

# City of Santa Clarita Climate Action Plan

Final Report

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## EXECUTIVE SUMMARY

The State of California requires all cities that create a new general plan or update their general plan document to consider its impacts on greenhouse gas (GHG) emissions. In order to do so, cities must complete a Climate Action Plan (CAP). The CAP must achieve the emission reduction goals outlined by the Global Warming Solutions Act of 2006 (AB 32). AB 32 requires that statewide GHG emissions must be reduced to 1990 levels by 2020. The revised AB 32 Scoping Plan adopted on August 24, 2011 by the California Air Resources Board indicates that California needs to reduce GHG emissions by approximately 16 percent below Business-as-Usual GHG emissions for year 2020 to achieve the 1990 levels. Measures identified in Santa Clarita's Climate Action plan will not only meet but exceed the State's AB 32 GHG emission reduction mandate.

In January 2011, the City of Santa Clarita began the process of developing a CAP. The purpose of the CAP is to measure the amount of greenhouse gas emissions generated within the City and to develop strategies to reduce the emissions in the future. The CAP includes a set of strategies the City can use to reduce the amount of greenhouse gas emissions produced in the community. In June 2011, the City Council adopted a new General Plan (formerly referred to as One Valley One Vision) which is intended to guide growth and development within all portions of the Santa Clarita Valley. The CAP is part of the General Plan process and as such will serve as a component of the general plan document for the City to address Greenhouse Gas (GHG) Emissions. Using the goals, objectives and policies of the General Plan as a starting point, the CAP identifies those mitigation measures that can be quantified and translated into significant reductions in the GHG emissions by the year 2020. The development of a CAP begins with a premise that establishing a complete GHG emissions inventory within the city's boundary is the critical foundation for the remainder of the project. The 2005 baseline year GHG emissions inventory has captured emissions from various sources. The total emissions of GHG in 2005 were estimated to be 1,717,648 MTCO<sub>2</sub>e.<sup>1</sup> The emissions are presented separately for community-wide sources and municipal sources. Of this total, the emissions from on-road vehicles were the main source of GHG emissions for the City in 2005 (60%) followed by residential energy use (18%) and commercial/industrial energy use (13%). The municipal source emissions make up approximately 2% of the total emissions. This emissions profile is typical for a City with the characteristics of Santa Clarita.

A large portion of the GHG reductions would be achieved by the decrease in vehicle miles traveled in the City via changes in land use patterns and a greater emphasis of transit and alternative transportation programs. Other significant reductions are due to the creation or acquisition of new vegetated space in line with the goals of the City's Open Space Preservation District and water use measures. Applying estimated reductions from CAP measures shows that the resulting 2020 net emissions are expected to be approximately 4% below the 2005 baseline level. The reduction represents a level that is 17% below the 2020 business-as-usual (BAU) emissions level and is consistent with the overall Statewide Goals of AB 32. Figure ES-1 shows a comparison of BAU Projections with the CAP Target.

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<sup>1</sup> 1 MTCO<sub>2</sub>e represents Metric Tonnes of Carbon Dioxide equivalent emissions.

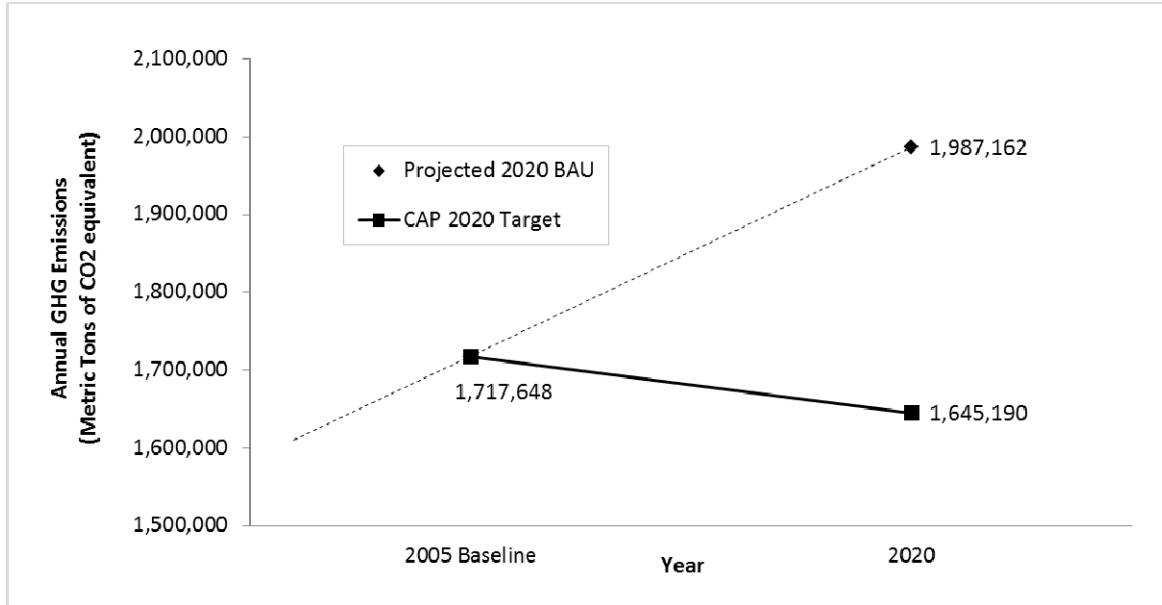


Figure ES-1. Comparison of Business-as-Usual Projections with the CAP Target.

The Climate Action Plan not only identifies a reduction target or commitments, but it also sets forth the complement of goals, policies, measures, and ordinances that will achieve the target. These policies and other strategies include measures in transportation, land use, energy conservation, water conservation, and vegetation.

## 1.0 INTRODUCTION

### 1.1 Background

The State of California requires all cities that create a new general plan document to consider its impacts on greenhouse gas (GHG) emissions. In order to address this requirement, many cities are preparing a Climate Action Plan (CAP) that adheres to the guidelines under Senate Bill 97 (CEQA Guidelines).<sup>2</sup> The CAP must achieve emission reduction goals consistent with those outlined by the Global Warming Solutions Act of 2006 (AB 32).<sup>3</sup> On a statewide basis, AB 32 requires that greenhouse gas emissions be reduced to 1990 levels by the year 2020.

In January 2011, the City of Santa Clarita began the process of developing a CAP. The purpose of the CAP is to measure the amount of greenhouse gas emissions generated within the City and to develop strategies to reduce the emissions in the future. The plan includes a set of strategies the City can use to reduce the amount of greenhouse gas emissions produced in the community. The CAP includes the following components:

- Emissions Inventory – This component includes an inventory of greenhouse gas (GHG) emissions for the entire community from all sources. Emissions of GHG generated within the City of Santa Clarita are primarily from vehicles and energy use.
- Emission Forecasts – This component assesses future year activities within the City to create future year forecasts of GHG emissions for the Business-as-usual case without any further GHG emissions reductions.
- Public Outreach – This component includes engaging community stakeholders and the public to gather feedback on the types of strategies the City can employ to reduce GHG emissions in the future.
- Mitigation Plan – This component creates the overall plan for mitigating the GHG emissions based on information from the inventory, the public outreach component and the goals, objectives and policies of the General Plan developed by the City. The goal is to reduce GHG emissions to a level that is consistent with the Global Warming Solutions Act of 2006 (AB 32) and Scoping Plan.
- Monitoring Plan – This component of the plan establishes a monitoring program to allow the City to monitor the progress towards reduction the GHG emissions once the CAP has been completed.

The following paragraphs describe the relationship of the CAP to the General Plan, a description of greenhouse gases and why it is important to minimize these emissions, the regulatory setting for accomplishing the goals and objectives of the CAP and the process used to develop the CAP.

### 1.2 Relationship of the CAP to the General Plan

The General Plan for the City of Santa Clarita is the foundation for making land use decisions based on goals and policies related to land use, population growth and distribution, development, open space, resource preservation and utilization, air and water supply and other

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<sup>2</sup> Section 15183.5(b). Amendments to CEQA Guidelines. December 30, 2009.

<sup>3</sup> See <http://www.arb.ca.gov/cc/ab32/ab32.htm>

factors. Recognizing that the City is located within and is an integral part of the greater Santa Clarita Valley, the City Council and the Los Angeles County Board of Supervisors initiated a joint planning effort which is intended to guide growth and development within all portions of the Santa Clarita Valley. In recognition of anticipated continuation of growth, the General Plan focuses on ways to manage the City's growth while addressing the need for improving the lifestyle of its residents. As part of this effort, the City identified its goals, objectives and policies that address land use, continued development of efficient, cost-effective and comprehensive transportation systems, conservation of natural resources and the benefits of open space preservation.

The CAP builds from the goals, objectives and policies delineated in the General Plan and develops specific actions to be implemented and monitored to achieve GHG reduction goals. The City's general plan process developed a number of goals, objectives and policies that address climate change. Accordingly, the General Plan goals, objectives and policies are incorporated into the Climate Action Plan's mitigation plan component and to the extent feasible are translated into measures that result in reductions in GHG emissions. At build out, compared to the previous General Plan, the new General Plan will:

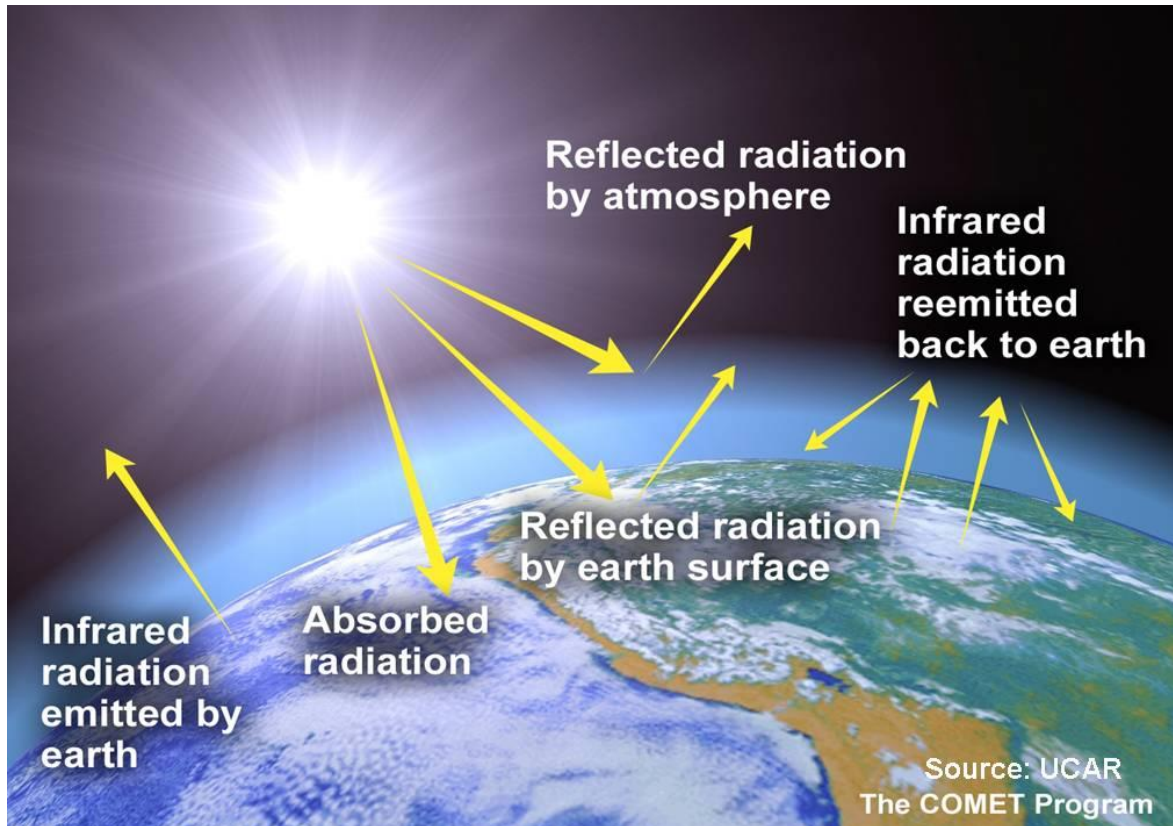
- Reduce vehicle miles traveled ;
- Include more focus on higher residential and commercial density including transit oriented development and mixed use development;
- Reduce the valley-wide carbon footprint

The General Plan contains numerous goals, objectives and policies and project features that would reduce GHG emissions from "business as usual" conditions. Using these goals, objectives and policies as a starting point, the CAP identifies those mitigation measures that can be quantified and translated into significant reductions in the GHG emissions by the year 2020.

### **1.3 Greenhouse Gases and Climate Change**

The Earth's surface temperature is a delicate balance between the energy from the Sun and the energy reradiated back to space. As depicted by Figure 1-1 below, the incoming energy from the Sun, called short-wave radiation composed of ultra-violet light and visible light, is partly reflected off the of the atmosphere and off the Earth's surface. The Earth absorbs the remainder of the energy and then reradiates long-wave, infrared radiation back towards space. However, if all of this infrared radiation reached space, the Earth's surface would be at sub-zero temperatures. The Earth's atmosphere traps some of this long-wave radiation emitted from the Earth's surface and reradiates it back to Earth, providing a blanket effect to keep the temperature at livable levels. This trapping of some of the long-wave radiation by the atmosphere is called the greenhouse effect, a naturally occurring process which moderates the temperature of the earth.





**Figure 1-1. The Greenhouse Effect.**

Greenhouse gases (GHGs) refer to a collection of gases that have the ability to absorb and reradiate infrared energy. Some of these gases are naturally-occurring, such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and water vapor (H<sub>2</sub>O); while some are only man-made and that are emitted through the use of modern industrial products, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). The amount of GHGs in the atmosphere has fluctuated throughout the history of the planet within a predictable range, and these have been closely correlated with the observed glacial and interglacial periods. However, modern day human activities, primarily from fossil fuel burning, have been introducing more GHGs into the atmosphere, which are accumulating and intensifying the heat trapping mechanism, resulting in global temperature increases. In response to climate change concerns, the Kyoto Protocol was entered into force in 2005 as an international effort to mandate GHG reductions, although the United States did not adopt the Protocol.

CAPs generally act to reduce six major greenhouse gases, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). The effect each of these gases has on global warming is a combination of the volume of their emissions and their 100-year global warming potential (GWP). Global warming potential indicates, on a pound-for-pound basis, how much a gas will contribute to global warming relative to how much warming would be caused by the same mass of carbon dioxide. For example, CH<sub>4</sub> and N<sub>2</sub>O are substantially more potent than CO<sub>2</sub>, with global



warming potentials of 21 and 310, respectively. However, these natural GHGs are nowhere near as potent as sulfur hexafluoride and various HFCs and PFCs. Sulfur hexafluoride has a 100-year GWP of 23,900 and PFCs and HFCs have GWPs ranging from 140 to 11,700.<sup>4</sup> In emissions inventories, GHG emissions are typically reported in terms of pounds (lbs) or metric tons (“tonnes,” equivalent to 1000 kilograms) of carbon dioxide equivalents (CO<sub>2</sub>e), which are calculated as the product of the mass emitted of a given GHG and its specific global warming potential. In this document, the unit metric ton (MT) is used to report GHG emissions.

The most important GHG in human-induced global warming is CO<sub>2</sub>. While many gases have much higher global warming potentials than the naturally occurring GHGs, CO<sub>2</sub> is emitted in such higher quantities that it accounts for 85 percent of the global warming potential of all GHGs emitted by the United States.<sup>5</sup> Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO<sub>2</sub> emissions and thus substantial increases in atmospheric CO<sub>2</sub> concentrations. In 2005, atmospheric CO<sub>2</sub> concentrations were about 379 parts per million (ppm), over 35 percent higher than the pre-industrial (defined as the year 1750) concentrations of about 280 ppm.<sup>6</sup> In addition to the sheer volume of its emissions, CO<sub>2</sub> is a major factor in human-induced global warming because of its lifespan in the atmosphere of 50 to 200 years.

Concentrations of the second most prominent GHG, CH<sub>4</sub>, have also increased due to human activities such as rice production, degradation of waste in landfills, cattle farming, and natural gas mining. In 2005, atmospheric levels of CH<sub>4</sub> were more than double pre-industrial levels, up to 1774 parts per billion as compared to 715 parts per billion<sup>6</sup>. CH<sub>4</sub> has a relatively short atmospheric lifespan of only 12 years, but has a higher global warming potential than CO<sub>2</sub>.

N<sub>2</sub>O concentrations have increased from about 270 parts per billion in pre-industrial times to about 319 parts per billion by 2005<sup>8</sup>. Most of this increase can be attributed to agricultural practices (such as soil and manure management), as well as fossil-fuel combustion and the production of some acids. N<sub>2</sub>O has a 120-year atmospheric lifespan, meaning that in addition to its relatively large global warming potential its influence is long-lasting, thus increasing its role in global warming.

Hydrofluorocarbons (HFCs), used as refrigerants, and fully fluorinated species, such as sulfur hexafluoride (SF<sub>6</sub>) and tetrafluoromethane (CF<sub>4</sub>), are present in the atmosphere in relatively small concentrations, but have extremely long life spans of 50,000 and 3,200 years each, making them potent GHGs. Perfluorocarbons (PFCs) are generated from traditional aluminum production among other activities, but have very large radiative efficiencies and lifetimes in the range of 1,000 to 50,000 years. Given their long lifetimes, HFC's, SF<sub>6</sub>, CF<sub>4</sub>, and PFC's are essentially permanent contributors to climate change.

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4 See [http://www.climateregistry.org/resources/docs/protocols/grp/GRP\\_3.1\\_January2009.pdf](http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf).

5 Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006, US Environmental Protection Agency. Website: [http://epa.gov/climatechange/emissions/downloads/08\\_CR.pdf](http://epa.gov/climatechange/emissions/downloads/08_CR.pdf).

6 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 (Core Writing Team, R.K. Pachauri, and A. Reisinger, Editors). IPCC, Geneva, Switzerland.

GHGs differ from criteria pollutants (defined as those pollutants that are common in the lower atmosphere as indicators of air quality and health effects) in that GHG emissions do not cause direct adverse human health effects. Rather, the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans. For example, some observed changes include shrinking glaciers, thawing permafrost, later freezing and earlier break-up of ice on rivers and lakes, a lengthened growing season, shifts in plant and animal ranges, and earlier flowering of trees.<sup>7</sup> Other, longer term environmental impacts of global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack (for example, estimates include a 30-90% reduction in snowpack in the Sierra Mountains.<sup>8</sup> Data from this report suggests that in the next 25 years, in every season of the year, California would experience unprecedented heat, longer and more extreme heat waves, greater intensity and frequency of heat waves, and longer dry periods.

#### 1.4 Federal Actions and Regulations

When considering potential GHG reductions at the community level, it is important to note that a number of programs and initiatives at the Federal, State and County levels to reduce GHG emissions are already occurring and will contribute to reductions at the local level. These programs and initiatives are discussed further in the following sections. These programs and initiatives in many cases will create GHG reductions at the local level that are quantifiable. This CAP has considered these programs and initiatives in the development of its reduction goals and measures to ensure potential reductions not affected by these regulations are addressed.

##### ***Corporate Average Fuel Economy (CAFE) Standards***

On December 7, 2009, as a result of the April 2007 Supreme Court Ruling,<sup>9</sup> the USEPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act: An Endangerment Finding which establishes that the current and projected concentrations of the six key well-mixed greenhouse gases – CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, and SF<sub>6</sub> – in the atmosphere threaten the public health and welfare of current and future generations; and a Cause or Contribute Finding establishing that the combined emissions of these greenhouse gases from new motor vehicles contribute to the greenhouse gas pollution which threatens public health and welfare. The finding itself does not impose any requirements on industry or other entities. However, this action was a prerequisite to finalizing the USEPA's proposed greenhouse gas emissions standards for light-duty vehicles.<sup>10</sup>

In April 1, 2010, the United States Environmental Protection Agency (USEPA) and the National Highway Traffic Safety Administration (NHTSA) issued a Final Rulemaking establishing new

7 "Third Assessment Report (TAR)." Available online at: [http://www.grida.no/climate/ipcc\\_tar/wg1/143.htm](http://www.grida.no/climate/ipcc_tar/wg1/143.htm) and [http://www.grida.no/climate/ipcc\\_tar/wg1/268.htm](http://www.grida.no/climate/ipcc_tar/wg1/268.htm).

8 2009 California Adaptation Strategy, Public Review Draft, A Report to the Governor of the State of California in Response to Executive Order S-13-2008, California Natural Resources Agency.

9 Massachusetts et al. v. Environmental Protection Agency et al. 549 U.S. 497 (2007)

10 US Environmental Protection Agency (EPA). Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards. Regulatory Impact Analysis. See <http://www.epa.gov/oms/climate/regulations/420r10009.pdf>

federal GHG and fuel economy standards for model years (MYs) 2012 to 2016 passenger cars, light-duty trucks, and medium-duty passenger vehicles. These agencies are now in the process of developing a rulemaking to set standards for model years 2017 to 2025 passenger cars, light-duty trucks, and medium-duty passenger vehicles, as well as the first-ever GHG and fuel economy standards for medium-duty, and heavy-duty engines and trucks. The comment period has recently ended on February 13, 2012. The proposed MYs 2017-2025 CAFE standards are projected to require, on an average industry fleet-wide basis for cars and trucks combined, 40.1 miles per gallon (mpg) in model year 2021, and 49.6 mpg in model year 2025. The CAFE standards for MYS 2012-2016 will require these vehicles to meet an estimated combined average mile per gallon (mpg) level of 29.7 in model year 2012 and 34.1 in model year 2016.

First enacted by Congress in 1975 as part of the 1975 Energy Policy Conservation Act in response to the 1973-1974 oil crises, the purpose of CAFE standards is to reduce energy consumption by increasing the fuel economy of passenger cars and light-duty trucks. The CAFE regulation requires each car manufacturer to meet a standard for the sales-weighted fuel economy for the entire fleet of vehicles sold in the U.S. in each model year. Fuel economy, expressed in miles per gallon (mpg), is defined as the average mileage traveled by an automobile per gallon of gasoline or equivalent amount of other fuel. The NHTSA of the US Department of Transportation (USDOT) administers the CAFE program, and the USEPA provides the fuel economy data. NHTSA sets fuel economy standards for passenger cars and light-duty trucks sold in the U.S. while USEPA calculates the average fuel economy for each manufacturer. In response to a U.S. Presidential Memorandum Regarding Fuel Efficiency Standards dated May 21, 2010, the USEPA and NHTSA are taking coordinated steps to enable the production of a new generation of clean vehicles, through reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines.

### ***Energy Independence and Security Act of 2007***

The Energy Independence and Security Act of 2007 was signed into law on December 19, 2007 and includes provisions covering:

- Renewable Fuel Standard (Section 202);
- Appliance and Lighting Efficiency Standards (Section 301–325);
- Building Energy Efficiency (Sections 411–441).

Additional provisions of the Energy Independence and Security Act address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of “green jobs.”

### ***Renewable Fuel Standard (RFS2)***

The USEPA is responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel. The RFS program was created under the Energy Policy Act (EPAAct) of 2005, and established the first renewable fuel volume mandate in the United States. The second renewable fuel program (RFS2) lays the foundation for achieving significant reductions of greenhouse gas emissions from the use of renewable fuels, for reducing imported petroleum, and encouraging the

development and expansion of our nation's renewable fuels sector.<sup>11</sup> Under RFS2, EPA proposes updated volumetric targets for each calendar year. RFS2 requires annual increases in biofuels sold – both biodiesel and bioethanol – from the years 2010-2022. The original RFS program (RFS1) required 7.5 billion gallons of renewable- fuel to be blended into gasoline by 2012. By year 2022, RFS will require at least 74 billion gallons of biofuel to be sold in the US, as compared to a current (2010) level of approximately 14.5 billion gallons.

### ***Appliance and Efficiency Standards***

The Energy Independence and Security Act (EISA) of 2007 amended the Energy Policy Conservation Act of 1975 establishes energy conservation standards and test procedures for certain consumer products and commercial and industrial equipment such as residential electric appliances, lamps, small commercial air conditioning equipment, Class A power supplies, etc. The US Department of Energy (DOE) estimates that the EISA-prescribed standards will save approximately 31 Quadrillion Btu (quads) of energy over 30 years (2008 – 2038) nationwide.<sup>12</sup> One quad can be translated into over 8 billion gallons of gasoline and 36 million metric tons of coal.

### ***Building Energy Efficiency***

EISA 2007 (an amendment to the Energy Policy Conservation Act of 1975) establishes energy management goals and requirements while also amending portions of the National Energy Conservation Policy Act.<sup>13</sup> It sets Federal energy management requirements in several areas, including establishing an Energy Performance Requirement for Federal Buildings, setting a percentage reduction of 30 percent by 2015 for federal buildings. For instance, Performance and Standards for New Building and Major Renovations, establishes that buildings shall be designed so that the fossil fuel-generated energy consumption of the buildings is reduced by 100 percent in year 2030. Other areas it discusses are Energy Savings Performance Contracts, Metering, Energy-Efficient Product Procurement, Reporting, etc., all of which have the objective of reducing energy consumption and thus reducing related greenhouse gases.

## **1.5 State Regulations and Agreements**

### ***California Legislation***

California has enacted a variety of legislations that relate to climate change, much of which sets aggressive goals for GHG reductions within the state. The discussion below provides a brief overview of the regulatory documents and of the primary legislation that relates to climate change which may affect the GHG emissions.

### ***Assembly Bill 32 (Statewide GHG Reductions)***

The California Global Warming Solutions Act of 2006, widely known as AB 32, requires the California Air Resources Board (CARB) to develop and enforce regulations for the reporting and verification of statewide greenhouse gas emissions. CARB is directed to set a greenhouse gas

11 US Environmental Protection Agency (EPA). Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis. See <http://www.epa.gov/otaq/renewablefuels/420r10006.pdf>

12 US Department of Energy. Technical Support Document. Impacts on the Nation of the Energy Independence and Security Act of 2007. See [http://www1.eere.energy.gov/buildings/appliance\\_standards/pdfs/en\\_masse\\_tsd\\_march\\_2009.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/en_masse_tsd_march_2009.pdf)

13 See [http://www1.eere.energy.gov/buildings/appliance\\_standards/pdfs/en\\_masse\\_tsd\\_march\\_2009.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/en_masse_tsd_march_2009.pdf)

emission limit, based on 1990 levels, to be achieved by 2020. The bill sets a timeline for adopting a scoping plan for achieving greenhouse gas reductions in a technologically and economically feasible manner. The scoping plan was approved by CARB on August 24, 2011.<sup>14</sup>

The heart of the bill is the requirement that statewide GHG emissions must be reduced to 1990 levels by 2020. In its original Scoping Plan, CARB established that California needs to reduce GHG emissions by 30 percent below Business-as-Usual GHG projections by the year 2020. CARB revised its estimates in August of 2011 based on the recent economic downturn. The revised Scoping Plan indicates that California needs to reduce GHG emissions by approximately 16 percent below Business-as-Usual GHG emissions for year 2020 to achieve this goal.<sup>15</sup> The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. Key AB 32 milestones are as follows:

- January 1, 2010—Adoption and enforcement of regulations to implement the discrete early action measures.
- January 1, 2011 (and throughout 2011) —Adoption of GHG emissions limits and reduction measures by regulation.
- Adoption of the Scoping Plan on August 24, 2011.
- December 13, 2011, CARB adopted a California cap-and-trade program. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions.
- January 1, 2012—GHG emissions limits and reduction measures adopted in 2011 became enforceable.

### ***Executive Order S-3-05 (Statewide GHG Targets)***

California Executive Order S-03-05 (June 1, 2005) mandates a reduction of GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. Although the 2020 target is the core of AB 32, and has been incorporated into AB 32, the 2050 target remains the goal of the Executive Order.

### ***Low Carbon Fuel Standard (LCFS)***

Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by CARB. CARB identified the Low Carbon Fuel Standard (LCFS) as a Discrete Early Action item under AB 32, and the final resolution (09-31) was issued on April 23, 2009.<sup>16</sup> On December 29, 2011 a preliminary injunction against CARB's LCFS was issued by an U.S. court from a lawsuit considering interstate commerce issues by LCFS which has put a temporary hold on the implementation of the regulation.

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<sup>14</sup> See <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

<sup>15</sup> See <http://www.arb.ca.gov/cc/scopingplan/fed.htm>

<sup>16</sup> See [www.arb.ca.gov/fuels/lcfs/lcfs.htm](http://www.arb.ca.gov/fuels/lcfs/lcfs.htm).

***Senate Bill 1368 (GHG Emissions Standard for Baseload Generation)***

Senate Bill 1368 (SB1368) prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant.<sup>17</sup> This performance standard applies to electricity generated out-of-state as well as in-state, and to publicly owned as well as investor-owned electric utilities.

***Assembly Bill 1493 (Mobile Source Reductions)***

Assembly Bill (AB) 1493 (“the Pavley Standard”) requires automakers to meet GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles of model years 2009 to 2016. Manufacturers have flexibility in meeting these standards through a combination of reducing tailpipe emissions of carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and methane (CH<sub>4</sub>) and receiving credit for systems demonstrated to mitigate fugitive emissions of hydrofluorocarbons (HFCs) from vehicle air conditioning systems.<sup>18</sup> When fully phased in, the near term (2009-2012) standards will result in about a 22 percent reduction in greenhouse gas emissions as compared to the 2002 fleet, and the mid-term (2013-2016) standards will result in about a 30 percent reduction. These first set of standards are usually referred to as “Pavley I”. The “Pavley II”, post-MY2016 standards established under AB 1493 and consistent with Federal CAFE standards, will further require new model years 2017 to 2025 light duty vehicles to control greenhouse gas emissions. Pavley II is now part of the Advanced Clean Cars Program which aims to address reduction in other criteria pollutants as well.

***Senate Bills 1078, 107 and 2 (Renewables Portfolio Standard)***

Established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107, California's Renewables Portfolio Standard requires retail suppliers of electric services to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010. On April 12, 2011, Governor Brown signed SB 2 which requires one-third of the state's electricity to come from renewable sources. The legislation increases California's current 20 percent renewable portfolio standard target in 2010 to a 33 percent renewable portfolio standard by December 31, 2020.

***Senate Bill 375 (Land Use Planning)***

Senate Bill (SB) 375 provides for a new planning process to coordinate land use planning and regional transportation plans and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires regional transportation plans, developed by Metropolitan Planning Organizations (MPOs) relevant to the proposed Project area to incorporate a "sustainable communities strategy" (SCS) in their Regional Transportation Plans (RTP) that will achieve GHG emission reduction targets set by CARB. The Southern California Association of Governments (SCAG) is the federally designated MPO for the majority of the southern California region, including the City of Santa Clarita. The approved regional GHG emission reduction targets approved by CARB for SCAG are 8 percent by 2020 and 13 percent by 2035. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit oriented development. SB 375 will be implemented over the next several years.

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<sup>17</sup> See [http://www.energy.ca.gov/emission\\_standards/index.html](http://www.energy.ca.gov/emission_standards/index.html)

<sup>18</sup> See <http://www.arb.ca.gov/cc/ccms/ccms.htm>



SCAG<sup>19</sup> will develop and finalize a sustainable community's strategy as part of its 2012 Regional Transportation Plan. The City of Santa Clarita participated in the SCS process through formal collaboration with SCAG. The City also provided SCAG with formal comments on the RTP/SCS during the comment period in February, 2012.

### ***Assembly Bill 341 (Commercial Recycling)***

This bill declared that it is the policy goal of the state that not less than 75% of solid waste generated be source reduced, recycled, or composted by the year 2020. Increasing the recovery of recyclable materials will directly reduce GHG emissions. This is a goal of one of the measures in the AB 32 Scoping Plan adopted by CARB in 2008 pursuant to Assembly Bill (AB) 32, the California Global Warming Solutions Act (Chapter 488, Statutes of 2006). In particular, recycled materials can reduce the greenhouse gas emissions from multiple phases of product production including extraction of raw materials, preprocessing and manufacturing. A co-benefit of increased recycling is avoided methane emissions at landfills from the decomposition of organic materials. Use of composted organic materials also provides environmental benefits such as carbon storage in soils and reduced use of fertilizers, pesticides, and water. As required by AB 341, CalRecycle adopted the Mandatory Commercial Recycling Regulation on January 17, 2012.

### ***Energy Conservation Standards (Title 24)***

Energy Conservation Standards for new residential and commercial buildings were originally adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2008 (Title 24, Part 6 of the California Code of Regulations).<sup>20</sup> In general, Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

Part 11 of Title 24, referred to as California Green Building Standards Code, establishes voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements, Title 24 Part 6), water conservation, material conservation, and internal air contaminants. Some of these standards have become mandatory in the 2010 edition of the Part 11 Code. The City has adopted the Baseline standards included in CalGreen into the Santa Clarita Building Code.

### ***Senate Bill 97 (CEQA Guidelines)***

SB 97 required that the California Natural Resources Agency (CNRA) coordinate on the preparation of amendments to the CEQA Guidelines regarding feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions. Pursuant to SB 97, CNRA adopted CEQA Guidelines amendments on December 30, 2009 and transmitted the Adopted Amendments and the entire rulemaking file to the Office of Administrative Law (OAL) on December 31, 2009. The amendments were approved by the Office of Administrative Law on February 16, 2010, and became effective on March 18, 2010.

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<sup>19</sup> See <http://www.climateplan.org/californias-new-vision/around-the-state/southern-california/>

<sup>20</sup> See <http://www.energy.ca.gov/title24/>



With respect to the significance assessment, newly added CEQA Guidelines section 15064.4, subdivision (b), indicates:

A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

- The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;

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.

The Guidelines (SB 97, 2009) also apply retroactively to any incomplete environmental impact report, negative declaration, mitigated negative declaration, or other related documents. The amendments also provide that lead agencies should consider all feasible means of mitigating greenhouse gas emissions that substantially reduce energy consumption or GHG emissions. These potential mitigation measures may include carbon sequestration. If off-site or carbon offset mitigation measure are proposed they must be part of reasonable plan of mitigation that the agency itself is committed to implementing. However, no threshold of significance or any specific mitigation measures have been developed under the CEQA Guidelines to this date.

## **1.6 Local Regulations, Ordinances and Agreements**

### ***South Coast Air Quality Management District (SCAQMD) Policies***

On December 5, 2008, the SCAQMD Governing Board adopted its staff proposal for an interim CEQA GHG significance threshold for proposed Projects where the SCAQMD is the lead agency. Currently, the Board has only adopted thresholds relevant to industrial (stationary source) projects.<sup>21</sup> To achieve a policy objective of capturing 90 percent of GHG emissions from new residential/commercial development projects and implement a “fair share” approach to reducing emission increases from each sector, SCAQMD staff proposed in September 2010 combining performance standards and screening thresholds. The performance standards suggested have primarily focused on energy efficiency measures beyond Title 24 Part 6, California’s building energy efficiency standards, and a screening level of 3,000 tons of CO<sub>2</sub>e per year based on direct operational emissions. Above this screening level, project design features designed to reduce GHGs must be implemented to reduce the impact to below a level of significance. The CEQA Significance Thresholds Working Group, which includes government agencies implementing CEQA and representatives from various stakeholder groups, provided

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<sup>21</sup> See [www.aqmd.gov/hb/2008/December/081231a.htm](http://www.aqmd.gov/hb/2008/December/081231a.htm).

input for this effort in the past, but have not met since September 2010 and this threshold was never formally adopted by SCAQMD. Information on development of the CEQA Significance Thresholds Working Group can be found on the SCAQMD website.<sup>22</sup>

## 1.7 Process Used to Develop the Climate Action Plan

The development of a CAP begins with a premise that establishing a complete GHG emissions inventory within the city's boundary is the critical foundation for the remainder of the project. This inventory includes GHG emissions from various sectors within the City of Santa Clarita for the baseline year of 2005. There are two sub-inventories: (1) municipal inventory, which covers all sources under the City's municipal operation, and (2) community inventory, which covers the rest of the sources within the City's boundaries. The sectors for which the GHG inventory was developed was Building Energy (electricity and natural gas consumption), Transportation (on-road vehicles, off-road equipment and rail travel), Industrial (combustion and fugitive emissions from industrial processes, Waste (wastewater treatment and solid waste landfills), Area lighting (streetlights, traffic lights and other outdoor area lights), Potable Water (electricity consumed for water supply and conveyance, treatment and distribution), Agriculture (electricity consumed for agriculture purposes) and Refrigerant Use (blends of hydrofluorocarbons used for refrigerants).

The results of the baseline inventory for 2005 were then used to develop forecasts. Forecasting the baseline GHG emissions relied on available data on future year activities within the City domain. Surrogates were assigned to each GHG emission source category in the baseline to determine what activity parameter will be associated with each source for purposes of the projection. For example, community-wide building energy was projected using population as a surrogate. Other surrogates came from the City's General Plan, specific development plans, or a combination of these sources. If some utility data were obtained from other agencies (i.e. wastewater or solid waste), the team contacted these agencies to determine information on projected activities. The Business-as-Usual (BAU) forecasts were then conducted by creating a ratio of the projection surrogates in the baseline to their future year values in 2020, and then applying the ratio to the baseline emissions.

The next step was to engage in a community outreach effort. The City hosted public workshops in April, May and June of 2011 that presented the inventory results, projections of emissions, and the need for community action regarding climate change and GHG emissions. A total of ten meetings were held with the general public as well as the Boards of local business organizations. The meetings were held throughout the City to elicit more input from interested and concerned residents. Residents and stakeholders provided valuable input regarding the direction of the CAP effort and what could be done to do more in this area.

These initial steps set the stage for an informed and defensible Climate Action Plan that can then accurately consider potential reduction measures in all areas of the city's boundaries in addition to transportation and land use measures. Although transportation and land use measures will be primarily used to consider the City's consistency with the final SB 375 targets

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<sup>22</sup> Available at: [www.aqmd.gov/ceqa/handbook/GHG/GHG.html](http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html).

set for the SCAG region, other reasonable and achievable reduction measures were identified to augment the CAP and help the overall case for a plan that is consistent with AB 32 targets.

Section 2.0 of the CAP describes the methodologies, the protocols and the sources of data used to develop the 2005 Baseline Inventory and to forecast 2020 GHG emissions. Section 3.0 provides detailed results for the 2005 GHG emission level and 2020 Business as Usual (BAU) GHG emissions forecasts which assumes that no new emission controls and strategies are adopted. Section 4.0 describes GHGs mitigation measures including the accomplishments of the current City programs and the specific federal, state, local and City measures that provide the GHG reductions that are included in this CAP. The resulting 2020 emissions forecasts that include the reduction measures included in the CAP are presented in Section 5.0. Finally, Section 6.0 describes the administration of the CAP going forward, the staffing level to implement and monitor the plan as well as finance and budget considerations relevant to CAP implementation. Also, included is the timeline and prioritization of the GHG reduction measures. The measures are grouped into those GHG mitigation measures that are included in the CAP to meet the GHG reduction goal and could be quantified, measures that are not quantifiable at this time but will be included in the Monitoring Plan, those measures that will be considered in future amendments to the CAP and finally those measures that are not considered a high priority to meet the goals of the City by 2020. Finally, Section 6.0 includes steps the City will take to effectively monitor and track progress of the CAP are outlined in the Monitoring Section. Detailed emissions calculations, emissions projections, reduction quantification from measures, and data sources are included in the Appendices.

## 2.0 GHG EMISSIONS INVENTORY METHODOLOGY

The City of Santa Clarita 2005 base year GHG emissions inventory was developed to capture GHG emissions from various sectors. 2005 is chosen as the base year as established by SB 375. There are two sub-inventories: (1) municipal inventory, which covers all sources under the City's municipal operation, and (2) community inventory, which covers the rest of the sources within the City's boundaries. Since there is no standard inventory protocol, this inventory methodology was developed based on procedures established in three documents: The Intergovernmental Panel on Climate Change (IPCC) Guidelines for the National Greenhouse Gas Inventories, the Local Government Operational Protocol (LGOP), and the Climate Registry General Reporting Protocol (GRP). The specific methodology used for each emission source is discussed in detail in the rest of this section. The City of Santa Clarita is aiming to reduce its emissions to levels below the 2005 baseline level by the year 2020.

### *Six Greenhouse Gases*

There are six main greenhouse gases cited in international and national reporting programs and are listed in Table 2-1 with their respective global warming potentials (GWPs). The GWP for each gas is calculated based on its atmospheric lifetime and its tendency to absorb and reradiate heat and then normalized by that of carbon dioxide. It is a useful indicator of how potent a gas is compared to carbon dioxide. Some gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are used in small quantities, but they are important in climate science analysis due to their high GWP.

**Table 2-1 Global Warming Potential of Different Greenhouse Gases.**

GHG	Chemical Formula	Global Warming Potential
Carbon dioxide	CO <sub>2</sub>	1
Methane	CH <sub>4</sub>	21
Nitrous Oxide	N <sub>2</sub> O	313
Hydrofluorocarbons	CxHyFz	Various
Perfluorocarbons	CyFy	Various
Sulfur Hexafluoride	SF <sub>6</sub>	23,900

### *Units*

In this report, greenhouse gas emissions are reported in metric tons (MT) of carbon dioxide equivalent (CO<sub>2</sub>e), which is calculated by multiplying the amount of emissions for each of the six above GHGs by their respective GWP. Since most of the consumption data associated with emissions and some emissions factors are reported in English units, conversion factors are applied in those calculations.

## 2.1 Transportation Sector

The transportation sector includes on-road vehicles, off-road equipment, and rail travel. For the municipal inventory, on-road vehicles include a fleet of light-duty and heavy vehicles owned and operated by the City, City-wide buses, the County Sheriff vehicles that operate within the City, and solid waste hauling trucks. Emissions from these vehicles are determined on either a vehicle miles travelled (VMT) basis or fuel consumption basis, and these data are provided by related departments. The emissions factors for each vehicle class in the municipal inventory are modeled using ARB's EMFAC 2007 version 2.3 or are obtained from the General Reporting Protocol.

The community-wide inventory of the transportation sector estimates on-road emissions based on VMT on freeways, arterial roads, and local roads within the City's boundary. The VMT data are modeled and provided by the City's Traffic and Planning division. ENVIRON then apportions the total VMT into different vehicle classes according to distribution in the Southern California Associate of Governments (SCAG) region in order to apply the appropriate emissions factors. Because the modeled VMT includes all trips within the City boundaries, the community inventory on-road emissions would already encompass those of the municipal inventory. To avoid double-counting, the community-wide on-road emissions presented in this report has subtracted out the municipal on-road emissions. In addition to the in-City emissions, the community-wide inventory also includes bio-solid hauling truck trips between wastewater treatment plants and land application in Kern County, as per information provided by Los Angeles County Sanitation District.<sup>23</sup>

Off-road equipment covers a wide range of engines and equipment types, such as lawn and garden, airport service, recreational and marine, industrial, agricultural, logging, construction, mining, and light commercial equipment. Emissions from off-road sources are estimated based on fuel consumption and or hours of operation. The City has provided a list of City-owned and operated off-road equipment and their usage for the municipal inventory. For the community inventory, ENVIRON has determined that engines used in construction and mining, other commercial and industrial equipment, transportation refrigeration units, and lawn and garden equipment are the most significant contributors to the total off-road source GHG emissions in the City, and these types of equipment are modeled using ARB's OFFROAD 2007 model. Because the OFFROAD model has resolution at the county level, emissions for the County of Los Angeles are estimated and then scaled down to the City of Santa Clarita using the appropriate surrogates. For construction and mining, transportation refrigeration units, and lawn and garden equipment, the 2005 population ratio between the County and the City is used; for industrial equipment, the 2000 Census manufacturing employee ratio between the County and the City is used; and for light commercial equipment, the 2000 Census wholesale and retail employee ratio between the County and the City is used.

There are two types of rail operations in Santa Clarita which contribute to GHG emissions to the community inventory. Freight rail trains travel mainly between ports and inland areas, and the

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<sup>23</sup> Data request communication between David Rothbart of Los Angeles County Sanitation District and ENVIRON. Biosolids generated from Saugus and Valencia facilities are trucked from Valencia to Kern County for land application.

length of rail lines crossing over Santa Clarita is captured using GIS. The GHG emissions for freight rail in Los Angeles County were obtained and scaled to the City of Santa Clarita based on the length of rail lines. The Metro Link is a passenger rail system. ENVIRON has obtained information about the trains' operation schedule and estimated the annual fuel consumption, which is then used to calculate the emissions using fuel combustion mass balance and standard emission factors from The Climate Registry (TCR) General Reporting Protocol.

City-wide transportation analyses for GHG inventories have used two differing methodologies for determining the total VMT to include in the GHG inventory. The first methodology is the city boundary methodology, which counts all VMT on all roadway types within the geographic boundaries of the city. This is the methodology which has been used in this CAP. The second methodology is the trip generation methodology, which determines the length of all trips originating or with destinations in the city, and then accounts for all VMT within the city and 50% of VMT outside of the city. The city boundary methodology was selected for Santa Clarita because it is believed that this methodology allows for an easier integration of results from one city to another. However, it should be noted that the city boundary methodology does include VMT related to pass-through traffic which is being counted in the inventory but which may not be generated by Santa Clarita.

## 2.2 Building Energy Sector

Building sector emissions include indirect emissions from electricity consumption (for lighting and appliances) and direct emissions from fuel combustion (for heating, hot water, power generation, and running portable equipment). Electricity emissions are estimated by multiplying the consumption data (in megawatt-hour or gigawatt-hour) by the utility-specific emission factors. Southern California Edison (SCE) is assumed to be the sole electricity provider for the City of Santa Clarita and thus SCE-specific emissions factors are used to reflect its 2005 fuel mix. Natural gas emissions come from direct burning and are determined by multiplying the consumption by the standards emissions factors from TCR General Reporting Protocol. The natural gas consumption data is provided by Southern California Gas (SCG).

There are several types of use of electricity and natural gas. Residential buildings include single-family houses and multi-family units. Commercial and industrial buildings include office space, restaurants, food stores, warehouses, retail stores, schools, colleges/universities, hotels, hospitals/clinics, factories, and some public, governmental, and military services. City-owned buildings or county-owned buildings serving the City are categorized separately for the municipal inventory.

## 2.3 Industrial Sector

There are two categories of emission sources in the industrial sector: (1) fuel combustion for industrial operations, (2) fugitive emissions from industrial processes. Since electricity and natural gas use for industrial operation are already captured in the Building Energy sector discussed above, operational fuel combustion in this section refers to additional fossil fuel use (e.g. diesel fuel oil) to power industrial equipment or as power generation feedstock. ENVIRON has obtained a list of industries in Santa Clarita and their fuel consumption data South Coast Air Quality Management District, which are used directly for emissions calculations. Fugitive

industrial process emissions include a wide range of criteria and toxic pollutants, coming from facilities for metals processing, chemical preparation, electronic services, painting, oil and gas exploration, and others. Methane is a common greenhouse gas from these processes and is usually estimated by a process-specific speciation from TOG. To identify these facilities and their emissions, ENVIRON has obtained data from the South Coast Air Quality District and California's Division of Oil, Gas, and Geothermal Resources (DOGGR) database. For oil and gas activities specifically, emissions estimation is based on the number of wells within the City of Santa Clarita and their production information, and emissions factors are from the Western Regional Air Partnership (WRAP) GHG Emissions Protocol. Both operational fuel combustion and process fugitive emissions are categorized under the City's community inventory.

## 2.4 Waste Sector

The waste sector of greenhouse gas emissions includes two major sources: wastewater treatment and solid waste at landfills. The two wastewater treatment facilities serving the City of Santa Clarita are the Valencia Water Reclamation Plant and the Saugus Water Reclamation Plant, and they are responsible for four types of greenhouse gas emissions: (1) N<sub>2</sub>O from effluent discharge, (2) N<sub>2</sub>O from nitrification / denitrification processes, (3) fugitive CH<sub>4</sub> from septic systems, and (4) CH<sub>4</sub> from incomplete combustion of digester gas. The CO<sub>2</sub> emissions from combustion of the digester gas is not counted towards this inventory because the gas is considered biogenic (produced by life processes) in origin. All of the emissions estimation methodologies follow those outlined in the Local Government Operation Protocol (LGOP) and data are provided by the Los Angeles County Sanitation District. All wastewater treatment related emissions are part of the community inventory.

There were ten landfills serving the City of Santa Clarita in 2005, but the largest two – Chiquita Canyon Landfill and Sunshine Canyon City/County Landfill – accounted for 82% of the City's solid waste. Thus ENVIRON focused on estimating the emissions from these two landfills and then used a scaling method to estimate the remaining emissions. Due to limited data available on the actual operation of the landfills, a top-down method is applied by obtaining the facility's 2008 GHG emissions as reported to the California Air Resources Board and downscaling by the ratio of the quantity of solid waste from Santa Clarita in 2005 over the total quantity received at the landfills. Also, because the reported emissions only include those from stationary combustion of the captured landfill gas, ENVIRON separately estimated the fugitive CH<sub>4</sub> emissions applying standard flare efficiency and landfill gas capture rate factors. Note that although the solid waste hauling trucks emissions are counted towards the municipal inventory due to its contracts with the City, the landfills are private entities and their emissions are categorized into the community inventory.

## 2.5 Others

- Area lighting (traffic lights, street lights, part of municipal inventory)

GHG emissions associated area lighting refers to indirect emissions of electricity consumed for streetlights, traffic lights, and other outdoor area lights (e.g. parks). The methodology is very similar to that discussed in the Building Energy sector, given data provided by SCE.



- Potable water (include electricity consumption relating to water pumping)

GHG emissions associated with potable water use refer to indirect emissions from electricity consumed for water supply and conveyance, treatment, and distribution. Emission estimation is based on Southern California-specific water-energy proxies, which is the amount of electricity, needed to treat and deliver a unit of water consumed, and then apply the facility-specific electricity emission factors as discussed in the Building Energy sector. There are three water companies served the City of Santa Clarita in 2005: Valencia Water Company, Newhall County Water District, and Santa Clarita Water Company. All consumption related to municipal accounts and county offices that served Santa Clarita are grouped into the municipal inventory; all other accounts in the City are grouped into the community inventory.

- Agricultural (include electricity consumption relating to agricultural activities)

Agricultural related GHG emissions in the context of this inventory refer to the indirect emissions from electricity consumed for agricultural purposes. It does not include the use of non-electric equipment or fugitive emissions from agricultural practices. Emissions from electricity consumption are estimated similar to that outlined in the Building Energy sector, using data provided by SCE. Agricultural emissions are part of the community inventory.

- Refrigerant use (municipal only)

Many refrigerants are blends of hydrofluorocarbons (HFCs), which are extremely potent greenhouse gases due to their high global warming potentials (GWPs). Their emissions are estimated based on purchase records. The City has provided data on the type and amount of refrigerant acquisition for municipal buildings and vehicles operations. However, data on their use in the community were scattered and limited, and thus not included in the community inventory.

## 2.6 2020 Business-As-Usual Scenario Projections

Based on the 2005 baseline GHG emissions inventory, the 2020 business-as-usual emissions are projected by applying several surrogates to the appropriate emission sources. For the municipal inventory, a population growth factor of 1.19, calculated as a ratio of the 2020 SCAG population forecast for the North Los Angeles County Subregion over the 2005 census population data for the City of Santa Clarita, is used for most categories, including electricity and natural gas consumption for county offices, VMT/ fuel use for City's on-road and off-road fleet, city buses, county sheriff, and solid waste hauling trucks, potable water consumption for city and county offices, refrigerant use for the City, traffic and streetlights, and time of use agricultural electricity demand. However, there are a few exceptions. Municipal office electricity and natural gas consumption remains at a 2005 level with the assumption that municipal office size will stay the same even with the growing population of the City. Also, on top of VMT growth for city buses, the City has also committed to switching the entire bus fleet to CNG-fueled by 2020; CNG-specific emission factors are applied instead of using those of diesel as in the baseline.

For the community inventory, residential building energy consumption is expected to grow with population, as is the case for wastewater, solid waste, water usage, and agricultural electricity demand. Commercial and industrial energy consumption, industrial fuel use and most process emissions are projected using a non-residential land usage growth factor provided by the City. Oil and gas activities are expected to remain at current levels.

The transportation sector is again broken down to three main source categories: on-road vehicles, off-road equipment, and rail. In the baseline inventory, the City has provided modeled data for freeway and arterial roads VMT, and the same model is used to project the 2020 VMT under various city planning assumptions. ENVIRON applies the same method as in the baseline to estimate the on-road emissions on freeways and arterials roads for 2020 but keeps the same 2005 VMT for local and collector roads as no projections were made. Note again that the on-road vehicle emissions in the community inventory captures all traffic within the City; thus the municipal on-road emissions is a subset of, and not an addition to, the community inventory. For off-road equipment, ENVIRON re-runs the OFFROAD model for calendar year 2020 and keeps all other assumptions and methodology the same as in the baseline. Rail transport is again divided into two sources. Metro Link (passenger rail) grows with population, whereas freight rail is scaled by a projected tonnage throughput in rail transport at the Port of Los Angeles, which is assumed to be the primary contributor to cargo movement through the City of Santa Clarita.

In 2008, CARB published its Scoping Plan to meet the targets specified in the AB 32 legislation. The 2008 forecasts of GHG emissions showed that the California GHG emissions would require a 30% reduction by 2020 to meet the 1990 GHG emission levels in California. Since 2008, CARB has updated projected BAU emissions based on more current economic forecasts (i.e., as influenced by the economic downturn) and reduction measures already in place. Considering statewide measures already in place (Renewable Portfolio Standard and Pavley I vehicle regulations), a revised estimate of a 16% reduction below the estimated 2020 BAU levels will be necessary to return to 1990 levels. Therefore, the 2020 forecasts in the CAP are based on the revised BAU forecasts for 2020 which include the two statewide measures already in place. The BAU projections are shown in the following Section.

### 3.0 BASELINE AND 2020 BUSINESS AS USUAL GHG EMISSIONS

As described in Section 2, the 2005 baseline year GHG emissions inventory has captured emissions from community-wide and municipal sources. The summary of emissions by source category is outlined in Table 3-1 below. The emissions are presented separately for community-wide sources and municipal sources. The municipal source emissions make up approximately 2% of the total emissions.

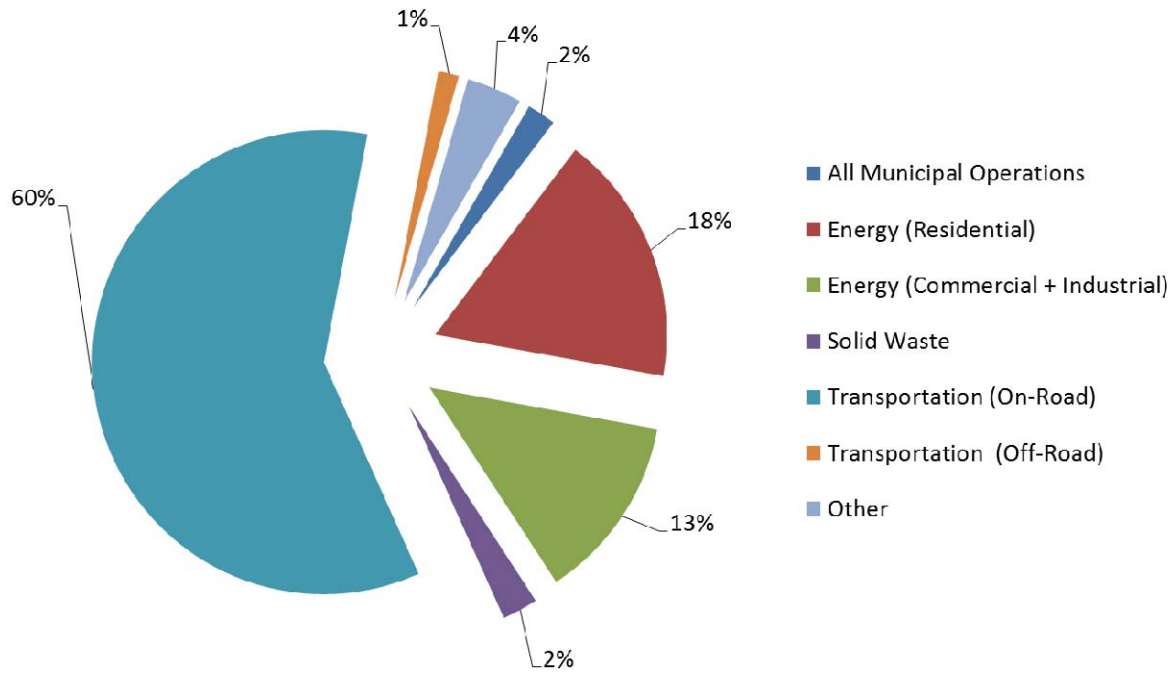
**Table 3-1. Summary of 2005 CO<sub>2</sub>e Emissions (metric tons/yr) by Sector for the City of Santa Clarita.**

SECTOR	CO <sub>2</sub> e Emissions (metric tons/yr)		
	Community-wide	Municipal	Total Community + Municipal
<b>TRANSPORTATION SECTOR</b>	<b>1,050,637</b>	<b>15,081</b>	<b>1,065,718</b>
<b>On-Road</b>			
Light Duty Vehicles	868,815	-	868,815
Light Duty Trucks	81,581	-	81,581
Medium Duty Trucks	40,975	-	40,975
Heavy Duty Trucks	9,047	-	9,047
Urban Buses	25,371	-	25,371
Motorcycles	10	-	10
City-Owned Fleet (LDVs, LDTs, HDTs)	-	604	604
County Sheriff Fleet (LDVs)	-	2,733	2,733
Solid Waste Hauling Trucks	-	2,717	2,717
City Buses	-	8,871	8,871
<b>Subtotal</b>	<b>1,025,799</b>	<b>14,925</b>	<b>1,040,725</b>
<b>Off-Road</b>			
Construction and Mining Equipment	3,124	-	3,124
Industrial Equipment	166	-	166
Lawn and Garden Equipment	38	-	38
Light Commercial Equipment	42	-	42
Transport Refrigeration Units	31	-	31
Rail	21,437	-	21,437
Municipal Off-Road Equipment	-	156	156
<b>Subtotal</b>	<b>24,838</b>	<b>156</b>	<b>24,994</b>
<b>BUILDING and INDUSTRIAL SECTOR</b>	<b>523,582</b>	<b>8,029</b>	<b>531,611</b>
<b>Residential</b>			
Electricity	147,724	-	147,724
Natural Gas	153,134	-	153,134
<b>Subtotal</b>	<b>300,858</b>	<b>0</b>	<b>300,858</b>
<b>Commercial + Industrial</b>			
Electricity	182,760	-	182,760
Natural Gas	39,267	-	39,267
<b>Subtotal</b>	<b>222,027</b>	<b>0</b>	<b>222,027</b>

**Table 3-1. Summary of 2005 CO<sub>2</sub>e Emissions (metric tons/yr) by Sector for the City of Santa Clarita (continued).**

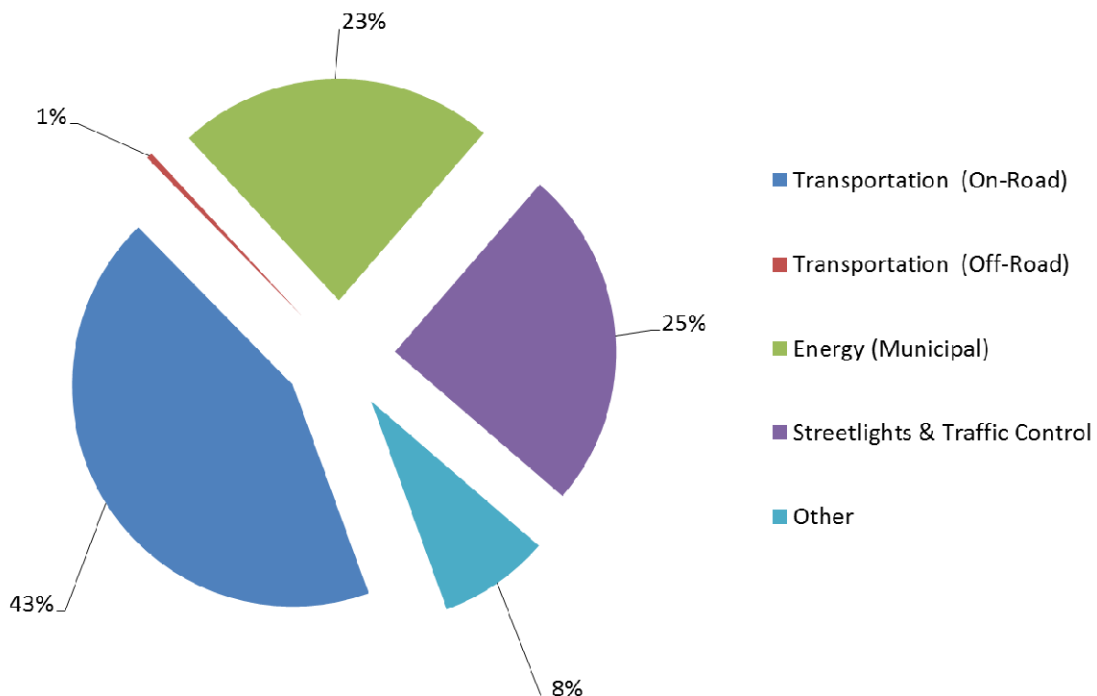
SECTOR	CO <sub>2</sub> e Emissions (metric tons/yr)		
	Community-wide	Municipal	(Community + Municipal)
<b>BUILDING and INDUSTRIAL SECTOR</b>			
<b>Industrial Operations</b>			
Other Fuel Use	27	-	27
<b>Industrial Processes</b>			
Oil & Gas	670	-	670
Other Processes	0	-	0
<b>Subtotal</b>	<b>698</b>	<b>0</b>	<b>698</b>
<b>Municipal</b>			
Electricity	-	5,862	5,862
Natural Gas	-	2,167	2,167
<b>Subtotal</b>	<b>0</b>	<b>8,029</b>	<b>8,029</b>
<b>OTHERS</b>	<b>108,894</b>	<b>11,425</b>	<b>112,226</b>
<b>Waste</b>			
Wastewater Treatment	7,679	-	7,679
Landfills	42,760	-	42,760
<b>Outdoor Area Lighting</b>			
Streetlights & Traffic Control	-	8,615	8,615
<b>Agricultural</b>			
Electricity	11,619	-	11,619
<b>Water Usage</b>			
Water Pumping Unit	46,835	2,805	49,641
<b>Refrigerant</b>			
Refrigerant	-	5	5
<b>Total</b>	<b>1,683,113</b>	<b>34,535</b>	<b>1,717,648</b>

Figure 3 presents the distribution of 2005 baseline emissions, showing that on-road vehicles were the main source of GHG emissions for the City in 2005 (60%).



**Figure 3-1. 2005 Total Greenhouse Gas Emissions Contribution by Source Category.**

The 2005 GHGs contribution of municipal operations is further detailed in Figure 3-2 by source category.



**Figure 3-2. 2005 Municipal Greenhouse Gas Emissions Contribution by Source Category.**

The projected GHG emissions for 2020 under Business as Usual Scenario (BAU), i.e. without control applied by the City, are shown in Table 3-2 below. However, in accordance to statewide goals delineated in California's AB32 Scoping Plan, the 2020 Business as Usual projections include reductions from two California statewide regulations - Pavley I and the Renewable Portfolio Standard (RPS). Detailed emissions are presented in Table 3-2.

**Table 3-2. Summary of 2020 Business as Usual CO<sub>2</sub>e Emissions (metric tons/yr) by Sector for the City of Santa Clarita.**

SECTOR	BAU CO <sub>2</sub> e Emissions (metric tons/yr)		
	Community-wide	Municipal	Total (Community + Municipal)
<b>TRANSPORTATION SECTOR</b>	<b>1,241,172</b>	<b>15,761</b>	<b>1,256,933</b>
<b>On-Road</b>			
Light Duty Vehicles	1,011,269	-	1,011,269
Light Duty Trucks	90,912	-	90,912
Medium Duty Trucks	46,261	-	46,261
Heavy Duty Trucks	17,662	-	17,662
Urban Buses	37,570	-	37,570
Motorcycles	10	-	10
City-Owned Fleet (LDVs, LDTs, HDTs)	-	608	608
County Sheriff Fleet (LDVs)	-	2,614	2,614
Solid Waste Hauling Trucks	-	3,189	3,189
City Buses	-	9,166	9,166
<b>Subtotal</b>	<b>1,203,684</b>	<b>15,576</b>	<b>1,219,260</b>
<b>Off-Road</b>			
Construction and Mining Equipment	4,369	-	4,369
Industrial Equipment	160	-	160
Lawn and Garden Equipment	66	-	66
Light Commercial Equipment	105	-	105
Transport Refrigeration Units	72	-	72
Rail	32,717	-	32,717
Municipal Off-Road Equipment	-	185	185
<b>Subtotal</b>	<b>37,488</b>	<b>185</b>	<b>37,673</b>
<b>BUILDING and INDUSTRIAL SECTOR</b>	<b>597,315</b>	<b>7,588</b>	<b>604,903</b>
<b>Residential</b>			
Electricity	141,692	-	141,692
Natural Gas	181,519	-	181,519
<b>Subtotal</b>	<b>323,211</b>	<b>0</b>	<b>323,211</b>
<b>Commercial + Industrial</b>			
Electricity	216,033	-	216,033
Natural Gas	57,361	-	57,361
<b>Subtotal</b>	<b>273,393</b>	<b>0</b>	<b>273,393</b>

**Table 3-2. Summary of 2020 Business As Usual CO<sub>2</sub>e Emissions (metric tons/yr) by Sector for the City of Santa Clarita (continued).**

SECTOR	BAU CO <sub>2</sub> e Emissions (metric tons/yr)		
	Community-wide	Municipal	(Community + Municipal)
<b>BUILDING and INDUSTRIAL SECTOR</b>			
<b>Industrial Operations</b>			
Other Fuel Use	40	-	40
<b>Industrial Processes</b>			
Oil & Gas	670	-	670
Other Processes	0	-	0
<b>Subtotal</b>	<b>710</b>	<b>0</b>	<b>710</b>
<b>Municipal</b>			
Electricity	-	5,373	5,373
Natural Gas	-	2,215	2,215
<b>Subtotal</b>	<b>0</b>	<b>7,588</b>	<b>7,588</b>
<b>OTHERS</b>	<b>114,365</b>	<b>10,960</b>	<b>125,325</b>
<b>Waste</b>			
Wastewater Treatment	7,611	-	7,611
Landfills	50,687	-	50,687
<b>Outdoor Area Lighting</b>			
Streetlights & Traffic Control	-	8,263	8,263
<b>Agricultural</b>			
Electricity	11,144	-	11,144
<b>Water Usage</b>			
Water Pumping Unit	44,923	2,691	47,614
<b>Refrigerant</b>			
Refrigerant	-	6	6
<b>Total</b>	<b>1,952,852</b>	<b>34,309</b>	<b>1,987,162</b>



## 4.0 GHG EMISSIONS REDUCTIONS

The State of California has set specific targets for reducing GHG emissions from transportation, energy, industry, waste management, and other activities discussed in the baseline inventory. These targets call for state-wide emission reductions that will attain 1990 GHG emissions levels by 2020. This section identifies the GHG emissions reductions that will be achieved by the Plan consistent with the targets set by California. The reductions include:

- GHG reductions from regulatory actions that have already taken place or are in progress resulting from federal, state and local regulations, ordinances and incentive programs
- GHG reductions from City actions that have taken place since 2005 as a result of City programs including building energy installations, tree planting and land acquisition;
- Reductions in Vehicle Miles Traveled (VMT) from high priority transportation and land use measures; and
- Reductions from other high priority measures where data were available to quantify the emissions reductions.

### 4.1 Santa Clarita Programs

In the past the City has undertaken a series of initiatives to reduce energy consumption, promote conservation and reduce emissions. These actions are summarized below:

#### ***Energy Efficiency, Conservation and Renewable Energy***

In 2004, the City joined the Community Energy Partnership (CEP), a multi-city collaboration that provides education and services to promote sustainable and efficient energy practices to many different individuals and communities including homeowners, renters, business owners, senior citizens, and cities. Based on accomplishments from this partnership, the National Resources Defense Council (NRDC) cited a reduction of over 1 million kilowatt hours of electricity and over 9,000 therms of natural gas for the City in 2010, resulting in a savings of over 1 million pounds of pollutants. The City has established and participated in various funding programs to finance improvements and retrofitting strategies for existing municipal facilities, city street lighting and private businesses, through programs such as the Green Energy Partnership and Los Angeles County PACE Loan Program. In addition, the City actively promotes the benefits of solar power and local solar retailers and installers on its website, GreenSantaClarita.com. As a result of these and other factors, the number of solar permits issued has increased significantly over the past six years. The City is also in the process of revising its current Small Wind-Energy Ordinance which enables residents and businesses to take advantage of this alternative energy source.

#### ***Water and Waste Water Systems Activity***

Electricity used for pumping and treatment of water contributes to the release of GHG emissions. The City has implemented programs to promote water conservation for its Parks and Landscape Maintenance District (LDM) areas through the use of “smart” and weather-based irrigation controllers. The City also complies with federal and state regulations, such as the Model Water Efficient Landscape ordinance and their National Pollution Discharge

Elimination System (NPDES) stormwater permit, and collaborates with water purveyors and retailers to support responsible waste water management and conservation of water resources.

### ***Waste Reduction and Recycling Activity***

The City has implemented many recycling programs, including mandatory residential and commercial recycling, that have helped achieve a diversion rate of 56% in 2006. A complete list of waste reduction and recycling programs and strategies available to the community can be viewed in the Santa Clarita Green Guide (at [GreenSantaClarita.com](http://GreenSantaClarita.com)). The City has committed to use recycled or reused materials in its capital improvement projects whenever practical; as of today, five of the City's parks have used recycled tire rubber as playground surface, diverting 5,332 tires from the waste stream. Other waste reduction initiatives taken by the City include establishing a construction and demolition materials ordinance, franchising a Materials Recovery Facility to improve the recycling rate and adopting the Environmentally Preferably Purchasing Policy (EPPP). The goal of the EPPP is to reduce environmental impact by identifying environmentally friendly products and distribution systems, rewarding vendors with sustainable practices, and creating a successful model for environmental purchasing.

### ***Green Building Activity***

A section of the Environmentally Preferable Purchasing Policy (EPPP) adopted by the City in 2005 requires that all municipal construction projects for new buildings achieve a LEED Silver certification or equivalent. Since then, one building has been constructed, the Transit Maintenance Facility which has been certified LEED Gold, as the building is capable of sustaining 97% of its power needs through onsite solar generation. Among other projects currently under construction are the Newhall Library, anticipating LEED Silver certification, and the Newhall Community Center. The City has also made available the Community Character and Design Guidelines (CCDG) document to guide the creation of new residential and non-residential developments and give clear direction for the renovation and redevelopment of built areas including a focus in green building to green site development.

### ***Low-Carbon Fuels and Efficient Transportation Activity***

City residents have access to mass transit within the City and surrounding areas of Los Angeles County from a fleet of 91 buses maintained by the City. In 2010 approximately 3.7 million riders used Santa Clarita Transit, which resulted in approximately 1.6 million miles travelled within the City, equivalent to an estimated 34,000 gallons of fuel savings throughout the community. From the transit fleet, 37 vehicles are powered by compressed natural gas (CNG). Similarly, 88% of vehicles franchised by the City for waste collection are powered with CNG or liquefied natural gas (LNG). The City's Transit Maintenance Facility serves as a refueling station for these vehicles. In addition, 14% of the municipal on-road vehicle fleet (other than the Transit and Waste Fleet) are powered by alternative fuels, mainly CNG. In 2008, the City Council approved the Non-Motorized Master Plan (NMMP), which seeks to promote bicycling and walking as integral modes of transportation and identifies a variety of strategies and recommendations to improve the quality and use of the City's bicycle and pedestrian network.

### ***Land Use, Open Space and Offsetting Carbon Emissions Activity***

The City is committed to developing a land use pattern that offers a diverse housing mix, provides access to a variety of alternative transportation modes, and seeks to reduce vehicle miles traveled via mixed use and a reduced automobile dependence. The City's new General Plan, adopted in June of 2011, furthers that commitment by providing more opportunities for Transit Oriented Development (TOD) in its objectives and policies. Another component of the General Plan consists of the Conservation and Open Space Element, a policy framework for the long-term preservation of open space within the planning areas. In 2007, the City formed the Open Space Preservation District, which helps the City acquire and preserve open space lands in and around the City. The goal of the District is to form a green belt of land surrounding the City and preserve the land as open space in perpetuity. Since its inception, the District has assisted in funding the acquisition of nearly 2,000 acres of open space. In addition, the City has implemented other practices to offset carbon emissions by establishing the Oak Tree Preservation ordinance that provides regulatory measures to protect and preserve oak trees in the City. The City has also been designated "Tree City USA" by the Arbor Day Foundation for 22 years for its efforts towards tree planting. The Urban Forestry Division of the City estimates that over 50,000 trees exist within the City with approximately 1,000 additional trees planted each year.

### ***Promoting Community and Individual Action Activity***

In July of 2009, the City launched GreenSantaClarita.com, a website dedicated to providing information to the entire community about sustainability topics such as sustainable practices for residents, businesses and builders, incentives and rebate programs, local green products, upcoming environmental related events, trainings and workshops, and a variety of sustainable programs currently implemented by the City. The website received an "Award of Merit" for Innovation in Green Community Planning from the American Planning Association in 2010. Additionally, the City hosts a series of annual events to encourage and emphasize sustainability issues, such as the Bike to Work Day, Earth/Arbor Day, River Rally, among others. Since launch the site has received over 50,000 hits from users in 76 countries around the world.

## **4.2 GHG Mitigation Measures**

### ***Statewide Measures***

The following statewide measures will have proportional GHG emissions reductions in the City's GHG emissions inventory:

#### **Renewable Portfolio Standard**

The California Renewable Portfolio Standard (RPS) was established in 2002 and later expanded to require investor-owned-utilities (IOUs) and other electric service providers in California to procure at least 33% of renewable energy resources by 2020. Increasing the fraction of renewable resources in the energy mix reduces the relative amount of fossil fuel use and thus reduces greenhouse gas emissions. As one of the largest IOUs in the state, Southern California Edison (SCE) has already committed to using 19.4% renewable resources in their electricity mix by 2010.<sup>24</sup> For the purpose of this inventory and future emissions projections, the 2005

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24 Southern California Edison: <http://www.sce.com/PowerandEnvironment/Renewables/default.htm>

baseline inventory has incorporated 17.2% renewable resources, as was committed by SCE.<sup>25</sup> The 2020 business-as-usual scenario, which includes the goal of 33% renewables as described in the revised AB32 Scoping Plan, is developed by first factoring in the increased electricity demand by 2020 to the 2005 baseline and then factoring in an additional 19.08% to address the difference in renewable mix between the 2005 actuals and the 2020 goal. Applicable emission sources include all residential, commercial, municipal, industrial, streetlights, pumping for potable water and agriculture, as well as electricity use for waste water treatment.

### Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS) was signed in as an Executive Order in 2007 and later became law in January of 2010. The LCFS targets at reducing the life-cycle carbon intensity in transportation fuels, reducing GHG emissions associated with fuel production, distribution, and combustion. Emission reductions can be achieved by improving the efficiency of the upstream production or by using or blending in low-carbon alternative fuels such as ethanol or electricity. Though currently not being enforced due to a legal challenge, the current goal of the LCFS is to reduce GHG emissions by 10% by year 2020. To account for this reduction in the controlled scenario, ENVIRON has applied a 10% reduction to all on-road, off-road, and rail emission categories.

### Pavley, Assembly Bill 1493

As a commitment to a nation-wide program to reduce GHG emissions from passenger cars between 2012 and 2016, California has adopted the Pavley regulations, also known as the Clean Car Standard, requiring manufacturers to improve fuel efficiency in new passenger cars and light duty trucks. There are two timelines to the Pavley regulation: Pavley I is applicable to vehicle model years 2009 to 2016, and Pavley II is applicable to vehicle model years 2017 to 2025. GHG reductions as a result of Pavley I are factored into the 2020 projected business-as-usual emissions scenario. The reductions are calculated using the ARB's Pavley I and Low Carbon Fuel Standard Postprocessor version 1.0<sup>26</sup> and are applied to the passenger cars and light-duty trucks emissions categories. However, GHG reductions from Pavley II are neither quantified nor included in this inventory due to the lack of approved quantification tools available.

### Assembly Bill 341 – Solid Waste Diversion

Building on the success of AB 939, which requires Cities, Counties, and regional agencies to achieve solid waste diversion by 50% by 2000, AB 341 directs CalRecycle to increase statewide waste diversion to 75% by year 2020. This is achieved, via strategic planning, by reducing waste source and increasing recycling and composting from the residential and commercial waste streams. By reducing the amount of waste going to landfills directly reduces anaerobic CH<sub>4</sub> emissions as well as combustion and flare emissions of landfill gas. Since the City of Santa Clarita has already met 50% waste diversion in the 2005 Baseline GHG Emissions Inventory, and ENVIRON has confirmed this based on waste data, the additional fraction of waste diversion

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<sup>25</sup> California Energy Commission Renewable Energy Program 2008 Annual Report to the Legislature (Table 4), October 2008: <http://www.energy.ca.gov/2008publications/CEC-300-2008-008/CEC-300-2008-008-CTD.PDF>

<sup>26</sup> <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>

needed to meet the 75% diversion goal is calculated and applied to the 2020 projected emissions controlled scenario.

### ***Regional Measures***

The following regional measures will have proportional GHG emissions reductions in the City's GHG emissions inventory:

#### **Senate Bill 375 (SB 375)**

SB 375 was passed in 2008 with the aim of reaching the goals established by AB32 for reducing GHG emissions from cars and light duty trucks through improved transportation planning. To address these requirements, the Southern California Association of Governments (SCAG) released the 2012-2035 Draft Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS) in December 2011. This document outlines SCAG's plan to integrate the transportation network as well as develop a land use pattern to achieve the reduction goals set by the ARB. The SCS plan for transit-oriented development is to focus the majority of new housing and job growth in high quality transit areas as well as in existing commercial areas (e.g. main streets, downtowns). Specifically, the SCS focuses jobs and housing in designated High Quality Transit Areas, calls for an expanded transit network, and improving transportation management by increasing capacity and improving efficiency, among others. SCAG estimates that these measures in the SCS will reduce GHG emissions by 8% by 2020 and 13% by 2035 on a per capita basis as compared to 2005, achieving the goals set by the ARB.<sup>27</sup> The City of Santa Clarita participated in the SCS process through formal collaboration with SCAG. The City also provided SCAG with formal comments on the RTP/SCS during the comment period in February, 2012.

### ***CAP Measures***

The measures considered for the CAP were from two primary sources. The first was Quantifying Greenhouse Gas Mitigation Measures, a Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, published by the California Air Pollution Control Officers Association (CAPCOA).<sup>28</sup> The CAPCOA report provides methods for quantifying emission reductions from specified mitigation measures. The measures included in this report were selected because they are frequently considered as mitigation for GHG impacts, and standardized methods for quantifying emissions from these measures were not previously available. Measures were screened on the basis of the feasibility of quantifying the emissions, the availability of robust and meaningful data upon which to base the quantification, and whether the measures (alone or in combination with other measures) would result in appreciable reductions in GHG emissions. The second source of mitigation measures was the General Plan prepared by the City in partnership with the County of Los Angeles which is intended to guide growth and development in the Santa Clarita Valley. The General Plan identified the goals and policies related to land use, transportation, conservation of natural

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27 Southern California Association of Governments (SCAG). The 2012-2035 Draft Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Available at: <http://rtpscsc.scag.ca.gov/Pages/Draft-2012-2035-RTP-SCS.aspx>. Accessed 23 January 2012.

28 Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, California Air Pollution Control Officers Association (CAPCOA), August, 2010.

resources among other things. These goals and policies as well as specific GHG Measures identified as a high priority for the City are included in the list of measures that are analyzed in this section.

### ***CAP Energy Measures***

#### **Higher Efficacy Public Street and Area Lighting**

Power consumed by lighting sources contributes to GHG emissions. Lamp efficiency and the amount of lighting produced (lumens) per watt of power supplied vary by light fixture design. A strategy to reduce GHG emissions is the installation of more efficient public street and area lights that are able maintain the level of lumens per area while consuming less electricity. In 2010 the City pursued a program funded by the Department of Energy American Recovery and Reinvestment Act (ARRA) to reduce the energy consumption of municipal operations. As part of the program high pressure sodium and metal halide lights were replaced by energy efficient induction lighting throughout the City. The program replaced a total of 756 lights from City bridges, parking lots and parks, resulting in estimated annual savings of nearly 284,000 kilowatt hours of electricity. GHG reductions from this measure can be calculated by using local utility emission factors the energy saved from installing efficient lamps.

#### **Replace Traffic Lights with LED Traffic Lights**

Similar to the LE-1 measure, replacing traffic lights with higher efficacy ones, such as light-emitting diode (LED) traffic lights, can result in a reduction of GHG emissions since they consume about 90% less energy than traditional incandescent traffic lights. The City's Traffic and Transportation Planning Division recently completed a five year program which replaced the old incandescent lamps with LED technology. This effort installed LED modules at 176 signalized intersections in the City. GHG emissions reductions from this measure may be quantified by multiplying a local utility emission factor to the amount of offset electricity-use from the installation of LED traffic lights.

#### **Establish Onsite Renewable Energy Systems - Solar Power**

Electricity generated from photovoltaic (PV) systems is associated with zero GHG emissions<sup>29</sup>, thus installation of PV systems in residential or commercial buildings displaces electricity consumed from local utilities that generally have larger carbon footprints; this translates into a reduction of GHG emissions. From 2005 through 2011 the City has issued approximately 430 permits for solar installations in residential and commercial sites. The City encourages the use of solar power through its website GreenSantaClarita.com and is actively looking for additional funds to continue the Green Energy Partnership which provides incentives for solar projects. GHG reductions from this measure are quantified by estimating the amount of kilowatt hours displaced from the grid by PV systems and applying local electricity emission factors.

### ***CAP Transportation Measures***

#### **Overall Land Use Transportation Measure**

Emission reductions from land use planning are generally achieved by reducing total vehicle miles travelled (VMT) and improving traffic flow (i.e. reducing idling and low-speed emissions).

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<sup>29</sup> This measure does not quantify GHG emissions associated with the manufacturing of PV panels.



While many of these are implemented on a project level, for the purpose of a region analysis, ENVIRON has utilized the in-City VMT projection in the prior City General Plan, which did not include land-use improvement measures, as well as the valley-wide VMT projections in the new General Plan, which are modeled to incorporate a mix of land use planning measures. With the guidance from City Staff, ENVIRON has estimated an overall 10% VMT reduction within City boundaries by 2020 as compared to the business-as-usual scenario. This reduction incorporates a mix of measures including, but not limited to, increase density of in-City development and diversity of urban and suburban developments, increase the location efficiency, destination and transit accessibility, integrate affordable and below market rate housing, implement trip reduction programs such as ride-share, improve the transit system by expanding the transit network and increase service frequency, and improve the flow of traffic at city intersections and congested roadways. Reductions in VMT by implementing these programs are directly correlated with reductions in GHG emissions.

#### Provide Pedestrian Network Improvements

Improving pedestrian access to off-site areas through pedestrian network enhancements is a strategy to encourage users to walk and bike instead of drive, hence reducing VMT and vehicle-associated GHG emissions. Enhancements can range from improving interconnectivity by expanding the pedestrian network to minimizing barriers to pedestrian access such as walls, landscaping, slopes, or anything that impedes circulation. The City has developed the Non-Motorized Master Plan (NMMP) to guide future development of bicycle and pedestrian facilities, paseos and trails and to provide recommendations to improve the quality of current pedestrian networks. Reductions in VMT by implementing these programs can be translated into reductions in GHG emissions by applying local on-road vehicle fleet emission factors.

### ***CAP Water Measures***

#### Use Reclaimed Water

Reclaimed water is water treated from a wastewater treatment plant but instead of being released to the environment is re-used for non-potable purposes. Using reclaimed water requires less energy to collect and redistribute to their consumption points since it is generated in local treatment plants, as opposed to fresh water supplies that may be transported over long distances from its natural sources. Since reclaimed water is less energy intensive, its consumption has a smaller carbon footprint. The City's demand for landscape water could partially be met through reclaimed water with the pursuit of this measure. To estimate associated reductions, GHG emissions are calculated for a baseline scenario without use of reclaimed water, and a mitigated scenario where part of the non-potable water use is replaced with reclaimed water. The reduction in GHG emissions will result from the difference in energy intensity of the type of local water supplied (reclaimed vs. non-potable).

#### Low-Flow Water Fixtures

Decreasing water use reduces GHG emissions associated with the electricity consumed to pump, treat and distribute the water. A strategy to reduce indoor water demand is installing low-flow or high efficiency water fixtures such as low-flow toilets, urinals, showerheads, or faucets, or high-efficiency clothes-washers and dishwashers in residential and commercial buildings. For each improved water fixture installed, there is an associated reduction in indoors



water demand and hence in GHG emissions. To quantify reductions from this measure, GHG emissions are calculated for a baseline scenario (regular water demand) and a mitigated scenario, with reduced water demand from the percentile reduction provided by each water fixture installed. The difference in GHG emissions from both scenarios represents the reduction achieved by this measure.

### Landscape Irrigation Systems

Water consumption for outdoor uses can be diminished by utilizing water-efficient landscape irrigation systems. Efficient Irrigation techniques, such as “smart” irrigation technology, reduce water use and its associated GHG emissions. “Smart” irrigation systems relay on weather, climate and soil moisture information to adjust watering frequency, hence maintaining the vegetation adequately moist while conserving water. The City’s Landscape Maintenance District installed smart irrigation controllers in 2007, and the City has reached an estimated annual savings of 200 million gallons of outdoor water of since 2011. Quantification of this measure can be achieved by calculating the water savings from this technology, multiplying by the water energy intensity of the local water supply and applying a local utility emission factors to calculate GHG emissions.

### ***CAP Vegetation Measures***

#### Urban Tree Planting

Carbon dioxide is sequestered in trees during their active growing years (generally their first 20 years<sup>30</sup>). The species of tree planted will influence the level of carbon sequestration achievable by this measure. GHG emission reductions from this measure can be estimated based on the numbers of trees planted multiplied by the default annual mass of CO<sub>2</sub> accumulation per tree which depends on the tree species. The City’s Urban Forestry Division has been planting an average of 1000 trees annually since 2005 and plans to continue planting nearly 1500 per year through 2020.

#### New Vegetated Open Space

Vegetated open space serves as natural “carbon sinks”, places where carbon dioxide is naturally sequestered. By creating new vegetated open space, or preventing the transformation of open space into urban/rural development areas, GHG emissions reductions are achieved by the amount of carbon dioxide sequestered per acre of preserved land. The amount of carbon sequestered will depend on the type of vegetated land (forests, croplands, grasslands, etc.) The City has developed an Open Space Plan that calls for the creation of a "green belt" around the City, serving as a vegetated buffer between the City and County development. Through this plan, the City will seek to acquire as much as 9300 acres of open space with the purpose of saving the land from development threat from other jurisdictions, or for restorative purposes of the land from contamination where necessary. The GHG reductions associated with this measure are calculated based on the amount of preserved land (acres) multiplied by the expected annual CO<sub>2</sub> accumulation per acre, which depends on the type of vegetated land.

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30 Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, California Air Pollution Control Officers Association (CAPCOA), August, 2010.

### 4.3 Estimated Reductions from Control Measures

The annual GHG reductions from the application of the statewide measures and the CAP measures presented in Section 4.2 were estimated for year 2020 and are presented below. Statewide measure reductions are based on the City's activity projections for year 2020 and the expected mitigation effects of each measure. Reductions from CAP measures were estimated using CAPCOA's methodology<sup>31</sup> as briefly described per measure in Section 4.2. The input data used in these calculations were based on the various program accomplishments by the City since 2005, and activity projections for future or continuing City programs through year 2020. For example, the City's Forestry Division urban tree planting program that has been planting nearly 1000 trees annually since 2005 and will continue through 2020. Details of the GHG reduction calculations from individual CAP measures can be found in the Appendix. Estimated reductions for year 2020 statewide measures and the sum of quantified CAP measures are shown in Table 4-1.

**Table 4-1. Control measures and estimated GHG reductions (MTCO<sub>2</sub>e) in year 2020.**

Control Measure Applied to City Emissions	GHGs Reductions in 2020 (MTCO <sub>2</sub> e per year)
Statewide Measures (RPS + PAVLEY I)	360,321
Statewide Measures (LCFS + AB 341)	148,952
City's Climate Action Plan Measures	193,020
Cumulative Annual Reductions	702,293

Detailed reductions from individual CAP measures and their overall percent contribution to the total are presented in Table 4-2 and Figure 4-1.

31 Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, California Air Pollution Control Officers Association (CAPCOA), August, 2010.

**Table 4-2. Annual GHG Emissions Reductions for 2020 from individual Climate Action Plan (CAP) Measures.**

Measure # <sup>a</sup>	CAP Measure Description	2020 GHG Emissions Reductions (MT CO <sub>2</sub> e per year)
<b>Energy Measures</b>		
LE-1	Install Higher Efficacy Public Street and Area Lighting	83
LE-3	Replace Traffic Lights with LED Traffic Lights	31
AE-2	Establish Onsite Renewable Energy Systems - Solar Power	5,971
	<b>Total</b>	<b>6,085</b>
<b>Transportation Measures</b>		
LUT-0 <sup>b</sup>	Overall Land Use / Location Measures	118,563
SDT-1	Provide Pedestrian Network Improvements	6,068
	<b>Total</b>	<b>124,631</b>
<b>Water Measures</b>		
WSW-1	Use Reclaimed Water	2,605
WUW-1	Install Low-Flow Water Fixtures	18,256
WUW-4	Use Water-Efficient Landscape Irrigation Systems	646
	<b>Total</b>	<b>21,507</b>
<b>Vegetation Measures</b>		
V-1	Urban Tree Planting	715
V-2	Create New Vegetated Open Space	40,083
	<b>Total</b>	<b>40,798</b>
<b>TOTAL POTENTIAL REDUCTIONS FROM CAP MEASURES</b>		<b>193,020</b>

a. Measure numbers follow the CAPCOA protocol<sup>32</sup>

b. Reductions under LUT-0 are estimated based on a mix of measures including, but not limited to, increase density of in-City development and diversity of urban and suburban developments, increase the location efficiency, destination and transit accessibility, integrate affordable and below market rate housing, implement trip reduction programs such as ride-share, improve the transit system by expanding the transit network and increase service frequency, and improve the flow of traffic at city intersections and congested roadways.

32 Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, California Air Pollution Control Officers Association (CAPCOA), August, 2010.

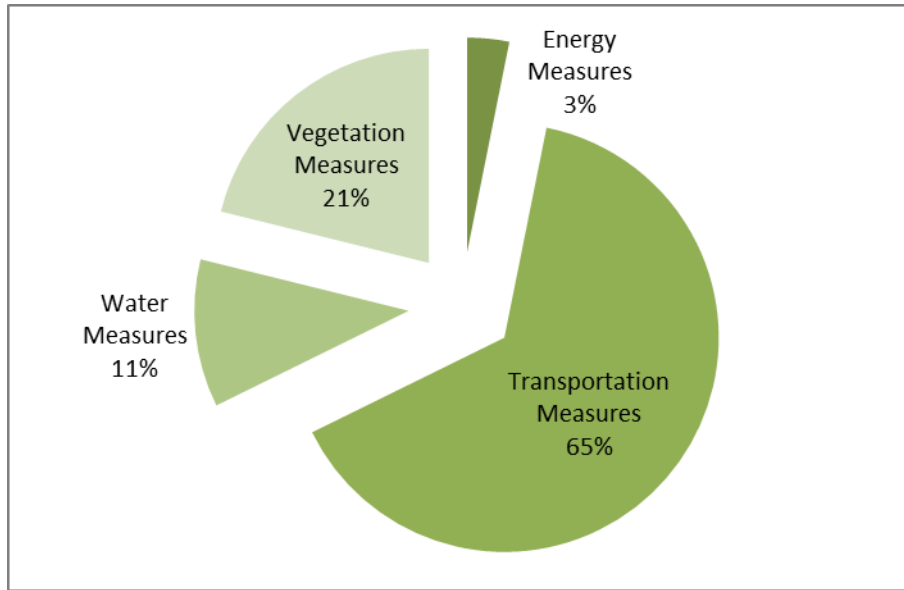


Figure 4-1. Percent Contribution to total GHG Reductions from CAP measures by Source Category.

A large portion of the reductions would be achieved by the decrease in vehicle miles traveled in the City from the LUT-0 measure, which is a compilation of land use changes enacted by the City in their current General Plan to reduce VMT and in turn reduce the emissions from on-road vehicles, the largest component of the 2020 GHG inventory. Other significant reductions are due to the creation or acquisition of new vegetated space, in line with the goals of the City’s Open Space Preservation District, and the uptake of low-flow water fixtures in residential and commercial developments

## 5.0 2020 CONTROLLED GHG EMISSIONS

The revised AB 32 Scoping Plan adopted by the California Air Resources Board indicates that California needs to reduce GHG emissions by approximately 16% below the business-as-usual GHG emissions for year 2020 to achieve the 1990 levels.

The calculated GHG reductions from all statewide and CAP control measures were deducted from the City's 2020 GHG projected BAU scenario emissions. Statewide controls were integrated directly in the 2020 emissions inventory calculations, hence resulting in the "2020 Controlled" emissions inventory, which includes reductions from Pavley I, RPS, LCFS and AB341. The 2020 Controlled emissions are presented in Table 5-1.

**Table 5-1. Summary of 2020 Controlled CO<sub>2</sub>e Emissions (metric tons/yr) by Sector for the City of Santa Clarita.**

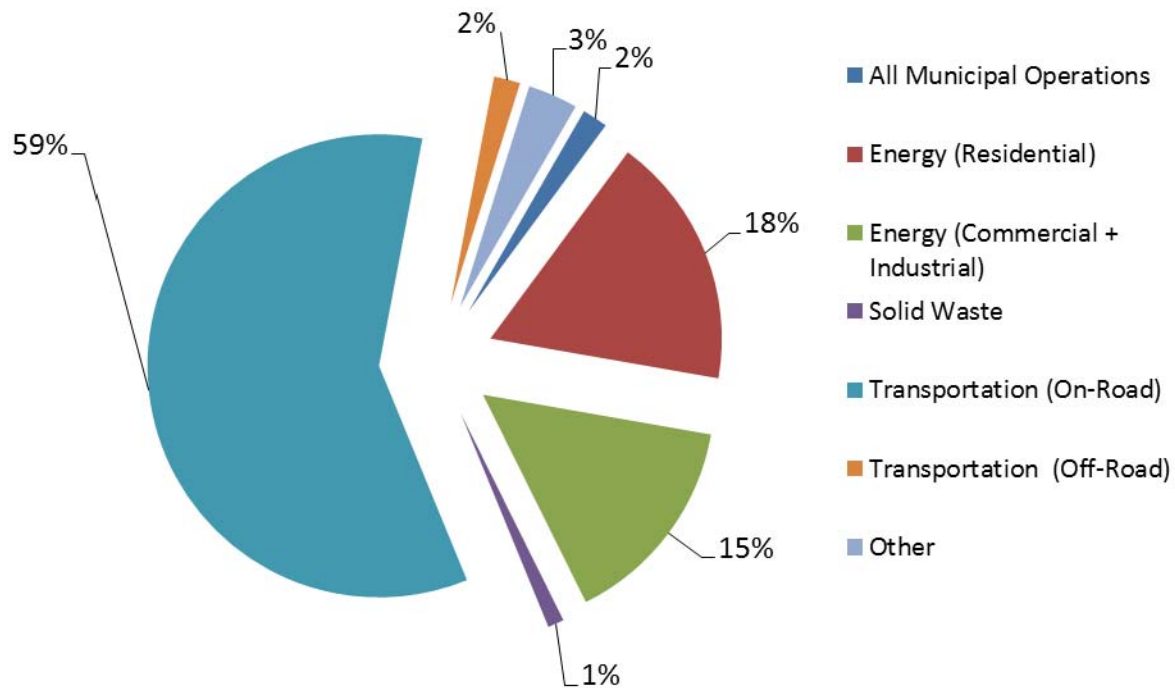
SECTOR	CO <sub>2</sub> e Controlled Emissions (metric tons/yr)		
	Community-wide	Municipal	Total (Community + Municipal)
<b>TRANSPORTATION SECTOR</b>	<b>1,119,113</b>	<b>14,212</b>	<b>1,133,325</b>
<b>On-Road</b>			
Light Duty Vehicles	912,006	-	912,006
Light Duty Trucks	81,964	-	81,964
Medium Duty Trucks	41,681	-	41,681
Heavy Duty Trucks	15,893	-	15,893
Urban Buses	33,793	-	33,793
Motorcycles	9	-	9
City-Owned Fleet (LDVs, LDTs, HDTs)	-	548	548
County Sheriff Fleet (LDVs)	-	2,353	2,353
Solid Waste Hauling Trucks	-	2,875	2,875
City Buses	-	8,269	8,269
<b>Subtotal</b>	<b>1,085,346</b>	<b>14,045</b>	<b>1,099,391</b>
<b>Off-Road</b>			
Construction and Mining Equipment	3,932	-	3,932
Industrial Equipment	144	-	144
Lawn and Garden Equipment	60	-	60
Light Commercial Equipment	95	-	95
Transport Refrigeration Units	65	-	65
Rail	29,472	-	29,472
Municipal Off-Road Equipment	-	167	167
<b>Subtotal</b>	<b>33,767</b>	<b>167</b>	<b>33,934</b>
<b>BUILDING and INDUSTRIAL SECTOR</b>	<b>597,315</b>	<b>7,588</b>	<b>604,903</b>
<b>Residential</b>			
Electricity	141,692	-	141,692
Natural Gas	181,519	-	181,519
<b>Subtotal</b>	<b>323,211</b>	<b>0</b>	<b>323,211</b>
<b>Commercial + Industrial</b>			
Electricity	216,033	-	216,033
Natural Gas	57,361	-	57,361
<b>Subtotal</b>	<b>273,393</b>	<b>0</b>	<b>273,393</b>

**Table 5-1. Summary of 2020 Controlled CO<sub>2</sub>e Emissions (metric tons/yr) by Sector for the City of Santa Clarita (continued).**

SECTOR	CO <sub>2</sub> e Controlled Emissions (metric tons/yr)		
	Community-wide	Municipal	(Community + Municipal)
<b>BUILDING and INDUSTRIAL SECTOR</b>			
<b>Industrial Operations</b>			
Other Fuel Use	40	-	40
<b>Industrial Processes</b>			
Oil & Gas	670	-	670
Other Processes	0	-	0
<b>Subtotal</b>	<b>710</b>	<b>0</b>	<b>710</b>
<b>Municipal</b>			
Electricity	-	5,373	5,373
Natural Gas	-	2,215	2,215
<b>Subtotal</b>	<b>0</b>	<b>7,588</b>	<b>7,588</b>
<b>OTHERS</b>	<b>89,022</b>	<b>10,960</b>	<b>99,982</b>
<b>Waste</b>			
Wastewater Treatment	7,611	-	7,611
Landfills	25,343	-	25,343
<b>Outdoor Area Lighting</b>			
Streetlights & Traffic Control	-	8,263	8,263
<b>Agricultural</b>			
Electricity	11,144	-	11,144
<b>Water Usage</b>			
Water Pumping Unit	44,923	2,691	47,614
<b>Refrigerant</b>			
Refrigerant	-	6	6
<b>TOTAL FROM ALL SECTORS</b>	<b>1,805,450</b>	<b>32,760</b>	<b>1,838,210</b>

For purposes of comparing the reductions with the revised Scoping Plan adopted by CARB, reductions from two of the statewide measures (RPS and Pavley I) were included into the 2020 Business As Usual Forecast. Thus, the revised BAU forecast would be 1,987,162 (see Table 3-2). Table 5-2 demonstrates that by applying additional statewide measures per AB 32 and the measures identified in Santa Clarita's Climate Action Plan, a 17% reduction will be achieved below the 2020 BAU projection.

The contribution from each sector to the total 2020 controlled emissions is shown in Figure 5-1.



**Figure 5-1. 2020 Controlled Greenhouse Gas Emissions Contribution by Source Category.**

The total GHG reductions from the City’s CAP measures, 193,020 MTCO<sub>2</sub>e, are then subtracted from the 2020 controlled inventory total to generate the 2020 Net Emissions which combines City and State control measures. The change in the City’s 2020 GHGs emission inventory as a result of the City and Statewide measures is shown in Table 5-2.

**Table 5-2. Effects of different control measures in 2020 GHG Emissions.**

Scenario	Control Measure Applied	GHGs Emissions (Metric Tons of CO <sub>2</sub> e per year)	% Reduction below 2020 BAU
2005 Baseline	None	1,717,648	-
2020 Business-as-Usual	RPS and PAVLEY I	1,987,162	-
2020 Controlled	Statewide Measures (RPS + PAVLEY I + LCFS + AB 341)	1,838,210	7.50%
2020 Net Emissions with CAP	Statewide Measures and CAP City Measures	1,645,190	17.21%

As mentioned, the 2020 project BAU emissions shown in Table 5-2 already include reductions from RPS and Pavley I, and this case is used as the basis for estimating GHG reductions needed by 2020, consistent with the current forecasts by the California Air Resources Board’s updated Scoping Plan which shows a need to reduce GHG emissions by 16% (from a BAU case) to reach 1990 Statewide GHG emission levels. The estimated reductions from LCFS, AB 341, and CAP measures show the resulting 2020 Net Emissions are expected to be approximately 17% below the 2020 BAU level, which exceeds the California statewide goal of 16%. In addition, 2020 Net Emissions are consistent with the City’s goal to reduce 2020 GHG emissions below the 2005



GHG emissions level, and are in fact lower than 2005 emissions by approximately 4%. The City’s overall GHG emissions from the 2005 Baseline, the 2020 BAU estimates and the 2020 Net Emissions with the CAP in place are shown in Figure 5-2 in units of million metric tonnes of carbon dioxide equivalent (MMT<sub>CO<sub>2</sub>e</sub>).

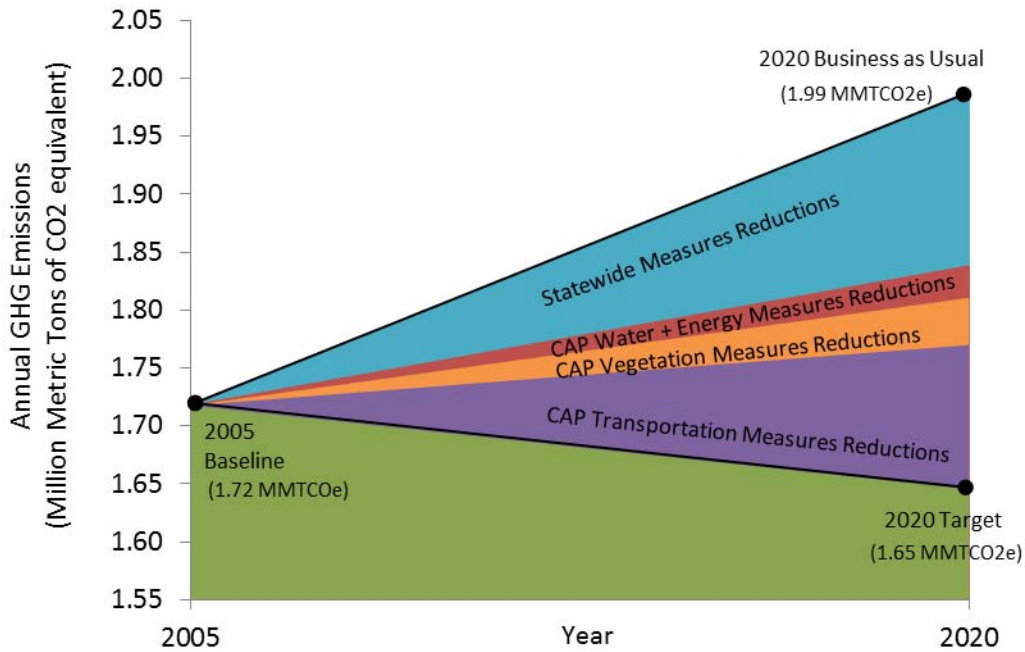


Figure 5-2. Comparison of Business-as-Usual Projections with the CA Target.

## 6.0 IMPLEMENTATION

The City recognizes the importance not only of preparing a Climate Action Plan but also the importance of achieving the emissions reduction targets and how those targets can translate into concrete actions that will reduce the amount of GHG emissions produced in the Community. It is important to emphasize that the Climate Action Plan not only identifies a reduction target or commitment, but it also sets forth the complement of goals, policies, measures, and ordinances that will achieve the target. These policies and other strategies include measures in transportation, land use, energy conservation, water conservation, and other elements. This section describes how the City will implement the goals, policies, GHG reduction measures and ordinances. Included are a series of tables that identify the measures in each category that will be implemented. This chapter contains the following five sections:

- **Administration and staffing:** Describes the city staffing to support and guide the GHG reduction efforts including the designation of a lead person and staffing for the CAP implementation and a description of Departments involved and the coordination with other Departments and Agencies.
- **Financing Opportunities:** Identifies various rebates, incentives and funding programs in California and at the federal level that the City can leverage when encouraging its residents and commercial or industrial projects to implement GHG mitigation measures.
- **Timeline and Prioritization:** Identifies measures, policies and ordinances that are a high priority to the City and the timeframe for achieving the targets set in the CAP. In addition, this section identifies measures that are will be included in the Monitoring Plan, those that will be considered in the future and those measures that will no longer be considered. The City's role for each measure is also identified
- **Project Review:** Identifies and defines the role of the CAP in the City of Santa Clarita's environmental review of projects under the California Environmental Quality Act.
- **Monitoring Plan:** Identifies elements of the Monitoring Plan including Performance indicators, Data Gathering, GHG Emissions Quantification and Progress Reporting. To be developed upon approval of the CAP by the City?

### 6.1 Administration and Staffing

An integral part of successful implementation of the CAP will be the designation of a City staff member as the Project Manager for the CAP. The Manager will have the responsibility of overseeing the monitoring process and tracking each mitigation measure as it is implemented. The Manager will coordinate with the departments and/or managers responsible for overseeing the implementation of each mitigation measure. The responsible person will gather and document performance and activity data, estimate emissions reductions, evaluate mitigation measure performance, and prepare progress reports. Recommendations for each step in this process are provided in the sections below. The process of GHG monitoring will vary by year depending on the type of performance evaluation required (i.e., performance indicator evaluation or GHG inventory update).

## 6.2 Financing Opportunities

### *Financing Opportunities*

This section provides examples of funding sources for the City to leverage to help finance costs of implementing GHG mitigation measures. The advances in technology relevant to residential, commercial and industrial operations have shown the potential for improvements in efficiency and emissions as well as reductions in costs. When considering GHG mitigation measures, the City will encourage its residents and commercial and/or industrial projects to identify the best funding options to pursue. The various rebates, incentives and funding programs in California and at the federal level provide several opportunities for the City to pursue in its municipal operations as well as community projects to reduce GHG emissions by improving energy efficiency, installing on-site renewable energy equipment, or encouraging or assisting developers, project proponents and residents in their efforts to improve efficiency and save costs. Potential sources of funding include the following:

- U.S. Department of Energy (DOE)
- U.S. Environmental Protection Agency (EPA)
- California Energy Commission (CEC)
- California Public Utilities Commission (CPUC)
- California Solar Initiative (CSI)
- California Infrastructure and Economic Development Bank (I-Bank)
- California Department of Resources Recycling and Recovery (CalRecycle)
- South Coast Air Quality Management District (SCAQMD) and Air Resources Board (ARB) Grants
- Southern California Association of Governments (SCAG)
- Southern California Edison (SCE)
- Southern California Gas Company (SCG)
- EPA Climate Showcase Communities Grants

This section reviews the funding opportunities currently available in California for renewable energy and energy efficiency projects as well as the substantial Federal and State tax credits that are available.

### *California Funding Opportunities*

#### California Infrastructure and Economic Development Bank (I-Bank)

As the State's only general purpose financing authority, the I-Bank mission is to finance public infrastructure and private development that promote economic development in communities.<sup>33</sup> The I-Bank has broad statutory powers to issue revenue bonds, make loans and provide credit enhancements for a wide variety of infrastructure and economic development projects and other government purposes. Specific programs include the Infrastructure State Revolving Fund Program which provides low-cost financing to public agencies for a wide variety of infrastructure programs, the Revenue Bond Program which provides tax-exempt financing to

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<sup>33</sup> California Infrastructure and Economic Development Bank: <http://www.ibank.ca.gov/>

nonprofit public benefit corporations for the acquisition and/or improvement of facilities and capital assets, the Industrial Development Revenue Bond Program, which provides tax-exempt financing up to \$10 Million for qualified manufacturing and processing companies for the construction and acquisition of facilities and equipment, the Exempt Facility Revenue Bond Program which provides tax-exempt financing for projects that are government-owned or consist of private improvements within publicly-owned facilities and the Government Bond Program. To date, the amount of financing has approached \$32 billion in various financing arrangements.

### ***Self-Generation Incentive Program***

The California Public Utilities Commission's (CPUC) Self-Generation Incentive Program (SGIP) is a statewide program developed to provide incentives for the installation of certain renewable and clean energy generation. The SGIP was established in 2001 as a peak-load reduction program seeking to encourage the development and commercialization of new distributed generation - generation installed on the customer's side of the utility meter. In September 2011, the CPUC improved and streamlined the SGIP to modify its eligibility criteria and incentive amounts and payment structures for eligible technologies.

Eligibility for participation in the SGIP was to be changed based on greenhouse gas (GHG) emissions reductions. Technologies that achieve reductions of GHG emissions are eligible for the program, including wind turbines, fuel cells, organic rankine cycle/waste heat capture, pressure reduction turbines, advanced energy storage, and combined heat and power gas turbines, micro-turbines, and internal combustion engines.

Participants receive up-front and performance-based incentives (PBI). The incentives apply only to the portion of the generation that serves a project's on-site electric load. The program is available to customers of Pacific Gas and Electric Company, Southern California Edison, Southern California Gas Company, and San Diego Gas & Electric. Table 6-1 below identifies the incentive levels by technology type.

**Table 6-1. Incentive levels by technology type.**

Technology Type	Incentive (\$/W)
Renewable and Waste Energy Capture	
Wind Turbine	1.25
Waste Heat to Power Technologies	1.25
Pressure Reduction Turbine	1.25
Conventional Combined Heat and Power (CHP)	
Internal Combustion Engine-CHP	0.50
Microturbine – CHP	0.50
Gas Turbine – CHP	0.50
Emerging Technologies	
Advance Energy Storage	2.00
Biogas	2.00
Fuel Cell – CHP or Electric Only	2.25

There are no minimum or maximum size restrictions provided that the project meets onsite load with the exception that wind & renewable-fueled fuel cell projects are limited to 30kW minimum. Smaller projects may apply to the California Energy Commission's Emerging Renewables Program described below.

### ***California Solar Initiative (CSI)***

All electric customers of Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E) are eligible to apply for California Solar Initiative incentives. This includes residential homeowners, commercial, industrial and agricultural enterprises, and local governments and non-profit organizations. The day-to-day administrative policy and activities, including application processing and incentive payment, are handled by a Program Administrator for each of the three Investor-Owned Utilities mentioned above.

The CSI Program pays solar consumers an incentive based on system performance. The incentives are either an upfront lump-sum payment based on expected performance, or a monthly payment based on actual performance over five years. The Expected Performance-Based Buy-down (EPBB) is the upfront incentive available only for smaller systems. The EPBB incentive is a capacity-based incentive that is adjusted based on expected system performance calculated using an EPBB calculator that considers major design characteristics of the system, such as panel type, installation tilt, shading, orientation, and solar insolation available by location. The EPBB calculator<sup>34</sup> estimates the expected performance of a solar system based various factors including the tilt, azimuth, location, PV module type and mounting type of a specific system.

The Performance Based Incentive (PBI)<sup>35</sup> is paid based on actual performance<sup>35</sup> over the course of five years. The PBI is paid on a fixed dollar per kilowatt-hour (\$/kWh) of generation basis and is the required incentive type for systems greater than 30 kW in size, although smaller systems may opt to be paid based on PBI. In the beginning of the CSI Program, all systems 100kW and greater were required to take the PBI incentive. In January 2008, all systems 50kW and greater were required to take the PBI incentive. As of January 2010, all systems 30kW and greater are required to take the PBI incentive.

### ***Net Energy Metering***

Customers who install small solar, wind, biogas, and fuel cell generation facilities (1 MW or less) to serve all or a portion of onsite electricity needs are eligible for the state's net energy metering (NEM) program<sup>36</sup>. NEM allows a customer-generator to receive a financial credit for power generated by their onsite system and fed back to the utility. The credit is used to offset the customer's electricity bill. NEM is an important element of the policy framework supporting direct customer investment in grid-tied distributed renewable energy generation, including customer-sited solar PV systems.

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34 Expected Performance-Based Buy-Down: <http://www.csi-epbb.com/index.aspx>.

35 Performance Based Incentive: <http://www.gosolarcalifornia.org/csi/rebates.php>

36 Net Energy Metering Program: <http://www.cpuc.ca.gov/PUC/energy/DistGen/netmetering.htm>

The vast majority of solar PV customer-generators choose to be on a NEM tariff, with over 40,000 residential and non-residential accounts enrolled in California's NEM program.

NEM allows the customer to size their generation to meet their annual load instead of the peak demand. This allows for a slightly smaller system to meet the load than would otherwise be required because of seasonal variation in both the demand for electricity and the solar resource itself.

NEM also reduces concerns about short term fluctuations in generation. Solar PV generation is relatively predictable on an annual basis, but shows strong variability, even on an hourly basis, as passing clouds, inclement weather or other fluctuations in the available solar resource affect the actual output of the solar system. Since customer load also varies, at any given moment it is very difficult to determine if a solar PV system will be serving onsite load or exporting energy to the grid. NEM means that load and generation do not have to be precisely coincident to return value to the customer.

### ***Emerging Renewables Program***

The California Energy Commission's Emerging Renewables Program<sup>37</sup> provides rebates to consumers who install qualifying renewable energy systems (small wind or fuel cell electricity systems) on their property. The financial incentive varies according to the system size, technology, and installation method. Eligible renewable energy systems must be permanently interconnected to the electrical distribution grid of the utility serving the customer's electrical load. The site where the system is installed must receive electrical distribution service from PG&E, SCE, SDG&E, or BVE.

All types of consumers are eligible: residential, institutional (such as schools) commercial, agricultural, and industrial.

Under this program an eligible consumer can receive the following rebates:

**Table 6-2. Rebate from Emerging Renewables Program.**

Technology Type	Size Category	Rebate Offered
Fuel Cells using a renewable fuel	<30 kW	\$3.00 per watt
Wind	First 10 kW	\$3.00 per watt through May 7, 2012 \$2.50 per watt beginning May 7, 2012
	Increments between >10 kW and <30 kW	\$1.50 per watt

### ***Feed-in Tariffs for Highly Efficient Combined Heat and Power (CHP)***

On December 17, 2009, the California Public Utilities Commission adopted a decision implementing Assembly Bill 1613, the Waste Heat and Carbon Emissions Reduction Act

37 Emerging Renewables Program: [http://www.energy.ca.gov/renewables/emerging\\_renewables/index.html](http://www.energy.ca.gov/renewables/emerging_renewables/index.html)

(Blakeslee 2007). This Decision approved the rules for a feed-in tariff program for new, highly efficient and small CHP including the purchase price of power and two standard offer contracts (SOCs). The decision adopts two separate contracts for the purchase of excess electricity from eligible CHP systems. A standard contract will be available to all eligible CHP systems up to 20 megawatts (MW) and a simplified contract will be available to CHP systems that export no more than 5 MW. Investor-owned utilities' (IOUs) offers under the AB 1613 contracts are based on the costs of a new combined cycle gas turbine, and a location bonus shall be applied to eligible CHP systems located in high-value areas.

### ***CalRecycle Grant, Payment, and Loan Programs***

The California Department of Resources Recycling and Recovery (CalRecycle) offers funding opportunities authorized by legislation to assist public and private entities in the safe and effective management of the waste stream.<sup>38</sup> Several hazardous waste management grants are available including Used Oil Grants, Block Grants, Opportunity Grants, Nonprofit Grants Research, Testing and Demonstration Grant, Household Hazardous Waste Grants and Coordination Grants. Other grants include Farm and Ranch Cleanup Grants, Solid Waste Disposal Sites and Codisposal Site Cleanup Grants, Local Enforcement Grants and Reuse Assistance Grants.

### ***Energy Efficiency Financing***

The Energy Conservation Assistance Act (ECAA) is a low interest loan program administered by the California Energy Commission (CEC). The CEC accepts loan applications on a first-come, first-served basis for eligible energy projects from all eligible entities including Cities, Counties, Public Care Institutions, Public Hospitals, Public Schools & Colleges and Special Districts. Residential and commercial projects and non-profit institution are not eligible for these funds. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements. Examples of projects include:

- Lighting systems
- Pumps and motors
- Streetlights and LED traffic signals
- Automated energy management systems/controls
- Building insulation
- Energy generation including renewable and combined heat and power projects
- Heating and air conditioning modifications
- Waste water treatment equipment

Energy efficiency projects must be technically and economically feasible.

### ***Energy Upgrade California***

Energy Upgrade California is an alliance among California counties, cities, non-profit organizations, the state's investor-owned utilities (Pacific Gas and Electric, Southern California Edison, Southern California Gas Company, and San Diego Gas & Electric Company), and publicly

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<sup>38</sup> CalRecycle funding sources: <http://www.calrecycle.ca.gov/grants/>



owned utilities.<sup>39</sup> Funding for this effort comes from the American Recovery and Reinvestment Act (ARRA, also known as federal stimulus funds), California utility ratepayers, and private contributions. Energy upgrade rebates are administered by participating utilities.

Energy Upgrade California makes available incentives of up to \$4,000 to Southern California Edison and SoCal Gas residential customers with detached single-family homes who complete qualifying energy-saving home upgrade projects.<sup>40</sup> The upgrades include wall insulation, proper sizing of hot water systems and heating and cooling systems, energy efficient windows, cool roofs, and other permanently affixed measures. Customers can also receive up to \$1,000 in incentives when upgrades packages include:

- Air sealing
- Attic insulation
- Duct test and seal
- Pipe wrap of domestic hot water heater
- Low-flow showerhead with, or in addition to, thermostatic valve control
- Combustion Safety Test
- Low-flow showerhead with or in addition to thermostatic-activated flow restriction flow device

On January 16th, 2012 Los Angeles County launched a new Energy Upgrade option called Flex Path which provides a new way to customize upgrades to meet a user's budget needs. This program offers a \$1,500 incentive to owners of detached single family homes. Energy efficiency measures that can make up a whole-house upgrade are given point values based on their contribution towards energy savings. To qualify for an incentive, participants must choose two or more qualifying upgrade measures that provide a combined point value of at least 100, such as attic insulation and sealing (45 pts) and windows (65 pts), and have them installed by an Energy Upgrade Participating Contractor.

Energy Upgrade California in Los Angeles County is also offering property owners a 2% fixed interest rate on eligible residential energy efficiency and solar projects. To qualify, energy efficiency projects must be enrolled in the Southern California Edison and/or Southern California Gas Energy Upgrade California incentive program, and the property must be a residential, single family detached property. Solar projects must be installed concurrently or after the installation of energy efficiency measures and must be enrolled in the California Solar Initiative program.

### ***Federal Funding Opportunities***

#### **Federal Production Tax Credit (PTC)**

The investment tax credit (ITC) and production tax credit (PTC) both provide tax relief to a renewable energy developer. The PTC<sup>41</sup> is tax credit for each unit of energy produced by a

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39 Energy Upgrade California: <https://energyupgradeca.org/overview>

40 [http://www.sce.com/residential/rebates-savings/home\\_upgrade\\_projects/homeowners/default.htm](http://www.sce.com/residential/rebates-savings/home_upgrade_projects/homeowners/default.htm)

41 Federal Production Tax Credit: [http://dsireusa.org/incentives/incentive.cfm?Incentive\\_Code=US13F](http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=US13F)

renewable energy system. The PTC is not available for all renewables projects, specifically; solar PV is not eligible for the PTC. Projects using the PTC include landfill gas, biomass, hydroelectric, geothermal electric and municipal waste. The amount of credit is 2.2 cents/kWh for wind geothermal, closed-loop biomass and geothermal electric. Other technologies, such as "open-loop" biomass (using farm and forest wastes rather than dedicated energy crops), incremental hydropower, small irrigation systems, landfill gas, and municipal solid waste (MSW), receive a lesser value tax credit of 1.1 cent per kWh. Systems are eligible for this credit during the first 10 years of energy production. Renewables project developers must choose between the PTC and ITC as project cannot apply for both credits.

The PTC for wind, which as the largest producer of renewable energy has the greatest impact on the budget, is available until the end of 2012. The PTC for incremental hydro, geothermal, MSW, and bioenergy was extended until the end of 2013. The bill also extends the PTC for electricity produced by wave and tidal energy through 2013.

The City cannot take advantage of the PTC program directly, as the City does not pay Federal taxes and hence, does not depreciate equipment. The City can indirectly take advantage of this incentive if an eligible renewable system is owned and operated by a third party.

#### ***Federal Investment Tax Credit (ITC)***

The ITC is available to a wide range of renewables projects including solar heat and electric (PV), wind, biomass, fuel cells and several others.<sup>42</sup> In addition, the ITC is available for cogeneration systems as well as geothermal systems utilizing ground-source heat pumps. The ITC is not applicable to hydroelectric projects. Under the ITC, the IRS approves a tax credit equal to 30% of the total project cost amount invested to develop a project (cogeneration and geothermal projects are limited to a 10% credit). While there are maximum incentives established for some technologies (fuel cells, micro turbines and wind turbines), solar technologies do not have a maximum incentive. The tax credit can be claimed when filing Federal income taxes subsequent to the project going into service. The value of the tax credit may be sold to other private entities which have a tax interest and see an economic advantage to partnering on the project. With the tax credit, the private entity never receives cash to help pay for a project, but rather receives a credit on payments due, thereby producing a net positive on the company's balance sheet. Renewables project developers must choose between the PTC and ITC as project cannot apply for both credits. Similar to the PTC, the City cannot take advantage of the ITC program directly, as the City does not pay Federal taxes and hence, does not depreciate equipment. The City can indirectly take advantage of this incentive if an eligible renewable system is owned and operated by a third party.

Businesses and individuals who buy solar energy systems had been previously eligible to receive an ITC of 30 percent. The ARRA extended this option for solar facilities while in addition allowing other eligible technologies to receive the ITC in lieu of the PTC. This measure is designed to promote the development of renewable energy in instances of economic uncertainty where a PTC is not as enticing to developers as an ITC.

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<sup>42</sup> Federal Investment Tax Credit: [http://www.dsireusa.org/incentives/incentive.cfm?Incentive\\_Code=US02F](http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US02F)

### ***Energy Efficient Commercial Buildings Deduction (EECBD)***

The Energy Policy Act of 2005 (EPAct) established the Energy Efficient Commercial Buildings Deduction (EECBD) which allows building owners to take Federal tax deductions for improvements to building efficiency.<sup>43</sup> The level of tax deductions available under the EECBD is set according to what type of efficiency projects is completed. A full deduction of up to \$1.80 per square foot of building space is available for projects that reduce the building's energy consumption to 50 percent below the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) standard 90.1-2001 (Energy Standard for Buildings Except Low-Rise Residential Buildings). Partial deductions of \$0.60 per square foot of building space are available for projects that address a single building system (lighting, HVAC or envelope). To be eligible for partial deductions, lighting or HVAC projects must reduce building energy consumption to 20 percent below ASHRAE 90.1-2001, while envelope projects must reduce energy consumption to 10 percent below ASHRAE 90.1-2001. Whether a full or partial deduction is taken, the deduction cannot exceed the cost of the projects implemented.

The EECBD can be claimed by the primary (non-tax-exempt) designer of any project. The EECBD is authorized through the end of 2013.

### ***Modified Accelerated Cost-Recovery System (MACRS)***

Another mechanism used to reduce project costs through tax relief is the Modified Accelerated Cost-Recovery System (MACRS).<sup>44</sup> For non-tax-exempt entities, taxes must be paid on the value of installed equipment including investments in renewable energy projects. As the equipment gets older, its value depreciates and tax payments based on value will also depreciate. The IRS program called Modified Accelerated Cost Relief System (MACRS) establishes a five-year period after which the equipment depreciation cycle is complete and taxes on value no longer need to be paid. Similarly to the ITC and PTC, the City cannot take advantage of the MACRS program directly, as the City does not pay Federal taxes and hence, does not depreciate equipment. The City can indirectly take advantage of this incentive if an eligible renewable system is owned and operated by a third party. MACRS is authorized through the end of 2012.

The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (H.R. 4853) created a special bonus depreciation for projects placed into service before the end of 2011. The bonus depreciation allows for a 100% first year depreciation.

### ***EPA Clean Water State Revolving Fund***

Clean Water State Revolving Fund (CWSRF) programs provided more than \$5 billion annually in recent years to fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management.<sup>45</sup> This program offers low interest rates and flexible terms and includes significant funding for Nonpoint Source Pollution Control and Estuary Protection. The CWSRF program has assisted range of borrowers including municipalities, communities of all sizes, farmers, homeowners, small businesses, and nonprofit

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43 Energy Efficient Commercial Buildings Deduction:

[http://www.dsireusa.org/incentives/incentive.cfm?Incentive\\_Code=US40F&re=1&ee=1](http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US40F&re=1&ee=1)

44 Modified Accelerated Cost-Recovery System: [http://www.dsireusa.org/incentives/incentive.cfm?Incentive\\_Code=US06F](http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US06F)

45 Clean Water State Revolving Fund: [http://water.epa.gov/grants\\_funding/cwsrf/cwsrf\\_index.cfm](http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm)

organizations. CWSRFs partner with banks, nonprofits, local governments, and other federal and state agencies to provide the best water quality financing source for their communities.

### ***Property-Assessed Clean Energy (PACE) Programs***

The Property-Assessed Clean Energy (PACE) model is a financing structure that enables local governments to raise money through the issuance of bonds or other sources of capital to fund energy efficiency and renewable energy projects.<sup>46</sup> Land-secured financing districts (also known as "special tax" or "special assessment" districts) are a familiar tool in municipal finance. In a typical assessment district, a municipality issues bonds to fund projects with a public purpose such as streetlights, sewer systems or underground utility lines. The property owners that benefit from the improvement repay the bond through property assessments, which are secured by a property lien and paid as an addition to the property tax bill.

The extension of this financing model to energy efficiency and renewable energy improvements allows a property owner to install improvements without a large up-front cash payment. The financing is repaid over a set number of years through the "special tax" or "assessment" only on those property owners who voluntarily choose to attach the cost of their energy improvements to their property tax bill. The financing is secured with a lien on the property and in the event of foreclosure; the energy financier is paid before other claims against the property. If the property is sold before the end of the repayment period, the new owner inherits both the remaining repayment obligation and the financed energy improvements.

This has been an important and successful finance mechanism, but it has been greatly slowed since mid-2010 when Fannie Mae and Freddie Mac, the government-backed home mortgage lenders that control 80 percent of American home mortgages, took exception to PACE loans and stated they would not accept home mortgages that included the PACE lien. The Federal Housing Finance Authority is now under court orders to develop rules that will require Fannie Mae and Freddie Mac to accommodate PACE loans. Congress is also considering a bipartisan bill to address this problem.

## **6.3 Timeline and Prioritization**

The reduction measures in this Plan will be implemented through a menu of options. The goals of each reduction measure can often be achieved through a variety of means, such as those related to building energy efficiency. Compliance with the energy efficient building measures can be achieved through combinations of actions including (but not limited to): installing energy efficient appliances, lighting, and HVAC systems; installing solar panels and solar water heaters; siting and orienting buildings to optimize conditions for natural heating, cooling, and lighting; installing top-quality windows and insulation; and incorporating natural shading, skylights, and reflective surfaces. For example Measure (CO 4.1.6 calls for the City to amend building codes to promote energy efficiency when issuing permits for existing buildings that are being modified. Additionally, Measure OVOV CO 8.2.1 calls for the City to ensure that all new City buildings, and all major renovations and additions, meet adopted green building standards, with a goal of achieving the LEED (Leadership in Energy and Environmental Design) Silver rating or above, or equivalent where appropriate. While many of these measures are considered a

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<sup>46</sup> Property-Assessed Clean Energy: <http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/PACE.html>

high priority by the City, the amount of GHG emissions reductions for some of these measures could not be estimated at this time. For other measures, the specific amount of GHG emissions reductions could be identified and are included towards the 2020 emissions reduction of the CAP. An example of these measures is the installation of onsite solar systems. In Santa Clarita, over 8 Million Kilowatt hours of energy has been produced since 2005 from PV systems installed in the City resulting in a reduction of nearly 6,000 MMTCO<sub>2</sub>e of GHG emissions.

GHG reduction measures are grouped into four categories: 1) Those GHG mitigation measures that are included in the CAP to meet the GHG reduction goal and could be quantified; 2) Measures that are not quantifiable at this time but will be included in the Monitoring Plan; 3) Measures that will be considered in future amendments to the CAP; and 4) Measures that are not considered a priority to meet the goals of the City by 2020.

For those measures included in the CAP, the first category noted above, a qualitative analysis of each measure was performed to identify the cost, cost-effectiveness, the ability of the City to implement the measure and the role of the City in implementing each measure. This analysis is included in the Appendix. The GHG emissions reduction potential for some goals, policies and measures that are desired for inclusion in the CAP could not be quantified at this time. These measures are grouped into the second category. For these measures, the City will identify methods to quantify the GHG emissions for the measure and consider including the measure in the CAP at a future date.

Other measures which are not considered a priority at this time but have some potential for cost-effective reductions will be further studied and considered for inclusion in the CAP at a future date. Lastly, those measures which are not considered a priority at this time or which may not be cost-effective or implementable at this time are placed in the category of “No further Consideration”. Following is a description of the priority assigned to the measures by category.

#### ***Measures Included in the CAP (High Priority and Quantifiable)***

The measures that are considered a high priority and are quantifiable are shown in Table 6-3. Several of the General Plan measures coincide with these measures and are identified in the Table below. These measures are described in more detail in Section 4.2 GHG Mitigation Measures. A qualitative analysis of these measures is included in Appendix D.

#### ***Measures Included in the Monitoring Plan***

The monitoring plan will consist of three phases: data gathering, GHG quantification and assessment and progress reporting. As stated earlier, there are several measures that are a high priority but that cannot be quantified at this time. These measures along with the measures identified in Table 6-4 for inclusion in the CAP will be included in the Monitoring Plan. Prior to gathering data, ENVIRON will work with the City to identify the measurement method or performance indicators that will be used to quantify and assess the measures. In some cases, these measures will be implemented on a project-by-project basis as new residential, commercial and industrial development occurs.

**Table 6-3. GHG Reduction Measures included in the CAP Goal for 2020.**

Measure Category	Measure Description	Related OVOV Measure2
Building Energy	AE-2: Establish Onsite Renewable Energy Systems-Solar Power	Policy LU 7.1.2 Policy CO 8.2.3, 8.2.5, 8.3.4, 8.3.5
	LE-1: Install Higher Efficacy Public Street and Area Lighting	Policy LU 7.6.1 Policy CO 8.2.4, 8.3.9
	LE-3: Replace Traffic Lights with LED Traffic Lights	Policy CO 8.2.10
Transportation	LUT-0: Overall VMT Reduction from High Priority Measures1	
	LUT-1: Increase Density	Policy LU 2.3.3, 2.3.5, 5.2.1 Policy CO 1.5.5 Policy 1.2.1
	LUT-2: Increase Location Efficiency	Policy LU 5.2.5 Policy CO 1.5.7
	LUT-3: Increase Diversity of Urban and Suburban Developments (Mixed Use)	Policy LU 1.2.13, 2.1.2, 2.3.2,2.3.5, 5.2.4, 5.2.5 Policy C 1.2.1
	LUT-4: Increase Destination Accessibility	Policy LU 2.1.1, 3.2.1, 3.2.2 , 5.1.1,5.1.2, 5.2.1, 5.2.4, 5.2.5 Policy C 1.1.2, 1.1.3, 1.1.5, 1.2.3,5.3.1, 6.1.5
	LUT-5: Increase Transit Accessibility	Policy LU 1.2.13, 5.1.2 5.2.1, 5.2.4 Policy N 2.1.6 Policy C 1.1.3, 1.1.5, 1.2.1, 1.2.2, 1.2.4, 4.1.1, 4.1.2, 5.1.1, 5.1.2, 5.1.4, 5.3.1, 6.1.5
	LUT-6: Integrate Affordable and Below Market Rate Housing	Policy C 1.1.2, 1.2.1
	LUT-9: Improve Design of Development	Policy LU 2.3.2, 2.3.5 Policy C 1.1.1, 1.2.1, 1.2.2, 1.2.3, 1.2.9, 6.1.5
	SDT-1: Provide Pedestrian Network Improvements	Policy LU 1.2.13, 3.2.1, 3.2.2 Policy C 1.1.3, 1.2.2, 1.2.3, 2.2.6 Policy CO 1.5.7
	Water	WSW-1: Use Reclaimed Water
WUW-1: Install Low-Flow Water Fixtures		Policy CO 4.1.5
	WUW-4: Use Water Efficient Landscape Irrigation	
Solid Waste	SW-1: Institute or Extend Recycling and Composting Services	Policy CO 1.3.2, 1.3.3, 4.1.8, 4.2.1, 8.2.11, 8.4.3
Vegetation	V-1: Urban Tree Planting	
	V-2: Create New Vegetated Open Space	

1. Measure LUT-0 combines Measures LUT-1 through LUT-9 into one measure.
2. Policy Designations in OVOV: LU-Land Use Element, C-Circulation Element, CO-Conservation Open Space Element, N-Noise Element



**Table 6-4. GHG Reduction Measures included in the Monitoring Plan.**

Measure Category	Measure Description
Building Energy	BE-4: Install Energy Efficient Appliances
	BE-5: Install Energy Efficient Boilers
	OVOV CO 4.1.6: Amend Building Codes to Promote Energy Eff. When Issuing Permits Existing Bldgs.
	OVOV CO 8.1.4: Public Outreach about Energy Conservation and Climate Change
	OVOV CO 8.2.1: Ensure New Bldg. Meet Adopted Green Standards. With Goal to Achieve LEED.
	OVOV CO 8.2.2: Ensure Energy Efficiency of Existing Bldgs. Through Energy Audits, Repairs and Retrofits
	OVOV CO 8.2.3: Support Purchase of Renewable Energy for Public Bldgs.
	OVOV CO 8.3.6: Require New Developments to Use Passive Solar in Heating and Cooling Design
Transportation	TRT-1: Implement Commute Trip Reduction Program-Voluntary/Required
	TRT-3: Provide Ride-Sharing Programs
	TRT-7: Implement Commute Trip Reduction Marketing
	TST-1: Transit System Improvements
	TST-3: Expand Transit Network
	RPT-2: Improve Traffic Flow
	VT-3: Utilize Electric or Hybrid Vehicles
	OVOV C 1.1.10: Accommodate New Technology to Reduce Trips by Vehicles using fossil fuels
	OVOV C 1.1.12: Implement City's Non-Motorized Trans. Plan for Alt Travel Modes
	OVOV C 3.2.1: Adopt Clean Vehicle Purchase Policies for Fleets
	OVOV C 3.2.4: Encourage Prioritized Parking for EVs and Alt Fuel Vehicles
	OVOV LU 4.2.3: Encourage Job Creation In Closer Proximity to Workforce Housing
	Water
WUW-2: Adopt a Water Conservation Strategy	
WUW-3: Design Water-Efficient Landscapes	
WUW-5: Reduce Turf in Landscapes and Lawns	
WSW-3: Use Locally Sourced Water Supply	
OVOV CO 4.1.5: Promote Low-Flow and/or Waterless Plumbing Fixtures for New Non-Residential Development	
OVOV CO 4.1.6: Amend Bldg. Code to Promote Water and Energy Efficiency Upgrades for Existing Bldg. Permits	
OVOV CO 4.1.7: Apply Water Conservation Policies to All Pending Development Projects	
OVOV CO 4.1.8: Discourage Use of Potable Water for Washing Outdoor Surfaces	
Solid Waste	SW-2: Recycle Demolished Construction Material
	OVOV CO 8.4.2: Adopt Mandatory Recycling for Single and Multi-Family Dwellings
	OVOV CO 8.4.3: Allow and Encourage Composting of Greenwaste
	OVOV CO 8.4.5: Develop Standards for Refuse and Recycling Receptacles and Enclosures for All Development
	OVOV CO 8.4.6: Assist with Placement of Receptacles for Recyclable Products in Public Places
Vegetation	OVOV LU 7.1.1: Require Shade Trees within Parking Lots and Adjacent to Buildings to Reduce Heat Island Effect
	OVOV LU 8.3.7: Encourage Trees and Landscaping To Reduce Heating and Cooling Loads



## 6.4 Project Review

The CAP defines a local threshold of significance for GHG emissions for project level submittals that trigger review by the California Environmental Quality Act. Because goals, objectives and policies approved under the General Plan are forecast to meet the GHG emission reduction targets mandated by AB 32, development projects that are able to demonstrate consistency with the General Plan and zoning ordinance will by association demonstrate consistency with the CAP.

Projects requiring a zone change/General Plan amendment will be required to demonstrate consistency with the CAP. Some large scale development projects that generate a significant number of vehicle miles travelled and/or are heavy industrial uses may also be required to demonstrate consistency with the CAP. Compliance can be demonstrated by performing a quantitative analysis using approved modeling techniques indicating the proposed zone change/General Plan amendment or large scale development project can reduce its associated GHG emissions by 12% below the business-as-usual scenario. This reduction is consistent with the overall reduction expected in the CAP, not counting the three statewide measures (RPS, LCFS and Pavley I) which are not affected by local development. Greenhouse gas reduction measures for zone change/General Plan amendments and large scale development projects should be consistent with those measures outlined in the CAP. Such projects that cannot reduce the associated GHG emissions by 12% below the business-as-usual scenario should be considered to have a significant and unavoidable impact and require a Statement of Overriding Consideration as part of any project approval.

## 6.5 Monitoring Plan

The steps the City will take to effectively monitor and track progress of the CAP are outlined in this section. An integral part of successful monitoring will be the designation of a City staff person as the Manager with responsibility for overseeing the monitoring process and tracking each mitigation measure as it is implemented. The Manager will coordinate with the departments and/or managers responsible for overseeing the implementation of each mitigation measure. The responsible person will gather and document performance and activity data, estimate emissions reductions, evaluate mitigation measure performance, and prepare progress reports. Recommendations for each step in this process are provided in the sections below. The process of GHG monitoring will vary by year depending on the type of performance evaluation required (i.e., performance indicator evaluation or GHG inventory update).

### *Performance Indicators*

An annual mitigation measure performance evaluation will be conducted using performance indicators. Indicators are metrics that can be readily measured and correlated with reductions in GHG emissions to help judge the achievement of CAP mitigation measures. The indicator may be a measure of participation or activity associated with a mitigation measure. For each mitigation measure, the measured performance indicator will be compared to a predetermined performance target. The performance target for each mitigation measure is a specified level of participation or performance required to achieve the CSP's projected GHG reductions. As part of the implementation process for each mitigation measure in Table 6-3 and 6-4, ENVIRON will work with the City to develop and finalize the indicator to be used, the process for data collection, and determine an appropriate performance target.

### ***Data Gathering***

Data gathering is necessary to evaluate individual mitigation measures and to update the City's GHG inventory. The process of data collection will be an ongoing requirement of the CAP implementation and monitoring. For each mitigation measure, it will be necessary to collect performance indicator data. The City's monitoring manager will determine the most feasible and cost effective approach for collecting and documenting progress indicator data. If it is found infeasible to collect or track the recommended progress indicator, an alternative or surrogate indicator will be identified. To make the data collection process as efficient as possible, the process should be institutionalized into the regular operations of each department responsible for collecting the data. A data collection schedule will be established and will define a deadline for finalizing data collection. To facilitate data sharing between the implementation and monitoring managers, it is recommended that a central repository for the data be established (e.g., email address or online database). A standard format for recording and sharing monitoring data should be mutually agreed on to avoid misinterpretation of data and ensure that data is provided in a ready to use format.

### ***GHG Emissions Quantification***

To evaluate emissions reductions of individual mitigation measures based on performance indicators, the City will develop a tracking tool(s) to calculate the GHG emissions reductions based on mitigation measure indicators. The tool(s) will use metrics derived for each performance indicator which correlate the monitored indicator with GHG emissions levels. The tool(s) will both expedite and routinize the performance evaluation process. The tool(s) should be updated with each GHG inventory update to ensure that the most current metrics, assumptions, and methodologies are being used. For each mitigation measure, performance will be evaluated based on the estimated emissions reductions and against the mitigation measure performance targets.

### ***Progress Reporting***

The City will begin mitigation measure implementation by focusing on the measures included in the CAP. In addition, the City will initiate the development of performance indicators for those measures that will be included in the Monitoring Plan (See Section 6.3 Timeline and Prioritization). The information from these updates will allow the City to describe progress towards meeting performance targets and estimated GHG reductions. Every four years the City will assess the performance of the CAP and will prepare a progress report to document performance. On an eight-year basis, the performance evaluation will consist of a comprehensive update of the City's GHG inventory and an assessment of the City's overall progress as well as the progress of individual mitigation measures. At the four year performance assessment intervals, results to date or changes in requirements could trigger an update of the City's CAP. Such triggers could include significant legislative changes to the Global Warming Solutions Act of 2006 (AB 32), the Sustainable Communities Planning Act (SB 375), California Environmental Quality Act (CEQA) or other events that would change the implementation schedule of the CAP measures. Where it is determined that a measure or group of measures fall well short of the projected GHG emissions reductions, other measures included in the Monitoring Plan may be included in the CAP to assure sufficient progress in meeting the overall goals of the CAP by 2020.