

# City of Escondido

## Adopted Climate Action Plan

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Prepared for:



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# Acronyms

|                      |   |
|----------------------|---|
| AB 32                | Assembly Bill 32, The California Climate Change Solutions Act of 2006 |
| AEP                  | Association of Environmental Professionals                            |
| CAA                  | Clean Air Act   |
| CAAQS                | California Ambient Air Quality Standards                              |
| CalEPA               | California Environmental Protection Agency                            |
| CalGreen             | California Green Building Standard                                    |
| CAP                  | Climate Action Plan   |
| CARB                 | California Air Resources Board  |
| CAS                  | Climate Adaption Strategy   |
| CAT                  | California Action Team  |
| CCAR                 | California Climate Action Registry                                    |
| CCAT                 | California Climate Action Team  |
| CCR                  | California Code of Regulations  |
| CCSE                 | California Center for Sustainable Energy                              |
| CEC                  | California Energy Commission  |
| CEQA                 | California Environmental Quality Act                                  |
| CFC                  | Chlorofluorocarbons   |
| CIWMB                | California Integrated Waste Management Board                          |
| CSI                  | California Solar Initiative   |
| CWSRF                | Clean Water State Revolving Funds                                     |
| E-CAP                | Escondido Climate Action Plan   |
| ECM                  | Energy Conservation Measures  |
| EECBG                | Energy Efficiency Community Block Grants                              |
| EMFAC2007            | On-Road Emission Factors published by the CARB in 2007                |
| GHG                  | Greenhouse Gas  |
| kWh                  | Kilowatt hours  |
| LCFS                 | Low Carbon Fuel Standard  |
| LGOP                 | Local Government Operations Protocol                                  |
| MPO                  | Metropolitan Planning Organization                                    |
| MT CO <sub>2</sub> e | Metric Tons Carbon Dioxide Equivalent                                 |
| NCTD                 | North County Transit District   |
| OPR                  | California Office of Planning and Research                            |
| RPS                  | Renewable Portfolio Standard  |
| RTP                  | Regional Transportation Plan  |
| SANDAG               | San Diego Association of Governments                                  |
| SB                   | Senate Bill   |

## ACRONYMS

|              |   |
|--------------|---|
| SCP          | Sustainable Communities Project                           |
| SCS          | Sustainable Communities Strategy                          |
| SDAPCD       | San Diego Air Pollution Control District                  |
| SDG&E        | San Diego Gas and Electric Company                        |
| SRI          | Solar Reflective Index                                    |
| TDM          | Transportation Demand Management                          |
| TPP          | Transit Priority Project                                  |
| UNFCCC       | United Nations Framework Convention on Climate Change     |
| URBEMIS 2007 | Urban Emissions Model, version 9.2 published in June 2007 |
| USEPA        | United States Environmental Protection Agency             |
| VMT          | Vehicle miles traveled                                    |

# Executive Summary

The City of Escondido, in concert with adopted state and federal legislation, is committed to providing a more livable and economically vibrant community through the incorporation of greenhouse gas (GHG) emission reduction measures that help preserve community assets. By using energy more efficiently, harnessing renewable energy to power buildings, recycling waste, conserving and recycling water, and enhancing access to sustainable transportation modes, Escondido will keep dollars in the local economy, create new green jobs and improve community quality of life. The efforts toward reducing GHG emissions described in this report would be done in coordination with the City's land use decisions. The foundation of planning land use decisions is found in the General Plan policies and programs.

Through this Escondido Climate Action Plan (E-CAP), the City has established goals and policies that incorporate environmental responsibility into its daily management of residential, commercial and industrial growth, education, energy and water use, air quality, transportation, waste reduction, economic development, and open space and natural habitats to further their commitment.

The first step in completing the E-CAP was to update Escondido's GHG emissions inventory. In February 2011, Escondido completed an inventory of 2005 emissions through participation in the San Diego Foundation's Regional Climate Protection Initiative. The report included an inventory of both municipal and community-wide GHG emissions. The 2005 emissions amounted to 1,019,318 metric tons of carbon dioxide equivalents (MT CO<sub>2</sub>e) community-wide and 20,861 MT CO<sub>2</sub>e from municipal operations. The methodology used to estimate municipal emissions in the previous report is similar to the methodology used in this report. However, there are three key differences between the previous report and this one in the methodologies used for the community-wide inventory.

- The estimate for vehicle miles traveled (VMT) used in the previous inventory calculations includes pass-through trips. These are trips that begin and end outside of the City boundaries, but do pass-through Escondido. Because the City does not have control over these trips, they have been omitted from the revised inventory.
- Emissions from water have been calculated differently in the revised inventory. The previous inventory includes emissions from wastewater and the electricity associated with local treatment and distribution of water. In addition to these emissions, the revised inventory includes the emissions associated with the electricity used to bring imported water to Escondido.
- The previous emission inventory does not include emissions associated with the transportation of waste to the landfill. These emissions are included in the revised 2005 inventory.

The revised community-wide inventory in this E-CAP totaled 927,266 MT CO<sub>2</sub>e, which is 92,052 MT CO<sub>2</sub>e below the previous inventory. Table ES-1 contains the breakdown of emissions for both the previous 2005 inventory and the revised 2005 inventory in the E-CAP.

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| Table ES-1 2005 Emissions Comparison   |                                  |                |
|--|----------------------------------|----------------|
| Source Category  | Metric tons of CO <sub>2</sub> e |                |
|  | 2005 (Previous)                  | 2005 (Revised) |
| Transportation <sup>a</sup>  | 509,904                          | 375,769        |
| Energy   | 427,305                          | 419,177        |
| Area Sources   | 43,136                           | 53,287         |
| Water and Wastewater <sup>b</sup>  | 4,008                            | 28,384         |
| Solid Waste <sup>c</sup>   | 34,964                           | 48,361         |
| Construction <sup>d</sup>  | -                                | 2,288          |
| <b>Total</b>   | <b>1,019,318</b>                 | <b>927,266</b> |
| <p>Note: Mass emissions of CO<sub>2</sub>e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.</p> <p><sup>a</sup> The previous methodology for calculating transportation emissions includes the pass-through vehicle trips in the City of Escondido.</p> <p><sup>b</sup> Previous emissions only include direct emissions from the wastewater treatment plant. The updated inventory also includes emissions associated with the electricity to pump water from non-local sources.</p> <p><sup>c</sup> The previous inventory does not include emissions associated with transporting waste to the landfill; the updated inventory does include these emissions.</p> <p><sup>d</sup> Construction emissions were not included in the previous inventory; the updated inventory includes estimates of CO<sub>2</sub>e emissions associated with the use of construction equipment.</p> |                                  |                |

In addition to the 2005 revised inventory, the E-CAP includes GHG inventories of community-wide and municipal sources based on the most recent data available for the year 2010. Sources of emissions include transportation, electricity and natural gas use, landscaping, water and wastewater pumping and treatment, and treatment and decomposition of solid waste. Escondido's 2010 inventory amounted to 886,118 MT CO<sub>2</sub>e community-wide and 18,143 MT CO<sub>2</sub>e from municipal operations.

Following the state's adopted AB 32 GHG reduction target, Escondido has set a goal to reduce emissions back to 1990 levels by the year 2020. This target was calculated as a 15 percent decrease from 2005 levels, as recommended in the AB 32 Scoping Plan. The estimated community-wide emissions for the year 2020, based on population and housing growth projections associated with the assumptions used in the proposed General Plan Update, are 992,583 MT CO<sub>2</sub>e. In order to reach the reduction target, Escondido must offset this growth in emissions and reduce community-wide emissions to 788,176 MT CO<sub>2</sub>e by the year 2020.

The development of this E-CAP coincides with Escondido's General Plan Update. A community-wide emissions inventory is also calculated for the horizon year of 2035. The residential and commercial growth rates from the General Plan Update were used to estimate the 2035 emissions.

The City of Escondido has already demonstrated its commitment to conserve energy and reduce emissions through a variety of programs and policies. Programs to reduce emissions include flexible employee work schedules, energy retrofits of City facilities, participation in the San Diego Association of

Governments (SANDAG) Energy Roadmap Program, water conservation education efforts, and coordination with SANDAG and North County Transit District to expand transit systems.

Various state policies have enacted programs that will also contribute to reduced GHG emissions in Escondido by the year 2020. Some of these policies include updated building codes for energy efficiency, the low carbon fuel standard, Pavley vehicle emissions standards, and the Renewables Portfolio Standard for utility companies. By supporting the state in the implementation of these measures, Escondido will experience substantial GHG emissions reductions. These GHG reductions from the State measures are accounted for in the reduced inventories.

In order to reach the reduction target, Escondido would also implement the additional local reduction measures described in this report. These measures encourage energy efficiency and renewable energy in buildings, transit oriented planning, water conservation, and increase waste diversion. Table ES-2, below, summarizes the community wide emissions for 2010, 2020, and the reduced 2020 inventory with the inclusion of the proposed reduction measures.

| <b>Table ES-2 Projected 2020 GHG Emissions Comparison</b>  |                                       |                |                     |                  |
|--|---------------------------------------|----------------|---------------------|------------------|
| <b>Source Category</b>   | <b>Metric tons of CO<sub>2</sub>e</b> |                |                     |                  |
|  | <b>2010</b>                           | <b>2020</b>    | <b>Reduced 2020</b> | <b>% Reduced</b> |
| Transportation   | 368,622                               | 419,741        | 310,662             | 26%              |
| Energy   | 395,565                               | 441,025        | 357,914             | 19%              |
| Area Sources   | 52,559                                | 54,977         | 54,451              | 1%               |
| Water and Wastewater   | 25,360                                | 27,278         | 21,979              | 19%              |
| Solid Waste  | 41,724                                | 47,273         | 41,061              | 13%              |
| Construction   | 2,288                                 | 2,288          | 2,059               | 10%              |
| <b>Total</b>   | <b>886,118</b>                        | <b>992,583</b> | <b>788,127</b>      | <b>21%</b>       |
| <b>Emission Reduction Target <sup>a</sup></b>  |                                       | <b>788,176</b> |                     |                  |
| Note: Mass emissions of CO <sub>2</sub> e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.<br><sup>a</sup> The reduction target for 2020 is based on a 15% decrease from Escondido’s revised 2005 emissions inventory. |                                       |                |                     |                  |

Table ES-3 summarizes the 2035 emissions for Escondido based on the anticipated growth rates included in Escondido’s General Plan update. After 2020, GHG emissions would continue to grow; however, the growth in Escondido’s future emissions would be offset by the reductions from incorporation of the E-CAP measures. The reduction measures included in the E-CAP have been developed to meet the 2020 reduction target; however the implementation of the E-CAP would require periodic updates to ensure that the City is continually tracking GHG emissions and making adjustments as necessary to ensure that future targets are met. The 2035 reduced inventory represents the estimated GHG emissions from Escondido with the continued implementation of the reduction measures outlined in the E-CAP as well as the assumption that the current statewide measures are

## EXECUTIVE SUMMARY

extended beyond 2020. This represents a strategy for the City to continue to reduce emissions below the 2020 reduction target through to 2035 and beyond.

| <b>Table ES-3 Projected 2035 GHG Emissions Comparison</b>  |                                       |                  |                     |                  |
|--|---------------------------------------|------------------|---------------------|------------------|
| <b>Source Category</b>   | <b>Metric tons of CO<sub>2</sub>e</b> |                  |                     |                  |
|  | <b>2010</b>                           | <b>2035</b>      | <b>Reduced 2035</b> | <b>% Reduced</b> |
| Transportation   | 368,622                               | 556,818          | 271,436             | 51%              |
| Energy   | 395,565                               | 523,427          | 357,294             | 32%              |
| Area Sources   | 52,559                                | 59,151           | 57,733              | 2%               |
| Water and Wastewater   | 25,360                                | 30,980           | 23,779              | 23%              |
| Solid Waste  | 41,724                                | 57,518           | 41,061              | 29%              |
| Construction   | 2,288                                 | 2,288            | 2,059               | 10%              |
| <b>Total</b>   | <b>886,118</b>                        | <b>1,230,182</b> | <b>753,363</b>      | <b>39%</b>       |
| <b>2020 Reduction Target <sup>a</sup></b>  | <b>788,176</b>                        |                  |                     |                  |
| Note: Mass emissions of CO <sub>2</sub> e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.<br><sup>a</sup> The reduction target for 2020 is based on a 15% decrease from Escondido's revised 2005 emissions inventory. |                                       |                  |                     |                  |

In addition to the emission reductions, this plan describes the cost savings associated with each of the reduction measures. The financing opportunities and strategies for implementing the reduction measures are described in Chapter 7.

This E-CAP describes sets a baseline for Escondido's GHG emissions, projects how these emissions will grow, and includes strategies to reduce emissions to a level consistent with California's emissions reduction target. These strategies complement Escondido's General Plan policies and are consistent with Escondido's vision for a more sustainable community.

# Chapter 1 Introduction

## CHAPTER 1 INTRODUCTION

Escondido is committed to providing a more livable, equitable and economically vibrant community. Recently adopted legislation requires jurisdictions to reduce GHG emissions generated in the community. By using energy more efficiently, harnessing renewable energy to power buildings, recycling waste, and enhancing access to sustainable transportation modes, Escondido can keep dollars in its local economy, create new green jobs and improve community quality of life. These efforts toward reducing GHG emissions would be done in coordination with Escondido's land use decisions. The foundation of planning land use decisions is found in the General Plan policies and programs.

The policies and programs of Escondido's General Plan serve as a foundation for most land use decisions. Preparing, adopting, implementing, and maintaining the General Plan aims to:

- Describe the community's vision and define the community's environmental, social, and economic goals;
- Inform citizens about their community and provide them with opportunities to participate in the planning and decision-making process;
- Coordinate the community and environmental protection activities among local, regional, state and federal agencies; and
- Guide in the short and long-term development of the community.

This section describes the purpose and goals of the E-CAP; describes the relationship of the E-CAP to Escondido's General Plan; provides background information on GHG emissions; and summarizes the regulatory framework surrounding GHG emissions and climate change.

---

## 1.1 Purpose

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The E-CAP was designed under the premise that the City of Escondido and the community it represents are uniquely capable of addressing emissions associated with sources under the City's jurisdiction. Escondido's emission reduction efforts would coordinate with the state strategies in order to accomplish emission reductions in an efficient and cost effective manner. The E-CAP has been developed with the following purposes in mind:

- Create an updated 2010 emissions inventory from which to benchmark GHG reductions;
- Provide a plan that is consistent with and complementary to the GHG emissions reduction efforts being conducted by the State of California through the Global Warming Solutions Act (AB 32) and the federal government through the actions of the Environmental Protection Agency;
- Guide the development, enhancement, and implementation of actions that reduce GHG emissions; and
- Provide a policy document with specific implementation measures meant to be considered as part of the planning process for future development projects.

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## 1.2 Goals

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To fulfill the purposes of the E-CAP, Escondido has identified the following achievement goals:

- Provide a list of specific actions that will reduce GHG emissions, with the highest priority given to actions that provide the greatest reduction in GHG emissions and benefits to the community at the least cost;
- Reduce emissions attributable to Escondido to levels at or below 1990 GHG emissions by year 2020 consistent with the target reductions of AB 32; and
- Establish a qualified reduction plan from which future development within Escondido can tier and thereby streamline the environmental analysis necessary under the California Environmental Quality Act (CEQA).

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## 1.3 Relationship to the Escondido General Plan

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

The E-CAP is an implementation tool of the General Plan to guide development in Escondido by focusing on attaining the various goals and policies of the General Plan as well as the GHG reduction goals outlined in Section 1.2 above. Table 1-1 summarizes the policies of the proposed General Plan that are related to reducing GHG emissions and the reduction measures in the E-CAP that have been developed in coordination with these General Plan policies. Chapter 4 includes a description of all E-CAP reduction measures.

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## 1.4 Background

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The E-CAP achieves the purpose and goals described above by providing an analysis of GHG emissions and sources attributable to Escondido; estimates on how those emissions are expected to increase with the General Plan Update; recommended policies and actions that can reduce GHG emissions to meet state and federal targets; a timeline of implementation; and a defined tracking and reporting mechanism that will measure progress toward the goals.

The following discussion includes a brief overview regarding the nature of GHG emissions, the climate change impacts anticipated within Escondido, and the federal, state, and local regulatory framework designed to address climate change.

CHAPTER 1 INTRODUCTION

| Table 1-1 GHG-Related Escondido General Plan Policies |   |   |
|---|---|---|
| General Plan Element                                  | General Plan Policies                           | E-CAP Reduction Measures  |
| <b>Energy</b>   |   |   |
| <b>Energy Efficiency</b>                              |   |   |
| Community Health and Services                         | 2.26, 5.10                                      | R2-E1: Residential Energy Efficiency Requirements                     |
| Land Use/ Community Form                              | 1.8   | R2-E2: Commercial Energy Efficiency Requirements                      |
| Mobility  | 14.6-14.8, 14.10                                | R2-E5: Residential Energy Retrofits                                   |
| Resource Conservation                                 | 6.3   | R2-E6: Commercial Energy Retrofits                                    |
| <b>Energy Conservation</b>                            |   |   |
| Mobility  | 14.3, 14.4                                      | R2-A2: Reduce Heat Island Impacts<br>R3-A1: Expand City Tree Planting |
| <b>Renewable Energy</b>                               |   |   |
| Mobility  | 14.5, 14.10                                     | R2-E3: Residential Renewable Energy Requirements                      |
| Resource Conservation                                 | 6.2   | R2-E4: Commercial Renewable Energy Requirements                       |
| <b>Transportation</b>                                 |   |   |
| <b>Improved Pedestrian and Bicycle Access</b>         |   |   |
| Community Health and Services                         | 1.11, 2.5-2.7, 2.11, 3.5, 5.4                   |   |
| Land Use/Community Form                               | 1.4, 1.9, 3.4, 4.3, 7.1, 7.4, 9.3               | R2-T2: Bicycle Master Plan  |
| Mobility  | 1.1, 2.1, 2.4, 3.1-3.12, 4.1-4.8, 14.2          |   |
| Resource Conservation                                 | 2.2-2.4, 6.2                                    |   |
| <b>Improved Transit Access</b>                        |   |   |
| Community Health and Services                         | 3.5, 5.4, 1.9                                   |   |
| Land Use/ Community Form                              | 1.4, 1.5, 3.4, 7.3, 7.4                         | R2-T3: Transit Improvements   |
| Mobility  | 1.1, 2.1, 2.2, 2.4, 2.8, 5.1-5.10, 6.1-6.3      |   |
| <b>Smart Growth</b>                                   |   |   |
| Community Health and Services                         | 2.11  | R2-T1: Land Use Based Trips and VMT Reduction Policies                |
| Land Use/Community Form                               | 1.1, 1.4, 1.5, 1.8, 1.9, 3.4, 3.9, 4.6, 7.2-7.4 |   |
| Mobility  | 1.1, 2.3, 2.8, 14.2                             | R3-T1: Regional Land Use and Transportation Coordination              |
| Resource Conservation                                 | 6.2   |   |
| <b>Other Transportation Reductions</b>                |   |   |
| Mobility  | 7.9, 8.2  | R2-T4: Transportation Demand Management                               |
| Resource Conservation                                 | 6.3, 6.5-6.10                                   |   |
| <b>Water</b>  |   |   |
| <b>Water Conservation</b>                             |   |   |
| Community Health and Services                         | 2.26, 5.10                                      | R2-W2: Water Conservation Strategies                                  |
| Mobility  | 10.11, 10.12, 10.14, 11.10                      |   |
| Resource Conservation                                 | 2.9, 4.4, 5.3, 6.2                              |   |
| <b>Energy Efficiency in Water</b>                     |   |   |
| Mobility  | 10.9, 11.11                                     | R2-W1: Energy Efficient Water Treatment Plan                          |

| Table 1-1 GHG-Related Escondido General Plan Policies |                       |  |
|---|-----------------------|--|
| General Plan Element                                  | General Plan Policies | E-CAP Reduction Measures   |
| <b>Recycled Water</b>                                 |                       |  |
| Mobility  | 10.13                 | R2-W3: Increased Recycled Water Use  |
| <b>Area Source</b>                                    |                       |  |
| Resource Conservation                                 | 2.9                   | R2-A1: Electric Landscaping Equipment  |
| <b>Solid Waste</b>                                    |                       |  |
| Mobility  | 13.2-13.5, 13.7, 13.8 | R2-S1: Waste Disposal Programs   |
| <b>Construction</b>                                   |                       |  |
| Resource Conservation                                 | 6.3, 6.8              | R2-C1: Construction Emissions Reductions   |
| <b>Regional</b>                                       |                       |  |
| Resource Conservation                                 | 6.1, 6.11             | R3-E1: Regional Energy Planning Coordination<br>R3-T1: Regional Land Use and Transportation Coordination |

## 1.5 Greenhouse Gases

Parts of the Earth's atmosphere act as an insulating blanket, trapping sufficient solar energy to keep the global average temperature within a range suitable for human habitation. The 'blanket' is a collection of atmospheric gases called 'greenhouse gases' or GHGs because they trap heat similar to the effect of glass walls in a greenhouse. These gases, mainly water vapor, carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbons (CFCs) all act as effective global insulators, reflecting infrared radiation back to earth. Human activities, such as producing electricity and driving internal combustion vehicles, emit these gases in the atmosphere.

Due to the successful global bans on chlorofluorocarbons (primarily used as refrigerants, aerosol propellants and cleaning solvents), Escondido does not generate significant emissions of these GHGs and therefore, they are not considered any further in this analysis. Other synthesized gases such as Hydrofluorocarbons and Carbon Tetrafluoride have been banned and are no longer available on the market. Because of the ban, the City of Escondido will not generate emissions of these GHGs and therefore, they are not considered any further in this analysis.

Another potent GHG is sulfur hexafluoride, which is mainly used as a gaseous dielectric medium in electric switchgear of high voltage electric transmission lines and medical use in retinal detachment surgery and ultrasound imaging. In both uses, sulfur hexafluoride is not released to the atmosphere and therefore, it is not considered further in this analysis.

Because GHGs have variable heat-trapping properties, a common unit of measurement, the carbon dioxide equivalent, is used to normalize the GHG emission capacity from the different GHGs. Each GHG is compared to carbon dioxide with respect to its ability to trap infrared radiation, its atmospheric lifetime, and its chemical structure. For example, methane is a GHG that is 21 times more potent than carbon dioxide; therefore, one metric ton of methane is equal to 21 MT CO<sub>2</sub>e.

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## 1.6 Regulatory Setting

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In an effort to stabilize GHG emissions and reduce impacts associated with climate change, international agreements, as well as federal and state actions were implemented beginning as early as 1988. The government agencies discussed below work jointly, as well as individually, to address GHG emissions through legislation, regulations, planning, policy-making, education, and a variety of programs.

### International and Federal

#### GLOBAL EFFORTS

The United States participated in the United Nations Framework Convention on Climate Change (UNFCCC) (signed on March 21, 1994). The Kyoto Protocol, a treaty made under the UNFCCC was the first international agreement to regulate GHG emissions. The United States is a signatory to the Kyoto Protocol; however, Congress has not ratified the Protocol and the United States is not bound by the Protocol's commitments.

#### CLIMATE CHANGE TECHNOLOGY PROGRAM

The United States has opted for a voluntary and incentive-based approach toward emissions reductions in lieu of the Kyoto Protocol's mandatory framework. The Climate Change Technology Program is a multi-agency research and development coordination effort (which is led by the Secretaries of Energy and Commerce) that is charged with carrying out the President's National Climate Change Technology Initiative.

#### UNITED STATES ENVIRONMENTAL PROTECTION AGENCY



The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address global climate change. The Federal government administers a wide array of public-private partnerships to reduce GHG intensity generated by the United States. These programs focus on energy efficiency, renewable energy, methane and other non-carbon dioxide gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA implements several voluntary programs that substantially contribute to the reduction of GHG emissions.

In *Massachusetts v. Environmental Protection Agency* (Docket No. 05–1120), argued November 29, 2006 and decided April 2, 2007, the U.S. Supreme Court held that the USEPA has authority to regulate GHG, and the USEPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the USEPA should be required to regulate carbon dioxide and other GHGs as pollutants under Section 202(a)(1) of the federal Clean Air Act (CAA).

The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October of 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufactures of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. The

Final Rule became effective December 29th 2009 with data collection to begin on January 1st 2010 and the first annual reports due in March of 2011<sup>1</sup>. This rule does not regulate the emission of GHGs it only requires the monitoring and reporting of GHG emissions for those sources above certain thresholds. USEPA adopted a Final Endangerment Finding for the six defined GHGs on December 7, 2009. The Endangerment Finding is required before USEPA can regulate GHG emissions under Section 202(a) (1) of the CAA in fulfillment of the U.S. Supreme Court decision.

On May 13, 2010, the USEPA issued a final rule that establishes a common sense approach to addressing GHG emissions from stationary sources under the CAA permitting programs. This final rule sets a threshold of 75,000 tons per year for GHG emissions. New and existing industrial facilities that meet or exceed that threshold will require a permit under the New Source Review Prevention of Significant Deterioration and title V Operating Permit programs. This rule took effect on January 2, 2011.

## State

### CALIFORNIA AIR RESOURCES BOARD



The California Air Resources Board (CARB), a part of the California EPA (CalEPA) is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards (California Ambient Air Quality Standards (CAAQS)), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of California's State Implementation Plan, for which it works closely with the federal government and the local air districts.

### EXECUTIVE ORDER S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

The first California Climate Action Team (CCAT) Report to the Governor in 2006 contained recommendations and strategies to help meet the targets in Executive Order S-3-05. In April 2010, the Draft California Action Team (CAT) Biennial Report expanded on the policy oriented 2006 assessment.

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<sup>1</sup> USEPA, Final Rule for mandatory reporting of GHG emissions. October 2009.  
<http://www.epa.gov/climatechange/emissions/downloads09/GHG-MRR-FinalRule.pdf>

## CHAPTER 1 INTRODUCTION

The new information detailed in the CAT Assessment Report includes development of revised climate and sea-level projections using new information and tools that have become available in the last two years; and an evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts<sup>2</sup>. The action items in the report focus on the preparation of the Climate Change Adaptation Strategy, required by Executive Order S-13-08, described later in this section.

### ASSEMBLY BILL 1493, CLEAN CAR STANDARDS

AB 1493 (also known as the Pavley Bill, in reference to its author Fran Pavley) was enacted in 2002 and requires the “maximum feasible and cost effective reduction” of GHGs from automobiles and light-duty trucks. Subsequently, in 2004, CARB approved the “Pavley I” regulations limiting the amount of GHGs that may be released from new passenger automobiles beginning with model year 2009 through 2016; these regulations would reduce emissions by 30 percent from 2002 levels by 2016. The second set of regulations (“Pavley II”) is currently in development and will cover model years 2017 through 2025 in order to reduce emissions by 45 percent by the year 2020. The automotive industry legally challenged the bill claiming that the federal gas mileage standards preempted these state regulations. In 2005, California filed a waiver request to the USEPA in order to implement the GHG standards and in March of 2008, the USEPA denied the request. However, in June 2009, the decision was reversed and the USEPA granted California the authority to implement the GHG reduction standards for passenger cars, pickup trucks, and sport utility vehicles.

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

### ASSEMBLY BILL 32, THE CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006



In 2006, the California State Legislature adopted AB 32, the California *Global Warming Solutions Act of 2006*. AB 32 focuses on reducing GHG in California. GHGs as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 required CARB to adopt rules and regulations that would achieve GHG emissions equivalent to 1990 statewide levels by 2020. On or before June 30, 2007, CARB was required to publish a list of discrete early action GHG emission reduction measures that would be implemented by 2010. The law further required that such measures achieve the maximum technologically feasible and cost effective reductions in GHGs from sources or categories of sources to achieve the statewide GHG emissions limit for 2020.

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<sup>2</sup> California Environmental Protection Agency, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006.

CARB published its final report for Proposed Early Actions to Mitigate Climate Change in California in October 2007. The measures included are part of California’s strategy for achieving GHG reductions under AB 32. Three new regulations were proposed to meet the definition of “discrete early action GHG reduction measures”: a low carbon fuel standard; reduction of hydrofluorocarbon 134a emissions from non-professional servicing of motor vehicle air conditioning systems; and improved landfill methane capture<sup>3</sup>. CARB estimates that by 2020, the reductions from those three measures would be approximately 13-26 million MT CO<sub>2</sub>e.

Under AB 32, CARB has the primary responsibility for reducing GHG emissions. CARB published a staff report titled California 1990 GHG Emissions Level and 2020 Emissions Limit<sup>4</sup> that determined the statewide levels of GHG emissions in 1990 to be 427 million MT CO<sub>2</sub>e. Additionally, in December 2008, CARB adopted the Climate Change Scoping Plan, which outlines the state’s strategy to achieve the 2020 GHG limit. The Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. The plan emphasizes a cap-and-trade program, and also includes the discrete early actions.

### SENATE BILL 97 (SB 97)

SB 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed the California Office of Planning and Research (OPR) to develop draft CEQA Guidelines “for the mitigation of GHG emissions or the effects of GHG emissions” and directed the Resources Agency to certify and adopt the State CEQA Guidelines.

On April 13, 2009, OPR submitted the proposed amendments to the Secretary for Natural Resources. The Natural Resources Agency conducted formal rulemaking in 2009, certified, and adopted the amendments in December 2009. The California Office of Administrative Law codified into law the amendments in March 2010. The amendments became effective in June 2010 and provide regulatory guidance with respect to the analysis and mitigation of the potential effects of GHG emissions.

CEQA Guidelines § 15183.5, Tiering and Streamlining the Analysis of GHG Emissions, was added as part of the CEQA Guideline amendments that became effective in 2010 and describes the criteria needed in a Climate Action Plan (CAP) that would allow for the tiering and streamlining of CEQA analysis for subsequent development projects:

*§15183.5. Tiering and Streamlining the Analysis of Greenhouse Gas Emissions.*

*(a) Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate*

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<sup>3</sup> California EPA- California Air Resources Board, Proposed Early Actions to Mitigate Climate Change in California, October 2007.

<sup>4</sup> California EPA- California Air Resources Board, California 1990 GHG Emissions Level and 2020 Emissions Limit, November 2007.

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*plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of greenhouse gas emissions as provided in section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs), 15175-15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).*

*(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.*

*(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:*

- (A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;*
- (B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;*
- (C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;*
- (D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;*
- (E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;*
- (F) Be adopted in a public process following environmental review.*

*(2) Use with Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project.*

One of the goals of the E-CAP is to allow programmatic level review and mitigation of GHG emissions that allows streamlining of CEQA review for subsequent development projects. To accomplish this, the E-CAP framework is designed to fulfill the requirements identified in CEQA Guidelines § 15183.5, above.

### EXECUTIVE ORDER S-1-07

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS) (issued on January 18, 2007), calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. It instructed the California Environmental Protection Agency to coordinate activities between the University of California, the California Energy Commission and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target. Furthermore, it directed ARB to consider initiating regulatory proceedings to establish and implement the LCFS. In response, ARB identified the LCFS as an early action item with a regulation to be adopted and implemented by 2010.

### EXECUTIVE ORDER S-13-08

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08, *The Climate Adaptation and Sea Level Rise Planning Directive*, which provides clear direction for how the state should plan for future climate impacts. Executive Order S-13-08 calls for the implementation of four key actions to reduce the vulnerability of California to climate change:

- Initiate California's first statewide Climate Change Adaptation Strategy (CAS) that will assess the state's expected climate change impacts, identify where California is most vulnerable, and recommend climate adaptation policies;
- Request that the National Academy of Sciences establish an expert panel to report on sea level rise impacts in California in order to inform state planning and development efforts;
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new and existing projects; and
- Initiate studies on critical infrastructure and land-use policies vulnerable to sea level rise.

The 2009 CAS report summarizes the best known science on climate change impacts in the state to assess vulnerability, and outlines possible solutions that can be implemented within and across state agencies to promote resiliency. This is the first step in an ongoing, evolving process to reduce California's vulnerability to climate impacts<sup>5</sup>.

### CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 6

California Code of Regulations (CCR) Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically

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<sup>5</sup> California Natural Resources Agency, 2009 California Climate Adaption Strategy-A Report to the Governor in Response to Executive Order S-13-2008. September 2009. [www.Climatechange.Ca.Gov/Adaptation](http://www.Climatechange.Ca.Gov/Adaptation)

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to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels and natural gas use result in GHG emissions and energy efficient buildings require less electricity and natural gas. Therefore, increased energy efficiency results in decreased GHG emissions.

The California Energy Commission (CEC) adopted 2008 Standards on April 23, 2008 and the Building Standards Commission approved them for publication on September 11, 2008. These updates became effective on August 1, 2009. CEC adopted the 2008 changes to the Building Energy Efficiency Standards for several reasons:

- To provide California with an adequate, reasonably priced, and environmentally sound supply of energy;
- To respond to AB 32, *the Global Warming Solutions Act of 2006*, which mandates that California must reduce its GHG emissions to 1990 levels by 2020;
- To pursue California energy policy, which states that energy efficiency is the resource of first choice for meeting California's energy needs;
- To act on the findings of California's Integrated Energy Policy Report that concludes that the Standards are the most cost effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the Standards in reducing energy related to meeting California's water needs and in reducing GHG emissions;
- To meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes; and
- To meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards.

## ASSEMBLY BILL 1493

AB 1493 (also known as the Pavley Bill, in reference to its author Fran Pavley) was enacted in 2002 and requires the “maximum feasible and cost effective reduction” of GHGs from automobiles and light-duty trucks. Subsequently, in 2004, CARB approved the “Pavley I” regulations limiting the amount of GHGs that may be released from new passenger automobiles beginning with model year 2009 through 2016; these regulations would reduce emissions by 30 percent from 2002 levels by 2016. The second set of regulations (“Pavley II”) is currently in development and will cover model years 2017 through 2025 in order to reduce emissions by 45 percent by the year 2020. The automotive industry legally challenged the bill claiming that the federal gas mileage standards preempted these state regulations. In 2005, California filed a waiver request to the USEPA in order to implement the GHG standards and in March of 2008, the USEPA denied the request. However, in June 2009, the decision was reversed and the USEPA granted California the authority to implement the GHG reduction standards for passenger cars, pickup trucks, and sport utility vehicles. In September 2009, CARB adopted amendments to the “Pavley I”

regulations providing vehicle manufacturers with new compliance flexibility. The amendments also coordinated California's rules with the federal rules for passenger vehicles.

### SENATE BILL 375

SB 375, which establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions, was adopted by the State on September 30, 2008. On September 23, 2010, CARB adopted the vehicular GHG emissions reduction targets that were developed in consultation with the metropolitan planning organizations (MPOs); the targets require a 7 to 8 percent reduction by 2020 and between 13 to 16 percent reduction by 2035 for each MPO. SANDAG, of which Escondido is a member agency, serves as the region's MPO. SB 375 recognizes the importance of achieving significant GHG reductions by working with cities and counties to change land use patterns and improve transportation alternatives. Through the SB 375 process, MPOs will work with local jurisdictions in the development of sustainable communities strategies (SCS) designed to integrate development patterns and the transportation network in a way that reduces GHG emissions while meeting housing needs and other regional planning objectives. MPOs will prepare their first SCS according to their respective regional transportation plan (RTP) update schedule; to date, no region has adopted an SCS. The first of the RTP updates with SCS strategies are expected in 2012.

### CAL GREEN BUILDING CODE

CCR Title 24, Part 11: California's Green Building Standard Code (CalGreen) was adopted in 2010 and went into effect January 1, 2011. CalGreen is the first statewide mandatory green building code and significantly raises the minimum environmental standards for construction of new buildings in California. The mandatory provisions in CalGreen will reduce the use of volatile organic compounds emitting materials, strengthen water conservation, and require construction waste recycling.

## Regional

### SAN DIEGO AIR POLLUTION CONTROL DISTRICT

The City of Escondido is located in the San Diego Air Basin, and the San Diego Air Pollution Control District (SDAPCD) is the agency principally responsible for comprehensive air pollution control in the Basin. SDAPCD has not yet adopted an impact significance threshold for analyzing GHG emissions for development projects subject to the CEQA.

### SAN DIEGO ASSOCIATION OF GOVERNMENTS

The MPO for the region is the SANDAG. SANDAG adopted the 2050 RTP and SCS for the County of San Diego on October 28, 2011. The 2050 RTP is aimed at attaining the reduction targets of a 7 percent per capita reduction in GHG emissions from passenger vehicles by the year 2020 and a 13 percent reduction by 2035. Many of the transportation-related reduction measures included in this E-CAP would coordinate with SANDAG's efforts. Table 1-2, below, summarizes the goals and policies of the 2050 RTP and demonstrates the proposed Escondido General Plan Policies that coordinate with each.

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| <b>Table 1-2 SANDAG RTP Policies and Escondido Proposed General Plan Policies</b>  |  |   |
|--|--|---|
| <b>SANDAG 2050 RTP Goals</b>   | <b>SANDAG RTP Policy Objectives</b>  | <b>Escondido Proposed General Plan Policies</b>   |
| <b>Mobility</b>  |  |   |
| The transportation system should provide the general public and those who move goods with convenient travel options. The system also should operate in a way that maximizes productivity. It should reduce the time it takes to travel and the costs associated with travel.     | Tailor transportation improvements to better connect people with jobs and other activities.<br>Provide convenient travel choices including transit, intercity and high-speed trains, driving, ridesharing, walking, and biking.<br>Preserve and expand options for regional freight movement.<br>Increase the use of transit, ridesharing, walking, and biking in major corridors and communities.<br>Provide transportation choices to better connect the San Diego region with Mexico, neighboring counties, and tribal nations. | Community Character Policies 1.1, 1.4, 1.5,1.9<br>Residential Development Policies 3.4, 3.9<br>Neighborhood Maintenance & Preservation Policies 4.3, 4.6<br>Mixed Use Overlay Policies 7.1, 7.2, 7.3, 7.4<br>Office Land Use Policy 9.3<br>Regional Transportation Planning Policy 1.1<br>Complete Streets Policies 2.1, 2.3, 2.4, 2.8<br>Pedestrian Network Policies 3.1, 3.4-3.7<br>Bicycle Network Policies 4.1, 4.4-4.7<br>Transit System Policies 5.1, 5.3-5.7, 5.9<br>TDM Policies 6.1-6.3<br>Parking Policy 8.2<br>Air Quality and Climate Protection Policies 6.5 |
| <b>Reliability</b>   |  |   |
| The transportation system should be reliable.<br>Travelers should expect relatively consistent travel times, from day to day, for the same trip and mode of transportation.  | Employ new technologies to make travel more reliable and convenient.<br>Manage the efficiency of the transportation system to improve traffic flow.  | Pedestrian Network Policies 3.2, 3.9<br>Bicycle Network Policies 4.2, 4.3,<br>Transit System Policy 5.2<br>Street Network Policy 7.9  |
| <b>System Preservation and Safety</b>  |  |   |
| The transportation system should be well maintained, to protect the public’s investments in transportation. It also is critical to ensure a safe regional transportation system.   | Keep the region's transportation system in a good state of repair.<br>Reduce bottlenecks and increase safety by improving operations.<br>Improve emergency preparedness within the regional transportation system.   | Pedestrian Network Policy 3.8<br>Bicycle Network Policy 4.8<br>Transit System Policy 5.8, 5.10  |
| <b>Social Equity</b>   |  |   |
| The transportation system should be designed to provide an equitable level of transportation services to all segments of the population.   | Create equitable transportation opportunities for all populations regardless of age, ability, race, ethnicity, or income.<br>Ensure access to jobs, services, and recreation for populations with fewer transportation choices.  | Complete Streets Policy 2.2<br>Transit System Policy 5.1  |
| <b>Healthy Environment</b>   |  |   |
| The transportation system should promote environmental sustainability, and foster efficient development patterns that optimize travel, housing, and employment choices. The system should encourage growth away from rural areas and closer to existing and planned development. | Develop transportation improvements that respect and enhance the environment.<br>Reduce greenhouse gas emissions from vehicles and continue to improve air quality in the region.<br>Make transportation investments that result in healthy and sustainable communities.   | Health and Wellness Policy 1.11<br>Parks and Recreation Policies 2.5, 2.6, 2.7, 2.11, 2.26<br>Library Services Policy 3.5<br>Schools and Education Policies 5.4, 5.10<br>Pedestrian Network Policies 3.3, 3.10-3.12<br>Energy Policy 14.2<br>Air Quality and Climate Protection Policy 6.1-6.3, 6.6-6.11  |
| <b>Prosperous Economy</b>  |  |   |
| The transportation system should play a significant role in raising the region’s standard of living.   | Maximize the economic benefits of transportation investments.<br>Enhance the goods movement system to support economic prosperity.   | Transit System Policy 5.3<br>TDM Policy 6.1, 6.2<br>Parking Policy 8.2<br>Air Quality and Climate Protection Policy 6.7   |

## COUNTY OF SAN DIEGO

The County of San Diego published its Guidelines for Determining Significance for Climate Change on February 17, 2012. The purpose of the guideline document is to ensure that new development within the unincorporated County implements its fair share of GHG emission reductions needed to meet the statewide AB 32 mandate. The County's guidelines establish a screening level threshold of 2,500 MT CO<sub>2</sub>e emitted annually. Projects that emit more than 2,500 MT CO<sub>2</sub>e annually would result in a potentially significant cumulatively considerable impact and would be required to incorporate measures from the County's CAP and prepare a technical analysis to demonstrate that the project's design features, along with CAP measures and, if necessary, additional mitigation measures, are incorporated that would allow the project to be below the applicable County significance threshold. There are four thresholds that can be used by proposed projects: (1) a GHG emission limit based on emissions per service population; (2) a maximum annual GHG emissions limit for standard development projects; (3) a GHG limit for stationary emission sources; and (4) a required percent reduction compared to business as usual emissions.

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# Chapter 2      **Methodology**

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## 2.1 Overview

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The first step in drafting this E-CAP is to prepare the GHG inventories for Escondido. GHG inventories include all major sources of emissions attributable directly or indirectly to Escondido's municipal operations or activities within the community the City serves. GHG inventories are divided into two broad categories: municipal GHG inventories and community-wide GHG inventories. Municipal GHG Inventories include emissions resulting from City municipal operations. Community-wide GHG inventories include a broader range of emissions associated with both the activities within the community the City serves and the municipal operations. As such, the municipal GHG inventory is a subset of the larger community-wide GHG inventory. The methodology for preparing GHG inventories incorporates the protocols, methods, and emission factors found in the California Climate Action Registry (CCAR) *General Reporting Protocol* (version 3.1, January 2009), the *Local Government Operations Protocol* (LGOP) (version 1.1, May 2010), and the *Draft Community-wide GHG Emissions Protocol* under development by the Association of Environmental Professionals (AEP) and the Governor's Office of Planning and Research Climate Action Plan Guidance. The LGOP provides the guidance and protocols in the development of the municipal GHG inventory. Currently, there is not an adopted protocol for the development of community-wide GHG inventories. However, the *Draft Community-wide GHG Emissions Protocol* provides draft guidance in the development of the Community-wide inventory.

The LGOP and the *Draft Community-wide GHG Emissions Protocol* categorize GHG emissions into three distinct "scopes" as a way of organizing GHG emissions, as follows:

- **Scope 1 Emissions** – All "direct" sources of community-wide GHG emissions from sources within the jurisdictional boundaries of Escondido. This includes fuel burned onsite in buildings and equipment such as natural gas or diesel fuel; transportation fuels burned in motor vehicles; and wood-burning emissions from household hearths. For inventories of only municipal operations, these emissions are limited to activities under the operational control of the local government.
- **Scope 2 Emissions** – Encompasses "indirect" sources of GHG emissions resulting from the consumption of purchased electricity, which is electricity used by the residents, businesses, and City's facilities. An "indirect" source is one where the action that generates GHGs is separated from the where the GHGs are actually emitted. For example, when a building uses electricity, it necessitates the burning of fossil fuels, such as coal or natural gas (and resultant release of GHGs) to generate electricity by a utility facility located elsewhere. Thus they are distinguished from *direct* emissions (i.e., Scope 1 emissions) from electricity production, which are reported by the utility itself, in order to avoid double counting.
- **Scope 3 Emissions** – An optional reporting category that encompasses all other "indirect emissions" that are a consequence of activities of Escondido's residents and businesses, but occur from sources out of the jurisdictional control of the local government. The key to this category of emissions is that they must be "indirect or embodied emissions over which the local government exerts significant control or influence" (CCAR 2010). For example, when considering

GHG emissions from trucks hauling waste under a City contract, the City does not own the waste hauling trucks, but does have significant control over how many pickups the trucks make.

Scope 1 emissions are characterized in this report as “direct emissions,” while Scope 2 emissions are characterized as “indirect source emissions.”

The analysis herein is tailored to include all existing and projected emission sources within Escondido to provide, to the fullest extent feasible, a comprehensive analysis of GHG reductions. The AB 32 Scoping Plan establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of GHG emissions.

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## 2.2 Calculation of GHGs

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The first step in developing the E-CAP was to establish an existing inventory of Escondido’s GHG emissions. The purpose of this inventory is to update Escondido’s existing 2005 inventory to align with the Escondido General Plan Update. The E-CAP uses 2010 as the year on which to base the existing inventory; this is the most recent year for which reliable data concerning Escondido’s residential, commercial, and government operations are available. This inventory provides a framework on which to design programs and actions that specifically target reductions by emissions sources. Programs and actions already in place within Escondido are described in Chapter 4. The 2010 inventory serves as a reference against which to measure Escondido’s progress towards reducing GHG emissions since 2005 and into the future, and also serves as documentation for potential emission trading opportunities.

The methodology used for the calculation GHG emissions differs depending on the emission source, as described below. The emissions calculations follow the CCAR General Reporting Protocol, version 3.1; LGOP, version 1.1; and CARB’s Mandatory GHG Reporting Regulations (Title 17, CCR Sections 95100 et seq.). These protocols are consistent with the methodology and emission factors endorsed by CARB and USEPA. In cases where these protocols do not contain specific source emission factors, current industry standards or the USEPA’s *AP 42 Compilation of Air Pollution Emission Factors* were used.

In estimating Escondido’s total GHG emissions in 2010, the 2005 inventory was consulted in order to utilize the same data sources and retain consistency between the two analyses. San Diego Gas and Electric (SDG&E) provided both municipal and community wide electricity and natural gas data. Solid waste data was taken from the California Integrated Waste Management Board’s (CIWMB) database. The City of Escondido Water and Wastewater Rate Study Report (December 2010) provided the water use data for the inventory. Transportation emissions were calculated based on VMT modeled by SANDAG and a traffic study performed by Linscott, Law & Greenspan Engineers (LLG 2011) in coordination with Escondido’s General Plan Update. Land use data and development estimates from the General Plan Update were used to calculate GHG emissions associated with construction. In cases where specific data for 2010 was not available, estimates were made by extrapolating from existing data. The data used in the calculations for each inventory are summarized in Chapter 3. All of the contributors to GHG emissions (kilowatt-hours [kWh] of electricity generated by fossil fuel combustion in power plants, natural gas in therms, vehicle travel in VMT, and solid waste in tons) are expressed in the common unit of MT CO<sub>2</sub>e released into the atmosphere in a given year.

## CHAPTER 2 METHODOLOGY

In addition, the costs associated with the GHG emissions were calculated for each sector (based on availability of data). The costs were based on the consumer fees for each fuel type included in the inventory. By including the costs, the City can assess where consumers are spending the most money and utilize the information in making decisions on reduction measures. Coefficients, modeling inputs, and other assumptions, used in the calculations of GHGs are included in the Appendix of this report.

GHG emissions are typically segregated into direct and indirect sources as discussed previously. However, direct and indirect sources are not completely independent of each other and are often combined into other more encompassing categories. For example, although natural gas combustion is a direct source and electricity generation is an indirect source, they both are typically discussed under a heading of “Energy” when policies are put in place to reduce emissions. Therefore, this E-CAP discusses emissions with respect to the general source categories of Transportation, Energy, Area Source, Water, Wastewater, Solid Waste, and Construction.

## Transportation

### ON-ROAD VEHICLES

Carbon dioxide emissions from vehicles were calculated utilizing EMFAC2007 emission factors. The emission factors model was developed by CARB and used to calculate emission rates from on-road motor vehicles from light-duty passenger vehicles to heavy-duty trucks that operate on highways, freeways, and local roads in California. Motor vehicle emissions of methane, and nitrous oxide were also calculated using USEPA emission factors for on-road vehicles based on the total annual mileage driven multiplied by their respective emission factors by year.

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

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

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

## Energy

### ELECTRICITY

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



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

Costs of electricity calculations were based on the annual kWh use and price per kWh for each rate class. Electricity rates fluctuate throughout the year, so average values were used.

### NATURAL GAS COMBUSTION

The City emits GHGs from the combustion of natural gas. The annual natural gas usage for Escondido in therms was converted to million British thermal units and multiplied by the respective emissions factors for carbon dioxide, methane, and nitrous oxide to determine the emissions from natural gas combustion, typically used for heating. Natural gas usage for 2010 was obtained from SDG&E. The costs associated with natural gas use were calculated using SDG&E rates aligned with the use breakdowns of residential, industrial, and commercial use.

## Area Sources

### LANDSCAPING

Emissions of carbon dioxide, methane, and nitrous oxide are generated by the use of landscape equipment through the combustion of gasoline. Carbon dioxide emissions were determined directly through URBEMIS2007 for the existing inventory. URBEMIS2007 is a computer software package that is used for modeling projected emissions of air quality pollutants including carbon dioxide. From the carbon dioxide emissions, the approximate number of gallons of gasoline consumed through landscape equipment use was calculated. This number was then multiplied by emission factors presented in the General Reporting Protocol, version 3.1 to determine both methane and nitrous oxide emissions.

## WOOD BURNING

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

## Water

### POTABLE WATER

Electricity is needed to move and treat water. Escondido residents and businesses currently use approximately 8.2 billion gallons of drinking water annually. Escondido's water comes from both local sources and purchased water. About 12 percent of the water is locally sourced while the remainder is purchased from San Diego County Water Authority, which is sourced from a mixture of water from the Colorado River Aqueduct and the State Water Project. There are additional emissions associated with this purchased water from the Colorado River and the State Water Project due to the electricity used to transport the water over a long distance. Costs associated with water were based on the average rates for residential, commercial, and industrial customers. This category also includes the agricultural water used in Escondido. Agricultural operations in Escondido primarily consist of citrus and avocado orchards. Maintenance of orchards does not typically involve intensive agricultural equipment that would emit substantial GHGs; therefore, the indirect GHG emissions associated with the water use are the only GHG emissions included in these inventories.



### WASTEWATER TREATMENT

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

## Waste Management

### SOLID WASTE

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

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



Landfill equipment emissions are only included in the inventory if the landfill is under the direct control of the City or County of interest. As the Sycamore landfill used for the disposal of waste for Escondido, is not under the City's direct control, emissions from onsite equipment are not included in this inventory.

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

## Construction

Construction-related GHG emissions vary depending on the individual project, the type of equipment used, the timeline for the project, and a number of other factors. Annual construction-related CO<sub>2</sub>e emissions were estimated using the assumed worst-case activity data and the emission factors included URBEMIS 2007 model. Table 2-1 summarizes the 2035 planning horizon assumptions for construction activities associated with the General Plan Update. For the purposes of modeling a worst-case construction scenario, it was assumed that development associated with the General Plan Update would take place over a 25-year period between the 2010 baseline conditions and the 2035 planning horizon, with an equal amount of construction occurring each year. At 2035, a total of 9,924 new residential units and 13,650,000 sf of new non-residential development could be accommodated within the General Plan Update planning area boundary (this includes areas outside Escondido's current jurisdictional boundaries, but within the sphere of influence). Additionally, existing land uses would be

## CHAPTER 2 METHODOLOGY

demolished and redeveloped. To account for construction emissions from redevelopment as well as new development, a citywide average of approximately 15 percent of existing development is assumed to be demolished and reconstructed over the same time period. Using this approach, it is assumed that 316 single family dwelling units, 405 multi-family units, 279,406 sf of commercial/retail development, 246,026 sf of office development, and 197,454 sf of industrial development would be constructed every year for 25 years between 2010 and 2035. Model defaults were used to estimate emissions associated with construction equipment. It was assumed that construction emissions would be the same for each inventory year, including the 2005 and 2010 inventories.

| <b>Table 2-1 Annual Construction Assumptions</b> |   |
|--|---|
| <b>Category</b>                                  | <b>Assumption</b>   |
| Total New Development                            | 9,924 residential units and 13,650,000 sf non-residential development |
| Total Redevelopment                              | 8,105 residential units and 4,422,150 sf non-residential development  |
| Phasing  | 25 years (2010-2035)  |
| Annual New Construction per Phase                | 397 residential units and 546,000 sf non-residential development      |
| Annual Redevelopment per Phase                   | 324 residential units and 176,886 sf non-residential development      |
| Percent of Existing Development to be Demolished | 15%   |

# Chapter 3      **Greenhouse Gas Emissions Inventory**

## CHAPTER 3 GREENHOUSE GAS EMISSIONS INVENTORY

The following sections describe Escondido's 2010 municipal operations and community-wide GHG emissions inventories. The municipal operations inventory includes sources and quantities of GHG emissions from government owned or rented buildings, facilities, vehicles, and equipment. The community-wide emissions inventory identifies and categorizes the major sources and quantities of GHG emissions produced by residents, businesses, and municipal operations in Escondido using the best available data. By having the municipal emissions separated from the community as a whole, the local government can implement reduction strategies where it has direct control, closely monitor the changes in emissions over time, and set an example for the rest of Escondido.

### 3.1 2010 Municipal Emissions Inventory

#### Data Inputs

Data for the municipal inventory was gathered from various City government departments. Table 3-1, below, summarizes the data inputs and sources for each of the emission categories included in the inventory.

| <b>Category</b>                         | <b>Data Input</b> | <b>Data Source</b> |
|---|-------------------|--------------------|
| Electricity (kWh)                       | 33,328,709        | SDG&E              |
| Natural Gas (therms)                    | 460,959           | SDG&E              |
| Vehicle Fleet                           |                   |                    |
| <i>Gasoline(gallons)</i>                | 270,279           | Fleet Manager      |
| <i>Diesel (gallons)</i>                 | 35,289            |                    |
| Employee Commute (responses)            | 386               | Employee Survey    |
| Solid Waste (tons)                      | 3,931             | EDCO Disposal      |
| Wastewater                              |                   |                    |
| <i>Digester Gas(ft<sup>3</sup>/day)</i> | 295,000           | Wastewater Dept.   |
| <i>Methane fraction</i>                 | 0.61              |                    |

With the exception of the employee commute data, each data input was then multiplied by the associated emission factor to calculate the emissions inventory. The data from the employee commute survey was used to estimate total miles traveled, fuel used, and associated GHG emissions for all City employees' commutes. Additionally, where possible, the emissions were categorized by City Department.

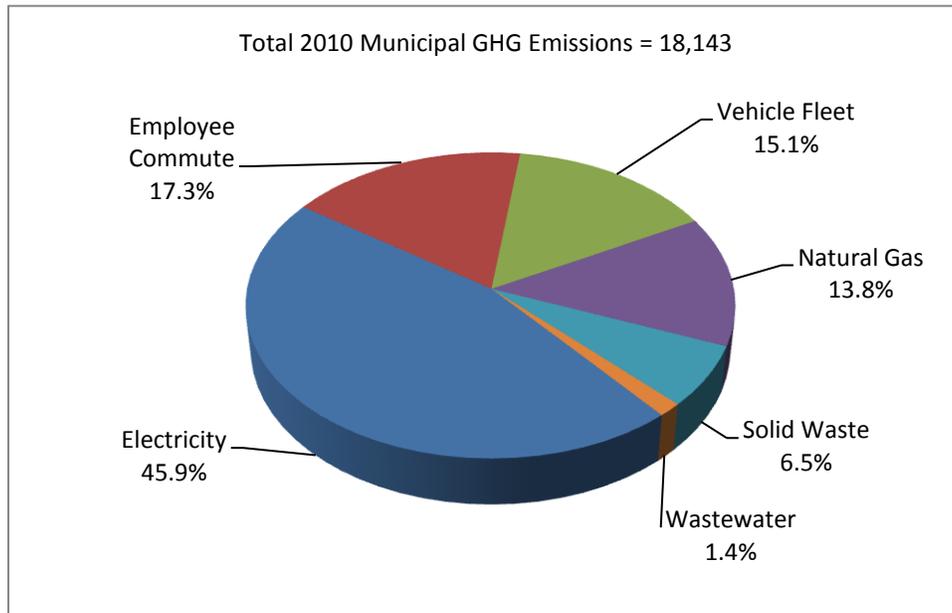
# Emissions Summary

Escondido emitted 18,143 MT CO<sub>2</sub>e through its municipal operations in 2010. The emissions were calculated based on the vehicle and equipment fleet fuel use, energy accounts, waste management, and a survey of the City’s employee commutes. The largest portion of Escondido’s 2010 government emissions were from electricity (46 percent), followed by emissions from employee commutes (17 percent). Table 3-2 summarizes Escondido’s net 2010 emissions of CO<sub>2</sub>e as broken down by emissions category. Figure 3-1 is a graphical representation of Table 3-2. A detailed breakdown of 2010 emissions by category is available in the Appendix.

| Table 3-2 2010 Total Municipal Emissions |                                  |
|--|----------------------------------|
| Category                                 | Metric tons of CO <sub>2</sub> e |
| Electricity                              | 8,323                            |
| Employee Commute                         | 3,142                            |
| Vehicle Fleet                            | 2,739                            |
| Natural Gas                              | 2,502                            |
| Solid Waste                              | 1,179                            |
| Wastewater <sup>a</sup>                  | 259                              |
| <b>Total</b>                             | <b>18,143</b>                    |

<sup>a</sup> Note: the wastewater emissions category represents only the fugitive methane emissions from the wastewater treatment facility. The emissions due to electricity used at the facility are included in the Electricity category.

**Figure 3-1 2010 Municipal Emissions Generated by Source**



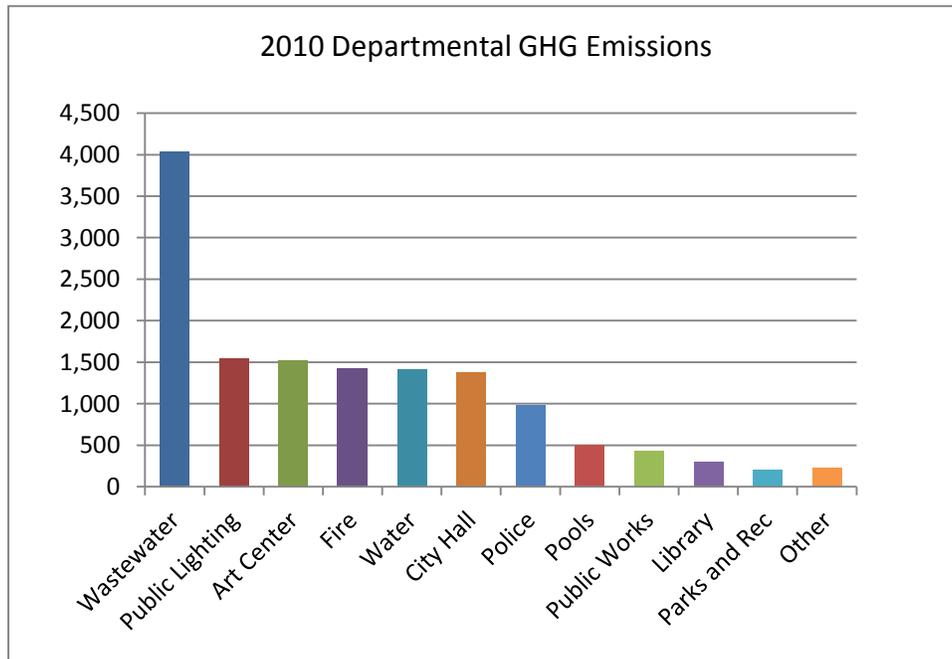
## 2010 MUNICIPAL DEPARTMENT EMISSIONS AND COSTS

For the municipal inventory it is helpful to see which departments are generating the most emissions. This helps to pinpoint where emissions are coming from and where the focus should be placed for targeting emissions reductions. Table 3-3 and Figure 3-2, below, summarize the electricity, natural gas, and employee commute emissions by department. Vehicle fleet fuel use was not available for each individual department, so those emissions are not included in Table 3-3.

The wastewater department represents the largest sources of emissions and costs in Escondido. The energy intensive process for wastewater treatment contributes to the large amount of emissions and associated costs from electricity use in the department.

| <b>Table 3-3 2010 Municipal and Employee Emissions and Costs by Department</b>   |                                       |                     |
|--|---------------------------------------|---------------------|
| <b>Category</b>  | <b>Metric Tons of CO<sub>2</sub>e</b> | <b>Cost</b>         |
| Wastewater <sup>a</sup>  | 4,036                                 | \$ 1,942,803        |
| Public Lighting  | 1,544                                 | \$ 884,258          |
| CA Center for the Arts   | 1,528                                 | \$ 573,041          |
| Fire Department  | 1,425                                 | \$ 615,078          |
| Water <sup>a</sup>   | 1,407                                 | \$ 951,241          |
| City Hall  | 1,382                                 | \$ 760,057          |
| Police   | 986                                   | \$ 315,953          |
| Pools  | 498                                   | \$ 204,727          |
| Public Works   | 432                                   | \$ 234,362          |
| Library  | 298                                   | \$ 161,178          |
| Parks and Recreation   | 208                                   | \$ 68,936           |
| Other  | 222                                   | \$ 165,897          |
| <b>Total</b>   | <b>13,966</b>                         | <b>\$ 6,137,351</b> |
| Note: Emission sources include electricity, natural gas, and vehicle emissions from employee commutes.<br><sup>a</sup> Water and wastewater emissions here represent only emissions associated with electricity and natural gas use in the water/wastewater facilities and fuel use from employee commutes for members of these departments. |                                       |                     |

**Figure 3-2 2010 Comparison of Municipal Emissions Generated by Department (MT CO<sub>2</sub>e)**



### 2010 TOTAL MUNICIPAL COST ESTIMATES

The costs associated with the inventory represent the municipal energy and fuel use costs. These cost estimates give the City a perspective on where the City is spending the most money and help to prioritize reduction measures toward the sectors that have the potential to both reduce emissions and costs. Electricity was the largest source of emissions and cost in 2010. Table 3-4, below, summarizes the cost estimates for 2010. Additionally, the City employees collectively spend approximately \$1.4 million annually on their commutes to and from work.

| Table 3-4 Estimated Municipal Energy Costs |                     |
|--|---------------------|
| Category                                   | Cost                |
| Electricity                                | \$ 5,090,500        |
| Natural Gas                                | \$ 357,841          |
| Vehicle Fleet                              | \$ 960,189          |
| <b>Municipal Total</b>                     | <b>\$ 6,408,530</b> |
| Employee Commute                           | \$ 1,429,190        |

## 3.2 2010 Community-Wide Emissions Inventory

The community-wide inventory represents all emissions from sources located within the jurisdictional boundaries of the City of Escondido. Therefore, the municipal emissions described in the previous section are a subset of the community-wide inventories presented here. In 2010, the City of Escondido emitted a total of 886,118 MT CO<sub>2</sub>e from the community as a whole. The following sections describe the data inputs, emissions by source, and emissions by land use in 2010.

### Data Inputs

Data for the community-wide inventory was gathered from various City departments, SDG&E, SANDAG, and reports. Table 3-5, below, summarizes the data inputs and sources for each of the emission categories included in the inventory.

Each data input was then multiplied by the associated emission factor to calculate the emissions associated with each source. For construction emissions, the land use assumptions were entered in URBEMIS and default construction assumptions were used.

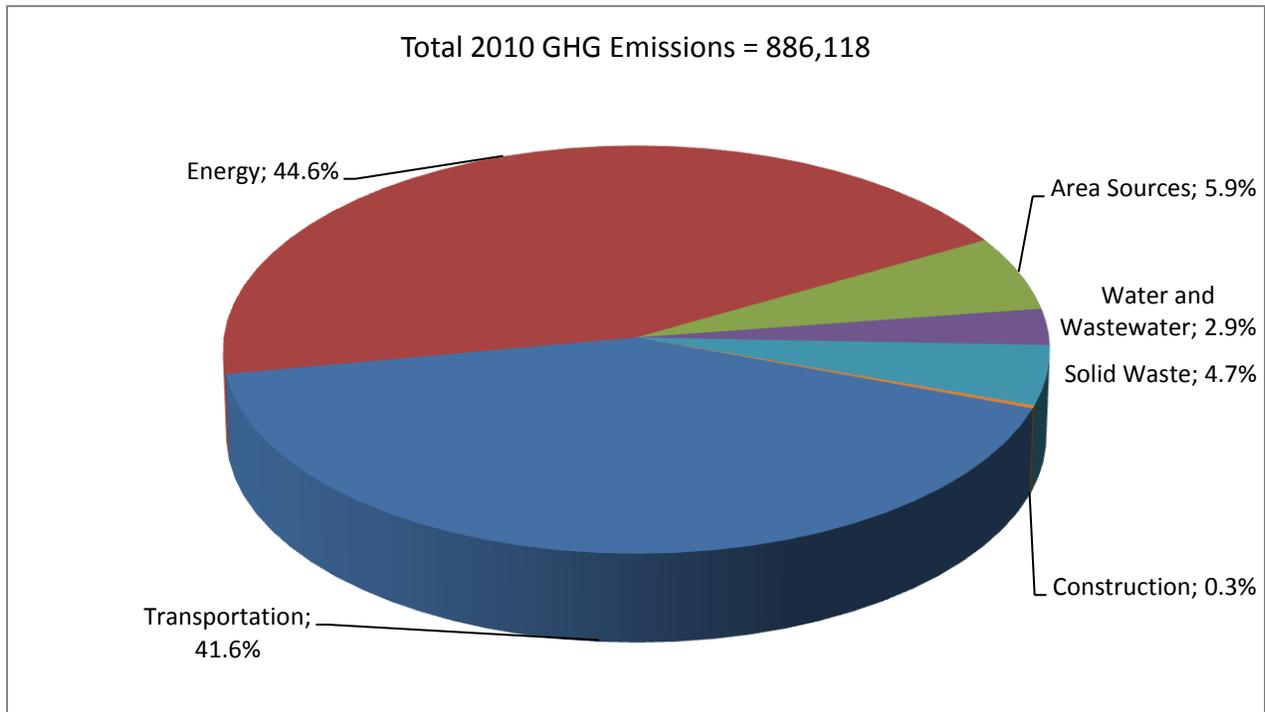
| Table 3-5 2010 Community-wide Data Inputs |             |   |
|---|-------------|---|
| Category                                  | Data Input  | Data Source                                       |
| Electricity (kWh)                         | 652,737,784 | SDG&E   |
| Natural Gas (therms)                      | 40,833,330  | SDG&E   |
| Transportation                            |             |   |
| <i>Annual VMT</i>                         | 735,247,975 | SANDAG/General Plan<br>Update Traffic Study       |
| <i>Annual Trips</i>                       | 231,644,061 |   |
| Area Source (based on land use)           |             |   |
| <i>SFR (units)</i>                        | 31,107      | City Planning<br>Department                       |
| <i>MFR (units)</i>                        | 16,477      |   |
| <i>Commercial (ksf)</i>                   | 17,092      |   |
| <i>Industrial (ksf)</i>                   | 12,389      |   |
| Solid Waste (tons)                        | 147,166     | CIWMB   |
| Water (kgal)                              | 8,224,556   | 2010 Water and<br>Wastewater Rate Study<br>Report |
| Wastewater                                |             |   |
| <i>Digester Gas(ft<sup>3</sup>/day)</i>   | 295,000     | Wastewater Dept.                                  |
| <i>Methane fraction</i>                   | 0.61        |   |
| Construction                              |             |   |
| <i>New Residential (units)</i>            | 397         | General Plan Update<br>Land Use                   |
| <i>New Commercial (sf)</i>                | 546,000     |   |
| <i>Residential Redevelopment (units)</i>  | 324         |   |
| <i>Commercial Redevelopment (sf)</i>      | 176,886     |   |

## Emissions by Source

Table 3-6 includes the total amount of community-wide GHG emissions for Escondido in 2010 by emission source category. Escondido as a whole emitted 886,118 MT CO<sub>2</sub>e in 2010. The largest portion of Escondido’s 2010 emissions were from electricity and natural gas use in buildings (45 percent), followed by emissions from transportation (42 percent). Figure 3-3 provides a comparison of GHG emissions by source category.

| Table 3-6 2010 Community-wide GHG Emissions by Source |                                  |
|---|----------------------------------|
| Category  | Metric tons of CO <sub>2</sub> e |
| Energy  | 395,565                          |
| Transportation  | 368,622                          |
| Area Sources  | 52,559                           |
| Solid Waste   | 41,724                           |
| Water and Wastewater                                  | 25,360                           |
| Construction  | 2,288                            |
| <b>Total</b>  | <b>886,118</b>                   |

**Figure 3-3 2010 Community GHG Emissions by Source**

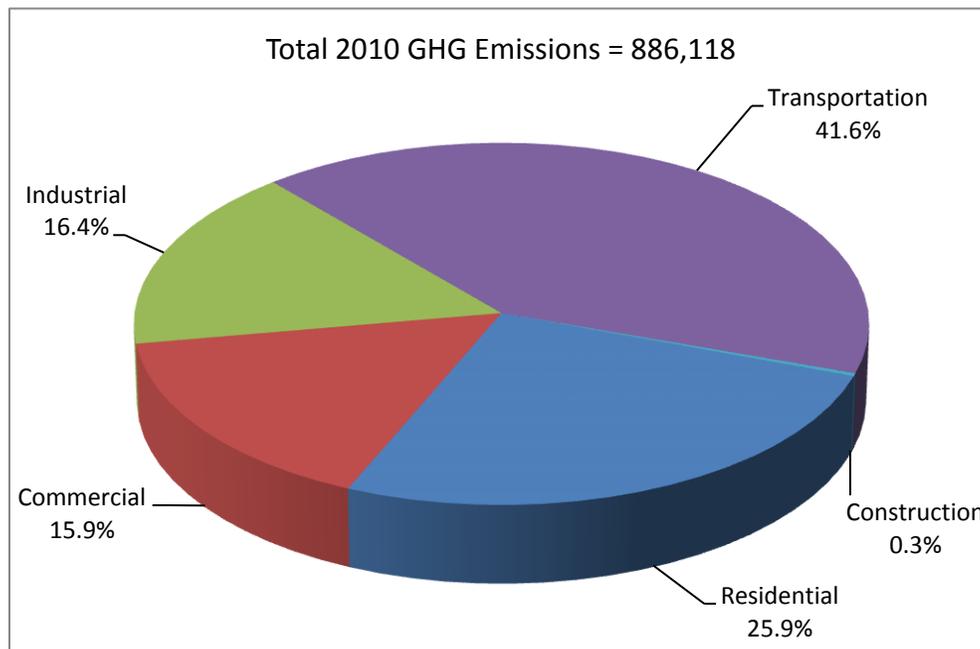


## Emissions by Land Use

Table 3-7 summarizes the total amount of community-wide GHG emissions for Escondido in 2010 by land use category. Escondido as a whole emitted 886,118 MT CO<sub>2</sub>e in 2010. The largest portion of Escondido’s 2010 emissions were from transportation (42 percent), followed by emissions from residential land uses (26 percent). Due to the nature of mobile emissions, transportation and construction emissions could not be allocated to the individual land use types. Figure 3-4 provides a comparison of GHG emissions by land use category.

| Table 3-7 2010 Community-wide GHG Emissions by Land Use |                                  |
|---|----------------------------------|
| Category  | Metric tons of CO <sub>2</sub> e |
| Transportation  | 368,622                          |
| Residential   | 229,512                          |
| Industrial  | 145,170                          |
| Commercial  | 140,526                          |
| Construction  | 2,288                            |
| <b>Total</b>  | <b>886,118</b>                   |

**Figure 3-4 2010 Community GHG Emissions by Land Use**



## 3.3 2020 Community-Wide Emissions Inventory

In 2020, Escondido is projected to emit a total of 992,583 MT CO<sub>2</sub>e based on the growth rates in the General Plan Update and without the inclusion of the reduction measures described in this E-CAP. As with the 2010 community-wide inventory, these emissions represent all sources within the jurisdictional boundary of Escondido, including emissions due to the municipal operations of City departments. The following sections describe the data inputs, emissions by source, and emissions by land use category for the year 2020.

### Data Inputs

Data for the 2020 community-wide inventory was estimated based on the General Plan growth rates for Escondido and the traffic model's forecasts. Table 3-8, below, summarizes the growth rates and annual VMT data for 2020.

| Table 3-8 2020 Community-wide Data Inputs  |  |  |
|--|--|--|
| Category   | Data Input                               | Data Source                              |
| Transportation   |  |  |
|  | <i>Annual Vehicle Miles</i>              | 903,409,558                              |
|  | <i>Annual Traveled Trips</i>             | 338,626,654                              |
|  |  | SANDAG/General Plan Update Traffic Study |
| Growth Rates (based on land use) <sup>a</sup>  |  |  |
|  | <i>Single Family Residential</i>         | 2.2%                                     |
|  | <i>Multi-Family Residential</i>          | 16.5%                                    |
|  | <i>Commercial</i>                        | 20.1%                                    |
|  | <i>Industrial</i>                        | 9.3%                                     |
|  |  | City Planning Department                 |
| Construction   |  |  |
|  | <i>New Residential (units)</i>           | 397                                      |
|  | <i>New Commercial (sf)</i>               | 546,000                                  |
|  | <i>Residential Redevelopment (units)</i> | 324                                      |
|  | <i>Commercial Redevelopment (sf)</i>     | 176,886                                  |
|  |  | General Plan Update Land Use             |
| <sup>a</sup> Note: The growth rates represent the overall growth from 2010 to 2020 and are derived from the projected land use growth based on the proposed General Plan Update. The 2020 growth numbers were extrapolated from the 2035 build-out growth rates. |  |  |

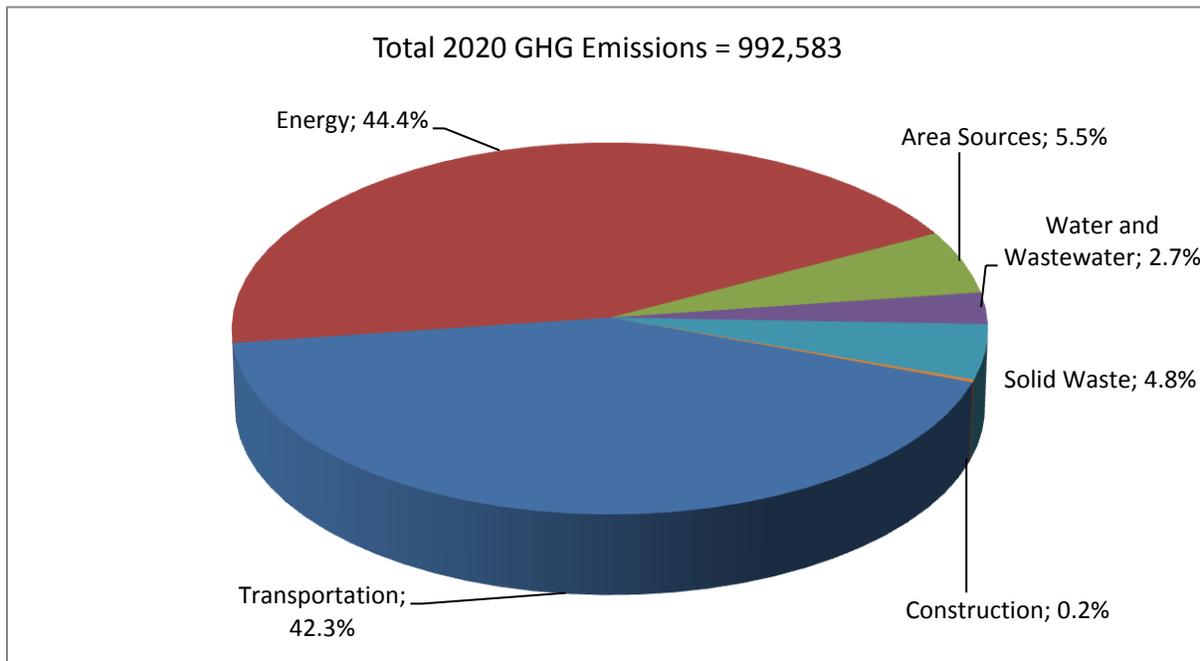
The VMT data from the traffic study was used to estimate emissions from transportation in 2020. The land use specific growth rates were used to estimate the emissions associated with electricity, natural gas, water, wastewater, area source, and solid waste. Construction emissions were estimated using URBEMIS and the default construction assumptions.

## Emissions by Source

The 2020 emissions are estimated based on the projected growth in Escondido from 2010 to 2020. These projections include a 7.5 percent increase in housing, a 20.1 percent increase in commercial development, and a 9.3 percent increase in industrial development; these growth rates were applied, respectively, to residential, commercial, and industrial 2010 community-wide emissions in order to estimate 2020 emissions with the proposed General Plan Update. Table 3-9 summarizes the 2020 Escondido emissions of CO<sub>2</sub>e as broken down by emissions category. Figure 3-5 is a graphical representation of Table 3-9. A detailed breakdown of 2020 emissions by category is available in the Appendix.

| Table 3-9 2020 GHG Emissions by Source |                                  |
|--|----------------------------------|
| Category                               | Metric tons of CO <sub>2</sub> e |
| Energy                                 | 441,025                          |
| Transportation                         | 419,741                          |
| Area Sources                           | 54,977                           |
| Solid Waste                            | 47,273                           |
| Water and Wastewater                   | 27,286                           |
| Construction                           | 2,288                            |
| <b>Total</b>                           | <b>992,583</b>                   |

**Figure 3-5 2020 GHG Emissions Generated by Source**

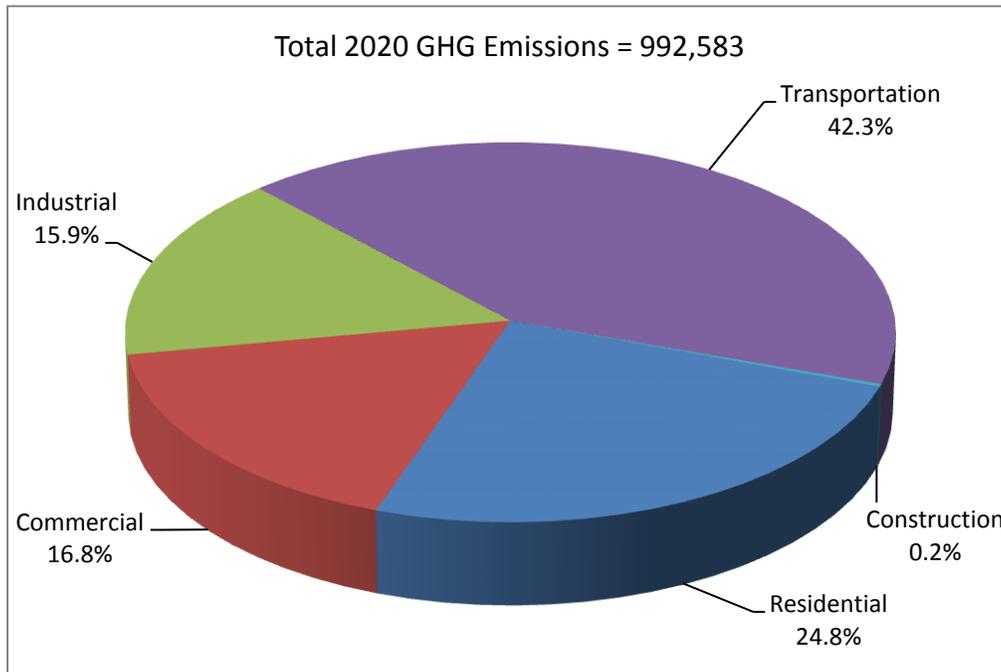


## Emissions by Land Use

Table 3-10 summarizes the total amount of community-wide GHG emissions for Escondido in 2020 by land use category. Escondido as a community is projected to emit 992,583 MT CO<sub>2</sub>e in 2020. The largest portion of Escondido’s 2020 emissions are from transportation (42 percent), followed by emissions from residential land uses (26 percent). Due to the nature of mobile emissions, transportation and construction emissions could not be allocated to the individual land use types. Figure 3-6 provides a comparison of GHG emissions by land use category.

| Table 3-10 2020 GHG Emissions by Land Use |                                  |
|---|----------------------------------|
| Category                                  | Metric tons of CO <sub>2</sub> e |
| Transportation                            | 419,741                          |
| Residential                               | 246,021                          |
| Commercial                                | 166,950                          |
| Industrial                                | 157,583                          |
| Construction                              | 2,288                            |
| <b>Total</b>                              | <b>992,583</b>                   |

**Figure 3-6 2020 GHG Emissions by Land Use**



## 3.4 2035 Community-Wide Emissions Inventory

In 2035, Escondido is projected to emit a total of 1.23 million MT CO<sub>2</sub>e based on the growth rates associated with the proposed General Plan Update and without the inclusion of the proposed reduction measures presented in this E-CAP.

### Data Inputs

Data for the 2035 community-wide inventory was estimated based on projected growth rates for Escondido and the traffic model’s forecasts for the General Plan 2035 horizon year. Table 3-11 summarizes the growth rates and VMT data for 2035 with the proposed General Plan Land Use and Circulation Elements.

| Category  | Data Input                               | Data Source   |
|---|--|---------------|
| Transportation  |  |               |
|   | <i>Annual Vehicle Miles</i>              | 1,219,016,356 |
|   | <i>Annual Traveled Trips</i>             | 456,926,126   |
| Growth Rates (based on land use) <sup>a</sup>   |  |               |
|   | <i>Single Family Residential</i>         | 5.7%          |
|   | <i>Multi Family Residential</i>          | 46.5%         |
|   | <i>Commercial</i>                        | 61.0%         |
|   | <i>Industrial</i>                        | 24.8%         |
| Construction  |  |               |
|   | <i>New Residential (units)</i>           | 397           |
|   | <i>New Commercial (sf)</i>               | 546,000       |
|   | <i>Residential Redevelopment (units)</i> | 324           |
|   | <i>Commercial Redevelopment (sf)</i>     | 176,886       |
| <sup>a</sup> Note: The growth rates represent the overall growth from 2010 to 2035 and are derived from the projected land use growth based on the proposed General Plan. |  |               |

The VMT data from the traffic study was used to estimate emissions from transportation in 2035. The land use specific growth rates were used to estimate the emissions associated with electricity, natural gas, water, wastewater, area source, and solid waste.

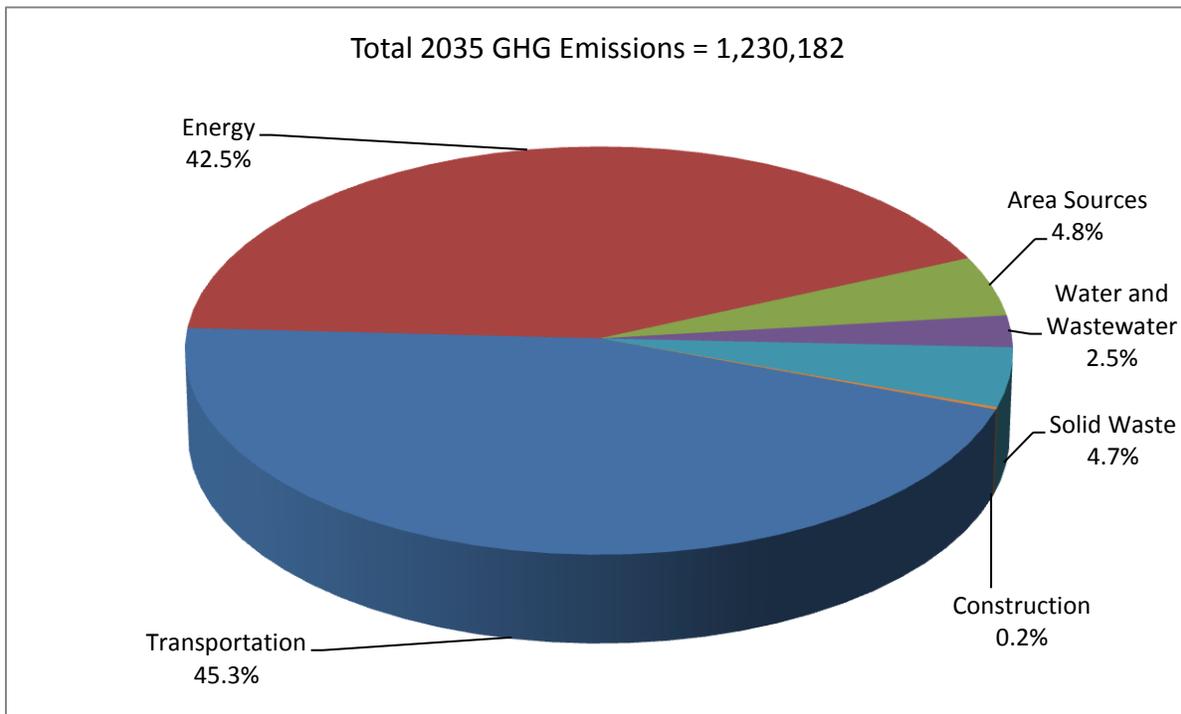
### Emissions by Source

The 2035 emissions are estimated based on the projected growth in Escondido from 2010 to 2035. These projections include a 5.7 percent increase in single family housing, a 46.5 percent increase in multi-family housing, a 61.0 percent increase in commercial development, and a 24.8 percent increase in industrial development; these growth rates were applied, respectively, to single family residential, multi-family residential, commercial, and industrial emissions in order to estimate 2035 emissions. Table 3-12 summarizes the net 2035 City emissions of CO<sub>2</sub>e as broken down by emissions category. Figure 3-7 is a graphical representation of Table 3-12. A detailed breakdown of 2035 emissions by category is available in the Appendix.

3.4 2035 COMMUNITY-WIDE EMISSIONS INVENTORY

| Table 3-12 2035 GHG Emissions by Source |                                  |
|---|----------------------------------|
| Category                                | Metric tons of CO <sub>2</sub> e |
| Transportation                          | 556,818                          |
| Energy                                  | 523,427                          |
| Area Sources                            | 59,151                           |
| Water and Wastewater                    | 30,980                           |
| Solid Waste                             | 57,518                           |
| Construction                            | 2,288                            |
| <b>Total</b>                            | <b>1,230,182</b>                 |

Figure 3-7 2035 GHG Emissions by Source

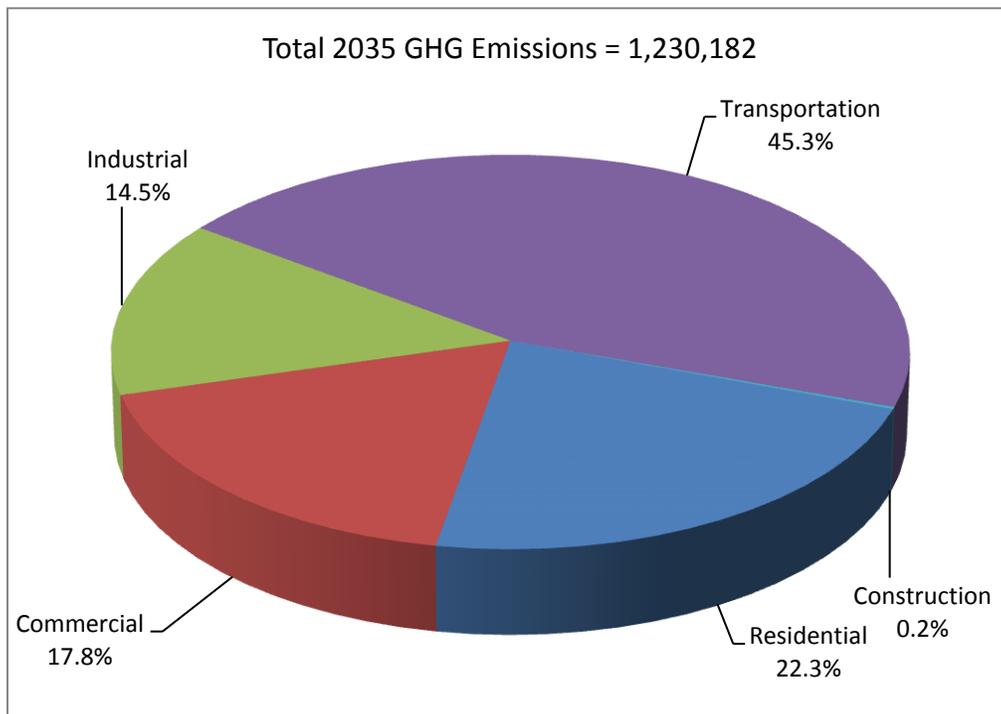


## Emissions by Land Use

Table 3-13 summarizes the total amount of community-wide GHG emissions for Escondido in 2035 by land use category. Escondido is projected to emit 1,230,182 MT CO<sub>2</sub>e in 2035. The largest portion of Escondido’s 2035 emissions are from transportation (45 percent), followed by emissions from residential land uses (22 percent). Due to the nature of mobile emissions, transportation emissions could not be allocated to the individual land use types. Figure 3-8 provides a comparison of GHG emissions by land use category.

| Table 3-13 2035 GHG Emissions by Land Use |                                  |
|---|----------------------------------|
| Category                                  | Metric tons of CO <sub>2</sub> e |
| Transportation                            | 556,818                          |
| Residential                               | 273,948                          |
| Commercial                                | 218,762                          |
| Industrial                                | 178,367                          |
| Construction                              | 2,288                            |
| <b>Total</b>                              | <b>1,230,182</b>                 |

**Figure 3-8 2035 GHG Emissions by Land Use**



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## 3.5 2020 Reduction Target

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In order for California to meet the goals of AB 32, statewide GHG emissions will need to be reduced back to 1990 levels by 2020. To be consistent with the goals of AB 32, the City of Escondido would also need to achieve the same GHG emission reduction target. In the AB 32 Scoping Plan, CARB equated a return to 1990 levels to a 15 percent reduction from “current” levels. CARB states, “... ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today’s levels by 2020 to ensure that their municipal and community-wide emissions match the state’s reduction target.” (CARB 2008) The reduction target calculated in the Scoping Plan was based on an inventory of the state’s 2004 GHG emissions (then considered to be “current” levels); these emissions represent a high-point in the economy before the economic recession. The City’s reduction target is based on Escondido’s revised 2005 GHG emissions inventory. By using 2005 to set the reduction target, Escondido is consistent with CARB in using an inventory target that is based on pre-recession conditions.

In February 2011, Escondido completed an inventory of 2005 emissions through participation in the San Diego Foundation’s *Regional Climate Protection Initiative* that included an inventory of both municipal and community-wide GHG emissions. The 2005 emissions amounted to 1,019,318 MT CO<sub>2</sub>e community-wide and 20,861 MT CO<sub>2</sub>e from municipal operations. The methodology used to estimate municipal emissions in the previous report is similar to the methodology used in this report. However, there are three key differences between the methodologies used in the previous report and this one for the community-wide inventory.

- The estimate for VMT used in the previous inventory calculations includes pass-through trips. These are trips that begin and end outside of the city boundaries, but do pass-through the city. Because the Escondido local government does not have jurisdictional control over these trips, they have been omitted from the revised inventory.
- Emissions from water have been calculated differently in the revised inventory. The previous inventory includes emissions from wastewater and the electricity associated with local treatment and distribution of water. In addition to these emissions, the revised inventory includes the emissions associated with the electricity used to bring imported water to the city.
- The previous emissions inventory does not include emissions associated with the transportation of waste to the landfill. These emissions are included in the revised 2005 inventory.
- Construction emissions were not included in the previous inventory; for the revised inventory, emissions from construction were estimated using the General Plan land use data.

The revised 2005 community-wide inventory in the E-CAP totaled 927,266 MT CO<sub>2</sub>e, which is 92,052 MT CO<sub>2</sub>e below the previous 2005 inventory. Table 3-14 contains the breakdown of emissions for both the previous 2005 inventory and the revised 2005 inventory used in the E-CAP.

CHAPTER 3 GREENHOUSE GAS EMISSIONS INVENTORY

| Table 3-14 2005 Emissions Comparison |                                  |                |
|--------------------------------------|----------------------------------|----------------|
| Category                             | Metric tons of CO <sub>2</sub> e |                |
|                                      | 2005 (Previous)                  | 2005 (Revised) |
| Transportation <sup>a</sup>          | 509,904                          | 375,769        |
| Energy                               | 427,305                          | 419,177        |
| Area Sources                         | 43,136                           | 53,287         |
| Water and Wastewater <sup>b</sup>    | 4,008                            | 28,384         |
| Solid Waste <sup>c</sup>             | 34,964                           | 48,361         |
| Construction <sup>d</sup>            | -                                | 2,288          |
| <b>Total</b>                         | <b>1,019,318</b>                 | <b>927,266</b> |

Note: Mass emissions of CO<sub>2</sub>e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.

<sup>a</sup> The previous methodology for calculating transportation emissions includes the pass-through vehicle trips in the City of Escondido.

<sup>b</sup> Previous emissions only include direct emissions from the wastewater treatment plant. The updated inventory also includes emissions associated with the electricity to pump water from non-local sources.

<sup>c</sup> The previous inventory does not include emissions associated with transporting waste to the landfill; the updated inventory does include these emissions.

<sup>d</sup> Construction emissions were not included in the previous inventory; the updated inventory includes estimates of carbon dioxide emissions associated with the use of construction equipment.

Consistent with the State’s adopted AB 32 GHG reduction target, Escondido has set a goal to reduce GHG emissions back to 1990 levels by the year 2020. This target was calculated as a 15 percent decrease from 2005 levels, as recommended in the AB 32 Scoping Plan. The reduction target is displayed in Table 3-15. Having one overall reduction target, as opposed to targets for each sector, allows Escondido the flexibility to reduce emissions from the sector with the most cost-effective reduction strategies (i.e. the greatest reduction in emissions at the least cost).

| Table 3-15 2020 GHG Emissions Reduction Target |                                  |
|--|----------------------------------|
|  | Metric Tons of CO <sub>2</sub> e |
| 2005 Emissions                                 | 927,266                          |
| % Reduction                                    | 15%                              |
| <b>2020 Reduction Target</b>                   | <b>788,176</b>                   |

The 2005 emissions inventory was used to set the GHG emissions reduction target for the year 2020. The 2010 inventory, discussed previously and summarized below, provides a baseline for Escondido to measure future progress toward attaining the 2020 target.

## 3.6 Emissions Comparison by Year

This report analyzes GHG emissions from the most current year with data available (2010) and estimates the future emissions for Escondido in 2020 and 2035. Additionally, this report includes a revised estimate of 2005 GHG emissions which is used to set the 2020 reduction target for Escondido. See Table 3-16 for a summary of all inventories.

The 992,583 MT CO<sub>2</sub>e of GHG emissions for 2020 is an estimated increase of 106,465 MT CO<sub>2</sub>e above 2010 levels. The growth from 2005 and 2010 to 2020 is a 7.1 percent increase and 12.0 percent increase, respectively. Table 3-16 shows a comparison of total emissions for 2005 (following the methodology used in this analysis), 2010, 2020 emissions, and the 2035 emissions.

| Source               | Metric Tons of CO <sub>2</sub> e |                |                |                  |
|----------------------|----------------------------------|----------------|----------------|------------------|
|                      | 2005                             | 2010           | 2020           | 2035             |
| Transportation       | 375,769                          | 368,622        | 419,741        | 556,818          |
| Energy               | 419,177                          | 395,565        | 441,025        | 523,427          |
| Area Sources         | 53,287                           | 52,559         | 54,977         | 59,151           |
| Water and Wastewater | 28,384                           | 25,360         | 27,278         | 30,980           |
| Solid Waste          | 48,361                           | 41,724         | 47,273         | 57,518           |
| Construction         | 2,288                            | 2,288          | 2,288          | 2,288            |
| <b>Total</b>         | <b>927,266</b>                   | <b>886,118</b> | <b>992,583</b> | <b>1,230,182</b> |

The impact of the economic recession is evident in the emission summaries. 2005 emissions represent the peak of the economy with a decline to the levels in 2010; this is consistent with trends in the overall economy.

The AB 32 Scoping Plan suggests local governments estimate a reduction target for 2020 that is 15 percent below 2005 emissions. Table 3-17 shows the 2020 reduction target for Escondido's community-wide emissions, the 2020 emissions projected for Escondido, and the difference between the two. This difference represents the total emissions that Escondido will need to reduce in order to meet the target by 2020.

|                                 | Metric Tons of CO <sub>2</sub> e |
|---------------------------------|----------------------------------|
| 2020 Emissions                  | 992,583                          |
| 2020 Reduction Target           | 788,176                          |
| <b>Amount to Reduce by 2020</b> | <b>204,406</b>                   |

### CHAPTER 3 GREENHOUSE GAS EMISSIONS INVENTORY

With the reduction target set at 788,176 MT CO<sub>2</sub>e, Escondido will need to reduce emissions by 204,406 MT CO<sub>2</sub>e from the 2020 emissions. This amounts to a 20.6 percent decrease from 2020 emissions and an 11.1 percent decrease from the 2010 community-wide emissions. Chapter 4 describes the efforts currently underway in Escondido and the reduction strategies that would be implemented to reduce emissions in Escondido in order to reach the 2020 reduction target.

# Chapter 4 **GHG Emissions Reduction Programs and Regulations**

## CHAPTER 4 GHG EMISSIONS REDUCTION PROGRAMS AND REGULATIONS



The State of California has set specific targets for reducing GHG emissions from the burning of fossil fuels in both power plants and vehicles by adopting various regulations. In addition, state energy efficiency and renewable requirements provide another level of reductions. In order to provide credit to Escondido for regulatory actions already taken or planned by the State of California, this E-CAP first evaluates the GHG reductions that will occur within Escondido as a result of these actions. These are identified in the E-CAP as R1 reduction measures. The R1 measures are included to show all of the anticipated reduction strategies identified in the

AB 32 Scoping Plan for implementation at the state level that will ultimately result in a reduction of GHG emissions at the local level. The R1 measures are not administered or enforced by the City, but the City - by describing them herein- substantiates the reductions associated with these state measures.

R2 and R3 reduction measures are measures that would be incorporated at the local level to provide additional reductions in GHG emissions. R2 measures are those measures that can be quantified to show the value of the reduction from the incorporation of those measures. A complete list of assumptions and reductions for each of the R1 and R2 measures is included in the Appendix.

Many of the R2 measures would be implemented through the Screening Tables for New Development. Through a menu of reduction options, the Screening Tables allow flexibility in how new development implements the R2 measures. This provides a flexible component into the implementation of the E-CAP by allowing prospective developers to choose the fair share of R2 measures that best fits their project at least cost. The Screening Tables serve as the main implementation document for the E-CAP. The tables allow new development projects to tier from and demonstrate consistency with the reduction target established in this E-CAP, thus streamlining the CEQA analysis of project-level GHG emissions as described in the CEQA Guidelines §15183.5. The Screening Table would be provided to the developer, who would then choose from a list of GHG emissions-reducing design features that are each assigned a point value. The point values are allocated based on the effectiveness of the strategy in reducing GHG emissions. In order to demonstrate consistency with the E-CAP, a project that earns 100 points from the Screening Table would implement the project's fair share portion of GHG emission reductions within the E-CAP. Chapter 7 includes more details on the implementation process and how it complies with CEQA, including the Screening Table that would be used to implement the E-CAP.

R3 measures are those measures that, although they provide a program through which reductions in emissions would occur, cannot be quantified at this time. The R3 measures are supportive measures or methods of implementation for the R2 measures. For example, R3-E3: Energy Efficiency Training and Public Education, is a measure that provides education to inform people of the programs, technology, and potential funding available to them to be more energy efficient, and provides the incentives to participate in the voluntary programs shown in R2-E1 through R2-E7. R3-E3 is supportive of measures R2-E1 through R2-E6 because it would provide more publicity, reduce the perceived challenge of being energy efficient, and provide information on potential rebates and other funding programs which will make retrofits more accessible to everyone. Therefore, although by itself R3-E3 cannot be quantified, its

### 3.6 EMISSIONS COMPARISON BY YEAR

implementation provides a level of assurance that the reduction goals specified in the R2 measures will be achieved.

Also included in the R3 measures are reduction measures that reduce Escondido's government operation emissions. Government operations make up less than 5 percent of the city's total emissions, but the government of Escondido can set an example for residents by implementing reduction measures at the municipal level.

Over the last few years Escondido has implemented several programs that have already begun to reduce Escondido's GHG emissions and will continue to provide reductions throughout the implementation of this E-CAP. Programs that were in place prior to 2010 are accounted for in the existing inventory while programs implemented since 2010 are included below as reduction measures used to reach the 2020 target.

The following discussion summarizes the existing Escondido programs and the proposed reduction measures to be implemented by the City to further reduce GHG emissions. The reduction measures are organized herein by source category (transportation, energy, area source, water, solid waste, and agriculture) then by R1, R2, and R3 measure. The convention to be used for numbering the mitigation measures will be to list the R designation (R1, R2, or R3) then an abbreviation of the source category, followed by the order number. So, R1-E1 is the first R1 measure within the energy category, R1-E2 is the second measure within the energy category, and so on. The source category abbreviations are as follows: T – transportation; E – energy; L – area source; W – water; S - solid waste; and C – construction.

Each of the R2 measures include the GHG reduction potential, estimated cost, estimated savings, and additional community co-benefits. The co-benefits describe the additional community benefits from implementing the reduction measure beyond the GHG emissions reduced. The following icons are used to indicate the co-benefits for each measure:



Air Quality



Energy Use/Energy Efficiency



Land Use/Community Design



Livable Communities



Public Health



Renewable Energy



Transportation Mobility



Waste Reduction/Recycling



Water Quality



Water Use/Water Conservation

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## 4.1 Existing Local Programs

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### City of Escondido Municipal Programs

#### EMPLOYEE WORK SCHEDULES

Approximately 650 City employees currently work modified hours in a staggered four-day work week. This collectively eliminates approximately 2.5 million vehicle miles annually traveled, decreasing employees' transit-related emissions, reducing highway congestion during peak hours and saving approximately 113,000 gallons of gasoline. The four-day work week currently implemented at City Hall allows for the facility to be closed on Fridays, lowering the facility's energy requirements and effectively saving the City approximately \$50,000 in annual heating and cooling costs. To increase public access to City Hall and municipal facilities, the four-day work week may be eliminated for some or all employees prior to 2020. The employee commute survey conducted for the municipal inventory accounts for the emissions saved from this existing program; however, because it represents such a small portion of the community-wide transportation GHG emissions within Escondido as a whole, the emissions reduction from city employees working a four-day work week was not incorporated into the community-wide emissions inventory that was used to determine future community GHG emissions and Escondido's emission reduction target. The partial or complete elimination of the program would not affect the City's ability to meet its emissions reduction target.

#### CITY FACILITIES

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

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

The City pursued leadership in energy and environmental design (LEED) certification for the new police and fire facility located on North Centre City Parkway.

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

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

### WATER CONSERVATION

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

Escondido offers incentives through a regional program to reduce water used in landscaping and to eliminate irrigation runoff.

The City offers education and public outreach in the form of presentations to elementary school students about water conservation.

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

### PUBLIC TRANSPORTATION

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

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

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

## Community-Wide Programs

### LOCAL BUSINESS PROGRAMS

#### **PALOMAR MEDICAL CENTER WEST**

Palomar Medical Center West is located in Escondido, and has installed a green roof totaling more than 1 acre in area on one of its structures. A green roof is a roof that is partially or completely covered in vegetation, which helps to absorb rainwater and provide insulation to the interior of the building. Apart from being pleasant to look at, green roofs reduce the heat island effect, lowering the need for air conditioning, and retain storm water, reducing the amount of runoff that enters the sewer system.

#### **STONE BREWERY**

The Stone Brewery is located in Escondido and incorporates many features that use green technology. Surrounded by drought-tolerant landscaping, topped with a 312-kW solar array which provides roughly

## CHAPTER 4 GHG EMISSIONS REDUCTION PROGRAMS AND REGULATIONS

40 percent of Stone's energy needs, and serviced by a fleet of biodiesel trucks, the rapidly expanding brewery has made environmentalism part of their business plan. Stone Brewery's World Bistro & Gardens is a "slow-food" restaurant, offering a menu of seasonal, organic, and locally grown sundries. In 2009, Stone Brewery earned the Pam Slater-Price Sustainability Award.

### WESTFIELD SHOPPINGTOWN

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

### SAN DIEGO REGIONAL CLIMATE PROTECTION INITIATIVE

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

### SANDAG ENERGY ROADMAP PROGRAM

The Energy Roadmap Program is coordinated by SANDAG to offer energy-planning assistance to local governments in the San Diego region through an energy-efficiency partnership with SDG&E. The Energy Roadmap Program assists local governments in meeting state and regional sustainability goals. It implements the SANDAG Regional Energy Strategy (2009) and Climate Action Strategy (2010), as well as the California Public Utilities Commission Long-term Energy Efficiency Strategic Plan. The program provides energy management plans, or "Energy Roadmaps," to local jurisdictions. The Roadmaps offer a detailed, comprehensive framework for saving energy at the government facilities and in the communities as a whole. Escondido began its Energy Roadmap with SANDAG in April 2011. As of February 2012, the baseline electricity and natural gas use for 29 municipal sites was established through this program. The 29 preliminary energy assessments indicated that almost all of Escondido's municipal sites were performing significantly more efficiently than comparable facilities in California and the nation. Either in response to a specific issue discovered through the site assessment process, or as instructed by city staff, eight sites and two technologies citywide were identified to be further evaluated in the form of comprehensive energy audits. The energy assessments were performed at no cost to the City. Escondido is finalizing its Energy Roadmap with SANDAG, which is scheduled for completion in spring 2012. The government operations component of the Roadmap includes the following elements:

- Saving Energy in City Buildings and Facilities
- Demonstrating Emerging Energy Technologies
- Greening the City Vehicle Fleet
- Developing Employee Knowledge of Energy Efficiency
- Promoting Commuter Benefits to City Employees

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

- Leveraging Planning and Development Authority, including smart growth development policies, energy efficient building upgrades, and clean and efficient transportation options
- Marketing Energy Programs to Local Residents, Schools, and Businesses
- Supporting Green Jobs and Workforce Training opportunities

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## 4.2 Transportation

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Transportation contributes the largest portion of emissions in all of the inventories presented in Chapter 3. Measures targeted toward reducing emissions from vehicles will have a greater impact on reducing emissions overall. The State has already enacted many policies to encourage production of more efficient vehicles, but Escondido can help to reduce the use of vehicles by utilizing transit-oriented design and smart growth principles. These reduction measures are described in the sections below.

### R1 Statewide Transportation Measures

The following list of R1 transportation related measures are those measures that California has identified in the AB 32 Scoping Plan that will result in emission reductions within Escondido.

#### R1-T1: ASSEMBLY BILL 1493: PAVLEY I

AB 1493 (Pavley) requires the CARB to adopt regulations that will reduce GHG emissions from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016, effective with 2009 models. By 2020, this requirement will reduce emissions in California by approximately 16.4 million MT CO<sub>2</sub>e, representing 17.3 percent of emissions from passenger/light-duty vehicles in the state. Implementation of Pavley I was delayed by the USEPA's denial of California's waiver request to set state standards that are more stringent than the federal standards, but in June 2009 the denial of the waiver was reversed and California was able to begin enforcing the Pavley requirements.

#### R1-T2: ASSEMBLY BILL 1493: PAVLEY II

California committed to further strengthening the AB 1493 standards beginning in 2017 to obtain a 45 percent GHG emission reduction from 2020 model year vehicles. This requirement will reduce emissions in California by approximately 4 million MT CO<sub>2</sub>e, representing 2.5 percent of emissions from passenger/light-duty vehicles in the state beyond the reductions from the Pavley I regulations described above.

#### R1-T3: EXECUTIVE ORDER S-1-07 (LOW CARBON FUEL STANDARD)

The LCFS will require a reduction of at least ten percent in the carbon intensity of California's transportation fuels by 2020. By 2020, this requirement will reduce emissions in California by approximately 15 million MT CO<sub>2</sub>e, representing 6.9 percent of emissions from passenger/light-duty vehicles in the state. The emissions reduced by this strategy overlap with emissions as a result of the

## CHAPTER 4 GHG EMISSIONS REDUCTION PROGRAMS AND REGULATIONS

Pavley legislation; adding the emissions reductions would be an overestimate of the actual emissions reductions. This is accounted for in the emission reduction calculations following the methodology used by CARB to calculate emissions reductions in the AB 32 Scoping Plan.

### R1-T4: TIRE PRESSURE PROGRAM

The AB 32 early action measure involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. Automotive service providers are required to check and inflate each vehicle's tires to the recommended tire pressure rating at the time of performing any automotive maintenance or repair service, indicate on the vehicle service invoice that a tire inflation service was completed and the tire pressure measurements after the services were performed, and keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the ARB, or its authorized representative upon request. By 2020, CARB estimates that this requirement will reduce emissions in California by approximately 0.55 million MT CO<sub>2</sub>e, representing 0.3 percent of emissions from passenger/light-duty vehicles in the state.

### R1-T5: LOW ROLLING RESISTANCE TIRES

This AB 32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 million MT CO<sub>2</sub>e, representing 0.2 percent of emissions from passenger/light-duty vehicles in the state.

### R1-T6: LOW FRICTION ENGINE OILS

This AB 32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce emissions in California by approximately 2.8 million MT CO<sub>2</sub>e, representing 1.7 percent of emissions from passenger light-duty vehicles in the state.

### R1-T7: GOODS MOVEMENT EFFICIENCY MEASURES

This AB 32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this requirement will reduce emissions in California by approximately 3.5 million MT CO<sub>2</sub>e, representing 1.6 percent of emissions from all mobile sources (on-road and off-road) in the state.

### R1-T8: HEAVY-DUTY VEHICLE GHG EMISSION REDUCTION (AERODYNAMIC EFFICIENCY)

This AB 32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 million MT CO<sub>2</sub>e, representing 1.9 percent of emissions from heavy-duty vehicles in the state.

## R1-T9: MEDIUM AND HEAVY-DUTY VEHICLE HYBRIDIZATION

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 million MT CO<sub>2</sub>e, representing 0.2 percent of emissions from all on-road mobile sources in the state. This reduction is also equivalent to a 1.0 percent reduction of emissions from all heavy-duty trucks in the state.

## R2 Local Transportation Measures

The following list of R2 transportation related measures are those measures that Escondido would implement in order to reduce emissions beyond the emissions reduction associated with the R1 state measures described above.

### R2-T1: LAND USE BASED TRIPS AND VMT REDUCTION POLICIES

#### GHG Reduction Potential:

The traffic study prepared for the General Plan Update altered trip rates according to the increases in density and mixed use included in the General Plan. Therefore, the emissions reductions associated with this measure are accounted for, but the savings cannot be calculated separately.

#### Community Co-Benefits:



#### Cost Savings:

Cost and savings estimates are not available for this strategy.

The demand for transportation is influenced by the density and geographic distribution of people and places. Whether neighborhoods have sidewalks or bike paths, whether homes are within walking distance of shops or transit stops will influence the type and amount of transportation that is utilized. By changing the focus of land use from automobile centered transportation, a reduction in vehicle miles traveled would occur. Escondido has incorporated many policies into the Escondido General Plan that promote smart growth, complete streets, mixed use projects, and transit oriented development. These policies would help to promote walking and bicycling and reduce overall VMT. Specifically, Escondido is targeting the following areas as mixed use overlays:

- Escondido Boulevard at Felicita Avenue
- Centre City Parkway at Brotherton Avenue
- East Valley Parkway at Ash Street

These mixed use overlay areas are transit oriented in nature by incorporating features such as bus stops and multi-modal connections that promote the use of alternative transportation. In addition, mixed use overlay areas are pedestrian friendly environments that incorporate trails, pathways, bikeways, and safe crosswalks to connect neighboring uses.

Additionally, Escondido's General Plan identifies Targeted Opportunity Areas where land use changes are anticipated and development shall be based on smart growth principles that promote compact, walkable development patterns in close proximity to transit, and strong multi-modal connection to adjacent areas. Refer to the Land Use and Community Form Element of the General Plan for more information on the following Target Areas:

## CHAPTER 4 GHG EMISSIONS REDUCTION PROGRAMS AND REGULATIONS

1. Transit Station Target Area
2. Highway 78 at Broadway Target Area
3. South Quince Street Target Area
4. S. Escondido Boulevard/Center City Parkway Target Area
5. S. Escondido Boulevard/Felicita Avenue Target Area
6. Centre City Parkway/Brotherton Road Target Area
7. Westfield Shoppingtown Target Area
8. East Valley Parkway Target Area
9. Promenade Retail Center
10. Felicita Corporate Office Target Area

Projects in Escondido may be eligible for Statutory Exemptions under CEQA and/or CEQA streamlining provisions if the project is consistent with the requirements of a Sustainable Communities Project (SCP) or a Transit Priority Project (TPP) under SB 375. The criteria identified in SB 375 are described below; however, the City, as the CEQA lead agency for projects within its jurisdiction, makes this determination and would be responsible for establishing a protocol for implementing the provisions and approving TPPs in Escondido. After SANDAG has adopted the SCS and CARB has accepted the determination that the SCS can achieve the regional GHG reduction target, then the City can determine that a project is a TPP. The project must be consistent with the general use designation, density, building intensity, and applicable policies identified in the SCS. In addition, the project must be:

1. At least 50 percent residential use, based on total building square footage and, if a project contains between 26 percent and 50 percent non-residential uses, a FAR of not less than 0.75;
2. Minimum density of at least 20 dwelling units per acre; and,
3. Be within one-half mile of a major transit stop or high-quality transit corridor (defined as having 15-minute frequencies during peak periods) that is included in the SANDAG 2050 RTP.

If a project meets all of these criteria, it may be analyzed under a new environmental document created by SB 375, called the Sustainable Communities Environmental Assessment, or through an EIR for which the content requirements have been reduced. These two options are described below:

1. The Sustainable Communities Environmental Assessment is similar to a Mitigated Negative Declaration and would need to include an analysis of all significant environmental effects, as well as mitigation measures to reduce those impacts to an insignificant level.
2. If an EIR were prepared for a TPP, the document would not need to include an analysis of cumulative impacts, or of GHG emissions from cars and light duty trucks. In addition, project alternatives – as required in EIRs – need not address reduced density of off-site location alternatives.

## 4.2 TRANSPORTATION

In order to be eligible for a full statutory CEQA exemption, the project would need to meet all the requirements described above for TPPs and meet the criteria for a SCP. The TPP criteria needed to meet the SCP would be incorporated in the City's regulatory ordinances. A SCP must comply with the following environmental criteria:

1. The TPP served by existing utilities and the applicant has paid or committed to pay all applicable fees.
2. The site of the TPP does not contain wetlands or riparian areas, does not have significant value as a wildlife habitat, and the TPP does not harm any protected species.
3. The TPP is not included on any sites on the Cortese List.
4. The TPP is subject to a preliminary endangerment assessment to determine the existence of any hazardous substance on the site and to determine the potential for exposure of future occupants to significant health hazards from the area.
5. The TPP does not have a significant effect on historical resources.
6. The TPP site is not subject to:
  - a. a wildland fire hazard, as determined by CalFire,
  - b. an unusually high risk of fire or explosion from materials stored or used on nearby properties,
  - c. risk of a public health exposure,
  - d. seismic risk as a result of being within a delineated earthquake fault zone or a seismic hazard zone, and
  - e. landslide hazard, flood plain, flood way, or restriction zone.
7. The TPP is not located on developed open space (parkland).
8. The TPP buildings are 15 percent more energy efficient than Title 24 and use 25 percent less water than average households.

A sustainable communities project must also comply with the following land use criteria:

1. TPP site is not more than eight acres.
2. TPP does not contain more than 200 residential units.
3. TPP does not result in a net loss of affordable housing within the project area.
4. TPP does not include any single level building exceeding 75,000 square feet.
5. Applicable mitigation measures or performance standards from prior EIRs have been incorporated.
6. TPP does not conflict with nearby industrial uses.
7. TPP is located within one-half mile of a rail transit station or high-quality transit corridor, or ferry terminal that have been included in a RTP.

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8. The TPP meets one of the following criteria (PRC Section 21155.1 (c)):
  - a. the TPP will sell at least 20 percent of housing to families of moderate income, 10 percent of housing will be rented to families of low income, or at least 5 percent of the housing is rented to families of very low income, and the developer provides legal commitments to ensure the continued availability of these housing units for very low, low-, and moderate income households,
  - b. the TPP developer has paid or will pay in-lieu fees sufficient to result in the development of the affordable units described above, and
  - c. the TPP provides public open space equal or greater than 5 acres per 1,000 residents of the project.

### R2-T2: BICYCLE MASTER PLAN

#### GHG Reduction Potential:

2,675 MT CO<sub>2</sub>e

These reductions assume a 1% decrease in passenger vehicle trips due to the expanded bicycle network.

#### Community Co-Benefits:



#### City Costs:

\$600,000 (one-time cost)

Assumes 10 miles of bike infrastructure at \$60,000 per mile average (League of American Cyclists 2009).

#### City Savings:

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#### Private Costs:

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#### Private Savings:

\$911,519 annually through gasoline savings. The payback for this program would be approximately eight months; however, the City assumes the initial cost, but individuals within the community would receive the fuel savings.

#### Potential Funding Sources:

SANDAG

Bicycle Network Policy 4.1 of the Mobility Element of the proposed General Plan Update states that Escondido will “maintain and implement a Bicycle Master Plan that enhances existing bike routes and facilities; defines gaps and needed improvements; outlines standards for their design and safety; describes funding resources; and involves the community.” Escondido’s Master Plan for Parks, Trails, and Open Space includes plans for urban trails, which include bicycle paths. This plan was last updated in 1999 and describes a bicycle system that connects across Escondido from North to South as well as East to West, and includes a path surrounding the city.

Implementation of an updated bicycle master plan for the city will ensure safe, adequate bike routes and encourage the replacement of vehicle trips with bicycle trips. This reduces the overall VMT for the city thereby reducing emissions from transportation. The Screening Tables for New Development include an option for projects to incorporate bicycle facilities and connections to the existing bicycle ways in order to earn sufficient points to demonstrate consistency with the goals of this E-CAP.

## R2-T3: TRANSIT IMPROVEMENTS

### **GHG Reduction Potential:**

3,785 MT CO<sub>2</sub>e

The expansion of the Bus Rapid Transit is estimated to reduce passenger vehicle VMT by 0.47%

The expansion of the North County Transit District rail line is estimated to reduce passenger vehicle VMT by 0.96%

### **Community Co-Benefits:**



### **City Costs:**

A more detailed cost analysis would need to be completed in order to assess the costs that the City would incur from these projects.

### **City Savings:**

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### **Private Costs:**

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### **Private Savings:**

\$1,289,783 annually based on fuel savings from trips taken on public transit rather than private vehicles.

### **Potential Funding Sources:**

SANDAG TransNet

Escondido will continue to coordinate with the NCTD and SANDAG in order to provide timely and cost effective transit services. In particular, Escondido will work to expand the commuter rail system to desirable destinations and provide adequate facilities and connections to pedestrian and bicycle systems.

Comment: Escondido currently has two major transit improvements in operation:

- 1) Downtown multi-modal station on West Valley Parkway and,
- 2) Bus Rapid Transit from the Multi-modal transit station to Westfield Shoppingtown.

SANDAG's 2050 RTP includes plans for a high speed rail station in Escondido along with expansion of the existing SPRINTER line in Escondido. A list is provided below for projects planned in Escondido:

- 2018: Bus Rapid Transit from Escondido to UTC via Mira Mesa Boulevard
- 2018: Bus Rapid Transit from Escondido to Downtown
- 2018: Rapid Bus from Escondido to Del Lago via Escondido Boulevard & Bear Valley Parkway
- 2030: SPRINTER double tracking to increase frequencies of trains
- 2030: SPRINTER Express Train
- 2035: Rapid Bus from Downtown Escondido to East Escondido

For new projects, Escondido will include an option in the Screening Tables for New Development for a project to earn points for incorporating transit-supporting facilities into the project design.

## R2-T4: TRANSPORTATION DEMAND MANAGEMENT

### GHG Reduction Potential:

5,221 MT CO<sub>2</sub>e

TDM programs are estimated to reduce VMT from commute trips by 4%; however, in combination with the other R2 measures, this measure's effectiveness is reduced. The effectiveness was reduced by 40% and thus, reductions in VMT due to R2-T4 were estimated at 2.4%.

### Community Co-Benefits:



### City Costs:

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### City Savings:

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### Private Costs:

Minimal administrative fees

### Private Savings:

\$1,779,012 annually, based on decreased fuel use

### Potential Funding Sources:

SANDAG

Transportation Demand Management (TDM) programs work to reduce automobile travel by encouraging ride-sharing, carpooling, and alternative modes of transportation. The City of Escondido would implement this strategy by including a TDM strategy in the Screening Table for New Development; new businesses can earn points by offering programs, facilities and incentives to their employees that would promote carpooling, transit use, and use of other alternative modes.

## R3 Other Transportation Measures

The following list of R3 transportation measures are those that complement or support the implementation of the R1 and R2 measures described above, but cannot be quantified.

### R3-T1: REGIONAL LAND USE AND TRANSPORTATION COORDINATION

Coordinating with SANDAG, Caltrans, and neighboring jurisdictions enhances the implementation of the R2-T1 and R2-T3 measures described above. Additionally, working with the entire region aids in the state's implementation of SB 375 and helps SANDAG to achieve the GHG emission reduction targets for passenger vehicles.

## 4.3 Energy

Energy use in buildings represents the second largest source of emissions in Escondido. The state of California has already enacted legislation to promote energy efficiency and the use of renewable energy in the utility companies and new buildings state-wide. The reductions associated with these statewide measures are accounted for in the reduced inventory presented in Chapter 5.

### R1 Statewide Energy Reduction Measures

The following list of R1 building energy efficiency related measures are those measures that California has identified in the AB 32 Scoping Plan that will result in emission reductions within Escondido.

#### R1-E1: RENEWABLE PORTFOLIO STANDARD FOR BUILDING ENERGY USE

SB 1075 (2002) and SB 107 (2006) created the state's Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires state agencies to take all appropriate actions to ensure the target is met. In April 2011, Governor Jerry Brown signed SB 2 (2011), which codified the Executive Order and requires the state to reach the 2020 goal (CARB 2008).

Local implementation of R1-E1 includes a 20-year agreement the City of Escondido has entered into with a company to allow solar equipment to be constructed on City-owned property in exchange for a reduced rate to purchase power produced by the solar equipment during peak demand hours. The City anticipates purchasing approximately 1,072 megawatt hours per year of solar-produced power as a result of this agreement. This agreement is part of SDG&E's commitment to increase renewable energy production as part of implementing SB 2 (2011), the statewide renewable portfolio standard.

#### R1-E2 AND R1-E3: ASSEMBLY BILL 1109 ENERGY EFFICIENCY STANDARDS FOR LIGHTING (RESIDENTIAL AND COMMERCIAL INDOOR AND OUTDOOR LIGHTING)

AB 1109 mandated that the CEC on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other state efforts, shall be structured to reduce state-wide electricity consumption in the following ways:

- R1-E2: At least 50 percent reduction from 2007 levels for indoor residential lighting by 2018; and
- R1-E3: At least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

#### R1-E4: ELECTRICITY ENERGY EFFICIENCY

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's AB 32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described

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in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the state-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the CCR; hereinafter referred to as, "Title 24 Energy Efficiency Standards") of California's Green Building Standards Code (Title 24, Part 11 of the CCR; or "CalGreen").

By 2020, this requirement will reduce emissions in California by approximately 21.3 million MT CO<sub>2</sub>e, representing 17.5 percent of emissions from all electricity in the state. This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid);
- Broader standards for new types of appliances and for water efficiency;
- Improved compliance and enforcement of existing standards;
- Voluntary efficiency and green building targets beyond mandatory codes;
- Voluntary and mandatory whole-building retrofits for existing buildings;
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation;
- More aggressive utility programs to achieve long-term savings;
- Water system and water use efficiency and conservation measures;
- Additional industrial and agricultural efficiency initiatives; and
- Providing real time energy information technologies to help consumers conserve and optimize energy performance.

### R1-E5: NATURAL GAS ENERGY EFFICIENCY

This measure captures the emission reductions associated with natural gas energy efficiency activities included in CARB's AB 32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the state-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in the Title 24 Energy Efficiency Standards or CalGreen. By 2020, this requirement will reduce emissions in California by approximately 4.3 million MT CO<sub>2</sub>e, representing 6.2 percent of emissions from all natural gas combustion in the state. This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid);
- Broader standards for new types of appliances and for water efficiency;
- Improved compliance and enforcement of existing standards;

- Voluntary efficiency and green building targets beyond mandatory codes;
- Voluntary and mandatory whole-building retrofits for existing buildings;
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation;
- More aggressive utility programs to achieve long-term savings;
- Water system and water use efficiency and conservation measures;
- Additional industrial and agricultural efficiency initiatives; and
- Providing real time energy information technologies to help consumers conserve and optimize energy performance.

## R1-E6: INCREASED COMBINED HEAT AND POWER

This measure captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB 32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 gigawatt-hours state-wide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible combined heat and power portfolio standard, transmission and distribution support systems, or the use of feed-in tariffs. By 2020, this requirement will reduce emissions in California by approximately 6.7 million MT CO<sub>2</sub>e, representing 7.6 percent of emissions from all electricity in the state.

## R1-E7: INDUSTRIAL EFFICIENCY MEASURES

This measure captures the reduction in industrial building energy emissions associated with the energy efficiency measures for industrial sources included in CARB's AB 32 Scoping Plan. By 2020, this requirement will reduce emissions in California by approximately 1.0 million MT CO<sub>2</sub>e, representing 3.9 percent of emissions from all industrial natural gas combustion in the state. CARB proposes the following possible state-wide measures:

- Oil and gas extraction regulations and programs to reduce fugitive methane emissions;
- GHG leak reduction from oil and gas transmission;
- Refinery flare recovery process improvements; and
- Removal of methane exemption from existing refinery regulations.

## R2 Local Energy Reduction Measures

The following list of R2 energy related measures are those measures that Escondido would implement to reduce GHG emissions beyond the reduction associated with the R1 state measures described above. These measures would be implemented either through the policies in the proposed General Plan Update or through the implementation of the Screening Tables for New Development. Included in the Screening Tables are options that reduce GHG emissions from energy.

## R2-E1: RESIDENTIAL ENERGY EFFICIENCY REQUIREMENTS

**GHG Reduction Potential:**

1,879 MT CO<sub>2</sub>e

These emissions reductions assume all new residential units will increase energy efficiency an average of 10% beyond currently adopted California Title 24 standards. Based on the 2008 Title 24 standards, this would result in a 25% decrease in electricity and natural gas use from new residential developments.

**Community Co-Benefits:**



**City Costs:**

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**City Savings:**

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**Private Costs:**

\$4.06 million (one time cost)

100% units going 10% beyond 2008 Title 24 is approximately equivalent to 83% of units increasing efficiency to 15% beyond Title 24.

The cost is based on an estimated \$1,500 per unit to go 15% beyond Title 24 (Anders 2009)

**Private Savings:**

\$780,000 annually in reduced energy costs, resulting in an estimated 5.2 year payback period on the initial cost.

**Potential Funding Sources:**

Rebates and incentives from SDG&E and/or CCSE

Construction of new homes allows the opportunity to include energy efficient measures and lessen the impact of the new development on both energy demands and Escondido community-wide GHG emissions. The Screening Tables for New Development contain many measures that go beyond the requirements of Title 24 and can be included in a new project in order to garner points in the screening table and demonstrate consistency with Escondido’s GHG reduction goals. These measures include, but are not limited to:

- Install ENERGY STAR-qualified or equivalent appliances, including air conditioning and heating units, dishwashers, water heaters, etc.;
- Install solar water heaters;
- Install ENERGY STAR-qualified or equivalent windows and appropriate insulation per climate zone;
- Install ENERGY STAR-qualified or equivalent lighting;
- Optimize conditions for natural heating, cooling and lighting by building siting and orientation;
- Use features that incorporate natural ventilation;
- Install light-colored “cool” pavements, and strategically located shade trees along all bicycle and pedestrian routes; and
- Incorporate skylights; reflective surfaces, and natural shading in building design and layouts.

There are a variety of financial incentives and programs to assist homeowners that make the implementation of these goals feasible (see Chapter 7: Implementation of this report for details). Additionally, residential and non-residential projects that exceed current California Title 24 Energy standards by a minimum 10 percent are granted expedited plan processing and elimination of the Plan Check Fee Energy Surcharge.

## R2-E2: COMMERCIAL ENERGY EFFICIENCY REQUIREMENTS

### GHG Reduction Potential:

3,664 MT CO<sub>2</sub>e

These emission reductions assume all new residential units will increase energy efficiency an average of 10% beyond currently adopted California Title 24 standards. Based on the 2008 Title 24 standards, these emission reductions assume a 25% decrease in electricity and natural gas use from new commercial developments.

### Community Co-Benefits:



### City Costs:

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### City Savings:

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### Private Costs:

\$4.6 million (one time cost)

The cost is based on an estimated \$1.00 per square foot to achieve 10% beyond 2008 Title 24 standards (Anders 2009)

### Private Savings:

\$2.3 million annually in reduced energy costs, resulting in an estimated 2 year payback period on the initial cost.

### Potential Funding Sources:

SDG&E and CCSE

Construction of new commercial buildings allows the opportunity to include energy efficient measures and lessen the impact of the new development on both energy demands and Escondido community-wide GHG emissions. As described in R2-E1 above, Escondido would provide all developers with the Screening Tables for New Development, which includes a list of potentially feasible GHG reduction measures that reflect the current state of the regulatory environment. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this E-CAP. This system will provide flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Install ENERGY STAR-qualified or equivalent appliances, including air conditioning and heating units, dishwashers, water heaters, etc.;
- Install solar water heaters;
- Install ENERGY STAR-qualified or equivalent windows and appropriate insulation for climate zone;
- Install ENERGY STAR-qualified or equivalent lighting;
- Install ENERGY STAR-qualified or equivalent computer systems and electronics to reduce electricity need from plug load;
- Optimize conditions for natural heating, cooling and lighting by building siting and orientation;
- Use features that incorporate natural ventilation;
- Install light-colored “cool” pavements, and strategically located shade trees along all bicycle and pedestrian routes; and
- Incorporate skylights; reflective surfaces, and natural shading in building design and layouts.

Additionally, residential and non-residential projects that exceed current California Title 24 Energy standards by a minimum 10 percent are granted expedited plan processing and elimination of the Plan Check Fee Energy Surcharge.

## R2-E3: RESIDENTIAL RENEWABLE ENERGY REQUIREMENTS

### GHG Reduction Potential:

716 MT CO<sub>2</sub>e

These emissions reductions assume 25% of the electricity use from new residential developments would be derived from renewable energy.

### Community Co-Benefits:



### City Costs:

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### City Savings:

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### Private Costs:

\$12.7 million (one time cost)

This cost is associated with 25% of new residential units installing 2kW solar PV systems at \$7,796/kW (Anders 2009).

### Private Savings:

\$739,000 annually from reduced electricity costs, resulting in an estimated 17.2 year payback period on the initial cost

### Potential Funding Sources:

CCSE, SDG&E

Construction of new homes allows the opportunity to include renewable energy production and lessen the impact of the new development on both energy demands and Escondido community-wide GHG emissions. The Screening Tables for New Development contain measures that can be included in a new project in order to garner points in the screening table and demonstrate consistency with Escondido's GHG reduction goals. These renewable energy measures include:

- On-site solar photovoltaics
- On-site thermal water heating
- Providing support for off-site solar or wind generation

Renewable energy retrofits of existing homes within the City allow the opportunity to expand renewable energy generation. In addition to the current incentive programs for renewable energy retrofits provided by SDG&E, the Screening Tables for New Development contain a measure that allows developers to provide renewable energy retrofits of existing buildings to offset energy related emissions of their projects. This Screening Table option allows the City to provide renewable energy within the existing community including areas of low-income and disadvantaged communities that would not otherwise have renewable energy and the savings it provides.

## R2-E4: COMMERCIAL RENEWABLE ENERGY REQUIREMENTS

### GHG Reduction Potential:

2,314 MT CO<sub>2</sub>e

These emissions reductions assume 25% of the electricity use from new commercial developments would be derived from renewable energy, and that an average of 5kW of solar photovoltaic cells would be installed per 10,000 square feet of building space.

### Community Co-Benefits:



### City Costs:

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### City Savings:

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### Private Costs:

\$15 million (one time cost)

This cost represents 5kW of solar photovoltaic per 10,000 square feet of new commercial development at an estimated \$6,526/kW.

### Private Savings:

\$2.2 million annually from reduced electricity costs, resulting in an estimated 6.8 year payback period on the initial cost.

### Potential Funding Sources:

CCSE, SDG&E

Construction of new commercial buildings allows the opportunity to include renewable energy production and lessen the impact of the new development on both energy demands and Escondido community-wide GHG emissions. The Screening Tables for New Development contain measures that can be included in a new project in order to garner points in the screening table and demonstrate consistency with Escondido's GHG reduction goals. In addition, this measure would provide an incentive for facilities to be equipped with "solar ready" features where feasible to facilitate future installation of solar energy systems. These features would include optimal solar orientation for buildings (south facing roof sloped at 20 degrees to 55 degrees from the horizontal), clear access on south sloped roofs, electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water systems, and space provided for a solar hot water tank. Additional renewable energy measures include:

- On-site solar photovoltaics
- On-site thermal water heating
- Providing support for off-site solar or wind generation

Renewable energy retrofits of existing non-residential buildings within the City allow the opportunity to expand renewable energy generation. In addition to the current incentive programs for renewable energy retrofits provided by SDG&E, the Screening Tables for New Development contain a measure that allows developers to provide renewable energy retrofits of existing buildings to offset energy related emissions of their projects. This Screening Table option allows the City to provide renewable energy within the

existing community including areas of low-income and disadvantaged communities that would not otherwise have renewable energy and the savings it provides.

## R2-E5: RESIDENTIAL ENERGY RETROFITS

**GHG Reduction Potential:**

4,086 MT CO<sub>2</sub>e

These emissions reductions assume 8% of the electricity and natural gas use from existing residential developments will be reduced through retrofits.

**Community Co-Benefits:**



**City Costs:**

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**City Savings:**

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**Private Costs:**

\$13.7 million (one time cost)

Cost estimates based on USD EPIC study assumptions: \$0.75/kWh and \$4.35/therm (Anders 2009)

**Private Savings:**

\$3.2 million annually from reduced energy costs, resulting in an estimated 4.3 year payback period on the initial cost.

**Potential Funding Sources:**

CCSE, SDG&E

Existing homes, particularly those built prior to implementation of the Title 24 requirements of 1978, are a large source of GHG emissions attributed to energy use. By retrofitting existing homes with energy efficiency upgrades and renewable energy generation systems, homeowners can reduce their monthly energy bills while also reducing GHG emissions. Because this strategy targets existing homes, it is not implemented through the Screening Tables for New Development. In order to implement this strategy, Escondido would coordinate with local agencies such as the California Center for Sustainable Energy (CCSE), SDG&E, and SANDAG in order to educate homeowners about rebates and incentive programs available for energy upgrades and renewable energy installations. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Replace inefficient air conditioning and heating units with ENERGY STAR-qualified or equivalent models;
- Replace older, inefficient appliances with ENERGY STAR-qualified or equivalent models;
- Seal and insulate homes to stop drafts, block heat loss in winter, and block heat gain in summer;
- Replace old windows and insulation with ENERGY STAR-qualified or equivalent windows and insulation;
- Install solar water heaters;
- Replace inefficient and incandescent lighting with energy efficient lighting; and
- Weatherize the existing building to increase energy efficiency.

## R2-E6: COMMERCIAL ENERGY RETROFITS

### GHG Reduction Potential:

3,101 MT CO<sub>2</sub>e

These emissions reductions assume 8% of the electricity and natural gas use from existing commercial developments would be reduced through retrofits.

### Community Co-Benefits:



### City Costs:

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### City Savings:

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### Private Costs:

\$3.5 million (one time cost)

### Private Savings:

\$3.3 million annually from reduced energy costs, resulting in an estimated 1.1 year payback period on the initial cost.

### Potential Funding Sources:

CCSE, SDG&E

Existing commercial buildings, particularly those built prior to implementation of the Title 24 requirements of 1978, are also a large source of GHG emissions attributed to energy use. By retrofitting existing buildings with energy efficiency upgrades and renewable energy generation systems, business owners can reduce their monthly energy bills while also reducing GHG emissions. Because this strategy targets existing buildings, it is not implemented through the Screening Tables for New Development. In order to implement this strategy, the City of Escondido would coordinate with local agencies such as CCSE, SDG&E, and SANDAG in order to educate business owners about rebates and incentive programs available for energy upgrades and renewable energy installations. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Replace inefficient air conditioning and heating units with ENERGY STAR-qualified or equivalent models;
- Replace older, inefficient appliances with ENERGY STAR-qualified or equivalent models;
- Seal and insulate buildings to stop drafts, block heat loss in winter, and block heat gain in summer;
- Replace old windows and insulation with ENERGY STAR-qualified or equivalent windows and insulation;
- Install solar water heaters;
- Replace inefficient and incandescent lighting with energy efficient lighting; and
- Weatherize the existing building to increase energy efficiency.

## R3 Other Energy Reduction Measures

The following list of R3 energy measures are those that complement or support the implementation of the R1 and R2 measures described above, but cannot be quantified.

### R3-E1: REGIONAL ENERGY PLANNING COORDINATION

Implementation of the above R1 and R2 energy measures is supported by coordination with SANDAG, SDG&E, SDAPCD, local non-profits, and other local jurisdictions in the San Diego region to optimize

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energy efficiency and renewable resource development and usage. This allows for economies of scale and shared resources to more effectively implement these environmental enhancements.

### R3-E2: ENERGY EFFICIENT DEVELOPMENT, AND RENEWABLE ENERGY DEPLOYMENT FACILITATION AND STREAMLINING

This measure encourages Escondido to identify and remove any regulatory and procedural barriers to the implementation of green building practices and the incorporation of renewable energy systems. This could include the updating of codes and zoning requirements and guidelines. This measure could be further enhanced by providing incentives for energy efficient projects such as priority in the reviewing, permitting, and inspection process. Additional incentives could include flexibility in building requirements such as height limits or set-backs in exchange for incorporating green building practices or renewable energy systems.

### R3-E3: ENERGY EFFICIENCY TRAINING AND PUBLIC EDUCATION

This measure provides public education and publicity about energy efficiency measures and reduction programs available within Escondido through a variety of methods including newsletters, brochures, and the city's website. This measure would enhance this existing program by including rebates and incentives available for residences and businesses as well as providing training in green building materials, techniques, and practices for all plan review and building inspection staff.

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## 4.4 Area Source

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The following list includes measures related to landscaping and wood burning emissions that will reduce emissions and help the City to achieve an AB 32 compliant reduction target.

### R1 Statewide Area Source Reduction Measures

The following R1 area source related measure is implemented by the SDAPCD and will result in emission reductions within Escondido.

#### R1-A1: LAWNMOWER TRADE-IN PROGRAM

The SDAPCD holds an annual lawnmower trade-in event where residents of San Diego County can turn in their working, gasoline-powered lawn mower in order to purchase a new cordless, rechargeable electric mower at a highly discounted price. This annual event began in the year 2000 with the focus of reducing volatile organic compounds, but the trade-in also reduces GHG emissions. SDAPCD has distributed 5,939 electric lawnmowers. The continued implementation of this program will continue to reduce GHG emissions associated with gas-powered lawnmowers.

## R2 Local Area Source Reduction Measures

### R2-A1: ELECTRIC LANDSCAPING EQUIPMENT

#### GHG Reduction Potential:

525 MT CO<sub>2</sub>e

The change out from gas powered equipment to electric powered equipment reduces emissions by 39%. The reduction calculations assume all new developments use electricity rather than gas powered equipment.

#### Community Co-Benefits:



#### City Costs:

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#### City Savings:

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#### Private Costs:

There is no additional cost associated with installing external outlets and purchasing electric equipment rather than gas-powered.

#### Private Savings:

Savings vary depending on fuel used

#### Potential Funding Sources:

SDAPCD lawn-mower trade-in program

This measure reduces GHG emissions by substituting electric landscaping equipment for the traditional gas-powered equipment. Electric lawn equipment including lawn mowers, leaf blowers and vacuums, shredders, trimmers, and chain saws are available. When electric landscaping equipment is used in place of conventional equipment, direct GHG emissions from natural gas combustion are replaced with indirect GHG emissions associated with the electricity used to power the equipment. In the Screening Tables for New Development, projects would be able to earn points for including accessible outdoor outlets in the project design.

## R3 Other Area Source Reduction Measures

The following list of R3 area source measures are those that complement or support the implementation of the R1 and R2 measures described above, but cannot be quantified.

### R3-A1: EXPAND CITY TREE PLANTING

Under this reduction measure, the City would evaluate the feasibility of expanding tree planting within Escondido. This includes the evaluation of potential carbon sequestration from different tree species, potential reductions of building energy use from shading, and GHG emissions associated with pumping water used for irrigation. Commercial and retail development is encouraged to exceed shading requirements by a minimum of 10 percent and to plant low emission trees. All future development shall be encouraged to preserve native trees and vegetation to the furthest extent possible. CCSE has an

## CHAPTER 4 GHG EMISSIONS REDUCTION PROGRAMS AND REGULATIONS

Advice and Technical Assistance Center for urban forestry that offers public workshops, community events, and information for local governments on urban forestry in San Diego.

### R3-A2: REDUCE HEAT ISLAND IMPACTS

The implementation of this measure includes promoting the use of cool roofs, cool pavements, and parking lot shading throughout Escondido by increasing the number of strategically placed shade trees. Further, City-wide Design Guidelines should be amended to include that all new developments and major renovations (additions of 25,000 square feet or more) are encouraged to incorporate the following strategies such that heat gain would be reduced for 50 percent of the non-roof impervious site landscape (including parking, roads, sidewalks, courtyards, and driveways). The strategies include:

- Strategically placed shade trees;
- Paving materials with a Solar Reflective Index (SRI) of at least 29. SRI is a method for evaluating a material based on its solar reflectance and emittance, a standard black material has an SRI of 0 while a standard white material has an SRI of 100. Materials with a higher SRI absorb and emit less heat;
- Open grid pavement system; or
- Covered parking (with shade or cover having an SRI of at least 29).

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## 4.5 Water

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### R1 Statewide Water Reduction Measure

The following R1 water related reduction measure has been identified in the AB 32 Scoping Plan and will result in emission reductions within Escondido.

#### R1-W1: RENEWABLE PORTFOLIO STANDARD (33 PERCENT BY 2020) RELATED TO WATER SUPPLY AND CONVEYANCE

This measure would increase electricity production from eligible renewable power sources to 33 percent by 2020. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 million MT CO<sub>2</sub>e, representing 15.2 percent of emissions from electricity generation (in-state and imports).

## R2 Water Reduction Measure

The following list of R2 water related measures are those measures that Escondido would implement in order to reduce emissions beyond the emissions reduction associated with the R1 state measures described above.

### R2-W1: ENERGY EFFICIENT WATER TREATMENT PLANT

#### GHG Reduction Potential:

13.03 MT CO<sub>2</sub>e

#### Community Co-Benefits:



#### City Costs:

\$31,398 - \$6,720 SDG&E rebates = \$24,678 (one time cost)

#### City Savings:

\$5,097 annually in reduced energy costs, resulting in an estimated 4.8 year payback period on the initial cost.

#### Private Costs:

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#### Private Savings:

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#### Potential Funding Sources:

SDG&E

Escondido's Energy Roadmap, completed in coordination with SANDAG, included energy audits and recommended Energy Conservation Measures (ECM) for reducing energy use in the City's facilities. For the Water Treatment Plant, the ECMs and annual kWh savings include:

- ECM 1: Replace Parking Lot Lighting with Fluorescent – 7,717 kWh saved
- ECM 2: Replace Sedimentation Pool Lighting with Induction – 13,490 kWh saved
- ECM 3: Replace T12 Lamps with T8 Lamps – 2,759 kWh saved
- ECM 4: Replace Electric Resistance Block Heater on Backup Generator – 16,248 kWh saved

The Energy Roadmap estimates a total savings of 39,514 kWh/year, which is equivalent to 13.03 MT CO<sub>2</sub>e/year. These reductions also equate to a cost savings of \$5,097/year. These savings will be experienced at a municipal level as well as community-wide.

## R2-W2: WATER CONSERVATION STRATEGIES

**GHG Reduction Potential:**

327 MT CO<sub>2</sub>e

The calculated emission reductions assume all new developments reduce water consumption by 20%.

**Community Co-Benefits:**



**City Costs:**

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**City Savings:**

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**Private Costs:**

Considered negligible if implemented with new development

**Private Savings:**

\$517,917 annually in reduced water costs.

**Potential Funding Sources:**

County Water Authority rebates

Importing water from either the State Water Project via the California Aqueduct or the Colorado River is an energy intensive process. The energy used to transport, treat, and deliver this imported water in Escondido results in GHG emissions. In contrast, water derived from local sources does not need to be transported as far. By reducing water use, Escondido can reduce the amount of imported water and utilize more of the local sources. Escondido is already implementing programs to conserve water, these include:

- City Ordinance 96-14 requires that residential and non-residential remodel improvements valued at or more than \$23,828.00 shall retrofit all existing toilets, showerheads and faucets with low-flow (2.2 GPM) faucets/showerheads and low-flush (1.6 GPF) toilets
- Free home outdoor water surveys to single-family customers
- Incentives for businesses and multi-family customers targeting at reducing outdoor water use.
- Education and public outreach in the form of presentations to elementary school students about water conservation
- 20-Gallon Challenge participant

In addition to these programs Escondido would include measures in the Screening Table for New Development that aim to increase the use of recycled water, incorporate water efficient fixtures, drought tolerant landscaping, permeable hardscapes, and on-site stormwater capture and reuse facilities. Many of these water conservation strategies are included in the new CalGreen building standards; however, the Screening Table would allow new development projects the opportunity to exceed these standards in order to attain points toward the goal of achieving 100 points.

## R2-W3: INCREASED RECYCLED WATER USE

### GHG Reduction Potential:

916 MT CO<sub>2</sub>e

By using reclaimed water rather than imported water, emissions are reduced by 81%. These emission reductions assume 5% of Escondido's water is converted to reclaimed water.

### Community Co-Benefits:



### City Costs:

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### City Savings:

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### Private Costs:

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### Private Savings:

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### Potential Funding Sources:

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California water supplies come from a variety of sources including ground water, surface water, and reservoirs. For Southern California in particular, much of the water is transported over long distances, which can require a substantial amount of electricity. Recycled, or reclaimed, water is water reused after wastewater treatment for non-potable uses instead of returning the water to the environment. Since less energy is required to provide reclaimed water, fewer GHG emissions are associated with reclaimed water use compared to the average California water supply use. The Screening Table would allow new development to achieve points by including the use of recycled water.

*A more detailed, in depth cost analysis would need to be completed to determine the City's costs and savings as well as those to the City's customers. Potential costs include recycled water infrastructure and expanded operations at water treatment plant. Potential savings include less imported water and lower rates for consumers.*

## R3 Other Water Reduction Measure

The following R3 water measure complements the implementation of the R1 and R2 measures described above, but cannot be quantified.

### R3-W1: WATER EFFICIENCY AND CONSERVATION EDUCATION

Under this measure the City, in coordination with local water purveyors would continue to implement its public information and education program that promotes water conservation (see page 4-4 for information on Escondido's existing program). The program could be expanded to include certification programs for irrigation designers, installers, and managers, as well as classes to promote the use of drought tolerant, native species and xeriscaping. Xeriscaping refers to landscaping techniques that eliminate the need for water.

## 4.6 Solid Waste

### R1 Statewide Solid Waste Measure

The following R1 measure has been identified in the AB 32 Scoping Plan as a statewide measure that would result in emission reductions associated with solid waste.

#### R1-S1: WASTE MEASURES

The CARB AB 32 Scoping Plan recommends three measures for reducing emissions from Municipal Solid Waste at the state level, including: 1) landfill methane control; 2) increase the efficiency of landfill methane capture; and 3) high recycling/zero waste. CARB approved a regulation implementing the discrete early action program for methane recovery (1), which became effective June 17, 2010. This measure is expected to result in a 1.0 million MT CO<sub>2</sub>e reduction by 2020. Other measures proposed by CARB include increasing efficiency of landfill methane capture (2) and instituting high recycling/zero waste policies (3). Potential reductions associated with these measures are still to be determined.

### R2 Local Solid Waste Measure

At a local level, Escondido would implement the following R2 solid waste related measure to reduce emissions beyond the emissions reduction associated with the R1 state measure described above.

#### R2-S1: WASTE DISPOSAL PROGRAMS

**GHG Reduction Potential:**

6,212 MT CO<sub>2</sub>e

The emissions reductions account for a 15% decrease in non-construction waste sent to landfills. Non-construction waste represents 87.6% of Escondido's total waste.

**Community Co-Benefits:**



**City Costs:**

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**City Savings:**

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**Private Costs:**

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**Private Savings:**

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**Potential Funding Sources:**

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In 2006, the City of Escondido's diversion rate was 53 percent. Beginning in 2007, CIWMB began monitoring jurisdictions under a different metric; the diversion rates have been replaced with waste disposal per resident or per employee. The disposal rate targets established for Escondido are 5.9 pounds per resident and 16.5 pounds per employee per year. In 2009, Escondido's annual per capita disposal rates were 5.3 pounds per resident, below the residential target, and 16.5 pounds per employee, meeting the employee target. By disposing less than the targets set by CIWMB, Escondido is sending less waste to the landfill.

This reduction measure sets a more stringent target for Escondido to achieve 15 percent below each of the per capita targets for waste disposal. This would be equivalent to a disposal rate of 5 pounds per resident and 14 pounds per employee. This measure would be implemented through the Screening Tables by allocating points to new development projects that incorporate strategies to reduce the amount of waste disposed at landfills.

*A more detailed, in depth cost analysis would need to be completed to determine the community's costs and savings associated with this measure. Potential costs include costs associated with expanded recycling facilities and increased recycling pickups. Potential savings include lower fuel costs as a result of less frequent waste pick-ups and lower operating costs at landfills.*

## R3 Other Solid Waste Measures

The following list of R3 energy measures are those that complement or support the implementation of the R1 and R2 measures described above, but cannot be quantified.

### R3-S1: ENCOURAGE INCREASED EFFICIENCY OF GAS TO ENERGY SYSTEM

Sycamore landfill currently operates a gas-to-energy system that captures methane gas from the landfill and converts it to electricity producing a capacity of approximately 1.5 megawatts. This measure encourages Sycamore to keep current with upgrades in efficiencies to gas-to-energy systems and to upgrade as feasible when significant increases in conversion efficiencies are available. Escondido's waste is deposited in the Sycamore Landfill, so the GHG emissions from Escondido's solid waste are dependent on the waste management and methane capture systems in place at Sycamore. Any reductions in GHG emissions from the landfill will, in turn, reduce Escondido's GHG emissions from solid waste generation.

### R3-S2: WASTE-RELATED EDUCATION AND OUTREACH

This measure builds upon Escondido's existing waste education program to provide public education and increased publicity about commercial and residential recycling. This measure includes educating the public about waste reduction options available at both residential and commercial levels, including composting, yard waste recycling, waste prevention, and available recycling services.

## 4.7 Construction

### R2 Local Construction Measure

Although construction emissions make up a small portion of Escondido’s total emissions, the following R2 Construction measure would further reduce GHG emissions from construction.

**GHG Reduction Potential:**

229 MT CO<sub>2</sub>e

The emissions reductions account for a 10% decrease in construction-related GHG emissions.

**Community Co-Benefits:**



**City Costs:**

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**City Savings:**

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**Private Costs:**

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**Private Savings:**

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**Potential Funding Sources:**

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#### R2-C1: CONSTRUCTION EMISSIONS REDUCTIONS

This measure would reduce construction-related GHG emissions by 10 percent. The following measures will be incorporated into the Screening Tables for New Development as options for new projects to reduce their emissions:

- Turn off all diesel-powered vehicles and gasoline-powered equipment when not in use for more than five minutes.
- Use electric or natural gas-powered construction equipment in lieu of gasoline or diesel-powered engines, where feasible.
- Require 10 percent of the construction fleet to use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters, and/or CARB-certified Tier III equipment or better.
- Support and encourage ridesharing and transit incentives for the construction crew.

*A more detailed, in depth cost analysis would need to be completed to determine the community’s costs and savings associated with this measure. Potential costs include costs associated with replacing gasoline or diesel-powered equipment, or installing technology to reduce emissions. Potential savings include lower fuel costs as a result of less fuel being used during idling and the increased use of alternative power sources.*

## Chapter 5

# Meeting 2020 GHG Reduction Targets

## CHAPTER 5 MEETING 2020 GHG REDUCTION TARGETS

Combined statewide and local GHG reduction measures will achieve the required 20 percent reduction target for Escondido by 2020. The City is projected to emit a total of 992,583 MT CO<sub>2</sub>e without the incorporation of reduction measures by 2020. With implementation of the reduction measures discussed in Chapter 4, Escondido emissions for 2020 would be reduced to 788,127 MT CO<sub>2</sub>e. The statewide reduction measures (the R1 Measures in Chapter 4) would reduce Escondido's emissions by 17 percent and make a substantial contribution toward reaching the 2020 reduction target. However, the City would need to supplement the state measures with the implementation of the local reduction measures (R2 measures) discussed in Chapter 4 to achieve the remaining 3 percent reduction in GHG.

### 5.1 Reductions from Statewide Measures

The following tables summarize the GHG reductions afforded to the City of Escondido from the implementation of the statewide R1 reduction measures. Table 5-1 shows the annual MT CO<sub>2</sub>e and the corresponding percent of emissions reduced for each of the R1 statewide measures described in Chapter 4 during the year 2020. Note that some R1 measures are not quantifiable and are not included in Table 5-1.

| <b>Table 5-1 Statewide Measures and Associated Emissions Reduced from the 2020 Inventory</b> |                                   |                                      |
|--|-----------------------------------|--------------------------------------|
| <b>Transportation</b>  | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Transportation Emissions</b> |
| R1-T1 & R1-T2: Pavley Vehicle Efficiency   | 58,405                            | 13.9%                                |
| R1-T3: Low Carbon Fuel Standard  | 26,009                            | 6.2%                                 |
| R1-T4: Tire Pressure   | 834                               | 0.2%                                 |
| R1-T5: Low Rolling Resistance Tires  | 554                               | 0.1%                                 |
| R1-T6: Low Friction Oils   | 4,701                             | 1.1%                                 |
| R1-T7: Goods Movement Efficiency   | 5,268                             | 1.3%                                 |
| R1-T8: Aerodynamic Efficiency  | 1,073                             | 0.3%                                 |
| R1-T9: Medium/Heavy Duty Hybridization   | 554                               | 0.1%                                 |
| <b>Transportation Total</b>  | <b>97,398</b>                     | <b>23.2%</b>                         |
| <b>Energy</b>  | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Energy Emissions</b>         |
| R1-E1: RPS – 33% Renewable by 2020   | 40,772                            | 8.8%                                 |
| R1-E2: Indoor Residential Lighting   | 6,136                             | 1.8%                                 |
| R1-E3: Indoor Commercial and Outdoor Lighting  | 4,555                             | 1.3%                                 |
| R1-E4: Electrical Energy Efficiency  | 3,183                             | 0.9%                                 |
| R1-E5: Natural Gas Energy Efficiency   | 1,382                             | 0.3%                                 |
| R1-E6: Increased Combined Heat and Power   | 10,532                            | 3.1%                                 |
| R1-E7: Industrial Efficiency   | 791                               | 0.2%                                 |
| <b>Energy Total</b>  | <b>67,351</b>                     | <b>15.3%</b>                         |
| <b>Water</b>   | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Water Emissions</b>          |
| R1-W1: RPS – 33% Renewable by 2020   | 4,044                             | 14.8%                                |
| <b>Water Total</b>   | <b>4,044</b>                      | <b>14.8%</b>                         |

## 5.1 REDUCTIONS FROM STATEWIDE MEASURES

Table 5-2 compares the 2020 inventory (without the incorporation of any reduction measures) to the community-wide emissions with the statewide reductions. As shown in the table, the statewide reduction measures would reduce 17 percent of Escondido’s total community wide annual emissions by the year 2020.

| <b>Table 5-2 Statewide Reduction Summary for 2020 Inventory</b> |                                |  |  |                    |
|---|--------------------------------|--|--|--------------------|
|   | <b>2020 MT CO<sub>2</sub>e</b> | <b>State Reductions<br/>MT CO<sub>2</sub>e</b> | <b>2020 Reduced<br/>MT CO<sub>2</sub>e</b> | <b>% Reduction</b> |
| Transportation  | 419,741                        | 97,398   | 322,343                                    | 23%                |
| Energy  | 441,025                        | 67,351   | 373,674                                    | 15%                |
| Area Sources  | 54,977                         | 0  | 54,977                                     | 0%                 |
| Water/Wastewater  | 27,278                         | 4,044  | 23,235                                     | 15%                |
| Solid Waste   | 47,273                         | 0  | 47,273                                     | 0%                 |
| Construction  | 2,288                          | 0  | 2,288                                      | 0%                 |
| <b>Total</b>  | <b>992,583</b>                 | <b>168,793</b>                                 | <b>823,790</b>                             | <b>17%</b>         |

Although the statewide measures would significantly reduce Escondido’s emissions, they would not be enough to reach the established 2020 reduction target. Escondido’s reduction target was calculated as 15 percent below 2005 levels, which equates to 788,176 MT CO<sub>2</sub>e. The statewide reduction measures would bring Escondido down to 823,790 MT CO<sub>2</sub>e, which leaves 35,641 MT CO<sub>2</sub>e to be reduced by measures implemented at the community level, see Table 5-3.

| <b>Table 5-3 Comparison to Reduction Target</b> |                           |
|---|---------------------------|
|   | <b>MT CO<sub>2</sub>e</b> |
| 2020 with State Reductions                      | 823,790                   |
| 2020 Reduction Target                           | 788,176                   |
| <b>Amount left to Reduce</b>                    | <b>35,641</b>             |

The R2 reduction measures described in Chapter 4 would be implemented to reduce the remaining 35,641 MT CO<sub>2</sub>e in order to reach the 2020 reduction target for the City of Escondido.

The 2020 Reduction Target is an estimated 20 percent below the 2020 inventory. The statewide reduction measures work to reduce Escondido’s emissions by 17 percent from the 2020 inventory.

| <b>Table 5-4 Percentage Reduction from 2020 Inventory</b> |                              |
|---|------------------------------|
|   | <b>% from 2020 Inventory</b> |
| 2020 Reduction Target                                     | 20%                          |
| State Reduction Measures                                  | 17%                          |
| <b>Amount left to Reduce</b>                              | <b>3%</b>                    |

The remaining 3 percent of emissions would be reduced through the implementation of the R2 reduction measures described in Chapter 4. R2 measures include several categories of reductions: the energy-efficiency measures that the City has incorporated since 2005; measures that implement policies included in the proposed General Plan Update; and additional measures that applicants could include as part of their project when filling out the Screening Table.

## 5.2 Reductions from Local Measures

The R2 measures discussed in Chapter 4 would be implemented primarily through the Screening Tables for New Development or with General Plan policies. The measures go beyond the State measures to reduce GHG emissions in order to meet the 2020 reduction target. Table 5-5 summarizes the MT CO<sub>2</sub>e and the corresponding percentage of emissions reduced for each of the R2 measures. The incorporation of the Statewide R1-E1 Renewable Portfolio Standard measure would indirectly decrease the GHG emission reductions associated with the R2 energy efficiency measure. This is because the Statewide R1-E1 Renewable Portfolio Standard measure reduces the overall GHG emissions associated with the amount of electricity demand. The combination of R1 and R2 measures work together to reduce the overall GHG emissions associated with the production of energy.

| <b>Table 5-5 R2 Local Measures and Associated Emissions Reduced from 2020 Inventory</b>   |                                   |                                      |
|---|-----------------------------------|--------------------------------------|
| <b>Transportation</b>   | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Transportation Emissions</b> |
| R2-T1: Land Use and VMT Reduction Policies*   | -                                 | -                                    |
| R2-T2: Bicycle Master Plan  | 2,675                             | 0.8%                                 |
| R2-T3: Transit Improvements   | 3,785                             | 1.2%                                 |
| R2-T4: Transportation Demand Management   | 5,221                             | 2.0%                                 |
| <b>Transportation Total</b>   | <b>11,681</b>                     | <b>4.0%</b>                          |
| <b>Energy</b>   | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Energy Emissions</b>         |
| R2-E1: Residential Energy Efficiency  | 1,878                             | 0.4%                                 |
| R2-E2: Commercial Energy Efficiency   | 3,664                             | 0.9%                                 |
| R2-E3: Residential Renewable Energy   | 716                               | 0.2%                                 |
| R2-E4: Commercial Renewable Energy  | 2,314                             | 0.5%                                 |
| R2-E5: Residential Retrofits  | 4,086                             | 1.0%                                 |
| R2-E6: Commercial Retrofits   | 3,101                             | 0.7%                                 |
| <b>Energy Total</b>   | <b>15,759</b>                     | <b>3.7%</b>                          |
| <b>Area Source</b>  | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Area Source Emissions</b>    |
| R2-A1: Electric Landscaping Equipment   | 526                               | 1.0%                                 |
| <b>Area Source Total</b>  | <b>526</b>                        | <b>1.0%</b>                          |
| <b>Water</b>  | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Water Emissions</b>          |
| R2-W1: Energy Efficient Water Treatment Plant   | 13                                | 0.1%                                 |
| R2-W2: Water Conservation Strategies  | 327                               | 1.4%                                 |
| R2-W3: Increased Recycled Water Use   | 916                               | 4.1%                                 |
| <b>Water Total</b>  | <b>1,256</b>                      | <b>5.6%</b>                          |
| <b>Solid Waste</b>  | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Solid Waste Emissions</b>    |
| R2-S1: Waste Disposal Program   | 6,212                             | 13.1%                                |
| <b>Solid Waste Total</b>  | <b>6,212</b>                      | <b>13.1%</b>                         |
| <b>Construction</b>   | <b>MT CO<sub>2</sub>e Reduced</b> | <b>% of Construction Emissions</b>   |
| R2-C1: Construction Emissions Reductions  | 229                               | 10.0%                                |
| <b>Construction Total</b>   | <b>229</b>                        | <b>10.0%</b>                         |
| *Note: The GHG emission reductions associated with measure R2-T1 have already been accounted for in the projected VMT calculation included in the traffic study prepared for the General Plan Update. |                                   |                                      |

## 5.2 REDUCTIONS FROM LOCAL MEASURES

With the statewide reduction measures and the implementation of the R2 measures, Escondido would reduce its community-wide emissions to a level below the established 2020 reduction target. Table 5-6 summarizes the 2020 inventory emissions, the GHG reductions associated with the statewide and R2 measures, and the reduced 2020 emissions.

| <b>Table 5-6 Local Reduction Summary for 2020 Inventory</b> |  |   |   |  |                        |
|---|--|---|---|--|------------------------|
|   | <b>2020 Projected Escondido GHG Emissions<br/>MT CO<sub>2</sub>e</b> | <b>Local GHG Reductions from R1 Statewide Measures<br/>MT CO<sub>2</sub>e</b> | <b>Local GHG Reductions From E-CAP R2 Measures<br/>MT CO<sub>2</sub>e</b> | <b>Reduced 2020 GHG Emissions From State and E-CAP Measures<br/>MT CO<sub>2</sub>e</b> | <b>% GHG Reduction</b> |
| Transportation  | 419,741  | 97,398  | 11,681  | 310,662  | 26%                    |
| Energy  | 441,025  | 67,351  | 15,759  | 357,914  | 19%                    |
| Area Sources  | 54,977   | 0   | 526   | 54,451   | 1%                     |
| Water/Wastewater  | 27,278   | 4,044   | 1,256   | 21,979   | 19%                    |
| Solid Waste   | 47,273   | 0   | 6,212   | 41,061   | 13%                    |
| Construction  | 2,288  | 0   | 229   | 2,059  | 10%                    |
| <b>Total</b>  | <b>992,583</b>   | <b>168,793</b>  | <b>35,663</b>   | <b>788,127</b>   | <b>21%</b>             |

The majority of the reductions necessary to meet the 2020 target for Escondido would be accomplished through the statewide measures. The percent reduction for each source associated with the state and local GHG reduction measures is shown in Table 5-7. Table 5-8 summarizes the GHG reductions associated with the statewide and R2 measures compared to the 2020 reduction target. The total reduction is 20.6 percent compared to the 2020 Projected Inventory, which exceeds the target reduction of 20 percent.

| <b>Table 5-7 Percent Reduction Summary for 2020 Inventory</b> |                                |                         |  |                               |  |
|---|--------------------------------|-------------------------|--|-------------------------------|--|
|   | <b>2020 MT CO<sub>2</sub>e</b> | <b>State Reductions</b> | <b>% Reduction from State Measures</b> | <b>Local E-CAP Reductions</b> | <b>% Reduction from E-CAP Measures</b> |
| Transportation  | 419,741                        | 97,398                  | 23.2%                                  | 11,681                        | 2.8%                                   |
| Energy  | 441,025                        | 67,351                  | 15%                                    | 15,759                        | 3.7%                                   |
| Area Sources  | 54,977                         | 0                       | 0.0%                                   | 526                           | 1.0%                                   |
| Water/Wastewater  | 27,278                         | 4,044                   | 14.8%                                  | 1,256                         | 4.6%                                   |
| Solid Waste   | 47,273                         | 0                       | 0.0%                                   | 6,212                         | 13.1%                                  |
| Construction  | 2,288                          | 0                       | 0.0%                                   | 229                           | 10.0%                                  |
| <b>Total</b>  | <b>992,583</b>                 | <b>168,793</b>          | <b>17.0%</b>                           | <b>35,663</b>                 | <b>3.5%</b>                            |

| <b>Table 5-8 Percentage Reduction from 2020 Inventory with the Inclusion of State and Local Measures</b> |   |                              |
|--|---|------------------------------|
|  | <b>GHG Emissions MT CO<sub>2</sub>e</b> | <b>% from 2020 Inventory</b> |
| 2020 Projected Inventory   | 992,583                                 |                              |
| State Reduction Measures   | (168,793)                               | 17.0%                        |
| Local E-CAP Reduction Measures   | (35,663)                                | 3.6%                         |
| <b>2020 Reduced Inventory</b>  | <b>788,127</b>                          | <b>20.6%</b>                 |
| <b>2020 Reduction Target</b>   | <b>788,176</b>                          | <b>20%</b>                   |

## 5.3 Reduced 2020 Community-Wide Emissions Inventory

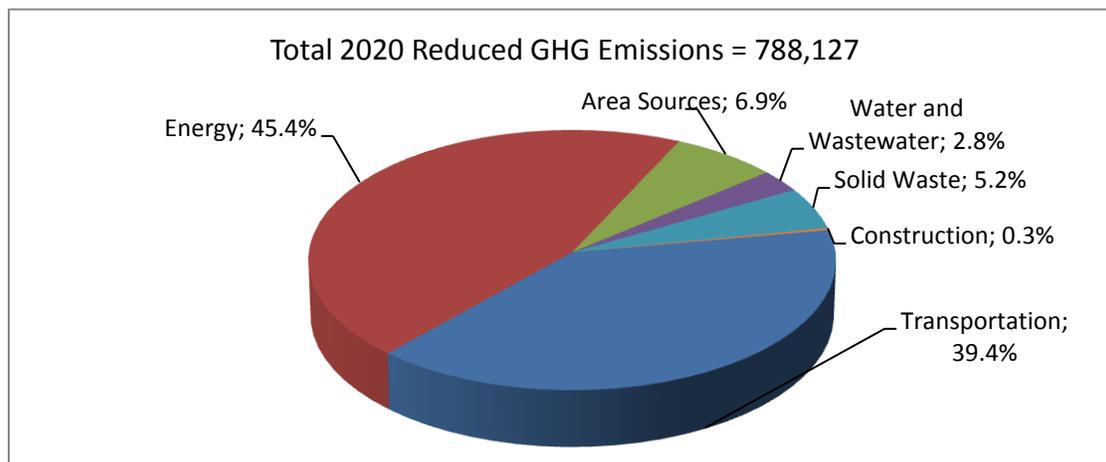
With the implementation of GHG reduction measures, Escondido is projected to reduce its emissions to a total of 788,127 MT CO<sub>2</sub>e, which is 49 MT CO<sub>2</sub>e below the 2020 reduction target. This is a decrease of 20.6 percent from Escondido’s 2020 emissions inventory and 11 percent from the 2010 emissions. The reduction measures reduce GHG emissions from all sources of community-wide GHG emissions including transportation, energy, area sources, water, and solid waste. The following sections describe the emissions by source and land use category for the year 2020.

### Emissions by Source

The emissions by source for the reduced 2020 inventory were calculated by applying a percent reduction to the 2020 emissions for each reduction measure. Table 5-9 summarizes the reduced 2020 City emissions of CO<sub>2</sub>e as broken down by emissions category. Figure 5-1 is a graphical representation of the reduced inventory shown in Table 5-9. A detailed breakdown of reduced 2020 emissions by category is available in the Appendix.

| Category             | Metric tons of CO <sub>2</sub> e |
|----------------------|----------------------------------|
| Energy               | 357,914                          |
| Transportation       | 310,662                          |
| Area Sources         | 54,451                           |
| Solid Waste          | 41,061                           |
| Water and Wastewater | 21,979                           |
| Construction         | 2,059                            |
| <b>Total</b>         | <b>788,127</b>                   |

**Figure 5-1 Reduced 2020 GHG Emissions Generated by Source**

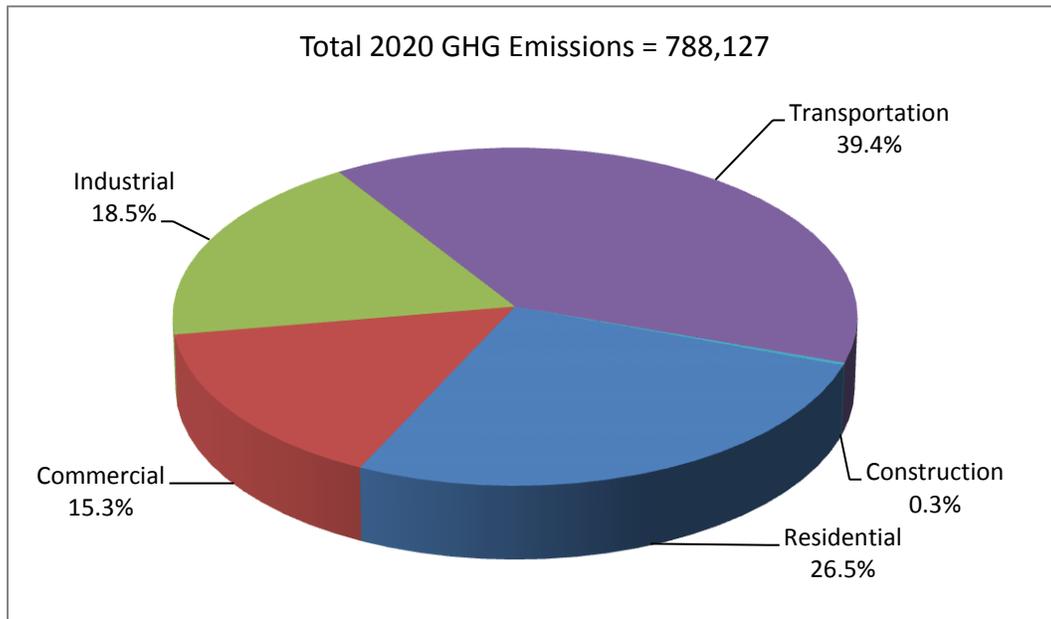


## Emissions by Land Use

Table 5-10 summarizes the total amount of community-wide GHG emissions for Escondido in the reduced 2020 inventory by land use category. The largest portion of Escondido’s reduced 2020 emissions would be from transportation (40 percent), followed by emissions from residential land uses (27 percent). Due to the nature of mobile emissions, transportation emissions could not be allocated to the individual land use types. Figure 5-2 provides a comparison of GHG emissions by land use category.

| Table 5-10 Reduced 2020 GHG Emissions by Land Use |                                  |
|---|----------------------------------|
| Category  | Metric tons of CO <sub>2</sub> e |
| Transportation                                    | 310,662                          |
| Residential                                       | 208,792                          |
| Commercial  | 120,692                          |
| Industrial  | 145,922                          |
| Construction                                      | 2,059                            |
| <b>Total</b>                                      | <b>788,127</b>                   |

**Figure 5-2 Reduced 2020 GHG Emissions by Land Use**



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## 5.4 Reduced 2035 Community-Wide Emissions Inventory

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Beyond 2035, Escondido's GHG emissions would reduce with the continued implementation of the 2020 reduction strategies, expansion of the transit system according to the SANDAG RTP, and increased stringency of state reduction measures. In addition to the 2020 reduction measures, the following assumptions were included in the reduced 2035 GHG emissions:

- Pavley vehicle efficiency standards would continue beyond 2035 at a similar rate.
- The low carbon fuel standard would increase from 10 percent to 12 percent.
- Bicycle infrastructure would expand such that 2 percent of all passenger vehicle trips are replaced with bicycle trips.
- The post-2020 SPRINTER and Bus Rapid Transit improvements included in the 2050 RTP would increase public transit ridership such that 4.5 percent of passenger trips are replaced with public transit.
- TDM programs would continue and decrease passenger trips by 4 percent.
- The RPS would continue past 2020 and an estimate 37 percent of San Diego's electricity would be derived from renewable sources.
- 15 percent of existing homes and buildings would be demolished and rebuilt by 2035.
- All new homes and commercial buildings would achieve an average of 15 percent beyond 2008 Title 24 standards.
- 30 percent of the electricity use from new homes and buildings would be from renewable sources.
- 30 percent of existing homes and commercial buildings would be retrofitted to achieve 2008 Title 24 standards.
- 10 percent of potable water use would be replaced with recycled water.

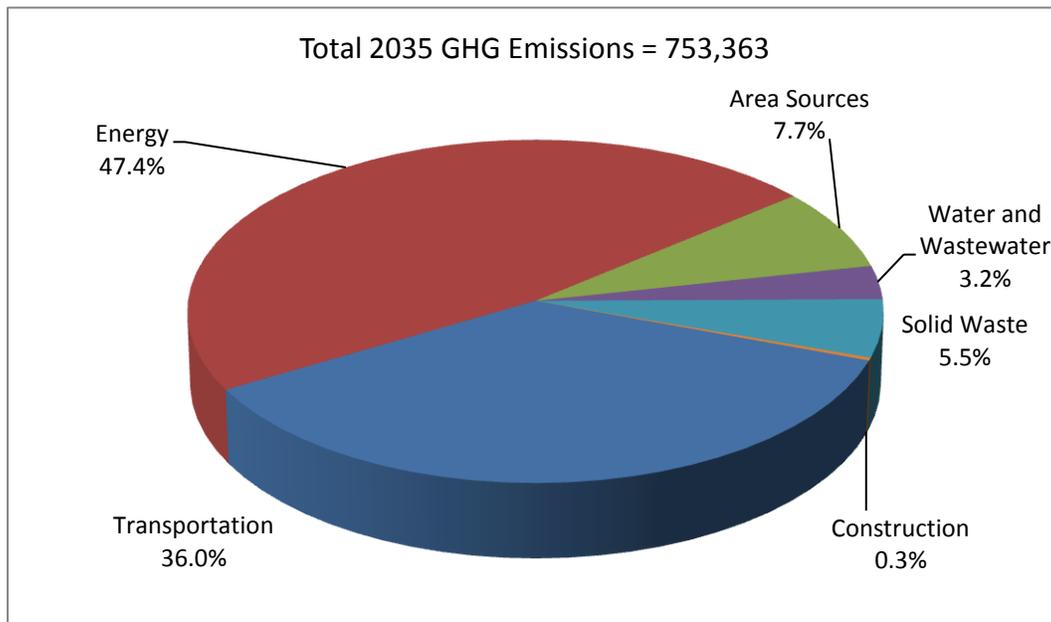
With the continued implementation of the Screening Tables for New Development and predicted future developments at the state level, Escondido's 2035 emissions would be reduced to 753,363 MT CO<sub>2</sub>e, this represents a 39 percent decrease from the 2035 emissions inventory and is 4 percent below the 2020 reduction target. The assumptions described above represent one possible scenario for achieving reductions beyond 2020.

## Emissions by Source

The emissions by source for the 2035 reduced inventory were calculated by applying a percent reduction to the 2035 emissions inventory for each reduction measure. Table 5-11 summarizes the 2035 Escondido emissions of CO<sub>2</sub>e as broken down by emissions category. Figure 5-3 is a graphical representation of Table 5-11. A detailed breakdown of the reduced 2035 emissions by category is available in the Appendix.

| Table 5-11 Reduced 2035 GHG Emissions by Source |                                  |
|---|----------------------------------|
| Category  | Metric tons of CO <sub>2</sub> e |
| Transportation                                  | 271,436                          |
| Energy  | 357,294                          |
| Area Sources                                    | 57,733                           |
| Water and Wastewater                            | 23,779                           |
| Solid Waste                                     | 41,061                           |
| Construction                                    | 2,059                            |
| <b>Total</b>                                    | <b>753,363</b>                   |

**Figure 5-3 Reduced 2035 GHG Emissions by Source**

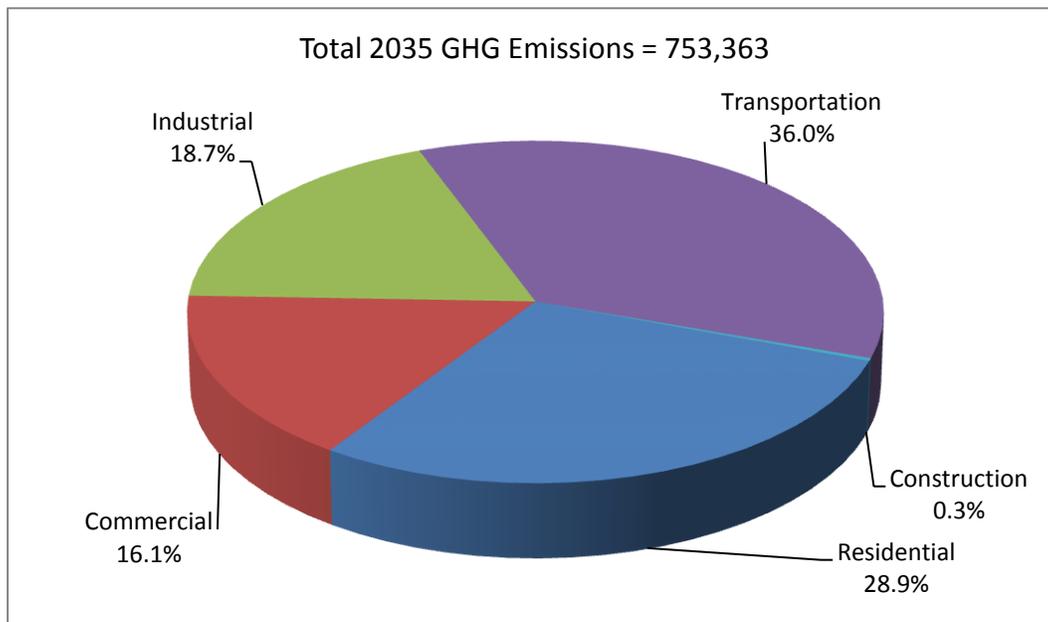


## Emissions by Land Use

Table 5-12 summarizes the total amount of community-wide GHG emissions by land use type for Escondido in 2035 with the reduction measures. Escondido is projected to emit 753,363 MT CO<sub>2</sub>e in 2035. The largest portion of Escondido’s 2035 reduced emissions are from transportation (36 percent), followed by emissions from residential land uses (29 percent). Due to the nature of mobile emissions, transportation emissions could not be allocated to the individual land use types. Figure 5-4 provides a comparison of GHG emissions by land use category.

| Table 5-12 Reduced 2035 GHG Emissions by Land Use |                                  |
|---|----------------------------------|
| Category  | Metric tons of CO <sub>2</sub> e |
| Transportation                                    | 271,436                          |
| Residential                                       | 217,884                          |
| Commercial  | 121,011                          |
| Industrial  | 140,973                          |
| Construction                                      | 2,059                            |
| <b>Total</b>                                      | <b>753,363</b>                   |

**Figure 5-4 Reduced 2035 GHG Emissions by Land Use**



## 5.5 Emissions Summary

With the implementation of the reduction measures outlined in Chapter 4, Escondido would reduce its emissions to a level below the 2020 reduction target calculated in Chapter 3. This represents a 21 percent decrease from the 2020 inventory and is consistent with the State's GHG reduction goals. Table 5-13 summarizes the existing 2010 emissions, the 2020 emissions inventory, and the reduced 2020 emissions.

| Source Category  | Metric tons of CO <sub>2</sub> e |                |                |            |
|--|----------------------------------|----------------|----------------|------------|
|  | 2010                             | 2020           | Reduced 2020   | % Reduced  |
| Transportation   | 368,622                          | 419,741        | 310,662        | 26%        |
| Energy   | 395,565                          | 441,025        | 357,662        | 19%        |
| Area Sources   | 52,559                           | 54,977         | 54,451         | 1%         |
| Water and Wastewater   | 25,360                           | 27,278         | 21,979         | 19%        |
| Solid Waste  | 41,724                           | 47,273         | 41,061         | 13%        |
| Construction   | 2,288                            | 2,288          | 2,059          | 10%        |
| <b>Total</b>   | <b>886,118</b>                   | <b>992,583</b> | <b>788,127</b> | <b>21%</b> |
| <b>Emission Reduction Target</b>   |                                  | <b>788,176</b> | <b>788,176</b> |            |
| <b>Below Reduction Target?</b>   |                                  | <b>No</b>      | <b>Yes</b>     |            |
| Note: Mass emissions of CO <sub>2</sub> e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding. |                                  |                |                |            |

Beyond 2020, these reduction measures would continue to reduce emissions particularly from new development projects and transportation. Although Escondido's growth beyond 2020 would result in more GHG emissions, these emissions can be offset with the implementation of the Screening Tables for New Development and the General Plan's transit oriented development strategies. Table 5-14 summarizes Escondido's existing 2010 emissions, anticipated 2035 emissions inventory, and reduced 2035 emissions.

Table 5-14 shows that the continued implementation of the reduction measures combined with the anticipated increased stringency of state reduction measures would reduce 2035 emissions by 39 percent, which is 4 percent below the 2020 reduction target. The State's ambitious reduction target for the year 2050 is to reduce emissions 80 percent below 1990 emissions. In order to reach this target, technology must advance significantly and more stringent measures for building and vehicle efficiency must be implemented. While the measures included in this E-CAP would provide a plan for Escondido to reduce emissions enough to meet the 2020 target and experience further reductions through to 2035, the E-CAP would need to be updated periodically in the future in order to update these measures.

CHAPTER 5 MEETING 2020 GHG REDUCTION TARGETS

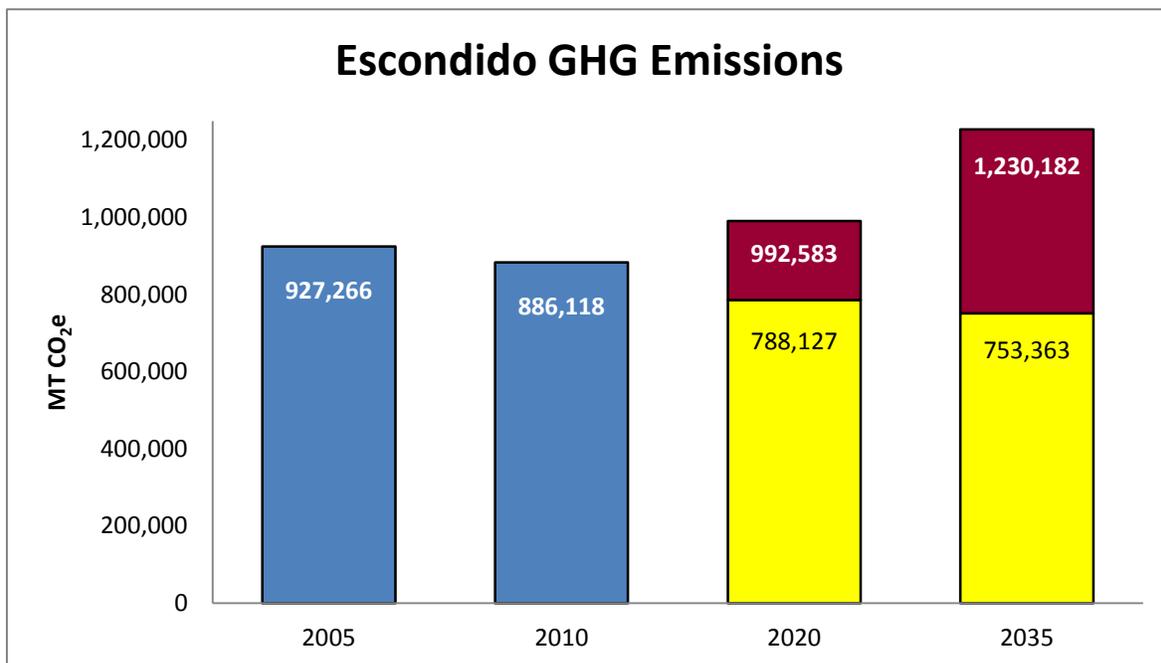
| <b>Table 5-14 2035 GHG Emissions Comparison</b>  |                                       |   |   |                  |
|--|---------------------------------------|---|---|------------------|
| <b>Source Category</b>   | <b>Metric tons of CO<sub>2</sub>e</b> |   |   |                  |
|  | <b>2010</b>                           | <b>2035 GP Horizon<br/>Escondido without GHG<br/>reduction measures</b> | <b>Reduced 2035<br/>Escondido with GHG<br/>reduction measures</b> | <b>% Reduced</b> |
| Transportation   | 368,622                               | 556,818   | 271,436   | 51%              |
| Energy   | 395,565                               | 523,427   | 357,294   | 32%              |
| Area Sources   | 52,559                                | 59,151  | 57,733  | 2%               |
| Water and Wastewater   | 25,360                                | 30,980  | 23,779  | 23%              |
| Solid Waste  | 41,724                                | 57,518  | 41,061  | 29%              |
| Construction   | 2,288                                 | 2,288   | 2,059   | 10%              |
| <b>Total</b>   | <b>886,118</b>                        | <b>1,230,182</b>  | <b>753,363</b>  | <b>39%</b>       |
| <b>Emission Reduction Target</b>   |                                       | <b>788,176</b>  | <b>788,176</b>  |                  |
| <b>Below Reduction Target?</b>   |                                       | <b>No</b>   | <b>Yes</b>  |                  |
| Note: Mass emissions of CO <sub>2</sub> e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding. |                                       |   |   |                  |

# Chapter 6 Conclusion

## CHAPTER 6 CONCLUSION

This E-CAP serves as a guide to help the City implement the objectives of conserving resources and reducing GHG emissions. This document also serves as a technical resource for the proposed update of Escondido's current General Plan and other land use related documents that may require evaluation and documentation of GHG emissions. Figure 6-1 shows a comparison between the emission inventories, including the reduced 2020 and 2035 inventories. The blue bars represent the calculated GHG inventories for Escondido for 2005 and 2010. The red bars show the projected growth in GHG emissions in 2020 and 2035 based on the General Plan growth rates. The yellow bars demonstrate the reduced inventories after the implementation of the statewide and community reduction measures described in Chapter 4.

**Figure 6-1 Escondido GHG Emissions by Year**



This E-CAP sets a target to reduce community-wide GHG emission emissions by 15 percent from 2005 levels by 2020 consistent with the California statewide reduction goals in AB 32. The CARB Scoping Plan outlines the reduction strategies designed to meet the statewide reduction goal of AB 32. The City has a reduction strategy as described in Chapter 4 that would meet the State reduction goal. Reduction measures provided herein would ensure that Escondido meets the AB 32 reduction target of reducing to 15 percent below 2005 levels (GHG target of 788,176 MT CO<sub>2</sub>e) by 2020. Such programs include strengthening the City's existing ordinances as well as implementing the Screening Tables for New Development. In some cases, implementation will require the cooperation of other agencies, private businesses, and residents. The success of these measures will be tracked using indicators and targets such as those described in this E-CAP. Even with the anticipated growth, the modernization of vehicle fleets, combined with the continued implementation of the proposed measures, will reduce GHG emissions by approximately 206,515 MT CO<sub>2</sub>e from 2020 levels. Therefore, the implementation of the State (R1) measures combined with Escondido's R2 and R3 measures will reduce GHG emissions down to 788,127 MT CO<sub>2</sub>e by year 2020, which exceeds the reduction target by 49 MT CO<sub>2</sub>e.

## 5.5 EMISSIONS SUMMARY

Beyond 2020, Escondido would continue implementation of the Screening Tables through to 2035, the General Plan horizon year. During this time, the reduction measures implemented through the Screening Tables would continue to reduce GHG emissions from new development. Additionally, it is assumed that the State measures would be reinforced post-2020 to further reduce emissions. With these assumptions, Escondido's emissions would decrease to a level below the 2020 reduction target by 2035. Continued implementation of this E-CAP in post 2020 years is discussed in Chapter 7.

## CHAPTER 6 CONCLUSION

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# Chapter 7 Implementation

## CHAPTER 7 IMPLEMENTATION

This section describes implementation steps for the E-CAP to support achievement of the GHG reduction goals for the community at large. Success in meeting Escondido's GHG emission reduction goal will depend on cooperation, innovation, and participation by the City and residents, businesses, and local government entities. This section outlines key steps that the City would follow for the implementation of this E-CAP.

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### 7.1 STEP 1—Administration and Staffing

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The City would implement the following key internal administration and staffing actions:

1. Create a GHG Reduction Team to support and guide the City's efforts to reduce emissions.
2. Designate an Implementation Administrator to oversee, direct and coordinate implementation of the E-CAP as well as monitor and report GHG reduction efforts.

The City GHG Reduction Team would be responsible for the implementing this E-CAP, coordinating among all involved City departments, and recommending modifications and changes to the E-CAP over time. The team will, at a minimum, include the following departments and divisions, but would be expanded as needed to ensure coordinated leadership in plan implementation: engineering, public works, utilities, community services, and community development.

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### 7.2 STEP 2—Financing and Budgeting

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Successful implementation of the E-CAP will require a strong commitment from the City and community. Local, regional, state, and federal public sources of funding will be needed along with the substantial involvement of the private sector. The following different financing options would be explored by Escondido:

- State and Federal Grants and Low-interest Loans —As described below there are a variety of grant and loan programs that exist in various sectors.
- Support from Local Businesses, Non-Profits, and Agencies—Opportunities for public/private partnerships (like the SDG&E partnerships) exist to provide cooperation on many aspects of the E-CAP including energy efficiency retrofits, waste minimization, transit promotion, and education.
- Self-Funding and Revolving Fund Programs—Innovative programs to fund residential solar investments.
- Agreements with Private Investors—Energy service companies and other private companies can finance up-front investments in energy efficiency and then be reimbursed through revenues from energy savings.
- Local Funding—Various local governments have used targeted finance instruments for solar, transportation, vehicle improvements, and landfill methane controls.

Given that financing is the key to implementing many measures, a review of current and potential funding sources was completed for the different sectors covered in this E-CAP and is presented below to help early phase implementation of the E-CAP. Whether at the federal, western regional or state level, it appears likely that there will be stronger legislation and/or regulations aimed at further curbing GHG emissions. Such requirements are likely to influence energy prices (for electricity, natural gas, and vehicle fuels), and may make currently cost-ineffective measures more economically feasible and allow the financing of a broader range of plan measures.

### Energy Efficiency and Renewable Energy Financing

**Federal Energy Efficiency Community Block Grants (EECBG).** As part of the stimulus package (the “American Recovery and Reinvestment Act” or ARRA), signed into law by President Obama in spring 2009, block grants are available for energy efficiency planning and improvements in the building, transportation, and other sectors. The purpose of the EECBG Program is to assist eligible entities in creating and implementing strategies to: reduce fossil fuel emissions in a manner that is environmentally sustainable and that maximizes, to the greatest extent practicable, benefits for local and regional communities; reduce the total energy use of the eligible entities; and improve energy efficiency in the building sector, the transportation sector, and other appropriate sectors. Eligible activities include: development of an energy efficiency and conservation strategy; technical consultant services; residential and commercial building energy audits; financial incentive programs; energy efficiency retrofits; energy efficiency and conservation programs for buildings and facilities; development and implementation of certain transportation programs; building codes and inspections; certain distributed energy projects; material conservation programs; reduction and capture of methane and GHG from landfills and dairies; efficiency traffic signals and street lighting; renewable energy technologies on government buildings; and other appropriate activity.

See: <http://www1.eere.energy.gov/wip/eeecbg.html>

**Federal Tax Credits for Energy Efficiency.** On October 3, 2008, President Bush signed into law the “Emergency Economic Stabilization Act of 2008.” This bill extended tax credits for energy efficient home improvements (windows, doors, roofs, insulation, HVAC, and non-solar water heaters). These residential products during 2008 were not eligible for a tax credit, as previous tax credits had expired at the end of 2007. The bill also extended tax credits for solar energy systems and fuel cells to 2016. New tax credits were established for small wind energy systems and plug-in hybrid electric vehicles. Tax credits for builders of new energy efficient homes and tax deductions for owners and designers of energy efficient commercial buildings were also extended.

See: [http://www.energystar.gov/index.cfm?c=products.pr\\_tax\\_credits](http://www.energystar.gov/index.cfm?c=products.pr_tax_credits)

## CHAPTER 7 IMPLEMENTATION

### **SDG&E Energy Efficiency / Renewable Energy Incentives.**

- Sustainable Communities Program. The Sustainable Communities Program advances and promotes the use of clean energy generation technologies within SDG&E's service area. The program strategically integrates utility-owned generation systems, such as photovoltaics, fuel cells and wind power with sustainable building projects to provide energy to the grid. The systems are installed, maintained, and operated by SDG&E.
- California Advanced Homes Incentives. SDG&E offers an incentive for home builders to build homes which exceed 2008 Title 24 standards by 15 percent. The program is open to all single-family and multi-family new construction projects.
- Non-Residential On-Bill Financing Program. This program offers qualified business customers zero percent financing for qualifying natural gas equipment.
- Home Energy Efficiency Rebates. SDG&E offers rebates on many energy-efficient products that can save energy, including attic and wall insulation, dishwashers, pool pumps and motors, refrigerators, room air conditioning, whole house fans, and clothes washers.
- Multi-family Energy Efficiency Rebates. This program offers cash rebates for energy-saving improvements to existing multi-family residential properties of two or more units.
- AC Quality Care. Under this program, a qualified contractor inspects an A/C system and inventories the equipment and diagnoses any service needs. The contractor provides detailed report that shows any recommended maintenance or repairs and the rebates available to offset the costs.
- Summer Saver. SDG&E installs a Summer Saver device central air conditionings unit at no cost to the consumer. The Summer Saver device is activated remotely by a paging signal that lets SDG&E cycle the central air conditioner "on and off" for a few hours on a limited number of summer days when demand for electricity is at a peak. Summer Saver is only used May to October.
- Lighting Exchange Program. SDG&E holds lighting exchanges that allow customers to trade in halogen and incandescent light bulbs for new, energy-efficient compact fluorescent light bulbs or energy-efficient torchiere lamps.
- Home Energy Efficiency Survey. SDG&E offers free home energy efficiency surveys to customers to recommend ways to save energy.
- New Solar Homes Partnership. SDG&E offers builders, developers, and solar contractors financial incentives for energy-saving photovoltaic installations.
- Savings By Design. SDG&E's Savings By Design program offers cash incentives and technical assistance to maximize energy performance in commercial new construction projects.

**AB 811 Financing Districts.** AB 811 permits the creation of assessment districts to finance installation of distributed generation renewable energy sources or energy efficiency improvements that are permanently fixed to residential, commercial, industrial, or other real property. Escondido will participate in the CaliforniaFIRST Program. The CaliforniaFIRST Program will provide financing for energy efficiency and renewable energy projects on residential and commercial properties. Under

## 7.2 STEP 2—FINANCING AND BUDGETING

CaliforniaFIRST, the property owner repays the cost of the clean energy project through a line item on their property tax bill.

See: [http://www.gosolarcalifornia.org/professionals/2-17-10\\_CalFIRST\\_FACT\\_SHEET.pdf](http://www.gosolarcalifornia.org/professionals/2-17-10_CalFIRST_FACT_SHEET.pdf)

**Energy Upgrade California.** Energy Upgrade California is a statewide program that offers cash incentives to single-family homeowners who complete select energy-saving home improvements. Working with participating contractors, homeowners can choose from a variety of participation options to make the energy-saving improvements to correct energy inefficiencies.

See: <https://energyupgradeca.org/overview>.

**California Energy Commission Energy Efficiency Financing.** The CEC offers up to \$3 million per application in energy efficiency financing and low interest loans to cities and counties for installing energy-saving projects. 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, and waste water treatment equipment.

See: <http://www.energy.ca.gov/efficiency/financing/>

**California Energy Commission Bright Schools Program.** This is a collaborative project of the CEC, California Conservation Corps, local utility companies and other qualifying energy service companies to assist schools in undertaking energy efficiency projects. Project staff will guide schools through identifying and determining a project's feasibility, securing financing for the project, and purchasing and installing the new energy efficient equipment.

See <http://www.energy.ca.gov/efficiency/brightschoools/index.html>

**California Solar Initiative (CSI).** In January 2006, the California Public Utilities Commission adopted the CSI to provide more than \$3 billion in incentives for solar-energy projects with the objective of providing 3,000 megawatts of solar capacity by 2016. In December 2011, the Commission increased the CSI budget by \$200 million in order to cover a budget shortfall. The action implements SB 585 signed by Governor Jerry Brown on Sept. 22, 2011. The CSI program is administered by Pacific Gas & Electric, Southern California Edison, and CCSE for the SDG&E territory. CSI is comprised of five rebate programs: (1) the general CSI Program of solar rebates for existing homes, new/existing commercial, agricultural, and public agencies; (2) the CSI-Thermal Program for solar hot water rebates for homes and businesses; (3) the Single-family Affordable Solar Homes program for low-income residents that own their own single-family home and meet a variety of income and housing eligibility criteria; (4) the Multifamily Affordable Solar Housing program for multifamily affordable housing; and (5) the CSI Research, Development, Demonstration, and Deployment Program.

See <http://energycenter.org/csi>

## Transportation Financing

**Federal Energy Efficiency Community Block Grants.** As described above, eligible activities include development and implementation of certain transportation programs and efficiency traffic signals and street lighting.

**Regional Transportation Improvement Program.** The SANDAG 2010 Regional Transportation Improvement Program is funded by the state from the State Transportation Improvement Program and State Highway Operations and Protection Program. Locally, projects are funded with the County Transportation Sales Tax, *TransNet*, as well as sales tax, city General Funds, street taxes, developer fees, and registration fees. Federal funding is also available from the Federal Transit Administration and the Federal Highway Administration.

**Interregional Improvement Program.** The Interregional Improvement Program is funded from funds made available for transportation capital improvement projects under the State Transportation Improvement Program. This program targets projects that are needed to improve interregional movement of people and goods. Caltrans recommends to the CTC the selection of these projects, which can include state highway improvements, intercity passenger rail, mass transit guideways, or grade separation projects.

## Waste Reduction Financing

**California Integrated Waste Management Board Grants and Loans.** The CIWMB offers funding opportunities authorized by legislation to assist public and private entities in the safe and effective management of the waste stream.

See: <http://www.ciwmb.ca.gov/grants/>

## Water Conservation and Treatment Financing

**Clean Water State Revolving Funds (CWSRF).** CWSRFs fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management. CWSRFs have funded over \$74 billion, providing over 24,688 low-interest loans to date.

CWSRF's offer:

- **Low Interest Rates, Flexible Terms**—Nationally, interest rates for CWSRF loans average 2.3 percent, compared to market rates that average 5 percent. For a CWSRF program offering this rate, a CWSRF funded project would cost 22 percent less than projects funded at the market rate. CWSRFs can fund 100 percent of the project cost and provide flexible repayment terms up to 20 years.
- **Funding for Nonpoint Source Pollution Control and Estuary Protection**—CWSRFs provided more than \$167 million in 2009 to control pollution from nonpoint sources and for estuary protection, more than \$3 billion to date.

## 7.3 STEP 3—TIMELINE AND PRIORITIZATION

- Assistance to a Variety of Borrowers—The CWSRF program has assisted a range of borrowers including municipalities, communities of all sizes, farmers, homeowners, small businesses, and nonprofit organizations.
- Partnerships with Other Funding Sources—CWSRFs partner with banks, nonprofits, local governments, and other federal and state agencies to provide the best water quality financing source for their communities.

See: <http://www.epa.gov/owm/cwfinance/cwsrf/index.htm>

**SoCal Water Smart.** The SoCal Water Smart program offers rebates to customers of the Metropolitan Water District’s member agencies for installing water-saving appliances. Qualifying products include high-efficiency clothes washers, rotating nozzles, and weather-based irrigation controllers.

See: <http://socalwatersmart.com/home>

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## 7.3 STEP 3—Timeline and Prioritization

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The City would develop an implementation schedule for the R2 reduction measures. Prioritization would be based on the following factors:

- Cost effectiveness;
- GHG reduction efficiency;
- Availability of funding;
- Level of City Control;
- Ease of implementation; and
- Time to implement.

In general consideration of these factors, the following is an outline of key priorities for three (3) phases starting in 2012 through 2020.

- Phase 1 (2012-2014): Development of key ordinances, completion of key planning efforts, implementation of most cost-effective measures, and support of voluntary efforts.
- Phase 2 (2014–2017): Continued implementation of first tier measures, implementation of second tier measures, and implementation of key planning outcomes from Phase 1.
- Phase 3 (2017–2020): Continued implementation of first and second tier measures, implementation of third tier of measures.

Because the goals of this E-CAP are aggressive, success in meeting the goals depends on some flexibility in the GHG reduction actions. The City is committed to flexibility in implementing the reduction measures and meeting the goals of this E-CAP. Many of the reduction measures in this E-CAP would be

## CHAPTER 7 IMPLEMENTATION

implemented through the Screening Tables for New Development. The goals of each reduction measure can often be achieved through a variety of means, especially those related to building energy efficiency. For example, the City would adopt energy efficient design requirements for new development (measures R2-E1 and R2-E2). Compliance with the energy efficient design programs can be achieved through many combinations of actions including (but not limited to): installing energy efficient appliances, lighting, and HVAC systems; installing 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. Table 7-1 presents the potential timeline and phasing schedule for the GHG reduction measures.

| Table 7-1 GHG Reduction Measure Timeline and Phasing Schedule |         |
|---|---------|
| Reduction Measure   | Phase   |
| <b>Transportation</b>   |         |
| R2-T1: Land Use Based Trips and VMT Reduction Policies        | 1, 2, 3 |
| R2-T2: Bicycle Master Plan                                    | 1, 2, 3 |
| R2-T3: Transit Improvements                                   | 2, 3    |
| R2-T4: Transportation Demand Management                       | 1, 2, 3 |
| <b>Energy</b>   |         |
| R2-E1: New Residential Energy Efficiency Requirements         | 1, 2, 3 |
| R2-E2: New Commercial Energy Efficiency Requirements          | 1, 2, 3 |
| R2-E3: New Residential Renewable Energy Requirements          | 1, 2, 3 |
| R2-E4: New Commercial Renewable Energy Requirements           | 1, 2, 3 |
| R2-E5: Existing Residential Energy Retrofits                  | 2, 3    |
| R2-E6: Existing Commercial Energy Retrofits                   | 2, 3    |
| <b>Area Source</b>  |         |
| R2-A1: Electric Landscaping Equipment                         | 1, 2, 3 |
| <b>Water</b>  |         |
| R2-W1: Energy Efficient Water Treatment Plant                 | 1, 2, 3 |
| R2-W2: Water Conservation Strategies                          | 1, 2, 3 |
| R2-W3: Increase Recycled Water Use                            | 2, 3    |
| <b>Solid Waste</b>  |         |
| R2-S1: Waste Disposal Programs                                | 2, 3    |
| <b>Construction</b>   |         |
| R2-C1: Construction Emissions Reductions                      | 1, 2, 3 |

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## 7.4 STEP 4—Public Participation

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The citizens and businesses in Escondido are integral to the success of GHG reduction efforts. Their involvement is essential in order to reach the reduction goals because the E-CAP depends on a combination of state and local government efforts, public and private sources of finance, and the voluntary commitment, creativity, and participation of the community at large. The City must strike a balance between development and environmental stewardship to keep the economy strong and, at the same time, protect the environment. Education programs should be developed for stakeholders such as businesses, business groups, residents, developers, and property owners outlining the benefits of the E-CAP's cost-saving measures and streamlined project processing features to encourage participation in efforts to reduce GHG emissions in all possible sectors.

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## 7.5 STEP 5—Project Review

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The CEQA guidelines support projects that lower the carbon footprint of new development, and encourage programmatic mitigation strategies that may include reliance on adopted regional blueprint plans, CAPs, and general plans that meet regional and local GHG emissions targets and that have also undergone CEQA review. The criteria needed to use adopted plans in evaluating impacts of GHG emissions from subsequent development projects is found in CEQA Guidelines § 15183.5. Once adopted, this E-CAP fulfills these requirements. The City is responsible for ensuring that new projects conform to these guidelines and meet the goals and requirements outlined in this E-CAP.

The City would implement the reduction measures for new development during the CEQA review, through the use of a local CEQA GHG Emission Screening Table based upon the E-CAP. Proposed projects would first be screened to determine if compliance with the E-CAP measures is required. Small projects that generate less than 2,500 MT CO<sub>2</sub>e would be considered to have a “less than significant GHG emissions impact” because of the low amount of GHG emissions generated. Projects this small have a difficult time implementing the R2 measures and would not be able to achieve the 100 point criteria in the Screening Tables. The 2,500 MT CO<sub>2</sub>e is based on the County of San Diego's Guidelines for Determining Significance for Climate Change document that was published on February 17, 2012. As stated in the Guidelines, the 2,500 MT CO<sub>2</sub>e screening level is based on regional data, including the incorporated cities, and would be appropriate to be used by lead agencies in the region other than the County of San Diego Department of Planning and Land Use.

If a project is anticipated to generate more than 2,500 MT CO<sub>2</sub>e, the project would be required to use the screening table to demonstrate compliance with the E-CAP. The screening table will provide a menu of reduction options. A project that obtains a minimum of 100 points from the E-CAP screening table, would implement the project's fair share portion of pertinent GHG reduction measures and would be considered to generate a “less than significant” CEQA finding associated with GHG emissions. Projects would be required to implement measures from the E-CAP screening table proportional to the project's fair share of projected community-wide GHG emissions. The menu of options in the screening table is tied to the R2 Measures in the E-CAP such that 100 points would meet the emission reductions

## CHAPTER 7 IMPLEMENTATION

associated with the R2 Measures. This menu allows for maximum flexibility for projects to meet their reduction allocation balancing the need to reduce emissions while maintaining a business friendly environment that keeps the City of Escondido competitive for development.

The methodology discussed above will be described in more detail in the City's CEQA GHG Emission Screening Table document and will be consistent with the analysis and quantification methodology used in this E-CAP.

The Screening Table would also serve to document the implementation of GHG emission reduction measures. The use of the Screening Table as a reduction measure monitoring tool is described in more detail in Section 7.6 below.

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### **7.6 STEP 6—Monitoring and Inventorying**

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Escondido would use a system for monitoring the implementation of this E-CAP and adjusting the plan as opportunities arise. As the plan is implemented and as technology changes, the E-CAP would be revised to take advantage of new and emerging technology. If promising new strategies emerge, the City would evaluate how to incorporate these strategies into the E-CAP. Further, state and federal action would also result in changes that would influence the level of Escondido GHG emissions.

Screening tables completed during project review, as described in Section 7.5 above, would serve as documentation of the implementation of reduction measures. The City would retain the completed screening tables for each project in order to maintain a record of the types and levels of implementation of each of the R2 measures. The point values in the completed screening tables also document the estimated levels of emission reductions anticipated during implementation. By maintaining these records, the City can monitor the E-CAP reduction measure implementation and compare the anticipated emission reductions with the goals for the E-CAP over time.

The GHG inventory would be periodically updated in coordination with the three phases noted above: 2014 (to update with the progress of cost-effective measures and voluntary efforts); 2017 (to review first tier and second tier measure progress, allow for course corrections to keep progress on target for 2020, and to develop post-2020 forecasts for use in planning for after 2020); and 2020 (to establish baseline for post-2020 GHG reduction planning). The City would also implement a monitoring and reporting program to evaluate the effectiveness of reduction measures with regards to progress towards meeting the goals of the E-CAP.

To provide periodic updates to the Escondido inventory of GHG emissions, the City would use a Microsoft Excel format emissions inventory worksheet. This worksheet would include all the emission factors and emission sources specific to Escondido. The worksheet would be designed such that City staff can input VMT, water use, and energy consumption data and the worksheet would quantify emissions for the community. The E-CAP Implementation Coordinator would be responsible for maintaining records of reduction measure implementation and insuring that the periodic updates to the emissions inventory are completed using the Microsoft Excel-based emission inventory worksheet.

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## 7.7 STEP 7—Beyond 2020

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As described above under the discussion of Reduction Goals, 2020 is only a milestone in GHG reduction planning. Executive Order S-03-05 calls for a reduction of GHG emissions to a level 80 percent below 1990 levels by 2050, and this level is consistent with the estimated reductions needed to stabilize atmospheric levels of carbon dioxide at 450 parts per million. Thus, there will be a need to start planning ahead for the post-2020 period. Escondido would commence planning for the post-2020 period in 2017, at the approximate midway point between plan implementation and the reduction target, and after development of key ordinances and implementation of cost-effective measures. By that time, the City would have implemented the first two phases of this E-CAP and would have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches. Further, the State's regulations under AB 32 would have been fully in force since 2012; federal programs and policies for the near term are likely to be well underway; market mechanisms that influence energy and fuel prices would likely be in effect; and technological advances are anticipated in the fields of energy efficiency, alternative energy generation, vehicles, fuels, methane capture, and other areas. The City would then be able to take the local, regional, state, and federal context into account. Further, beginning the post-2020 plan preparation in 2017 would allow enough time so that the plan could be ready for full implementation, including potential new policies, revisions to the General Plan (as necessary), programs, ordinances, and financing by 2020. The new plan would include a specific target for GHG reductions for 2035 and 2050. The targets would be consistent with broader state and federal reduction targets and with the scientific understanding of the needed reductions by 2050. Escondido would anticipate adopting the post-2020 plan prior to January 1, 2020.

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# Chapter 8      **References**

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## Appendix **Emissions Data**



# Municipal GHG Inventory

|                 |                   |
|-----------------|-------------------|
| Municipality:   | City of Escondido |
| Inventory Year: | 2010              |

## Departmental Breakdown of Emissions

| Government Department  | Electricity  |                        | Natural Gas  |                      | Vehicle Fleet |                      | Employee Commute |                        | TOTAL         |                        |
|------------------------|--------------|------------------------|--------------|----------------------|---------------|----------------------|------------------|------------------------|---------------|------------------------|
|                        | MT CO2e      | \$                     | MT CO2e      | \$                   | MT CO2e       | \$                   | MT CO2e          | \$                     | MT CO2e       | \$                     |
| CA Center for the Arts | 700.58       | \$ 459,654.35          | 827.19       | \$ 113,387.08        | -             | \$ -                 | -                | \$ -                   | 1,527.77      | \$ 573,041.43          |
| Police                 | 178.06       | \$ 98,148.82           | 43.14        | \$ 7,245.54          | -             | \$ -                 | 764.66           | \$ 210,559.05          | 985.86        | \$ 315,953.41          |
| Public Works           | 93.39        | \$ 64,742.52           | 10.54        | \$ 2,116.56          | -             | \$ -                 | 328.47           | \$ 167,502.78          | 432.41        | \$ 234,361.86          |
| Community Center       | 72.68        | \$ 56,660.33           | -            | \$ -                 | -             | \$ -                 | -                | \$ -                   | 72.68         | \$ 56,660.33           |
| City Hall              | 289.72       | \$ 177,970.66          | 19.67        | \$ 3,604.75          | -             | \$ -                 | 1,072.17         | \$ 578,481.81          | 1,381.56      | \$ 760,057.22          |
| Pools                  | 27.19        | \$ 15,433.89           | 147.13       | \$ 21,789.97         | -             | \$ -                 | 323.83           | \$ 167,502.78          | 498.14        | \$ 204,726.64          |
| Fire                   | 713.93       | \$ 429,487.49          | 387.81       | \$ 56,560.66         | -             | \$ -                 | 323.56           | \$ 129,029.92          | 1,425.30      | \$ 615,078.07          |
| Communications         | 20.74        | \$ 14,603.44           | -            | \$ -                 | -             | \$ -                 | -                | \$ -                   | 20.74         | \$ 14,603.44           |
| Library                | 159.98       | \$ 105,766.90          | 48.57        | \$ 8,743.19          | -             | \$ -                 | 89.29            | \$ 46,667.44           | 297.83        | \$ 161,177.53          |
| Parks and Rec          | 43.07        | \$ 24,821.74           | 139.40       | \$ 21,197.44         | -             | \$ -                 | 25.26            | \$ 22,917.05           | 207.72        | \$ 68,936.23           |
| Water                  | 1,268.42     | \$ 881,682.87          | 1.62         | \$ 390.67            | -             | \$ -                 | -                | \$ -                   | 1,406.92      | \$ 951,241.35          |
| Wastewater             | 3,115.71     | \$ 1,788,880.39        | 843.27       | \$ 116,560.42        | -             | \$ -                 | 136.88           | \$ 69,167.81           | 4,036.43      | \$ 1,942,802.54        |
| Public Lighting        | 1,543.71     | \$ 884,257.74          | -            | \$ -                 | -             | \$ -                 | 77.45            | \$ 37,361.73           | 1,543.71      | \$ 884,257.74          |
| Other Sources          | 95.38        | \$ 88,388.64           | 33.27        | \$ 6,244.66          | -             | \$ -                 | -                | \$ -                   | 128.65        | \$ 94,633.30           |
| Department 15          | -            | \$ -                   | -            | \$ -                 | -             | \$ -                 | -                | \$ -                   | -             | \$ -                   |
| Department 16          | -            | \$ -                   | -            | \$ -                 | -             | \$ -                 | -                | \$ -                   | -             | \$ -                   |
| Department 17          | -            | \$ -                   | -            | \$ -                 | -             | \$ -                 | -                | \$ -                   | -             | \$ -                   |
| <b>TOTAL</b>           | <b>8,323</b> | <b>\$ 5,090,499.78</b> | <b>2,502</b> | <b>\$ 357,840.94</b> | <b>2,739</b>  | <b>\$ 960,189.30</b> | <b>3,142</b>     | <b>\$ 1,429,190.36</b> | <b>16,705</b> | <b>\$ 6,877,531.08</b> |

## Waste and Wastewater

1,438 \$ -  
18,143 \$ 6,877,531.08

## Other Sources

| Solid Waste and Wastewater | N2O (metric tons) | CH4 (metric tons) | CO2e (metric tons) |
|----------------------------|-------------------|-------------------|--------------------|
| Generated                  | -                 | 56.16285714       | 1179.42            |
| Owned Landfills            | -                 | -                 | -                  |
| Wastewater                 | -                 | 12.31             | 258.59             |
| <b>TOTAL</b>               |                   |                   | <b>1,438.01</b>    |

# Electricity

Instructions: Insert electricity use data for all facilities, streetlights, buildings, and other electric accounts owned/operated by the local gover for each department. Also enter the emissions factors for CO2, CH4, and N2O obtained from EPA eGrid or directly from the utility provider. Entering the rate code and associated cost per kWh of gas will allow the calculation of the total cost for each department's electricity use.

Utility Provider: SDG&E

| Emissions Coefficients | lbs/MWh | metric tons/kWh | CH4 | N2O | GWP |
|------------------------|---------|-----------------|-----|-----|-----|
| CO2                    | 546.5   | 0.000247888     |     |     | 21  |
| CH4                    | 0.029   | 1.31542E-08     |     |     | 310 |
| N2O                    | 0.011   | 4.98952E-09     |     |     |     |

| Department             | Annual kWh      | \$                     | CO2                | CH4                | Metric Tons     |                 |                    | CO2e |
|------------------------|-----------------|------------------------|--------------------|--------------------|-----------------|-----------------|--------------------|------|
|                        |                 |                        |                    |                    | N2O             | CH4             | N2O                |      |
| CA Center for the Arts | 2805554         | \$ 459,654.35          | 695.46             | 0.04               | 0.01            | 0.01            | 700.58             |      |
| Police                 | 713073          | \$ 98,148.82           | 176.76             | 0.01               | 0.00            | 0.00            | 178.06             |      |
| Public Works           | 374006          | \$ 64,742.52           | 92.71              | 0.00               | 0.00            | 0.00            | 93.39              |      |
| Community Center       | 291055          | \$ 56,660.33           | 72.15              | 0.00               | 0.00            | 0.00            | 72.68              |      |
| City Hall              | 1160216         | \$ 177,970.66          | 287.60             | 0.02               | 0.01            | 0.01            | 289.72             |      |
| Pools                  | 108876          | \$ 15,433.89           | 26.99              | 0.00               | 0.00            | 0.00            | 27.19              |      |
| Fire                   | 2859017         | \$ 429,487.49          | 708.72             | 0.04               | 0.01            | 0.01            | 713.93             |      |
| Communications         | 83075           | \$ 14,603.44           | 20.59              | 0.00               | 0.00            | 0.00            | 20.74              |      |
| Library                | 640646          | \$ 105,766.90          | 158.81             | 0.01               | 0.00            | 0.00            | 159.98             |      |
| Parks and Rec          | 172473          | \$ 24,821.74           | 42.75              | 0.00               | 0.00            | 0.00            | 43.07              |      |
| Water                  | 5079528         | \$ 881,682.87          | 1,259.16           | 0.07               | 0.03            | 0.03            | 1,268.42           |      |
| Wastewater             | 12477264        | \$ 1,788,880.39        | 3,092.97           | 0.16               | 0.06            | 0.06            | 3,115.71           |      |
| Public Lighting        | 6181982         | \$ 884,257.74          | 1,532.44           | 0.08               | 0.03            | 0.03            | 1,543.71           |      |
| Other Sources          | 381944          | \$ 88,388.64           | 94.68              | 0.01               | 0.00            | 0.00            | 95.38              |      |
| Department 15          |                 | \$ -                   | -                  | -                  | -               | -               | -                  |      |
| Department 16          |                 | \$ -                   | -                  | -                  | -               | -               | -                  |      |
| Department 17          |                 | \$ -                   | -                  | -                  | -               | -               | -                  |      |
| <b>TOTAL</b>           | <b>33328709</b> | <b>\$ 5,090,499.78</b> | <b>8261.797019</b> | <b>0.438411919</b> | <b>0.166294</b> | <b>0.166294</b> | <b>8322.554864</b> |      |

# Natural Gas

Instructions: Insert natural gas use data for all facilities, buildings, and other accounts owned/operated by the local government for each department. Entering the rate code and associated cost per therm of gas will allow the calculation of the total cost for each department's natural gas use.

Utility Provider:

SDG&E

## Emissions Coefficients

|     |       |          |
|-----|-------|----------|
| CO2 | 52.91 | kg/MMBTU |
| CH4 | 5     | g/MMBTU  |
| N2O | 0.1   | g/MMBTU  |

|           |                   |
|-----------|-------------------|
| 0.005291  | metric tons/therm |
| 0.000005  | metric tons/therm |
| 0.0000001 | metric tons/therm |

|     |     |
|-----|-----|
| 21  | CH4 |
| 310 | N2O |

GWP

| Department             | Annual therms | \$        | Metric Tons       |                |             | CO2e        |                |
|------------------------|---------------|-----------|-------------------|----------------|-------------|-------------|----------------|
|                        |               |           | CO2               | CH4            | N2O         |             |                |
| CA Center for the Arts | 152422        | \$        | 113,387.08        | 806.46         | 0.76        | 0.02        | 827.19         |
| Police                 | 7950          | \$        | 7,245.54          | 42.06          | 0.04        | 0.00        | 43.14          |
| Public Works           | 1942          | \$        | 2,116.56          | 10.28          | 0.01        | 0.00        | 10.54          |
| Community Center       | 0             | \$        | -                 | -              | -           | -           | -              |
| City Hall              | 3625          | \$        | 3,604.75          | 19.18          | 0.02        | 0.00        | 19.67          |
| Pools                  | 27110         | \$        | 21,789.97         | 143.44         | 0.14        | 0.00        | 147.13         |
| Fire                   | 71460         | \$        | 56,560.66         | 378.09         | 0.36        | 0.01        | 387.81         |
| Communications         | 0             | \$        | -                 | -              | -           | -           | -              |
| Library                | 8950          | \$        | 8,743.19          | 47.35          | 0.04        | 0.00        | 48.57          |
| Parks and Rec          | 25686         | \$        | 21,197.44         | 135.90         | 0.13        | 0.00        | 139.40         |
| Water                  | 299           | \$        | 390.67            | 1.58           | 0.00        | 0.00        | 1.62           |
| Wastewater             | 155384        | \$        | 116,560.42        | 822.14         | 0.78        | 0.02        | 843.27         |
| Public Lighting        |               | \$        | -                 | -              | -           | -           | -              |
| Other Sources          | 6131          | \$        | 6,244.66          | 32.44          | 0.03        | 0.00        | 33.27          |
| Department 15          |               | \$        | -                 | -              | -           | -           | -              |
| Department 16          |               | \$        | -                 | -              | -           | -           | -              |
| Department 17          |               | \$        | -                 | -              | -           | -           | -              |
| <b>TOTAL</b>           | <b>460959</b> | <b>\$</b> | <b>357,840.94</b> | <b>2438.93</b> | <b>2.30</b> | <b>0.05</b> | <b>2501.62</b> |

## Vehicle Fleet

Instructions: Total fuel use includes off-road vehicles. Cost is based on average price per gallon of gasoline and diesel fuel in California in 2010 and total gallons of fuel used.

### Emissions Coefficients

|          |       |               |         |                        |
|----------|-------|---------------|---------|------------------------|
| Gasoline | 8.81  | kg CO2/gallon | 0.00881 | metric tons CO2/gallon |
| Diesel   | 10.15 | kg CO2/gallon | 0.01015 | metric tons CO2/gallon |

|                             |    |      |
|-----------------------------|----|------|
| Average \$/gallon Gasoline: | \$ | 3.14 |
| Average \$/gallon Diesel:   | \$ | 3.16 |

|                      | CO2 (metric tons) |                  | Total Cost           |
|----------------------|-------------------|------------------|----------------------|
| Total Gasoline (gal) | 270279            | 2381.15799       | \$ 848,676.06        |
| Total Diesel (gal)   | 35289             | 358.18335        | \$ 111,513.24        |
|                      |                   | <b>2739.3413</b> | <b>\$ 960,189.30</b> |

# Employee Commute

The values below are based on the Employee Commute Survey. The survey results were extrapolated to estimate emissions from the employee commutes of all City employees.

## Emissions Coefficients

|          |       |               |
|----------|-------|---------------|
| Gasoline | 8.81  | kg CO2/gallon |
| Diesel   | 10.15 | kg CO2/gallon |

|  |         |                        |
|--|---------|------------------------|
|  | 0.00881 | metric tons CO2/gallon |
|  | 0.01015 | metric tons CO2/gallon |

## GWP

|     |     |
|-----|-----|
| CH4 | 21  |
| N2O | 310 |

| Department             | Survey Responses |             |             |                 |                   | All Employees   |                     |
|------------------------|------------------|-------------|-------------|-----------------|-------------------|-----------------|---------------------|
|                        | Metric Tons      |             | CO2e        | Cost            | MT CO2e           | Extrapolated    |                     |
|                        | CO2              | CH4         |             |                 |                   | N2O             | Cost (\$)           |
| CA Center for the Arts |                  |             |             |                 |                   |                 |                     |
| Police                 | 283.54           | 0.01        | 0.01        | 286.28          | 78,832.00         | 764.6567375     | \$ 210,559.05       |
| Public Works           | 121.24           | 0.01        | 0.01        | 122.98          | 62,712.00         | 328.4749569     | \$ 167,502.78       |
| Community Center       | -                | -           | -           | -               | -                 | -               | \$ 0                |
| City Hall              | 401.41           | 0.02        | 0.02        | 401.41          | 216,580.00        | 1072.166001     | \$ 578,481.81       |
| Pools                  | 121.24           | 0.01        | 0.01        | 121.24          | 62,712.00         | 323.8264202     | \$ 167,502.78       |
| Fire                   | 121.14           | 0.01        | 0.01        | 121.14          | 48,308.00         | 323.5590211     | \$ 129,029.92       |
| Communications         | -                | -           | -           | -               | -                 | -               | \$ 0                |
| Library                | 33.43            | 0.00        | 0.00        | 33.43           | 17,472.00         | 89.28600322     | \$ 46,667.44        |
| Parks and Rec          | 9.46             | 0.00        | 0.00        | 9.46            | 8,580.00          | 25.25555563     | \$ 22,917.05        |
| Water                  | 51.25            | 0.00        | 0.00        | 51.25           | 25,896.00         | 136.8833575     | \$ 69,167.81        |
| Wastewater             | 29.00            | 0.00        | 0.00        | 29.00           | 13,988.00         | 77.44957832     | \$ 37,361.73        |
| Public Lighting        |                  |             |             |                 |                   |                 | \$ 0                |
| Other Sources          |                  |             |             |                 |                   |                 | \$ 0                |
| Department 15          |                  |             |             |                 |                   |                 | \$ 0                |
| Department 16          |                  |             |             |                 |                   |                 | \$ 0                |
| Department 17          |                  |             |             |                 |                   |                 | \$ 0                |
| <b>TOTAL</b>           | <b>1,171.70</b>  | <b>0.05</b> | <b>0.05</b> | <b>1,176.18</b> | <b>535,080.00</b> | <b>3,141.56</b> | <b>1,429,190.36</b> |

Total Computer Respondents 386  
 Total Escondido Employees 1031  
 % Response rate 37.4%

## Solid Waste

Instructions: Emissions from solid waste come from two sources: the waste generated by the government and the emissions from landfills owned/operated by the government. For generated solid waste, enter the landfill name where the waste is deposited, the total annual tons of waste, and select the landfill's methane recovery system. For the landfills, enter the name and the annual LFG gas collected, then override the default values related to the LFG system if specific values are known.

### Generated Solid Waste

| Landfill Name     | Tons Waste/Year | Methane Recovery System | CH4 Emissions Coefficient (metric tons CH4/ton waste) | Total CH4 Emissions (metric tons) | Total CO2e (metric tons) | EPA Methane Recovery Systems | metric tons CH4/ton waste |
|-------------------|-----------------|-------------------------|---|-----------------------------------|--------------------------|------------------------------|---------------------------|
| Sycamore Landfill | 3931.4          | Gas-to-Energy           | 0.3   | 56.16285714                       | 1179.42                  | No Recovery                  | 3.1                       |
|                   |                 |                         |   | 0                                 | 0                        | Flaring                      | 0.64                      |
|                   |                 |                         |   | 0                                 | 0                        | Gas-to-Energy                | 0.3                       |
| <b>TOTAL</b>      | <b>3931.4</b>   |                         |   | <b>56.16285714</b>                | <b>1179.42</b>           |                              |                           |

### Wastewater Emissions

|                            |         |
|----------------------------|---------|
| Digester Gas               | 295,000 |
| Fraction of methane in Gas | 0.61    |

CH4/N2O (metric tons)      CO2e (metric tons)  
 Stationary Methane Emissions      12.31      258.5864686

### Stationary Methane Emissions

|          |              |                                    |
|----------|--------------|------------------------------------|
| 662      | g/m3         | Density CH4 at standard conditions |
| 0.99     |              | CH4 Destruction Efficiency         |
| 0.0283   | m3/ft3       | conversion                         |
| 365.25   | days/year    | conversion                         |
| 0.000001 | metric ton/g | conversion                         |

## Annual Usage and Generation

Inventory Year: 2010

|                         | Growth Rates |              |
|-------------------------|--------------|--------------|
|                         | 2010 to 2020 | 2010 to 2035 |
| Single Family           | 2.24%        | 5.68%        |
| Multi Family            | 16.49%       | 46.46%       |
| Average Residential     | 7.50%        | 19.80%       |
| Commercial              | 20.10%       | 60.98%       |
| Industrial              | 9.30%        | 24.84%       |
| Average Non-Residential | 16.30%       | 45.79%       |

### Transportation

| On-road Transportation        | 2005        | 2010        | 2020        | 2035          |
|-------------------------------|-------------|-------------|-------------|---------------|
| Annual Vehicle Miles Traveled | 745,048,457 | 735,247,975 | 903,409,558 | 1,219,016,356 |
| Annual Trips                  | 234,731,758 | 231,644,061 | 338,626,654 | 456,926,126   |
| Average \$/gallon Gasoline    | 2.54        | 3.16        |             |               |
| Average \$/gallon Diesel      | 2.61        | 3.16        |             |               |

### Electricity and Natural Gas

#### Electricity

##### SDG&E

| Rate Code       | Bundled Service    |                          | Direct Access     |
|-----------------|--------------------|--------------------------|-------------------|
|                 | Annual kWh         | \$/kWh                   | Annual kWh        |
| Residential     | 277,165,624        | \$0.17400                | 331,233           |
| Commercial      | 265,359,290        | \$0.17400                | 42,478,455        |
| Industrial      | 35,900,196         | \$0.17400                | 25,683,447        |
| Street Lighting | 5,819,539          | \$0.17400                |                   |
| <b>TOTAL</b>    | <b>584,244,649</b> | <b>\$ 101,658,568.93</b> | <b>68,493,135</b> |

| Electricity Emission Factors |           |             |
|------------------------------|-----------|-------------|
| SDG&E 2005                   | WECC 2005 | Units       |
| 546.5                        | 724.1     | lbs CO2/MWh |
| 0.011                        | 0.008     | lbs CH4/MWh |
| 0.029                        | 0.03      | lbs N2O/MWh |

Note: SDG&E emission factors used for bundled service and WECC emission factors used for direct access.

##### Direct Electricity Emissions

|                       | Generation (MWh) | CO2 (tons)       | CH4(tons)     | N2O (tons)   | (eGRID2010 data, year 2007) |
|-----------------------|------------------|------------------|---------------|--------------|-----------------------------|
| Escondido Power Plant | 2,897            | 2473.90          | 96.98         | 9.70         |                             |
| Palomar Energy        | 3,352,807        | 1403805.32       | 55038.75      | 5503.87      |                             |
| <b>Total</b>          | <b>3,355,704</b> | <b>1,406,279</b> | <b>55,136</b> | <b>5,514</b> |                             |

#### Natural Gas

|              | Bundled Service |                        | Direct Access   |
|--------------|-----------------|------------------------|-----------------|
|              | therms          | \$/therms              | therms          |
| Residential  | 14121490        | \$0.94                 | 32053           |
| Commercial   | 5031767         | \$0.78                 | 962676          |
| Industrial   |                 | \$0.66                 | 20685344        |
| <b>TOTAL</b> | <b>19153257</b> | <b>\$17,216,184.50</b> | <b>21680073</b> |

### Area Source Emissions: Landscaping and Woodburning Emissions

#### Landscaping Emissions

| Land use:                        | 2005   | 2010   |                  |
|----------------------------------|--------|--------|------------------|
| Single Family Residential Units: | 29,637 | 31,107 | units            |
| Multi-family Residential Units:  | 15,853 | 16,477 | units            |
| Commercial Building Space:       | 17,092 | 17,092 | 1000 square feet |
| Industrial Building Space:       | 12,389 | 12,389 | 1000 square feet |

#### Woodburning Emissions

|                         |        |                        |
|-------------------------|--------|------------------------|
| Homes with wood stoves: | 10%    | % of residential homes |
| Amount of wood burned:  | 0.80   | cords/unit             |
| Homes with fireplaces:  | 10%    | % of residential homes |
| Price of wood:          | \$3.50 | \$/cord of wood        |

Metered Water Deliveries

Wastewater Treatment Plant

|                              | 2005          | 2010             |                      |                                 |
|------------------------------|---------------|------------------|----------------------|---------------------------------|
|                              | AF            | kgal             | Cost of Service      |                                 |
| SFR                          | 12,500        | 3,391,821        | \$ 14,140,952        | Digester Gas 295,000            |
| Residential/Agricultural     |               | 23,313           | \$ 97,195            | Fraction of methane in Gas 0.61 |
| MFR                          | 5,200         | 1,470,637        | \$ 6,131,281         |                                 |
| Commercial/Industrial/School | 3,355         | 1,033,789        | \$ 4,192,888         |                                 |
| Irrigation/Institutional     | 1,260         | 650,183          | \$ 2,859,805         |                                 |
| Landscape District           | 2,090         | 23,891           | \$ 105,084           |                                 |
| Wild Animal Park             |               | 182,036          | \$ 738,310           |                                 |
| Special Unfiltered           |               | 188,432          | \$ 470,614           |                                 |
| Agricultural Use             | 6,190         | 218,253          | \$ 874,057           |                                 |
| SAWR Use                     |               | 1,042,201        | \$ 4,429,012         |                                 |
| <b>TOTAL</b>                 | <b>30,595</b> | <b>8,224,556</b> | <b>\$ 34,039,198</b> |                                 |

| Source          | AF    |
|-----------------|-------|
| Local Water     | 3500  |
| Purchased Water | 23806 |

Solid Waste

| Waste Disposal Sites | Name              | Mileage (round trip)* | Annual Waste (tons) | Methane Recovery Type | Entity Owned/ Operated? |
|----------------------|-------------------|-----------------------|---------------------|-----------------------|-------------------------|
| 2010                 | Sycamore Landfill | 26.6                  | 147166              | Gas-to-Energy         | No                      |
| 2005                 | Sycamore Landfill | 26.6                  | 161203.86           | Gas-to-Energy         | No                      |

\*Distance from center of area to facilities outside the city boundaries. For facilities within entity boundaries, use the average trip mileage for all trips.

46% Residential  
 49% Commercial  
 5.2% Industrial

Construction

|                       | CO <sub>2</sub> (tons from URBEMIS) |
|-----------------------|-------------------------------------|
| Demolition            | 260.48                              |
| Fine Grading          | 759.56                              |
| Trenching             | 22.71                               |
| Building              | 956.20                              |
| Paving                | 25.00                               |
| Architectural Coating | 51.51                               |
| <b>TOTAL</b>          | <b>2075.46</b>                      |

**Transportation Emission Reduction Measures**

| Reductions     |             |            |                |    |            |
|----------------|-------------|------------|----------------|----|------------|
| VMT            |             |            | Emissions      |    |            |
| Passenger Cars |             | Heavy Duty | Passenger Cars |    | Heavy Duty |
| %              | miles       | %          | %              | MT | %          |
|                | 686,721,609 | 49,261,614 | 347,127,6116   |    | 72,613.81  |
| Existing 2020  |             |            |                |    |            |

**Reduction Strategy**

|       |                                 |             |            |         |        |
|-------|---------------------------------|-------------|------------|---------|--------|
| R1-T1 | Pavley I                        | 686,721,609 | 49,261,614 | 347,128 | 72,614 |
| R1-T2 | Pavley II                       | 686,721,609 | 49,261,614 | 288,723 | 72,614 |
| R1-T3 | Low Carbon Fuel Standard        | 686,721,609 | 49,261,614 | 277,944 | 57,384 |
| R1-T4 | Tire Pressure                   | 686,721,609 | 49,261,614 | 0.3%    | 57,384 |
| R1-T5 | Low Rolling Resistance Tires    | 686,721,609 | 49,261,614 | 0.2%    | 57,384 |
| R1-T6 | Low Friction Oils               | 686,721,609 | 49,261,614 | 1.7%    | 57,384 |
| R1-T7 | Goods Movement Efficiency.      | 686,721,609 | 49,261,614 | 1.6%    | 56,465 |
| R1-T8 | Aerodynamic Efficiency          | 686,721,609 | 49,261,614 | 267,504 | 55,393 |
| R1-T9 | Med/Heavy Hybridization         | 686,721,609 | 49,261,614 | 267,504 | 54,839 |
| R2-T1 | Land Use & VMT Reduction        | 686,721,609 | 49,261,614 | 267,504 | 54,839 |
| R2-T2 | Bicycle Master Plan             | 686,721,609 |            | 1%      | 54,839 |
| R2-T3 | Transit Improvements (BRT)      | 686,721,609 |            | 0.47%   | 54,839 |
| R2-T3 | Transit Improvements (Sprinter) | 686,721,609 |            | 0.96%   | 54,839 |
| R2-T4 | TDM                             | 686,721,609 |            | 2.00%   | 54,839 |
|       |                                 |             |            | 4%      | 0.0437 |

Strategies

**Transportation Emission Reduction Measures**

|               |             |            |                |                                   |
|---------------|-------------|------------|----------------|-----------------------------------|
| Existing 2020 | Gasoline    | Diesel     | Cost (\$)      | Total Emissions Reduced (MT CO2e) |
|               | 37431467.77 | 6796366.85 | \$ 139,759,957 | \$/MT CO2e                        |

| Reduction Strategy                    | Cost of strategy | Gasoline gallons saved | Diesel gallons saved | \$ Saved      | Total Emissions Reduced (MT CO2e) |
|---------------------------------------|------------------|------------------------|----------------------|---------------|-----------------------------------|
| R1-T1 Pavley I                        |                  |                        |                      |               | -                                 |
| R1-T2 Pavley II                       |                  | 6297921.96             | 0.00                 | \$ 19,901,433 | 58,405                            |
| R1-T3 Low Carbon Fuel Standard        |                  | 1162330.00             | 1425491.90           | \$ 8,177,517  | 26,009                            |
| R1-T4 Tire Pressure                   |                  | 89913.65               | 0.00                 | \$ 284,127    | 834                               |
| R1-T5 Low Rolling Resistance Tires    |                  | 59762.60               | 0.00                 | \$ 188,850    | 554                               |
| R1-T6 Low Friction Oils               |                  | 506966.17              | 0.00                 | \$ 1,602,013  | 4,701                             |
| R1-T7 Goods Movement Efficiency.      |                  | 469033.17              | 85934.00             | \$ 1,753,696  | 5,268                             |
| R1-T8 Aerodynamic Efficiency          |                  | 0.00                   | 100413.88            | \$ 317,308    | 1,073                             |
| R1-T9 Med/Heavy Hybridization         |                  | 0.00                   | 51845.27             | \$ 163,831    | 554                               |
| R2-T1 Land Use & VMT Reduction        | General Plan     | 0.00                   | 0.00                 | \$ -          | -                                 |
| R2-T2 Bicycle Master Plan             | 600000           | 288455.40              | 0.00                 | \$ 911,519    | 2,675                             |
| R2-T3 Transit Improvements (BRT)      | N/A              | 133932.73              | 0.00                 | \$ 423,227    | 1,242                             |
| R2-T3 Transit Improvements (Sprinter) | N/A              | 274226.57              | 0.00                 | \$ 866,556    | 2,543                             |
| R2-T4 TDM                             | N/A              | 562978.51              | 0.00                 | \$ 1,779,012  | 5,221                             |
|                                       |                  |                        |                      | \$ 36,369,090 | 11,681                            |

Strategies



|      |           |           |
|------|-----------|-----------|
| Land | 39,192.00 | 38,666.42 |
| Wood | 15,784.89 | 15,784.89 |
|      |           | 525.58    |
|      |           | 1.34%     |

**Electric outlets for landscaping equipment**

39% Source:  
new landscaping  
1,351.10

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



**R2-S1**

**County Diversion Program**

This measure would implement a County wide waste diversion plan to further the goal of diverting 75% of all waste from landfills by 2020. The following is a potential list of waste reduction measures that will further strengthen existing waste reduction/diversion programs.

- \* Provide outreach and education programs for residential, commercial, and industrial land uses in order to further promote existing County diversion programs;
- \* Increase disposal fees and/or reduce residential pick-up frequency;
- \* Encourage businesses to adopt a voluntary procurement standard and prioritize those products that have less packaging, are reusable, recyclable, or compostable;
- \* Support State level policies that provide incentives for efficient and reduced packaging waste for commercial products;
- \* Expand list of recyclable materials;
- \* Work with Recology to develop and provide waste audits;
- \* Make recycling and composting opportunities mandatory at all public events;
- \* Establish an appliance end-of-life requirement;
- \* For new developments, require the use of recycled-content materials, or recycled materials;
- \* Require a minimum of 15% of materials used in construction be sourced locally, as feasible; and
- \* Encourage the use of recycled building materials and cement substitutes for new developments.

**Assumptions:**

- \* Applies to existing and future development not associated with Sutter Pointe.
- \* Assumes an existing diversion rate of 58%
- \* Assumes 2020 goal of 75% diversion rate.
- \* Does not apply to construction activities

**Reductions:**

|                                    |   |        |
|------------------------------------|---|--------|
| % reduction applied                | = | 15.00% |
| % not from construction activities | = | 87.60% |
| % reduction applied                | = | 13.14% |

0

| Target Year  | 2020                          |                 | Hauling      |          |                                  |                                  |                                   | Landfill Offgasing    |  |
|--------------|-------------------------------|-----------------|--------------|----------|----------------------------------|----------------------------------|-----------------------------------|-----------------------|--|
|              | distance (round trip) (miles) | Waste tons/year | tons / truck | # trucks | Metric Tons/year CO <sub>2</sub> | Metric Tons/year CH <sub>4</sub> | Metric Tons/year N <sub>2</sub> O | Methane Recovery type | off-gasing Metric Tons CH <sub>4</sub> |
|              | 0                             | 136870.954      | 12           | 11406    | 583.81                           | 0                                | 0.001456                          | Gas-to-Energy         | 41,061                                 |
| <b>Total</b> |                               |                 |              |          | <b>583.81</b>                    | <b>0</b>                         | <b>0.001456</b>                   |                       | <b>41061.28619</b>                     |

BAU: 47,273  
 R2-S1 Reductor 6,212

construction to minimize emissions of ozone precursors (NOx and VOCs):

- i. Turn off all diesel-powered vehicles and gasoline-powered equipment when not in use for more than five minutes.
- ii. Use electric or natural gas-powered construction equipment in lieu of gasoline or diesel-powered engines, where feasible.
- iii. Require 10 percent of the construction fleet to use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters, and/or CARB-certified Tier III equipment or better.
- iv. Support and encourage ridesharing and transit incentives for the construction crew.

|                   | Percent Reduced | 10%         |
|-------------------|-----------------|-------------|
| BAU Emissions     | 2,287.78        | 2059.001602 |
| Reduced Emissions | 228.78          |             |

## Greenhouse Gas Emission Inventory Comparison Summary

|                             | 2005           | 2010           | 2020           | Reduced<br>2020 |
|-----------------------------|----------------|----------------|----------------|-----------------|
| <b>Transportation</b>       |                |                |                |                 |
| Mobile Source Emissions     | 374,454        | 367,332        | 418,477        | 288,916         |
| HFC Emissions               | 1,315          | 1,290          | 1,265          | 21,746          |
| <b>Sub Total</b>            | <b>375,769</b> | <b>368,622</b> | <b>419,741</b> | <b>310,662</b>  |
| <b>Energy</b>               |                |                |                |                 |
| Electrical Consumption      | 174,732        | 170,061        | 193,232        | 112,294         |
| Electricity Generation      | 0              | 8,286          | 8,286          | 8,286           |
| Natural Gas                 | 244,445        | 217,217        | 239,507        | 237,334         |
| <b>Sub Total</b>            | <b>419,177</b> | <b>395,565</b> | <b>441,025</b> | <b>357,914</b>  |
| <b>Area Sources</b>         |                |                |                |                 |
| Landscaping                 | 38,399         | 37,841         | 39,192         | 38,667          |
| Woodburning                 | 14,887         | 14,718         | 15,785         | 15,785          |
| <b>Sub Total</b>            | <b>53,287</b>  | <b>52,559</b>  | <b>54,977</b>  | <b>54,451</b>   |
| <b>Water and Wastewater</b> |                |                |                |                 |
| Water consumption           | 28,125         | 25,102         | 27,000         | 21,705          |
| Wastewater Generation       | 259            | 259            | 278            | 274             |
| <b>Sub Total</b>            | <b>28,384</b>  | <b>25,360</b>  | <b>27,278</b>  | <b>21,979</b>   |
| <b>Solid Waste</b>          |                |                |                |                 |
| Landfill Offgasing          | 48,361         | 41,724         | 47,273         | 41,061          |
| <b>Sub Total</b>            | <b>48,361</b>  | <b>41,724</b>  | <b>47,273</b>  | <b>41,061</b>   |
| <b>Construction</b>         |                |                |                |                 |
| Construction Emissions      | 2,288          | 2,288          | 2,288          | 2,059           |
| <b>Sub Total</b>            | <b>2,288</b>   | <b>2,288</b>   | <b>2,288</b>   | <b>2,059</b>    |
| <b>TOTAL</b>                | <b>927,266</b> | <b>886,118</b> | <b>992,583</b> | <b>788,127</b>  |

| Source               | 2005           | 2010           | 2020 BAU       | 2020 Reduced   |
|----------------------|----------------|----------------|----------------|----------------|
| Transportation       | 375,769        | 368,622        | 419,741        | 310,662        |
| Energy               | 419,177        | 395,565        | 441,025        | 357,914        |
| Area Sources         | 53,287         | 52,559         | 54,977         | 54,451         |
| Water and Wastewater | 28,384         | 25,360         | 27,278         | 21,979         |
| Solid Waste          | 48,361         | 41,724         | 47,273         | 41,061         |
| Construction         | 2,288          | 2,288          | 2,288          | 2,059          |
| <b>Total</b>         | <b>927,266</b> | <b>886,118</b> | <b>992,583</b> | <b>788,127</b> |

|                             | 2005           | 2010           | 2035             | Reduced<br>2035 |
|-----------------------------|----------------|----------------|------------------|-----------------|
| <b>Transportation</b>       |                |                |                  |                 |
| Mobile Source Emissions     | 374,454        | 367,332        | 554,869          | 271,436         |
| HFC Emissions               | 1,315          | 1,290          | 1,949            | 20,431          |
| <b>Sub Total</b>            | <b>375,769</b> | <b>368,622</b> | <b>556,818</b>   | <b>271,436</b>  |
| <b>Energy</b>               |                |                |                  |                 |
| Electrical Consumption      | 174,732        | 170,061        | 236,230          | 88,181          |
| Electricity Generation      | 0              | 8,286          | 8,286            | 8,286           |
| Natural Gas                 | 244,445        | 217,217        | 278,911          | 260,828         |
| <b>Sub Total</b>            | <b>419,177</b> | <b>395,565</b> | <b>523,427</b>   | <b>357,294</b>  |
| <b>Area Sources</b>         |                |                |                  |                 |
| Landscaping                 | 38,399         | 37,841         | 41,487           | 40,068          |
| Woodburning                 | 14,887         | 14,718         | 17,665           | 17,665          |
| <b>Sub Total</b>            | <b>53,287</b>  | <b>52,559</b>  | <b>59,151</b>    | <b>57,733</b>   |
| <b>Water and Wastewater</b> |                |                |                  |                 |
| Water consumption           | 28,125         | 25,102         | 30,664           | 23,475          |
| Wastewater Generation       | 259            | 259            | 316              | 304             |
| <b>Sub Total</b>            | <b>28,384</b>  | <b>25,360</b>  | <b>30,980</b>    | <b>23,779</b>   |
| <b>Solid Waste</b>          |                |                |                  |                 |
| Landfill Offgasing          | 48,361         | 41,724         | 57,518           | 41,061          |
| <b>Sub Total</b>            | <b>48,361</b>  | <b>41,724</b>  | <b>57,518</b>    | <b>41,061</b>   |
| <b>Construction</b>         |                |                |                  |                 |
| Construction Emissions      | 2,288          | 2,288          | 2,288            | 2,059           |
|                             | <b>2,288</b>   | <b>2,288</b>   | <b>2,288</b>     | <b>2,059</b>    |
| <b>TOTAL</b>                | <b>927,266</b> | <b>886,118</b> | <b>1,230,182</b> | <b>753,363</b>  |

| Source               | 2005           | 2010           | 2035 BAU         | 2035 Reduced   |
|----------------------|----------------|----------------|------------------|----------------|
| Transportation       | 375,769        | 368,622        | 556,818          | 271,436        |
| Energy               | 419,177        | 395,565        | 523,427          | 357,294        |
| Area Sources         | 53,287         | 52,559         | 59,151           | 57,733         |
| Water and Wastewater | 28,384         | 25,360         | 30,980           | 23,779         |
| Solid Waste          | 48,361         | 41,724         | 57,518           | 41,061         |
| Construction         | 2,288          | 2,288          | 2,288            | 2,059          |
| <b>Total</b>         | <b>927,266</b> | <b>886,118</b> | <b>1,230,182</b> | <b>753,363</b> |

## Modeling Coefficients and Data Assumptions

### Standard

0.85 backcasting multiplier  
2204.6226 lbs / metric ton  
1000 kg/metric ton  
1000000 g/metric ton  
0.907 metric tons/short ton  
2000 lbs/ton  
2204.6226 lbs/metric ton  
0.0283 m3/ft3  
365.25 days/year  
0.000001 metric ton/g  
748 gal/ccf  
325,851 gal/acre-foot

### GWP

21 CH4  
310 N2O

## Transportation

### On-Road Vehicles

8.81 kg/gallon CO<sub>2</sub> Gasoline  
10.15 kg/gallon CO<sub>2</sub> Diesel

Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.3)

### Emfac Settings:

Version : Emfac2007 V2.3 Nov 1 2006  
Scen Years: 2005, 2010, 2020, 2035  
Season : Annual  
Area : San Diego County  
Temperature: 65; Humidity 60%; Sped 30 MPH

## Electricity

### Emission Factors

| SDG&E (2005) | WECC (2005)                    |
|--------------|--------------------------------|
| 546.5        | 724.1 lbs CO <sub>2</sub> /MWh |
| 0.011        | 0.008 lbs CH <sub>4</sub> /MWh |
| 0.029        | 0.03 lbs N <sub>2</sub> O/MWh  |

Source: EPA Emissions and Generation Resource Integrated Database (eGRID2007), Version 1.1, December 2007.

## Natural Gas

53.06 kg CO<sub>2</sub>/MMBTU  
5 g CH<sub>4</sub>/MMBTU  
0.1 g N<sub>2</sub>O/MMBTU  
1000 scf = 1Mcf  
0.9649 Mcf/MMBTU  
10 therms/mmbtu

Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.7)

**Multifamily**

24.55 Acres/property  
 0.25 tons/property/day  
 0.010183299 tons/acre/day  
 24.44 units/acre  
**0.000416665 tons/unit/day**

**Single Family**

0.0193 tons/acre/day  
 3 units/acre  
**0.00643333 tons/unit/day**

**Non Residential**

2\*sqt=acreage  
 43560 sqft=1 acre  
 21780 sqft/acre  
 0.010183299 tons/acre/day  
**4.67553E-07 tons/sqft/day**

Source: URBEMIS2007 Emissions Estimation for Land Use Development Projects, Version 9.2

**Wood Burning Coefficients and Conversions:**

3400 lbs CO<sub>2</sub>/ton wood  
 2458 lbs in a cord of wood  
 316 g CH<sub>4</sub>/MMBTU  
 4.2 g N<sub>2</sub>O/MMBTU  
 15.38 MMBTU/ton wood

Source: EPA AP-42 Emission Coefficients, Fifth Edition, Volume I October 1996 (Section 1.10)

**Water and Waste Water**

| kWh/MG                      | Indoor Uses |        | Outdoor Uses |        |
|-----------------------------|-------------|--------|--------------|--------|
|                             | NorCal      | SoCal  | NorCal       | SoCal  |
| Water Supply and Conveyance | 2117        | 9727   | 2117         | 9727   |
| Water Treatment             | 111         | 111    | 111          | 111    |
| Water Distribution          | 1272        | 1272   | 1272         | 1272   |
| Wastewater Treatment        | 1911        | 1911   | 0            | 0      |
| Regional Total              | 5,411       | 13,021 | 3,500        | 11,110 |

Source: California Energy Commissions Refining Estimates of Water-Related Energy Use in California, December 2006 (Table ES-1)

**Wastewater Coefficients****Stationary Methane Emissions**

|                      |  |
|----------------------|--|
| 662 g/m <sup>3</sup> | Density CH <sub>4</sub> at standard conditions |
| 0.99                 | CH <sub>4</sub> Destruction Efficiency         |

Source: Local Government Operations Protocol, Version 1.0, September 2008 (Chapter 10: Wastewater Treatment Facilities)

**Process CH<sub>4</sub>**

|                                     |   |
|-------------------------------------|---|
| 0.000003785 l/MG                    | Conversion                              |
| 0.6 kgCH <sub>4</sub> /kgBOD remove | CH <sub>4</sub> producing capacity (Bo) |
| 0.8 (For anaerobic systems)         | CH <sub>4</sub> Correction Factor       |
| 365.25 days/year                    | Conversion                              |
| 0.001 metric tons/kg                | Conversion                              |

**Solid Waste**

**metric tons CH<sub>4</sub>/ton waste**

Landfill w/o recovery 3.1  
 Landfill w/ Flaring 0.64  
 Landfill w/ electric gen 0.3

Source: EPA Solid Waste Management and Greenhouse Gases; A life-cycle assessment of emissions and Sinks, 3rd edition, September 2006.

