfall and snowfall, and affect habitat.

Senate Bill (SB) 97, enacted in August 2007, requires OPR to prepare guidelines to submit to the CNRA regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA.<sup>193</sup> The CNRA adopted amendments to the State CEQA Guidelines addressing GHG emissions on December 30, 2009. The amendments became effective on March 18, 2010. The guidelines are reflected in this EIR.

The significance of GHG emissions are specifically addressed in State CEQA Guidelines Section 15064.4. Section 15064.4 calls for a lead agency to make a “good-faith effort” to “describe, calculate or estimate” GHG emissions in CEQA environmental documents. Section 15064.4 further states that the analysis of GHG impacts should include consideration of (1) the extent to which the project may increase or reduce GHG emissions; (2) whether the project emissions would exceed a locally applicable threshold of significance; and (3) the extent to which the project would comply with “regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.” The guidelines also state that a project’s incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations for the reduction of GHG emissions) that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (State CEQA Guidelines Section 15064(h)(3)). The State CEQA Guidelines do not, however, set a numerical threshold of significance for GHG emissions.

### Title 24 Energy Standards

Although not originally intended to reduce GHG emissions, California’s Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were first established in 1978 in response to a legislative mandate to reduce California’s energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. The latest amendments were made in June 2015 and went into effect on January 1, 2017. The premise for the standards is that energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and onsite fuel combustion (for example, for water heating or from the use of onsite generators) result in GHG emissions. Therefore, increased energy efficiency in buildings results in fewer GHG emissions on a building-by-building basis.

### Green Building Standards

The 2013 California Green Building Standards Code (24 CCR Part 11; also referred to as CALGreen) took effect January 1, 2014.<sup>194</sup> The Green Building Standards, as updated (2016), require that every new building constructed in California reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low-pollutant-emitting materials. They also require separate water meters for nonresidential buildings’ indoor and outdoor water use, with a requirement for moisture-sensing irrigation systems for larger landscape projects and mandatory inspections of energy systems (e.g., heat furnace, air conditioner, and mechanical equipment) for nonresidential buildings larger

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<sup>193</sup> California Senate Bill 97, Chapter 185, Statutes of 2007.

<sup>194</sup> 24 California Code of Regulations, Part 11, California Building Standards Commission, *2016 California Green Building Standards Code (CALGreen)*.

than 10,000 square feet to ensure that all are working at their maximum capacity and according to their design efficiencies.

### Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets for all of California: 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.<sup>195</sup>

### Executive Order B-30-15

In 2015, California Governor Edmund G. Brown issued Executive Order B-30-15 to establish a California GHG emissions reduction target of 40 percent below 1990 levels by 2030.<sup>196</sup>

### California Assembly Bill 32

Assembly Bill 32 (AB 32), titled the California Global Warming Solutions Act of 2006 (Pavley) and signed by Governor Schwarzenegger in September 2006, required CARB to adopt regulations to require the reporting and verification of Statewide GHG emissions and to monitor and enforce compliance with the program.<sup>197</sup> In general, the bill required CARB to reduce Statewide GHG emissions to the equivalent of those in 1990 by 2020. CARB adopted regulations in December 2007 for mandatory GHG emissions reporting. In December 2008, CARB approved the AB 32 Climate Change Scoping Plan (Scoping Plan) outlining the state's strategy to achieve the 2020 GHG emissions limit. The Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. On August 24, 2011, the Scoping Plan was re-approved by CARB, including the final supplement to its functional equivalent document, as required by CEQA. The First Update to the Scoping Plan, which will guide the continued development and implementation of the state's efforts to fight climate change, was approved by CARB on May 22, 2014.

Part of the Scoping Plan includes an economy-wide cap-and-trade program, which sets a statewide limit on sources responsible for 85 percent of California's GHG emissions, and established a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The program is designed to provide covered entities the flexibility to seek out and implement the lowest-cost options to reduce emissions. The final cap-and-trade plan was approved on October 21, 2011 and went into effect on January 1, 2013.

In late 2017, CARB adopted an update to the Scoping Plan to reflect the Executive Order B-30-15 GHG reduction target of 40 percent below 1990 levels by 2030, a target also identified in SB 32, described below.<sup>198</sup>

### California Senate Bill 32

Senate Bill 32 (SB 32), which extends the California Global Warming Solutions Act of 2006 (AB 32) beyond 2020, was approved in the 2015/2016 legislative session and approved by the Governor on September 8, 2016.<sup>199</sup> SB 32 requires CARB to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions to ensure that statewide greenhouse

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<sup>195</sup> California Executive Order S-3-05, June 1, 2005.

<sup>196</sup> California Executive Order B-30-15, April 29, 2015.

<sup>197</sup> California Assembly Bill 32, Chapter 488, Statutes of 2006.

<sup>198</sup> California Air Resources Board, *California's 2017 Climate Change Scoping Plan*.

Available: [https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf), accessed on April 2, 2018.

<sup>199</sup> California Senate Bill 32, Chapter 249, Statutes of 2016.

### 4.3 Greenhouse Gas Emissions

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gas emissions are reduced to at least 40 percent below the 1990 statewide greenhouse gas emissions limit no later than December 31, 2030, the target established by Executive Order B-30-15. CARB recently adopted a strategy for achieving this goal, which takes into account the key programs associated with implementation of the AB 32 Scoping Plan--such as GHG reduction programs for cars, trucks, fuels, industry, and electrical generation--and builds upon, in particular, existing programs related to the Cap-and-Trade Regulation; the Low Carbon Fuel Standard; much cleaner cars, trucks, and freight movement; power generation for the State using cleaner renewable energy; and strategies to reduce methane emissions from agricultural and other wastes by using it to meet the State's energy needs. The 2017 Scoping Plan also addresses, for the first time, GHG emissions from natural and working lands, including the agriculture and forestry sectors.<sup>200</sup>

#### California Senate Bill 375

Under Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act of 2008, each metropolitan planning organization (MPO) in the state is required to develop Sustainable Community Strategies through integrated land use and transportation planning and to attain per capita GHG reduction targets for passenger vehicles set by CARB by 2020 and 2035.<sup>201</sup> CARB issued an 8 percent per capita reduction target for the Southern California Association of Governments (SCAG) region for 2020 and a target of 13 percent per capita reduction by 2035. SCAG adopted the latest Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the six-county Southern California region on April 7, 2016, as described below.<sup>202</sup>

#### California Assembly Bill 1493

Enacted on July 22, 2002, Assembly Bill 1493 (AB 1493), commonly known as the Pavley law (named for then-Assembly Member Fran Pavley, who sponsored the bill), required CARB to develop and adopt regulations that will lead to a reduction in GHGs emitted by passenger vehicles and light-duty trucks. Subsequent regulations adopted by CARB, often referred to as the Pavley regulations, apply to 2009 through 2016 vehicles. CARB estimated that the regulations would reduce GHG emissions from the light-duty and passenger vehicle fleet by 18 percent in 2020 and by 27 percent in 2030, compared to recent years.<sup>203</sup> In 2011, the U.S. Department of Transportation, USEPA, and California announced a single timeframe for proposing fuel and economy standards, thereby aligning the Pavley regulations with the federal standards for passenger cars and light-duty trucks.<sup>204</sup> Emission estimates included in this analysis account for the Pavley standards.

#### California Advanced Clean Cars Program

In January 2012, CARB approved a new emissions-control program for vehicles of model years 2017 through 2025. The program combines the control of smog, soot, and GHG into a single package of standards referred to as the Advanced Clean Cars program (13 CCR §1962.1 and 1962.2). The Advanced Clean Cars requirements include new GHG standards for model year 2017 to 2025 vehicles. The Advanced

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<sup>200</sup> California Air Resources Board, California's 2017 Climate Change Scoping Plan, [https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf), accessed on April 2, 2018.

<sup>201</sup> California Senate Bill 375, Chapter 728, Statutes of 2008.

<sup>202</sup> Southern California Association of Governments, *Final 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy: A Plan for Mobility, Accessibility, Sustainability and a High Quality of Life*, adopted April 7, 2016. Available: <http://scagrtpscsc.net/Pages/FINAL2016RTPSCS.aspx>.

<sup>203</sup> California Air Resources Board, *Fact Sheet: Climate Change Emission Control Regulations*, December 10, 2004. Available: [https://www.arb.ca.gov/cc/ccms/factsheets/cc\\_newfs.pdf](https://www.arb.ca.gov/cc/ccms/factsheets/cc_newfs.pdf).

<sup>204</sup> U.S. Department of Transportation, *EPA, DOT and California Align Timeframe for Proposing Standards for Next Generation of Clean Cars*, January 21, 2011. Available: <https://www.transportation.gov/briefing-room/epa-dot-and-california-align-timeframe-proposing-standards-next-generation-clean-cars>.

Clean Cars Program also includes amendments to the low emission vehicle (LEV) amendments (referred to as the LEV III regulations; 13 CCR §1900 et seq.), zero emission vehicle (ZEV) regulations, and the Clean Fuels Outlet Regulation. The LEV III regulations are aimed at reducing criteria pollutant and GHG emissions from light- and medium-duty vehicles. The ZEV regulation requires manufacturers to produce an increasing number of the very cleanest cars available, including battery electric, fuel cell, and plug-in hybrid electric vehicles. The Clean Fuels Outlet regulation is designed to ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to market.<sup>205,206</sup>

### Executive Order S-01-07 and the Low Carbon Fuel Standard

California Executive Order S-01-07 established a statewide goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020 from 2005 levels. The Executive Order also mandated the creation of Low Carbon Fuel Standard (LCFS) for transportation fuels. The LCFS requires that the lifecycle GHG emissions for the mix of fuels sold in California decline on average. Each fuel provider may meet the standard by selling fuel with lower carbon content, using previously banked credits from selling fuel that exceeded the LCFS, or purchasing credit from other fuel providers who have earned credits.<sup>207</sup>

### Renewable Portfolio Standard

Senate Bill 1078 (SB 1078; Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, the Governor signed Executive Order S-14-08, which expands the State's Renewable (Energy) Portfolio Standard (RPS) to 33 percent renewable power by 2020. On September 15, 2009, the Governor issued Executive Order S-21-0911 requiring CARB, under its AB 32 authority, to adopt regulations to meet a 33 percent RPS target by 2020. The CARB regulations use a phased-in or tiered requirement to increase the amount of electricity from eligible renewable sources over an eight-year period beginning in 2012. CARB adopted the regulations in September 2010.

In March 2011, the Legislature passed Senate Bill XI-2 (SB XI-2), which was signed into law by the Governor the following month. SB XI-2 requires utilities to procure renewable energy products equal to 33 percent of retail sales by December 31, 2020, and also established interim targets: 20 percent by December 31, 2013, and 25 percent by December 31, 2016. According to the Los Angeles Department of Water and Power (LADWP), the utility provider for the City of Los Angeles, LADWP achieved the 25 percent renewable energy milestone in 2016.<sup>208</sup> Senate Bill SB 350 of 2015 (Chapter 547, Statutes of 2015) increased the renewable portfolio standard to 50 percent by the year 2030.

#### 4.3.3.1.4 Regional Plans, Policies, and Regulations

##### Regional Transportation Plan/Sustainable Communities Strategy

In accordance with Senate Bill 375, described above, SCAG developed a Sustainable Communities Strategy to reduce per capita GHG emissions within its jurisdiction. SCAG adopted the 2012-2035 RTP/SCS on April 4, 2012. The RTP/SCS included an extensive list of individual transportation projects that aim to

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<sup>205</sup> California Air Resources Board, *Advanced Clean Cars Program Homepage*, page last reviewed January 18, 2017. Available: <https://www.arb.ca.gov/msprog/acc/acc.htm>.

<sup>206</sup> California Air Resources Board, *News Release: California Air Resources Board Approves Advanced Clean Car Rules*, January 27, 2012.

<sup>207</sup> 17 California Code of Regulations, Section 95480 et seq., *Low Carbon Fuel Standard*.

<sup>208</sup> City of Los Angeles, Los Angeles Department of Water and Power, *LADWP Achieves 25 Percent Renewable Energy Milestone*, undated. Available: <http://www.ladwpnews.com/ladwp-achieves-25-percent-renewable-energy-milestone-2/>.

## 4.3 Greenhouse Gas Emissions

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improve the region's mobility and air quality and revitalize the economy. Following adoption of the RTP/SCS, subsequent amendments of the project list were approved on June 6, 2013 and September 11, 2014. The 2012-2035 RTP/SCS aimed to reduce emissions from transportation sources to comply with SB 375 and meet SB 375 regional GHG emission reduction targets for light duty vehicles, improve public health, and reduce air emissions. On April 7, 2016, SCAG's Regional Council adopted the 2016-2040 RTP/SCS, with subsequent amendments of the project list on April 6, 2017 and July 6, 2017. The 2016-2040 RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The Plan charts a course for closely integrating land use and transportation. It outlines more than \$556.5 billion in transportation system investments through 2040.<sup>209,210</sup>

### 4.3.3.1.5 Local Plans, Policies, and Regulations

#### Green LA

In May 2007, the City of Los Angeles introduced *Green LA - An Action Plan to Lead the Nation in Fighting Global Warming* (Green LA).<sup>211</sup> Aimed at reducing the City's GHG emissions by 35 percent below 1990 levels by 2030, the plan calls for an increase in the City's use of renewable energy to 35 percent by 2020 in combination with promoting water conservation, improving the transportation system, reducing waste generation, greening the ports and airports, creating more parks and open space, and greening the economic sector. Green LA identifies objectives and actions in various focus areas, including airports. The goal for Los Angeles' airports is to "green the airports," and the following actions are identified: (1) fully implement the Sustainability Performance Improvement Management System (discussed below); (2) develop and implement policies to meet the USGBC's LEED® green building program rating standards in future construction; (3) improve recycling, increase use of alternative fuel sources, increase use of recycled water, increase water conservation, reduce energy needs, and reduce GHG emissions; and (4) evaluate options to reduce aircraft-related GHG emissions.

#### ClimateLA

In 2008, the City of Los Angeles followed up Green LA with an implementation plan called *ClimateLA – Municipal Program Implementing the Green LA Climate Action Plan* (ClimateLA).<sup>212</sup> A Departmental Action Plan for LAWA is included in ClimateLA, which identifies goals to reduce CO<sub>2</sub> emissions 35 percent below 1990 levels by 2030 at LAX and Van Nuys Airport (also owned and operated by LAWA), implement sustainability practices, and develop programs to reduce the generation of waste and pollutants. Actions are specified in the areas of aircraft operations, ground vehicles, buildings and facilities, and construction.

#### Executive Directive No. 10

As part of the City's efforts to reduce GHG emissions and promote long-term sustainability, in July 2007, Mayor Antonio Villaraigosa issued Executive Directive No. 10 regarding environmental stewardship practices.<sup>213</sup> Consistent with the goal specified in Green LA to make the City of Los Angeles a worldwide

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<sup>209</sup> Southern California Association of Governments, *Final 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy: A Plan for Mobility, Accessibility, Sustainability and a High Quality of Life*, adopted April 7, 2016. Available: <http://scagrtpscsc.net/Pages/FINAL2016RTPSCS.aspx>.

<sup>210</sup> Southern California Association of Governments, *2016-2040 RTP/SCS - 2016 RTP/SCS Amendments*. Available: <http://scagrtpscsc.net/Pages/2016RTPSCSAmendments.aspx>; accessed April 19, 2018.

<sup>211</sup> City of Los Angeles, *Green LA - An Action Plan to Lead the Nation in Fighting Global Warming*, May 2007. Available: [http://environmentla.org/pdf/GreenLA\\_CAP\\_2007.pdf](http://environmentla.org/pdf/GreenLA_CAP_2007.pdf).

<sup>212</sup> City of Los Angeles, *ClimateLA - Municipal Program Implementing the Green LA Climate Action Plan*, 2008.

<sup>213</sup> City of Los Angeles, Office of the Mayor, Mayor Antonio R. Villaraigosa, *Executive Directive No. 10, Subject: Sustainable Practices in the City of Los Angeles*, July 18, 2007. Available: [https://www.lacity.org/sites/g/files/wph1101/f/villaraigosa\\_ed10.pdf](https://www.lacity.org/sites/g/files/wph1101/f/villaraigosa_ed10.pdf).

leader in green buildings, Executive Directive No. 10 requires that City departments, including LAWA, create and adopt a “Statement of Sustainable Building Policies,” which should encompass sustainable design, energy and atmosphere, materials and resources, water efficiency, and landscaping and transportation resources. In addition, City departments and offices must create and adopt sustainability plans that include procedures, programs, and policies that are designed to improve internal environmental efficiency. Finally, City departments are required to submit annual sustainability reports to the Mayor for review. ClimateLA, which was adopted subsequent to Executive Directive No. 10, also includes goals supportive of green building and energy efficiency through building design and retrofits.

### Sustainable City pLAN

In 2014, Mayor Eric Garcetti launched the City of Los Angeles’ first-ever Sustainable City Plan (“pLAN”). The pLAN is a comprehensive and actionable policy roadmap that prepares the City for an environmentally healthy, economically prosperous, and equitable future for all.<sup>214</sup> Mayor Garcetti released the pLAN in April 2015 along with corresponding Executive Directive No. 7 that incorporates the pLAN into city-wide management.<sup>215</sup> The framework of pLAN is organized into three sections – environment, economy, and equity – addressing a total of 14 topics, each of which sets forth a vision of milestones to transform Los Angeles over the next 20 years and highlighting near- and long-term outcomes. With respect to the environment, the topics are local water, local solar, energy-efficient buildings, carbon and climate leadership, and waste and landfills. Through the pLAN, Mayor Garcetti committed the City to becoming a national leader in carbon reduction and climate action by eliminating coal from the City’s energy mix, prioritizing energy efficiency, and inspiring other cities to take similar action. The Plan sets targets of reducing GHG emissions below 1990 levels by at least 45 percent by 2025, 60 percent by 2035, and 80 percent by 2050.

### Resilient Los Angeles

In March 2018, Mayor Eric Garcetti released *Resilient Los Angeles*, a comprehensive, strategically coordinated approach to urban resilience.<sup>216</sup> This plan addresses a range of challenges facing Los Angeles, including preparing for climate adaptation. One of the key climate adaptation initiatives in the resiliency plan is the goal of accelerating reductions in GHG emissions and meeting or exceeding climate resilience outcomes consistent with the Paris Climate Agreement by 2020. In addition, one of the actions in *Resilient Los Angeles* is to leverage the modernization at LAX to incorporate sustainability and resilience measures.

### City of Los Angeles Green Building Code (LAGBC)

In December 2013, the Los Angeles City Council approved Ordinance No. 182,849, which updated Chapter IX of the Los Angeles Municipal Code (LAMC) to incorporate portions of the 2013 CALGreen Code and add other conservation-related measures to the LAGBC for residential and non-residential development. The requirements of the adopted LAGBC, as updated (2017), apply to new building construction, building renovations, and building additions within the City of Los Angeles.<sup>217</sup> Key measures in the LAGBC related to energy use that apply to nonresidential buildings include a requirement that energy conservation for

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<sup>214</sup> City of Los Angeles, Office of the Mayor, Mayor Eric Garcetti, *Sustainable City pLAN, Transforming Los Angeles, Environment - Economy - Equity*, April 8, 2015. Available: <http://plan.lamayor.org/wp-content/uploads/2017/03/the-plan>.

<sup>215</sup> City of Los Angeles, Office of the Mayor, Mayor Eric Garcetti, *Executive Directive No. 7, Subject: Sustainable City pLAN*, April 8, 2015. Available: [https://www.lacity.org/sites/g/files/wph281/f/Executive\\_Directive\\_No.\\_7\\_Sustainable\\_City\\_pLAN.pdf](https://www.lacity.org/sites/g/files/wph281/f/Executive_Directive_No._7_Sustainable_City_pLAN.pdf).

<sup>216</sup> Mayor Eric Garcetti, *Resilient Los Angeles*, March 2018. Available: <https://www.lamayor.org/sites/g/files/wph446/f/page/file/Resilient%20Los%20Angeles.pdf>.

<sup>217</sup> City of Los Angeles, Los Angeles Municipal Code, Chapter IX, Article 9, *Green Building Code*, as amended.

### 4.3 Greenhouse Gas Emissions

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new buildings must meet or exceed California Energy Commission (CEC) requirements set forth in the California Building Energy Efficiency Standards.

#### LAWA Sustainability Plans and Guidelines

LAWA adopted the Sustainability Performance Improvement Management System (SPIMS) in August 2007 as a tool for identifying sustainability objectives, implementing actions to achieve the objectives, establishing targets, and continually monitoring progress. This was followed by LAWA's Sustainability Plan, developed in April 2008, which described LAWA's sustainability practices and set goals and actions that LAWA would undertake to implement its long-term objectives and targets.<sup>218</sup>

In 2008, LAWA developed Sustainable Airport Planning, Design and Construction Guidelines for Implementation on All Airport Projects, which were subsequently updated in 2009 and 2010.<sup>219</sup> These guidelines were developed to provide a comprehensive set of performance standards focusing on sustainability specifically for airport projects on a project-level basis. Based on these guidelines, LAWA implemented numerous steps to increase its sustainability practices related to daily airport operations, many of which directly or indirectly contributed to a reduction in GHG emissions. Actions that LAWA undertook included promoting and expanding non-stop shuttle services to the airport in an effort to reduce the number of vehicle trips to the airport, establishing an employee rideshare program, using alternative fuel vehicles, purchasing renewably-generated green power from LADWP, and reducing electricity consumption by installing energy-efficient lighting, variable demand motors on terminal escalators, and variable frequency drives on fan units at terminals and LAWA buildings.<sup>220</sup> Subsequently, LAWA consolidated its design standards into the LAWA Design and Construction Handbook, which includes sustainable guidelines for all construction projects.

On September 7, 2017, LAWA adopted the *Sustainable Design and Construction Policy*.<sup>221</sup> Under this policy, new buildings and major building renovation projects are required to achieve a minimum of LEED® Silver certification. New LAWA or tenant building construction and building renovation projects that are not eligible for LEED® certification, such as runways, taxiways, and civil infrastructure, or are exempted by LAWA's Sustainability Review Committee, are required to meet LAGBC Tier 1 requirements. Projects that cannot meet USGBC's or LAWA's LEED® Eligibility Criteria or LAGBC Tier 1 requirements, or are exempted by LAWA's Sustainability Review Committee, must adhere to LAWA's Sustainable Design and Construction Requirements, which incorporate sustainability concepts from the LEED® system as well as the LAGBC, Envision, and other airport sustainability guidelines.<sup>222</sup> The requirements will ensure that all projects at LAWA facilities are environmentally responsible and resource-efficient throughout the structure's life-cycle, from siting to design, construction, operation, maintenance, and renovation, reflecting LAWA's commitment to sustainability.

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<sup>218</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports Sustainability Plan*, April 2008. Available: [https://www.lawa.org/-/media/sustainability/resources/final\\_sustainability\\_plan.ashx](https://www.lawa.org/-/media/sustainability/resources/final_sustainability_plan.ashx).

<sup>219</sup> City of Los Angeles, Los Angeles World Airports, *Sustainable Airport Planning, Design and Construction Guidelines for Implementation on All Airport Projects*, Version 5.0, February 2010. Available: <http://losangelesairport.net/uploadedFiles/LAWA/pdf/LSAG%20Version%205.0%20021510.pdf>.

<sup>220</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports Sustainability Report 2015*. Available: [https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability\\_report\\_2015.pdf](https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability_report_2015.pdf).

<sup>221</sup> City of Los Angeles, Los Angeles World Airports, *LAWA Sustainability Design and Construction Policy*, adopted September 7, 2017. Available: [http://lawa.granicus.com/MetaViewer.php?view\\_id=4&clip\\_id=448&meta\\_id=31352](http://lawa.granicus.com/MetaViewer.php?view_id=4&clip_id=448&meta_id=31352).

<sup>222</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles International Airport Sustainable Design & Construction Requirements*, August 4, 2017. Available: <https://www.lawa.org/en/lawa-businesses/lawa-documents-and-guidelines/lawa-design-and-construction-handbook>.

## LAWA Commitment to Carbon Management Goals

In August 2016, LAWA adopted an internal commitment to reduce GHG emissions from LAWA owned and operated sources 45 percent below 1990 levels by 2025, 60 percent by 2035, and 80 percent by 2050.<sup>223</sup> Additionally, in 2017, LAWA upgraded LAX's ACA, which is granted by ACI, from "Level 2 Reduction" to Level 3 (Optimization).<sup>224</sup> Airports are certified under ACA at four progressively stringent levels of participation with recognition of improvements at each stage. The first stage, Level 1 Mapping, requires airports to produce a Scope 1 and 2 "carbon footprint" for the airport, along with evidence of a publicly available environmental/carbon policy endorsed at the highest level of airport management. Independent verification of an airport's carbon footprint is required on entry into the program, and then again every two years on renewal at the same level, or upon each upgrade. The ACA program notes that the carbon footprint serves as the basis for developing carbon management and engagement plans (Level 2 Reduction and Level 3 Optimization). An airport may then also seek to achieve carbon neutrality for CO<sub>2</sub> emissions under its direct control (Scope 1 and 2) by offsetting its residual emissions which it cannot reduce by other means (Level 4 Neutrality).

It is important to note that LAWA's internal commitment to the GHG emissions reduction goals identified above, as reflected in the ACI certification that LAWA has achieved for Level 3 Optimization, takes into account a wide array of existing and anticipated GHG reduction programs and improvements, which will continue to be implemented and may be refined, adjusted, and added to by LAWA in the course of achieving the goals set for 2025, 2035, and 2050. Examples of such GHG reduction programs and improvements for LAWA owned and operated sources include, but are not limited to, the following:

- **LAWA's Clean Fleet Program.** LAWA introduced alternative fuel technology to its fleet in 1993. LAWA currently operates the nation's largest alternative-fuel airport fleet consisting primarily of compressed natural gas (CNG), liquefied natural gas (LNG), propane, full-electric, hybrid-electric, and bi-fuel vehicles.<sup>225</sup> In 2016, approximately 60 percent of the LAX fleet was powered by alternative fuel.<sup>226</sup> In an effort to increase its electric vehicle fleet, LAWA adopted its first electric vehicle purchasing policy (EVPP) on June 15, 2017. The EVPP will improve air quality in and around LAX as LAWA gradually increases the percentage of all-electric vehicle purchases to 100 percent by 2035.<sup>227</sup> In addition, on October 5, 2017, LAWA approved an update to the LAX Alternative Fuel Vehicle Requirement (AFV Requirement).<sup>228</sup> The original AFV Requirement, which was adopted in 2007 and is included in all operator contracts, permits, leases and licenses, was updated to allow LAWA to take advantage of evolving technological developments in clean vehicles. The update also adds enforcement provisions to ensure compliance by operators at LAX. The LAX Alternative

<sup>223</sup> Flint, Deborah, Chief Executive Officer, Los Angeles World Airports, *Memorandum, Subject: LAWA's Commitment to Carbon Management Goals*, August 31, 2016.

<sup>224</sup> City of Los Angeles, Los Angeles World Airports, *News Release: Los Angeles World Airports (LAWA) Leads the Way on Sustainability – Van Nuys Airport Recognized as Only One of Two General Aviation Airports in World to Achieve Airport Carbon Accreditation "Level 2 – Reduction" Tier; LAX Progresses to "Level 3 – Optimization" as Only One of Three U.S. Airports at this Tier*, September 18, 2018. Available: <https://www.lawa.org/en/News%20Releases/2017/News%20Release%2025>.

<sup>225</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports Sustainability Report 2015*. Available: [https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability\\_report\\_2015.pdf](https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability_report_2015.pdf).

<sup>226</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports 2016 Sustainability Report*. Available: [https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability\\_report\\_2016.pdf](https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability_report_2016.pdf).

<sup>227</sup> City of Los Angeles, Los Angeles World Airports, *Electrical Vehicle Purchasing Policy*, adopted June 15, 2017. Available: [https://lawa.org/-/media/lawa-web/tenants411/file/lawa\\_ev\\_purchasing\\_policy.ashx](https://lawa.org/-/media/lawa-web/tenants411/file/lawa_ev_purchasing_policy.ashx).

<sup>228</sup> City of Los Angeles, Los Angeles World Airports, *Alternative Fuel Vehicle Requirement Program (LAX Only)*, adopted October 5, 2017. Available: [http://lawa.granicus.com/GeneratedAgendaViewer.php?view\\_id=4&clip\\_id=455](http://lawa.granicus.com/GeneratedAgendaViewer.php?view_id=4&clip_id=455).

## 4.3 Greenhouse Gas Emissions

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Fuel Vehicle Program is projected to improve air quality at LAX and throughout the Los Angeles region. LAWA demonstrated its commitment to the EVPP and AFV Requirements through the recent approval to purchase new electric buses. With this purchase, LAWA's airfield bus fleet will be all-electric. This purchase is projected to reduce GHG emissions by 308 tons per year.<sup>229</sup>

- **Green Power Purchase.** LAWA has been purchasing green power from LADWP for several years. More specifically, LAWA voluntarily purchased 15.9 million kilowatt-hours (kWh) of green power in 2016, which equates to 10 percent of the total energy consumed at LAX.<sup>230</sup> In addition, LAWA has been a U.S. EPA Green Power Partner since 2002.<sup>231</sup>
- **Lighting Retrofit Projects.** LAWA continues to replace lights and fixtures that serve terminals, streets, parking lots, and the airfield at LAX with a mix of energy efficient equipment.<sup>232</sup> LAWA installed over 5,700 linear feet of light ribbon in the Central Terminal Area (CTA) between 2014 and 2016. The project complies with CALGreen and LAGBC Tier 1 requirements. As part of this project, LAWA removed and replaced 78 high pressure sodium street lights in front of the Tom Bradley International Terminal with 91 new light-emitting diode (LED) light poles, resulting in an almost 45 percent reduction in electricity usage.<sup>233</sup>
- **Energy Efficiency Projects.** LAWA continues to upgrade air handling equipment and perform regular maintenance to improve energy efficiency of air handling units. LAWA replaces old computers and related equipment with Energy Star certified office equipment.
- **Ground Support Equipment Emissions Reductions Policy.** LAWA encourages airlines and other GSE operators to meet emissions targets through conversion or retirement of conventionally-fueled equipment used to service aircraft.<sup>234</sup>
- **The Utility Monitoring Infrastructure Project (UMIP).** LAWA is in the midst of a program to add sub-meters for utilities across the LAX campus. One of the goals of the project is to allow LAWA to monitor energy usage at each of its facilities at the building level. Currently, LAWA is able to monitor electricity and natural gas consumption via the utility providers' invoices and meters, but these meters do not always correspond to a single structure.
- **Central Utility Plant.** LAWA recently replaced the 50-year-old Central Utility Plant (CUP) at LAX with a new 90,000 square foot facility. The new CUP, which achieved LEED® Gold certification, is a state-of-the-art computerized facility that provides heating and cooling for the CTA at LAX, and includes a co-generation system that simultaneously generates electrical power and steam. The new chillers, high-efficiency motors, and variable frequency drives save over 6.5 million kWh annually. The new turbines and boilers use natural gas and state-of-the-art pollution control equipment, resulting in a reduction of nearly 4,900 tons of CO<sub>2</sub> emissions annually. The CUP's heat

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<sup>229</sup> City of Los Angeles, Los Angeles World Airports, *Board of Airport Commissioners Approve Purchase of 20 Electric Buses for Airside Use at LAX*, April 20, 2018. Available: <https://www.lawa.org/News%20Releases/2018/News%20Release%202049>.

<sup>230</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports 2016 Sustainability Report*. Available: [https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability\\_report\\_2016.pdf](https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability_report_2016.pdf).

<sup>231</sup> U.S. Environmental Protection Agency, Green Power Partnership, *Green Power Partner List*. Available: <https://www.epa.gov/greenpower/green-power-partner-list>, accessed March 1, 2018.

<sup>232</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports Sustainability Report 2015*. Available: [https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability\\_report\\_2015.pdf](https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability_report_2015.pdf).

<sup>233</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports 2016 Sustainability Report*. Available: [https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability\\_report\\_2016.pdf](https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability_report_2016.pdf).

<sup>234</sup> LAWA set a target of 2.65 grams per horsepower-hour of hydrocarbons plus nitrogen oxides (g/bhp-hr) by December 31, 2021. UAL is currently operating below this target.

reflective roof helps decrease cooling load, and heat recovered from the gas turbines is used to heat water and provide heat to terminal space.<sup>235</sup>

- **Sustainable Construction Practices.** LAWA's has incorporated Sustainable Construction Practices into the design and construction of new projects. These practices are designed to reduce emissions from construction through increased use of low emission equipment and alternative fuels.<sup>236</sup>

In addition to the above, the continued implementation of LAWA's sustainability programs will support LAWA's ability to achieve its carbon management goals.

In summary, LAWA's internal commitment to reduce GHG emissions from LAWA owned and operated sources will be implemented through a variety of programs and improvements through 2025, 2035, and 2050 including, but not limited to, the programs described above. LAWA's GHG reduction goals are aimed at organization-wide improvements and are not intended or designed to be applied on an individual project-by-project basis.

### 4.3.3.2 Existing Greenhouse Gas Setting

According to the IPCC, in 2010, worldwide man-made emissions of GHGs were approximately 49,000 million metric tons of CO<sub>2</sub>e (MMTCo<sub>2</sub>e).<sup>237</sup> Total U.S. GHG emissions in 2016 were 6,511 MMTCo<sub>2</sub>e, or about 13 percent of worldwide GHG emissions.<sup>238</sup>

California, due in part to its large size and large population, is a substantial contributor of global GHGs, and is the second largest contributor to GHG emissions in the United States (Texas is first). As mandated by the Global Warming Solutions Act of 2006 (AB 32), CARB is required to compile GHG inventories for the State of California, including establishment of the 1990 Greenhouse Gas Emissions Level. Inventories have been prepared for 2000 through 2015. Based on the 2015 GHG inventory data (i.e., the latest year for which data are available), California emitted 440.4 MMTCo<sub>2</sub>e if emissions associated with imported electrical power are included, and approximately 405 MMTCo<sub>2</sub>e if these emissions are excluded.<sup>239</sup>

**Table 4.3-2** identifies and quantifies statewide anthropogenic GHG emissions and sinks in 1990 and 2015.<sup>240,241</sup> Although a large overall contributor to GHG emissions, California had the fourth lowest CO<sub>2</sub> emissions per capita from fossil fuel combustion in the U.S., due to the success of its energy efficiency and

<sup>235</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports 2016 Sustainability Report*. Available: [https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability\\_report\\_2016.pdf](https://lawamediastorage.blob.core.windows.net/lawa-media-files/media-files/sustainability/resources/sustainability_report_2016.pdf).

<sup>236</sup> City of Los Angeles, Los Angeles World Airports, *Los Angeles World Airports Design and Construction Handbook: Design Standards and Guide Specifications, Division I – General Requirements*, July 2017. Available: <https://www.lawa.org/en/lawa-businesses/lawa-documents-and-guidelines/lawa-design-and-construction-handbook/design-standards-and-guide-specifications>.

<sup>237</sup> Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)], *Climate Change 2014 – Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change – Summary for Policymakers*, 2015, p. 5.

<sup>238</sup> U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016*, April 12, 2018. Available: [https://www.epa.gov/sites/production/files/2018-01/documents/2018\\_complete\\_report.pdf](https://www.epa.gov/sites/production/files/2018-01/documents/2018_complete_report.pdf).

<sup>239</sup> California Air Resources Board, *California Greenhouse Gas Inventory for 2000-2015 - by Category as Defined in the 2008 Scoping Plan*, June 6, 2017. Available: [https://www.arb.ca.gov/cc/inventory/data/tables/ghg\\_inventory\\_scopingplan\\_sum\\_2000-15.pdf](https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-15.pdf).

<sup>240</sup> Per USEPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016* (p. ES-1), "The term 'anthropogenic,' in this context, refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been affected by human activities (IPCC 2006)." Available: <https://www.epa.gov/sites/production/files/2016-04/documents/us-ghg-inventory-2016-main-text.pdf>.

<sup>241</sup> The term "sink," in this context, refers to a natural or artificial reservoir that accumulates and stores greenhouse gases for an indefinite period.

### 4.3 Greenhouse Gas Emissions

renewable energy programs and commitments that have lowered the State’s GHG emissions rate of growth by more than half of what it would have been otherwise.<sup>242</sup>

Category	Total 1990 Emissions (MMTCO <sub>2</sub> e)	Percent of Total 1990 Emissions	Total 2015 Emissions (MMTCO <sub>2</sub> e)	Percent of Total 2015 Emissions
Transportation	150.7	35%	164.6	37%
Electric Power	110.6	26%	83.7	19%
Commercial	14.4	3%	14.7	3%
Residential	29.7	7%	23.2	5%
Industrial	103.0	24%	91.7	21%
Recycling and Waste	-- <sup>2</sup>	-- <sup>2</sup>	8.7	2%
High GWP/Non-Specified <sup>3</sup>	1.3	<1%	19.1	4%
Agriculture	23.4	5%	34.7	8%
Forestry	0.2	<1%	-- <sup>4</sup>	-- <sup>4</sup>
Forestry Sinks	-6.7	--	-- <sup>4</sup>	-- <sup>4</sup>
<b>Net Total</b>	<b>426.6</b>	<b>100%</b>	<b>440.4</b>	<b>100%</b>

Sources: California Air Resources Board, *Staff Report: California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*, November 16, 2007. Available: [http://www.arb.ca.gov/cc/inventory/pubs/reports/staff\\_report\\_1990\\_level.pdf](http://www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf), accessed November 2015; California Air Resources Board, *California Greenhouse Gas Inventory for 2000-2015 – by Category as Defined in the 2008 Scoping Plan*, June 6, 2017. Available: [https://www.arb.ca.gov/cc/inventory/data/tables/ghg\\_inventory\\_scopingplan\\_sum\\_2000-15.pdf](https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-15.pdf), accessed November 21, 2017.

Notes:

1. Numbers may not add due to rounding.
2. Included in other categories for the 1990 emissions inventory.
3. High GWP gases are not specifically called out in the 1990 emissions inventory.
4. Revised methodology under development (not reported for 2014).

Prepared By: CDM Smith, November 2017.

Between 1990 and 2010, the population of California grew by approximately 7.5 million (29.8 to 37.3 million).<sup>243</sup> This represents an increase of approximately 25 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from \$773 billion in 1990 to 1.97 trillion in 2010, representing an increase of approximately 154 percent (over twice the 1990 gross state product).<sup>244</sup> Despite the population and economic growth, California’s net GHG emissions only grew by approximately 6 percent. The California Energy Commission attributes the slow rate of growth to the success of California’s renewable energy programs and its commitment to clean air and clean energy.<sup>245</sup>

<sup>242</sup> U.S. Energy Information Administration, *Energy-Related Carbon Dioxide Emissions at the State Level, 2000-2013*, October 2015.

<sup>243</sup> California Department of Finance, Demographic Research Unit, *Report E-5 Population and Housing Estimates for Cities, Counties, and the State*, January 1, 2011–2015 with 2010 Benchmark, May 1, 2015.

<sup>244</sup> California Department of Finance, *California State Gross Domestic Product*, (GDP) 1963 to 2016, last updated May 11, 2017. Available: [http://www.dof.ca.gov/Forecasting/Economics/Indicators/Gross\\_State\\_Product/](http://www.dof.ca.gov/Forecasting/Economics/Indicators/Gross_State_Product/), accessed November 21, 2017. Estimated gross state product for 1990 and 2010 are based on current dollars as of May 2017.

<sup>245</sup> California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*, December 2006.

### 4.3.4 Thresholds of Significance

For the purposes of the UAL East Aircraft Maintenance and GSE Project EIR analysis, and in accordance with Appendix G of the State CEQA Guidelines, environmental impacts related to GHG emissions are considered significant if the proposed project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

#### 4.3.4.1 Quantitative Threshold

Section 15064.7 of the State CEQA Guidelines defines a threshold of significance as an identifiable quantitative, qualitative, or performance level of a particular environmental effect, compliance with which determines the level of impact significance. CEQA gives wide latitude to lead agencies in determining what impacts are significant and does not prescribe thresholds of significance, analytical methodologies, or specific mitigation measures. CEQA leaves the determination of significance thresholds to the reasonable discretion of the lead agency and encourages lead agencies to develop and publish thresholds of significance to use in determining the significance of environmental effects. However, neither SCAQMD nor the City of Los Angeles have yet established project-level specific quantitative significance thresholds for GHG emissions. State CEQA Guidelines Section 15183.5 encourages lead agencies to make use of programmatic mitigation plans and programs from which to tier when they perform any individual project analyses. However, the City of Los Angeles has not developed a Greenhouse Gas Reduction Plan meeting the requirements set forth in State CEQA Guidelines Section 15183.5.(b)

On December 5, 2008, the SCAQMD Governing Board adopted its staff proposal for an interim CEQA GHG Significance threshold for projects where the SCAQMD is the lead agency.<sup>246</sup> For industrial projects where SCAQMD is the lead agency, the SCAQMD's adopted threshold is 10,000 metric tons of carbon dioxide equivalent per year (MTCO<sub>2</sub>e/yr). Selection of 10,000 MTCO<sub>2</sub>e/yr as a mass emissions threshold of significance for industrial projects was based largely on the GHG emissions associated with the natural gas consumption characteristics of numerous facilities evaluated by the SCAQMD. Selection of that threshold for industrial projects also took into consideration that industrial facilities typically containing stationary source equipment are largely permitted or regulated by the SCAQMD, consequently providing some ability to directly address GHG emissions. In addition to stationary sources, the threshold is intended to include mobile (off-road and on-road) sources. In developing the threshold, SCAQMD identified three land use definitions: industrial, residential, and commercial. At this time, this adopted threshold applies to only industrial projects where the SCAQMD is the lead agency. Although SCAQMD is not the lead agency for the proposed UAL East Aircraft Maintenance and GSE Project, the main source of GHG emissions associated with the proposed project is considered to be comparable to that of a stationary industrial source. The proposed project is an aircraft and GSE maintenance facility, and certain activities and equipment at the facility are regulated as stationary sources (e.g., as noted previously, the natural gas boilers and water heaters, a diesel-operated emergency generator, and a maintenance-related spray booth). However, the proposed project activities would be similar to those that occur at other stationary industrial facilities. Similar to other industrial facilities, activities at the proposed project would include

<sup>246</sup> South Coast Air Quality Management District, *Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group Meeting #8, Diamond Bar*, January 28, 2009. Available: [http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-8/ghg-meeting-8-minutes.pdf?sfvrsn=2](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-8/ghg-meeting-8-minutes.pdf?sfvrsn=2).

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use of machinery and heavy equipment to repair engines and other components, as well as the manufacture of components needed to complete the repairs. As with typical industrial facilities, industrial chemicals would be used and stored onsite, including solvents, oils, and other substances. Also, as with other industrial facilities, mobile sources would travel to and from the project site. The mobile sources associated with the proposed project would include aircraft as well as trucks and passenger vehicles, whereas typical industrial facilities are only associated with trucks and passenger vehicles. However, all of these mobile sources were assumed to emit GHG. As a result, for the purposes of this analysis, the adopted 10,000 MTCO<sub>2</sub>e/yr threshold was used.

#### 4.3.4.2 Plan Consistency Threshold

This EIR also uses a second “plan consistency” impact significance threshold. The proposed project’s GHG emission would be significant if they conflict with an applicable state regional, or local plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

### 4.3.5 Impacts Analysis

#### 4.3.5.1 Project GHG Emissions

##### 4.3.5.1.1 Construction Emissions

Annual GHG emissions for construction of the proposed project are presented in **Table 4.3-3**, which, as indicated in the table, would total 5,897.7 MTCO<sub>2</sub>e. As noted in Section 4.3.2.1, construction emissions were amortized over the lifetime of the proposed project, which is assumed to be 30 years. The total CO<sub>2</sub>e amortized over the 30-year life of the proposed project is equal to 196.6 MTCO<sub>2</sub>e per year. See Appendix B.1 for detailed calculations.

Emission Source	2018	2019	2020	Project Total
Off-Road, On-Site Equipment	274.6	1,668.4	71.6	2,014.6
On-Road, On-Site Trucks	101.6	688.7	303.6	1,093.9
On-Road, Off-Site Workers	83.2	1,049.5	843.9	1,976.6
On-Road, Off-Site Deliveries	181.7	343.1	0.1	524.9
On-Road, Off-Site Operational Workers	10.1	59.6	38.2	107.9
On-Site Aircraft GPUs	16.1	98.5	65.2	179.9
<b>All Sources (Metric Tons):</b>	<b>667.4</b>	<b>3,907.8</b>	<b>1,322.5</b>	<b>5,897.7</b>

Source: Appendix B.1 of this EIR.  
Note: Totals may not add due to rounding.  
Prepared By: CDM Smith, May 2018.

##### 4.3.5.1.2 Operational Emissions

As noted in Section 4.3.2.2, aircraft taxiing/towing distance would decrease as a result of the proposed project. As shown in **Table 4.3-4**, that, alone, would lead to a net decrease in CO<sub>2</sub>e compared to existing conditions. Additionally, project-related operational energy demands associated with lighting and heating of the consolidated hangar would be reduced when compared with existing conditions due to the reduction in project-related building area and the use of more efficient lighting and heating, ventilation, and air conditioning systems (HVAC); these reductions were not quantified and no credit is taken for these

reductions. When the amortized construction emissions are added to the incremental operational emissions presented in the table, the resulting net GHG emissions would be lower than emissions under existing conditions (a decrease of 691.6 MTCO<sub>2</sub>e/yr), which would be a beneficial result of the proposed project. Therefore, project-related incremental emissions would not exceed the 10,000 MTCO<sub>2</sub>e/yr threshold and impacts of the proposed project related to GHG emissions would be less than significant.

Emissions Source	Exiting Conditions	Proposed Project	Incremental Difference
Aircraft Taxiing, East Hangar	683.1	1,214.5	531.3
Aircraft Taxiing, West Hangar	1,424.9	-	-1,424.9
Aircraft Towing, East Hangar	65.6	116.5	51.0
Aircraft Towing, West Hangar	45.6		-45.6
Total Operational <sup>1</sup>	2,219.2	1,331.0	-888.2
Amortized Construction	-	196.6	196.6
<b>Total Net<sup>2</sup></b>	<b>2,219.2</b>	<b>1,527.6</b>	<b>-691.6</b>

Source: Appendix B.2 of this EIR.

Notes:  
CO<sub>2</sub>e = carbon dioxide equivalent

1. Totals may not add due to rounding.
2. Operational emission reductions associated with a decrease in project-related operational square footage and an increase in more efficient lighting and HVAC was not quantified, but would serve to further reduce operational GHG emissions.

Prepared By: CDM Smith, May 2018.

### 4.3.5.2 Consistency with Greenhouse Gas Reduction Plans

International and Federal plans, policies, and regulations are aimed at global and national GHG emissions, respectively. These plans, policies, and regulations do not apply at the individual project level. Therefore, the focus of the assessment of the project’s consistency with GHG reduction plans is on plans, policies, and regulations adopted by state, regional, and local agencies that address GHG emissions.

#### 4.3.5.2.1 Local

Implementation of the proposed project would not conflict with local plans, policies, and regulations adopted for the purpose of reducing GHG emissions, including Green LA, ClimateLA, Executive Directive No. 10, the Sustainable City pLAN, Resilient Los Angeles, LAGBC, and LAWA’s Sustainable Design and Construction Policy and commitment to carbon management goals.

Green LA includes the goal for LA’s airports to “green the airports,” including the need for sustainability programs, LEED® green building rating standards in future construction, improvements in recycling, increased use of alternative fuel sources, increased use of recycled water, increased water conservation, reduced energy needs, reduced GHG emissions, and evaluation of options to reduce aircraft-related GHG emissions. Implementation of the proposed project would comply with LAWA’s sustainability requirements and would be designed and constructed to achieve LEED® Silver certification. As such, the proposed project would be consistent with the airport-related goals of Green LA by increasing energy efficiency in new construction, increasing recycling and water conservation, and reducing GHG emissions, in conjunction with LAWA’s overall program for recycling, conservation, and GHG reductions.

### 4.3 Greenhouse Gas Emissions

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ClimateLA identifies goals to reduce CO<sub>2</sub> emissions 35 percent below 1990 levels by 2030 at LAX, implement sustainability practices, and develop programs to reduce the generation of waste and pollutants. Actions are specified in the areas of aircraft operations, ground vehicles, electrical consumption, building construction, and other actions. Implementation of the proposed project would not increase the number of aircraft operations or ground vehicles. Moreover, project-related aircraft and ground vehicle movements would decrease due to the decreased distance between the UAL gates in the CTA and the East Maintenance Facility. As shown in Section 6.5, *Energy Impacts and Conservation*, of this EIR, the energy efficiency of the new building area associated with the proposed project would be substantially better than that of the existing building areas on a per square foot basis. Implementation of the proposed project would comply with LAWA's sustainability requirements. Building construction would feature the use of low-emitting carpets, adhesives, sealants, paints and coatings, which is recognized as a GHG reduction action in ClimateLA, and LAWA's requirements for the use of low emission construction equipment (e.g., Tier 4 engines) would also serve to reduce GHG emissions associated with construction. The proposed project would not include any landscaped areas that would require watering.

Executive Directive No. 10 requires City departments to create and adopt a statement of sustainable building policies. LAWA has sustainability programs, with which implementation of the proposed project would comply.

As noted above, the Sustainable City Plan (pLAn) framework related to the environment focuses on local water, local solar, energy-efficient buildings, carbon and climate leadership, and waste and landfills. Implementation of the proposed project would include sustainability measures that would serve to reduce water demands. Restroom facilities would be equipped with low- or ultra-low-flow systems, which would be consistent with the pLAn goals relating to water conservation. The building would be equipped with energy efficient lighting fixtures and controls with occupancy sensors where appropriate to reduce energy consumption, and the heating, ventilation, and air conditioning controls within occupied areas would be designed to reset temperatures to maximum efficiency without sacrificing occupant comfort. Natural lighting would be provided in the hangar bays through the use of transparent or translucent panels in the sidewalls. In addition, non-hazardous construction and demolition debris generated at the site would be recycled or salvaged to the extent required to meet LEED® Silver certification. The emphasis of pLAn relative to carbon and climate leadership is to reduce GHG emissions, improve GHG efficiency, and eliminate coal power as a source of electricity for the City and invest in green energy. With respect to reducing GHG emissions, as shown in Table 4.3-4, the proposed project would result in lower GHG emissions than the existing UAL maintenance operations. With respect to coal-free electricity, although the project proponent has no control over this aspect of the plan, LAWA has been purchasing, and plans to continue to purchase, green energy for LAX, as noted in Section 4.3.3.1.5.

Resilient Los Angeles includes an action for LAWA to leverage the modernization at LAX to incorporate sustainability and resilience measures. As noted above, implementation of the proposed project would comply with LAWA's sustainability requirements and would be designed and constructed to achieve LEED® Silver certification. As such, the proposed project would be consistent with this action.

With the construction practices and design features identified above, the proposed project would comply with the applicable requirements of the LAGBC and LAWA's Sustainable Design and Construction Policy. Compliance with these plans, policies, and regulations would be consistent with LAWA's commitment to reducing GHG emissions from LAWA owned and operated sources as part of its overall carbon management goals.

Based on the above analysis, the proposed project would not conflict with local plans, policies, and regulations adopted for the purposed of reducing GHG emissions.

### 4.3.5.2.2 State and Regional

State and regional plans, policies, and regulations are generally aimed at setting statewide and regional policy, and are not directed at individual projects. Additionally, these plans and policies – including Executive Order S-3-05, Executive Order B-30-15, the AB 32 Scoping Plan, SB 32, and SCAG’s 2016-2040 RTP/SCS – do not provide a specific basis for calculating what the proposed project’s hypothetical “fair share” of statewide or regional emissions reductions might be (See *Center for Biological Diversity v. California Department of Fish and Wildlife* [2015] 62 Cal.4th 205, 225-226.). It should also be noted that the Executive Orders referenced, including the GHG reduction trajectories, directly apply to State agencies and not to local agencies or the private sector. Similarly, the AB 32 Scoping Plan and SB 32, including the 2017 Scoping Plan for SB 32, are directed toward statewide programs, as identified through the California Air Resources Board, and do not directly limit GHG emissions from individual projects. Statewide programs and initiatives directly implementing GHG reductions called for in AB 32 and SB 32 include, but are not limited to, the Renewable Portfolio Standard, the Low Carbon Fuel Standard, the Mobile Source Strategy, the Sustainable Freight Action Plan, the Short-Lived Climate Pollutant Reduction Strategy, SB 375 (which in Southern California is implemented by SCAG’s RTP/SCS), the Cap-and-Trade Program, and the proposed Integrated Natural and Working Lands Action Plan.

GHG emissions occurring from construction and operation of the proposed project would be less than the SCAQMD threshold of significance, which is intended to achieve the level of GHG reductions set forth in Executive Order S-3-05 which, in turn, would achieve the GHG reduction goal of AB 32 (i.e., Executive Order S-3-05 includes the GHG reduction goal to reduce statewide GHG emissions to 1990 levels by 2020, which is the same goal as in AB 32).<sup>247</sup> In addition, the SCAQMD threshold of significance was set to allow small projects to proceed without conflicting with the statewide EO S-3-05 2050 GHG reduction goal of 80 percent below 1990 levels.<sup>248</sup> As a result, GHG emissions from the proposed project would not conflict with statewide and regional plans and policies such as AB 32, whose purpose is to reduce statewide emissions to 1990 levels by 2020; Executive Order S-3-05, whose 2050 goal is 80 percent below 1990 levels; Executive Order B-30-15 and SB 32, which call for interim reductions in statewide GHG emissions to 40 percent below 1990 levels by 2030; the 2017 Scoping Plan; or the SCAG 2016-2040 RTP/SCS, which outlines a vision for land use and transportation for the region that would achieve state GHG emissions reduction goals.

In summary, the proposed project would not conflict with state, regional and local plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs. Therefore, the impact of the proposed project would be less than significant.

### 4.3.5.3 Summary of Impacts

Based on the information presented above in Sections 4.3.5.1 and 4.3.5.2, the GHG impacts associated with construction and operation of the proposed project are summarized as follows:

- Implementation of the proposed project compared to baseline conditions would result in a decrease in GHG emissions. Therefore, impacts associated with project-related GHG emissions would be less than significant.

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<sup>247</sup> South Coast Air Quality Management District, *Board Meeting Date: December 5, 2008, Agenda No. 31: Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans*, December 5, 2008. Available: [http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2).

<sup>248</sup> South Coast Air Quality Management District, *Board Meeting Date: December 5, 2008, Agenda No. 31: Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans*, December 5, 2008. Available: [http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2).

### 4.3 Greenhouse Gas Emissions

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- Implementation of the proposed project would not conflict with state, regional, and local plans, policies, or regulations adopted for the purpose of reducing GHG emissions. Therefore, impacts associated with applicable plans, policies, and regulations would be less than significant.

#### 4.3.6 Cumulative Impacts

As discussed previously in Section 4.3.2, GHG impacts are exclusively cumulative impacts; hence, an evaluation of cumulative GHG impacts is already provided above and no further analysis is necessary.<sup>249</sup>

#### 4.3.7 Mitigation Measures

As indicated in Section 4.3.5, GHG impacts associated with construction and operation of the proposed project would be less than significant; therefore, no mitigation measures are required. However, as discussed in Section 4.1, *Air Quality and Human Health Risk*, Mitigation Measure MM-AQ (UAL)-1 (Construction-Related Air Quality Mitigation Measures) would reduce construction-related air pollutant emissions associated with the proposed project. Although developed to address construction-related air quality impacts, this mitigation measure would also reduce construction-related GHG emissions associated with the proposed project.

#### 4.3.8 Level of Significance after Mitigation

GHG impacts associated with construction and operation of the proposed project would be less than significant.

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<sup>249</sup> Potential impacts associated with the combined energy consumption from proposed improvements to the East Maintenance Facility, in conjunction with the reasonably foreseeable future use of the West Maintenance Facility, are addressed in the discussion of cumulative energy impacts in Chapter 6, *Other Environmental Considerations*, of this EIR.