CITY OF PERRIS
CLIMATE ACTION PLAN

ADOPTED
FEBRUARY 23, 2016
BY CITY COUNCIL

ACKNOWLEDGEMENTS

City Council

Daryl R. Busch, Mayor
Tonya Burke, Mayor Pro Tem
Rita Rogers, Councilmember
David S. Rabb, Councilmember
Mark Yarbrough, Councilmember

Planning Commission

Brady McCarron, Chair
Olivia Balderrama, Vice Chair
David G. Stuart, Commissioner
Dwayne L. Hammond, Commissioner
Jose M. Marin, Commissioner
Jack Shively, Commissioner

City Staff

Richard Belmudez, City Manager
Clara Miramontes, Director of Development Services
Diane Sbardellati, Associate Planner

In Partnership with:

Western Regional Council of Governments (WRCOG)
4080 Lemon Street, 3rd Floor, MS 1032
Riverside, CA 92501

Special thanks to:

Alexa Washburn, Consultant, Program Manager WRCOG
Vice President of Planning, National Community Renaissance

Jennifer Ward, Director of Government Relations WRCOG

Tyler Masters, Program Manager WRCOG

TABLE OF CONTENTS

LIST OF ACRONYMS

AB – Assembly Bill

AR4 – Fourth Assessment Report

AFV – Alternative Fuel Vehicle

ARRA – American Recovery and Reinvestment Act

BAU – Business-as-Usual

BEU – Banning Electric Utility

BTA – Bicycle Transportation Account

CALGreen – California Green Building Standards Code

CAP – Climate Action Plan

CAPCOA – California Air Pollution Control Officers Association

CARB – California Air Resources Board

CAT – Climate Action Team

CEAP – Community Energy Action Plan

CEC – California Energy Commission

CEESP – California Long-Term Energy Efficiency Strategic Plan

CEQA – California Environmental Quality Act

CESA – California Endangered Species Act

CH_4 – Methane

CIP – Capital Improvement Plan

CO_2 – Carbon Dioxide

CO_2e – Carbon Dioxide Equivalents

EAP – Energy Action Plan

EGPR – Environmental Goals and Policy Report

EIR – Environmental Impact Report

ESA – U.S. Endangered Species Act

EO – Executive Order

FHA – Federal Housing Administration

GHG – Greenhouse Gas

GWP – Global Warming Potential

HFCs – Hydroflourocarbons

IPCC – International Panel on Climate Change

LGO – Local Government Operations

MAP-21 – Moving Ahead for Progress in the 21st Century

MEAP – Municipal Energy Action Plan

MPO – Metropolitan Planning Organization

MSHCP – Multiple Species Habitat Conservation Plan

MT – Metric Ton

N_2O – Nitrous Oxide

OPR – Office of Planning and Research

PACE – Property Assessed Clean Energy

PD TAC – Planning Directors' Technical Advisory Committee

PFCs – Perfluorocarbons

RCA – Regional Conservation Authority

RCHC – Riverside County Health Coalition

RCTC – Riverside County Transportation Commission

RPU – Riverside Public Utilities

RTA – Riverside Transit Agency

RTP – Regional Transportation Plan

SAFETEA-LU – Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users

SAR – Second Assessment Report

SB – Senate Bill

SCAG – Southern California Association of Governments

SCE – Southern California Edison

SCG – Southern California Gas Company

SCS – Sustainable Communities Strategy

SGC – Strategic Growth Council

SF_6 – Sulfur Hexafluoride

TAR – Third Assessment Report

TUMF – Transportation Uniform Mitigation Fee

VMT – Vehicle Miles Traveled

WRCOG – Western Riverside Council of Governments

WRELP – Western Riverside Energy Leader Partnership

CHAPTER 1
INTRODUCTION

The City of Perris is cognizant of its ability as a local government to contribute to the achievement of subregional, regional, and state greenhouse gas (GHG) reduction targets. This Climate Action Plan (CAP) has been developed to address global climate change through the reduction of harmful greenhouse gas (GHG) emissions at the community level, and as part of California's mandated statewide GHG emissions reduction goals (AB 32). The City of Perris has developed multiple sustainable strategies to directly benefit the community by decreasing carbon emissions while adapting to a changing climate. Programs and actions in this CAP will help Perris grow healthily, resourcefully and sustainably.

The creation of this document results from the foresight of the Western Riverside Council of Governments (WRCOG) and WRCOG's Subregional Climate Action Plan (CAP). WRCOG's CAP is a comprehensive document that establishes a subregional emissions reduction target, emissions reduction measures, and action steps to support each community's goal to demonstrate consistency with California's Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32). WRCOG has been a leader in promoting sustainability through its adopted Sustainability Framework, Western Riverside Energy Leader Partnership (WRELP), the HERO Program, and the Western Riverside County Clean Cities Coalition.

Perris's CAP, including the GHG inventories and forecasts contained within, is based on WRCOG's innovative Subregional Climate Action Plan (CAP). Perris is proud to participate with WRCOG to address climate change through a variety of local programs, all of which have made Western Riverside County a leader in energy efficiency and sustainability efforts in the country.

Along with Perris, several jurisdictions in the WRCOG subregion have adopted a local CAP, or are in the process of doing so. Table 1-1 below illustrates which jurisdictions have participated in the subregional CAP effort, as well as the regional sustainability programs that jurisdictions are participating in that are relevant to the subregional CAP. These regional sustainability programs include the WRELP Program, an important collaboration between WRCOG, Southern California Edison (SCE) and the Southern California Gas Company (SCG), which helped to develop Energy Action Plans (EAP) for eleven communities, including Perris. Other jurisdictions participate in different partnerships with SCE, or have their own utility companies.

Table 1-1: WRCOG Member Participation in Sustainability Programs

	Participating in Subregional CAP	Locally Adopted, or In-Progress CAP	Participating in WRELP Energy Action Plan	Participating in other SCE Partnership	Municipally-Owned Utility
Banning	✓				✓
Calimesa	✓		✓		
Canyon Lake	✓		✓		
Corona		✓		✓	✓
Eastvale	✓				
Hemet	✓	✓	✓		
Jurupa Valley	✓				
Lake Elsinore		✓	✓		
Menifee		✓	✓		
Moreno Valley		✓		✓	✓
Murrieta		✓	✓		
Norco	✓		✓		
Perris	✓	✓	✓		
Riverside	✓	✓			✓
San Jacinto	✓		✓		
Temecula	✓		✓		
Wildomar	✓		✓		
County of Riverside		✓			

Several strategies for monitoring and addressing climate change have emerged at the international, national, and state levels. California remains a leader in the effort to reduce GHG emissions through mitigation and adaptation strategies. AB 32 directs California to reduce statewide GHG emissions to 1990 levels by 2020. California is the first state in the U.S. to mandate reductions in GHG emissions across its entire economy. To achieve these reductions, the California Air Resources Board (CARB)

recommends that local governments target their 2020 emissions at 15% below "current"[1] levels, consistent with the statewide commitment, to account for emissions growth that has occurred since 1990. Several initiatives at the state level will help the subregion reduce GHG emissions, but they alone will not be sufficient to meet the 2020 target. Each municipality participating in the development of a climate action plan is developing a roadmap for reduction of GHG emissions through local actions to collectively target these goals.

The release of GHGs into the atmosphere is the direct and indirect result of everyday activities of residents and businesses, as energy is used in homes and offices, and people travel to work, generate waste, and use water. Local governments also emit GHGs as they perform essential services and operate buildings, vehicles, street lights, traffic signals, water systems, and wastewater plants. The strategies described in this CAP to reduce such emissions include increasing energy efficiency in buildings and facilities, utilizing renewable energy sources, reducing waste generation and converting household waste to energy, supporting increased vehicle fuel efficiency and alternative transportation, and reducing water consumption. In addition to addressing climate change, reducing GHG emissions can provide co-benefits such as reducing energy and transportation costs for residents, businesses, and local governments; creating green jobs and supporting advancement of green technologies and industries; improving air quality and the overall health of residents; and making the community a more attractive place to live and locate a business.

The Perris CAP utilizes WRCOG's analysis of existing GHG reduction programs and policies that have already been implemented in the subregion and of applicable best practices from other regions to assist in meeting the 2020 subregional reduction target. The resulting GHG reduction measures chosen for the Subregional CAP were based on their GHG-reduction potential, cost-benefit characteristics, funding availability, and feasibility of implementation. Perris, and other member jurisdictions, independently determined the level of implementation of each measure, and the WRCOG CAP presents the results collectively, demonstrating the collaborative effort and partnership that will facilitate implementation.

The Perris CAP is organized into four chapters:

- **Chapter 1, Introduction:** provides the framework for the CAP, places the CAP in the context of current climate change science and policy, describes existing regional and local sustainability efforts and accomplishments, and discusses the CAP's relationship to the California Environmental Quality Act (CEQA).
- **Chapter 2, GHG Emissions Inventory, Projections and Goals:** describes the emissions inventory process and results, forecasted business-as-usual emissions for the subregion, and the adopted subregional emissions reduction target.

[1] "Current" is a term used by CARB in its Climate Change Scoping Plan of September 2008, but is undefined. It is generally taken to mean emissions for a year between 2005 and 2008, although other years have been used by local communities.

- **Chapter 3, GHG Reduction Measures:** contains the anticipated State and federal emissions reductions, and the local reduction measures and actions that will be implemented to meet the subregional reduction target.
- **Chapter 4, Implementation and Monitoring:** provides best practices and specific resources for implementing reduction measures, the role for measure-specific evaluations, periodic updates to the inventories, the use of indicators to monitor the subregion's progress, and the need for future iterations of the CAP to incorporate new data and reduction measures as they become available.

GREENHOUSE GAS EMISSION (GHG) IMPACTS

Naturally occurring gases dispersed in the atmosphere determine the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect. Overwhelming evidence shows that human activities are increasing the concentration of GHGs and changing the global climate. The most significant contributor is the burning of fossil fuels for transportation, electricity generation and other purposes, which introduces large amounts of carbon dioxide and other GHGs into the atmosphere. Collectively, these gases intensify the natural greenhouse effect, causing global average surface and lower atmospheric temperatures to rise.

There are six internationally recognized GHGs regulated under the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)**.** Emissions of HFCs, PFCs, and SF_6 are not included in this inventory because of the lack of data availability on these sources. Data on refrigerants such as HFCs and PFCs are often difficult or unavailable to collect while emissions from SF_6 are typically only relevant for cities that own or operate a municipal power utility or transmission lines. Emissions summaries found throughout this report convert emissions from the various GHGs into metric tons (MT) of carbon dioxide equivalent (CO_2e). CO_2e is a measure of the amount of warming a GHG may cause compared to the amount of warming caused by CO_2. Since equal quantities of each GHG have more or less influence on the greenhouse effect, this approach converts all emissions to a standard metric, allowing for apples-to-apples comparisons amongst quantities of all six emissions types. An important and critical component to any inventory is how each GHG is treated amongst each other. Global warming potential (GWP), is the standard measure of the amount of warming a GHG may cause compared to the amount of warming caused by CO_2. As used in this report, CH_4 has a GWP of 21 which means for every 1 ton of CH_4, an equivalent of 21 tons of CO_2 is released into the atmosphere and N_2O has a GWP of 310.

Protocols for Emissions Accounting and Reporting

The inventory report was developed based on guidance from two standards for emissions accounting and reporting: the Local Government Operations Protocol (LGO Protocol) and the U.S. Community Protocol for Accounting and Reporting of GHG Emissions (Community Protocol). The LGO Protocol was developed through a partnership of the California Air Resources Board, The Climate Registry, and ICLEI USA. The Community Protocol was released by ICLEI USA in October 2012 and represents the first

comprehensive national standard for community-wide inventories. This inventory incorporated basic guidance from the Community Protocol for accounting and reporting emissions from energy consumed within the Residential and Commercial/Industrial sectors, as well as emissions from Transportation and Solid Waste sectors. Emissions that occur as a result of energy use to treat and distribute potable water are included for Perris because this data was readily available.

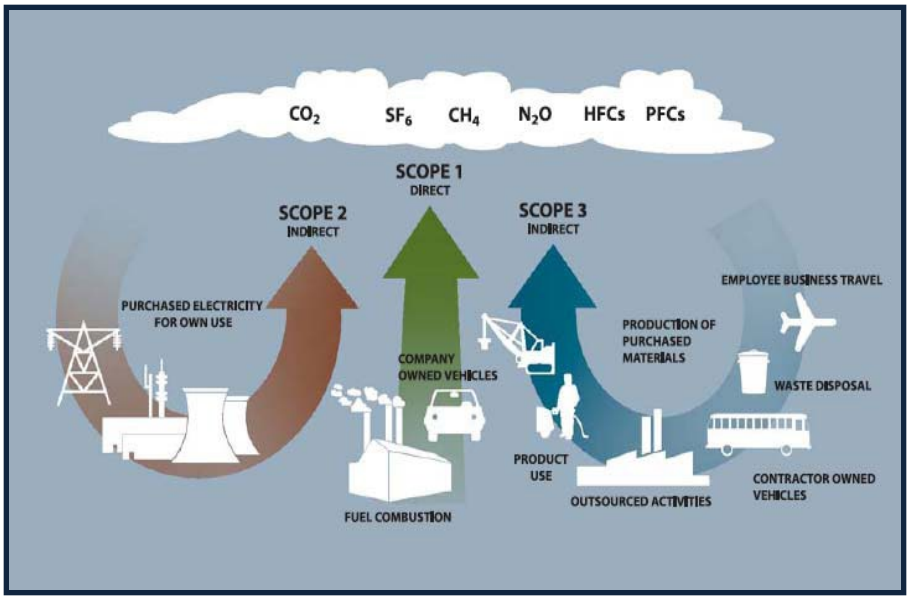
Understanding Aggregate Emissions

The aggregated emissions figures listed in the tables and discussed in this report are intended to represent totals for the most significant emissions sources and activities in Perris' government operations and community. However, these totals are a summary of inventoried emissions using available estimation methods. Each inventoried sector may have additional emissions sources associated with it that were not accounted for.

Also, communities provide different services to their residents and businesses, and the scale of the services (and thus the emissions) is highly dependent upon the size and purview of the local government. For these reasons, comparisons among community or local government inventories should not be made without a presentation of the municipal services provided or community-level indicators such as population or socioeconomic factors.

When aggregating emissions, it is critical to identify and avoid "double-counting" emissions whenever possible. Double-counting occurs when a single emissions source or activity is counted in multiple emissions categories (such as sectors) or in multiple jurisdictions. In the Government Operations Inventory, double-counting is avoided through the use of "scopes," which are described in Chapter 2. In the Community Inventory, double-counting is avoided by reporting activities and sources as line items rather than as larger aggregated groups.

Figure 1-2: Greenhouse Gases Sources



Global Warming Potential (GWP) is a quantitative measurement that expresses the relative warming potency of each GHG over a specific period of time. CO_2 is assigned a GWP value of 1 and the other GHGs are assigned GWPs relative to CO_2. For GHG emission inventories, the amount of each gas emitted is multiplied by its GWP and presented in units of carbon dioxide equivalents (CO_2e). **Table 1-2** below lists the six primary GHGs as defined in AB 32, their chemical formula, the lifetime of the compound, and their GWPs relative to CO_2. Although CO_2 has a lower GWP than other GHGs, it is the largest contributor to human-caused global warming, constituting about 84% of U.S. emissions.[2]

Table 1-2: Greenhouse Gases Regulated Under AB 32

Greenhouse Gas	**Chemical Formula**	**Lifetime (years)**	**Global Warming Potential for 100-year horizon**
Carbon Dioxide	CO_2	Variable	1
Methane	CH_4	12	21
Nitrous Oxide	N_2O	114	310
Sulfur Hexafluoride	SF_6	3,200	23,900
Hydrofluorocarbons	HFCs	1.4 – 270	140 – 11,700
Perfluorocarbons	PFCs	1,000 – 50,000	6,500 – 9,200

Source: International Panel on Climate Change (IPCC) Second Assessment Report: Climate Change 1995 (SAR). Available at: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml

Note: According to the Local Government Operations Protocol (LGO Protocol) and the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Community Protocol), the GWP values in **Table 1-2** were applied in this CAP. Since the SAR was published in 1995, the IPCC has published updated GWP values in its Third Assessment Report (TAR) and Fourth Assessment Report (AR4) that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2. However, GWP values from the SAR are still used by international convention to maintain consistency in GHG reporting. For GWP values that were not quantified in the SAR, GWP values from the TAR were used.

While the anticipated effects of climate change are likely to vary regionally, it is anticipated to have the following global effects[3]:

- Higher maximum temperatures and more hot days over most land areas;
- Higher minimum temperatures, fewer cold days, and frost days over most land areas;
- Reduced diurnal temperature range over most land areas;

[2] Ibid.
[3] IPCC Fourth Assessment Report: Climate Change 2007 (AR4). Available at: http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm

- Increased heat index over land areas; and
- More intense precipitation events.

Many secondary effects are anticipated to result from climate change in California, including loss in snow pack, sea level rise and inundation of coastal areas, increased flooding of low-lying areas, more extreme heat days per year, high ozone days, increased incidence of large forest fires, and more frequent and severe drought years.

REGULATORY CONTEXT

Many strategies for monitoring and addressing climate change have emerged at the international, national, and state levels. California remains a leader in the effort to reduce GHG emissions through mitigation and adaptation strategies. With AB 32, California is the first state in the U.S. to mandate GHG emissions reductions across its entire economy. To support AB 32, California has been developing policy and passing legislation that seeks to control emissions of gases that contribute to climate change. These have included regulatory approaches such as mandatory reporting for significant sources of GHG emissions and caps on emission levels, as well as market-based mechanisms, such as cap-and-trade. Voluntary local actions are also increasing, such as conducting emissions inventories, implementing practices to reduce emissions, and purchasing offsets and renewable energy certificates. While many local actions are currently voluntary, there is more emphasis being placed on monitoring and reporting emissions to demonstrate the effectiveness of policies and local consistency with state reduction goals. The following section highlights the primary state legislation and guidance related to this CAP.

STATE LAWS AND POLICIES

AB 32, also known as the Global Warming Solutions Act of 2006, directs public agencies in California to support the statewide goal of reducing GHG emissions to 1990 levels by 2020. Preparing a CAP supports AB 32 at the local level. The CAP provides a policy framework for how the subregion can do its part to reduce emissions. While compliance with AB 32 is not a requirement for local jurisdictions, demonstrating consistency with statewide reduction goals can significantly assist WRCOG jurisdictions in qualifying for incentives such as grant funding. Efforts to address climate change, reduce consumption of resources, and improve energy efficiency led by state legislation or programs are briefly described below and identified in **Figure 1-3**.

Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, which established 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.**

EO-S-3-05 created the California Climate Action Team (CAT), which is tasked with the preparation of biennial science assessment reports on climate changes and adaptation options for California. The first CAT Report to the Governor and Legislature was published in 2006, and contains recommendations and strategies to help meet the targets in EO-S-3-05. These were expanded upon in the 2009 CAT Biennial Report to the Governor and Legislature. The new information includes revised climate and sea-level projections, and an evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts[4]. The action items in the report focus on the preparation of the Climate Change Adaptation Strategy, required by EO-S-13-08.

AB 32 – California Global Warming Solutions Act of 2006

AB 32 was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires CARB to develop mechanisms that will reduce GHG emissions to 1990 levels by 2020. Mandatory actions under the legislation to be completed by CARB include:

- Identification of early action items that can be quickly implemented to achieve GHG reductions. These early action items were adopted by CARB in 2007 and include regulations affecting landfill operations, motor vehicle fuels, car refrigerants, and port operations, among other regulations.
- Development of a scoping plan[5] to identify the most technologically feasible and cost-effective measures to achieve the necessary emissions reductions to reach 1990 levels by 2020. The Scoping Plan identifies a variety of GHG reduction measures that include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based cap-and-trade program. The Plan identifies local governments as strategic partners to achieving the state goal and translates the reduction goal to a 15% reduction of current emissions by 2020.
- Creation and adoption of regulations to require the state's largest industrial emitters of GHGs to report and verify their emissions on an annual basis.

SB 97 – California Environmental Quality Act Guideline Amendments of 2007

Senate Bill (SB) 97 was adopted in 2007 and directed the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to address GHG emissions. The CEQA Guidelines prepared by OPR were adopted in December 2009 and went into effect March 18, 2010. Local governments may use adopted plans consistent with the CEQA Guidelines to assess the cumulative impacts of projects on climate change, if the plan for the reduction of GHG emissions accomplishes the following:

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.

[4] California EPA - Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006. Available at: http://www.climatechange.ca.gov/climate_action_team/reports/index.html

[5] CARB 2008 Scoping Plan. Available at http://arb.ca.gov/cc/scopingplan/scopingplan.htm

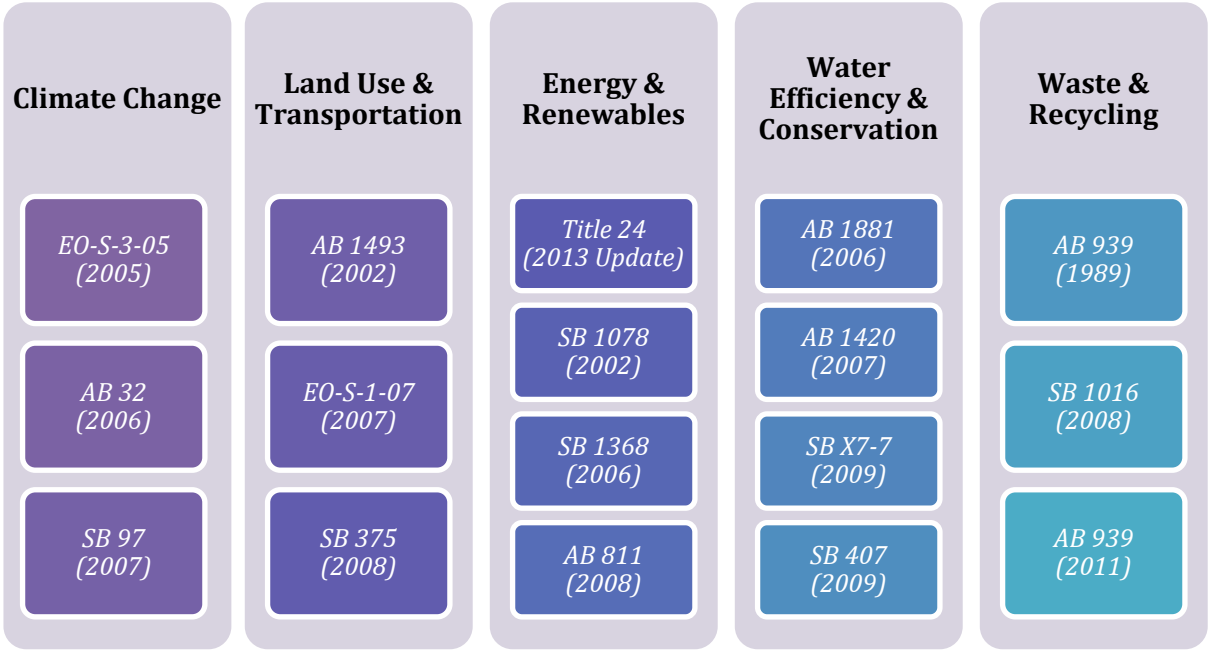
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specify measures or a group of measures, including performance standards, based on substantial evidence, to collectively achieve the specified emissions level.
- Establish a mechanism to monitor the plan's progress toward achieving the level and to require an amendment if the plan is not achieving specified levels.
- Be adopted in a public process following environmental review.

SB 375 – Sustainable Communities and Climate Protection Act of 2008

Senate Bill (SB) 375, also known as the Sustainable Communities and Climate Protection Act of 2008, builds from AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires the state's metropolitan planning organizations (MPO) to create a sustainable communities strategy (SCS) in their regional transportation plans (RTP) for the purpose of reducing urban sprawl. Under SB 375, CARB established regional targets for GHG emissions reductions from passenger vehicle use for each MPO. The regional reduction targets for the Southern California Association of Governments (SCAG) region, which is the MPO with jurisdiction over the WRCOG subregion, are 8% per capita by 2020, and a conditional target of 13% per capita by 2035 from 2005 levels. In April 2012, SCAG adopted its first SCS to identify how the region will achieve the GHG emissions reduction targets set by CARB.

Figure 1-3 below categorizes the applicable state regulations that provide a policy framework for addressing climate change. A more detailed description of these regulations is included in the jurisdictional Greenhouse Gas Inventory Reports (Appendix A).

Figure 1-3: Regulatory Framework for Climate Change



REGIONAL PLANS, PROGRAMS AND POLICIES

The regional initiatives described below contribute to the development and success of the WRCOG Subregional CAP, and by extension, Perris's CAP. Many of these programs are administered by WRCOG and several are conducted by other regional entities in partnership with WRCOG. Perris is one of several WRCOG member jurisdictions actively participating in one or more of these programs.

Southern California Association of Governments Regional Transportation Plan and Sustainable Communities Strategy

SCAG is the regional planning agency for Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties, and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the federally designated MPO for the Southern California region and is the largest MPO in the U.S. With respect to air quality planning, SCAG has prepared the 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (2012 RTP/SCS): Towards a Sustainable Future, to fulfill federal planning requirements contained in the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which calls for regions to consider urban form and natural resources as part of the transportation planning process.

Under SB 375, all of California's MPOs must prepare an SCS as a component of their RTP. The RTP serves as a long-range transportation plan that is developed and updated by SCAG every four years. The RTP provides a vision for the development of transportation facilities throughout the region based on growth forecasts and economic trends that project over a 20-year period. The SCS expands upon transportation strategies in the RTP to analyze growth patterns and establish future land use strategies that aid the region in meeting its GHG reduction targets. The SCS does not mandate future land use policies for local jurisdictions, but rather provides a foundation of regional policy upon which local governments can build. WRCOG and its member jurisdictions partner with SCAG and are active members in the development and implementation of the RTP/SCS.

HERO Program

Established under the guidance of AB 811 (2008) and AB 474 (2009), WRCOG's HERO Program is a Property Assessed Clean Energy (PACE) program that provides financing to residential and commercial property owners for the installation of energy efficient, renewable energy, and water conservation improvements on existing properties. Financing provided through the HERO Program is repaid through an assessment on property tax bills over 5-, 10-, 15-, 20-, and 25-year terms, based on the useful life of the products, and upon sale of the property, the balance generally stays with the property.

SUSTAINABILITY FRAMEWORK FOR WESTERN RIVERSIDE COUNTY

WRCOG's Sustainability Framework (Framework) is a subregional planning effort that establishes, implements, and continuously refines an overarching sustainability plan for the communities in Western Riverside County. The Framework aims to: initiate a dialogue about the importance of sustainability in the region; provide a vision and goals to guide local action and regional collaboration; define more immediate short-term goals that can contribute to the longer-term vision of the Framework; and define indicators, benchmarks, and targets that provide a measure of the effectiveness of Framework programs and policies. The Framework acts as a "living" document and contains goals and actions applying to economic development, education, public health, transportation, water and wastewater, energy, and the environment.

Western Riverside County Clean Cities Coalition

The Western Riverside County Clean Cities Coalition (Coalition) is a voluntary local government and industry partnership that aims to reduce the consumption of petroleum fuels and improve air quality in the WRCOG subregion. The Coalition works to mobilize local stakeholders toward expanding the use of alternative fuel vehicles (AFV) and advanced technology vehicles, promoting local idle reduction measures, and strengthening local AFV fueling infrastructure. The governments of Western Riverside County have taken leadership roles in the Coalition, coordinating efforts between government and industry to recognize the value of partnership in achieving air quality, energy efficiency, economic development, and transportation goals, while advancing the clean air and energy efficiency goals of the national Clean Cities program administered by the U.S. Department of Energy.

Healthy Communities

WRCOG and its member jurisdictions are engaged in numerous efforts and initiatives to promote healthy communities, including participating in the Riverside County Health Coalition (RCHC). The RCHC is a collaboration of public and private sectors, school districts, community businesses, local and regional organizations and community members committed to policy development and advocacy, environmental change and community empowerment for healthy lifestyles in Riverside County. This initiative includes a focused partnership effort with local governments to integrate healthy communities into the local planning and policy-making process.

Multiple Species Habitat Conservation Plan

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) is a comprehensive, multi-jurisdictional plan to conserve sensitive species and their associated habitats in the subregion. Created in 2004 by the Western Riverside County Regional Conservation Authority (RCA), the MSHCP provides subregional transportation and green infrastructure benefits to local agencies and allows WRCOG jurisdictions to make land use decisions and maintain a strong economy in a context that comprehensively addresses federal and state Endangered Species Acts (ESA and CESA) requirements.

Transportation Uniform Mitigation Fee

WRCOG's Transportation Uniform Mitigation Fee (TUMF) was implemented in 2003 as one of the largest multi-jurisdictional fee programs in the nation. TUMF makes improvements to the regional transportation system and provides transportation demand management through funds from new development, ensuring that development mitigates for increases in traffic volumes. TUMF is a 32-year program that provides subregional transportation and infrastructure benefits to local agencies in Western Riverside County. The program is expected to raise $4.2 billion, and 1.64% is allocated to the Riverside Transit Agency (RTA) for transit improvements. To mitigate the impacts of transportation construction projects, WRCOG allocates 1.59% of TUMF funds collected to the RCA to purchase habitat for the MSCHP.

Western Riverside Energy Leader Partnership

The WRELP Program builds upon the existing policies and programs in the region to analyze energy-sector emissions and propose energy conservation and renewable energy measures that reduce GHG emissions within Energy Action Plans (EAPs) for 11 WRCOG jurisdictions served by SCE. The WRELP partners include Calimesa, Canyon Lake, Hemet, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Temecula, San Jacinto, and Wildomar (see **Table 1-1**). The WRELP effort uses funding provided by SCE to implement within the region the California Long-Term Energy Efficiency Strategic Plan (CEESP), developed by the California Energy Commission (CEC) as a collaborative effort in response to California's need for a long-term strategic energy efficiency plan. Following CEESP Goal 4, individual EAPs were developed for each participating jurisdiction, creating a comprehensive program to address energy efficiency, sustainability, and climate change through the years 2020 and 2035. The EAPs informed the development of the energy efficiency measures in this CAP.

LOCAL PLANS AND POLICIES - GREEN PERRIS

Perris is one of several jurisdictions within the WRCOG subregion that will adopt an individual Climate Action Plan to define GHG emissions reduction policies and strategies. The City currently has multiple existing policies and programs that, over time, will reduce greenhouse gas emissions. These programs include multi-modal transportation opportunities, energy conservation measures, renewable energy development, solid waste reduction, expansion of the urban forest, and other sustainable practices. Perris actively supports energy-conservation programs available throughout the subregion, which are managed by WRCOG, SCE, Southern California Gas Company (SCG), Riverside Public Utilities (RPU), Banning Electric Utility (BEU), and the County of Riverside. These programs include financing for building energy retrofits and renewable energy projects, energy efficiency retrofit rebates, smart metering and smart grid technologies, and various energy efficiency education and outreach campaigns.

Perris's sustainable future began early in 2006, when the City began exploring ways to save energy costs and operate more efficiently. In 2007, Perris initiated the Solar Shine Program which, through a power-sharing agreement, retrofitted City Hall campus with energy-conserving heating and cooling equipment, light fixtures, and programmable thermostats. Photo-voltaic panels were installed on new carport structures in five municipal locations, and interactive real-time touchpad kiosks were placed at City Hall

and the Cesar E. Chavez Library to inform and educate the public about the energy and cost savings from the City's installation of these photo-voltaic panels.

The energy produced by the PV panels provides more than 25% of the City's energy needs, with individual sites meeting up to 100% of their energy need and returning excess energy to the grid. This combination of building retrofits and renewable energy eliminates approximately 960,000 pounds of GHG emissions. In addition to substantially reducing the City's annual greenhouse gas emissions, the City will save, over the life of the project, more than $1.8 million in energy costs. The Solar Shine Program earned the City of Perris a Helen Putnam Award in 2008.

Sustainable actions based on the City's leadership decisions include the following:

1) **Green Building Policy**. In 2009 Perris City Council adopted Resolution 4195 as a Green Building Policy to require sustainable development of municipal buildings and facilities. In 2010 the CalGreen Building Code was adopted and implemented.

2) **Urban Forestry.** As part of the Perris's commitment to urban reforestation, the City was awarded a grant from Green Trees for the Golden State Grant Program to fund the planting and maintenance of 600 trees in the City. In 2009, a new Zoning Code ordinance entitled "Urban Forestry" was added to the Perris Municipal Code.

3) **Alternative Fuel for City Fleet.** To minimize the use of fossil fuels contributing to greenhouse gases and global warming, 25% of the City's fleet of vehicles is powered by an alternative fuel source: compressed natural gas (CNG).

4) **Perris Downtown Specific Plan: Transit-Oriented Design + Smart Code.** In 2011, Perris adopted the revised Downtown Specific Plan to implement form-based, multi-modal design in the downtown area to encourage mixed use development and walkability. Perris is privileged to have mixed-use and transit-oriented developments that enrich the character and economic vitality of the Downtown and encourage residents to drive less. The Downtown Metrolink is scheduled to begin service by late 2015. A second Metrolink station is located in south Perris to serve surrounding cities and communities. The Downtown Specific Plan is currently being implemented and several mixed commercial and residential projects are in use.

5) **Historical Preservation and Building Reuse.** As part of Perris's commitment to historical preservation and building reuse, four buildings in the downtown area were completely renovated and re-occupied: the dilapidated old school building at the corner of San Jacinto Avenue and Perris Boulevard was rebuilt as the City Council Chambers and Conference Center; the historic Perris train depot was restored to its early glory and is a City museum and special event location; the original Perris Bank Building (1918) at the southwest corner of 4th Street and D Street was fully renovated to become the City's archive building; and the art deco Perris Theater (1940) on D Street has been refurbished and restored to its original name and glory. In addition, Perris's Downtown Commercial Façade Program provided exterior renovations to many historical buildings lining D Street, Perris's main downtown corridor.

6) **Waste Recycling and CR&R's Biodigester.** The City of Perris contracts with CR&R for waste management. Regarding construction and demolition material recycling, CR&R offers a variety

of ways to recycle and reduce waste on construction sites. Landfill is further reduced through construction waste re-planning, source separation, mixed recycling, and the reuse or donation of used or excess construction materials.

In 2009, the City of Perris partnered with CR&R to construct a $100 million Green Energy Facility with an anaerobic digester to remove up to 320,000 tons of household organic waste from landfill and convert it to 4 million gallons of high quality biogas. The production of this biogas results in zero GHG emissions. The biogas is a byproduct of the anaerobic digestion process which produces methane. The methane is refined within a fully enclosed gas upgrading system to become superior to natural gas. It will be used initially to fuel CR&R's truck fleet. The first phase of the Green Energy Facility will come on line in late 2015, with three additional phases to follow. The City of Perris was recognized in the June 2015 issue of Western City magazine for being home to one of the largest biodigesters in the world.

PERRIS GENERAL PLAN

The City of Perris's sustainable practices are guided by goals and policies contained within the City's General Plan. In 2008, Perris amended its General Plan to include a Sustainable Community section within the Conservation Element to encourage a comprehensive approach to sustainable practices. The adoption of this amendment sets the path and actions for Perris to take to shape its overall form and appearance in accordance with the community's fundamental values. The standards and guidelines contained in the Sustainable Community section are intended to support the City of Perris' commitment to protect the environment, improve quality of life, promote sustainable development, and reduce greenhouse gas emissions and other impacts to limited natural resources

These standards are intended to enhance public health and welfare and assure that further residential, commercial, industrial and civic development is consistent with the City's desire to create a more sustainable community by insuring future development and City operations actively involve green building and sustainable development policies and practices from initial site design to future operations. Effective green building design balances development with sustainable use of resources from site choice and design through to building occupancy by careful choice and cost effective use of materials and energy resources throughout the lifetime of the development.

More recently the City of Perris's General Plan has been updated to include the following:

- **Trails Master Plan (2013)**. The purpose of the Perris Trails Master Plan is to create a more walkable, bikeable community, and to identify and link existing and informal trail/bikeways to regional trail and bikeways. The plan includes a comprehensive network of off-road and on-road trails and facilities that utilize existing and planned roadway infrastructures, utility easements and linear parks to improve bicycle and pedestrian commuting and recreational opportunities. This network will connect users to neighborhoods, parks, recreational open spaces, schools, places of interest, and will provide connectivity to the hike and bike systems of adjacent cities and regional systems. The plan includes funding strategies and a phasing schedule for development of the public trail systems.

- **Healthy Communities Element**. The Healthy Communities Element was added to the Perris General Plan in 2015 to promote healthful living. Communities with access to vital resources like recreational facilities, healthy foods, medical services, transportation options, quality and affordable housing, living-wage jobs, safe neighborhoods, and quality education experience better health outcomes. The Healthy Communities Element provides the framework to implement the General Plan's vision for a healthier, sustainable Perris, and tackles critical areas where public health and advance planning intersect: transportation, active living, access to nutritious food, access to health care, mental health, and environmental health.

RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

In 2007, state lawmakers identified the need to analyze GHG emissions in the CEQA process through the adoption of SB 97. The bill required the Office of Planning and Research (OPR) to develop, for adoption by the Natural Resources Agency, amendments to the CEQA Guidelines that clarified several points about the analysis and mitigation of GHG emissions. Aside from establishing the need for lead agencies to analyze and mitigate for a project's potentially significant impacts relating to GHG emissions, the amendments also provided that a lead agency may streamline the analysis of GHG emissions for projects that follow a programmatic GHG emissions reduction plan, or climate action plan, meeting certain criteria. The amendments to the CEQA Guidelines became effective on March 18, 2010. OPR is currently developing a Technical Advisory that will further describe, among other climate action planning topics, how plans for reducing GHGs can be used in CEQA analyses.

PERRIS CLIMATE ACTION PLAN CEQA DETERMINATION

Based on the Initial Study prepared for the project, the City of Perris has determined the City's Climate Action Plan has less than significant potential for adverse environmental impacts under CEQA, and therefore has adopted a Negative Declaration.

CHAPTER 2
GHG EMISSIONS INVENTORY, PROJECTIONS AND GOALS

The purpose of compiling a greenhouse gas (GHG) inventory is to establish a baseline of GHG emissions for both the community and City sectors. This baseline is used to develop strategies for emissions reduction, and to measure future changes in GHG emissions after implementation of those strategies. By establishing baseline emissions, Perris is able to monitor its progress over time for efforts to reduce GHG emissions.

Baseline inventories were prepared for the City of Perris by WRCOG as part of the subregional climate action plan and include emissions from the following sectors: residential energy, commercial/industrial energy, transportation, waste, and wastewater. The inventory base year is 2010. The community-wide inventory includes GHG emissions resulting from activities taking place within the City's boundaries, as well as some activities that take place outside City boundaries that support activities within the jurisdiction, such as solid waste sent to landfill areas outside the City.

The baseline inventory summary presented in this chapter describes Perris's GHG emissions inventory, which has also been compared to the cumulative GHG emissions generated by other jurisdictions participating in the WRCOG Subregional CAP. For the sake of simplicity and efficiency, this report has included both the Community Inventory results and the Government Operations Inventory results in one document. The Community Inventory represents all of the community's activities such as the aggregate residential, commercial, and industrial energy use along with community transportation and waste emissions. The Government Operations Inventory represents what the municipality owns and operates and thus has operational control to implement policy such as government buildings, vehicles and other municipally owned equipment and services.

Baseline Emissions Inventory

Inventory Process

The Community Inventory is intended to promote understanding of the greenhouse gas (GHG) emissions profile of the City of Perris to inform future policy-making. The inventory includes emissions from the following sources and activities over which the City has significant influence:

- Combustion of natural gas in stationary equipment
- Use of electricity
- On-road passenger and freight vehicle travel generated by land uses
- Solid waste generated in the city
- Energy use from potable water treatment and distribution
- Process emissions from wastewater treatment facilities

Inventory Categories

In the community inventory, baseline emissions are categorized into sectors based on the following source(s):

- **Residential Energy:** Residences consume electricity and natural gas for daily operations and heating/cooling.
- **Commercial/Industrial Energy:** Commercial and industrial buildings consume electricity and natural gas for daily operations and heating/cooling. This sector includes all non-residential building energy use, including municipal government buildings, industrial buildings, and commercial buildings.
- **Transportation:** On-road passenger and freight vehicle use results in combustion of gasoline and diesel fuels.
- **Waste:** Disposal of solid waste in landfills causes anaerobic decomposition, which results in GHG emissions (CH_4).
- **Wastewater:** Emissions in this sector are associated with the treatment of community industrial, residential, and commercial wastewater.

The Local Government Operations (LGO) inventory is a subset of the community inventory, and represents what a municipality like Perris owns or operates, and has operational control over, including government buildings, vehicles, and other municipally-controlled equipment and services. While the overall community inventory is important to focus GHG reduction efforts, the LGO inventory provides a closer look at what changes a local jurisdiction can make to improve efficiency and reduce emissions.

The Community Inventory presented herein is intended to promote understanding of the greenhouse gas (GHG) emissions profile of Perris so that it can inform future policy-making. The inventory includes emissions from the following sources and activities over which the City has significant influence:

- Combustion of natural gas in stationary equipment in the community
- Use of electricity by the community
- On-road passenger and freight vehicle travel generated by community land uses
- Solid waste generated by the community
- Energy use from potable water treatment and distribution
- Process emissions from wastewater treatment facilities

COMMUNITY INVENTORY RESULTS

COMMUNITY EMISSIONS TOTAL

Total aggregated community emissions for Perris were approximately 378,099 metric tons (MT) of carbon dioxide equivalent (CO_2e) in the year 2010. When presenting an aggregated number for emissions (in which different sources and activities are added together), it is important to identify any double-counting of emissions that may have occurred. The total stated above includes energy use from potable water, and because this activity includes emissions also captured under broader community

electricity use, a minimal degree of double-counting occurs. This activity is included in the aggregate emissions because many of these emissions are occurring outside of the community boundary and would not be counted by looking at community energy use. The sources included in an aggregate number vary from community to community, so this number should not be used for comparison purposes without a careful analysis of the sources included in the aggregate.

Metric Ton of CO_2e Defined

To understand greenhouse gas in a visual way, it is useful to see how GHG emissions reported as metric tons (MT) of CO_2e can be equated to a various common items. Emitting 1 MT CO_2e is equal to the following:

- 102 gallons of gasoline
- 41 propane cylinders used for home barbecues
- One month's worth of energy used in a house

In contrast, reducing 1 MT CO_2e would require:

- Growing 25 tree seedlings for 10 years
- Recycling 600 pounds of waste instead of throwing it away

Note: Approximate equivalencies adapted from: http://www.epa.gov/cleanenergy/energy-resources/calculator.html

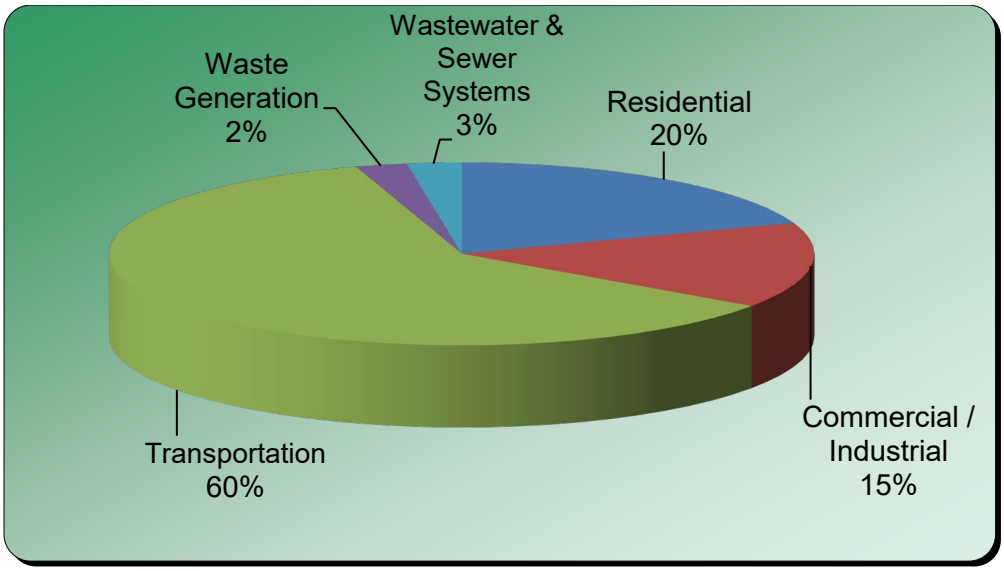
Emissions by Sector

In addition to total emissions, the Perris CAP details emissions by sector. As shown in Table 2-1 and Figure 2-1, CO_2e emissions within the Transportation Sector were the largest source of community emissions (60%). Figure 1 indicates emissions from electricity and natural gas usage within the Residential sector accounted for 20% of total community emissions, with electricity and natural gas consumption within the Commercial/Industrial sector accounting for 15% of the City's overall emissions. The remaining 5% of emissions are split between the Waste and Wastewater sectors. Further details on each sector follow.

Table 2-1: Community Emissions by Sector

Community Emissions by Sector - 2010	Residential	Commercial / Industrial	Transportation	Waste Generation	Wastewater & Sewer Systems	TOTAL
MT CO_2e	73,879	57,258	228,578	8,936	9,447	378,099
% of Total CO_2e	20%	15%	60%	2%	3%	100%

Figure 2-1: 2010 Perris CO_2e Emissions by Sector



Subregional Sector Emissions

Subregion Inventory Results

The baseline GHG inventory for the 12 WRCOG subregion jurisdictions participating in the CAP totals 5,834,400 metric tons (MT) of carbon dioxide equivalents (CO_2e). Figure 2-2 and Table 2-2 provide a breakdown of these emissions by sector. Emissions from the transportation sector accounted for 3,317,387 MT CO_2e, or 57% of the total emissions in the subregion, followed by the commercial/industrial energy sector, which generated 1,226,479 MT CO2e, or 21% of the total. The residential energy sector produced 1,167,843 MT CO2e, or 20% of the total.

Figure 2-2: WRCOG Subregion – Baseline Community Emissions by Sector

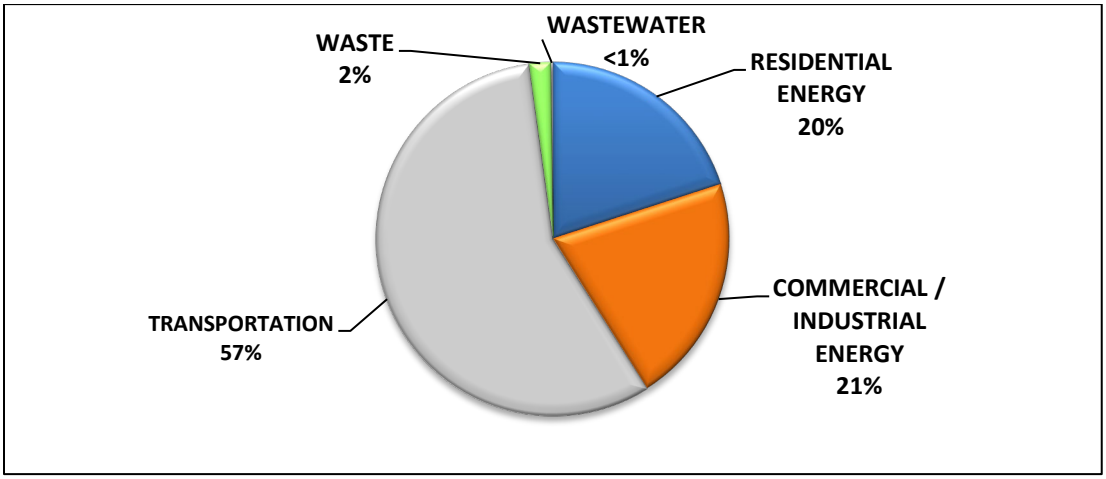


Table 2-2: WRCOG Subregion – Baseline Community Emissions by Sector (MT O_2e)

Sector	Total Emissions (MT CO_2e)	% of Total
Transportation	3,317,387	56.9%
Commercial/Industrial Energy	1,226,479	21.0%
Residential Energy	1,167,843	20.0%
Waste	112,161	1.9%
Wastewater	10,531	0.2%
TOTAL INVENTORY	**5,834,400**	**100%**

Note: Totals may not add up due to rounding

The baseline total GHG inventory for each participating jurisdiction is shown in Figure 2-3 below, sorted by greatest to smallest total emissions. Figure 2-4 shows baseline community emissions by service population for each jurisdiction. Service population is the number of residents and jobs in each community, and can be useful for measuring progress per-unit reduction of GHGs and comparing emissions between jurisdictions. Per capita emissions ranged from 3.6 MT CO_2e emissions per service population in Eastvale to 7.2 MT CO_2e in Calimesa.

Figure 2-3: Baseline Subregion Total Emissions by Jurisdiction (MT CO_2e)

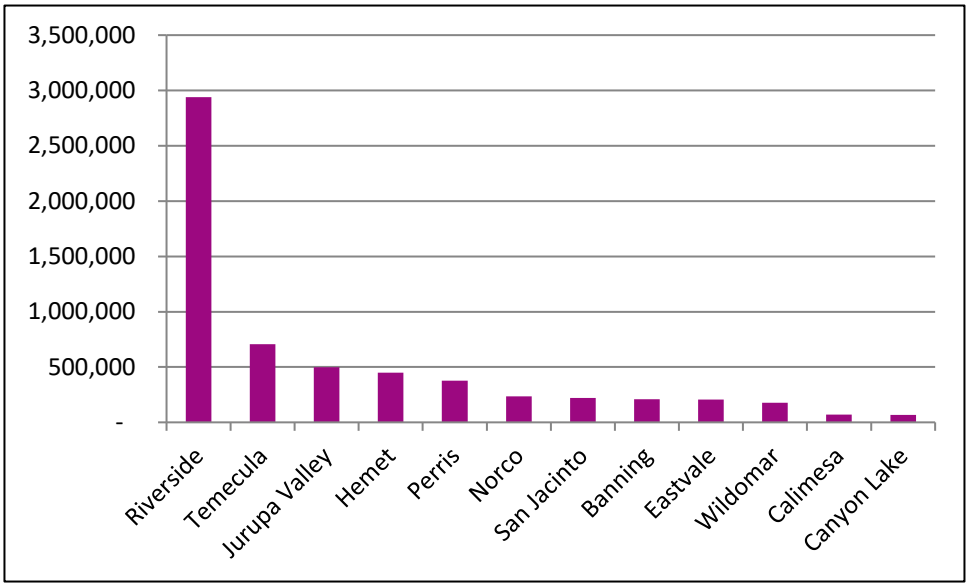
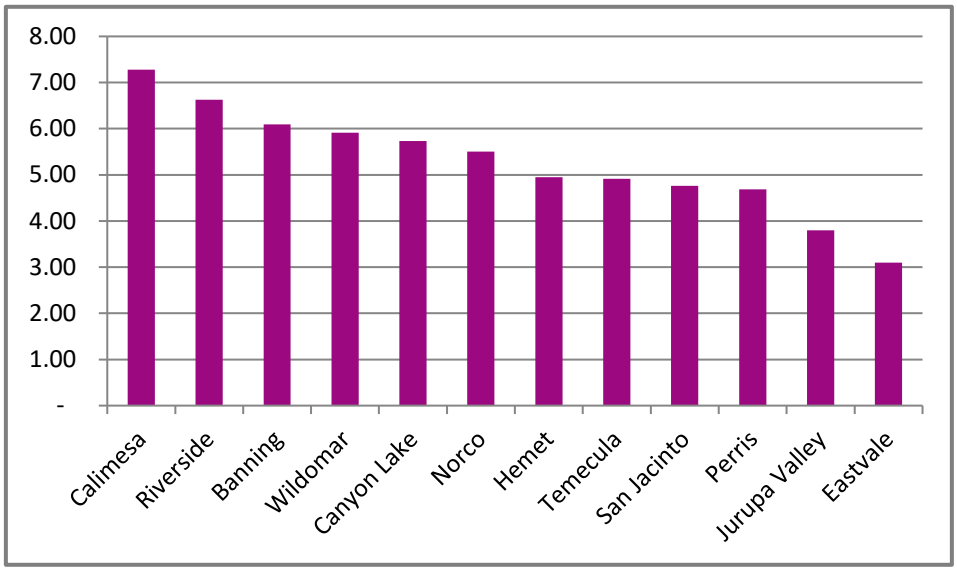
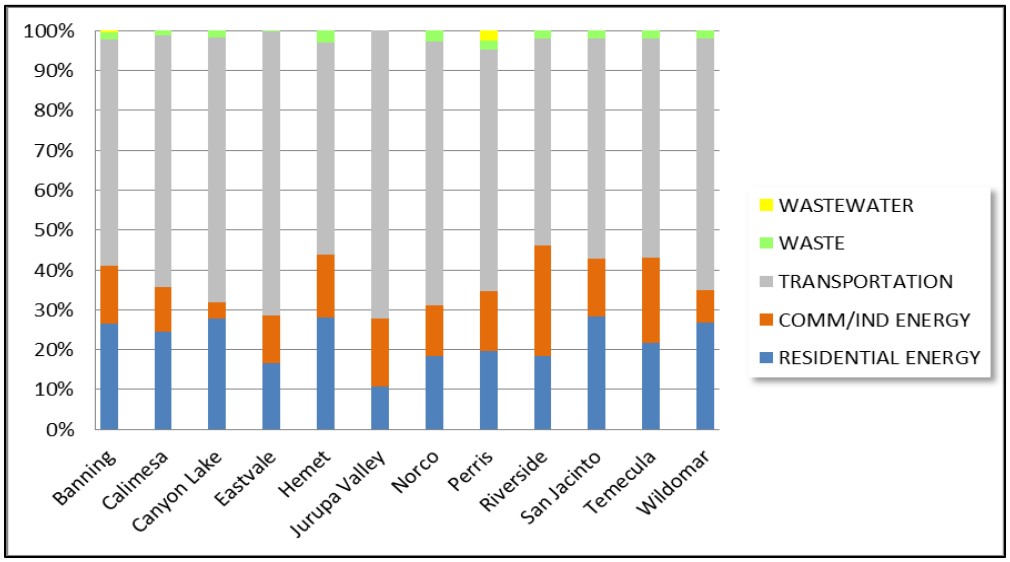


Figure 2-4: Baseline Subregion Jurisdictional Population Emissions (MT CO_2e/SP)



The baseline GHG Inventory by sector for each participating region is shown in Figure 2-5 below. The transportation sector is the largest emissions source in each jurisdiction, followed by residential energy, commercial/industrial energy, and waste for most jurisdictions. For the communities of Jurupa Valley and Riverside, commercial/industrial energy takes up a larger share of emissions than residential energy, due to a more developed commercial and industrial building infrastructure. Perris is the only jurisdiction for which wastewater emissions are included, because it is the only community containing a wastewater treatment plant within its boundaries for which emissions data could be calculated, and these emissions make up a larger share of the Perris inventory than waste-related emissions.

Figure 2-5: Baseline Subregional Emissions by Jurisdiction & Sector



Residential Sector

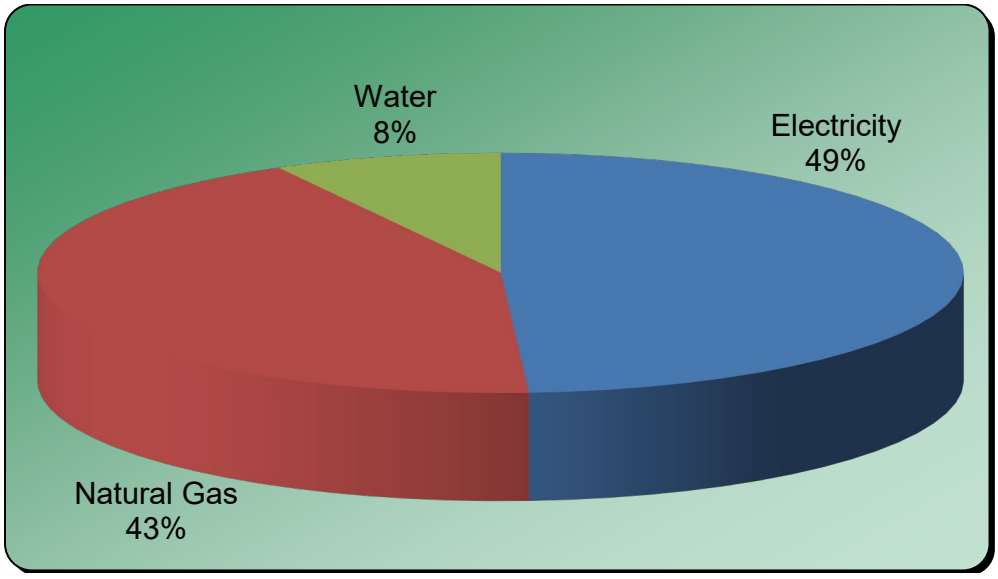
Perris' residential sector generated an estimated 73,879 MT CO_2e in 2010 through consumption of electricity and natural gas. This estimate was calculated using 2010 electricity and natural gas consumption data provided by Southern California Edison and the Southern California Gas Company, respectively. The figure only includes consumption in residential buildings. Data on residential equipment usage, such as lawnmowers or on-site electricity generation, was not included in this estimate. GHG emissions associated with residential transportation and residential waste generation are included separately in the Transportation and Waste sector emissions totals.

Table 2-3 and Figure 2-6 illustrate the breakdown of residential GHG emissions by activity. Nearly 43% of residential GHG emissions were generated from the use of natural gas. Natural gas is typically used in residences as a fuel for home heating, water heating and cooking. Approximately 49% of residential GHG emissions were generated through electricity provided by Southern California Edison. Energy used to transport and treat water for residential use accounted for approximately 8% of Residential energy emissions.

Table 2-3: Residential Emissions by Activity

Residential Emission Sources 2010	Electricity	Natural Gas	Water	TOTAL
MT CO_2e	36,228	31,752	5,899	73,879
% of Total CO_2e	49%	43%	8%	100%

Figure 2-6: Residential Emissions by Activity



Commercial / Industrial

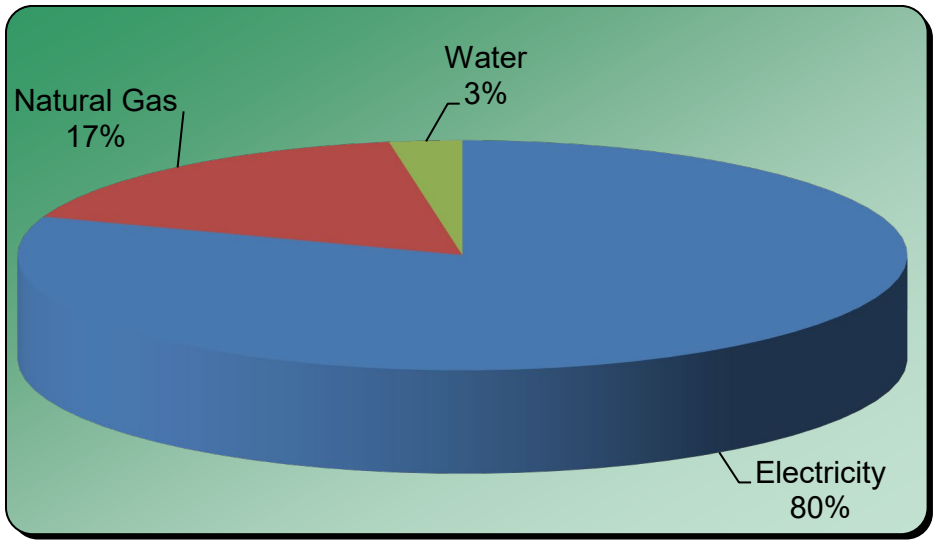
Perris' businesses, industries, and institutions generated nearly 15% of community-wide GHG emissions in 2010, or 57,258 MT CO_2e, in the use of electricity and natural gas.

As illustrated in Table 2-4 and Figure 2-7, 17% of emissions were generated from the combustion of natural gas from such activities as space heating or on-site generation of electricity in industrial facilities. Commercial and industrial electricity consumption accounts for 80% of the Commercial/Industrial GHG emissions total. The remaining 3% of Commercial/Industrial GHG emissions were associated with energy used to transport and treat water used for commercial/industrial purposes.

Table 2-4: Commercial / Industrial Emissions by Activity

Commercial / Industrial Emission Sources 2010	Electricity	Natural Gas	Water	TOTAL
MT CO_2e	46,049	9,693	1,516	57,258
% of Total CO_2e	80%	17%	3%	100%

Figure 2-7: Commercial / Industrial Emissions by Activity



Transportation

As shown previously in Figure 2-1, Perris' Transportation sector accounted for 228,578 MT CO_2e, or 60% of the City's 2010 GHG emissions. The Transportation sector analysis evaluated emissions from vehicle travel associated with land uses in Perris, a preferred method in the Community Protocol.

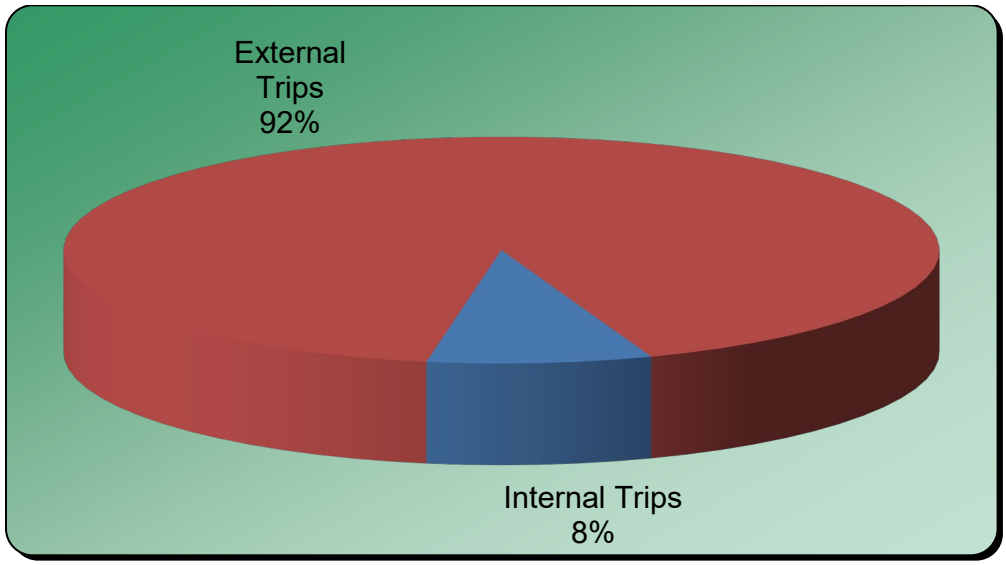
Transportation emissions were included in the City's inventory based on whether vehicle trips began or ended in the community. Internal trips begin and end within the community. External trips either begin or end in the community. Through trips are excluded from both travel modes due to a lack of jurisdictional influence by the City. The analysis encompassed on-road passenger and freight vehicles. Off-road vehicles and air and rail travel were excluded because the City has less jurisdictional influence on those emissions.

Table 2-5 and Figure 2-8 illustrate that nearly 92% of Perris' 2010 transportation-related GHG emissions resulted from external trips, while 8% of emissions resulted from internal trips.

Table 2-5: Community Transportation Emissions

Transportation Emissions Sources 2010	Internal Trips	External Trips	TOTAL
MT CO_2e	18,949	209,629	228,578
% of Total CO_2e	8%	92%	100%

Figure 2-8: Community Transportation Emissions



Waste

As noted above in Figure 2-2 and Table 2-2, the Waste sector constituted 2% of total 2010 emissions. Emissions from the Waste sector are an estimate of methane generation from the decomposition of organic wastes (such as paper, food scraps, plant debris, wood, etc.) that were deposited in a landfill in the base year.

Energy Use from Potable Water Treatment and Distribution

Electricity is needed to move and treat water. Locally pumped and treated water is part of the local electricity consumption data provided by Southern California Edison. However, energy used to import purchased water into the area is not, the emissions totals presented in this section included the emissions associated with treating and transporting water that is used by Perris. Although there may be some double counting with the data provided by Southern California Edison, this double counting will be very small relative to the total electricity use reported by SCE.

Consumers in Perris purchased approximately 10.6 million kgal (thousand gallons) of water annually from the Eastern Municipal Water District (EMWD). EMWD provides and delivers water to most of the City, and the City of Perris controls a small portion of water service mostly in the downtown area (Perris General Plan, 2004). According to the EMWD 2010 Urban Water Management Plan (UWMP), the City of Perris Water System purchased 580,667 kgal (1,700 acre-feet) of wholesale potable water from EMWD in 2010. From this amount, the City consumes a small portion, about 34,000 kgal annually and distributes the remaining within the community. As shown in Table 2-6, the Residential category of the community consumed the largest amount of water within the city, at 80%. The Commercial category accounted for 8% percent of the total, Industrial usage accounted for the lowest water demand, at 2% percent, and Public/ Institutional usage accounted for 10%.

Table 2-6: Energy Use from Potable Water Treatment and Distribution

Category	Purchased Water (kgal)	Cost ($)	% of Total Usage	% of Total Cost
Residential	2,022,231	$6.3	80%	84%
Commercial	192,904	$599,548	8%	7%
Industrial	63,541	$197,486	2%	2%
Public/ Institutional	263,288	$818,302	10%	7%
Total[1]	**10,641,610**	**$7.9million**	**100%**	**100%**

kgal = thousand gallons

[1] Totals may be off due to rounding.

Source: EMWD Usage Report (June 2012); Cost per gallon is estimated based on average flat rates.

Wastewater Treatment Process Emissions

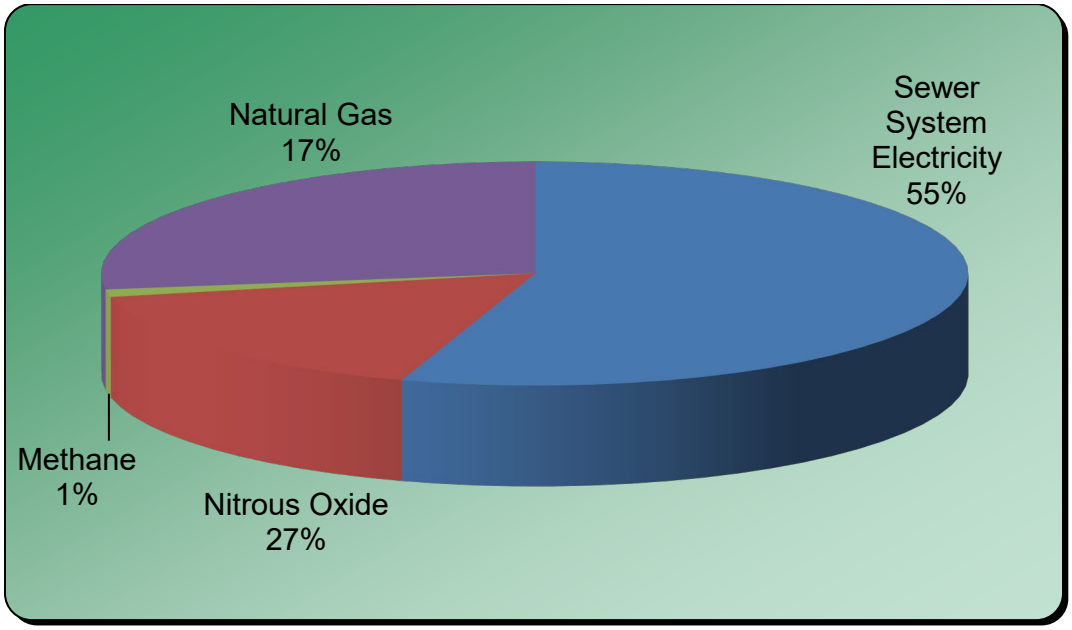
Wastewater coming from homes and businesses is rich in organic matter and has high concentrations of carbon and nitrogen (along with other organic elements). As wastewater is collected, treated, and discharged, chemical processes in aerobic and anaerobic conditions create and emit two GHGs: methane

(CH_4) and nitrous oxide (N_2O). Communities that have a wastewater treatment facility within their boundary often account for these emissions for reporting simplicity, with the understanding that this single community should not be responsible for addressing emissions on behalf of the entire service area.

EMWD's Perris Valley wastewater treatment plant covers approximately 300 acres and has a design capacity of 11 million gallons per day. In 2010, this facility served approximately 120,000 people, including residents and businesses located in Perris, Menifee, and portions of Moreno Valley.

The Wastewater sector had the least amount of emissions in this inventory. Overall, these facilities produced 9,447 MT CO_2e (2% of total emissions). As illustrated in Figure 2-9, the largest source of emissions was Sewer System Electricity.

Figure 2-9: Community Wastewater Process Emissions



Indicator-based Emissions

Table 2-7 provides information on emissions on a per capita, per household, and per service population basis. Service population refers to residential population plus the number of jobs in the community. Perris generated 378,099 MT CO_2e in 2010. These metrics can be useful for measuring progress in reducing GHGs and for comparing emissions with neighboring jurisdictions and against regional and national averages. Per capita emissions were 5.5 MT CO_2e. Emissions per household were 23.1 MT CO_2e. Emissions per service population were 4.7 MT CO_2e.

Table 2-7: Perris Indicator-based Community Emissions

Estimated 2010 Population	**68,386**
Community GHG Emissions (MT CO_2e)	**378,099**
GHG Emissions / Resident (MT CO_2e)	**5.5**
Estimated 2010 Households	**16,365**
Community GHG Emissions (MT CO_2e)	**378,099**
GHG Emissions / Households (MT CO_2e)	**23.1**
Estimated 2010 Service Population	**80,680**
Community GHG Emissions (MT CO_2e)	**378,099**
GHG Emissions / Service Population (MT CO_2e)	**4.7**

GOVERNMENT OPERATIONS INVENTORY RESULTS

The Government Operations Inventory analyzes emissions from scopes, sectors and sources which the local government has operational control over, such as the energy used in City-operated buildings and facilities. Scopes, sectors, and sources are key elements to a government operations inventory because each of these labels help local governments understand where emissions are coming from and what they have direct or indirect control over. The concept of scopes refers to whether or not the local government has control over the direct (on-site) or indirect (off-site) emissions.

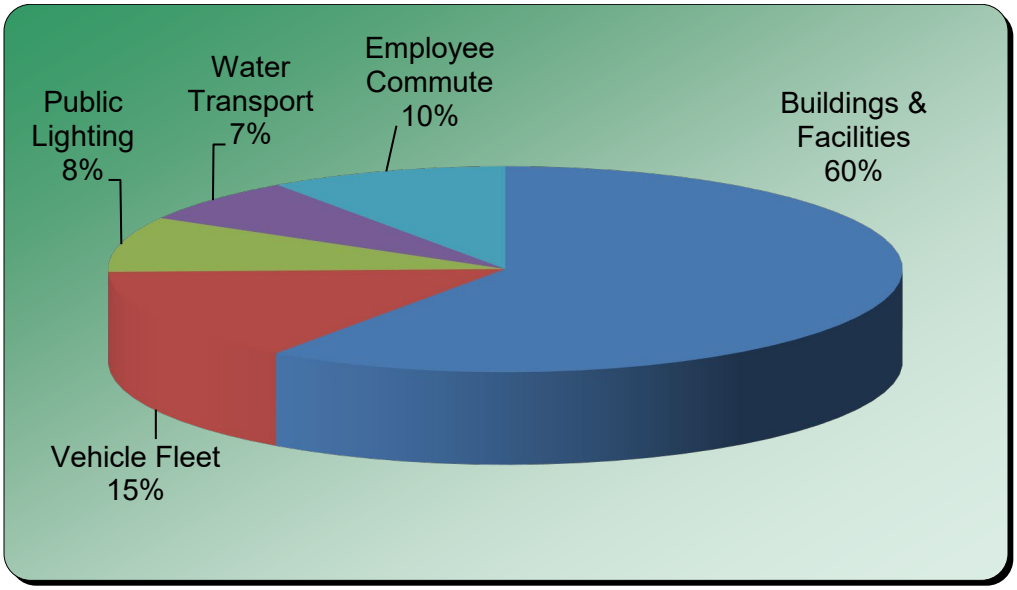
Government Operations Emissions Total

In 2010, Perris's greenhouse gas (GHG) emissions from government operations totaled 1,488 metric tons (MT) of carbon dioxide equivalent (CO_2e). Table 2-8 and Figure 2-10 summarize Perris's government operations emissions by sector.

Table 2-8: Government Operations Emissions by Sector

Government Operations Emissions by Sector	Buildings & Facilities	Vehicle Fleet	Public Lighting	Water Transport	Employee Commute	TOTAL
MT CO_2e	890	220	129	104	145	1,488
% of Total CO_2e	60%	15%	8%	7%	10%	100%

Figure 2-10: Government Operations Emissions by Sector



While the roll-up is a valuable figure, information on the breakdown of emissions from local government operations by scopes, sources, and sectors enables the comparative analysis and insight needed for effective decision-making. The LGO Protocol and ICLEI identify reporting by scopes, sources, and sectors as the strongly preferred form of reporting a government operations GHG inventory. Scopes, as defined below, describes what emissions the local government has direct or indirect control over whereas sources refer to the types of fuel and processes that create emissions and sectors categorize those sources within particular local government departments.

The Scoping Framework

This inventory reports GHG emissions by sector and additionally by "scope," consistent with the LGO Protocol and the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Emissions Protocol Corporate Standard. Emissions are categorized into the following scopes for reporting purposes:

Scope 1: Direct emissions from sources within a local government's operations that it owns and/or controls, with the exception of direct CO_2 emissions from biogenic sources. This includes stationary combustion to produce electricity, steam, heat, and power equipment; mobile combustion of fuels; process emissions from physical or chemical processing; fugitive emissions that result from production, processing, transmission, storage and use of fuels; leaked refrigerants; and other sources.

Scope 2: Indirect emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.

Scope 3: All other emissions sources relevant to local government operations that can be measured and reported. This includes all indirect emissions not covered in Scope 2 that occur as a result of activities within the operations of the local government. Scope 3 emission sources include (but are not limited to) tailpipe emissions from employee commutes, employee business travel, and emissions resulting from the decomposition of government-generated solid waste.

The LGO Protocol provides standard methodologies for calculating emissions from the sources shown in the following table. Other sources of emissions, such as those associated with the production of consumed products do not yet have standard calculation methodologies and are thus excluded from this inventory. As seen below in Table 2-9, Scope 1 emissions accounted for 435 MT CO_2e, Scope 2 for 909 MT CO_2e, and Scope 3 for 145 MT CO_2e.

Table 2-9: Government Operations Emissions by Scope

TOTAL EMISSIONS				
	CO_2e	CO_2	CH_4	N_2O
SCOPE 1	435	274	5.79	0.13
SCOPE 2	909	906	0.01	0.01
SCOPE 3	145	142	0.01	0.01

Buildings and Other Facilities

Facility operations contribute to GHG emissions in two significant ways. First, facilities consume electricity and fuels such as natural gas, which represent the majority of GHG emissions from facilities. In addition, fire suppression, air conditioning, and refrigeration equipment in buildings can emit hydrofluorocarbons (HFCs) and other GHGs when these systems leak refrigerants or fire suppressants. Refrigerants and fire suppressants are very potent GHGs, and have Global Warming Potential (GWP) many thousand times that of CO_2. For example, methane (CH_4), a very common GHG, has a GWP of 21, or 21 times more potent than CO_2.

Perris operates a number of facilities ranging from general City offices to parks and museums. For the purpose of reporting emissions, these facilities were grouped by department when possible. Facilities that were unknown or previously uncategorized were included in this section of the inventory and

assigned to the Buildings, Offices, and Public Safety category. Data relating to natural gas consumption were obtained from the Southern California Gas Company. Data relating to electricity consumption were obtained from Southern California Edison.

The Buildings and Facilities sector produced the largest amount of emissions by sector. Overall, these facilities produced 890 MT CO_2e (60% of total emissions). For the purpose of reporting emissions, these facilities were grouped by general Buildings & Offices and Parks & Recreation facilities. As illustrated in Figure 2-11 and Table 2-10, the facility group producing the most GHG emissions in the Perris was Offices & Public Safety facilities at 75%. The second largest contributor was Parks, Recreation, and Community Centers facilities at 18%.

Figure 2-11: Buildings and Other Facilities by Department

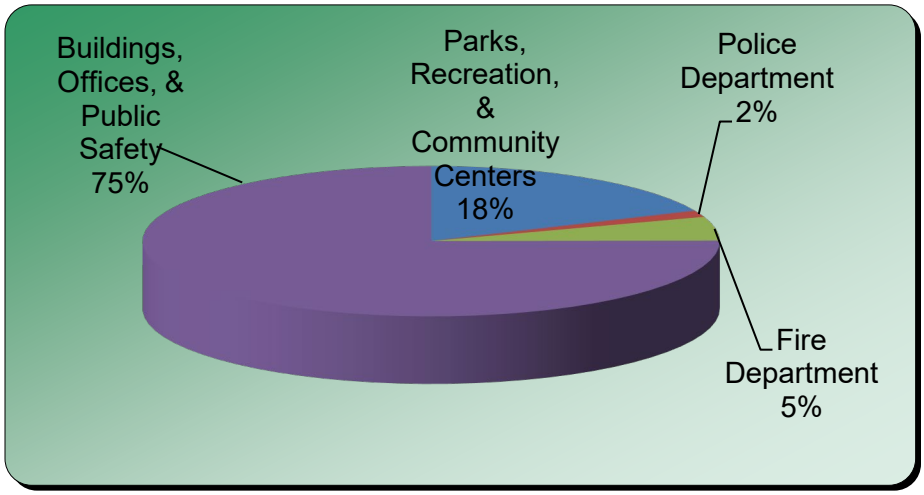


Table 2-10: Buildings and Other Facilities by Department

Buildings and Other Facilities by Department	Parks, Recreation, & Community Centers	Police Department	Fire Department	Buildings, Offices, & Public Safety	TOTAL
MT CO_2e	163	13	46	668	890
% of Total CO_2e	18%	1%	5%	75%	100%
Cost by Department	$140,653	$7,939	$9,519	$337,250	$495,362

As illustrated in Figure 2-12 and Table 2-11 below, the source producing the most GHG emissions in the Buildings and Facilities sector was purchased electricity at 76%, followed by natural gas at 24%.

Figure 2-12: Buildings and Other Facilities by Source

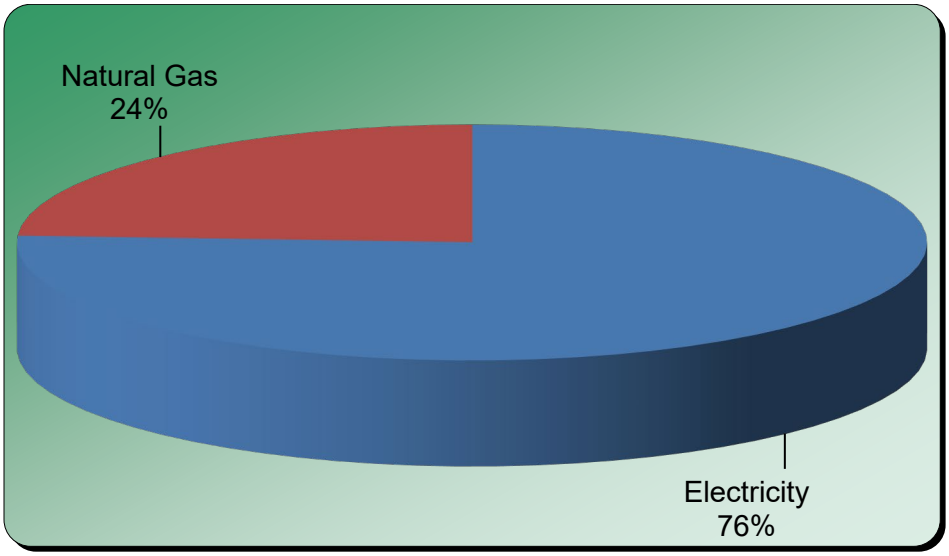


Table 2-11: Buildings and Other Facilities by Source

Buildings and Other Facilities by Source	Electricity	Natural Gas	TOTAL
MT CO_2e	675	214	890
% of Total CO_2e	76%	24%	100%
Cost by Source	$490,410	$4,952	$495,362

Table 2-12: LGO Protocol Report - Buildings Sector Emissions by Scope and Type

BUILDINGS & OTHER FACILITIES					
Scope	**Emission Type**	**Greenhouse Gas Emissions (MT)**			
SCOPE 1		**CO_2e**	**CO_2**	**CH_4**	**N_2O**
	Stationary Combustion	214	60	5.677	0.1
	Total Direct Emissions	**214**	**60**	**5.677**	**0.1**
SCOPE 2		**CO_2e**	**CO_2**	**CH_4**	**N_2O**
	Purchased Electricity	675	673	0.01	0.01
	Total Indirect Emissions	**675**	**673**	**0.01**	**0.01**

Streetlights, Traffic Signals, and Other Public Lighting

Like most local governments, Perris operates a range of public lighting including traffic signals, and street lights. The majority of emissions associated with the operation of this infrastructure are due to electricity consumption. Data relating to electricity consumption for public lighting was obtained from Southern California Edison.

The Public Lighting sector produced the fourth-largest amount of emissions of all sectors overall. Overall, these facilities produced 129 MT CO_2e (9% of total emissions). As illustrated in Table 2-13, the subsector producing the most GHG emissions in the Public Lighting sector is Streetlights at 54%, followed by Traffic Signals/Controllers at 46%.

Table 2-13: Public Lighting Emissions by Subsector

Public Lighting by Subsector	MT CO_2E	% of Sector Emissions	Electricity use (kWh)	Cost ($)
Traffic Signals/Controllers	**59**	**46%**	**205,183**	**$32,290**
Streetlights	**71**	**54%**	**245,632**	**$24,321**
% of Total CO_2e	**129**	**100%**	**450,815**	**$56,611**

Table 2-14 below summarizes the emissions by what level of direct or indirect control the local government has and by what type of GHG was emitted into the atmosphere based on the public lighting activity.

Table 2-14: LGO Protocol Report - Public Lighting Emissions by Scope and Emission Type

STREETLIGHTS, TRAFFIC SIGNALS AND OTHER PUBLIC LIGHTING					
Scope	**Emission Type**	**Greenhouse Gas Emissions (MT)**			
SCOPE 2		**CO_2e**	**CO_2**	**CH_4**	**N_2O**
	Purchased Electricity	**129.480**	**129.008**	**0.001**	**0.001**
	Total Indirect Emissions	129.480	129.008	0.001	0.001
SCOPE 3		**CO_2e**			
		0.00			

Water Transport Services

This sector includes emissions from equipment used for the distribution or transport of water, including drinking water, sprinkler systems and irrigation. Electricity consumption is a significant source of GHG emissions from the operation of water transport equipment. Data relating to electricity consumption was obtained from Southern California Edison.

EMWD provides and delivers water to most of the City, and a small portion of the City is served by the City of Perris Public Works (Perris General Plan, 2004). According to the EMWD 2010 UWMP, the City of Perris Water System purchased 580,667 kgal (1,700 acre-feet) of wholesale potable water from the EMWD in 2010. From this amount, the City consumes a small portion, about 34,000 kgal annually and distributes the remaining within the community. As Table 2-15 indicates, the Water Transport sector produced the smallest amount of emissions overall, with 104 MT CO_2e (7% of total emissions).

Table 2-15: Government Operations Water Transport Services

Scope	Emission Type	Greenhouse Gas Emissions (MT)			
SCOPE 2		**CO_2e**	**CO_2**	**CH_4**	**N_2O**
	Purchased Electricity	104	104	0.004	0.001
	Total Indirect Emissions	**104**	**104**	**0.004**	**0.001**

Vehicle Fleet and Mobile Equipment

The vehicles and mobile equipment used in Perris' daily operations include heavy duty trucks responding to emergency fire calls; heavy and light trucks used for landscape and maintenance tasks; passenger cars, light trucks, and sport utility vehicles (SUVs) driven on a variety of site visits, including building inspections. Most vehicles consume gasoline, some consume diesel, some consume compressed natural gas (CNG), and each results in GHG emissions. Gasoline and diesel-powered maintenance equipment contributes to GHG emissions as well; however, exact figures for off-road fuel consumption could not be acquired for individual equipment, so aggregate fuel data was used. In addition, vehicles with air conditioning or refrigeration equipment use refrigerants that can leak from the vehicle.

In 2010, Perris operated a vehicle fleet with 37 vehicles and other pieces of equipment. The majority of vehicles in the fleet (36%) were used in the Street Maintenance Department. Other vehicles were used by the Police Department, Fire Department, Animal Services Department, Development Services Department, and others.

The Vehicle Fleet sector produced the second-largest amount of emissions in this inventory. Overall, this sector produced 220 MT CO_2e (15% of total emissions). The department producing the most GHG emissions in the Vehicle Fleet sector was the Street Maintenance Department at (15%), followed by the Police Department at (11%). Emissions from vehicle fleet use by department are illustrated in Figure 2-13, and Table 2-16 summarizes the direct and indirect emissions from the vehicle fleet and what types of GHGs were emitted by this sector.

Figure 2-13: Government Operations Vehicle Fleet Emissions by Department

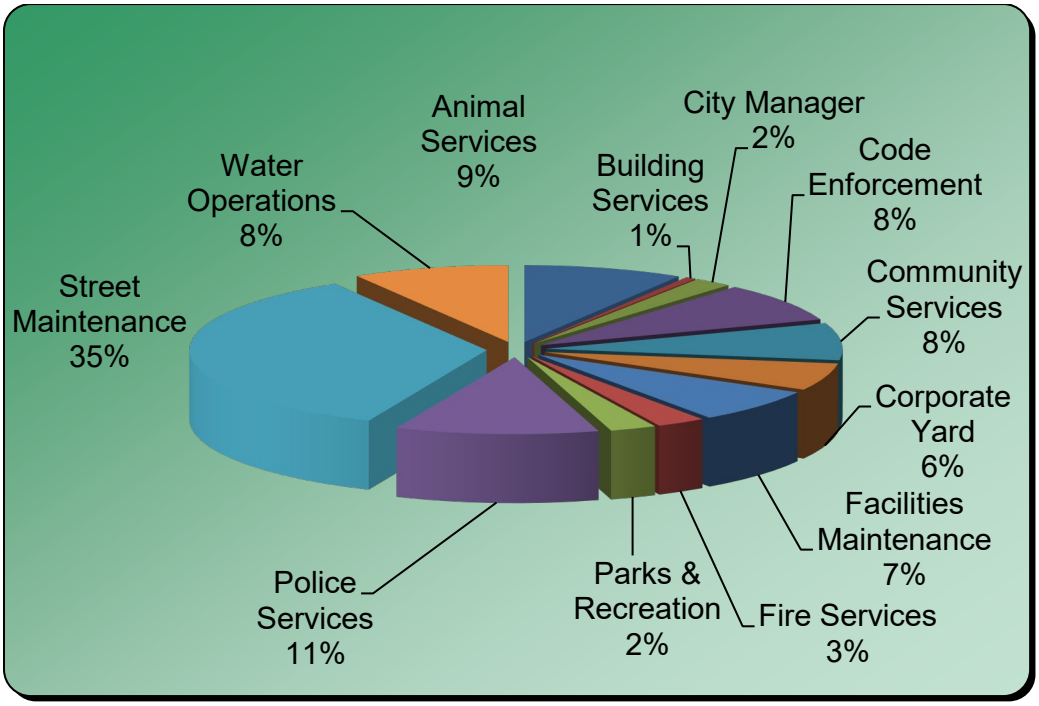


Table 2-16: LGO Protocol Report - Government Operations Vehicle Fleet Emissions by Scope and Emission Type

VEHICLE FLEET					
Scope	**Emission Type**	**Greenhouse Gas Emissions (MT)**			
SCOPE 1		**CO_2e**	**CO_2**	**CH_4**	**N_2O**
	Mobile Combustion	220	214	0.1	0.01
	Total Direct Emissions	**220**	**214**	**0.1**	**0.01**
INDICATORS	Number of Vehicles	37			
	Vehicle Miles Traveled	377,200			
	Gallons Consumed	21,213			

Employee Commute

Emissions in the Employee Commute sector are due to combustion of fuels in vehicles used by government employees for commuting to work at the City of Perris. Results from a survey administered by the City are shown below. Current full-time City staff members were surveyed and 44 responses were collected, resulting in a sample of approximately 77% of employees at 2010 staff levels. The survey was used to collect the data needed to calculate emissions and also capture other information that will help Perris set effective policy addressing this sector.

The Employee Commute sector produced the fourth-largest amount of emissions in this inventory. Overall, as shown by Table 2-17, this sector produced 145 MT CO_2e, or 10% of total emissions. Nearly all vehicles are fueled by gasoline, with only a few using diesel.

Table 2-17: LGO Protocol Report - Employee Commute Emissions by Scope and Emission Type

EMPLOYEE COMMUTE		
Scope	**Emission Type**	**Greenhouse Gas Emissions MT)**
SCOPE 3		**CO_2e**
	Mobile Combustion	145
INDICATORS	Vehicle Miles Traveled	259,961
	Gallons Consumed	16,175

EMISSIONS FORECASTS

Emissions Totals for 2020 and 2035

To illustrate potential emissions growth based on projected trends in energy use, driving habits, job growth, and population growth from the baseline year going forward, this report includes emissions forecasts for the years 2020 and 2035 for both community-wide and government operations emissions. WRCOG utilized the methodology established in the Energy Action Plans (EAP) produced under the Western Riverside Energy Leader Partnership (WRELP) for forecasting growth in energy and water demand within residential, community and government operations. Aggregate growth rates based on service population were applied to the remaining sectors such as Municipal Power Generation, Wastewater, Community Transportation and Community Waste to generate emissions forecasts. The EAP methodology for government operations and community residential and commercial energy and water demand were adopted in this report to maintain consistency throughout the region.

Community Forecast Emissions 2020

In 2020, community-wide emissions are projected to result in 513,764 metric tons (MT) of carbon dioxide equivalent (CO_2e). The 2020 emissions are estimated based on the projected growth in Perris from 2010 to 2020. Growth rates from the EAPs were applied to residential, commercial, and agricultural emissions in order to estimate 2020 emissions. Community waste and wastewater forecasts utilized aggregate growth rates based on service population growth (residents and jobs). These growth percentage figures were then applied to each particular data point (kilowatt hours, vehicle miles traveled, therms of natural gas, etc.) to calculate the projected growth in each inventory sector and the resulting project greenhouse gas (GHG) emissions. Growth in transportation emissions over the forecast period is closely related to planned transportation infrastructure investments and associated vehicle activity, as measured in vehicle miles traveled (VMT). Long-term transportation infrastructure planned through the Southern California Association of Governments (SCAG) 2012-2035 Regional Transportation

Plan/Sustainable Communities Strategy (2012 RTP/SCS), and travel activity projections performed by Fehr & Peers Transportation Consultants using the Riverside County Traffic Analysis Model (RIVTAM) are used as the basis for this plan. Appendix B further describes the VMT modeling process.

Data Inputs

Table 2-18 summarizes the estimated growth in population, households, employment and service population from 2010 to 2020 based on the information from SCAG's 2012 RTP/SCS.

Table 2-18: Estimated Growth from 2010 to 2020

	Population		Households		Employment		Service Population	
City	2010	2020	2010	2020	2010	2020	2010	2020
Perris	68,386	82,000	16,365	22,000	12,294	21,700	80,680	103,700

Emissions by Sector and Source

Table 2-19 summarizes the total amount of community-wide GHG emissions for Perris in 2020 by sector under a business as usual (BAU) scenario. As a community, Perris is projected to emit 513,764 MT CO_2e in 2020. The largest portion of Perris' 2020 emissions are from Transportation (60%), followed by Residential energy use (20%), Commercial energy use (15%), Community Waste (2%) and Wastewater (2%). Figure 2-14 provides a community-wide comparison of 2020 GHG emissions by source.

Table 2-13: 2020 Perris Emissions BAU Forecast by Sector

Sector	2010 (MT CO_2e)	2020 (MT CO_2e)	% Change from 2010 to 2020	Proxy Data Indicator
Residential	73,879	99,318	34%	Households
Commercial	57,258	98,875	73%	Commercial Employment
Transportation	228,578	291,942	28%	RIVTAM
Community Waste	8,936	11,486	29%	Service Population
Wastewater & Sewer System	9,447	12,143	29%	Service Population
TOTAL	**378,099**	**513,764**	**36%**	

Figure 2-13: 2020 Perris Emissions BAU by Source

2020 BAU GHG Emissions by Source			
CATEGORY	MT CO_2e	% OF TOTAL	DATA INPUTS
Electricity	108,360	63%	377.28 million kWh
Natural Gas	55,020	32%	10.34 million therms
Water	9,814	6%	3.36 million kgal
TOTAL	173,195	100%	

Community Forecast Emissions 2035

In 2035, community-wide emissions are projected to result in 690,648 MT CO_2e. The 2035 emissions are estimated based on the projected growth in Perris from 2010 to 2035. The methodology used for forecasting emissions to 2035 is identical to that described above for the 2020 forecast. Data inputs are shown in Table 2-20 below.

Table 2-20: Data Inputs: Population, Households, and Employment for 2010 and 2035

	Population		Households		Employment		Service Population	
City	2010	2035	2010	2035	2010	2035	2010	2035
Perris	68,386	114,000	16,365	30,900	12,294	26,700	80,680	140,700

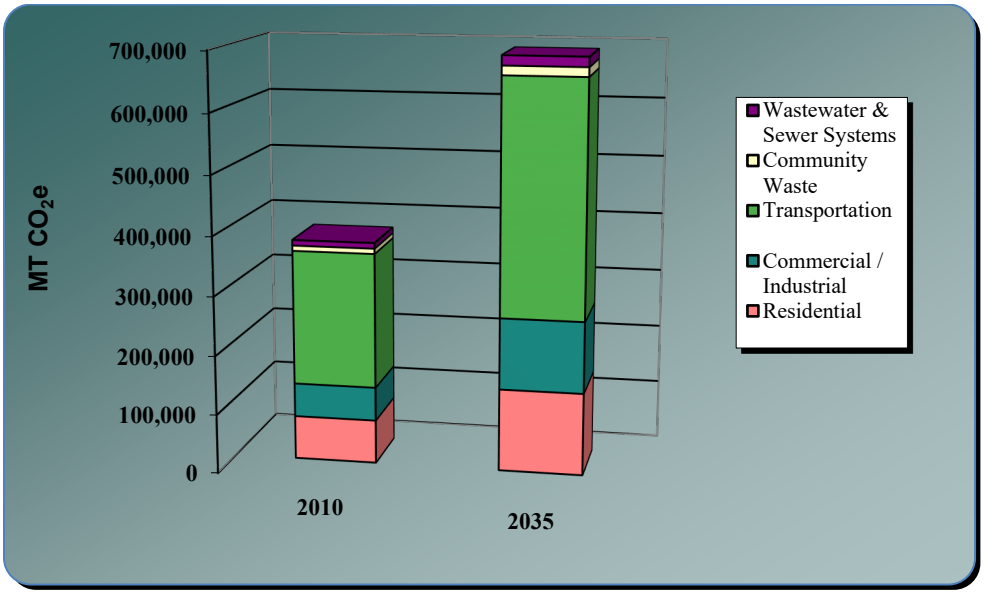
Emissions by Sector

Table 2-21 below summarizes the total amount of community-wide GHG emissions for Perris in 2035 by sector. As a community, Perris is projected to emit 690,648 MT CO_2e in 2035. The largest portion of the City's 2035 emissions are from Transportation (60%), followed by Residential energy use (20%), Commercial energy use (15%), Community Waste (2%) and Wastewater (2%). Figure 2-15 provides a comparison of 2035 GHG emissions by sector.

Table 2-21: 2035 Community Emissions BAU Forecast by Sector

Sector	2010 (MT CO_2e)	2035 (MT CO_2e)	% Change from 2010 to 2035	Proxy Data Indicator
Residential	73,879	139,497	80%	Households
Commercial / Industrial	57,258	120,998	111%	Commercial Employment
Transportation	228,578	398,094	74%	RIVTAM
Community Waste	8,936	15,584	74%	Service Population
Wastewater & Sewer Systems	9,447	16,475	74%	Service Population
TOTAL	**378,099**	**690,648**	**82%**	

Figure 2-14: 2035 Community Emissions BAU by Sector



Government Operations Forecast Emissions 2020

In 2020, government operations emissions are projected to result in 1,571 MT CO_2e. The following sections describe the methodologies for forecasting emissions in the year 2020. Government operations emissions account for a small portion (less than 1%) of the total community-wide emissions.

Data Inputs

For emissions from the following sectors: Buildings and Facilities, Public Lighting, Airports, Vehicle fleet, Employee Commute, and Government Generated Waste, WRCOG uses the EAP forecasting methodology to ensure consistency across the region. This method estimates growth in municipal employment from the overall institutional employment growth projections in SCAG's 2012 RTP/SCS and applies this proxy municipal employment growth rate to baseline emissions to determine emissions growth. For emissions from Water Transport Services, growth in service population (residents and jobs) is used as a proxy growth indicator. The municipal job sector is estimated to grow by 4% from 2010 to 2020. Service population is expected to grow by 29% from 2010 to 2020. Table 2-22 summarizes the growth data inputs for government operations in Perris.

Table 4: Data Inputs: Service Population and Employment for 2010 and 2020

	Service Population		Employment	
City	2010	2020	2010	2020
Perris	80,680	103,700	12,294	21,700

Emissions by Sector

Under a BAU scenario, Perris' government operations emissions are projected to grow by approximately 6% by the year 2020, from 1,489 to 1,571 MT CO_2e. The following Figure 2-16 and Table 2-23 show the results of this forecast.

Figure 2-15: 2020 Government Operations Emissions BAU Forecast by Sector

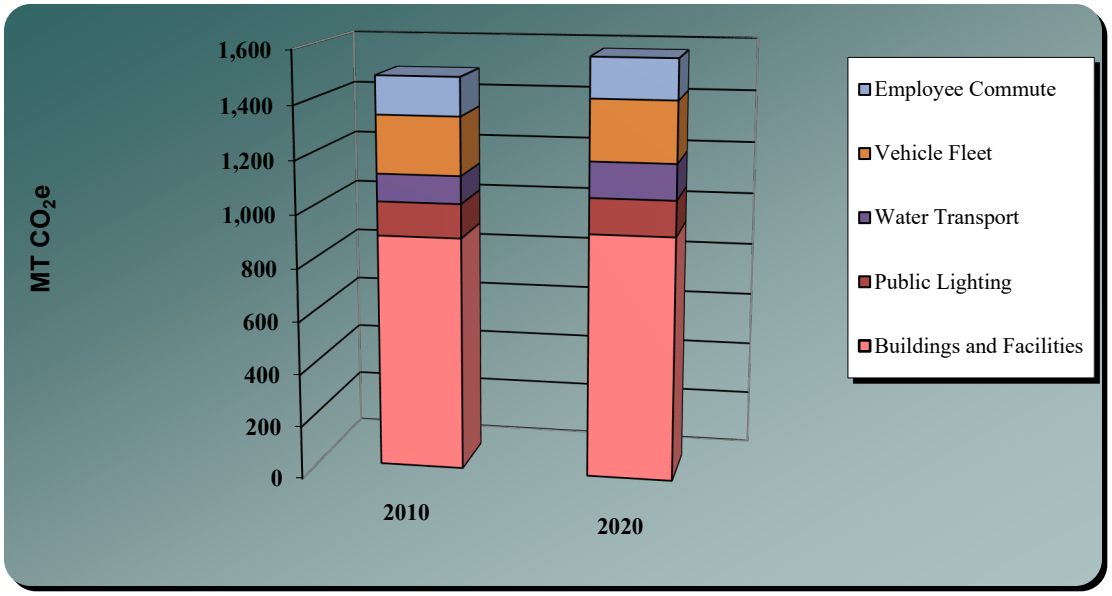


Table 2-23: 2020 Government Operations Emissions BAU Forecast by Sector

Sector	2010 (MT CO_2e)	2020 (MT CO_2e)	% Change from 2010 to 2020	Proxy Data Indicator
Buildings and Facilities	890	924	4%	Municipal Employment
Public Lighting	129	134	4%	Municipal Employment
Water Transport	104	134	29%	Service Population
Vehicle Fleet	220	228	4%	Municipal Employment
Employee Commute	145	151	4%	Municipal Employment
TOTAL	**1,489**	**1,571**	**6%**	

Government Operations Forecast Emissions 2035

This section presents the BAU forecast for government operations emissions to 2035. The methodology is identical to that described above for the 2020 forecast. Table 2-24 summarizes the growth data inputs for 2035 government operations forecasts for Perris. The municipal job sector is estimated to grow by 6% from 2010 to 2020. The service population is expected to grow by 74% from 2010 to 2020.

Table 2-24: Data Inputs: Service Population and Employment for 2010 and 2035

	Service Population		Employment	
City	**2010**	**2035**	**2010**	**2035**
Perris	80,680	140,700	12,294	26,700

Emissions by Sector

Under a business-as-usual scenario, Perris' government operations emissions are projected to grow by approximately 11% by the year 2035, from 1,489 to 1,647 MT CO_2e. Figure 2-17 and Table 2-25 show the results of this forecast.

Figure 2-16: 2035 Government Operations Emissions BAU Forecast by Sector

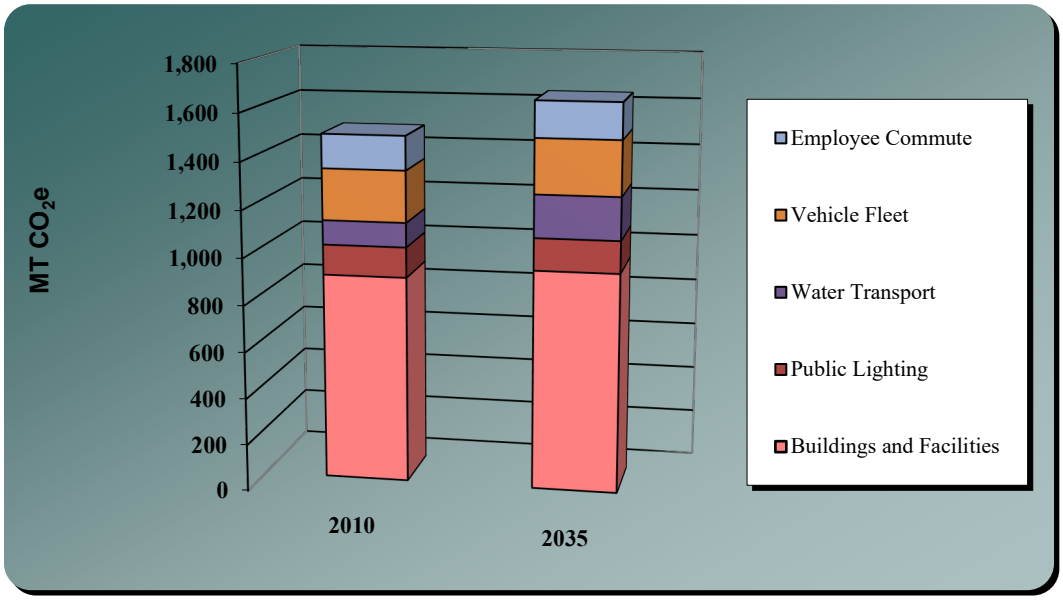


Table 2-25: 2035 Government Operations Emissions BAU Forecast by Sector

Sector	2010 (MT CO_2e)	2035 (MT CO_2e)	% Change from 2010 to 2035	Proxy Data Indicator
Buildings and Facilities	890	942	6%	Municipal Employment
Public Lighting	129	137	6%	Municipal Employment
Water Transport	104	182	74%	Service Population
Vehicle Fleet	220	233	6%	Municipal Employment
Employee Commute	145	154	6%	Municipal Employment
TOTAL	**1,489**	**1,647**	**11%**	

Note: Totals may not add up due to rounding

Conclusion

This analysis found that the Perris community as a whole was responsible for emitting 378,099 metric tons (MT) of carbon dioxide equivalent (CO_2e) in the inventory year 2010, with greenhouse gas (GHG) emissions from Community Transportation contributing the most to this total. With this information, Perris can make more strategic and informed decisions about its own operations and introduce new emission-reduction measures that will help decrease community-wide resource consumption and corresponding greenhouse gas emissions.

CHAPTER 3
GREENHOUSE GAS REDUCTION MEASURES

The emissions projections described in Chapter 2 illustrate the need for Perris to implement strategies to reduce greenhouse gas (GHG) emissions by 2020 and beyond. California has set specific targets for reducing GHG emissions by 2020, and has developed standards to increase energy efficiency and promote renewable energy sources. At the subregional level, WRCOG developed a CAP to assist local cities and jurisdictions in meeting statewide goals, as well as to encourage input and coordination among participating jurisdictions. To meet emissions reduction targets, the WRCOG CAP considers existing programs and policies in the subregion that achieve GHG emissions reductions, in addition to new GHG reduction measures. This CAP uses consistent methodologies and allows jurisdictions to collaboratively implement regionally-effective measures using economies of scale which may lead to lower administrative costs and greater publicity of incentives. Several proposed measures apply to participating jurisdictions uniformly, because they respond to adoption of a state law (e.g., the Low Carbon Fuel Standard) or result from programs administered at the discretion of a utility serving multiple jurisdictions (e.g. utility rebates).

As one of the participating jurisdictions of Western Riverside Energy Leadership Partnership (WRELP), the City worked with Western Riverside Council of Governments (WRCOG) to develop the Perris Community Energy Action Plan (CEAP) to reduce utility costs and greenhouse gas emissions associated with the energy use at the community level. This document was adopted in January 2014. A separate stand-alone document, “City of Perris Municipal Energy Action Plan” (MEAP, Atkins 2012) includes measures that are intended to specifically reduce municipal emissions. Although municipal operations comprise only a small percentage of community-wide emissions, the City leads by example through implementing a variety of reduction measures at the municipal level. A detailed analysis of the City’s municipal GHG emissions is provided in the City’s 2013 MEAP.

FEDERAL, STATE AND REGIONAL REDUCTIONS

Emissions reductions are achieved through the efforts of federal, State, and regional programs, in addition to local measures that jurisdictions such as Perris will implement in their community. State and federal emissions reductions are primarily achieved through regulations, such as efficiency standards for passenger vehicles (e.g., the Corporate Average Fuel Economy standards), reduction in carbon content of transportation fuels (e.g., the Low Carbon Fuel Standard), and minimum renewable energy supply requirements for utilities (e.g., the Renewables Portfolio Standard). Measures regulated and implemented by the State and federal government achieve reductions without additional action by local communities. That is, even if vehicle miles traveled within the subregion remain constant over time, resulting GHG emissions would decrease because as new vehicles are purchased, they would in general be more GHG-efficient than those they replace.

Some State and federal programs also require local action within communities. The California Green Building Standards Code (CALGreen) requires, at a minimum, that new buildings and renovations in

California meet certain design standards. New residential and commercial buildings must meet certain baseline efficiency and sustainability standards. These baselines are established through locally-adopted building codes and will result in GHG reductions. Additional voluntary building code provisions, known as Tier 1 and Tier 2 requirements, can be adopted locally, providing even greater energy savings and emissions reductions.

The Water Conservation Bill, known as SB X7-7, requires the State to reduce urban per capita water use 20% by 2020. Regional Urban Water Management Plans provide strategies and create incentives to achieve these targets, but local implementation strategies vary, and consumer participation is necessary to realize water use reductions. Local implementation strategies typically include tiered pricing or water budget-based (i.e., pricing water according to the amount consumed); water-efficient landscape requirements for water and irrigation management, planting location, and plant materials; and incentives where some utilities pay for turf grass removal and replacement with efficiently-irrigated landscaping.

Regional programs are those developed or administered at a level of government above the local jurisdiction but below the State. These programs often are more responsive to local context than statewide programs. They require local participation but do not require local administration to achieve GHG reductions.

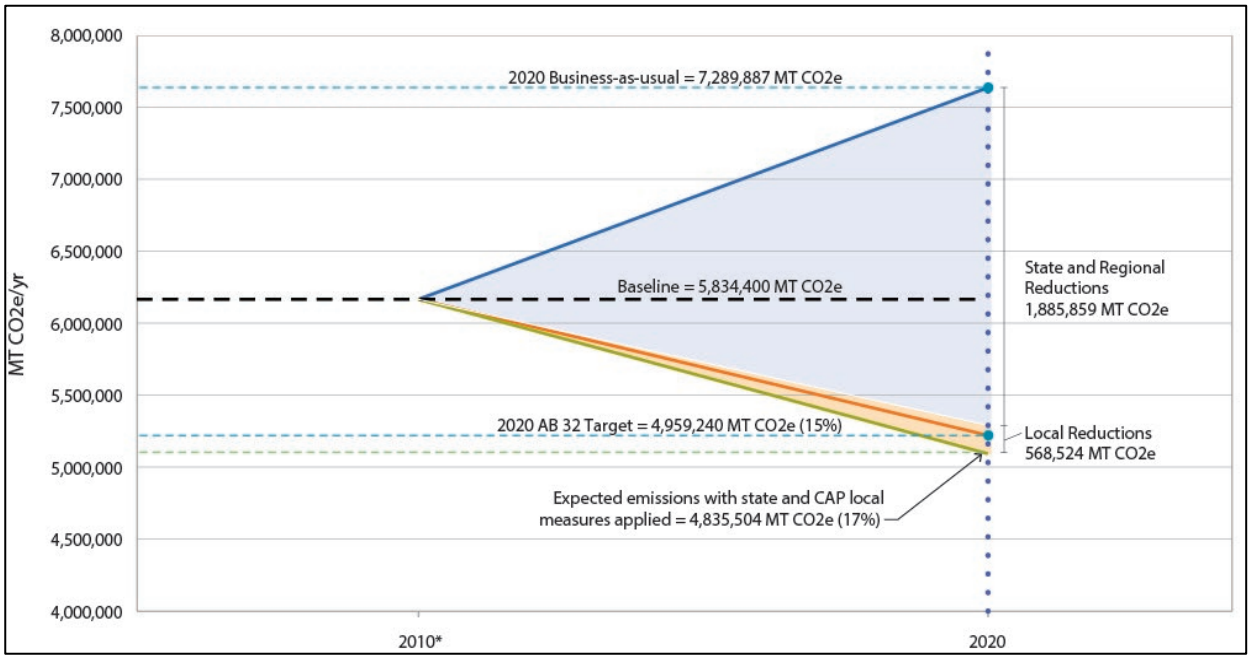
The WRCOG HERO Program, described in Chapter 1, is a regionally-administered program that offers financing options for home and business owners to retrofit or install energy-efficient, water conservation, and/or renewable energy generating products. This program is voluntary and therefore also up to individuals to implement, but regional administration lowers the burden to local governments and has already led to demonstrable reductions in the subregion since the HERO Program's inception in 2011.

WRCOG also administers the TUMF Program. The TUMF Program establishes a funding source to mitigate the cumulative regional transportation impacts of new development on regional arterials. TUMF fees are collected locally, and WRCOG works with its member agencies to identify priority projects to fund using fee revenues in order to reduce subregional transportation impacts caused by development. Facilitating movement on roads, by encouraging non-motorized transportation, increasing access to transit, or easing congestion on critical roadways may lead to GHG reductions. Therefore, TUMF can fund projects that meet this objective. Because the project relies on locally-collected fees, available funding depends on the economic vitality and development opportunities in the region.

A number of other transportation-related programs and projects under the primary control of the Riverside Transit Agency (RTA), Riverside County Transportation Commission (RCTC), California Department of Transportation (Caltrans), and other transportation entities can be implemented to reduce GHG emissions. The long-term planning of major transportation infrastructure is not under the participating jurisdictions' direct control; however, subregional jurisdictions participate in transportation planning decisions in a way that benefits the subregion. Local jurisdictions are in direct control of land uses, which can dictate how future transit is shaped. Individuals also play an important role in how they choose to move throughout the subregion; therefore, while individual jurisdictions do not implement these programs, local input is critical to the success of these programs. Additional projects anticipated to result in GHG reductions include California High Speed Rail, Metrolink expansion, express lanes, congestion pricing, goods movement, high frequency transit service, and electric vehicle infrastructure implementation.

Through federal, state, and regional measures implemented at the subregion level, participating jurisdictions can reduce 2020 emissions by 1,885,859 $MTCO_2e$, representing 77% of WRCOG subregion's 2020 reductions, as illustrated in **Figure 3-1**.

Figure 3-1: GHG Reductions Achieved through State, Regional, and Local Measures



*2010 is used as baseline year for all jurisdictions except for the cities of Eastvale and Jurupa Valley.

Progress Metrics

The GHG reduction potential of each measure is quantified based on the assumption that past trends would continue into the future (e.g., energy consumption, VMT) and standard methods and assumptions recommended by the State (e.g., CAPCOA 2010)[1]. For voluntary programs, the level of participation anticipated by each jurisdiction was developed using case studies and evidence of success with similar programs.

Monitoring emissions and reporting reductions are necessary to validate the success of the measures or to identify measures that are not achieving anticipated reductions. Metrics for monitoring progress are provided for individual measures, although jurisdictions are also encouraged to work with WRCOG to re-inventory local government and community-wide emissions to demonstrate progress.

In addition, CAP measures often have community benefits beyond reducing GHG emissions. These measures can:

- Improve public health by encouraging walking and biking, and reducing air pollution;
- Increasing economic potential of the City of Perris and the subregion by providing development and retrofitting incentives;
- Reducing energy use and lower utility bills; preserve natural resources by consuming and wasting less; and
- Increasing cleaner mobility through alternative transportation measures.

[1] **California** Air Pollution Control Officers Association Report titled Quantifying Greenhouse Gas Mitigation Measures (CAPCOA), 2010

STATE AND REGIONAL (SR) MEASURES

Table 3-1 below lists 2020 reductions potentially achieved through state and regional measures, and the breakdown of the GHG reduction potential for these measures. Following Table 3-1, the state and regional measures listed (SR 1 through 14) are described in detail.

Table 3-1: 2020 Reductions Achieved Through State and Regional Measures

State and Regional Measures by Sector		2020 (MT CO_2e/yr)
SR-1	Renewables Portfolio Standard	434,606
SR-2	2013 California Building Energy Efficiency Standards (Title 24, Part 6)	30,923
SR-3	HERO Residential Program	71,649
SR-4	HERO Commercial Program	10,079
SR-5	Utility Programs	7,873
SR-6	Pavley & Low Carbon Fuel Standard	1,095,555
SR-7	Metrolink Expansions	23,074
SR-8	Express Lanes	60,864
SR-9	Congestion Pricing	3,246
SR-10	Telecommuting	40,576
SR-11	Goods Movement	22,688
SR-12	Electric Vehicle Plan and Infrastructure	81,152
SR-13	Construction and Demolition Waste Diversion	3,574
SR-14	Water Conservation and Efficiency	Not Estimated
TOTAL STATE AND REGIONAL REDUCTIONS		**1,885,859**

Note: Total may not add up due to rounding.

Measure SR-1: Renewables Portfolio Standard

Utilities must secure 33% of their power from renewable sources.

2020 GHG Reduction Potential: 434,606 MT CO_2e/yr

Through a series of increasingly stringent bills first enacted in 2002, California has placed requirements on electric utilities to procure a portion of their energy from renewable sources. The standard, known as the Renewables Portfolio Standard (RPS), applies to investor-owned utilities, publicly-owned utilities, electricity service providers, and community choice aggregators. Therefore, all electricity-providing utilities in Western Riverside (SCE, Riverside Utility and Banning Utility) must meet these targets:

- 20% of retail sales from renewables by 2013
- 25% of retail sales from renewables by 2016
- 33% of retail sales from renewables by 2020

Meeting these goals will likely lead to reduced emissions associated with electricity, as more electricity will be generated by less carbon-intensive sources.

Measure SR-2: 2013 California Building Energy Efficiency Standards (Title 24, Part 6)

Mandatory energy efficiency standards for buildings.

2020 GHG Reduction Potential: 30,923 MT CO_2e/yr

Building energy efficiency standards are designed to ensure new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality. These measures (Title 24, Part 6) are listed in the California Code of Regulations. These standards began in 1978 and are updated every 5 years. The 2013 standards differ from the 2008 standards by requiring usage of less energy for lighting, heating, cooling, ventilation, and water heating. Buildings are also required to be solar-ready, allowing for easier and less expensive installation of photovoltaic or solar thermal panels in the future. The California Energy Commission estimates that the 2013 standards will result in residential construction that is 25% more efficient and nonresidential construction that is 30% more efficient than the 2008 standards. The new standards go into effect on July 1, 2014 and as the industry moves toward the goal of net-zero energy, even greater energy and GHG savings may be achieved over time.

Measure SR-3: HERO Residential Program

Financing for homeowners to make energy efficient, renewable energy, and water conservation improvements.

2020 GHG Reduction Potential: 71,649 MT CO_2e/yr

The HERO Program is a public-private partnership administered by WRCOG, offering financing to homeowners in the subregion for the installation of energy efficient, renewable energy, and water conservation improvements. This property assessed clean energy (PACE) financing program offers a continually expanding list of eligible products for financing and an ever-growing cadre of trained contractors who can assist property owners with selecting and installing eligible products. Products eligible for HERO Financing include, but are not limited to:

- Energy audits
- Insulation of attics, floors, walls, and home perimeter
- Lighting upgrades
- Drip and weather-based irrigation systems
- Rainwater catchment systems
- Pool pumps and heaters
- Energy-efficient windows
- Solar PV panels
- Air sealing and weatherization
- Cool roof system
- Cool wall coatings

This award-winning program is offered to eligible property owners in the WRCOG subregion who wish to participate.

WRCOG's Residential Program partner, Renovate America, collects data regarding participation, energy savings, renewable energy installation, job creation, and economic development by jurisdiction in the subregion. WRCOG will continue to partner with Renovate America to track ongoing participation and energy savings on a monthly or annual basis. Emissions reduction estimates for this CAP were calculated based on program participation assumptions developed by Renovate America. Since its inception in 2011, the HERO program has funded more than $135 million worth of eligible projects, and created more than 1,000 jobs. The program's growth has led to energy savings, GHG reductions, water conservation, and local job creation in each of its participating communities. The HERO program has also been an award-winning model for other PACE programs, earning recognition from various industry organizations including the Southern California Association of Governments, the U.S. Green Building Council, the Urban Land Institute, and the Governor of California.

Measure SR-4: HERO Commercial Program

Financing for business owners to make energy efficient, renewable energy, and water conservation improvements.

2020 GHG Reduction Potential: 10,079 MT CO_2e/yr

The HERO Program is a public-private partnership administered by WRCOG, offering financing to business owners in the subregion for the installation of energy efficient, renewable energy, and water conservation improvements. This PACE financing program offers a continually expanding list of eligible products for financing and an ever-growing cadre of trained contractors who can assist property owners with selecting and installing eligible products. Products eligible for HERO Financing include, but are not limited to:

- Energy audits
- Insulation of attics, floors, walls, and home perimeter
- Lighting upgrades
- Drip and weather-based irrigation systems
- Rainwater catchment systems
- Pool pumps and heaters
- Energy-efficient windows
- Solar PV panels
- Air sealing and weatherization
- Cool roof system
- Cool wall coatings

This award-winning program is offered to eligible property owners in the WRCOG subregion who wish to participate.

Measure SR-5: Utility Programs

Financing for business owners to make energy efficient, renewable energy, and water conservation improvements.

2020 GHG Reduction Potential: 7,873 MT CO_2e/yr

Southern California Edison (SCE), Southern California Gas Company (SCG), Riverside Public Utilities (RPU), and the Banning Electric Utility (BEU) provide energy to customers in the subregion. Each utility offers rebate programs to reduce energy consumption, which in turn, reduces local GHG emissions. The utilities offer a selection of rebates and other incentives to assist property owners (residential and commercial) with the installation of energy- and water-saving products. The following list provides a sample of programs and indicates which utilities are currently offering:

- ENERGY STAR™ appliance rebates – SCE, SCG, RPU, BEU
- Light bulb discounts – SCE
- Solar rebates – SCE, RPU
- Low-income programs – SCE, SCG, RPU, BEU
- Shade trees – RPU, BEU

Note: Some programs may have funding cycle and annual rebate limits; check with your local utility for up-to-date information regarding specific rebates.

These utility programs are provided to customers throughout the subregion and are managed at the discretion of each participating utility. Therefore, they do not have tiered implementation actions.

State and Regional Transportation Measures

The following are state and regional measures that are expected to reduce GHG emissions associated with the transportation sector.

Measure SR-6: Pavley and Low Carbon Fuel Standard

Requirements for vehicles to use cleaner fuels.

2020 GHG Reduction Potential: 1,095,555 MT CO_2e/yr

In 2002, California adopted AB 1493, referred to as "Pavley I", which directed CARB to develop fuel-efficiency standards for passenger vehicles in California by 2005. Through a series of rulings, CARB and the federal government agreed on federal standards that began in 2009 and increase through 2016. CARB and the federal government are currently finalizing fuel-efficiency standards that continue to become increasingly-stringent from 2017 through 2025. Building from Pavley I, Executive Order S-1-07, known as the Low Carbon Fuel Standard (LCFS), requires the carbon-intensity of California's transportation fuel to be reduced by at least 10% by 2020.

Measure SR-7: Metrolink Expansion

Additional Metrolink transit service provided to Western Riverside County.

2020 GHG Reduction Potential: 23,074 MT CO_2e/yr

Identified in SCAG's 2012 RTP/SCS, the Metrolink Perris Valley Line will be extended from Riverside to Perris in Western Riverside County, allowing for alternative transportation, reducing VMT and GHG emissions in Western Riverside County. Service along this route is expected to begin in late 2015.

Measure SR-8: Express Lanes

Add express lanes along major freeways in Western Riverside County.

2020 GHG Reduction Potential: 60,864 MT CO_2e/yr

SCAG's analysis of critical corridors found inter-county trips account for over 50% of all trips. Ongoing congestion issues—and therefore increased idle time and GHG emissions—have led to SCAG proposing increasing the network of express lanes that connect counties, including Riverside County. Extension of express lanes along State Route-91 (SR-91) and Interstate-15 (I-15) would be operational by 2017 and 2020 respectively, and would lead to reduced congestion according to regional transportation modeling. The SR-91 extension project is currently under construction. The I-15 Toll Express Lanes from State Route-60 (SR-60) to Cajalco Road has entered the preliminary engineering phase, and the anticipated opening year is 2020.

Measure SR-9: Congestion Pricing

Pricing mechanisms to discourage automobile travel by increasing travel costs.

2020 GHG Reduction Potential: 3,246 MT CO_2e/yr

Transportation demand management (TDM) consists of methods used to encourage transportation other than single-occupancy vehicle travel at peak traffic times. TDM strategies and are generally categorized as "soft" or "hard" strategies. Soft mechanisms are incentive-based and include:

- Increasing the availability and use of carpooling, vanpooling, transit, bicycling, and walking
- Shifting work schedules to non-peak periods or locations
- Telecommuting

Congestion pricing is a TDM tool examined by SCAG through its Express Travel Choices Study. Pricing mechanisms may include toll lanes/roads or mileage-based user fees, which discourage automobile traveling by increasing travel costs. Currently an expansion of the toll lanes on SR-91 is planned to continue these toll lanes through Corona and into Riverside.

The effectiveness of congestion pricing reflects the regional share of VMT reduction associated with this strategy, in addition to local actions. This approach accounts for the high degree of out-commuting that currently occurs in Western Riverside County as residents travel to jobs in Los Angeles, San Bernardino, and Orange Counties. Since many TDM strategies will be implemented at employment locations instead of residential locations, a separate accounting is needed in addition to the jurisdiction-specific TDM strategies identified in this Subregional CAP.

Measure SR-10: Telecommuting

Reducing the amount of vehicle miles travelled from commuting by encouraging telecommuting practices.

2020 GHG Reduction Potential: 40,576 MT CO_2e/yr

Telecommuting is a soft TDM mechanism that has increased considerably over the past decade. According to SCAG, telecommuting could increase even more by 2020 (to 5% of workers in the region) and 2035 (to 10% of workers), from the current 2.6% that currently telecommute. By telecommuting, GHG emissions associated with vehicles no longer on the road are reduced, as are idling or congestion-related emissions from vehicles remaining on the road. Similar to **Measure SR-9: Congestion Pricing**, this strategy reflects the regional share of TDM strategies that may be implemented on a regional level given the high degree of out-commuting that occurs in Western Riverside County.

Measure SR-11: Goods Movement

Efficient movement of goods through inland Southern California.

2020 GHG Reduction Potential: 22,688 MT CO_2e/yr

Southern California is a major hub for importing and exporting goods. SCAG estimates that over $2 trillion in cargo was moved across the region in 2010 alone, much of which travels through inland Southern California, including Western Riverside County. However, the many warehouses and distribution facilities employ non-passenger vehicles that contribute to GHG emissions. At the state level, more standards are being implemented to increase vehicle efficiencies and the 2012 RTP/SCS and AQMD are supporting greater penetration of low-emission trucks in the region. While goods will continue to be moved to support local and regional economies, electrification and other low-emission technologies installed in vehicles can reduce the GHG emissions of goods movement. The GHG reductions estimated here account for the region's "share" of SCAG and AQMD's anticipated investments and the effect of the investment on GHG emissions. These investments include both policies as well as physical improvements such as "truck climbing" lanes on State Route-60 (SR-60), funded by RCTC.

Measure SR-12: Electric Vehicle Plan and Infrastructure

Facilitate electric vehicle use by providing necessary infrastructure.

2020 GHG Reduction Potential: 81,152 MT CO_2e/yr

SCAG has developed a regional plug-in electric vehicle (PEV) readiness plan, and WRCOG has a similar subregional plan for PEV readiness. Together, these plans identify viable locations for charging stations, changes to development codes, and other strategies to encourage the purchase and use of electric vehicles. PEV chargers are already being installed in the WRCOG subregion. Through these plans and outreach efforts, alternative-fuel vehicles will be promoted as one strategy to reduce GHG emissions associated with passenger vehicles. This measure is anticipated to reduce nearly 82,000 MT CO_2e in participating jurisdictions by 2020.

State Solid Waste Measure

The following state measure is expected to reduce GHG emissions associated with the solid waste sector.

Measure SR-13: Construction & Demolition Waste Diversion

Mandatory requirement to divert 50% of construction and demolition waste from the landfill waste stream.

2020 GHG Reduction Potential: 3,574 MT CO_2e/yr

Recycling construction and demolition materials reduces GHG emissions by removing material from landfills that would otherwise generate methane. Construction and demolition (C&D) waste recycling also may reduce the need to harvest and transport new raw construction materials, as recycled materials can be locally repurposed and reused. For growing areas like the WRCOG subregion, C&D waste accounts for a significant portion of the waste stream.

Effective July 1, 2012, CALGreen, the state's Green Building Standards Code, requires jurisdictions to divert a minimum of 50% of their nonhazardous C&D waste from landfills.

State and Regional Water Measures

The following state measure is expected to reduce GHG emissions associated with the water sector.

Measure SR-14: Water Conservation and Efficiency

State requirement to reduce urban per capita water use.

2020 GHG Reduction Potential: not estimated

SB X7-7 is part of a California legislative package passed in 2009 that requires urban retail water suppliers to reduce per-capita water use by 10% from a baseline level by 2015, and to reduce per-capita water use by 20% by 2020. In Southern California, energy costs and GHG emissions associated with the transport, treatment, and delivery of water from outlying regions are high. Therefore, the region has extra incentive to reduce water consumption. While this is considered a state measure, it will be up to the local water retailers, jurisdictions, and water users to meet these targets. A number of policies have been established at the local level to require more efficient use of water, including landscape ordinances that require native or low-irrigation landscaping. Water retailers also offer resources that incentivize purchase of high-efficiency appliances and provide information on best management practices, landscaping, and the use of recycled and gray water systems.

While emissions reductions associated with water conservation efforts are likely, the emissions inventories do not separately include a water emissions sector. Therefore, to be conservative in estimating the CAP's emissions reduction potential, reductions associated with this measure are not quantified here. Future emissions inventory updates may include a separate water emissions sector, in which case it would be appropriate to estimate the reduction potential of water conservation efforts.

LOCAL GHG REDUCTION MEASURES

While federal, state, and regional measures are critical to meet emission reduction goals, choices made by local government, residents, and business owners will determine the region's ability to achieve the overall emissions reduction target. Through outreach campaigns, incentives, zoning changes, and ordinances, Perris and other cities will achieve additional reductions.

The following local measures were identified in WRCOG's Subregional Climate Action Plan and were selected for inclusion in the Perris CAP. Cities and other jurisdictions were given the opportunity to decide their potential level of commitment to a variety of GHG emission reduction strategies. These reduction measures are organized into major economic sectors similar to the emissions inventory: Energy – including electricity and natural gas consumption, Transportation and Land Use, and Solid Waste measures (E-1, T-1 through T-12, and SW-1 and SW-2). **Table 3-2** lists these measures with a breakdown of the GHG reduction potential for each.

Table 3-2: 2020 GHG Reduction Levels to be Achieved by Local Measures

Local Measures by Sector		2020 Reductions to be Achieved (MT CO_2e/yr)
Energy		
E-1	Energy Action Plan	357,581
Transportation		
T-1	Bicycle Infrastructure Improvements	29,255
T-2	Bicycle Parking	6,290
T-3	End of Trip Facilities	1,836
T-4	Transit Frequency Expansion	2,723
T-5	Traffic Signal Coordination	94,600
T-6	Density	2,857
T-7	Mixed-Use Development	4,069
T-8	Design/Site-Planning	912
T-9	Pedestrian Only Areas	2,812
T-10	Limited Parking Requirements for New Development	28,423
T-11	Voluntary Transportation Demand Management	2,464
T-12	Accelerated Bike Plan Implementation	5,340
Solid Waste		
SW-1	Yard Waste Collection	1,007
SW-2	Food Scrap and Paper Diversion	155
Local Measures Implemented by Other Participating WRELP Jurisdictions Traffic and Street Lights, Shade Trees, Promotional Transportation Demand Management, Transit Service Expansion, High Frequency Transit Services, Fixed Guideway Transit, Neighborhood Electric Vehicle Programs, and Subsidized Transit		28,200
TOTAL LOCAL ACTION REDUCTIONS		**568,524**

Local Energy Measures

A detailed description of the local measures to be implemented by the City of Perris for reduction of GHG emissions associated with the energy sector are described below. As described in Chapter 1, Perris is participating in the Western Riverside Energy Leader Partnership (WRELP) Program, which has developed municipal and community-wide Energy Action Plans (EAPs) for many jurisdictions in the subregion (**Table 1-1**). Measure E-1 includes the aggregate total GHG reduction potential for the 11 WRELP jurisdictions implementing the EAP.

Measure E-1: Energy Action Plans

Improve municipal and community-wide energy efficiency and reduce energy consumption through the adoption of local Energy Action Plans (EAP).

2020 GHG Reduction Potential: 357,581 MT CO_2e/yr

In 2011, Southern California Edison (SCE) provided funding to WRCOG to implement the California Long-Term Energy Efficiency Strategic Plan (CEESP) developed by the California Energy Commission. WRCOG and 11 participating jurisdictions established the WRELP Program and adopted energy efficiency targets and programs to meet those targets, which will reduce utility costs and GHG emissions associated with the energy use at the municipal and community level (**Table 1-1**). These targets and actions are captured in each jurisdiction's EAP. The EAPs use a similar approach to that described in this CAP, but only address emissions and GHG reductions associated with the energy sector. By implementing the proposed efficiency measures, jurisdictions demonstrate the potential economic, social, and environmental benefits of increasing energy efficiency and providing environmental stewardship within the community.

	ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
	This measure does not include tiered implementation actions. Perris has individual energy-conserving measures and actions in its EAP. Energy sector reductions anticipated will be tracked and reported in conjunction with the measures proposed within the CAP.	357,581
	PROGRESS INDICATORS	**YEAR**
1	A WRELP jurisdiction, Perris has received a tracking and monitoring tool to identify City's energy usage projections and goals, with a user-friendly workbook to evaluate emissions annually. Each jurisdiction has its own monitoring tool, but the assumptions used are consistent across all tools in the subregion and can be aggregated for subregional monitoring and reporting.	2020

Local Transportation and Land Use Measures

The following are local measures that Perris will implement, along with other WRELP jurisdictions, to reduce GHG emissions associated with the transportation and land use sector.

Measure T-1: Bicycle Infrastructure Improvements

Expand on-street and off-street bicycle infrastructure, including bicycle lanes and bicycle trails.

2020 GHG Reduction Potential: 29,255 MT CO_2e/yr

By providing more bicycle lanes and better connections between existing bicycle lanes, jurisdictions can increase the viability of bicycling as an emission-free commute option. Perris's Master Trails Plan promotes bicycle lanes throughout the City to increase alternative transportation options and reduce vehicle miles traveled and congestion for vehicles. Community health benefits from increased bicycling include improved air quality and exercise.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Along with other participating jurisdictions at this level, implement a 10% increase in bicycle lane mileage from baseline levels	**13,350**
PROGRESS INDICATORS	**YEAR**
1 Annual percentage increase in bicycle lane mileage from baseline levels.	2020

Measure T-2: Bicycle Parking

Provide additional options for bicycle parking.

2020 GHG Reduction Potential: 6,290 MT CO_2e/yr

Safe and convenient bicycle parking is a relatively low-cost action that leads to a demonstrated shift from automobile use to bicycle use. Helping business owners understand the potential benefits of bicycle parking and requiring new development projects to include bike racks as a condition of approval can facilitate implementation of this measure.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Along with other participating jurisdictions at this level, amend zoning code to require bike parking for all multi-family or mixed-use projects consisting of a mix of residential, retail, and office space.	**6,152**
PROGRESS INDICATORS	**YEAR**
1 Annual number of new bicycle parking slots installed.	2020

Measure T-3: End of Trip Facilities

Measure T-3: End of Trip Facilities

Encourage use of non-motorized transportation modes by providing appropriate facilities and amenities for commuters.

2020 GHG Reduction Potential: 1,836 MT CO_2e/yr

End-of-trip commuter facilities further incentivize alternative transportation modes, such as walking and biking. Such facilities commonly include showers, changing rooms, lockers, and bike racks.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Along with Banning and Jurupa Valley, amend zoning to require installation of end-of-trip facilities for new commercial buildings greater than 100,000 square feet.	391
PROGRESS INDICATORS	**YEAR**
1 Annual number of development projects installing end-of-trip facilities.	2020

Measure T-4: Transit Frequency Expansion

Collaborate with local and regional transit providers to provide more frequent transit in the subregion.

2020 GHG Reduction Potential: 2,723 MT CO_2e/yr

Future annual transit ridership is expected to grow by 3.5% across the nation, and many transportation systems are already operating beyond their capacity (APTA 2010). In addition to expanding service, transit agencies will need to increase service frequency by reducing headways or the time between buses on existing routes. Similar to transit service expansion, this measure provides air quality and mobility co-benefits by reducing the number of single-occupancy vehicles on the road. Information related to this measure may be updated upon completion of the RTA Forward 10-Year Transit Plan, a comprehensive operational analysis that will guide RTA's bus route and service decisions in future years. This measure considers service improvements along existing routes.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris will work with RTA to increase fixed-route service frequency by 20% over baseline levels in transit priority areas as defined by SCAG in the RTP/SCS.	**698**
PROGRESS INDICATORS	**YEAR**
1 Percentage change in average annual fixed-route service frequency in transit priority areas compared to baseline levels.	2020

Measure T-5: Traffic Signal Coordination

Incorporate technology to synchronize and coordinate traffic signals along local arterials.

2020 GHG Reduction Potential: 94,600 MT CO_2e/yr

Traffic signal coordination is a method of timing groups of traffic signals along an arterial to provide smooth movement of traffic with minimal stops. This technique reduces motorist stops and delays, lowers the amount of fuel needed to move a certain distance, and reduces GHG emissions. Signal coordination also lessens congestion and resulting tail pipe emissions, which reduces GHG emissions and improves air quality.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris, along with Canyon Lake, Riverside and Temecula, will coordinate traffic signals on an additional 50% of arterial roads not coordinated in the base year.	78,318
PROGRESS INDICATORS	**YEAR**
[1] Annual percentage of arterial roads with signal coordination which were not coordinated in the base year.	2020

Measure T-6: Density

Improve jobs-housing balance and reduce vehicle miles traveled by increasing household and employment densities.

2020 GHG Reduction Potential: 2,857 MT CO_2e/yr

Density describes the number of people, jobs, or housing units in a given area. Increasing density generally results in shorter distances between locations, making transit and non-motorized transportation options such as walking and biking more viable. GHG emissions associated with vehicle miles traveled (VMT) are reduced as more individuals choose alternative transportation modes. Increases in density must generally fit within assumptions of a jurisdiction's General Plan, although amendments can be made to increase density in certain areas, as the City of Perris has implemented.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris, Riverside and Temecula will achieve a 10% increase in community-wide household and employment density over baseline conditions by 2020.	2,054
PROGRESS INDICATORS	**YEAR**
1 Annual percentage change in community-wide household and employment density compared to baseline conditions	2020

Measure T-7: Mixed-Use Development

Provide for a variety of development types and uses.

2020 GHG Reduction Potential: 4,069 MT CO_2e/yr

Development can occur in many forms, ranging from single-family homes on large plots of land to multi-family housing with high vertical construction for residential areas, and single-use to multi-use zoning for commercial properties. While land development choices are typically made at the household or business level, recent studies show that individuals are more frequently demanding higher-density, multi-use regions that are more walkable. Most WRCOG jurisdictions have identified portions of their communities where future higher-density development is desirable. Such development reduces both VMT and GHGs, as individuals can accomplish many tasks in a single mixed-use area. This also can improve community health by encouraging bicycling and walking, improve air quality by reducing tailpipe emissions, and increase the community's sense of place.

WRCOG has classified mixed-use development as having at least three of the following features either on-site or within ¼ mile:

- Residential development
- Retail development
- Park
- Open space
- Office

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris and Hemet will achieve a 10% jobs/housing ratio improvement over baseline conditions.	764

PROGRESS INDICATORS	YEAR
1 Annual percentage change in jobs/housing ratio within new development areas compared to baseline conditions.	2020

Measure T-8: Design/Site Planning

Design neighborhoods and sites to reduce VMT.

2020 GHG Reduction Potential: 912 MT CO_2e/yr

The design of projects affects travel behavior. Typical suburban development patterns feature longer blocks which often discourage walking and biking. Conversely, projects with shorter blocks and more frequent intersections have higher levels of walking, biking, and transit use. This higher use of non-motorized and alternative modes leads to a reduction in automobile use, VMT, and GHG emissions.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris, Hemet and Temecula will achieve a 5% increase in intersection density and reduction in block length in new development compared to the baseline countywide average.	912
PROGRESS INDICATORS	**YEAR**
1 Annual percentage of neighborhood streets with traffic calming treatments installed.	2020

Measure T-9: Pedestrian-Only Areas

Encourage walking by providing pedestrian-only community areas.

2020 GHG Reduction Potential: 2,812 MT CO_2e/yr

Also referred to as an urban non-motorized zone, a pedestrian-only area restricts certain portions of a central business district or major activity center to non-motorized transportation.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris and Riverside will designate one additional major activity center in the community as a permanent pedestrian-only area over baseline conditions.	1,747
PROGRESS INDICATORS	**YEAR**
1 Annual number of temporary or permanent pedestrian-only zones compared to baseline conditions.	2020

Measure T-10: Limit Parking Requirements for New Development

Reduce requirements for vehicle parking in new development projects.

2020 GHG Reduction Potential: 28,423 MT CO_2e/yr

Limiting parking requirements for new development in certain areas may encourage alternative individual transportation choices, but caution should be taken to minimize the resulting incentive to travel to more distant locations with plenty of parking. This can be accomplished by:

- Eliminating (or reducing) minimum parking requirements;
- Creating maximum parking requirements; and
- Implementing shared parking.

Limiting parking requirements would encourage modes of transportation other than single-occupancy vehicles, thereby reducing VMT and GHG emissions. If these alternative transportation modes include walking and biking, mobility and health benefits would also be realized.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris and Jurupa Valley will amend zoning to reduce parking requirements for new non-residential development by 10% over baseline conditions.	6,093
PROGRESS INDICATORS	**YEAR**
1 New parking ordinance in place to reduce parking spaces required within new development or redevelopment areas.	2020

Measure T-11: Voluntary Transportation Demand Management

Reduce demand for roadway travel through incentives for alternative modes of transportation and disincentives for driving.

2020 GHG Reduction Potential: 2,464 MT CO_2e/yr

TDM describes strategies to reduce demand for roadway travel, particularly in single-occupancy vehicles. TDM strategies can include both "carrot" and "stick" approaches to change travel behavior patterns. Specific examples include preferential parking for carpoolers and parking pricing.

While SCAG offers regional approaches such as high-occupancy vehicle lanes, this measure focuses on efforts by individual existing business owners in the WRCOG subregion to develop TDM strategies, such as parking "cash out" programs and allowing telecommuting. Several TDM strategies can be offered; often, multiple programs can enhance one other rather than being redundant. In addition to reducing GHG emissions, TDM strategies often ease congestion and improve air quality.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
12.5% of employees within City of Perris to participate in voluntary TDM programs	279
PROGRESS INDICATORS	**YEAR**
1 Percentage of Perris employees participating in voluntary TDM programs.	2020

Measure T-12: Accelerated Bike Plan Implementation

Accelerate the implementation of all or specified components of a jurisdiction's adopted bike plan.

2020 GHG Reduction Potential: 5,340 MT CO_2e/yr

Perris is implementing a new Master Trails Plan which includes a series of on-street and off-street facilities to increase bicycle use within the community. This measure addresses accelerated implementation of these Master Plans to provide additional facilities by 2020 beyond those identified in Measure T-1.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Perris, Hemet, Temecula and Wildomar to install 25% of all bicycle facility miles identified in the jurisdiction's bicycle plan (e.g., Perris Master Trails Plan) by 2020.	1,844
NOTE: Reductions are assumed to be 1/2 of total reductions for bicycle infrastructure measure.	

PROGRESS INDICATORS	YEAR
1 Annual % of bicycle facility miles identified in the Master Trails Plan installed.	2020

Solid Waste Measures

The following are local measures Perris can implement along with other WRELP jurisdictions to reduce GHG emissions associated with the solid waste sector.

Measure SW-1: Yard Waste Collection

Provide green waste collection bins community-wide.

2020 GHG Reduction Potential: 1,007 MT CO_2e/yr

Most jurisdictions in the subregion offer green waste collection bins for residential yard waste. Diverting yard waste from landfills helps to extend the life of area landfills. In addition, grass clippings and leaves can be composted into nutrient-rich topsoil amendments, and branches can be chipped into mulch for reuse in landscaping. Removing beneficial organic materials from landfills also helps avoid the creation of landfill methane, a potent GHG.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
Along with other participating jurisdictions, Perris to provide residential green waste bins for collection and transport to an organic waste processing facility.	1,007
PROGRESS INDICATORS	**YEAR**
1 Achievement of 95% diversion of residential yard waste from landfill waste stream.	2020

Measure SW-2: Food Scrap and Compostable Paper Diversion

Divert food and paper waste from landfills by implementing collection system.

2020 GHG Reduction Potential: 155 MT CO_2e/yr

Food scraps are unwanted cooking preparation and table scraps, such as banana peels, apple cores, vegetable trimmings, bones, egg shells, meat, and pizza crusts. Compostable paper, sometimes called food-soiled paper, usually comes from the kitchen and is not appropriate for paper recycling due to contamination. Materials such as used pizza boxes, uncoated paper cups and plates, used coffee filters, paper food cartons, napkins, and paper towels are all compostable paper. Food scraps alone represent nearly 20% of total land-filled solid waste statewide. Diverting these organic items from landfills helps to reduce landfill methane gas generation, and can help prolong the lifespan of area landfills. Perris has the added bonus of CR&R's anaerobic digester to accelerate the processing of household waste products.

ACTIONS	GHG REDUCTION POTENTIAL (MT CO_2e/yr)
With Riverside and Temecula, Perris will accept food scraps and compostable paper within residential waste bins or provide separate food scrap collection bins.	155
PROGRESS INDICATORS	**YEAR**
1 CR&R to provide annual reports regarding anaerobic digester volumes	2020

EXISTING PROGRAMS

Over the last few years, the City has implemented several municipal and community-wide programs that have begun the process of reducing GHG emissions. These emission reductions will continue through the implementation of the Community Energy Action Plan (CEAP) prepared in 2014. 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 and 2035 targets.

Since the baseline emissions year of 2010, California has enacted legislation to promote energy efficiency and the use of renewable energy in utility companies and new building construction. In addition, the City has implemented energy-efficiency measures since 2010 that result in GHG reductions. Any local or statewide measure implemented since 2010 is counted towards the City's emissions target.

Perris has worked many years developing a comprehensive sustainable energy policy for municipal operations. Almost all City departments have played a role in reducing energy cost and achieving energy efficiency. Perris achieved Gold-Tier status through SCE's Energy Leader Partnership Program with completion of the CEAP. In 2011, through WRELP, the City was provided with technical expertise and resources to perform facility energy audits with the objective of identifying and developing cost effective energy saving projects that the City can implement. The scope of the study included a survey and analysis of potential energy efficiency projects for wells, pumps, and various indoor and outdoor lightings.

The City has demonstrated leadership in environmental and energy efficiency through its use of renewable solar energy. In 2008, the City installed photo-voltaic solar panels throughout its City Hall campus which conserves electricity usage by 20% and removes approximately one million pounds of carbon dioxide from the air annually (Perris Press Release, 2012). Additionally, through a power purchase agreement, the City installed solar roof panels and solar carports at the City's library, senior center, fire station, Public Works yard, and City Hall.

Prior to 2010, the City's lighting and HVAC system and thermostat upgrades resulted in savings of approximately 243,000-kilowatt hours of electricity. The City has also installed drought-resistant landscaping at City Hall. With an efficient irrigation system, the low-flow watering system ensures higher water efficiencies on City properties and prevents storm water runoff. The City has also planted more trees to provide natural cooling and shade. This strategy improves energy efficiency by reducing the energy required to cool facilities.

Perris's Public Works Department has been using clean-energy vehicles since 2006. In 2012, the City received funding to improve air quality and was able to purchase two hybrid vehicles which run on gas and electricity. The hybrid fleet is estimated to save the City thousands of gallons of gasoline and reduce carbon emissions over several years.

In 2009, the City Planning Division worked closely with a major developer to construct the largest LEED building in the world at that time, a 1.3 million square-foot distribution center in north Perris. The LEED system produces green buildings that are designed to save energy and costs by increasing building's operational efficiencies. Since 2009, other large warehouses have been developed to LEED standards.

COMMUNITY ENERGY ACTION PLAN (CEAP)

The emissions projections described in Chapter 2 illustrate the need for Perris to implement strategies to reduce greenhouse gas (GHG) emissions by 2020 and beyond. California has set specific targets for reducing GHG emissions by 2020, and has developed standards to increase energy efficiency and promote renewable energy sources. At the subregional level, WRCOG developed a CAP to assist local cities and jurisdictions in meeting statewide goals, as well as to encourage input and coordination among participating jurisdictions. To meet emissions reduction targets, the WRCOG CAP considers existing programs and policies in the subregion that achieve GHG emissions reductions, in addition to new GHG reduction measures. This CAP uses consistent methodologies and allows jurisdictions to collaboratively implement regionally-effective measures using economies of scale which may lead to lower administrative costs and greater publicity of incentives. Several proposed measures apply to participating jurisdictions uniformly, because they respond to adoption of a state law (e.g., the Low Carbon Fuel Standard) or result from programs administered at the discretion of a utility serving multiple jurisdictions (e.g. utility rebates). For additional, more discretionary measures, participating jurisdictions including Perris have voluntarily committed to a participation level that can be implemented in their community.

One of these discretionary measures is the development of Perris's Community Energy Action Plan (CEAP). The CEAP is designed to improve the energy efficiency of the City. Based on the energy efficiency analysis, the CEAP will assist the City in prioritizing goals, policies, and assign appropriate energy consumption reduction targets across the community. The CEAP includes statewide policies as R1 reduction measures. The R1 measures are included in this chapter 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.

At the local level, CEAP R2 and R3 measures would be incorporated to provide additional reductions in GHG emissions. R2 measures can be quantified to show the value of the reduction in GHG emissions. The R3 measures are supportive measures or methods of implementation for the R2 measures. R3 measures provide a program through which reductions in emissions would occur, but their value cannot be quantified. 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 be more energy efficient, and provides incentives to participate in the voluntary programs shown in some of the R2 measures. 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 that will make retrofits more accessible. Therefore, although by itself R3-E3 cannot be quantified, its implementation provides a level of assurance that the reduction goals specified in the R2 measures will be achieved.

A separate stand-alone document titled "City of Perris Municipal Energy Action Plan" (Atkins 2012) includes the measures (identified as "M1 Measures") that are intended to reduce municipal emissions. Municipal operations make up a small percentage of community-wide emissions, but the City sets a positive example for residents by implementing a variety of reduction measures at the municipal level. A detailed analysis of the City's municipal GHG emissions is provided in the City's 2013 MEAP.

R1 – STATE ENERGY REDUCTION MEASURES

The following R1 building energy efficiency measures are those that California has identified in the AB 32 Scoping Plan that will result in emission reductions for the City of Perris, in addition to other California cities and jurisdictions. Note that the state reduction measures apply to the entire community, and City-owned facilities will also benefit.

R1-E1: RENEWABLE PORTFOLIO STANDARD - BUILDING ENERGY USE

SB 1075 (2002) and SB 107 (2006) created the state's Renewable Portfolio Standard (RPS), with an initial goal of 20% renewable energy production by 2010. Executive Order S-14-08 establishes a RPS target of 33% 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). This increase in electricity production from renewable sources will reduce the GHG emissions from electricity usage by 14% by 2020.

As a result of SB 1075, utilities including SCE are required to have at least 33% renewable sources for producing electricity. An increase in renewable power sources generated by SCE will result in less electricity being generated by conventional sources such as burning natural gas. The benefit to the City is a reduction in air pollution and GHGs within the region, which broadly benefits the health of everyone. More speculative is the potential that increasing electricity generation from renewable resources may result in lower electricity rates from SCE over the next few years. However, because the RPS requirement is imposed on utility providers and not the customers, direct savings in utility bills may not be significant from this measure.

R1-E1 GHG REDUCTION POTENTIAL	CO-BENEFITS
9,201 MT CO2e per year The reductions are associated with an increase of 14% in renewable energy production by the year 2020.	Private Costs: None – State Program Private Savings: None Funding Sources: State Program kWh Savings: 51.5 million kWh of nonrenewable electricity will be replaced with renewable energy sources.

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

AB 1109 (2007) 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, are structured to reduce statewide electricity consumption in the following ways:

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

It is assumed that 20% of the building's electricity usage is associated with lighting. Because AB 1109 makes residential and commercial lighting 50% and 25% more efficient, respectively, and lighting is 20% of the total electrical usage for the buildings, AB 1109 requires a total reduction of 10% in the commercial electricity consumption and 5% in the residential electricity usage from 2007 levels by 2018.

R1-E2 & R1-E3 GHG REDUCTION POTENTIAL	CO-BENEFITS
7,835 MT CO2e per year The reductions are associated with an increase of 50% in residential and 25% in commercial lighting efficiency from 2007 levels by 2018.	Private Costs: None – State Program Private Savings: $3.8 million annually based on average electricity cost. Funding Sources: State Program kWh Savings: 27.34 million kWh

R1-E4: ELECTRICITY ENERGY EFFICIENCY

This measure captures the emission reductions for Perris that are associated with electricity energy efficiency activities included in CARB's AB 32 Scoping Plan that are not attributed to other R1 or R2 reductions. This measure includes the energy efficiency measures that CARB views as critical to meeting the statewide 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, hereafter referenced 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_2e, representing 17.5% 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-E4 GHG REDUCTION POTENTIAL	CO-BENEFITS
4,564 MT CO2e per year The reductions are associated with an increase of 17.5% in energy efficiency for buildings.	Private Costs: None – State Program Private Savings: $2.2 million annually, based on average electricity cost. Funding Sources: State Program kWh Savings: 15.89 million kWh

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. This measure includes energy efficiency measures that CARB views as crucial to meeting the statewide 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_2e, representing 6.2% 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, based on an annual average, no energy is extracted 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 GHG REDUCTION POTENTIAL	CO-BENEFITS
842 MT CO2e per year The reductions are associated with an increase of 6.2% in natural gas energy efficiency for buildings.	Private Costs: None – State Program Private Savings: $6,228 annually based on the average natural gas rates in 2010. Funding Source: State Program Therms Savings: 158,218 therms

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 (CHP) activities, as outlined in CARB's AB 32 Scoping Plan. The Scoping Plan suggests that increased CHP systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 gigawatt hours (GWh) statewide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible CHP 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_2e, representing 7.6% of emissions from all electricity in the state.

An increase in CHP systems will result in higher efficiency in local power generation. The benefit to the City is a reduction in energy demand, reduction of air pollution and greenhouse gases, and potential decrease in energy costs. These broadly benefit the health and economy of the entire community. Because this measure is applicable to power generating entities, immediate savings in energy bills may not occur in all land use categories. However, as a consequence of the reduction in energy demand associated with increased CHP standards, the cost of energy may reduce over the next few years.

R1-E6 GHG REDUCTION POTENTIAL	CO-BENEFITS
7,291 MT CO2e per year The reductions are associated with an increase of 7.6% in electricity usage efficiency	Private Costs: None – State Program Private Savings: $3.5 million. Based on average electricity cost. Funding Sources: State Program kWh Savings: 25.39 million kWh

R2 – LOCAL ENERGY REDUCTION MEASURES

The following list of R2 energy related measures are the measures that the City of Perris would implement to reduce GHG emissions beyond the reductions associated with the R1 state measures described above.

R2-E1: NEW RESIDENTIAL ENERGY EFFICIENCY

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 the community-wide GHG emissions. These measures include, but are not limited to:

- Installation of energy efficient appliances, including air conditioning and heating units, dishwashers, water heaters, etc.;
- Installation of solar water heaters;
- Installation of top quality windows and insulation;
- Installation of energy efficient lighting;
- Optimizing conditions for natural heating, cooling and lighting by building siting and orientation;
- Use of features that incorporate natural ventilation;
- Installation of light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes; and
- Incorporating skylights, reflective surfaces, and natural shading in building design and layouts.

A variety of financial incentives and programs exist to assist homeowners in implementing energy efficiency measures and making these goals feasible (see Chapter 4 for implementation measures).

R2-E1 GHG REDUCTION POTENTIAL	CO-BENEFITS
5,242 MT CO2e These emissions reductions assume all new residential units will increase energy efficiency an average of 15% beyond 2008 Title 24 standards. This results in a 25% decrease in electricity and natural gas use from new residential development.	Private Costs: $7.7 million (one time cost). 100% units going 10% beyond Title 24 is approximately equivalent to 83% of units increasing efficiency to 10% beyond Title 24. The cost is based on an estimate of $1,500 per unit at 10% beyond T-24 (Anders 2009). Private Savings: $1.3 million annually in reduced energy costs, resulting in an estimated 6 year payback period on the initial cost. Funding Sources: SCE, SCG kWh Savings: 8.88 million kWh Therms Savings: 505,915 Therms

R2-E2: NEW COMMERCIAL ENERGY EFFICIENCY

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 the community-wide GHG emissions. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

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

R2-E2 GHG REDUCTION POTENTIAL	CO-BENEFITS
3,004 MT CO2e These emissions reductions assume all new commercial units will increase energy efficiency an average of 10% beyond 2008 T-24 standards. These emission reductions assume a 25% decrease in electricity and natural gas use from new commercial development.	Private Costs: $16.9 million (one time cost) based on an estimated $1.00 per square foot to achieve 10% beyond Title 24 (Anders 2009). Private Savings: $1.2 million annually in reduced energy costs, resulting in an estimated 13 year payback period on the initial cost. Funding Sources: SCE, SCG kWh Savings: 8.45 million kWh Therms Savings: 108,651 Therms

R2-E3: RESIDENTIAL RENEWABLE ENERGY

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 community-wide GHG emissions. These renewable energy measures include:

- On-site solar photovoltaic;
- On-site thermal water heating;
- Support for off-site solar or wind generation

R2-E3 GHG REDUCTION POTENTIAL	CO-BENEFITS
1,926 MT CO2e These emissions reductions assume 20% of electricity use from new residential development would be derived from renewable energy.	Private Costs: $19.2 million (one time cost) associated with 10% of new residential units installing 2kW solar PV systems at $7,796/kW (Anders 2009). Private Savings: $0.9 million annually from reduced electricity costs, resulting in estimated 20.5 year payback period on the initial cost. Funding Sources: SCE, WRCOG kWh Savings: 6.71 million kWh

R2-E4: COMMERCIAL RENEWABLE ENERGY REQUIREMENTS

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 community-wide GHG emissions. 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 photovoltaic;
- On-site thermal water heating;
- Provide support for off-site solar or wind generation

R2-E4 GHG REDUCTION POTENTIAL	CO-BENEFITS
1,843 MT CO2e Emissions reductions assume 20% of electricity use from new commercial development 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.	Private Costs: $44.2 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: $0.9 million annually from reduced electricity costs, resulting in an estimated 49 year payback period on the initial cost. Funding Sources: SCE, WRCOG kWh Savings: 6.42 million kWh

R2-E5: RESIDENTIAL ENERGY RETROFITS

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. In order to implement this strategy, the City would coordinate with local agencies such as SCE, SCG, WRCOG, and SCAG 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 following actions:

- Replace inefficient air conditioning and heating units with new energy efficient models;
- Replace older, inefficient appliances with new energy efficient models;
- Replace old windows and insulation with top-quality 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-E5 GHG REDUCTION POTENTIAL	CO-BENEFITS
14,023 MT CO2e These emissions reductions assume 25% of the electricity and natural gas use from existing residential developments will be reduced through retrofits.	Private Costs: $18.04 million (one time cost). Cost estimates based on USD EPIC study assumptions: 0.75/kWh and $4.35/therm (Anders 2009). Private Savings: $3.3 million annually from reduced energy costs, resulting in an estimated 5.5 year payback period on the initial cost. Funding Sources: SCE, SCG, WRCOG kWh Savings: 23.25 million kWh Therms Savings: 1.38 million Therms

R2-E6: COMMERCIAL ENERGY RETROFITS

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. In order to implement this strategy, the City would coordinate with local agencies such as SCE, SCG, WRCOG, and SCAG 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 following actions:

- 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;
- Replace old windows and insulation with high quality and energy efficient products;
- Install solar water heaters;
- Replace inefficient and incandescent lighting with energy efficient lighting; and
- Weatherize the existing building to increase energy efficiency.

R2-E6 GHG REDUCTION POTENTIAL	CO-BENEFITS
9,678 MT CO2e These emissions reductions assume 25% of the electricity and natural gas use from existing commercial development would be reduced through retrofits.	Private Costs: $36.7 million (one time cost) based on a rate of $0.55 per square foot of commercial building space retrofit (Andres 2009). Private Savings: $3.0 million annually from reduced energy costs, resulting in an estimated 12.5 year payback period on the initial cost. Funding Sources: SCE, SCG, WRCOG kWh Savings: 21.13 million kWh Therms Savings: 678,642 Therms

R3 – LOCAL 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 R1 and R2 energy measures is supported by coordination with SCE, SCG, SCAG, WRCOG, local non-profits, and other local agencies in the region to optimize 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 the City 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 setbacks 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 the City through a variety of methods including newsletters, brochures, and the City's website. This measure would enhance existing programs 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.

R1 – STATE WATER REDUCTION MEASURES

The following R1 water-related reduction measures have been identified in the AB 32 Scoping Plan to result in emission reductions for the City of Perris.

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

This measure would increase electricity production from eligible renewable power sources to 33% 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_2e, representing 15.2% of emissions from electricity generation (in state and imports).

R1-W1 GHG REDUCTION POTENTIAL	CO-BENEFITS
1,469 MT CO2e per year The reductions are associated with a decrease of 15% in energy from nonrenewable sources in water facilities by the year 2020.	Private Costs: None – State Program Private Savings: None Funding Sources: State Program

R2 – LOCAL WATER REDUCTION MEASURES

The following list of R2 water related measures are those measures that the City would implement in order to reduce emissions beyond the emissions reduction associated with the R1 state measures described above. The numbering of the local measures is consistent across all cities that are participating in the WRELP program. However, if a measure is not applicable to a particular City, it has been omitted

from the list of measures. For example, the first measure R2-W1 has been omitted and the next measure described herein is R2-W2.

R2-W2: WATER CONSERVATION STRATEGIES

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

- Updating the landscape ordinance to further reduce outdoor water usage.
- Working with water agencies to establish an incentive program that assists property owners with retrofitting water intensive landscaping with California Friendly Landscaping.
- In addition to these programs, the City would implement measures that aim to increase the use of recycled water, incorporate water efficient fixtures, drought tolerant landscaping, permeable hardscapes, and on-site storm water capture and reuse facilities.

R2-W2 GHG REDUCTION POTENTIAL	CO-BENEFITS
408 MT CO2e The calculated emission reductions assume all new development reduces water consumption by 20%.	Private Costs: Considered negligible if implemented with new development. Private Savings: $164,480 annually from reduced water costs. Funding Sources: Clean Water State Revolving Funds (CWSRF), EMWD

R2-W3: INCREASED RECYCLED WATER USE

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 nonpotable 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. Note that the analysis in the CEAP was not able to predict the costs or savings associated with this measure, because specific data on recycled water was not available at the time of analysis. The City would need to conduct a more detailed, in depth cost analysis 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 plants. Potential savings include less imported water and lower rates for consumers.

R2-W3 GHG REDUCTION POTENTIAL	CO-BENEFITS
321 MT CO2e By using reclaimed water rather than imported water, emissions are reduced by 81%. These emission reductions assume 5% of the City's water is converted to reclaimed water.	Private Costs: Could not be determined at the time of this study. Private Savings: Could not be determined at the time of this study. Potential Funding Sources: CWSRF

R3 – OTHER WATER REDUCTION MEASURES

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 Section 4-1 for information on the City'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 and gardening that reduces or eliminates the need for supplemental water from irrigation.

REDUCTION MEASURE SUMMARY (CEAP)

By implementing the statewide and local reduction measures described above, the City would reduce its community-wide GHG emissions associated with the energy and water usage by 39% compared to the 2020 BAU emissions. Statewide measures reduce the City's GHG emissions by 18% and the local measures reduce it further by 21%.

The largest reduction is from the R2-E5 measure, which corresponds to 9% of the total amount. This is as a result of implementing energy retrofits in existing residential units. Table 4-1 summarizes the statewide and local measures and their reductions.

Table 4-1: Summary of Community GHG Reductions in Perris		
Statewide Measures (R1)	**MT CO2e Reduced**	**% Reduced from 2020 Emissions**
Energy		
R1-E1: RPS – 33% Renewable by 2020	9,201	6%
R1-E2: Indoor Residential	4,870	3%
R1-E3: Indoor/Outdoor Commercial	2,982	2%
R1-E4: Electrical Energy Efficiency	4,564	3%
R1-E5: Natural Gas Energy Efficiency	841	<1%
R1-E6: Increased Combined Heat and Power	7,292	5%
Water		
R1-W1: RPS – 33% Renewable by 2020	1,469	<1%
Total Statewide Reductions	**31,220**	**18%**
Local Measures (R2)		
Energy		
R2-E1: New Residential Energy Efficiency	5,242	3%
R2-E2: New Commercial Energy Efficiency	3,004	2%
R2-E3: New Residential Renewable Energy	1,926	1%
R2-E4: New Commercial Renewable Energy	1,843	1%
R2-E5: Residential Retrofits	14,023	9%
R2-E6: Commercial Retrofits	9,678	6%
Water		
R2-W2: Water Conservation Strategies	408	<1%
R2-W3: Increased Recycled Water Use	321	<1%
Total Local Reductions	**36,446**	**21%**
TOTAL REDUCTIONS	**67,666**	**39%**

Totals may be off due to rounding

CEAP GREENHOUSE GAS EMISSIONS TARGET COMPARISON

Figure 4-1 shows a comparison between the emission inventories for 2020 and 2035. The blue bar represents the calculated GHG inventories for the baseline year (2010). The red bars show the projected BAU GHG emissions in 2020 and 2035 based on the anticipated growth. The yellow bars demonstrate the reduced inventories after the implementation of the reduction measures described in Chapter 4, and the dashed lines represent the reduction targets for 2020 and 2035. Tables 4-2 and 4-3 summarize the existing 2010 emissions, the projected 2020 and 2035 emissions inventory, as well as the reduced 2020 and 2035 inventories after implementation of the reduction measures.

Figure 4-1 Estimated Future Reduced Emissions (MT CO_2e)

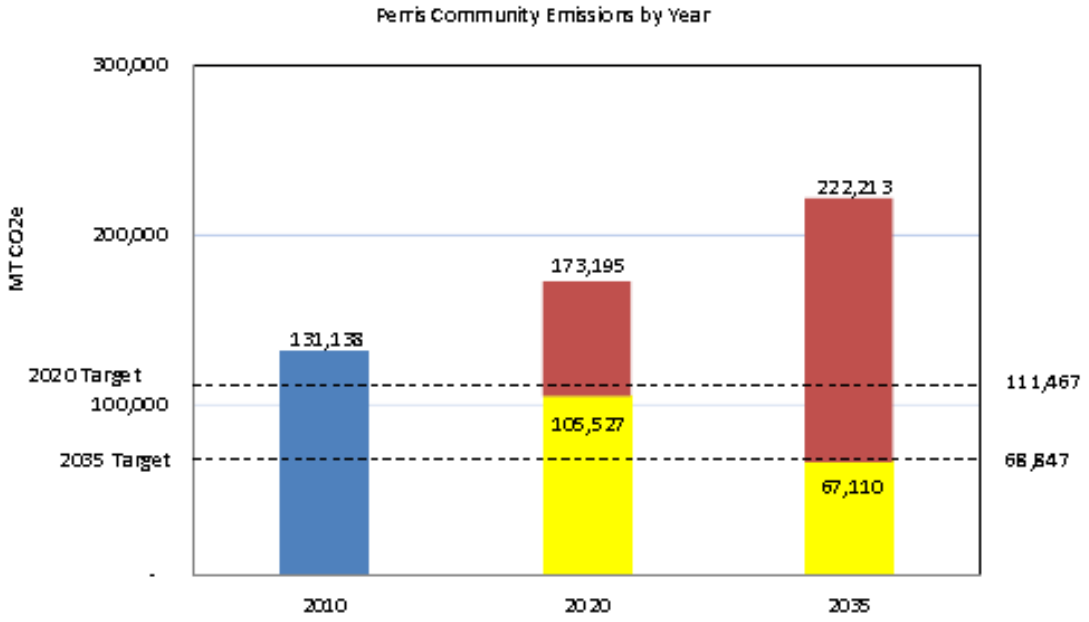


Table 4-2 2020 Community-wide GHG Emissions Summary

Source Category	MT CO_2e		
	2010	2020 BAU	Reduced 2020
Total Emissions	131,138	173,195	105,527
Emission Reduction Target	-	111,467	111,467
Below Reduction Target?	-	NO	YES
Note: Sources of emissions include electricity, natural gas, and the energy associated with purchased water.			

Table 4-3 2035 Community-wide GHG Emissions Summary

Source Category	MT CO_2e		
	2010	2035 BAU	Reduced 2035
Total Emissions	131,138	222,213	67,110
Emission Reduction Target	-	68,847	68,847
Below Reduction Target?	-	NO	YES
Note: Sources of emissions include electricity, natural gas, and the energy associated with purchased water.			

By 2020, the statewide and local measures together would reduce the City's community GHG emissions from the 2020 BAU condition by approximately 39% or 67,668 MT CO_2e (from 173,195 MT CO_2e to 105,527 MT of CO_2e). This reduction is equivalent to 20% decrease below the 2010 levels, which exceeds the 15% reduction target of the year 2020.

In estimating reductions for 2035, it is assumed that the City would continue implementation of its local measures, and these measures would continue to reduce municipal GHG emissions. Additionally, it is assumed that the State measures would be enforced post-2020 to further reduce emissions. For the purposes of this analysis, the downward trend of the reduction attributed to GHG emissions from 2020-2035 was extended linearly based on the reductions attributed to GHG emissions from 2010-2020. With these assumptions, by 2035 the City's GHG emissions from energy sources would decrease by 155,103 MT CO_2e from the 2035 BAU (from 222,213 MT CO_2e to 67,110 MT CO_2e), which is equivalent to 49% from 2010 emissions. This exceeds the 47.5% reduction target of the year 2035.

ELECTRICITY CONSUMPTION

Figure 4-2 and Table 4-4 compare the electricity consumption of the baseline year and the 2020 projections with the 2020 target.

Figure 4-2 Estimated Future Electricity Usage (kWh)

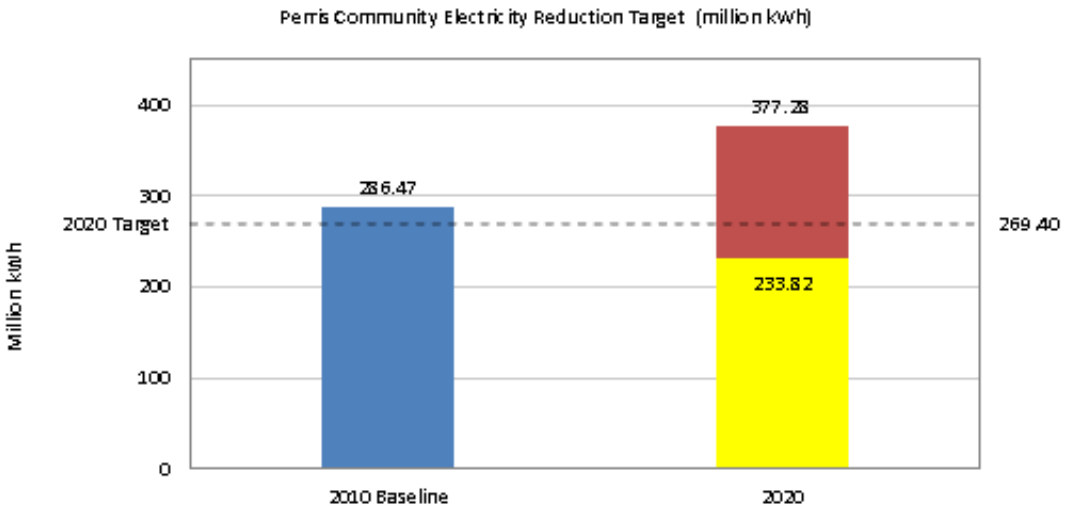


Table 4-4 Community Electricity Consumption Summary

Source Category	kWh of Electricity		
	2010	2020 BAU	Reduced 2020
Community Electricity Consumption	286.47 million	377.28 million	233.82 million
Electricity Consumption Target		269.40 million	269.40 million
Below Reduction Target?		NO	YES

Implementation of the reduction measures by 2020 would reduce the City's electricity consumption by approximately 19% below the BAU or by 143.46 million kWh (from 377.28 million kWh in 2020 to 233.82 million kWh). This is equivalent to a 19% reduction from the baseline year, which exceeds the 6% reduction target for 2020.

CHAPTER 4
IMPLEMENTATION AND MONITORING

This section describes implementation steps from the Perris Community Energy Action Plan (CEAP) developed in September 2012 to support achievement of the GHG reduction goals for the community at large. Success in meeting the GHG emission reduction goal will require cooperation, innovation and participation by residents, businesses, and other local governmental entities with the City of Perris. This section outlines key steps that the City would follow for the implementation of the CEAP.

STEP 1—Administration and Staffing

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

1. Create an Energy Efficiency Team to support and guide the City's efforts to conserve energy and reduce emissions.
2. Designate an Implementation Administrator to oversee, direct and coordinate implementation of the CEAP as well as monitor and report the energy efficiency and GHG reduction efforts. The City Energy Efficiency Team (Team) would be responsible for the implementing the CEAP, coordinating among all involved City departments, and recommending modifications and changes to the CEAP over time. The Team would include the following departments and divisions, but would be expanded as needed to ensure coordinated leadership in plan implementation: Development Services and Public Works department.

STEP 2—Financing and Budgeting

Successful implementation of the CEAP 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 financing options should be explored by the City:

■ **State and federal grants and low-interest loans** — A variety of grant and loan programs are available from numerous sectors.

■ **Support from local businesses, non-profits, and agencies** — Opportunities for public/private partnerships (like the SCE partnerships) exist to provide cooperation on many aspects of the CEAP including energy and water efficiency retrofits and raising public awareness regarding conservation strategies.

■ **Self-funding and revolving fund programs** — Innovative programs to fund renewable energy 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 renewable energy resource development and energy efficiency improvement projects.

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 the CEAP and is presented below to help early phase implementation. It is likely that there will be stronger legislation aimed at energy efficiency and renewable energy generation that will further curb GHG emissions. Such requirements are likely to influence energy prices (for electricity and natural gas), and may make measures that are currently cost ineffective more economically feasible in the future and allow the financing of a broader range of plan measures.

ENERGY EFFICIENCY AND RENEWABLE ENERGY FINANCING

The following opportunities for energy efficiency and renewable energy are available to homeowners and business owners:

Western Riverside Council of Government HERO Program. WRCOG, in partnership with Renovate America, Inc., offers homeowners and businesses in WRCOG participating jurisdictions the opportunity to finance energy and water efficiency projects for their properties. The HERO program is a Property Assessed Clean Energy (PACE) financing program that allows repayment through special assessments added to their property taxes. For a complete list of eligible products under the HERO program, visit the website: http://heroprogram.com and www.commercialhero.com.

Federal Tax Credits for Energy Efficiency. On October 3, 2008, the "Emergency Economic Stabilization Act of 2008" was signed into law. This law extended the Production Tax Credit for solar energy systems and fuel cells to 2016, and new tax credits were established for small wind energy systems. 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

Southern California Edison Energy Efficiency/Renewable Energy Incentives:

■ Residential and commercial customers can qualify for a variety of rebate programs through SCE. SCE offers savings to customers who purchase qualified energy efficient appliances, heating and cooling systems, pool pumps, Energy Star, CFLs lighting fixtures and other energy efficient technologies.

■ Multifamily residential developments can benefit from a variety of SCE rebate programs. Using energy efficient products and technologies such as high-performance dual-pane windows, Energy Star labeled ceiling fans, Energy Star CFLs, proper insulation, energy efficient electric storage water heaters, refrigerators and LED lights would save both money and energy.

■ SCE will provide free evaluation of mobile homes and provides free supply and installation of the energy upgrades recommended by their energy specialist.

■ SCE and SCG residents can benefit from incentives up to $4,000 for detached single-family residential energy upgrades.

■ SCE offers incentives, through utility rebate programs, for non-residential customers. This rebate is regardless of size and energy usage. Express efficiency rebates for lighting, refrigeration, and air conditioning technologies are available. In addition, SCE has a Custom Contracting Program in which non-residential users have the option of designing an energy retrofit conservation measure. Incentives are based on the type of measure installed and the reduction in energy usage over a 12-month period.
See http://energy.gov/savings/sce-non-residential-energy-efficiency-programs

■ SCE's Self-Generation Incentive Program (SGIP) provides financial incentives for the installation of new, qualifying customer self-generation equipment for their own on-site usage. Technologies currently eligible for SGIP incentives are generation related to wind, fuel cell, waste heat capture, and conventional CHP. The SGIP program is designed with business and large institutional customers in mind. Rebates for renewable generation—such as wind turbines or fuel cell—that generate less than 30 kilowatts of energy are available through the California Energy Commission's Emerging Renewables Program. Fuel cells of any size using non-renewable fuels may receive incentives under the SGIP program.
See http://www.sce.com/b-rs/sgip/about-the-program.htm

Southern California Gas Company:

■ The SGIP offers savings based on GHG emissions reductions and energy efficiency audits. Eligible technologies include but are not limited to renewable and waste energy capture technologies, conventional combined heat and power systems, emerging technologies such as fuel cells, biogas, and advanced energy storage.

■ The SCG On-Bill Financing program offers qualified business customers zero percent financing from $5,000 to $100,000 per gas meter for qualifying electric and natural gas equipment. All government customers may receive from $5,000 to $250,000 per meter, and the government can borrow up to $1,000,000 for one service account. The funds may be used for a wide variety of efficiency improvement projects, and the monthly loan payments will be added directly to the customer's bill. Monthly energy savings help to offset the monthly loan charges.

■ SCG offers rebates on various types of energy efficient equipment such as pipe insulation, steam traps, boilers, and other equipment. A full list of the eligible equipment can be found at SCG's website below.
See http://www.socalgas.com/for-your-business/rebates/industry/government

■ Commercial customers can benefit from rebates and incentives for energy efficient equipment such as pipe and tank insulation, water heaters, steam traps, pool heaters, boilers, commercial cooking equipment, and other technologies.

■ Single-family residential solar water heating systems qualify for up to $1,875 and commercial/multi-family customers can save up to $500,000 under the California Solar Initiative – Thermal Program. For a complete list and current savings, visit SCG's website.
See http://www.socalgas.com/for-your-business/rebates

California Energy Commission Energy Efficiency Financing. The CEC offers energy efficiency financing and low interest loans (up to 15 years) 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 wastewater 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/brightschools/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, SCE, and CCSE for the SDG&E territory. The CSI incentive for non-residential buildings includes a transition to performance-based and expected performance-based incentives, with the aim of promoting effective system design and installation. The applicable rebate programs for municipal facilities include (1) the general CSI Program of solar rebates for public agencies; (2) the CSI-Thermal Program for solar hot water rebates for municipal facilities; and (3) the CSI Research, Development, Demonstration, and Deployment Program. See http://energycenter.org/csi

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 offers:

■ **Low interest rates, flexible terms** — Nationally interest rates for CWSRF loans average 2.3%, compared to market rates that average 5%. For a CWSRF program offering this rate, a CWSRF funded project would cost 22% less than projects funded at the market rate. CWSRFs can fund 100% 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.

■ **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 collaborate 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, drip irrigation systems, and weather-based irrigation controllers.
See http://socalwatersmart.com/home

STEP 3—Measuring Implementation

After taking into account the reductions in energy and water usage and the GHG emissions resulting from statewide measures, the City would need to implement the local (R2) measures to reach its reduction targets for 2020 and 2035. 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
■ Time to implement

In general consideration of these factors, the following is an outline of key priorities for two phases starting in 2013 through 2020.

■ **Phase 1 (2013-2017)** — Development of key ordinances, completion of key planning efforts, implementation of most cost-effective measures, and support of voluntary efforts.

■ **Phase 2 (2017–2020)** — Continued implementation of first phase measures, implementation of second phase measures.

Because the goals of this CEAP 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 the CEAP. 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. Possible sources of funding to implement these measures are presented in Step 2 of this chapter. Table 4-1 presents the potential timeline and phasing schedule for the GHG reduction measures.

Table 4-1 GHG Reduction Measure Timeline and Phasing Schedule

Reduction Measure	Phase
Energy	
R2-E1: New Residential Energy Efficiency Requirements	1, 2
R2-E2: New Commercial Energy Efficiency Requirements	1, 2
R2-E3: New Residential Renewable Energy Requirements	2
R2-E4: New Commercial Renewable Energy Requirements	2
R2-E5: Existing Residential Energy Retrofits	1, 2
R2-E6: Existing Commercial Energy Retrofits	1, 2
Water	
R2-W2: Water Conservation Strategies	1, 2
R2-W3: Increase Recycled Water Use	2

STEP 4—Public Participation

The residents and businesses in the City are integral to the success of GHG reduction efforts. Their involvement is essential in order to reach the reduction goals because the CEAP 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 needs to 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 CEAP's cost-saving measures to encourage participation in efforts to reduce GHG emissions in all possible sectors.

STEP 5—Monitoring and Inventory Methods

The City will use a system for monitoring the reductions in energy use from local and statewide measures. If promising new strategies emerge, the City will evaluate how to incorporate these strategies into the CEAP. Further, state and federal action would also result in changes that would influence the

level of the City's GHG emissions. WRCOG through Task 11 of the SCE administered grant fund is providing the City qualitative and quantitative metrics by which the City can track progress in energy savings. A customized emissions inventory software package will be provided for City use in tracking emissions based upon energy consumption data. The CEAP 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 emission inventory worksheet. A simple energy efficiency measure-tracking tool will be provided to track the implementation of the measures. In this way, the City will be able to observe: 1) emissions estimates without implementation of the CEAP; 2) emissions estimates predicted with full implementation of the CEAP; and 3) progress-to-date as data are entered annually. This is critical to demonstrate progress toward the goal and identify whether adjustments need to be made to programs to meet the reduction goal.

STEP 6—Beyond 2020

The 2020 target is only a milestone in GHG reduction planning. Executive Order S-03-05 calls for a reduction of GHG emissions to a level 80% 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 for the post-2020 period.

Because state and federal strategies for post-2020 are speculative at this point, it is recommended that the City commence planning for the post-2020 period in 2017, at the approximate midway point between plan implementation and the reduction target. By that time, the City would have a better understanding of the effectiveness and efficiency of the reduction strategies and approaches. Also, the State's regulations under AB 32 will have been fully in force; federal programs and policies for the near term are likely to be well underway; market mechanisms that influence energy and fuel prices will likely be in effect; and technological advances are anticipated in the fields of energy efficiency, alternative energy generation, fuels, and other target 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 allows adequate time to ready the plan for full implementation, including the development of and approval by City Council of new policies and ordinances, any necessary revisions to the plan and related programs, and financing by 2020.

REFERENCES

The Perris Climate Action Plan utilizes and is based upon the information contained in the following documents:

1. Western Riverside Council of Governments (WRCOG), Subregional Climate Action Plan, Final Report, September 2014

2. City of Perris 2010 Greenhouse Gas Emissions Inventory, Narrative Report in Collaboration with WRCOG, AECOM, ICLEI, PMC, Atkins, and Fehr & Peers

3. City of Perris Community Energy Action Plan, prepared for WRCOG by Atkins, January 2014

4. City of Perris Municipal Energy Action Plan, prepared for WRCOG by Atkins, December 2013