4.7 Greenhouse Gas Emissions

This section provides background information on global and regional greenhouse gas (GHG) emissions in addition to evaluating the City of Escondido GHG contributions and an evaluation of the General Plan Update, Downtown Specific Plan Update and E-CAP's consistency with applicable plans, policies and regulations adopted for the purposes of reducing the emissions of GHG. Potential adverse impacts as a result of global climate change on the planning area are also addressed. The information provided in this section is based on information published by the California Air Pollution Control Officers Association (CAPCOA), California Air Resources Board (CARB), the U.S. Environmental Protection Agency (EPA), and other sources, as cited throughout the section. Appendix H of this EIR provides GHG inventory modeling information.

A summary of the GHG emission impacts identified in Section 4.7.3, Analysis of Project Impacts and Determination of Significance, is provided below.

GHG Summary of Impacts

Issue Number	Issue Topic	Project Direct Impact	Project Cumulative Impact	Impact After Mitigation
1	Compliance with AB 32	Less than Significant	Less than Significant	Less than Significant
2	Potential Effects of Global Climate Change on the Proposed General Plan Update	Less than Significant	Less than Significant	Less than Significant

4.7.1 Existing Conditions

4.7.1.1 Global Climate Change Overview

Climate change refers to any substantial change in measures of climate (such as temperature, precipitation, or wind) lasting for decades or longer. According to the EPA, the Earth's climate has changed many times during the planet's history, including events ranging from ice ages to long periods of warmth. Historically, natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy released from the sun have affected the Earth's climate. Some GHGs, such as water vapor, occur naturally and are emitted to the atmosphere through natural processes, while others are emitted through human activities. Beginning late in the 18th century, human activities associated with the Industrial Revolution have also changed the composition of the atmosphere and therefore very likely are influencing the Earth's climate. For over the past 200 years, the burning of fossil fuels, such as coal and oil, and deforestation has caused the concentrations of heat-trapping GHG to increase substantially in the atmosphere.

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effects of GHGs, the earth's temperature would be about 34 degrees Celsius cooler (California Climate Action Team [CCAT] 2007). However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

The Global Carbon Project (2010) released an update of the global carbon budget for the year 2009. The atmospheric carbon dioxide (CO_2) concentration in 2009 was 387 parts per million (ppm), 39 percent above the concentration at the start of the Industrial Revolution (about 280 ppm in 1750). The 2009 concentration was the second highest known concentration in human history, just behind 2008 emissions. The annual mean growth rate of atmospheric CO_2 was 1.6 ppm per year in 2009, below the average for the period 2000-2008 of 1.9 ppm per year. This cannot be explained by a decrease in CO_2 emissions alone but is mainly caused by an increase in the land and ocean CO_2 sinks in response to the tail of the La Niña climate event that perturbed the global climate system from mid 2007 until early 2009.

4.7.1.2 Greenhouse Gases

GHGs are gases that trap heat in the atmosphere, analogous to the way a greenhouse retains heat. Common GHGs include water vapor, CO_2, methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), ozone (O_3), and aerosols. Global atmospheric concentrations of CO_2, CH_4 and N_2O have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.

Individual GHGs have varying heat-trapping properties and atmospheric lifetimes. Table 4.7-1, Carbon Dioxide Equivalents and Atmospheric Lifetimes of Basic GHGs, identifies the CO_2 equivalent (CO_2e) and atmospheric lifetimes of basic GHGs. Each GHG is compared to CO_2 with respect to its ability to trap infrared radiation, its atmospheric lifetime, and its chemical structure. The CO_2e is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent measure. For example, CH_4 is a GHG that is 21 times more potent than CO_2; therefore, one metric ton of CH_4 is equal to 21 metric tons CO_2e.

Table 4.7-1 Carbon Dioxide Equivalents and Atmospheric Lifetimes of Basic GHGs

GHG	Formula	Carbon Dioxide Equivalent (CO_2e)	Atmospheric lifetime (years)
Carbon dioxide	CO_2	1	50-200
Methane	CH_4	21	12
Nitrous oxide	N_2O	310	114
Sulphur hexafluoride	SF_6	23,900	3,200

Source: EPA 2011

California Health and Safety Code Section 38505(g) defines GHGs to include the following compounds: CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. Descriptions of these compounds and their sources are provided below.

Carbon Dioxide

Carbon dioxide (CO_2) enters the atmosphere through the burning of fossil fuels, solid waste, trees and wood products, and as a result of other chemical reactions such as through the manufacturing of cement. Globally, the largest source of CO_2 emissions is the combustion of fossil fuels in power plants,

automobiles, industrial facilities, and other similar sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and petroleum-based products uses also produce CO_2 emissions. CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle. As part of the carbon cycle billions of tons of atmospheric CO_2 are removed from the atmosphere by oceans and growing plants, also known as 'sinks', and are emitted back into the atmosphere annually through respiration, decay, and combustion, also known as 'sources'. When in balance, the total CO_2 emissions and removals from the entire carbon cycle are roughly equal. Since the Industrial Revolution in the 1700s, human activities, such as the burning of oil, coal and gas or deforestation, have increased CO_2 concentrations in the atmosphere. In 2005, global atmospheric concentrations of CO_2 were 35 percent higher than they were before the Industrial Revolution (EPA 2010).

Methane

Methane (CH_4) is emitted from a variety of both human-related and natural sources. Human-related activities include fossil fuel production, animal husbandry, rice cultivation, biomass burning, and waste management. CH_4 is emitted during the production and transport of fossil fuels. CH_4 emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. It is estimated that 60 percent of global CH_4 emissions are related to human activities. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and wildfires. CH_4 emission levels from a source can vary significantly from one country or region to another, depending on many factors such as climate, industrial and agricultural production characteristics, energy types and usage, and waste management practices. For example, temperature and moisture have a significant effect on the anaerobic digestion process, which is one of the key biological processes that cause CH_4 emissions in both human-related and natural sources. Also, the implementation of technologies to capture and utilize CH_4 from sources such as landfills, coal mines, and manure management systems affects the emission levels from these sources (EPA 2010).

Nitrous Oxide

Nitrous Oxide (N_2O) is produced by both natural and human-related sources. N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. N_2O emission levels from a source can vary significantly from one country or region to another, depending on many factors such as industrial and agricultural production characteristics, combustion technologies, waste management practices, and climate. For example, heavy utilization of synthetic nitrogen fertilizers in crop production typically results in significantly more N_2O emissions from agricultural soils than that occurring from less intensive, low-tillage techniques. Also, the presence or absence of control devices on combustion sources, such as catalytic converters on automobiles, can have a significant effect on the level of N_2O emissions from these types of sources (EPA 2010).

Fluorinated Gases

HFCs, PFCs, and SF_6 are synthetic, powerful GHGs that are emitted from a variety of industrial processes, including aluminum production, semiconductor manufacturing, electric power transmission, magnesium production and processing, and the production of Chlorodifluoromethane (HCFC-22), commonly used in air conditioning applications. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances, such as CFCs, Hydrochlorofluorocarbons (HCFCs), and halons. These gases are typically emitted in smaller quantities, but have higher GWP than other GHGs (EPA 2011).

4.7.1.3 Global, National, Statewide, Countywide, and Escondido GHG Inventories

In an effort to evaluate and reduce the potential adverse impact of global climate change, international, state and local organizations have conducted GHG inventories to estimate their levels of GHG emissions and removals. The following summarizes the results of these global, national, state, countywide, and local GHG inventories.

Global

Worldwide anthropogenic GHG emissions in 2006 were approximately 49,000 million metric tons (MMT) CO_2e, including ongoing emissions from industrial and agricultural sources and emissions from land use changes (i.e., deforestation, biomass decay) (Intergovernmental Panel on Climate Change [IPCC] 2007). CO_2 emissions from fossil fuel use accounts for 56.6 percent of the total emissions of 49,000 MMT CO_2e (includes land use changes) and all CO_2 emissions are 76.7 percent of the total. CH_4 emissions account for 14.3 percent and N_2O emissions for 7.9 percent of GHG (IPCC 2007).

United States

The EPA publication, *Draft Inventory of U.S. GHG Emissions and Sinks: 1990-2009,* provides a comprehensive emissions inventory of the nation's primary anthropogenic sources and sinks of GHGs. Overall, total U.S. emissions had risen by 13 percent from 1990 to 2008, while the U.S. gross domestic product (GDP) had increased by 65 percent over the same period. Emissions decreased from 2008 to 2009, decreasing by six percent to 6,640 MMT CO_2e. GDP also decreased by three percent from 2008 to 2009. The publication indicated that the following factors were primary contributors to this decrease: 1) a decrease in economic output resulting in a decrease in energy consumption across all sectors; and 2) a decrease in the carbon intensity of fuels used to generate electricity due to fuel switching as the price of coal increased, and the price of natural gas decreased significantly (EPA 2011).

California

The State of California is a substantial contributor of GHG emissions as it is the second largest contributor in the U.S. and the 16th largest in the world. According to CARB, California generated 484 MMT CO_2e in 2004 (CARB 2007). Table 4.7-2, California GHG Emissions by Sectors in 2004, below provides CARB data on California GHG emissions by sector in 2004. GHG emissions in California are mainly associated with fossil fuel consumption in the transportation sector (38 percent). The industrial sector is the second-largest source of GHG emissions (20 percent). Electricity production, from both in-state and out-of-state sources, agriculture, forestry, commercial, and residential activities comprise the

balance of California's GHG emissions. Emissions of GHGs were offset slightly in 2004 by the sequestration (intake) of carbon within forests, reducing the overall emissions by 4.7 MMT CO_2e, resulting in net emissions of about 480 MMT CO_2e.

Table 4.7-2 California GHG Emissions by Sectors in 2004

Sector	Total Emissions (MMT CO_2e)	Percent of Total Emissions
Agriculture	27.9	6
Commercial	12.8	3
Electricity Generation	119.8	25
Forestry (excluding sinks)	0.2	<1
Industrial	96.2	20
Residential	29.1	6
Transportation	182.4	38
Miscellaneous[(1)]	16.0	3
Total (Gross) Emissions	**484.4**	**100**

[(1)] Unspecified fuel combustion which could not be attributed to an individual sector.
CO_2e = carbon dioxide equivalents
Notes: Percents may not total 100 due to rounding. Total gross emissions do not take into account the offset in emissions by carbon sequestration within forests.
Source: CARB 2007

San Diego County

In addition to the State of California GHG Inventory, a more specific regional GHG inventory was prepared by the University of San Diego School of Law Energy Policy Initiative Center (EPIC) in 2008. This San Diego County GHG Inventory (SDCGHGI) is a detailed inventory that considers the unique characteristics of the region in calculating emissions. A summary of the inventory results, by category and percent contribution for the year 2006, is provided below in Table 4.7-3, San Diego Countywide GHG Emissions by Category (2006).

Table 4.7-3, San Diego Countywide GHG Emissions by Category (2006), shows that in 2006, a total of 34.4 MMT CO_2e was generated in the San Diego County. This total includes both the incorporated and unincorporated areas. The largest contributor of GHG was from the on-road transportation category, which comprised 46 percent (16 MMT CO_2e) of the total amount. The second highest contributor was the electricity category, which contributed 9 MMT CO_2e, or 25 percent of the total. Together the on-road transportation and electricity category comprised 71 percent of the total GHG emissions for the San Diego region. The remaining amount was contributed by natural gas consumption, civil aviation, industrial processes, off-road transportation, waste, agriculture, rail, water-borne navigation, and other fuels.

Table 4.7-3 San Diego Countywide GHG Emissions by Category (2006)

Sector	Total Emissions (MMT CO_2e)	Percent of Total Emissions
On-Road Transportation	15.6	45
Electricity	8.5	25
Natural Gas Consumption	3	9
Civil Aviation	1.7	5
Industrial Processes & Products	1.6	5
Other Fuels / Other	1.1	3
Off-Road Equipment & Vehicles	1.3	3
Waste	0.7	2
Agriculture/Forestry/Land Use	0.4	2
Rail	0.3	1
Water-Borne Navigation	0.1	0.4
Total	**34.4**	**100**

CO_2e = carbon dioxide equivalents
Note: Numbers may not total to 100 percent due to rounding
Source: EPIC 2008

City of Escondido

The proposed E-CAP contains existing (2010) inventories for both municipal and community-wide GHG emissions. The City of Escondido emitted 18,143 MT CO_2e through its municipal operations in 2010. The emissions were calculated based on the vehicle and equipment fleet fuel use, energy accounts, waste management, and a survey of the City's employee commutes. The largest portion of the City's 2010 government emissions were from electricity (46 percent), followed by emissions from employee commutes (17 percent). Table 4.7-4, Escondido Municipal Emissions by Category (2010), summarizes the City's emissions of CO_2e broken down by emissions category.

Table 4.7-4 Escondido Municipal Emissions by Category (2010)

Category	Metric tons of CO_2e
Electricity	8,323
Employee Commute	3,142
Vehicle Fleet	2,739
Natural Gas	2,502
Solid Waste	1,179
Wastewater [(1)]	259
Total	**18,143**

(1) The wastewater emissions category represents only the fugitive methane emissions from the wastewater treatment facility. The emissions due to electricity used at the facility are included in the electricity emissions category.

CO_2e = carbon dioxide equivalents
Source: Atkins 2011

Table 4.7-5, Escondido Community-wide GHG Emissions by Source (2010), includes the total amount of communitywide GHG emissions for the City in 2010 by emission source category. The City as a whole emitted 886,124 MT CO_2e in 2010. The largest portion of the City's 2010 emissions were from electricity and natural gas use in buildings (45 percent), followed by emissions from transportation (42 percent).

Table 4.7-5 Escondido Community-wide GHG Emissions by Source (2010)

Category	Metric tons of CO_2e
Energy	395,565
Transportation	368,628
Area Sources	52,559
Solid Waste	41,724
Water and Wastewater	25,360
Construction	2,288
Total	**886,124**

CO_2e = carbon dioxide equivalents
Source: Atkins 2011

4.7.1.4 Regional Adverse Effects of Climate Change

The San Diego Foundation's Regional Focus 2050 Working Paper and Technical Assessment explored what the San Diego region would be like in the year 2050 if current climate change trends continue. The paper projected potential adverse effects on the San Diego region related to climate, energy needs, public health, wildfires, water supply, sea level, and ecosystems. The climate model simulations exhibited warming across San Diego County, ranging from about 1.5 °F to 4.5 °F, particularly in inland areas. Temperature changes for areas along the coast would be moderated by the influence of the Pacific Ocean. The increase in peak demand for electricity for cooling could result in blackouts and power outages without adequate planning. With an aging population, extreme heat conditions in the San Diego region are also a public health concern. Other health concerns include increased ozone air pollution levels due to an increase in sunny days, which can exacerbate asthma and other respiratory and cardiovascular diseases; increased fire-related injuries and death as intense wildfires occur more frequently; and more cases of mosquito-related West Nile Virus, tropical diseases such as malaria and dengue fever, and coastal algal blooms, which can harbor toxic bacteria and other diseases. Drought years might occur as much as 50 percent more often and be considerably drier. Even with plans in place to conserve, recycle, and augment our available water, it is estimated San Diego County could face an 18 percent shortfall in water supply by 2050. Rising sea levels will also have a major impact on the San Diego region's environment and economy, particularly in coastal areas. High tide flooding will threaten low-lying coastal communities and impact military, port and airport operations. High surf events and rising sea levels will cause even greater coastal erosion. Climate change will also add to the pressures on the variety of habitats and species in the County. The locations where environmental conditions are suitable for a particular species will shift with climate change. To survive, some animals and plants will have to relocate to find new habitat or potentially face extinction.

4.7.2 Regulatory Framework

4.7.2.1 Federal

Federal Clean Air Act

The Federal Clean Air Act (CAA), as amended, establishes air quality standards for several pollutants. These standards are divided into primary standards and secondary standards. Primary standards are designed to protect public health, and secondary standards are intended to protect public welfare from effects such as visibility reduction, soiling, nuisance, and other forms of damage. In 2006, twelve U.S. states and cities, in conjunction with several environmental organizations, sued to require the EPA to regulate GHGs as a pollutant pursuant to the CAA. The Supreme Court ruled that GHGs fit within the CAA's definition of a pollutant. The court held that the EPA must determine whether or not GHG emissions have the potential to endanger public health or welfare, consistent with the language in the CAA. On April 2, 2007, the EPA declared that GHGs, including CO_2, are air pollutants covered by the CAA. This public review for this proposal terminated on June 23, 2009. Despite the Supreme Court ruling and the EPA proposal, there are no promulgated federal regulations to date limiting GHG emissions that are applicable to the project (ICF Jones & Stokes 2009).

U.S. Environmental Protection Agency

The EPA is the federal agency responsible for setting and enforcing the federal ambient air quality standards for atmospheric pollutants. The EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The EPA also has jurisdiction over emission sources outside state waters (outer continental shelf), and establishes various emissions standards for vehicles sold in states other than California.

In September 2009, the EPA issued the Final Mandatory Reporting of GHG Rule. The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHG, manufacturers of vehicles and engines, and facilities that emit 25,000 MT or more per year of GHG emissions are required to submit annual reports to EPA. The EPA estimates that the rule covers about 10,000 facilities nationwide, accounting for about 85 percent of U.S. GHG emissions.

4.7.2.2 State

Assembly Bill 1493, Clean Car Standards

AB 1493 (also known as the Pavley Bill, in reference to its author Fran Pavley) was enacted in 2002 and requires the "maximum feasible and cost effective reduction" of GHGs from automobiles and light-duty trucks. Subsequently, in 2004, CARB approved the "Pavley I" regulations limiting the amount of GHGs that may be released from new passenger automobiles beginning with model year 2009 through 2016; these regulations would reduce emissions by 30% from 2002 levels by 2016. The second set of regulations ("Pavley II") is currently in development and will cover model years 2017 through 2025 in order to reduce emissions by 45 percent by the year 2020. The automotive industry legally challenged the bill claiming that the federal gas mileage standards preempted these state regulations. In 2005,

California filed a waiver request to the EPA in order to implement the GHG standards and in March of 2008, the EPA denied the request. However, in June 2009, the decision was reversed and the EPA granted California the authority to implement the GHG reduction standards for passenger cars, pickup trucks, and sport utility vehicles.

In September 2009, CARB adopted amendments to the "Pavley I" regulations that cemented California's enforcement of the Pavley rule starting in 2009 while providing vehicle manufacturers with new compliance flexibility. The amendments also coordinated California's rules with the federal rules for passenger vehicles.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG in California. GHG as defined under AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. Under AB 32, CARB has the primary responsibility for reducing GHG emissions and continues the CCAT to coordinate statewide efforts and promote strategies that can be undertaken by many other California agencies. AB 32 requires the CARB to adopt rules and regulations that would achieve GHG emissions equivalent to state-wide levels in 1990 by 2020.
In general, AB 32 directs the CARB to do the following:

- Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit;
- Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020;
- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures;
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and non-monetary incentives that reduce GHG emissions from any sources or categories of sources that CARB finds necessary to achieve the statewide GHG emissions limit; and
- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

Regarding the first two tasks, CARB has already made available a list of discrete early action GHG emission reduction measures. CARB has also published a staff report titled *California 1990 GHG Emissions Level and 2020 Emissions Limit* that determined the statewide levels of GHG emissions in 1990 (CARB 2007). CARB identified 427 MMT CO_2e as the total statewide aggregated GHG 1990 emissions level and 2020 emissions limit. Additionally, in December 2008, the CARB adopted the Climate Change Scoping Plan, which outlines the state's strategy to achieve the 2020 GHG limit. This Scoping Plan proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. The plan emphasizes a cap-and-trade program, but also includes the discrete early actions.

California Air Resources Board

The CARB, a part of the California EPA is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

The CARB Regional Targets Advisory Committee (RTAC), which was appointed in January 2009 to help address the requirements of Senate Bill (SB) 375, was tasked with recommending a method by which each major region of the state could reduce GHG emissions through more sustainable land use and transportation planning. After approximately 13 public meetings in Sacramento, the RTAC, in its September 29, 2009 report, recommended that regional targets be expressed as a percent per-capita GHG emission reduction from a 2005 base year. This differs from the 1990 base year established in Assembly Bill (AB) 32, described below, due to a lack of reliable regional transportation and land use data from 1990 (according to the RTAC). The RTAC also recommended CARB use an interactive process with the regional Metropolitan Planning Organizations, such as the San Diego Association of Governments (SANDAG), to set a single statewide uniform target that could be adjusted up or down to respond to regional differences. SANDAG proposed a target of reducing per-capita GHG emissions to seven percent below 2005 emissions by 2020, and 13 percent below 2005 emissions by 2035. The CARB adopted the regional targets, including SANDAG's proposed targets, on September 23, 2010.

California Code of Regulations Title 24, Part 6

Although it was not originally intended to reduce GHG emissions, California Code of Regulations (CCR) Title 24 Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* 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 efficiency technologies and methods. Energy efficient buildings require less electricity. Electricity production by fossil fuels results in GHG emissions. Therefore, increased energy efficiency results in decreased GHG emissions.

The California Energy Commission adopted 2008 Standards on April 23, 2008 and the Building Standards Commission approved them for publication on September 11, 2008. The 2008 updates became effective on August 1, 2009. The Energy Commission adopted the 2008 changes to the Building Energy Efficiency Standards for a the following reasons: 1) To provide California with an adequate, reasonably priced, and environmentally sound supply of energy; 2) To respond to AB 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its GHG emissions to 1990 levels by 2020; 3) To pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs; 4) To act on the findings of California's Integrated Energy Policy Report (IEPR) that Standards are the most cost effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the Standards in reducing energy related to meeting California's water needs and in reducing GHG emissions; 5) To meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building

codes; and 6) To meet the Executive Order S-20-04 in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards.

California Code of Regulations Title 24, Part 11

Title 24, Part 11: *California 2010 Green Building Standards Code* (CalGreen) became effective January 1, 2011. The purpose of this code is to improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories:

1. Planning and design
2. Energy efficiency
3. Water efficiency and conservation
4. Material conservation and resource efficiency
5. Environmental quality

The CalGreen standards establish green building requirements for new residential and non-residential development, including mandatory reductions in indoor water use. Section 5.408.3 of CalGreen requires that non-residential projects recycle at least 50 percent of construction waste. Although the code does not require energy efficiency beyond the California Code of Regulations Title 24, Part 6 energy standards, it recommends a 15 percent increase in energy efficiency compared to these standards. Reduced generation of solid waste and use of energy, water, and building materials with implementation of the CalGreen standards would result in reduced GHG emissions.

California Natural Resources Agency

The purpose of the California Natural Resources Agency (CNRA) is to restore, protect and manage the state's natural, historical and cultural resources for current and future generations using creative approaches and solutions based on science, collaboration and respect for all the communities and interests involved. In August 2009, the CNRA released a comprehensive plan to guide adaptation to the effects of climate change, becoming the first state to develop such a strategy. The 2009 California Climate Adaptation Strategy Discussion Draft summarizes the latest science on how climate change could impact the state, and provides recommendations on how to manage against those threats in seven sector areas. Additionally, on December 30, 2009, the CNRA certified and adopted the proposed CEQA Guidelines amendments related to GHG.

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: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels. The first CCAT Report to the Governor in 2006 contained recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met. The latest CCAT Biennial Report was released in April 2010. It expands on the policy oriented 2006 assessment. This report provides new information and scientific findings. The new information and details in the CCAT Assessment Report include development of new climate and sea-level projections using new information and tools that have become available in the last two years; and evaluation of climate change within the context of broader

social changes, such as land-use changes and demographic shifts (CCAT 2010). The action items in the draft report focus on the preparation of the Climate Change Adaptation Strategy, required by Executive Order S-13-08, described below.

Senate Bill 97

SB 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed the California Office of Planning and Research (OPR) to develop draft CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions." The guideline amendments have been adopted and became effective March 18, 2010. The amendments provide regulatory guidance with respect to the analysis and mitigation of the potential effects of GHG emissions.

Senate Bill 375

SB 375 provides a land use and transportation policy to meet the goals of AB 32. SB 375 builds on the existing regional transportation planning process (which is overseen by local elected officials with land use responsibilities) to connect the reduction of GHG emissions from cars and light trucks to land use and transportation policy. SB 375 requires the CARB to establish the GHG emission reduction targets for each region (as opposed to individual cities or households) and to review the region's determination that its plan achieves those targets. SB 375 has three goals to: 1) use the regional transportation planning process to help achieve AB 32 goals; 2) use CEQA streamlining as an incentive to encourage residential projects which help achieve AB 32 goals to reduce GHG emissions; and 3) coordinate the regional housing needs allocation process with the regional transportation planning process.

4.7.2.3 Regional/Local

San Diego Association of Governments Regional Energy Strategy, Climate Action Strategy and Regional Transportation Plan

The Metropolitan Planning Organization (MPO) for the region is SANDAG. SANDAG's Regional Energy Strategy (RES 2009), Climate Action Strategy (CAS 2010), and Regional Transportation Plan (RTP) help to shape the region's approach to reducing GHG emissions. The RES establishes goals for the San Diego region to be more energy efficient, increase use of renewable energy sources, and enhance the region's energy infrastructure to meet growing energy demand. The CAS is a tool for guiding climate change policy in the region. The RES and CAS identify a range of potential policy measures for consideration as SANDAG updates long-term planning documents like the RTP. SANDAG adopted the 2050 RTP and Sustainable Communities Strategy (SCS) for the County of San Diego on October 28, 2011. At the time of this EIR, the document has been legally challenged by environmental groups. The 2050 RTP and SCS is aimed at attaining the reduction targets of a 7 percent per capita reduction in GHG emissions from passenger vehicles by the year 2020 and a 13 percent reduction by 2035. Many of the transportation-related reduction measures included in the E-CAP would coordinate with SANDAG's efforts.

4.7.3 Analysis of Project Impacts and Determination of Significance

4.7.3.1 Issue 1: Compliance with AB 32

Guidelines for Determination of Significance

Per Appendix G of the CEQA Guidelines, impacts related to GHG emissions are normally considered significant if implementation of the proposed project would result in any of the following:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHG.

To assess impacts associated with GHG emissions, the proposed General Plan Update, Downtown Specific Plan Update, and E-CAP will be compared for consistency with AB 32 reduction targets to determine significance. The AB 32 reduction target has been determined as the reduction of statewide GHG emissions to 1990 levels by 2020, or as outlined in the AB 32 Scoping Plan, the functional equivalent of 15 percent below "current" (2005) levels by 2020. The reduction target calculated in the Scoping Plan was based on an inventory of the state's 2004 emissions (then considered to be "current" levels); these emissions represent a high-point in the economy before the economic recession. By using 2005 to set the reduction target, the City's target is also based on pre-recession conditions.

Through the proposed General Plan Update, Downtown Specific Plan Update, and E-CAP, the City would have to decrease community-wide GHG emissions to a level at least 15 percent below 2005 emissions by the year 2020 to be considered to have a less than significant impact. As shown below in Table 4.7-6, 2020 Emissions Reduction Target, the E-CAP calculated this 2020 reduction target to be 786,232 MT CO_2e.

Table 4.7-6 2020 Emissions Reduction Target

Reduction Target	Metric Tons CO_2e
2005 Emissions	927,266
% Reduction	15%
2020 Reduction Target	**788,176**

CO_2e = carbon dioxide equivalents
Source: Atkins 2011

Impact Analysis

The proposed E-CAP includes inventories of GHG emissions for the years 2005, 2010, 2020, and 2035. The 2005 inventory was used to set the reduction target for the City and the year 2010 was used to set an existing baseline. The 2020 and 2035 inventories are estimates based on the projected growth under the proposed General Plan Update. Although the horizon year for the General Plan Update is 2035, AB

32 requirements indicate the year 2020 as the limit by which GHG emissions need to be reduced to 1990 levels. Therefore, in order to determine the required reduction necessary for the City to comply with AB 32, the future year of 2020 is used for this analysis. The methodology, assumptions, and data used in the E-CAP are provided in Appendix H, Greenhouse Gas Inventory Modeling, of this EIR. The methodology for preparing the inventories incorporates the protocols, methods, and emissions factors found in the California Climate Action Registry General Report Protocol (version 3.1, January 2009), the Local Government Operation Protocol (LGOP) (version 1.1, May 2010), and the Draft Community-wide GHG Emissions Protocol under development by the Association of Environmental Professionals ~~and ICLEI~~. Data for the inventories was retrieved from SDG&E, the California Integrated Waste Management Board, the traffic study completed for the General Plan Update (LLG 2011a), land use data from the City Planning Department, and water use data from the City of Escondido Water and Wastewater Rate Study Report (December 2010). The E-CAP includes details regarding the data sources and methodology used for calculating the inventories. The GHG inventories analyzed below are community-wide inventories and include all operational sources of emissions related to land uses within the City's boundaries. The municipal inventory, presented above in Table 4.7-4, Escondido Municipal Emissions by Category (2010), is a subset of the community-wide emissions inventory.

Construction Emissions

Construction of future land uses would result in GHG emissions from the use of construction equipment. These emissions would be generated from fuel used during the operation of heavy equipment and vehicles during construction.

Annual construction-related CO_2 emissions were estimated using the assumed worst-case activity data and the emission factors included in the Urban Emissions (URBEMIS) 2007 model. These assumptions are consistent with those used in the air quality analysis described in Section 4.3, Air Quality, of this EIR. Table 4.7-7, Annual Construction Assumptions for General Plan Update Development, summarizes the 2035 planning horizon assumptions for construction activities associated with the proposed General Plan Update. For the purposes of modeling a worst-case construction scenario, it was assumed that development associated with the proposed General Plan Update would take place over a 25-year period between the 2010 baseline condition and the 2035 planning horizon, with an equal amount of construction occurring each year. At 2035, a total of 9,924 new residential units and 13,650,000 square feet (sf) of new non-residential development could be accommodated within the General Plan Update planning area boundary. Additionally, existing land uses would be demolished and redeveloped. To account for construction emissions from redevelopment as well as new development, a citywide average of approximately 15 percent of existing development is assumed to be demolished and reconstructed over the same time period. Some study areas would likely experience higher redevelopment intensity, while other areas outside of the study areas would remain relatively unchanged. Using this approach, it is assumed that 316 single family dwelling units, 405 multi-family units, 279,406 sf of commercial/retail development, 246,026 sf of office development, and 197,454 sf of industrial development would be constructed every year for 25 years between 2010 and 2035. Model defaults were used to estimate emissions associated with construction equipment.

Table 4.7-8, Construction Annual CO_2 Emissions, presents a summary of estimated annual GHG emissions for each construction phase associated with estimated annual construction under the General Plan Update. It is assumed that each phase of construction would generally occur consecutively, with some overlap between the paving and coating phases.

Table 4.7-7 Annual Construction Assumptions for General Plan Update Development

Category	Assumption
Total New Development	9,924 residential units and 13,650,000 sf non-residential development
Total Redevelopment	8,105 residential units and 4,422,150 sf non-residential development
Phasing	25 years (2010-2035)
Annual New Construction per Phase	397 residential units and 546,000 sf non-residential development
Annual Redevelopment per Phase	324 residential units and 176,886 sf non-residential development
Percent of Existing Development to be Demolished	15%

Source: Atkins 2011

Table 4.7-8 Construction Annual CO_2 Emissions

Construction Phase	CO_2e (Metric Tons)
Demolition	287
Fine Grading	837
Trenching	25
Building	1,054
Paving	28
Architectural Coating	57
TOTAL	**2,288**

Emission quantities are rounded to the nearest whole number. Exact values are provided in Appendix B, Air Quality Technical Report.
CO_2e = carbon dioxide equivalents
Source: URBEMIS 2007, version 9.2.4

Proposed policies and mitigation measures identified in the proposed E-CAP would contribute to reducing construction-related emissions. Individual projects include GHG emissions from construction activities, amortized over a 30-year project lifetime, in addition to operational emissions.

Operational Emissions

Transportation

Carbon dioxide emissions from vehicles were calculated utilizing EMFAC 2007 emission factors. The Emission Factors (EMFAC) model developed by CARB was used to calculate emission rates from on-road motor vehicles from light-duty passenger vehicles to heavy-duty trucks that operate on highways, freeways, and local roads in California. Motor vehicle emissions of methane and nitrous oxide were also calculated using EPA emission factors for on-road vehicles based on the total annual mileage driven multiplied by their respective emission factors by year.

For the community-wide inventory, vehicle miles travelled (VMT) were based on the results of the traffic impact analysis (LLG 2011a) prepared to analyze the proposed General Plan Update through a select-zone analysis for the City. This model estimates VMT for all trips that begin and/or end within the City limits. This accounts for traffic entering or exiting Escondido and traffic within the City, but excludes pass-through traffic. Escondido's VMT includes miles from all trips within the City and half of the miles from trips that begin or end in the City. Escondido is held accountable for all trips within the city limits while it shares accountability with other jurisdictions for trips that have only one end point in the City.

For the municipal inventory, emissions associated with transportation include two sources: the City's fleet of vehicles and the City's employee commutes. For the vehicle fleet, the emissions were calculated based on the total fuel used in City vehicles. For the employee commutes, the survey conducted in 2010 was used to estimate emissions associated with employees driving to and from work.

The estimates do not account for electrical, biodiesel (a blend of diesel and vegetable oil), or hydrogen powered systems. Any electrically powered vehicle which draws power from a residence, commercial or industrial land use will be accounted for in the electrical usage for the City. Costs associated with transportation were based on diesel and gasoline fuel use and their associated per gallon costs in 2010.

Energy

Electricity. The City emits carbon dioxide, methane, and nitrous oxide indirectly through the use of electricity provided by SDG&E. For the municipal inventory, electricity use in government facilities and streetlights was obtained from SDG&E and organized by department. Escondido is also home to two power plants: Escondido Power Plant and Palomar Energy Center.

SDG&E generates electricity primarily from natural gas combustion. The GHG emission factor associated with electricity use is therefore based on the emissions from the natural gas used to generate the electricity. The annual usage in megawatt hours per year (MWh/year) was multiplied by the emission factors appropriate to the inventory year for carbon dioxide, methane, and nitrous oxide to determine emissions from these sources.

Natural Gas. The City emits GHGs from the combustion of natural gas. The annual natural gas usage for the City in therms was converted to million British Thermal Units (MMBTUs) and multiplied by the respective emissions factors for carbon dioxide, methane, and nitrous oxide to determine the emissions from natural gas combustion, typically used for heating. Natural gas usage for 2010 was obtained from SDG&E.

Area Sources

Landscaping. Emissions of carbon dioxide, methane, and nitrous oxide are generated by the use of landscape equipment through the combustion of gasoline. Carbon dioxide emissions were determined directly through URBEMIS 2007 for the existing inventory. From the carbon dioxide emissions, the approximate number of gallons of gasoline consumed through landscape equipment use was calculated. This number was then multiplied by emission factors presented in the *General Reporting Protocol*, version 3.1, to determine both methane and nitrous oxide emissions.

Woodburning. Direct carbon dioxide emissions are produced from the burning of wood in wood stoves and fireplaces (the emissions from natural gas fired stoves are included in the Energy source category). Carbon dioxide, methane, and nitrous oxide emissions from wood stoves and fireplaces are calculated based on the percentage of residential units using each type of hearth and the estimated annual amount of wood burned. The emission coefficients used are taken from the EPA's AP-42 document.

Water

Potable Water. Electricity is needed to move and treat water. City residents and businesses currently use approximately 8.2 billion gallons of drinking water annually. The City's water comes from both local sources and purchased water. About 12 percent of the water is locally sourced while the remainder is purchased from San Diego County Water Authority (SDCWA). The SDCWA water is sourced from a

mixture of water from the Colorado River Aqueduct and the State Water Project. There are additional emissions associated with this purchased water from the Colorado River and the State Water Project due to the electricity used to transport the water over a long distance. This category of emissions also includes the agricultural water used in the City. Agricultural operations in the City primarily consist of citrus and avocado orchards. Maintenance of orchards does not typically involve intensive agricultural equipment that would emit substantial GHGs; therefore, the indirect GHG emissions associated with the water use are the only GHG emissions included in these inventories.

Wastewater Treatment. Escondido's Hale Avenue Resource Recovery Facility (HARRF) treats and disposes of the City's wastewater. GHG emissions arise from the electricity used to pump and treat the water and the direct methane emissions from the anaerobic digesters used in the treatment process. The electricity emissions are included in the Energy category described above. The direct emissions are calculated based on the amount of methane gas produced by the anaerobic digester and the fraction of methane.

Solid Waste

Emissions from solid waste are determined as the sum of emissions generated by transportation from its source to the landfill and fugitive emissions from decomposition in landfills.

Emissions from the transportation of solid waste is determined based on the annual pounds per year of total waste disposed in landfills including biosolids waste from wastewater treatment plants, the density of the waste, the capacity of the hauling trucks, the average number of miles traveled by each truck; and the carbon dioxide, methane, and nitrous oxide emissions generated per mile traveled.

Fugitive emissions of methane from the decomposition of solid waste are calculated based on the annual waste generation multiplied by the EPA emission factor for waste production for methane. The emission factor to determine methane generation varies if the landfill operations are known to operate a methane flare or to generate electricity from methane capture. Carbon dioxide generated by decomposition of waste in landfills is not considered anthropogenic because it would be produced through the natural decomposition process regardless of its disposition in the landfill. Nitrous oxide is not a by-product of decomposition and therefore no fugitive emissions of nitrous oxide are anticipated from this source.

Future 2020 and 2035 Emissions

Future emissions are estimated based on the projected growth that would be accommodated by the proposed General Plan Update from 2010 to 2035. The 2020 emissions were based on the interpolated growth rates for the year 2020. For 2020, these projections include a 2.2 percent increase in single family housing, a 16.5 percent increase in multi-family housing, a 20.1 percent increase in commercial development, and a 9.3 percent increase in industrial development. These growth rates were applied, respectively, to single family residential, multi-family residential, commercial, and industrial 2010 community-wide emissions in order to estimate 2020 emissions for the proposed General Plan Update. Table 4.7-9, 2020 GHG Emissions by Source, summarizes the 2020 City emissions of CO_2e broken down by emissions category.

Table 4.7-9 2020 GHG Emissions by Source

Category	Metric tons of CO_2e	Percent
Energy	441,025	44%
Transportation	419,741	42%
Area Sources	54,977	6%
Solid Waste	47,273	5%
Water and Wastewater	27,286	3%
Construction	2,288	0.3%
Total	**992,583**	**100%**
2020 Reduction Target	788,176	-
Amount to Reduce	**204,406**	**21%**

CO_2e = carbon dioxide equivalents
Source: Atkins 2011

The 2035 projections include a 5.7 percent increase in single family housing, a 46.5 percent increase in multi-family housing, a 61.0 percent increase in commercial development, and a 24.8 percent increase in industrial development; these growth rates were applied, respectively, to single family residential, multi-family residential, commercial, and industrial emissions from 2010 in order to estimate 2035 emissions. Table 4.7-10, 2035 GHG Emissions by Source, summarizes the net 2035 City emissions of CO_2e as broken down by emissions category.

Table 4.7-10 2035 GHG Emissions by Source

Category	Metric tons of CO_2e	Percent
Transportation	557,216	45%
Energy	523,427	43%
Area Sources	59,151	5%
Solid Waste	30,980	5%
Water and Wastewater	57,518	3%
Construction	2,288	0.2%
Total	**1,228,292**	**100%**

CO_2e = carbon dioxide equivalents
Source: Atkins 2011

Existing Municipal Programs

Employee Work Schedules

Approximately 650 City employees work modified hours in a staggered four-day work week. This collectively eliminates approximately 2.5 million vehicle miles annually traveled, decreasing employees' transit-related emissions, reducing highway congestion during peak hours and saving approximately 113,000 gallons of gasoline. The employee commute survey conducted for the municipal inventory accounts for the emissions saved from this program.

The four-day work week implemented at City Hall allows for the facility to be closed on Fridays, lowering the facility's energy requirements and effectively saving the City approximately $50,000 in annual heating and cooling costs.

City Facilities

The City Hall Central Energy Plant that was originally installed in 1988 was upgraded with a state-of-the-art energy efficient system in 2007 that now saves the City $179,000 in annual operating costs. Because the 2010 inventory represents emissions after this upgrade, the emission savings are included in the 2010 municipal inventory.

City Hall was re-roofed in 2007 with a heat reflective material further saving cooling costs. The California Consumer Energy Center has information about cool roof technology.

The City pursued LEED certification for the new Police and Fire Facility located on North Centre City Parkway.

At HARRF, the City installed California's first "green technology" that converts raw sewage gas into renewable natural gas, clean enough for use in homes and businesses.

Electric air compressors formerly used at Lake Dixon and Lake Wohlford to circulate and stabilize water temperatures have been replaced by solar powered facilities providing energy savings and improving water quality and fish habitat.

Water Conservation

The City, as a water provider and in partnership with other local water districts serving the community, provides free home water surveys to single family customers as well as incentives for businesses and multi-family customers looking to reduce outdoor water use.

The City offers incentives through a regional program to reduce water used in landscaping and to eliminate irrigation runoff. It also offers education and public outreach in the form of presentations to elementary school students about water conservation.

City Ordinance 96-14 requires that residential and non-residential remodel improvements valued at least $23,828 retrofit all existing toilets, showerheads and faucets with low-flow (2.2 gallons per minute) faucets/showerheads and low-flush (1.6 gallons per flush) toilets. Escondido is an active participant in the SDCWA's "20-Gallon Challenge" program that strives for reducing each person's water usage 20 gallons per day.

Public Transportation

Escondido is the home of two North County Transit District (NCTD) ~~Sprinter~~SPRINTER stops as well as the NCTD's storage and maintenance facility.

The Escondido Downtown Business Association has partnered with Palomar Pomerado Hospital to provide free shuttle service between the downtown area and the Escondido Transit Center during weekday commuting hours, making public transportation for downtown employees more viable.

SANDAG, in cooperation with NCTD, the City, and the County of San Diego, implemented the Escondido Rapid Bus Project that began operating in 2009 to enhance transit service between the Downtown Escondido Transit Center and Westfield Shoppingtown.

Community-wide Programs

Local Business Programs

Palomar Medical Center West. Palomar Medical Center West, located in the ERTC North SPA, and has installed a green roof totaling more than one acre in area on one of its structures. A green roof is a roof that is partially or completely covered in vegetation, which helps to absorb rainwater and provide insulation to the interior of the building. Apart from being pleasant to look at, green roofs reduce the heat island effect, lowering the need for air conditioning, and retain storm water, reducing the amount of runoff that enters the sewer system.

Stone Brewery. The Stone Brewery, located in the ERTC North SPA, incorporates many features that use green technology. Surrounded by drought-tolerant landscaping, topped with a 312-kW solar array which provides roughly 40 percent of Stone's energy needs, and serviced by a fleet of biodiesel trucks, the rapidly expanding brewery has made environmentalism part of their business plan. Stone Brewery's World Bistro & Gardens is a "slow-food" restaurant, offering a menu of seasonal, organic, and locally grown sundries. In 2009, Stone Brewery earned the County of San Diego's Pam Slater-Price Sustainability Award.

Westfield Shoppingtown. Westfield Shoppingtown, located in the Westfield Shoppingtown Target Area, sports a light-colored "cool roof" designed to curb the urban heat island effect and reduce the need for air conditioning. A cool roof is a roof painted in a light color or made of a reflective material that reflects the sun's rays and keeps the interior of the building cooler.

San Diego Regional Climate Protection Initiative

The City completed a 2005 inventory of its municipal and community-wide emissions through the San Diego Foundation's Regional Climate Protection Initiative. The initiative was launched in 2006 with the mission to raise awareness about the local implications of climate change and catalyze more comprehensive regional action to combat global warming. In coordination with ICLEI – Local Governments for Sustainability, all of the cities in San Diego County and the County of San Diego have completed baseline GHG emission inventories. The City's baseline inventory completed by ICLEI is for the year 2005 and follows a different methodology for estimating community-wide emissions; therefore, it was revised in the E-CAP report.

SANDAG Energy Roadmap Program

The Energy Roadmap Program is coordinated by SANDAG to offer energy-planning assistance to local governments in the San Diego region through an energy-efficiency partnership with SDG&E. The Energy Roadmap Program assists local governments in meeting state and regional sustainability goals. It implements the SANDAG Regional Energy Strategy (2009) and Climate Action Strategy (2010), as well as the California Public Utilities Commission Long-term Energy Efficiency Strategic Plan. The program provides energy management plans, or "energy roadmaps," to local jurisdictions. The roadmaps offer a detailed, comprehensive framework for saving energy at the government facilities and in the communities as a whole. Escondido began its Energy Roadmap with SANDAG in April 2011. As of February 2012, baseline electricity and natural gas use for 29 municipal sites was established through this program. The 29 preliminary energy assessments indicated that almost all Escondido municipal sites were performing significantly more efficient than comparable facilities in California and the nation. Either in response to a specific issue discovered through the site assessment process, or as instructed by city staff, eight sites and two technologies citywide were identified to be further evaluated in the form

of comprehensive energy audits. The energy assessments were performed at no cost to the City. Escondido is finalizing its Energy Roadmap with SANDAG, which is scheduled for completion in March 2012. ~~Currently, Escondido is in Phase 2 of the Energy Roadmap Program; energy assessments of the City's facilities have been completed, and SANDAG is currently finalizing Energy Conservation Measures (ECMs) for the City.~~ The government operations component of the roadmap ~~will~~ includes the following elements:

- Saving Energy in City Buildings and Facilities
- Demonstrating Emerging Energy Technologies
- Greening the City Vehicle Fleet
- Developing Employee Knowledge of Energy Efficiency
- Promoting Commuter Benefits to City Employees
- ~~Energy efficiency assessments of the buildings, facilities, and sites operated by the City;~~
- ~~Identification of clean transportation options for the City fleet and employee commutes;~~
- ~~Staff education and training;~~
- ~~Available partnerships and funding; and~~
- ~~Emerging technology demonstrations.~~

The communitywide component of the Roadmap will provide the following elements:

- Leveraging Planning and Development Authority, including smart growth development policies, energy efficient building upgrades, and clean and efficient transportation options
- Marketing Energy Programs to Local Residents, Schools, and Businesses
- Supporting Green Jobs and Workforce Training opportunities
- ~~Identification of policy measures and ordinances;~~
- ~~Public engagement and education materials;~~
- ~~Workforce education and training opportunities; and~~
- ~~Overview of smart meters and smart grid technology.~~

Federal, State and Local Regulations and Existing Regulatory Processes

The State of California has set specific targets for reducing GHG emissions from the burning of fossil fuels in both power plants and vehicles by adopting various regulations. In addition, state energy efficiency and renewable requirements provide another level of reductions. In order to provide credit to the City for regulatory actions already taken or planned by the state, the E-CAP first evaluates the GHG reductions that will occur within the City as a result of these actions. These are identified in the E-CAP as R1 reduction measures. The R1 measures are included to show all of the anticipated reduction strategies identified in the AB 32 Scoping Plan for implementation at the state level that will ultimately result in a reduction of GHG emissions at the local level. The R1 measures are not administered or enforced by the City, but the City substantiates the reductions associated with these state measures.

Proposed General Plan Update Goals and Policies and E-CAP Measures

The Escondido General Plan discusses the City's vision and the realization of this vision through the following Element: Community Health and Services, Community Protection, Economic Prosperity, Growth Management, Land Use and Community Form, Mobility and Infrastructure, and Resource Conservation. The General Plan also includes implementation tools that are presented as separate policies and documents.

The E-CAP is another implementation tool of the General Plan that can be used to guide development in the City by focusing on attaining the various goals and policies of the General Plan as well as the GHG reduction goals. For future development, each project subject to CEQA would follow one of three scenarios for their GHG analysis:

- If the project is below the set screening threshold for GHGs, then the project's GHG emissions are determined less than significant and no further GHG analysis would be required. This threshold is still in development and will be included in the implementation section of the E-CAP.
- If the project is above the set screening threshold, then the project would be able to tier from the GHG analysis associated with the E-CAP by accumulating 100 points from the E-CAP Screening Tables for New Development document.
- If the project is above the GHG screening threshold and the project has unusual characteristics that make the Screening Tables analysis inappropriate for the project, then the project would need to complete a separate, independent GHG analysis.

Table 4.7-11, GHG-Related General Plan Update Policies and E-CAP Measures, summarizes the policies of the proposed General Plan Update that are related to reducing GHG emissions and the reduction measures in the E-CAP that have been developed in coordination with these General Plan Update policies.

Many of the R2 measures of the E-CAP would be implemented through the Screening Tables for New Development that accompanies the E-CAP document. Through a menu of reduction options, the Screening Tables allow flexibility in how new development implements the R2 measures. The Screening Tables serve as the main implementation document for the E-CAP. The tables allow new development projects to tier from and demonstrate consistency with the reduction target established in the E-CAP, thus streamlining the CEQA analysis of project-level GHG emissions as described in the CEQA Guidelines Section 15183.5. The Screening Tables would be provided to the developer, who would then choose from a list of GHG emissions-reducing design features that are each assigned a point value. The point values are allocated based on the effectiveness of the strategy in reducing GHG emissions. In order to demonstrate consistency with the E-CAP, a project that earns 100 points from the Screening Table would implement the project's fair share portion of GHG emission reductions within the E-CAP.

Proposed Downtown Specific Plan Update Goals and Policies

The proposed Downtown Specific Plan Update does not contain goals and policies that pertain to compliance with AB 32.

Summary

Table 4.7-12, 2020 Emissions Summary, below summarizes the community-wide GHG emissions in the City for the years 2010 and 2020. By the year 2020, GHG emissions are projected to increase to 990,295 MT CO_2e (from 883,836 MT CO_2e in 2010) without incorporation of any GHG-reducing policies or mitigation measures. This amount represents an increase of 12 percent over 2010 levels. With the incorporation of the GHG-reducing General Plan Update policies and E-CAP measures, the City's GHG emissions would be reduced by 21 percent from the 2020 emissions inventory to a level of 786,068 MT CO_2e.

Table 4.7-11 GHG-Related General Plan Update Policies and E-CAP Measures

General Plan Update Topic	General Plan Update Policies	E-CAP Reduction Measures
Energy		
Energy Efficiency Community Health and Services Land Use/ Community Form Mobility Resource Conservation	 2.26, 5.10 1.8 14.6-14.8, 14.10 6.3	R2-E1: New Residential Energy Efficiency Requirements R2-E2: New Commercial Energy Efficiency Requirements R2-E5: Existing Residential Energy Retrofits R2-E6: Existing Commercial Energy Retrofits
Energy Conservation Mobility	 14.3, 14.4	R2-A2: Reduce Heat Island Impacts R3-A1: Expand City Tree Planting
Renewable Energy Mobility Resource Conservation	 14.5, 14.10 6.2	R2-E3: New Residential Renewable Energy Requirements R2-E4: New Commercial Renewable Energy Requirements
Transportation		
Improved Pedestrian and Bicycle Access Community Health and Services Land Use/Community Form Mobility Resource Conservation	 1.11, 2.5-2.7, 2.11, 3.5, 5.4 1.4, 1.9, 3.4, 4.3, 7.1, 7.4, 9.3 1.1, 2.1, 2.4, 3.1-3.12, 4.1-4.8, 14.2 2.2-2.4, 6.2	R2-T2: Bicycle Master Plan
Improved Transit Access Community Health and Services Land Use/ Community Form Mobility	 3.5, 5.4, 1.9 1.4, 1.5, 3.4, 7.3, 7.4 1.1, 2.1, 2.2, 2.4, 2.8, 5.1-5.10, 6.1-6.3	R2-T3: Transit Improvements
Smart Growth Community Health and Services Land Use/Community Form Mobility	 2.11 1.1, 1.4, 1.5, 1.8, 1.9, 3.4, 3.9, 4.6, 7.2-7.4 1.1, 2.3, 2.8, 14.2	R2-T1: Land Use Based Trips and VMT Reduction Policies R3-T1: Regional Land Use and Transportation Coordination
Other Transportation Reductions Mobility Resource Conservation	 7.9, 8.2 6.3, 6.5-6.10	R2-T4: Transportation Demand Management
Water		
Water Conservation Community Health and Services Mobility Resource Conservation	 2.26, 5.10 10.11, 10.12, 10.14, 11.10 2.9, 4.4, 5.3, 6.2	R2-W2: Water Conservation Strategies
Energy Efficiency in Water Mobility	 10.9, 11.11	R2-W1: Energy Efficient Water Treatment Plan

Table 4.7-11 continued

General Plan Update Element	General Plan Update Policies	E-CAP Reduction Measures
Recycled Water		
Mobility	10.13	R2-W3: Increased Recycled Water Use
Area Source		
Resource Conservation	2.9	R2-A1: Electric Landscaping Equipment
Solid Waste		
Mobility	13.2-13.5, 13.7, 13.8	R2-S1: Waste Disposal Programs
Construction		
Resource Conservation	6.3, 6.8	R2-C1: Construction Emissions Reductions
Regional		
Resource Conservation	6.1, 6.11	R3-E1: Regional Energy Planning Coordination R3-T1: Regional Land Use and Transportation Coordination

Table 4.7-12 2020 Emissions Summary

	Metric tons of CO_2e			
Source Category	2010	2020	Reduced 2020	% Reduced
Transportation	368,628	419,741	357,662	26%
Energy	395,565	441,025	310,662	19%
Area Sources	52,559	54,977	54,451	1%
Water and Wastewater	25,360	27,278	41,061	19%
Solid Waste	41,724	47,273	21,979	13%
Construction	2,288	2,288	2,059	10%
Total	**886,118**	**992,583**	**788,127**	**21%**
Emission 2020 Reduction Target		**788,176**	**788,176**	
Below 2020 Reduction Target?		**No**	**Yes**	

CO_2e = carbon dioxide equivalents
Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.
Source: Atkins 2011

The emissions summarized above analyze implementation of the proposed General Plan Update and the E-CAP up to the year 2020; however, the horizon year for the General Plan Update is 2035. The E-CAP describes the continued implementation of the reduction measures beyond 2020 and the anticipated associated reductions in 2035, which is the General Plan Update horizon year. These emissions are summarized below in Table 4.7-13, 2035 Emissions Summary. The E-CAP demonstrates that beyond 2020, with the implementation of the proposed General Plan Update policies and E-CAP reduction measures, the City's community-wide emissions will continue to decrease.

Table 4.7-13 2035 Emissions Summary

	Metric tons of CO_2e			
Source Category	2010	2035	Reduced 2035	% Reduced
Transportation	368,628	557,216	271,436	51%
Energy	395,565	523,427	357,294	32%
Area Sources	52,559	59,427	57,733	2%
Water and Wastewater	25,360	30,980	23,779	23%
Solid Waste	41,724	57,518	41,061	29%
Construction	2,288	2,288	2,059	10%
Total	**886,118**	**1,230,182**	**753,363**	**39%**
Emission 2020 Reduction Target		**788,176**	**788,176**	
Below 2020 Reduction Target?		**No**	**Yes**	

CO_2e = carbon dioxide equivalents
Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.
Source: Atkins 2011

The purpose of the E-CAP reduction measures is to reduce the City's GHG emissions to a level that is in compliance with AB 32's reduction target for 2020. The E-CAP demonstrates that with the incorporation of the GHG-reducing policies of the proposed General Plan Update and the E-CAP reduction measures, the City would reduce emissions to a level that is below the 2020 reduction target. Therefore, the impact associated with GHG emissions from the proposed project would be less than significant and no additional mitigation is required.

4.7.3.2 Issue 2: Potential Effects of Global Climate Change on the Proposed Project

Guidelines for Determination of Significance

Currently, no thresholds or guidelines exist for the determination of significance of the effects of global climate change on a project. Therefore, in the absence of published thresholds, global climate change would be considered to have a significant effect if it would subject development associated with the proposed project to substantial climate-related risks to public health or safety.

Impact Analysis

The San Diego Foundation's Regional *Focus 2050 Working Paper and Technical Assessment* explored what the San Diego region would be like in the year 2050 if current climate change trends continue. The range of impacts presented in the *Focus 2050 Working Paper and Technical Assessment* are based on projections of climate change on the San Diego region using three climate models and two emissions scenarios drawn from those used by the IPCC. A summary of the potential adverse effects of climate change on the San Diego region applicable to the City, as projected in the technical assessment, is provided below.

Potential Adverse Effects of Climate Change

Climate

From observations and model historical simulations, it appears that temperatures began to warm more substantially in the 1970s. Some scientists attribute the change to the response to the effects of GHG accumulation, which began to increase substantially during this time. All of the climate model simulations exhibit warming across the San Diego region, ranging from about 1.5 °F to 4.5 °F, with some differences in the timing and geographic distribution of the changes. The models predict greater warming in the summer than in winter, with surface air temperatures warming from 0.7 °F to more than 2 °F over that found in winter. Temperature changes for areas along the coast would be moderated by the influence of the Pacific Ocean, but interior areas, where the greatest population growth would occur, would experience the greatest temperature increase.

The months when the San Diego region experiences the most extreme warm temperatures, currently mostly in July and August, will likely begin in June and extend until September. It is estimated that the inland portion of San Diego County may have more than a threefold increase in hot days in 2050. Experts generally conclude that rainfall will continue to vary widely from year to year, leaving San Diego County highly vulnerable to drought.

Sea Level

If climate change trends continue, rising sea levels will have a major impact on the San Diego region's environment and economy, particularly in coastal areas. Because of its inland location, sea level rise will not have an impact on the project planning area.

Water Supply

The SDCWA predicts an increase in water demand for San Diego County of around 24 percent, from 668,000 acre-feet (AF)/year (the 2001-2005 average) to about 830,000 AF /year in 2030. About 70 percent of this demand is expected to come from imported sources. By 2050, the expected demand will increase to 915,000 AF/year, which is an increase of 37 percent over the 2001-2005 period. By 2050, about 80 percent of the water supply is expected to be imported.

Drought years may become more frequent and intense. San Diego's water supply plans are likely to be severely challenged by climate change. Even with plans in place to conserve, recycle, and augment available water, it is estimated San Diego County could face an 18 percent shortfall in water supply by 2050 (San Diego Foundation 2008). Section 4.17, Utilities and Service Systems, of this EIR contains additional information on water supply in the project planning area.

Wildfires

Fire occurrence has steadily increased in Southern California, in direct proportion to human population growth as most ignitions are caused by human activities. Most fires start during the summer, when coastal sage and chaparral vegetation have dried to a highly flammable state. Fires that start during the fall, however, burn many more acres because flames are intensified and spread by hot, dry Santa Ana winds. It is not entirely clear from climate change models how Santa Ana conditions will affect San Diego regional fire regimes in the future. More frequent fires would threaten native plant species by not allowing sufficient recovery time before they burn again.

As a result of climate change, we can expect higher spring temperatures, warmer summers, drier vegetation, and longer fire seasons. Section 4.8, Hazards and Hazardous Materials, of this EIR contains additional information on the impact of wildfires in the project planning area.

Ecosystems

The City supports a variety of biological habitats, such as chaparral, coastal sage scrub, oak woodlands, grasslands, wetland habitats, eucalyptus woodlands, freshwater marsh. This biodiversity is already under stress from human population growth and land use changes that have broken up and reduced species habitat. The impacts of climate change will add to the pressures on habitats and the species that live in the City. As a result, the locations where the temperature, moisture, and other environmental conditions are suitable for a particular species will shift. Plant and animal species are generally able to adapt to shifting habitats, but under existing trends, climate change would occur so rapidly that ecological conditions may shift faster than species are able to follow. Section 4.4, Biological Resources, of this EIR contains additional information on the biodiversity, habitats and species in the project planning area.

Public Health

Climate change impacts can cause increased heat, air pollution, and wildfires, which impact public health primarily through air quality. Californians experience the worst air quality in the nation, and the San Diego air basin is currently out of compliance with the state and federal ozone standards. By 2050, more hot sunny days will increase ozone air pollution levels, which can exacerbate asthma and other respiratory and cardiovascular diseases. Wildfires can also be a significant contributor to air pollution. Wildfire smoke contains numerous toxic and hazardous pollutants that are dangerous to breathe and can worsen lung disease and other respiratory conditions.

Energy Needs

If current climate change trends continue, warmer temperatures and a growing population will translate into big challenges for the San Diego region's energy supply by 2050. The main impact will be higher demand for electricity as a result of the greater need for summer cooling, especially in inland areas where temperature increases will be highest. Hotter summers and more frequent, longer and intense heat waves will increase peak demand for electricity, which could result in blackouts and power outages without adequate planning. Section 4.17, Utilities and Service Systems, contains additional information on the energy supply the project planning area.

Federal, State and Local Regulations and Existing Regulatory Processes

Compliance with CEQA would require all future discretionary development projects, depending on the type and size, to assess and mitigate the potential adverse effects associated with climate change. Additionally, multiple federal, state and local regulations exist to reduce GHG emissions in the City, and such reductions would also reduce the adverse effects associated with climate change. The proposed General Plan Update would be required to comply with AB 32, which is the California regulation that mandates GHG emissions to be reduced to 1990 levels by 2020. The proposed General Plan Update and E-CAP would implement policies and reduction measures in order to comply with CARB rules and regulations that would achieve the GHG reductions stated in AB 32. Future development consistent with land uses proposed under the General Plan Update would be required to comply with Title 24 energy efficiency standards, which would help reduce GHG emissions. Required compliance with air quality standards, such as those of the Air Pollution Control District (APCD), CARB, and CAA, would reduce

criteria pollutants and GHG emissions throughout the City. In addition, multiple City policies, such as those presented above in 4.7.3.1, Issue 1: Compliance with AB 32, exist to assist in the reduction of GHG emissions and adverse effects associated with climate change.

Proposed General Plan Update Goals and Policies and E-CAP Measures

There are multiple goals and policies within the proposed General Plan Update and E-CAP that would reduce GHG emissions and the adverse effects of climate change. In particular, the policies and measures designed to conserve water and reduce energy would reduce GHG emissions in addition to adapting to the effects of climate change in the City. Table 4.7-11, GHG-Related General Plan Update Policies and E-CAP Measures, above provides a list of the General Plan Update policies and E-CAP measures that work to reduce GHG emissions, conserve water, and decrease energy use in the City.

Proposed Downtown Specific Plan Update Goals and Policies

The proposed Downtown Specific Plan Update does not contain goals and policies that pertain to the effects of climate change on the proposed project.

Summary

Climate change impacts that would be most relevant to the proposed project are the effects on water supply, wildfires, energy needs, and impacts to public health. The climate change scenarios described above estimate impacts to the year 2050, which is further in the future than the scope of the proposed project, which plans for development to the year 2035. Also, the climate system is inherently complex and predictions of effects are likely to be refined as information becomes more readily available. The policies and measures included in the General Plan, E-CAP, and the various other environmental analysis sections of this EIR work to conserve resources affected by climate changes such as wildfires, ecosystems, public safety, water supply, public health, and energy. With the implementation of the policies and measures designed to reduce GHG emissions and impacts of climate change, impacts to the proposed project as a result of climate change would be less than significant.

4.7.4 Cumulative Impacts

Issue 1: Compliance with AB 32

Climate change is a global phenomenon which is cumulative by nature, as it is the result of combined worldwide contributions of GHG to the atmosphere over many years. Therefore, the discussion of the proposed project's compliance with AB 32 provided above in Section 4.7.3.1, Issue 1: Compliance with AB 32, also serves as the proposed project's cumulative impact analysis.

Issue 2: Effects of Global Climate Change on the Proposed Project

Climate change is a global phenomenon which is cumulative by nature, as it is the result of combined worldwide contributions of GHG to the atmosphere over many years. Therefore, impacts associated with the effects of global climate change on the proposed General Plan Update and E-CAP discussed above in Section 4.7.3.2, Issue 2: Potential Effects of Global Climate Change on the Proposed Project, also serve as the proposed project's cumulative impact analysis.

4.7.5 Significance of Impact Prior to Mitigation

The GHG-reducing General Plan Update policies and reduction measures of the E-CAP would reduce GHG emissions in the City such that prior to mitigation impacts associated with the proposed project's compliance with AB 32 would be less than significant. Additionally, future development consistent with the policies of the General Plan Update and the reduction measures of the E-CAP would work to reduce the effects of global climate change. Therefore, prior to mitigation, the impacts that may affect the proposed project would be less than significant. Climate change is a global phenomenon which is cumulative by nature, therefore cumulative impacts associated with compliance with AB 32 and effects of global climate change on the proposed project would also be less than significant.

4.7.6 Mitigation

Issue 1: Compliance with AB 32

The proposed General Plan Update policies, E-CAP reduction measures and required regulations would reduce direct and cumulative impacts associated with compliance with AB-32 to a level below significant. No mitigation is required.

Issue 2: Effects of Global Climate Change on the Proposed Project

The proposed General Plan Update policies, E-CAP reduction measures and required regulations would reduce direct and cumulative impacts related to the effects of climate change on the proposed project to a level below significant. No mitigation is required.

4.7.7 Conclusion

The discussion below provides a synopsis of the conclusion reached in each of the above impact analyses.

Issue 1: Compliance with AB 32

By the year 2020, the City's GHG emissions are projected to increase to 990,295 MT CO_2e (from 883,836 MT CO_2e in 2010) without incorporation of any GHG-reducing policies or mitigation measures. This amount represents an increase of 12 percent over 2010 levels. With the incorporation of the GHG-reducing policies of the proposed General Plan Update and reduction measures of the E-CAP, Escondido's GHG emissions would reduce to 786,068 MT CO_2e, which is below the 2020 reduction target of 786,232 MT CO_2e. Therefore, the proposed project would result in a less than significant impact related to compliance with AB 32. Because climate change is cumulative by nature, cumulative impacts associated with the proposed project's compliance with AB 32 would also be less than significant.

Issue 2: Effects of Global Climate Change on the Proposed Project

Climate change impacts that would be most relevant to the proposed project include effects on water supply, wildfires, energy needs, and impacts to public health. The proposed General Plan Update policies and E-CAP measures discussed above in Table 4.7-11, GHG-Related General Plan Update Policies and E-CAP Measures, in addition to compliance with applicable regulations such as the CARB standards, Title 24 standards, Executive Order S-3-05, AB 32, Executive Order S-01-07, SB 97, SB 1368, SB 1078, APCD standards and existing City programs and policies, would reduce the potential direct and cumulative impacts of global climate change . Because the City would be implementing strategies to reduce GHG emissions, conserve water, reduce wildfires, preserve ecosystems, and reduce energy use, impacts would be less than significant, and the project's cumulative contribution would also be less than significant.