Section 5.21:

Greenhouse Gas Emissions

SECTION 5.21
GREENHOUSE GAS EMISSIONS

5.21.1 PURPOSE

This section presents a discussion of existing climate conditions, the current state of climate change science, and greenhouse gas (GHG) emissions sources in California and in the City of Fullerton, as well as a summary of applicable regulations and a description of potential impacts of The Fullerton Plan related to climate change. Refer to Appendix F, *Climate Action Plan*, for the assumptions used in this analysis.

5.21.2 EXISTING REGULATORY SETTING

FEDERAL REGULATIONS

The Federal Clean Air Act (FCAA) requires the U.S. Environmental Protection Agency (EPA) to define national ambient air quality standards (NAAQS) to protect public health and welfare in the United States. The FCAA does not specifically regulate GHG emissions; however, on April 2, 2007 the U.S. Supreme Court in *Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the FCAA. The EPA adopted an endangerment finding and cause or contribute finding for GHGs on December 7, 2009. Under the endangerment finding, the Administrator found that the current and projected atmospheric concentrations of the six, key, well-mixed GHGs (carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]) threaten the public health and welfare of current and future generations. Under the cause of contribute finding, the Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Based on these findings, on April 1, 2010, the EPA finalized the light-duty vehicle rule controlling GHG emissions. This rule confirmed that January 2, 2011, is the date that a 2012 model year vehicles become subject to these rule requirements in order to be sold in the United States. On May 13, 2010, the EPA issued the final GHG Tailoring Rule. This rule set thresholds for GHG emissions that define when permits are required for new and existing industrial facilities under the Prevention of Significant Deterioration and Title V Operating Permit programs. Implementation of the Federal rules is expected to reduce the level of emissions from new motor vehicles and large stationary sources.

STATE

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG

emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Assembly Bill 1493. AB 1493 (also known as the Pavley Bill) requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHG emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, CARB approved amendments to the *California Code of Regulations* (*CCR*) in 2004 by adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to *CCR* Title 13, Sections 1900 and 1961 and adoption of *13 CCR* Section 1961.1 require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty weight classes for passenger vehicles (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily to transport people), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. When fully phased in, the near-term standards will result in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term standards will result in a reduction of about 30 percent.

Executive Order S-20-04 (Green Building Initiative). Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in State-owned buildings by 20 percent from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal. The initiative places the California Energy Commission (CEC) in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.

Executive Order S-3-05 (Target Dates for Emissions Reductions). Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- 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.

The Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). California passed the California Global Warming Solutions Act of 2006 (AB 32; *California Health and Safety Code* Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Senate Bill 1368. SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required the CEC to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas–fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

Executive Order S-1-07 (Fuel Sales). Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs the California Air Resources Board (CARB) to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

Senate Bill 97. SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA.

OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible. OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in *CEQA Guidelines* Section 15064.7 that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

The Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010.

Senate Bills 1078, 107, X1-2, Executive Orders S-14-08, and S-21-09. 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. Executive Order S-14-08 was signed in November 2008, expanding the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the state come from renewable energy by 2020. CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers. On April 12, 2011, Governor Jerry Brown reinforced the requirements of Executive Order S-21-09, and signed SB X1-2 requiring California's electric utilities to procure 33 percent of their energy from renewable resources by 2020.

Senate Bill 375. SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects may not be eligible for funding programmed after January 1, 2012.

Assembly Bill 3018. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California's emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.

Executive Order S-13-08 (Climate Adaptation Strategy). Executive Order S-13-08 seeks to enhance the State's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.

CARB Scoping Plan

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations.[1] CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2 equivalent (CO_2eq)[2] emissions by 174 million metric tons (MMT), or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO_2eq under a business as usual (BAU)[3] scenario (This is a reduction of 42 MMT CO_2eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020).

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

In *Association of Irritated Residents, et al. v. California Air Resources Board, et al*., the Superior Court of California for the County of San Francisco (Superior Court) issued a Final Order on May 20, 2011 that prevents CARB from implementing a statewide GHG regulatory program. Although the court upheld the impact analysis contained in the environmental document for the Scoping Plan, the court found that the analysis of project alternatives was not sufficient for informed decision-making and public review under CEQA. The court found that CARB violated CEQA by failing to fully evaluate possible alternatives to the measures described in the Scoping Plan, and focused specifically on the cap and trade program. The court noted that CEQA requires that CARB undertake a similar analysis of the impacts of each alternative so that the public may know not only why cap and trade was chosen, but also why the alternatives were not.

It should be noted that the Superior Court held in the favor of CARB on all substantive challenges to the State's compliance with AB 32 mandates. The Court stated that "as the agency with technical expertise and the responsibility for the protection of California's air resources, CARB has substantial discretion to determine the mix of measures needed to 'facilitate' the achievement of GHG reductions."[4]

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[1] California Air Resources Board, *Climate Change Scoping Plan, A Framework for Change*, December 2008.

[2] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

[3] "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See http://www.arb.ca.gov/cc/inventory/data/forecast.htm. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

[4] Superior Court of California, County of San Francisco, *Statement of Decision: Association of Irritated Residents, et al v. California Air Resources Board*, March 18, 2011.

On June 1, 2011, CARB filed a notice of appeal with the Court of Appeal, First Appellate District and followed up its appeal with a Petition for a Writ of Supersedeas, asking the First Appellate District to stay the Superior Court's decision. CARB's intent was to clarify the scope of the order, which enjoins CARB's implementation of all measures in the Scoping Plan, including programs like improved energy efficiency, clean car standards, and low-carbon fuel regulations. The First Appellate District granted CARB's Petition for Writ of Supersedeas, staying the Superior Court's injunction and allowing CARB to move forward with Scoping Plan implementation until the Court of Appeal renders a decision or issues another order. As a result of the lawsuit, CARB has adjusted the implementation schedule for the cap and trade program and compliance obligations have been pushed back.

CARB also released a *Supplement to the AB 32 Scoping Plan Functional Equivalent Document* on June 13, 2011, which is designed to address the CEQA flaws first identified by Superior Court. The Supplement provides an expanded analysis of the five alternatives to the Scoping Plan, including a no project alternative, a variation of the proposed combination of reduction measures proposed in the Scoping Plan, and three alternatives based on specific programs including cap-and-trade, source-specific regulatory requirements, and a carbon fee or tax.

LOCAL

Orange County

In 2011, the Orange County Transportation Authority (OCTA) and the Orange County Council of Governments (OCCOG) released the Orange County Sustainable Communities Strategy (OC SCS). The OC SCS is a subregional strategy created by a joint committee of representatives from the OCCOG and the OCTA called the OCCOG/OCTA Joint Working Committee. This Committee created a strategy to meet the requirements of SB 375 and the mutual agreements with the Southern California Association of Governments (SCAG) with a plan to reduce GHGs that all local jurisdictions in Orange County could support.

SB 375 (Steinberg, Statutes of 2008) states that "a subregional council of governments and the county transportation commission may work together to propose the sustainable communities strategy (SCS) and an alternative planning strategy (APS) for that subregional area." In addition, SB 375 authorizes that SCAG "may adopt a framework for a subregional SCS or a subregional APS to address the intraregional land use, transportation, economic, air quality, and climate policy relationships."

The OC SCS includes technical data, best management practices, and local priorities - both land use and transportation oriented - that have an effect on vehicle transportation and its air quality outcomes. The OC SCS reflects the input of local jurisdictions, stakeholders, and the general public to profile Orange County's existing commitment to future change in Countywide growth.

City of Fullerton

The City of Fullerton, as part of The Fullerton Plan, has prepared a Climate Action Plan (CAP). The purpose of the CAP is to address the main sources of emissions that contribute to global climate change. The CAP consists of the following:

- A city-wide existing GHG emissions inventory;
- Quantification of General Plan horizon year emissions;
- Development of measures aimed at reducing GHG emissions generated within the City;
- Development of thresholds of significance and a methodology for CEQA review of GHG and climate change impacts for subsequent projects within the City;
- A mechanism for monitoring and reporting of the GHG compliance program; and
- An implementation plan for future action.

As part of the CAP, the City has joined the International Council for local Environmental Initiatives (ICLEI)-Local Governments for Sustainability. ICLEI is an association of over 1,100 local governments from 67 countries who are committed to sustainable development. ICLEI provides technical consulting, training, and information services to build capacity, share knowledge, and support local governments in the implementation of sustainable development at the local level. Future GHG analyses for projects proposed in the City will be tiered off of the CAP.

5.21.3 EXISTING ENVIRONMENTAL SETTING

The project site lies within the southern portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

GLOBAL CLIMATE CHANGE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere through a three-fold process, summarized as follows: short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a

Global Warming Potential for each GHG based on its ability to absorb and re-radiate long wave radiation. The Global Warming Potential (GWP)[5] of a gas is determined using carbon dioxide as the reference gas with a GWP of one (1).

GHGs normally associated with a proposed project include the following:

- ***Water Vapor (H_2O).*** Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

  The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The IPCC has not determined a GWP for water vapor.

- ***Carbon Dioxide (CO_2).*** CO_2 is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of CO_2 in the atmosphere has increased 36 percent.[6] CO_2 is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

- ***Methane (CH_4).*** CH_4 is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of CH_4 are landfills, natural gas systems, and enteric fermentation. CH_4 is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of CH_4 is 21.

- ***Nitrous Oxide (N_2O).*** N_2O is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N_2O is 310.

- ***Hydrofluorocarbons (HFCs).*** HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.[7]

[5] All Global Warming Potentials are given as 100 year GWP. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. Climate Change (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

[6] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2008*, April 2010.

[7] U.S. Environmental Protection Agency, *High GWP Gases and Climate Change*, June 22, 2010.

- ***Perfluorocarbons (PFCs).*** PFCs are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semi conductor manufacturing. PFCs are potent GHGs with a GWP several thousand times that of CO_2, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).[8] The GWP of PFCs range from 6,500 to 9,200.

- ***Sulfur hexafluoride (SF_6).*** SF_6 is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).[9]

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric O_3 depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- ***Hydrochlorofluorocarbons (HCFCs).*** HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.[10]

- ***1,1,1 trichloroethane.*** 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 110 times that of CO_2.[11]

- ***Chlorofluorocarbons (CFCs).*** CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the EPA's Final Rule (57 FR 3374) for the phase out of O_3 depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,600 for CFC 11 to 14,000 for CFC 13.[12]

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[8] Ibid.

[9] Ibid.

[10] U.S. Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, October 29, 2009.

[11] Ibid.

[12] U.S. Environmental Protection Agency, *Class I Ozone Depleting Substances*, August 19, 2010.

GHG EMISSIONS INVENTORY METHODOLOGY

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. Community emissions from electricity and natural gas are based on usage rates specific to each land use type and are calculated using emissions coefficients compiled by ICLEI. Transportation data, including vehicle miles traveled (VMT), are based on traffic data provided by Kimley Horn and Associates, Inc. Solid waste data was based on generation factors as well as historic and projected generation data identified in Section 5.18, *Solid Waste*, and the *California Department of Resources Recycling and Recovery* (CalRecycle). City staff were instrumental in providing data on municipal operations.

The inventory was compiled using ICLEI's Clean Air Climate Protection (CACP) software. The CACP software estimates emissions derived from energy consumption and waste generation within a community. Emissions are determined using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of CO_2eq, which allows for the consideration of different GHGs in comparable terms. For example, methane is 21 times more powerful than CO_2 in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO_2eq. The emission coefficients and methodology employed by the software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National GHG Emissions Inventories), the U.S. Voluntary GHG Reporting Guidelines (EIA form 1605), and, for emissions generated from solid waste, the EPA's Waste Reduction Model (WARM).

Compiled data were entered into the CACP software to create a community emissions inventory and a municipal emissions inventory. The community inventory represents all the energy used and waste produced within Fullerton and its contribution to GHG emissions. Municipal sources represent all City operated buildings and vehicles, and include government buildings, solid waste, and street lights. The municipal inventory is a subset of the community inventory, and includes emissions derived from internal government operations.

Separate emissions inventories for community and municipal operations are generally created, since the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Additionally, by proactively reducing emissions generated by its own activities, the City of Fullerton takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in Fullerton, as well as for inspiring other communities.

When calculating the emissions inventory, all energy consumed in the City was included. As a result, even though the electricity used by Fullerton's residents is produced elsewhere, this energy and emissions associated with it appears in the City's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community. Additionally, the energy consumption is a result of activities that are within the City's regulatory authority.

GHG EMISSIONS SECTORS

CACP separates the GHG emissions inventory into community-wide and government-related emissions. Community-wide emissions represent the total GHG emissions originating from activity within each sector throughout the community. Government-related emissions, although separated in CACP, are considered a subset of the community-wide (i.e., total) GHG emissions. CACP calculates GHG emissions from energy consumption, transportation, and solid waste, which are further discussed below.

Energy Consumption

Energy-related emissions are from the consumption of both electricity and natural gas. These emissions are both direct (e.g., building energy consumption) and indirect (e.g., produced off-site from energy production and water consumption [including water treatment and delivery]). The emissions inventory used electricity and natural gas usage rates for residential, commercial, and industrial land uses for the year 2009 from the CEC California Grid Average. The energy consumption data separated private users from government-operated facilities (i.e., City owned).

In order to calculate GHG emissions from natural gas and electricity consumption, ICLEI obtained California-specific emission coefficients. For natural gas consumption, a 2009 emission coefficient (kilograms of CO_2 per million British thermal units [kg CO_2/MMBtu]) for natural gas delivery was used within CACP for both community-wide and government-related energy use. The specific natural gas emission coefficient used to calculate GHG emissions was verified by California Climate Action Registry (CCAR) and the CEC. Similar to natural gas consumption, a 2009 emission coefficient (pounds of CO_2 per kilowatt [lbs CO_2/kWh]) was used to calculate GHG emissions associated with electricity delivery, which is also verified by CCAR.

Transportation

Fullerton's transportation sector includes emissions generated from VMT. Kimley Horn and Associates, Inc. worked with the Orange County Transportation Authority (OCTA) to determine the vehicle activity data (i.e., VMT) occurring on local roadways and freeway ramps within the City limits. In order to determine VMT within the City, OCTA performed a select link analysis for all trips that originated and ended in the City of Fullerton for all time periods. Daily traffic volumes were then calculated by summing traffic volumes for each time period. The VMT data was calculated by multiplying the traffic volumes for each link by the length of each link. Additionally, City staff provided vehicle and VMT data for the Municipal (i.e., City) vehicle fleet.

ICLEI used CARB's Emission Factors model (EMFAC2007) to obtain Orange County-specific emission coefficients for vehicle fuel distribution, vehicle fuel efficiencies, and emission factors. Orange County-specific emissions factors data was only used for community-wide transportation data. The City provided municipal vehicle fleet data with specific information regarding fuel and vehicle types. The CACP software also used EMFAC2007 assumptions to generate emission factors for the City vehicle fleet.

Solid Waste

Emissions from waste result primarily from organic waste occurring at landfills where the waste is disposed. Methane (CH_4) is the primary GHG from waste and the emissions result from chemical reactions and microbes acting upon the waste as the biodegradable materials break down. Solid waste generation and disposal data was obtained from CalRecycle (formerly the California Integrated Waste Management Board [CIWMB]). CACP provides GHG emission coefficients for various solid waste categories. These national default emission coefficients were used to calculate GHG emissions associated with solid waste disposal. The only alteration made to these emission coefficients was to set all waste category sequestration rates to zero in order to avoid the City taking credit for downstream emissions sequestration without also accounting for upstream emissions associated with production, transport, and consumption.

BASELINE GHG EMISSIONS INVENTORY

Community Sector

Table 5.21-1, *Baseline (Year 2009) Community-Wide GHG Emissions Inventory*, presents Fullerton's 2009 community-wide GHG emissions and the percent contribution of each emissions sector. As shown below, transportation-related activities account for the majority of the City's GHG emissions (approximately 66.2 percent). Approximately 16.3 percent of Fullerton's community-wide GHG emissions are attributed to residential uses. Commercial retail, office, and institutional uses account for approximately 8.8 percent. Industrial uses make up 6.8 percent, and solid waste disposal makes up the remaining 1.9 percent.

Table 5.21-1
Baseline (Year 2009) Community-Wide GHG Emissions Inventory

Community Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Residential	278,485	16.3
Commercial/Institutional		
College/University	42,954	2.5
High Schools/Elementary Schools	3,955	0.2
Commercial/Retail	85,569	5.0
Office	14,282	0.8
Other[1]	4,371	0.3
Industrial	116,056	6.8
Waste	32,278	1.9
Transportation	1,133,886	66.2
TOTAL[2]	**1,711,836**	**100**

GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year

Notes:
1. Other includes places of worship and golf courses.
2. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

Municipal Sector

Municipal emissions include energy use from City facilities such as water delivery facilities as well as government buildings, vehicle fleets, streetlights, and City employee commuting. Municipal sector emissions represent an opportunity for the City to demonstrate how to reduce GHG emissions. Table 5.21-2, *Baseline (Year 2009) Municipal Operations GHG Emissions Inventory*, presents government-related GHG emissions and the percent contribution of each emission sector. Approximately 43.7 percent of government-related GHG emissions are generated from water pumping, treatment, and delivery and wastewater treatment accounts for 8.0 percent. Electricity consumption of streetlights and traffic signals represent 20.8 percent. GHG emissions from employee commute total approximately 5.6 percent and the City's vehicle fleet represents 2.9 percent of government-related emissions, while buildings and facilities account for just 14.4 percent of annual GHG emissions.

Table 5.21-2
Baseline (Year 2009) Municipal Operations GHG Emissions Inventory

Municipal Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Buildings and Facilities	6,536	14.4
Streetlights & Traffic Signals	9,476	20.8
Airport Facilities	2,165	4.8
Water Delivery Facilities (local and import)	19,877	43.7
Wastewater Facilities	3,627	8.0
Employee Commute	2,536	5.6
Vehicle Fleet	1,305	2.9
Total[1]	**45,523**	**100**

GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

Total Baseline GHG Emissions

Total Baseline GHG emissions include both the Community Sector and the Municipal Sector. As indicated in Table 5.21-3, *Total Baseline (Year 2009) GHG Emissions*, the Citywide GHG emissions are 1,757,359 metric tons (MT) CO_2eq per year. On a per capita basis, the annual emissions for each person in the City is 12.99 $MTCO_2eq$.

Table 5.21-3
Total Baseline (Year 2009) GHG Emissions

Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Community Sector	1,711,836	97.4
Municipal Sector	45,523	2.6
Total	**1,757,359**	**100**
GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year		
Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.		

5.21.4 SIGNIFICANCE THRESHOLDS AND CRITERIA

At this time, there is no absolute consensus in the State of California among CEQA lead agencies regarding the analysis of global climate change and the selection of significance criteria. In fact, numerous organizations, both public and private, have released advisories and guidance with recommendations designed to assist decision-makers in the evaluation of GHG emissions given the current uncertainty regarding when emissions reach the point of significance. That being said, several options are available to lead agencies.
First, lead agencies may elect to rely on thresholds of significance recommended or adopted by State or regional agencies with expertise in the field of global climate change (see *CEQA Guidelines* Section 15064.7(c)). However, to date, neither CARB nor SCAQMD have adopted significance thresholds for GHG emissions for residential or commercial development under CEQA.[13] CARB has suspended all efforts to develop a threshold, and SCAQMD's threshold remains in draft form. Accordingly, this option (i.e., reliance on an adopted threshold) is not viable.

Second, lead agencies may elect to conclude that the significance of GHG emissions under CEQA is too speculative. However, this option is not viable due to the important focus on global climate change created by the various regulatory schemes and scientific determinations cited in this section.

Third, lead agencies may elect to use a zero-based threshold, such that any emission of GHGs is significant and unavoidable. However, this type of threshold may indirectly truncate the analysis provided in CEQA documents and the mitigation commitments secured from new development, and could result in the preparation of extensive environmental documentation for even the smallest of projects, thereby inundating lead agencies and creating an administrative

[13] Of note, in December 2009, the San Joaquin Valley Unified Air Pollution Control District adopted guidance for use by lead agencies in the valley, in assessing the significance of a project's GHG emissions under CEQA. The guidance relies on the use of performance-based standards, and requires that projects demonstrate a 29 percent reduction in GHG emissions, from business-as-usual, to determine that a project would have a less than significant impact. The guidance is for valley land use agencies and not applicable to areas outside the district. The Bay Area Air Quality Management District (BAAQMD) adopted its own GHG thresholds of significance on June 2, 2010. The threshold is based on quantitative standards including a per capita emission standard and project emission standard as well as a qualitative standard based on compliance with a qualified GHG reduction strategy. The BAAQMD thresholds are based on an analysis of local inventories of GHG emissions and local reduction programs; therefore, they would not be an appropriate basis for a GHG significance threshold in the City of Fullerton.

burden. Moreover, because the GHG analysis is a cumulative analysis, a zero based threshold would be inconsistent with *CEQA Guidelines* Section 15130(a)(3), which requires that cumulatively significant impacts, such as GHG emissions, be "cumulatively considerable", as defined by *CEQA Guidelines* Section 15065(a)(3).

Fourth, lead agencies may elect to utilize their own significance criteria, so long as such criteria are informed and supported by substantial evidence. Recent amendments to the *CEQA Guidelines*, and specifically the addition of *CEQA Guidelines* Section 15064.4, subdivision (b), support the selection of this significance criterion:

> *"A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:*
>
> *(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;*
> *(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;*
> *(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project".*

Appendix G of the *CEQA Guidelines* also has been revised to provide some guidance regarding the criteria that may be used to assess whether a project's impacts on global climate change are significant. The Appendix G environmental checklist form asks whether a project would: (i) generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or (ii) conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Based on the above factors (and particularly the adopted addition of *CEQA Guidelines S*ection 15064.4, subdivisions [b][2] and [b][3]), it has been determined that it is appropriate to rely on AB 32 implementation guidance (such as the CARB Scoping Plan) as a benchmark for purposes of this EIR and use the statute to inform the City's judgment as to whether the proposed project's GHG emissions would result in a significant impact (refer to *CEQA Guidelines* Section 15064, subdivision [f][1]). Accordingly, the following significance criterion is used to assess impacts:

> *Will the project's GHG emissions impede compliance with the GHG emissions reductions mandated in AB 32?*

The City of Fullerton has prepared a CAP which recognizes the importance of reducing GHG emissions, and has identified a specific GHG emissions reductions target in compliance with the goals of AB 32. Clearly defined emissions reduction targets will provide City decision makers and the community with a clear direction for Fullerton's GHG emissions management efforts, and will provide milestones against which progress can be evaluated over time. This

quantitative reduction target coupled with strategies and actions in this CAP would allow Fullerton to have greater control of the amount of GHGs emitted into the atmosphere.

Under AB 32, the State has committed to reducing GHG emissions to 1990 levels by 2020. Based on the CARB *Scoping Plan*, reducing GHG emissions to 1990 levels means cutting approximately 30 percent from BAU emission levels projected for 2020, or about 15 percent from today's levels.[14] The CARB *Scoping Plan* projects future emissions by comparing potential reductions from various measures to a BAU scenario. The BAU scenario represents future GHG emissions without the implementation of reduction measures. As a result, the CARB *Scoping Plan* outlines the State's strategy to achieve the 2020 GHG emissions limit with a comprehensive set of actions that will be developed by 2012.

Consistent with the CARB Scoping Plan, the City has chosen a reduction target of 15 percent below their current (2009 baseline) emissions levels by 2020. This reduction target will contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals. Therefore, if The Fullerton Plan can reduce its GHG emissions by 15 percent below 2009 levels by 2020, a less than significant impact would result.

The issues presented in the Initial Study Environmental Checklist (Appendix G of the *CEQA Guidelines*) have been utilized as thresholds of significance in this Section. Accordingly, GHG impacts resulting from the implementation of The Fullerton Plan may be considered significant if they would result in the following:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

5.21.5 PROJECT IMPACTS AND MITIGATION MEASURES

GREENHOUSE GAS EMISSIONS

- **GREENHOUSE GAS EMISSIONS GENERATED BY DEVELOPMENT ASSOCIATED WITH IMPLEMENTATION OF THE FULLERTON PLAN COULD HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT.**

Impact Analysis:

EFFECTS OF CLIMATE CHANGE ON THE PROJECT

In addition to analyzing a project's impacts on the environment, *CEQA* requires a lead agency to consider the effects of bringing development into an area that may present hazards.[15] The primary effect of global climate change has been a rise in average global tropospheric

[14] In the CARB Scoping Plan, "today's levels" are based on the statewide GHG inventory for 2005. However, cities and counties are encouraged to set a 15 percent GHG reduction target for both municipal operations and the community as a whole based on the most current GHG inventory conducted.

[15] *CEQA Guidelines* Section 15126.2[a] (*Consideration and Discussion of Significant Environmental Impacts*).

temperature of 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005.[16] While there is broad agreement on the causative role of GHGs to climate change, there is considerably less information or consensus on how climate change would affect any particular location, operation, or activity. The IPCC has published numerous reports on potential impacts of climate change on the human environment. These reports provide a comprehensive and up-to-date assessment of the current state of knowledge on climate change. Despite the extensive peer review of reports and literature on the impacts of global climate change, the IPCC notes the fact that there is little consensus as to the ultimate impact of human interference with the climate system and its causal connection to global warming trends.

The following climate change effects could potentially affect the City of Fullerton.

- ***Sea Level Rise.*** According to the IPCC, climate change is expected to raise sea levels by up to four feet. The City of Fullerton is approximately 11 miles from the Pacific Ocean and has a mean elevation of 150 feet above mean sea level (msl). Sea levels are anticipated to rise 12 to 18 inches by 2050.[17] Therefore, sea level rise of this magnitude would be unlikely to inundate the City. Additionally, the effects related to sea level rise are speculative at this time. However, if determined to be a significant threat, protective measures such as levees would likely be installed by regional and local governments to protect urbanized areas.

- ***Water Supply.*** The City receives some of its water supplies from the State Water Project through the Metropolitan Water District of Southern California (MWD). Surface water supplies in the City from the State Water Project could potentially be reduced as a result of climate change effects.[18] Climate change could also impact groundwater supplies. Warmer temperatures could lead to higher evaporation or shorter rainfall seasons. Higher evapotranspiration would likely reduce the amount of water available for recharge and can lead to greater pumping of groundwater to make up for losses in surface water.[19] Groundwater serves as a source of water supply in Fullerton from wells in the Orange County Groundwater Basin, which could result in serious implications for water supply in the City.

- ***Natural Disasters.*** Climate change could result in increased flooding and weather-related disasters. The City is located approximately 11 miles from the Pacific Ocean and could be exposed to intense coastal storms. The frequency of large floods on rivers and streams could also increase. Portions of the City near creeks and streams are located within FEMA 100-year flood zone areas as well as small scattered areas in the south part of the City. However, the City is not expected to be impeded by flood flows from creeks and streams within the City due to the improved drainage and dam facilities.

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[16] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007.

[17] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

[18] California Department of Water Resources, *Progress on Incorporating Climate Change into Management of California's Water Resources*, July 2006.

[19] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

- ***Wildfires.*** Climate change could result in increased occurrences and duration of wildfire events due to warmer temperatures, longer dry seasons, reduced winter precipitation, and early snowmelt. Fullerton experiences long periods of hot-dry weather and high velocity desert winds. The City is not located within areas designated by the California Department of Forestry and Fire Protection (CalFire) as Very High Fire Hazard Severity Zones (VHFHSZ). While not considered to have significant areas subject to wildland fire hazard, the City does have large, undeveloped oil lands that are generally covered with grass and light brush; however, fire brakes and the weed abatement ordinance are maintained.

- ***Public Health.*** Climate change could cause an increase in infections, disease, asthma, and other health-related problems.[20] Heat waves are expected to have a major impact on public health as well as decreasing air quality and an increase in mosquito breeding and mosquito-borne diseases. Vector control districts throughout the State are already evaluating how they will address the expected changes to California's climate.[21]

- ***Air Quality.*** Climate change would compound negative air quality impacts in the South Coast Air Basin, resulting in respiratory health impacts.[22] Prepared by the California Natural Resources agency, the *2009 California Climate Adaptation Strategy* states that climate change influences on atmospheric processes will promote formation of ground-level pollutants, such as ozone and secondary aerosols (particulate matter), and that these increases could offset much of the potential gains achieved through air pollution control measures. However, this would be a regional effect.

Other predicted physical and environmental impacts associated with climate change include heat waves, alteration of disease vectors, biome shifts, impacts on agriculture and the food supply, reduced reliability in the water supply, and strain on the existing capacity of sanitation and water-treatment facilities. While these issues are a concern for society at large, implementation of City policies and regional, State, and Federal regulations regarding health and safety would lessen potential impacts to the City of Fullerton.

PROJECTED GREENHOUSE GAS EMISSIONS

To determine the GHG emission reductions necessary to achieve Fullerton's target (15 percent reduction in emissions from 2009 emission levels by 2020), the City's GHG emissions were projected for The Fullerton Plan buildout year, then GHG emissions were projected for year 2020 under a trend scenario. The trend scenario is based on future growth and development anticipated in the Fullerton Plan as well as future year consumption rates for energy, transportation, water transport, and waste. The existing and projected emissions are presented in Table 5.21-4, *Baseline and Projected 2020 and 2030 Business As Usual Emissions*. The emissions forecast estimates future emissions under a Business As Usual (BAU) scenario. The BAU scenario assumes that no effort has been made to reduce emissions. Therefore, the future emissions depicted in Table 5.21-4 present how GHG emissions may increase in Fullerton if no reduction programs are implemented.

[20] California Climate Change Center, *Our Changing Climate, Assessing the Risks to California,* July 2006.

[21] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

[22] California Environmental Protection Agency, *AB 1493 Briefing Package*, 2008.

Table 5.21-4
Baseline and Projected 2020 and 2030 Business As Usual Emissions

Emissions Sector	GHG Emissions					
	2009 Baseline		2020 Projected		2030 Projected	
	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]
COMMUNITY SECTOR						
Residential	278,485	16.3	306,472	16.8	331,915	17.2
Commercial/Institutional						
College/University	42,954	2.5	45,601	2.5	48,007	2.5
High Schools/ Elementary Schools	3,955	0.2	3,955	0.2	3,955	0.2
Commercial/Retail	85,569	5.0	96,971	5.3	107,336	5.6
Office	14,282	0.8	37,585	2.1	58,770	3.0
Other[2]	4,371	0.3	4,334	0.2	4,301	0.2
Industrial	116,056	6.8	123,347	6.8	129,975	6.7
Transportation	1,133,886	66.2	1,162,553	63.6	1,188,615	61.5
Waste	32,278	1.9	45,927	2.5	58,336	3.0
Community Sub-Total[3]	***1,711,836***	***100***	***1,826,747***	*100*	***1,931,211***	***100***
MUNICIPAL SECTOR						
Buildings and Facilities	6,536	14.4	6,879	14.1	7,190	13.9
Streetlights & Traffic Signals	9,476	20.8	9,973	20.5	10,424	20.2
Airport Facilities	2,165	4.8	2,279	4.7	2,382	4.6
Water Delivery Facilities	19,877	43.7	21,649	44.4	23,260	45.1
Wastewater Facilities	3,627	8.0	4,081	8.4	4,494	8.7
Employee Commute	2,536	5.6	1,902	3.9	1,325	2.6
Vehicle Fleet	1,305	2.9	1,951	4.0	2,539	4.9
Municipal Sub-Total[3]	***45,523***	***100***	***48,715***	***100***	***51,616***	***100***
Grand Total (Community and Municipal Sectors)[3]	**1,757,359**	N/A	**1,875,462**	N/A	**1,982,827**	N/A

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. The percentage of emissions refers to the respective sectors (either community or municipal) and not to the combined total.
2. Other includes places of worship and golf courses.
3. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

It should be noted that emissions associated with City employee commute activities are the only category where emissions decline in the future scenarios. This can be attributed to the fact that the City's growth in employees and commute emissions is outweighed by emissions reductions from improved vehicle emissions standards, improved fuel efficiency, and a newer average model year vehicle fleet in future scenarios.

Growth and development under a 2030 BAU scenario would continue along a similar trend as under the 2020 BAU conditions. Assuming that the same type of current emissions-generating practices continue to occur within Fullerton, the City's GHG emissions would be anticipated to increase from 1,757,359 $MTCO_2eq$ in 2009 to 1,982,827 $MTCO_2eq$ in 2030. This represents a

12.8 percent increase from the 2009 baseline level in 2030. In comparison, the City's projected population is expected to increase 12.7 percent by 2030 from 2009.[23] Therefore, if current emissions-generating practices continue, Fullerton's GHG emissions are expected to increase at a similar rate to its population in 2030.

Under a BAU scenario, the City's GHG emissions (municipal and community) would be anticipated to increase from 1,757,359 $MTCO_2eq$ in 2009 to 1,875,462 $MTCO_2eq$ in 2020. This represents a 6.7 percent increase from the 2009 baseline level. In comparison, the City's projected population is expected to increase 10.0 percent by 2020 from 2009.[24] Fullerton's projected growth is anticipated to occur near existing and future job centers, which would positively impact transportation patterns and therefore would potentially be beneficial to GHG emission reductions.

PROPOSED CLIMATE ACTION PLAN REDUCTION MEASURES

The City has prepared a CAP as part of The Fullerton Plan to address GHG emissions reduction within the City. There are four CAP strategies that Fullerton has crafted to achieve the desired reduction target of 15 percent below baseline levels by 2020. Combined, these strategies and statewide reductions would decrease GHG emissions in Fullerton by approximately 628,290 $MTCO_2eq$ by 2020, enabling the community to contribute to global efforts to combat climate change. It should be noted that the strategies and emissions reduction measures take into account projected growth within the City. Each of the strategies contains emission reduction measures from municipal and non-municipal operations. These measures are consistent with and build upon the goals and policies within The Fullerton Plan. Although GHG inventories for 2030 (buildout year associated with The Fullerton Plan) are included, these are included only for informational purposes, as the reduction strategy that was chosen is set to comply with the AB 32 benchmark of 2020. However, implementation of the GHG reduction measures in the CAP would ensure the GHG emissions are significantly reduced from a 2030 BAU scenario and also provide a foundation for the AB 32 goal of reducing emissions by 50 percent in 2050. As noted in the CAP, continuing action is required to achieve the State's goals for the future. The CAP provides a foundation and a framework for action, but is only a first step. Each of the four strategies recommends measures and actions that would make the vision of the CAP a reality. Measures define the direction that the City would take to accomplish its GHG reduction goals. Actions define the specific steps that City staff and decision-makers would take over time. The four emission reduction strategies and associated GHG reduction measures identified in the CAP are as follows:

- ***Transportation and Mobility Strategy (Climate Action Strategy 1).*** The Transportation and Mobility Strategy is intended to promote a balanced transportation system that facilitates the use of public transportation and bicycles, reduces congestion, and helps encourage residents to engage in healthy and active lifestyles.

[23] Southern California Association of Governments (SCAG), *Adopted 2008 RTP Growth Forecast by City*, http://www.scag.ca.gov/forecast/index.htm. Accessed May 3, 2011.

[24] Ibid.

Specific measures to implement this strategy include Climate Action Strategy 1, Measure T-1, which would reduce single occupant vehicle trips. This measure include conducting a travel commute survey, developing a Commute Trip Reduction Program to encourage employees to carpool or ride share, and transit network and access upgrades. Measure T-2 through T-5 would increase jurisdiction connections and create bicycle safety and infrastructure improvements as well as facilitate implementation of the *Fullerton Bicycle Master Plan*. These measures include working with OCTA to prioritize Fullerton's bicycle facility improvements and connect with bicycle networks of adjacent Cities, maintain the City's eligibility for State Bicycle Transportation Account funds, and focus on making bicycling safer and more convenient. Additionally, Climate Action Plan Measure T-6 through T-9 would increase the use of alternative modes of transportation by increasing circulation between cities, expanding rail and rapid transit facilities, and establishing infrastructure for low and zero emission vehicles.

- ***Energy Use and Conservation Strategy (Climate Action Strategy 2).*** The Energy Use and Conservation Strategy reduces the carbon footprint of community and municipal operations to serve as a leader for the community and support the construction of buildings that are energy efficient and incorporate clean, renewable energy sources.

  In support of this strategy, Climate Action Strategy 2, Measure E-1 would reduce GHG emissions from electrical generation through the promotion of renewable energy sources and onsite energy generation. Measures E-2 through E-4 promote energy efficient design through efficiency and retrofit programs. These measures also include the adoption of an energy conservation ordinance to ensure that new residential and commercial buildings are energy efficient. Measure E-5 promotes sustainable development by building on the goals and policies established within the *Fullerton Transportation Center Specific Plan*. The *Transportation Center Specific Plan* guides sustainable revitalization and transit-oriented development, which provide a foundation for increasing public transportation service throughout the City as well as Orange County.

- ***Water Use and Efficiency Strategy (Climate Action Strategy 3).*** The Water Use and Efficiency Strategy sets goals and identifies opportunities conserve and protect water resources and promote efficiency through public education.

  In support of this strategy, Climate Action Strategy 3, Measure W-1 and W-2 focus on conservation efforts and sustainable water practices. This would be accomplished through the establishment of a water conservation strategy that would require compliance with the voluntary standards in the 2010 California Green Building Standards Code. Measure W-3 supports regional and subregional efforts to reduce GHG emissions from water conveyance and expanding recycled water infrastructure.

- ***Solid Waste Reduction and Recycling Strategy (Climate Action Strategy 4).*** The Solid Waste and Recycling Strategy provides builds on past City successes by increasing waste diversion, reducing consumption of materials that otherwise end up in landfills, and increasing recycling.

In support of this strategy, Climate Action Strategy 4, Measure SW-1 would reduce the amount of waste generated in Fullerton through outreach programs and increased recycling efforts. Measures SW-2 through SW-4 provide additional methods to divert materials from landfills that include coordination with the City's waste disposal contractor, e-waste/hazardous materials collection, composting programs, and incentive programs. Measure SW-5 would reduce GHG emission from solid waste through the improved management of waste hauling and reductions in waste generation. This measure also includes working with the City's solid waste collection contractor to upgrade their truck fleet to use cleaner vehicles.

Implementation of the recommended measures and actions will result in a potential reduction in GHG emissions of up to 289,016 $MTCO_2eq$; refer to Table 5.21-5, *Summary of GHG Reduction Measures*. However, by 2020 the City's emissions are projected to be 1,875,460 $MTCO_2eq$ under BAU conditions. Implementation of the strategies within the CAP would reduce 2020 emissions to 1,586,444 $MTCO_2eq$. To achieve a reduction of 15 percent below the 2009 level, 2020 emissions would need to be 1,493,754 $MTCO_2eq$, or lower. As a result, the City of Fullerton would not achieve the emission reduction target of 15 percent below 2009 emission levels with these measures alone. However, the community can assume credit for a portion of the GHG emission reductions that occur through legislation that is being implemented at the statewide level. Senate Bill 107 (SB 107) establishes performance standards for GHG emission reductions from electric utilities and Assembly Bill 1493 (AB 1493) establishes performance standards for GHG emission reductions from motor vehicles. Executive Order S-1-07 (EO S-1-07) also establishes performance standards for the carbon intensity of transportation fuels. At the time of the CAP preparation, the City only has confidence in estimating the GHG emission reductions associated with SB 107, AB 1493, and EO S-1-07. As the regulatory framework surrounding AB 32 grows in the future, it may be possible to evaluate a wider range of statewide reductions. As indicated in Table 5.21-5, implementation of the CAP strategies and statewide measures would result in a total reduction of 628,290 $MTCO_2eq$.

The GHG reduction strategies and measures in the CAP were based on the goals and policies in The Fullerton Plan and were designed to include performance criteria that would allow the City to achieve its GHG reduction target of 15 percent below 2009 levels by 2020. As proposed, the CAP meets this target, with a projected 29.03 percent reduction (a reduction of 628,290 $MTCO_2eq$). This 29.03 percent reduction includes credit for a portion of the GHG emission reductions that occur through legislation that is being implemented at the statewide level (SB 107, AB 1493, and EO-E-1-07). The CAP includes other supporting measures that contribute to the GHG emission reductions of other related measures. Other measures could not be quantified, due either to a lack of substantial evidence or limitations inherent in quantifying the effect of less tangible programs and policies. For the CAP to successfully guide Fullerton toward meeting its GHG reduction target, the City must play a prominent role in implementing the CAP's programs and policies. The public also has a role by participating in and ensuring success of the measures and actions.

CONSISTENCY WITH THE CALIFORNIA ATTORNEY GENERAL'S MITIGATION MEASURES

With implementation of the proposed Climate Action Strategies and associated measures and actions, The Fullerton Plan would comply with measures that are consistent with the California Office of the Attorney General's recommended measures to reduce GHG emissions. The CAP

incorporates sustainable practices consistent with the Attorney General's recommended measures which include water, energy, solid waste, land use, and transportation efficiency measures.

Table 5.21-5
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
TRANSPORTATION AND MOBILITY STRATEGY			
T-1	Reduction of Single Occupant Vehicle Trips	110,623	17.61%
T-2	Inter-Jurisdiction Connection	6,987	1.11%
T-3	Bicycle Transportation Plan	29,111	4.63%
T-4	Bicycle Use on All Streets	Supporting Measure	N/A
T-5	Bicycle Safety and Convenience	Supporting Measure	N/A
T-6	Circulation Between Cities	23,289	3.71%
T-7	Infrastructure for Low and Zero Emission Vehicles	3,297	0.52%
T-8	Rail and Rapid Transit	1,744	0.28%
T-9	Car Sharing Pilot Program	6,975	1.11%
	Subtotal	**182,026**	**28.97%**
ENERGY USE AND CONSERVATION STRATEGY			
E-1	GHG Emissions from Electrical Generation	69,555	11.07%
E-2	Energy- and Resource-Efficient Design	23,185	3.69%
E-3	Energy Efficient Retrofits	Supporting Measure	N/A
E-4	Efficient Use of Energy Resources in Residential Development	Supporting Measure	N/A
E-5	Sustainable Regional Revitalization Efforts	Supporting Measure	N/A
	Subtotal	**92,740**	**14.76%**
WATER USE AND EFFICIENCY STRATEGY			
W-1	Conservation Efforts	Supporting Measure	N/A
W-2	Sustainable Water Practices in New Development	3,860	0.61%
W-3	GHG Emissions from Water Conveyance	433	0.07%
	Subtotal	**4,292**	**0.68%**
SOLID WASTE REDUCTION AND RECYCLING STRATEGY			
SW-1	the Efforts of Regional Waste Management	Supporting Measure	N/A
SW-2	Waste Reduction and Diversion	6,889	1.10%
SW-3	Waste Stream Separation and Recycling	Supporting Measure	N/A
SW-4	Food-Waste Processing Facility	3,068	0.49%
SW-5	GHG Emissions from Waste	Supporting Measure	N/A
	Subtotal	**9,957**	**1.58%**
	Total Strategy Reductions	**289,016**	**46.00%**
STATEWIDE REDUCTIONS			
	AB 1493 and EO S-1-07	291,114	46.33%
	SB 1078 and SB 107	48,160	7.67%
	Subtotal Statewide Reductions	339,274	**54.00%**
	Grand Total	***628,290***	***100%***

Source: City of Fullerton, *Draft Climate Action Plan*, September 2011.

CONSISTENCY WITH THE CARB SCOPING PLAN

CARB Scoping Plan Measures/Recommended Actions include those related to transportation, electricity consumption, natural gas usage, water conservation, green buildings, and recycling and waste management. The proposed CAP incorporates several Climate Action Strategies and associated measures and actions that would be consistent with, and help implement the CARB Scoping Plan in order to obtain AB 32 goals, as well as the Governor's Executive Order.

IMPACT CONCLUSION

As presented above, implementation of the GHG reduction strategies and measures in the CAP would allow The Fullerton Plan to achieve its GHG reduction target of 15 percent below 2009 levels by 2020. As proposed, the CAP meets this target with a projected 29.03 percent reduction, and The Fullerton Plan would be consistent with the reduction targets of AB 32. Thus, a less than significant impact would occur.

Proposed General Plan Update Policies and Actions:

P5.2 ***Reduction of Single Occupant Vehicle Trips***
Support regional and sub-regional efforts to increase alternatives to and infrastructure supporting a reduction of single occupant vehicle trips (CAP Measure T-1).

P6.2 ***Inter-Jurisdictional Connections***
Support efforts to maintain, expand and create new connections between the Fullerton bicycle network and the bicycle networks of adjacent cities, Orange County, and the region (CAP Measure T-2).

P6.3 ***Bicycle Transportation Plan***
Support projects, programs, and policies to maintain and update as necessary a Bicycle Transportation Plan prepared and approved pursuant to the California Streets and Highways Code to maintain eligibility for funding for State Bicycle Transportation Account funds (CAP Measure T-3).

P6.4 ***Bicycle Use on All Streets***
Support projects, programs, policies and regulations to recognize that every street in Fullerton is a street that a bicyclist can use (CAP Measure T-4).

P6.5 ***Bicycling Safety and Convenience***
Support projects, programs, policies, and regulations that make bicycling safer and more convenient for all types of bicyclists (CAP Measure T-5).

P5.1 ***Circulation Between Cities***

Support regional and sub-regional efforts to implement programs that coordinate the multi-modal transportation needs and requirements across jurisdictions, including but not limited to the Master Plan of Arterial Highways, the Commuter Bikeways Strategic Plan, the Signal Synchronization Master Plan, the Orange County Congestion Management Plan, and the Growth Management Plan (CAP Measure T-6).

P5.16 ***Infrastructure for Low and Zero Emission Vehicles***

Support projects, programs, policies, and regulations to encourage the development of private and/or public infrastructure facilitating the use of alternative fuel vehicles (CAP Measure T-7).

A5.3 ***Rail and Rapid Transit***

Participate in the planning efforts for regional and inter-state rail and rapid transit projects to represent the interests of the City (CAP Measure T-8).

A21.2 ***Car Sharing Pilot Program***

Explore the potential for a car sharing pilot program to be implemented in one or more of the City's Focus Areas (CAP Measure T-9).

P22.2 ***GHG Emissions from Electrical Generation***

Support regional and sub-regional efforts to reduce greenhouse gas emissions associated with electrical generation through energy conservation strategies and alternative/renewable energy programs (CAP Measure E-1).

P1.12 ***Energy- and Resource Efficient Design***

Support projects, programs, policies and regulations to encourage energy and resource efficient practices in site and building design for private and public projects (CAP Measure E-2).

A1.7 ***Energy Efficient Retrofits***

Prepare guidance to homeowners on energy efficient retrofits of existing dwellings (CAP Measure E-3).

P3.26 ***Efficient Use of Energy Resources in Residential Development***

The City shall encourage housing developers to maximize energy conservation through proactive site, building and building systems design, materials, and equipment. The City's goal is to provide the development community the opportunity to exceed the provisions of Title 24 of the California Building Code. The City shall continue to support energy conservation through encouraging the use of Energy Star-rated appliances, other energy-saving technologies and conservation. To enhance the efficient use of energy resources, the City shall review the potential of offering incentives or other strategies that encourage energy conservation (CAP Measure E-4).

P11.1 ***Sustainable Regional Revitalization Efforts***
Support regional and sub-regional efforts pertaining to community revitalization that are rooted in sustainable development principles (CAP Measure E-5).

P19.2 ***Conservation Efforts***
Support regional and sub-regional efforts to promote water efficiency and conservation (CAP Measure W-1).

P19.7 ***Sustainable Water Practices in New Development***
Support projects, programs, policies, and regulations to encourage water efficient practices in site and building design for private and public projects (CAP Measure W-2).

P22.3 ***GHG Emissions from Water Conveyance***
Support regional and sub-regional efforts to reduce greenhouse gas emissions associated with water conveyance through water conservation strategies and alternative supply programs (CAP Measure W-3).

P23.1 ***Regional Waste Management***
Support regional and sub-regional efforts on recycling, waste reduction, and product reuse (CAP Measure SW-1).

P23.3 ***Waste Reduction and Diversion***
Support projects, programs, policies, and regulations to promote practices to reduce the amount of waste disposed in landfills (CAP Measure SW-2).

P23.4 ***Waste Stream Separation and Recycling***
Support projects, programs, policies and regulations to expand source separation and recycling opportunities to all households (including multi-family housing), businesses, and City operations (CAP Measure SW-3).

A23.3 ***Food-Waste Processing Facility***
Explore the feasibility of a food-waste processing facility to serve the City's food-service and food-processing businesses and large institutions (CAP Measure SW-4).

P22.6 ***GHG Emissions from Waste***
Support projects, programs, policies, and regulations to reduce greenhouse gas emissions from waste through improved management of waste handling and reductions in waste generation (CAP Measure SW-5).

Mitigation Measures: No mitigation measures beyond the strategies, goals, and measures identified in the proposed Climate Action Plan are required.

Level of Significance After Mitigation: Not Applicable.

CONSISTENCY WITH APPLICABLE GHG PLANS, POLICIES OR REGULATIONS

■ IMPLEMENTATION OF THE FULLERTON PLAN COULD CONFLICT WITH AN APPLICABLE GREENHOUSE GAS REDUCTION PLAN, POLICY, OR REGULATION.

Impact Analysis: As previously stated, the City has prepared a CAP as part of The Fullerton Plan process, which includes a variety of strategies, measures, and actions to reduce GHG emissions in accordance with State reduction goals. These strategies, measures, and actions are consistent with and build upon the Goals and Policies within the City's proposed Fullerton Plan. Table 5.21-6, *Climate Action Strategy Reductions* illustrates the reductions that would be achieved per Climate Action Strategy with implementation of the CAP.

Table 5.21-6
Climate Action Strategy Reductions

Reduction Categories	Reductions from CAP Measures	
	$MTCO_2eq/yr$	Percentage
Climate Action Strategy 1: Transportation and Mobility Strategy	182,026	28.97
Climate Action Strategy 2: Energy Use and Conservation Strategy	92,740	14.76
Climate Action Strategy 3: Water Use and Efficiency Strategy	4,292	0.68
Climate Action Strategy 4: Solid Waste Reduction and Recycling Strategy	9,957	1.58
AB 1078 and SB 107	291,114	46.33
AB 1493 and EO S-1-07	48,160	7.67
Total	**628,290**	**100**
	29.03% from 2009 baseline	
Source: City of Fullerton, *Draft Climate Action Plan*, September 2011.		

CAP reduction measures would result in a total of approximately 628,290 $MTCO_2eq$, which is 29.03 percent below 2009 Baseline GHG emissions, and 33.43 percent below 2020 BAU emissions. The proposed Fullerton Plan would be consistent with the proposed CAP, as CAP strategies, measures, and actions are consistent with and build upon the goals and policies within The Fullerton Plan. Therefore, The Fullerton Plan would be consistent, and would not conflict with an applicable GHG reduction plan, policy, or regulation. Impacts in this regard are less than significant.

Proposed General Plan Update Policies and Actions: Refer to the Policies and Actions cited above.

Mitigation Measures: No mitigation measures beyond the strategies, goals, and measures identified in the proposed CAP are required.

Level of Significance After Mitigation: Not Applicable.

5.21.6 CUMULATIVE IMPACTS

- **GREENHOUSE GAS EMISSIONS RESULTING FROM DEVELOPMENT ASSOCIATED WITH IMPLEMENTATION OF THE FULLERTON PLAN AND CUMULATIVE DEVELOPMENT COULD IMPACT GREENHOUSE GAS EMISSIONS ON A CUMULATIVELY CONSIDERABLE BASIS.**

Impact Analysis: The proposed Fullerton Plan would result in a less than significant impact regarding GHG emissions with implementation of CAP reduction strategies, measures, and actions. These policies and measures would result in a reduction of approximately 628,290 $MTCO_2eq$ (29.03 percent) below 2020 BAU GHG emissions, which is consistent with the State reduction goals set forth in AB 32.

On December 30, 2009, the Natural Resources Agency adopted the CEQA Guideline Amendments prepared by Office of Planning and Research (OPR), as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010. The Natural Resources Agency originally proposed to add subdivision (f) to section 15130 to clarify that sections 21083 and 21083.05 of the Public Resources Code do not require a detailed analysis of GHG emissions solely due to the emissions of other projects (i.e., CEQA Guidelines, Section 15130(a)(1); *Santa Monica Chamber of Commerce v. City of Santa Monica* (2002) 101 Cal.App.4th 786, 799). Rather, the proposed subdivision (f) would have provided that a detailed analysis is required when evidence shows that the incremental contribution of the project's GHG emissions is cumulatively considerable when added to other cumulative projects (i.e., *Communities for a Better Environment v. California Resources Agency* (2002), supra, 103 Cal.App.4th at 119-120). In essence, the proposed addition would be a restatement of law as applied to GHG emissions. Analysis of GHG emissions as a cumulative impact is consistent with case law arising under the National Environmental Policy Act (e.g., *Center for Biological Diversity v. National Highway Traffic Safety Administration*, 538 F.3d 1172, 1215-1217 [9th Cir. 2008]). Other portions of the CEQA Guideline Amendments address how lead agencies may determine whether a project's emissions are cumulatively considerable (e.g., Proposed Sections 1506(h)(3) and 15064.4). However, public comments noted that the new subdivision merely restated the law, and was capable of misinterpretation. The Natural Resources Agency, therefore, determined that because other provisions of the CEQA Guideline Amendments address the analysis of GHG emissions as a cumulative impact, and because the reasoning of those is fully explained in the Initial Statement of Reasons, subdivision (f) should not be added to the CEQA Guidelines. The deletion was reflected in the revisions that were made available for further public review and comment on October 23, 2009.

It is generally the case that an individual project of this size is of insufficient magnitude by itself to influence climate change or result in a substantial contribution to the global GHG inventory. GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective. In addition, as noted in Table 5.21-6, implementation of the CAP would result in GHG reduction of approximately 628,290 MT CO_2eq (29.03 percent) below 2020 BAU. For the reasons discussed in this section and because the project incorporates GHG reduction measures, The Fullerton Plan's GHG emissions would not result in a cumulative considerable impact.

Proposed General Plan Update Policies and Actions: Refer to the Policies and Actions cited above.

Mitigation Measures: No mitigation measures beyond the strategies, goals, and measures identified in the proposed CAP are required.

Level of Significance After Mitigation: Not Applicable.

5.21.7 SIGNIFICANT UNAVOIDABLE IMPACTS

Greenhouse Gas emissions impacts associated with implementation of The Fullerton Plan would be less than significant by adherence to and/or compliance with CAP strategies, goals, and measures. No significant unavoidable GHG emissions impacts would occur as a result of buildout of The Fullerton Plan.

5.21.8 SOURCES CITED

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