County of Riverside

Draft Climate Action Plan

Public Review Draft

RIVERSIDE COUNTY
PLANNING DEPARTMENT

February 2015

County of Riverside | Transportation and Land Management Agency | Planning Department
4080 Lemon Street, 12th Floor | Riverside, CA 92502-1409 | Phone: (951) 955-3200 | Fax: (951) 955-1811

This page intentionally left blank

ACKNOWLEDGEMENTS

This Riverside County Climate Action Plan is the outcome of work contributed by a number of individuals. We wish to thank all individuals who contributed to the success of this report, in particular:

- Riverside County, Economic Development Agency for administering the Energy Efficiency and Conservation Block Grant funding
- Riverside County, Planning Department, Adam Rush, Principal Planner
- Riverside County, Planning Department, Cindy Thielman-Braun, Urban Regional Planner IV
- Riverside County, Transportation and Land Management Agency, JiHong McDermott, GIS Supervisor Analyst/Demographics
- Riverside County, Transportation Department, Kevin Tsang, Associate Engineer
- Riverside County, Waste Management Department, Hans Kernkamp, General Manager/Chief Engineer
- Riverside County, Waste Management Department, Sung Key Ma, Planner IV
- Riverside County, Economic Development Agency – Aviation Division, Chad Davies, Senior Airport Development Specialist
- Riverside County, Economic Development Agency – Aviation Division, Marsha Dunlap, Fiscal Analyst
- Southern California Edison, Gerard Wilson, SCE Account Manager
- Southern California Gas Company, Environmental Policy and Affairs, Daniel McGivney, Environmental Affairs Program Manager
- Southern California Gas Company, Frank Spasaro
- Southern California Association of Governments, Arnold San Miguel
- Southern California Association of Governments, Ping Wang
- United States Department of Energy, Energy Efficiency and Conservation Block Grant

This page intentionally left blank

Table of Contents

Table of Contents

List of Tables

List of Figures

List of Appendices

ACRONYMS

AB 32	Assembly Bill 32, The California Global Warming Solutions Act of 2006
ARRA	American Recovery & Reinvestment Act
BAU	Business As Usual Scenario
BTU	British Thermal Unit
CARB	California Air Resources Board
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
Cal Recycle	California Department of Resources Recycling and Recovery
CAS	California Climate Adaption Strategy
CCAT	California Climate Action Team
CCAR	California Climate Action Registry
CCR	California Code of Regulations
CCTP	Climate Change Technology Program
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbons
C_2F_6	Hexafluoroethane
CF_4	Carbon Tetrafluoride
CH_4	Methane
CIWMB	California Integrated Waste Management Board
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CSI	California Solar Initiative
CWSRF	Clean Water State Revolving Funds
DPM	Diesel Particulate Matter
EECGB	Energy Efficiency Community Block Grant
EMFAC2007	On-Road Emission Factors published by the CARB in 2007
GCC	Global Climate Change
GHG	Greenhouse Gas
GWh	Gigawatt Hours

GWP	Global Warming Potential
HFC	Hydrofluorocarbons
HFC-23	Trifluoromethane
HFC-134	Hydrofluorocarbon 134
HFC-152a	Difluoroethane
IPCC	Intergovernmental Panel on Climate Change
ITS	Intelligent Transportation Systems
LEED	Leadership in Energy and Environmental Design
MMT	Million Metric Tons
MT	Metric Tons
MWh	Megawatt Hours
N_2O	Nitrous Oxide
NSHP	New Solar Home Program
O_3	Ozone
RIP	Regional Improvement Program
RTIP	Regional Transportation Improvement Program
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCG	Southern California Gas Company
SIP	State Implementation Plan
SF_6	Sulfur Hexafluoride
STIP	State Transportation Improvement Plan
URBEMIS 2007	Urban Emissions Model, version 9.2 published in June 2007
USEPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled

Executive Summary

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

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

The first step in completing the CAP was to complete a GHG emissions inventory. The CAP includes GHG inventories of community-wide and municipal sources based on the most recent data available for the year 2008. Sources of emissions include transportation, electricity and natural gas use, landscaping, water and wastewater pumping and treatment and treatment and decomposition of solid waste. Riverside County's 2008 inventory amounted to 7,012,938 MT CO_2e community-wide and 226,753 MT CO_2e from municipal operations.

Following the state's adopted AB 32 GHG reduction target, Riverside County has set a goal to reduce emissions back to 1990 levels by the year 2020. This target was calculated as a 15% decrease from 2008 levels, as recommended in the AB 32 Scoping Plan. The estimated community-wide emissions for the year 2020, based on population and housing growth projections associated with the assumptions used in the proposed General Plan Update, are 12,129,497 MT CO_2e. In order to reach the reduction target, Riverside County must offset this growth in emissions and reduce community-wide emissions to 5,960,998 MT CO_2e by the year 2020.

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

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

In order to reach the reduction target, the County of Riverside would also need to implement the additional local reduction measures described in this report. These measures encourage energy efficiency and renewable energy in buildings, transit oriented planning, water conservation and increase waste diversion. Table ES-1 (2008 and 2020 GHG Emissions Comparison), below, summarizes the community-wide emissions for 2008, 2020 and the reduced 2020 inventory with the inclusion of the proposed reduction measures.

Table ES-1 2008 and 2020 GHG Emissions Comparison

Source Category	Metric tons of CO_2e			
	2008	2020 BAU	Reduced 2020	% Reduced
Transportation	2,850,520	6,977,331	2,454,032	64.83%
Energy	1,577,667	2,830,246	1,141,380	59.67%
Area Sources	269,181	442,024	230,188	47.92%
Purchased Water	152,473	175,344	109,021	37.82%
Solid Waste	132,666	181,728	92,273	49.22%
Agriculture	2,030,431	1,522,823	1,507,220	1.02%
Total	**7,012,938**	**12,129,497**	**5,534,113**	**54.37%**
Emission Reduction Target [a]		**5,960,998**	**5,960,998**	

Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.
a The reduction target for 2020 is based on a 15% decrease from Riverside County's 2008 emissions inventory.

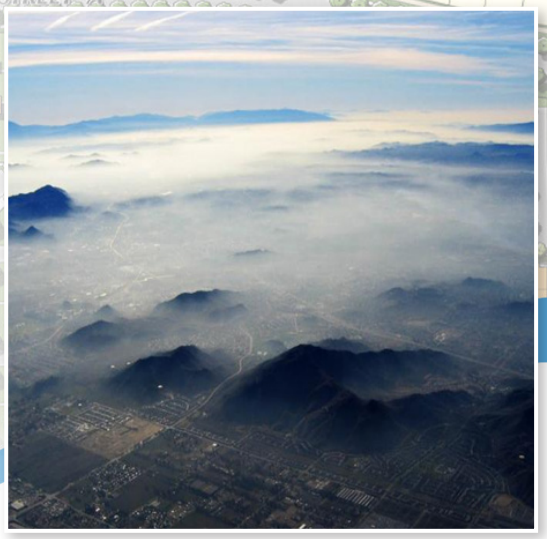
Table ES-2 (Projected 2035 GHG Emissions Comparison) summarizes the 2035 emissions for Riverside County based on the anticipated growth rates included in Riverside County's General Plan update. After 2020, GHG emissions would continue to grow; however, the growth in Riverside County's future emissions would be offset by the reductions from incorporation of the CAP measures. The reduction measures included in the CAP have been developed to meet the 2020 reduction target; however, the implementation of the CAP would require periodic updates to ensure that Riverside County is continually tracking GHG emissions and making adjustments as necessary to ensure that future targets are met. The 2035 reduced inventory represents the estimated GHG emissions from Riverside County with the continued implementation of the reduction measures outlined in the CAP as well as the assumption that the current statewide measures would be extended beyond 2020. This represents a strategy for Riverside County to continue to reduce emissions below the 2020 reduction target through to 2035 and beyond.

Table ES-2 Projected 2035 GHG Emissions Comparison

Source Category	Metric tons of CO_2e			
	2008	2035 BAU	Reduced 2035	% Reduced
Transportation	2,850,520	9,318,041	2,617,363	71.9%
Energy	1,577,677	3,610,701	1,323,685	63.3%
Area Sources	269,181	529,384	256,478	51.6%
Purchased Water	152,473	293,077	146,118	50.1%
Solid Waste	132,666	220,747	107,198	51.4%
Agriculture	2,030,431	1,522,823	1,486,815	2.4%
Total	**7,012,938**	**15,494,774**	**5,937,658**	**61.7%**
2020 Reduction Target [a]		**5,964,354**	**5,964,354**	

Note: Mass emissions of CO2e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.
a The reduction target for 2020 is based on a 15% decrease from Riverside County's 2008 emissions inventory.

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



Chapter 1
Introduction

This page intentionally left blank

Chapter 1 Introduction

NOTE TO THE READER:

The County of Riverside is recirculating Draft Environmental Impact Report No. 521 (DEIR No. 521) for public review from February 21, 2015 through April 6, 2015 in accordance with the California Environmental Quality Act, Section 15088.5. Correlative changes were made to Draft General Plan Amendment No. 960 (GPA No. 960) and the Draft Climate Action Plan. The revised GPA No. 960 and CAP documents are made available for public reference.

The documents were previously circulated from May 1, 2014, through June 30, 2014. The circulation garnered a substantial amount of comments from government and regulatory agencies, interest groups, and Riverside County citizens, which resulted in the aforementioned changes. Additionally, several changes to the documents occurred in order to more accurately reflect the existing conditions of the County, and to further analyze impacts associated with the GPA No. 960. The following is a summary of the changes that occurred to the documents:

Draft General Plan Amendment No. 960:

- *Data corrections to the Lakeview Nuevo Area Plan to reflect the removal of Specific Plan 342.*
- *Removal of the Lakeview Mountains Policy Area from the Lakeview Nuevo Area Plan.*
- *Addition of language clarifying the Wine Country Community Plan (GPA No. 1077) in relation to the Southwest Area Plan.*
- *Addition of language clarifying Airport Land Use consistency and Mixed Use Planning Areas.*
- *Addition of Policy S 1.4 requiring the County to implement the County of Riverside Multi-Jurisdictional Hazard Mitigation Plan.*
- *Addition of Policy OS 4.9 discouraging development within watercourses and areas within 100 feet of riparian vegetation.*
- *Minor modifications to text and policies as a result from comments received during the circulation of the draft document.*

Draft EIR No. 521:

- *The Draft EIR was updated to better reflect the existing conditions within the County.*
- *Several analysis sections of the Draft EIR were further refined in order to reflect changes associated with the updated background information. These sections included Air Quality, Greenhouse Gas, Biological Resources, Transportation and Circulation, Water Resources, and Cumulative Impacts.*
- *All analysis sections were updated where relevant to maintain consistency with any changes made in the Draft General Plan Update and Draft Climate Action Plan.*

Draft Climate Action Plan:

- *The Draft Climate Action Plan was updated with new implementation measures.*

The recirculated documents better account for the changing environment in Riverside County and more accurately address future conditions. Although comments submitted during the previous comment period do not require a written response, it should be noted that these comments are part of the administrative record and were taken into consideration while drafting the revised document. Any comments made during the May 2014 circulation of the documents will be included in the administrative record; however they will not be addressed in the Response to Comments. Per Section 15088.5(f)(1) of the CEQA Guidelines, only those comments submitted in response to the recirculated Environmental Impact Report will receive a formal written response in the Response to Comments as a part of the Final EIR.

In order to clearly display all of the changes that have been made during the General Plan Update Process, text has been formatted to show changes made in each step of the process. This includes:

- Black Text: General Plan text prior to GPA No. 960 is noted in black text.
- *Red Text: Textual changes proposed as part of the May 2014 previously circulated document are shown in red text.*
- *Blue Text: Textual changes made to the documents after the May 2014 circulation are shown in blue text.*

The color coding of the edits allows the reader to distinguish more clearly between the original General Plan text, the previously proposed May 2014 revisions (red) and the new February 2015 proposed revisions to GPA No. 960, EIR No. 521 and the Climate Action Plan.

1.1 Introduction

The County of Riverside is committed to reducing GHG emissions in an effort to provide a more livable, equitable, and economically vibrant community. By using energy more efficiently, harnessing renewable energy to power our buildings, enhancing access to sustainable transportation modes and recycling waste, dollars are kept in our local economy, new green jobs are created and community quality of life improves. These efforts toward reducing GHG emissions must be done in coordination with Riverside County's land use decisions. The foundation of planning land use decisions are the General Plan policies and programs. The policies and programs of the Riverside County General Plan are intended to underlie most land use decisions. Preparing, adopting, implementing and maintaining a general plan serves to:

- Define the community's environmental, social, and economic goals.
- Provide citizens with information about their community and with opportunities to participate in the planning and decision-making processes of their community.
- Coordinate the community and environmental protection activities among local, regional, state and federal agencies.
- Guide in the development of the community.

In order to achieve these goals and to provide a more livable, equitable and economically vibrant community, the County of Riverside has committed to prepare and implement the Riverside County Climate Action Plan (CAP) to help ensure that the impact of development on air quality is minimized, energy is conserved and land use

decisions made by Riverside County and all internal operations within Riverside County are consistent with adopted state legislation.

This section describes the purpose and goals of the CAP; describes the relationship of the CAP to the Riverside County General Plan, provides background information on GHG emissions; and summarizes the regulatory framework surrounding GHG emissions and climate change.

1.2 Purpose

The CAP was designed under the premise that the County of Riverside, and the community it represents, is uniquely capable of addressing emissions associated with sources under Riverside County's jurisdiction, and that Riverside County's emission reduction efforts should coordinate with the state strategies of reducing emissions in order to accomplish these reductions in an efficient and cost-effective manner. The County of Riverside developed this document with the following purposes in mind:

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

1.3 Goals

To fulfill the purposes of the CAP, the County of Riverside identified the following goals to be achieved:

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

1.4 Relationship to the County General Plan

The General Plan includes a series of linked documents including technical reports, and elements containing goals, policies and implementation programs that provide direction to the County of Riverside on managing its resources and how future development will occur.

The CAP is a separately bound document that will provide another implementation tool of the General Plan to guide development in Riverside County. The CAP focuses development on attaining the various goals and policies of the General Plan and all community plans relative to GHG emissions, and to achieve the goals outlined in Section 1.2 above.

1.5 Background

The CAP achieves the purpose and goals described above by providing:

- An analysis of GHG emissions and sources attributable to Riverside County.
- Estimates on how those emissions are expected to increase.
- Recommended policies and actions that can reduce GHG emissions to meet state, federal and international targets.
- A timeline of implementation.
- A defined tracking and reporting mechanism that will measure progress toward the goals.

In order to understand this process, the reader needs to know a few facts about GHG emissions, the climate change impacts anticipated within the County of Riverside and the international, federal, state and local regulatory framework designed to address climate change. The following information provides a brief background on these topics. A more complete description of the greenhouse effect, GHG emissions, and general climate change impacts can be found in Appendix A of this document.

A. Greenhouse Gases

Parts of the Earth's atmosphere act as an insulating "blanket" of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. This blanket is a collection of atmospheric gases called greenhouse gases, based on the idea that these gases also trap heat similar to the glass walls of a greenhouse. These gases, consisting mainly of water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3) and chlorofluorocarbons (CFC), all act as effective global insulators, reflecting back to earth infrared radiation. Human activities, such as producing electricity and driving internal combustion vehicles, emit these gases into the atmosphere.

Due to the successful global bans on chlorofluorocarbons (primarily used as refrigerants, aerosol propellants and cleaning solvents), Riverside County does not generate significant emissions of these GHGs. This also includes other synthesized gases such as hydrofluorocarbons (HFCs) and carbon tetrafluoride (CF_4) which have been banned and are no longer available on the market. Because of the ban, Riverside County will not generate emissions of these GHGs and therefore, they are not considered any further in this document. Sulfur

hexafluoride (SF_6) is another GHG with a high global warming potential; it is mainly used as a gaseous dielectric medium in electric switchgear of high voltage electric transmission lines and medical use in retinal detachment surgery and ultrasound imaging. In both uses, SF_6 is not released to the atmosphere and therefore, it is not considered further in this document.

Because GHGs have variable potencies, a common metric of carbon dioxide equivalents (CO_2e) is used to report the combined potency from all of the GHGs. The potency each GHG has in the atmosphere is measured as a combination of the volume of its emissions and its global warming potential,[1] and is expressed as a function of the potency with respect to the same mass of CO_2. Thus, by multiplying the individual gas by its global warming potential, the emissions of each individual gas can be measured in terms of metric tons of CO_2e (MT CO_2e).

This CAP contains two types of GHG inventories, one covering community-wide emissions and the other for Riverside County's municipal emissions. The community-wide inventory focuses on the sources and amounts of GHG emissions generated from activities associated with land uses within the unincorporated areas under the jurisdictional control of the County of Riverside, while the municipal inventory covers emissions solely from the buildings, facilities, and vehicles under the operational control of the local government. The purpose of the inventories is to create a clear picture of how the unincorporated communities within Riverside County and the government operations uses fossil fuels and other forms of energy, and to pinpoint the activities and sectors contributing the most GHGs.

1.6 Regulatory Setting

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

[1] The potential of a gas or aerosol to trap heat in the atmosphere.

A. International and Federal

Kyoto Protocol

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC) signed on March 21, 1994. Specifically, the Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions could be reduced by an estimated 5% from 1990 levels during the first commitment period of 2008–2012 (UNFCCC 1997). It should be noted that although the United States is a signatory to the Kyoto Protocol, Congress has not ratified the Protocol and the United States is not bound by the Protocol's commitments.

In December 2009, representatives from 170 countries met in Copenhagen to ratify an updated UNFCCC agreement known as the "Copenhagen Accord." This accord is a voluntary agreement between the United States, China, India and Brazil that recognizes the need to keep global temperature rise to below 2°C and obliges signatories to establish measures to reduce greenhouse gas emissions and to prepare to provide help to poorer countries in adapting to climate change. The countries met again in Cancun in December 2010 and adopted the Cancun Agreements, which reinforce and build upon the Copenhagen Accord. The nations agreed to recognize country targets, develop low-carbon development plans and strategies and report inventories annually. In addition, agreements were made regarding financing for developing countries, as well as for technology support and coordination among all nations. The next conference of the parties is scheduled for December 2011 in South Africa.

Climate Change Technology Program

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

U.S. Environmental Protection Agency

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address global climate change. The federal government administers a wide array of public-private partnerships to reduce GHG emissions generated by the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO_2 gases, agricultural practices and implementation of technologies to achieve GHG reductions. The USEPA implements several voluntary programs that help substantially reduce GHG

emissions. These programs include: the State Climate and Energy Partner Network, which fosters the exchange of information between federal and state agencies regarding climate and energy; the Climate Leaders program for companies; the Energy Star® labeling system for energy-efficient products; and the Green Power Partnership for organizations interested in buying green power. All of these programs play a significant role in encouraging voluntary reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

It should be noted that in *Massachusetts v. Environmental Protection Agency* (Docket No. 05–1120), the U.S. Supreme Court held in April of 2007 that the USEPA has authority to regulate greenhouse gases and that the USEPA's reasons for not regulating this area did not fit the statutory requirements. As such, the Court ruled that the USEPA should be required to regulate CO_2 and other greenhouse gases as pollutants pursuant to Section 202(a)(1) of the federal Clean Air Act (CAA).

Towards this aim, in 2009 the USEPA issued a Final Rule for mandatory reporting of GHG emissions by fossil fuel suppliers, industrial gas suppliers, direct GHG emitters and manufacturers of heavy-duty and off-road vehicles and vehicle engines. It also requires annual reporting of emissions. The first annual reports required by the Rule were due in March 2011. This rule does not regulate the emission of GHGs; it only requires the monitoring and reporting of greenhouse gas emissions for those sources above certain thresholds (USEPA 2009). In addition, the USEPA adopted a Final Endangerment Finding for the six defined GHGs in December 2009. This Endangerment Finding is required for the USEPA to regulate GHG emissions under Section 202(a)(1) of the CAA.

On May 13, 2010, the USEPA issued a Final Rule that establishes a common sense approach to addressing greenhouse gas emissions from stationary sources under the CAA permitting programs. The rule is in its second phase, which continues through June 2013. In this phase, new construction projects that exceed a CO_2e threshold of 100,000 tons per year and modifications of existing facilities that increase CO_2e emissions by at least 75,000 tons per year are subject to permitting requirements. Additionally, operating facilities that emit at least 100,000 tons per year are subject to Title V permitting requirements for GHGs (USEPA 2010a). New and existing industrial facilities that meet or exceed that threshold require a permit under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs.

B. State

California Air Resources Board

The California Air Resources Board (CARB), a part of the California Environmental Protection Agency (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets the California Ambient Air Quality Standards (CAAQS), compiles air emission inventories, develops suggested control measures and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints and barbecue lighter fluid) and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts. The SIP is required for the State of California to take over implementation of the federal Clean Air Act in California and consists of rules and technical documentation to support the State of California's plan for reducing emissions of criteria pollutants in areas that exceed EPA standards and are designated non-attainment.

Executive Order S-20-04

Governor Arnold Schwarzenegger signed Executive Order S-20-04 regarding Green Buildings on December 14, 2004. It established California's priority for energy and resource-efficient high performance buildings. The Executive Order sets a goal of reducing energy use in state-owned buildings by 20 percent by 2015 (from a 2003 baseline) and encourages the private commercial sector to set the same goal. Executive Order S-20-04 also directs compliance with the Green Building Action Plan which details the measures the state will take to meet these goals. To summarize, Executive Order S-20-04 and the Green Building Action Plan assigned the California Energy Commission to develop the following measures to achieve the goals of Executive Order S-20-04:

- Building efficiency benchmarking system for all state-owned and private commercial buildings.
- Develop commissioning and retro commissioning guidelines for commercial buildings.
- Develop and refine (Title 24) building energy efficiency standards applicable to commercial buildings sector to result in 20% reduction in energy use by 2015 using standards adopted in 2003 as the baseline.
- Consult and collaborate with the Department of General Services, Department of Finance and California Public Utility Commission on retrofitting all state-owned buildings.

Executive Order S-3-05

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

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

The first California Climate Action Team (CCAT) Report to the Governor in 2006 contained recommendations and strategies to help meet the targets in Executive Order S 3-05. In April 2010, the Draft California Action Team (CAT) Biennial Report expanded on the policy-oriented 2006 assessment. The new information detailed in the CAT Assessment Report includes development of revised climate and sea-level projections using new information and tools that have become available in the last two years, and an evaluation of climate change within the context of broader social changes such as land-use changes and demographic shifts (CCAT 2010). Action items in the report focus on the preparation of the Climate Change Adaptation Strategy, required by Executive Order S-13-08, described later in this report.

Assembly Bill 1493, Clean Car Standards

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

federal gas mileage standards preempted these state regulations. In 2005, California filed a waiver request to the USEPA in order to implement the GHG standards (Pavley I and II) and in March of 2008, the USEPA denied the request. However, in June 2009, the decision was reversed and the USEPA granted California the authority to implement the GHG reduction standards for passenger cars, pickup trucks, and sport utility vehicles.

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

Assembly Bill 32, The Global Warming Solutions Act of 2006

In 2006, the California State Legislature adopted AB 32, *the California Global Warming Solutions Act of 2006*, focusing on reducing GHG emissions in California. GHGs as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. AB 32 required CARB to adopt rules and regulations directing state actions that would reduce GHG emissions to 1990 statewide levels by 2020. CARB was also required to publish a list of "discrete early action" GHG emission reduction measures that would be made enforceable by 2010. The law further required that such measures achieve the maximum technologically feasible and cost-effective reductions in GHGs from sources or categories of sources to achieve the statewide greenhouse gas emissions limit for 2020.

Towards this aim, in October 2007, CARB published its Final Report for Proposed Early Actions to Mitigate Climate Change in California. This report described recommendations for discrete early action measures to reduce GHG emissions. Resulting from this were three new regulations including: a low carbon fuel standard, reduction of HFC-134a (a refrigerant chemical) emissions from non-professional servicing of motor vehicle air conditioning systems and improved landfill methane capture. CARB estimated that by 2020, reductions from these three measures would reduce emissions by approximately 13-26 million metric tons CO_2e.

In 2007, CARB released a report, *California 1990 GHG Emissions Level and 2020 Emissions Limit,* establishing that statewide levels of GHG emissions in 1990 were 427 MMT CO_2e. Additionally, in 2008, CARB adopted the *Climate Change Scoping Plan*, outlining the State of California's strategy to achieve the 2020 GHG limit. The Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs and enhance public health. The plan emphasizes a cap-and-trade program, but also includes the discrete early actions previously mentioned.

Senate Bill 97

SB 97, enacted in 2007, amended CEQA to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed the California Office of Planning and Research (OPR) to develop revisions to the *State CEQA Guidelines* "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the Resources Agency to certify and adopt these revised *State CEQA Guidelines* by January 2010 (See PRC Section 21083.05). The revisions were codified into the California Code of Regulations and became fully effective by July 2010. These revisions provide regulatory guidance for the analysis and mitigation of the potential effects of GHG emissions.

Among the changes resulting from SB 97 was the addition of criteria for Climate Action Plans used in the tiering and streamlining of CEQA analysis of GHGs for subsequent development projects. Riverside County has updated the Air Quality Element of the General Plan to include specific policies to address GHG emissions. The implementation mechanisms for these GHG-related policies are the Screening Tables for New Development, included in Appendix N of the General Plan. The Screening Tables allow new development projects a streamlined option for complying with the CEQA requirements for addressing GHG emissions. Additionally, Riverside County's Climate Action Plan details policies to reduce emissions from municipal and community-wide sources including emissions from existing buildings and new development. The addition to the *State CEQA Guidelines* reads as follows:

> *15183.5. Tiering and Streamlining the Analysis of Greenhouse Gas Emissions.*
>
> *(a) Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of greenhouse gas emissions as provided in Section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs), 15175-15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).*
>
> *(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to Sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.*
>
> *(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:*
>
> *(A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;*
>
> *(B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;*
>
> *(C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;*
>
> *(D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;*
>
> *(E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;*
>
> *(F) Be adopted in a public process following environmental review.*
>
> *(2) Use with Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis*

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

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

Senate Bill 375

SB 375 established mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions and was adopted by the State of California in September 2008. In response, in 2010, CARB adopted vehicular GHG emissions reduction targets developed in consultation with the state's metropolitan planning organizations (MPOs), which included the Southern California Association of Governments (SCAG), to which Riverside County belongs. The targets require a 7-8% reduction by 2020 and 13-16% reduction by 2035 for each MPO. The objective of these targets is to induce cities and counties to change their land use patterns and improve their transportation alternatives. Through the SB 375 process, MPOs, such as SCAG, are to work with local jurisdictions in the development of "Sustainable Communities Strategies" (SCS) designed to integrate development patterns and the transportation network in a way that reduces greenhouse gas emissions while meeting housing needs and other regional planning objectives. In particular, SCAG's reduction target for per capita vehicular emissions is 8% by 2020 and 13% by 2035 (CARB 2010b). SCAG is in the process of preparing its SCS according to its 2012 regional transportation plan (RTP) update schedule. To date, no region has adopted an SCS; the earliest RTP updates with SCSs are expected in 2012.

Executive Order S-13-08

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

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

The resultant 2009 CAS Report summarizes the best known science on climate change impacts in the state to assess vulnerability and outlines possible solutions that can be implemented within and across state agencies to

promote resiliency. This is the first step in an ongoing, evolving process to reduce California's vulnerability to climate impacts (California Natural Resources Agency 2009a).

California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Electricity production by fossil fuels results in GHG emissions, and energy-efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

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

- To provide California with an adequate, reasonably priced and environmentally sound supply of energy.
- To respond to AB 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its GHG emissions to 1990 levels by 2020.
- To pursue California energy policy, which states that energy efficiency is the resource of first choice for meeting California's energy needs.
- To act on the findings of California's Integrated Energy Policy Report (IEPR) that concludes that the Standards are the most cost-effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand and recognizes the role of the Standards in reducing energy related to meeting California's water needs and in reducing GHG emissions.
- To meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes.
- To meet the energy efficiency goals of Executive Order S-20-04 which established California's Green Building Initiative. The Executive Order seeks to improve the energy efficiency of nonresidential buildings through aggressive standards toward the target of a 20% reduction in building energy use from a 2003 baseline by the year 2015.

California Green Building Code

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

C. Regional

Riverside County spans three different air basins: South Coast, Salton Sea, and Mojave Desert. The portions of Riverside County within the South Coast and Salton Sea Air Basins are regulated by the South Coast Air Quality

Management District (SCAQMD), which also governs Los Angeles and Orange Counties, plus a small portion of San Bernardino County. The easternmost third of Riverside County, that within the Mojave Desert Air Basin, is under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD), which also governs most of San Bernardino County. The AQMDs are responsible for promoting and improving the air quality of their jurisdiction's basins. This is accomplished though air quality monitoring, evaluation, education, implementation of control measures to reduce emissions from stationary sources, permitting and inspection of pollution sources, enforcement of air quality regulations and by supporting and implementing measures to reduce emissions from motor vehicles. Both the SCAQMD and the MDAQMD have stationary, area and mobile source[2] control measures designed to bring the area into compliance with the state ozone standards.

After AB 32 was passed, SCAQMD formed the Climate Change Committee along with the Greenhouse Gases CEQA Significance Thresholds Working Group and the SoCal Climate Solutions Exchange Technical Advisory Group. On September 5, 2008, the SCAQMD Board approved the SCAQMD Climate Change Policy, which outlines actions SCAQMD will take to assist businesses and local governments in implementing climate change measures, decrease the agencies carbon emissions and provide information to the public regarding climate change. On December 5, 2008, the SCAQMD Board approved interim CEQA GHG significance thresholds for stationary sources, rules, and plans. SCAQMD adopted a tiered approach for determining significance; projects that are exempt from CEQA or consistent with a local GHG reduction plan are determined less than significant. Tier 3, the primary tier the board will use for determining significance, has a screening significance threshold using the 90th percentile of emissions capture rate approach.

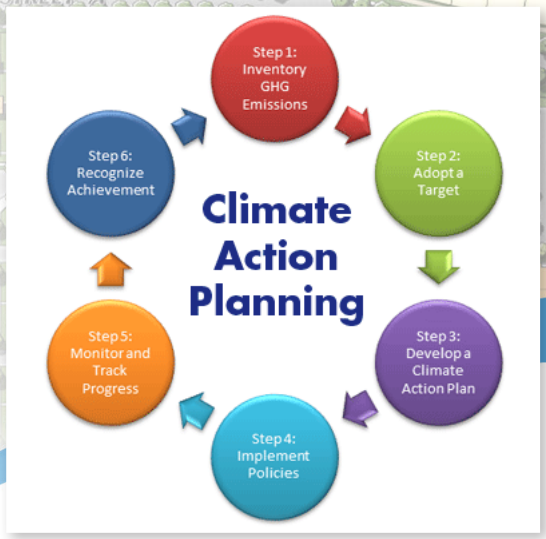
D. Local

In light of state and regional efforts to reduce GHGs, there are several avenues of opportunity Riverside County faces. In preparing this CAP, the County of Riverside is able to streamline its CEQA review of individual projects. By having a GHG reduction plan that adequately addresses emissions at the plan level, the County of Riverside is able to determine that projects that are consistent with the plan will not have significant GHG-related impacts. Coordination with CARB, SCAQMD, and the State Attorney General's office ensures that the inventories and reduction strategies presented in this report adequately address the County of Riverside's emissions. The County of Riverside will use screening tables for new development (described in Section 4 of this report) in order to evaluate the consistency of individual projects with the goals and reduction measures outlined in this report.

The screening tables are setup similar to a checklist with points allocated to certain elements that reduce greenhouse gas emissions; if the project garners 100 points (by including enough GHG-reducing elements), then the project is consistent with Riverside County's plan for reducing emissions. This streamlined process relieves the Riverside County development projects from lengthy studies or uncertainties, particularly for small development proposals. The screening tables are set up in such a way that a new development project can earn points by reducing emissions from an existing source (by making an existing building more energy efficient, for example). This is particularly beneficial for jurisdictions, such as Riverside County, that have significant housing stock built prior to the 1974 inception of Title 24 energy efficiency standards and requirements. Thus, Riverside County is able to reduce emissions from both existing sources and future development.

[2] Stationary sources emit pollutants from a fixed location, for example industrial boilers. Mobile sources are motor vehicles and other transportation sources that generate pollution through the combustion of fossil fuels. Area sources are those associated with the activities of a given area, such as from fireplaces and lawnmowers in a residential area.

This page intentionally left blank



Chapter 2
Methodology

This page intentionally left blank

Chapter 2 Methodology

2.1 Overview

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

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

- **Scope 1 Emissions** – All "direct" sources of community-wide GHG emissions from sources within the jurisdictional boundaries and unincorporated areas of Riverside County. This includes fuel burned onsite in buildings and equipment such as natural gas or diesel fuel; transportation fuels burned in motor vehicles; and wood-burning emissions from household hearths. For inventories of only government operations, these emissions are limited to activities under the operational control of the County of Riverside government.
- **Scope 2 Emissions** – Encompasses "indirect" sources of GHG emissions resulting from the consumption of purchased electricity, which is electricity used by the residents, businesses, and County of Riverside's facilities. An "indirect" source is one where the action that generates GHGs is separated from where the GHGs are actually emitted. For example, when a building uses electricity, it necessitates the burning of fossil fuels, such as coal or natural gas (and resultant release of GHGs) to generate electricity by a utility facility located elsewhere. Thus, they are distinguished from *direct* emissions (i.e., Scope 1 emissions) from electricity production, which are reported by the utility itself, in order to avoid double counting.

- **Scope 3 Emissions** – An optional reporting category that encompasses all other "indirect emissions" that are a consequence of activities of Riverside County's residents and businesses, but occur from sources out of the jurisdictional control of the local government. The key to this category of emissions is that they must be "indirect or embodied emissions over which the local government exerts significant control or influence" (CCAR 2010). For example, when considering GHG emissions from trucks hauling waste under a county contract, the County of Riverside does not own the waste hauling trucks, but does have significant control over how many pickups the trucks make.

Scope 1 emissions are characterized in this report as "direct emissions" While Scope 2 emissions are characterized as "indirect source emissions."

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

2.2 Calculation of GHGs

The first step in developing the CAP was to establish an existing inventory of Riverside County's GHG emissions. The purpose of this inventory is to create an existing inventory to align with the Riverside County General Plan Update. The CAP uses 2008 as the year on which to base the existing inventory; this is the most recent year for which reliable data concerning Riverside County's residential, commercial, and government operations are available. This inventory provides a framework on which to design programs and actions that specifically target reductions by emissions sources. Programs and actions already in place within Riverside County are described in Chapter 4. The 2008 inventory serves as a reference against which to measure Riverside County's progress towards reducing GHG emissions into the future, and also serves as documentation for potential emission trading opportunities.

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

In estimating Riverside County's total GHG emissions in 2008, many data sources were utilized. For community energy statistics, the following agencies and Riverside County departments were consulted: Riverside County Planning Department, Southern California Edison (SCE), Imperial Irrigation District (IID) and Southern California Gas Company (SCG). Transportation data sources included Riverside County Transportation Department, Riverside County Economic Development Agency, Southern California Association of Governments (SCAG) and California Department of Transportation (CalTrans). Agricultural data sources included Riverside County Agricultural Commissioner and SCAG. Water use data was gathered from Coachella Valley Water District, Desert Water Agency, Eastern Municipal Water District, Western Municipal Water District, Palo Verde Irrigation District, San Gorgonio Pass Water Agency and Metropolitan Water District of Southern California. Solid waste data was collected from Riverside County Waste Management Department, California Integrated Waste Board (CIWB) and California Department of Resources Recycling and Recovery (Cal Recycle). Appendix C includes a compilation of all data inputs. In cases where specific data for 2008 was not available,

estimates were made by extrapolating from existing data the County of Riverside had that was as close to 2008 as possible. Details on the data inputs and estimates made when 2008 data was not available can be found in Appendices B and C of this CAP. The data used in the calculations for each inventory are summarized in Chapter 3. All of the contributors to GHG emissions (kilowatt-hours (kWh) of electricity generated by fossil fuel combustion in power plants, natural gas in therms, vehicle travel in VMT, and solid waste in tons) are expressed in the common unit of MT of CO_2e released into the atmosphere in a given year.

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

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

A. Energy

Electricity

Emissions of CO_2, CH_4, and N_2O within Riverside County result from the use of electricity. Annual electricity usage in 2008, obtained from SCE and IID, the two major commercial electricity providers serving Riverside County territory, was used in determining community-wide electricity consumption and generation emission estimates for the existing inventory. For the municipal inventory, electricity use in government facilities and streetlights was included and categorized by department. For 2020, emissions estimates were based on the anticipated growth in population, housing and employment for the County of Riverside. The 2020 growth projections were interpolated from the General Plan Update growth rates.

SCE and IID provide electricity generated via a variety of sources, including combustion of natural gas and coal, nuclear, large hydroelectric, and renewable sources (solar, wind, etc.). Each of these sources of electricity emits different amounts of GHGs. Therefore, emissions from electricity were determined by multiplying annual usage in megawatt hours per year (MWh/year) by the SCE emission factors appropriate to the inventory year for CO_2, CH_4, and N_2O obtained from USEPA's Emissions and Generation Resource Integrated Database (eGRID) (USEPA 2007).

Two gas-to-energy facilities are located in unincorporated Riverside County, one at the Badlands Landfill and one at the El Sobrante Landfill. These facilities take the methane collected from the decomposition of solid waste and convert it to electricity. The generation of electricity from these alternative generation sources results in emission reductions. Therefore, the operation of these facilities offset electrical consumption within the inventory by approximately 13,016 megawatt hours to account for the electricity generated by these facilities in 2008. Concerning the El Sobrante Landfill, the County of Riverside cannot claim all of the benefits associated with the gas-to-energy facility at the landfill. The El Sobrante landfill is privately owned and operated. The majority of the waste disposed of at the landfill is generated from outside of Riverside County boundaries. The County of Riverside collects fees and has indirect control over the waste collected from within Riverside County at the El

Sobrante Landfill; however, the County of Riverside does not have control over the landfill waste collected by the private operator from outside Riverside County boundaries. Therefore, the benefits from cogeneration are limited to the portion of methane associated with waste collected within Riverside County. As of the end of 2008, approximately 49 percent of the total waste deposited in the El Sobrante landfill originated within Riverside County with the remaining 51 percent originating outside of Riverside County. The 2008 baseline inventory calculates the benefit of the El Sobrante cogeneration based on the portion of waste collected within Riverside County. The contractual split of waste at El Sobrante Landfill was updated after 2008 such that 40 percent of the waste will come from within Riverside County with the remaining 60 percent coming from outside Riverside County. Cogeneration benefits at the El Sobrante Landfill for years 2020 and 2035 reflect the contractual split of waste.

Natural Gas Combustion

The residents and businesses of Riverside County emit GHGs from the combustion of natural gas, most often used for space heating. The annual natural gas usage for the unincorporated areas of Riverside County measured in million British Thermal Units (MMBTUs) was multiplied by the respective emissions factors for CO_2, CH_4, and N_2O to determine the emissions from natural gas combustion. Existing inventory consumption levels for municipal operations and the community as a whole were obtained from the Southern California Gas Company (SCG) and future community-wide consumption estimates were based on anticipated growth in Riverside County.

B. Water Supply

Water-related emissions included in this section are indirectly produced as a result of electrical consumption to pump and treat water imported from outside Riverside County. There are many water agencies that operate in Riverside County providing both potable and non-potable water to customers in the unincorporated areas. The six major water importers and wholesalers serving Riverside County are: Coachella Valley Water District (CVWD), Desert Water Agency (DWA), Eastern Municipal Water District (EMWD), Western Municipal Water District (WMWD), Palo Verde Irrigation District (PVID) and San Gorgonio Pass Water Agency (SGPWA). Serving EMWD and WMWD, the Metropolitan Water District of Southern California (MWD) holds the rights to a large portion of the State Water Project supply (the system of aqueducts and canals that distributes water from the Sacramento Bay-San Joaquin Delta across the state) and is the largest water wholesaler in California. The San Gorgonio Pass Water Agency also gets its water from the State Water Project. The water agencies in the eastern portion of Riverside County predominantly get their water from the Colorado River.

Each agency's water supply comes from a mixture of the following sources: the Bay-Delta via the State Water Project, the Colorado River, local groundwater, recycled water, and local surface water. The GHG emissions associated with water use come from the energy used to collect, treat, convey, and distribute the water. Water imported through the State Water Project and from the Colorado River have higher GHG emissions associated with them, when compared to local water sources, as these distant sources require energy intensive transport to reach Riverside County. This category, "Water Supply," addresses the GHG emissions resulting from energy used to pump/transport these imported sources of water from their sources to Riverside County. This separate category is necessary, as the energy used is accrued across a varied of providers and is not included in the data collected from SCE and IID. For local water sources, the data collected from SCE and IID include associated electricity usage and, hence GHG emissions are included under the "Electricity" category described above. Showing GHG emissions associated with local water sources in the "Electricity" category avoided double counting because the electricity used to pump local water supplies was embedded in the SCE reported electrical consumption data for unincorporated Riverside County.

C. Wastewater Treatment

As with the local water supply just mentioned, GHG emissions associated with wastewater (that is, sewage, urban runoff, and, in some cases, industrial or manufacturing runoff) are based on the electricity needed to pump and treat the wastewater. Again, since wastewater treatment occurs locally within Riverside County, these emissions are also accounted for under the "Electricity" section of the community-wide inventory to avoid double counting of GHG emissions identical to how locally pumped water were treated.

D. Solid Waste Management

Riverside County Waste Management Department is responsible for managing the County's landfills, including both active and closed landfills, with one exception – the El Sobrante landfill, which is privately owned and operated. Table 2-1 (Riverside County Landfills), below, provides information on the closure year (either past or planned), the year the landfill gas (LFG) system was installed, the in place tonnage at the end of 2008 and the amount of waste disposed at each landfill in 2008. As discussed under "Electricity," the County of Riverside collects fees and has control over the portion of the El Sobrante landfill waste collected from within Riverside County. Therefore, the emissions associated with solid waste within the inventory are limited to the portion of waste collected within Riverside County.

Riverside County's municipal inventory includes the emissions associated with the landfills that are owned and managed by the County of Riverside. This includes emissions from county-owned vehicles and equipment as well as fugitive methane emissions from open and closed landfills that are managed by the County of Riverside. Riverside County's emissions from vehicles and equipment associated with solid waste are included, respectively, in the vehicle fleet and off-road equipment sections of the municipal operations inventory.

Table 2-1 Riverside County Landfills

Landfill Name (closure year)	Year LFG System Installed	In-place Tonnage (end of 2008)	Waste Disposed in 2008
Badlands (2016)	2001	8,389,807	582,404.62
Blythe (2034)	1998	609,373	15,178.80
Coachella (1997)	2001	3,237,845	-
Corona (1986)	1988	3,200,000	-
Desert Center	-	40,425	15.25
Double Butte (1994)	1997	1,977,463	-
Edom Hill (1997)	2008	7,323,778	-
Elsinore (1965)	1993	1,140,000	-
El Sobrante (2045)*	1989	22,127,558	960,363.49
Highgrove (1998)	1998	3,496,425	-
Lamb Canyon (2021)	2001	6,376,349	688,142.35
Mead Valley (1997)	1995	2,312,837	-
Mecca II	-	228,088	8.86
Oasis	-	176,410	1,479.97
W. Riverside (1993)	1988	1,260,000	-

*El Sobrante is a privately operated landfill; all others are operated by Riverside County Waste Management. Waste Disposed in 2008 associated with the El Sobrante landfill represents only the in County portion (or approximately 49 percent) of the total waste disposed at this landfill.

Emissions from solid waste result from three different waste-related sources of emissions: transportation from its source to the landfill, operation of the equipment used at the landfill and the fugitive emissions from waste decomposition. Emissions from the transportation of solid waste are determined based on the average number of

miles traveled by each truck multiplied by the CO_2, CH_4, and N_2O emissions generated per mile traveled. These emissions are accounted for under the "Transportation," Section 2.3.4, of the inventory, described below. The emissions from landfill equipment are dependent upon the type of equipment, fuel use and duration of use. Emissions from waste decomposition at both active and inactive landfills located in the unincorporated areas of Riverside County are included in the inventory. The operational information used in this section was collected from the Riverside County Waste Management Department.

Emissions from the equipment used at the landfills were calculated from total fuel use by the equipment and the emission factors for CO_2, CH_4 and N_2O, as determined from CARB off-road mobile source emission factors. Fugitive methane emissions from the decomposition of solid waste (typically buried) are calculated based on the annual waste generation multiplied by the applicable emission factors for waste production for CH_4. Many landfills now have a methane capture system in place; depending on the type of system, not all of the methane generated from the decomposition is included in the inventory. In Riverside County, three of the existing seven active landfills and nine inactive landfills have such systems. Although CO_2 is also a by-product of organic waste decomposition, the USEPA considers these emissions to be natural and not anthropogenic. Therefore, they are not included in the emissions inventory. Nitrous oxide is not a by-product of decomposition and, therefore, no fugitive emissions of nitrous oxide are anticipated or calculated from solid waste sources.

E. Area Source Emissions

Landscaping Emissions

Emissions of CO_2, CH_4 and N_2O are generated by the use of landscape equipment that runs on gasoline. CO_2 emissions were determined directly through URBEMIS2007 for the existing (2008) and 2020 community-wide inventories. URBEMIS2007 is a computer software package that is used for modeling projected emissions of air quality pollutants including carbon dioxide. From the CO_2 emissions, the approximate number of gallons of gasoline consumed by landscape equipment use was calculated (CARB 2007e). This number was then multiplied by emission factors presented in the General Reporting Protocol, version 3.1 (CCAR 2010) to derive both CH_4 and N_2O emissions. Landscaping emissions in the municipal inventory were calculated based on Riverside County's inventory of equipment and fuel use along with the specific CO_2, CH_4 and N_2O emission factors for each equipment type.

Wood Burning Emissions

Direct CO_2 emissions are produced from the burning of wood in wood stoves and fireplaces. Natural gas-fired stoves, barbecues and other heating devices are not included in this subcategory; they have already been accounted for under "Energy." Carbon dioxide, CH_4 and N_2O emissions from wood stoves and fireplaces are calculated based on the percentage of residential units using each type of hearth and the California average amount of wood burned per unit provided by the EIA 2005 Residential Energy Consumption Survey (EIA 2005). The emission coefficients used are taken from the USEPA's AP-42 document (USEPA 1985).

F. Transportation

On-Road Vehicles

For Riverside's municipal inventory, CO_2, CH_4 and N_2O emissions from Riverside County's municipal fleet were calculated based on the fuel use and annual miles traveled by each vehicle. CO_2 emissions were calculated using the total fuel use multiplied by the emission factor for either gasoline or diesel fuel. CH_4 and N_2O emissions are based on the vehicle's age, model and miles traveled. The emissions were then organized by each department.

For the community-wide inventory, emissions from on-road vehicles include all generated from trips attributable to activities taking place in the unincorporated parts of Riverside County. Carbon dioxide emissions from vehicles were calculated utilizing EMFAC2007 emission factors for the existing and 2020 inventories. The Emission Factors (EMFAC) model was developed by the California Air Resources Board and is used to calculate CO_2 emission rates for on-road motor vehicles, from light-duty passenger vehicles to heavy-duty trucks that operate on highways, freeways, and local roads in California (CARB 2007b). Motor vehicle emissions of CH_4 and N_2O were calculated using USEPA emission factors for on-road vehicles based on the total annual mileage driven multiplied by their respective emission factors by year. Vehicle miles traveled (VMT) were provided by the Riverside County Transportation Department. VMT was derived from transportation modeling of the trips entering Riverside County, trips leaving Riverside County, and trips within Riverside County. Pass-through traffic (that is, trips beginning and ending outside of Riverside County) is not included in this analysis. Since trips entering and leaving Riverside County have only one end in Riverside County, only half of these miles were included in the emissions analysis, in order to reflect the split jurisdiction of these trips.

The transportation modeling (RIVTAM) assumed that all vehicles are either gasoline or diesel powered. The estimates therefore do not account for electrical, biodiesel (a blend of diesel and vegetable oil), or hydrogen powered systems. Any electrically powered vehicle which draws its power from a residential, commercial, or industrial land use within Riverside County will be accounted for under electrical usage, i.e., "Energy." Predicted 2020 BAU vehicle trips were estimated by using Riverside County General Plan buildout (approximately Year 2060) conditions and interpolating back to year 2020.

Aviation Emissions

Riverside County owns and operates five airports: Hemet-Ryan, French Valley, Chiriaco Summit, Desert Center and Jacqueline Cochran Regional Airport. The municipal inventory includes the emissions from the energy used to run the facilities and lights at the airports and the emissions from onsite equipment, while the community-wide inventory includes emissions from all aviation activities. The GHG emissions associated with aircraft trips within Riverside County were calculated based on annual fuel consumption (extrapolated from airport aviation fuel sales) and emission factors for jet fuel and aviation fuel for CO_2, CH_4 and N_2O. Fuel services are not provided at the Chiriaco Summit or Desert Center Airport, so all fuel consumption data was obtained from the three larger airports. March Air Reserve Base is not included here as it is not under the direct jurisdiction of the County of Riverside.

G. Agriculture

Riverside County has a large amount of agricultural land with a variety of cultivation uses. The most prominent uses are field and seed crops, including primarily alfalfa and wheat, as well as irrigated pasturelands and rangelands (for grazing). Other uses include fruit trees, vineyards, vegetables, and livestock. Agricultural practices contribute

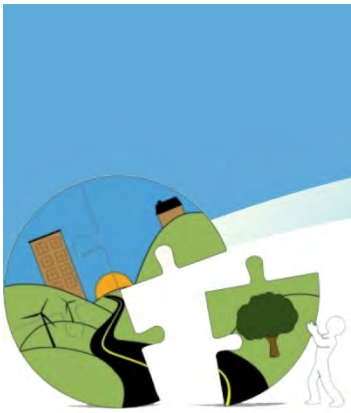
directly to emissions of greenhouse gases through a variety of processes. Assessment of non-carbon-dioxide emissions are from the following source categories: enteric fermentation in domestic livestock, livestock manure management, crop cultivation and field burning of agricultural residues.

Livestock emissions are divided into two categories based on the emissions source: enteric fermentation and manure management. Enteric fermentation is defined as a fermentation process that takes place in the stomach of ruminant animals, such as cows, sheep and goats. This process produces methane that is released through belching and flatulence. Manure management is the process of gathering and disposing of manure generated by livestock. Management practices vary by type of livestock, but in the case of dairy cows, manure is often collected and stored in lagoons. As the manure breaks down, methane is released.

Methane and nitrous oxide is the primary greenhouse gases emitted from crop cultivation and associated activities. Rice cultivation and field burning of agricultural residues are contributing sources of CH_4 (USEPA 2009b). Agricultural-related emissions for 2008 were based on data from SCAG and the Riverside County Agricultural Commissioner.

Chapter 3
GHG Emissions Inventory

This page intentionally left blank



Chapter 3 GHG Emissions Inventory

The following sections describe Riverside County's 2008 government operations and community-wide GHG emissions inventories. The government operations inventory includes sources and quantities of GHG emissions from government owned or rented buildings, facilities, vehicles, and equipment. The community-wide emissions inventory identifies and categorizes the major sources and quantities of GHG emissions produced by residents, businesses, and municipal operations in the unincorporated areas of Riverside County using the best available data. By having the government emissions separated from the community as a whole, the local government can implement reduction strategies where it has direct control, closely monitor the changes in emissions over time, and set an example for the rest of Riverside County.

3.1 2008 Government Emissions Inventory

A. Data Inputs

Data for the government inventory was gathered from various Riverside County departments. Table 3-1 (2008 Government Data Inputs), below, summarizes the data inputs and sources for each of the emission categories included in the inventory.

Table 3-1 2008 Government Data Inputs

Category	Data Input	Data Source
Electricity (kWh)		
Consumption	114,737,623	SCE
Generation*	13,015,642	Riverside County Waste management
Natural Gas (therms)	1,622,208	SCG
Vehicle Fleet		
Gasoline(gallons)	3,419,635	Riverside County Fleet Manager
Diesel (gallons)	469,649	
Off-Road Equipment		
Gasoline(gallons)	982	
Diesel (gallons)	1,031,016	
LNG (gallons)	368,838	Riverside County Fleet Manager
Propane (gallons)	3,607	
Jet Fuel (gallons)	1,832,210	
Aviation Fuel (gallons)	404,686	
Solid Waste Landfill Gas Collection (MMSCF)	2,406	Riverside County Waste Management

* El Sobrante is a privately operated landfill; all others are operated by Riverside County Waste Management Department. Electrical Generation for Riverside County reflects the Badlands facility and the portion of cogeneration at El Sobrante landfill associated with in-county disposal (or 49 percent) of the total generation at the El Sobrante facility.

Each data input was then multiplied by the associated emission factor to calculate the emissions inventory. Additionally, where possible, the emissions were categorized by county department.

B. Emissions Summary

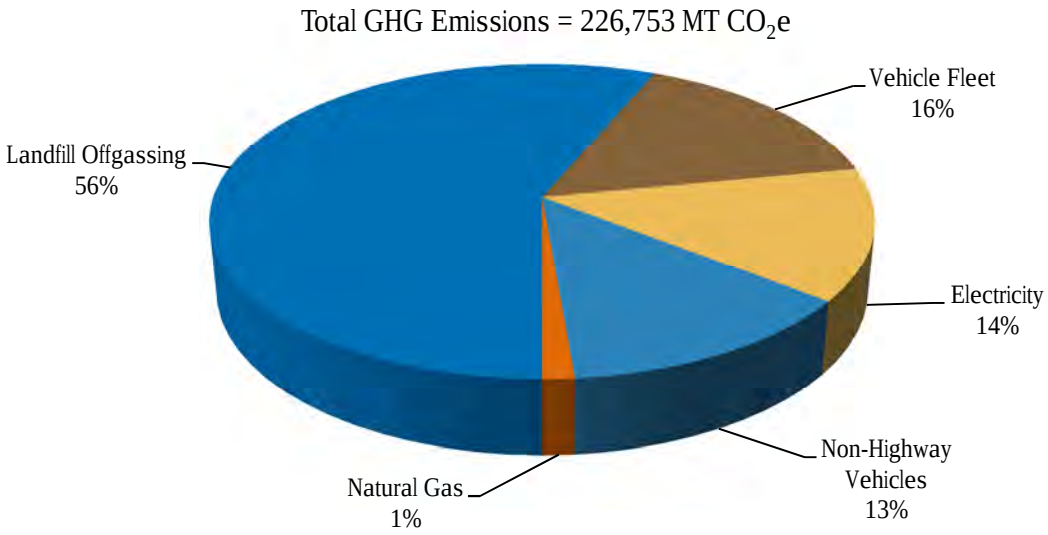
Riverside County emitted 226,753 MT CO_2e through its government operations in 2008. The emissions were calculated based on the vehicle and equipment fleet fuel use, energy accounts, and waste management. The largest portion of Riverside County's 2008 government emissions were from landfill emissions (56%), followed by emissions from the vehicle fleet (16%). Table 3-2 (2008 Total Government Emissions) summarizes Riverside County's 2008 emissions of CO_2e as broken down by emissions category. Figure 3-1 (2008 Government Emissions by Category) is a graphical representation of Table 3-2. A detailed breakdown of 2008 emissions by category is available in Appendix D of this CAP.

Table 3-2 2008 Total Government Emissions

Category	Metric tons of CO_2e
Landfill Offgassing	127,850
Vehicle Fleet	35,331
Electricity	30,859
Off-Road Equipment*	29,649
Natural Gas	3,065
Total	**226,753**

*Off-Road Equipment includes front end loaders, dozers, forklifts, etc.

Figure 3-1 2008 Government Emissions by Category (metric tons CO_2e)



C. 2008 Government Department Emissions and Costs

For the government operations inventory, it is helpful to see which departments are generating the most emissions. This helps to pinpoint where emissions are coming from and where the focus should be placed for targeting emissions reductions. Table 3-3 (2008 Government Emissions and Costs by Department) summarizes the solid waste, electricity, natural gas, and vehicle fleet emissions by department. Figure 3-2 (2008 Government Emissions by Department) is a graphical representation of Table 3-3.

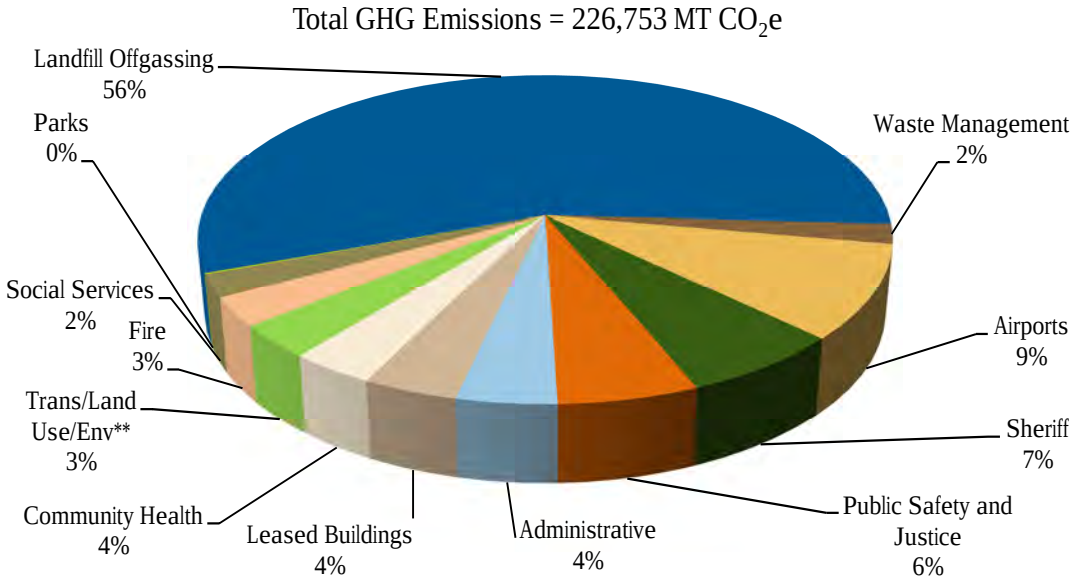
Landfill offgassing, while under the control of the waste management department, is listed as a separate category because the methane emitted from waste decomposition is the result of solid waste from the entire community, both unincorporated areas and municipal waste deposited in Riverside County Landfills. Separating out the emissions in this fashion gives a better comparison of the waste management department with other departments within the County of Riverside local government operations. Like the other departments, the waste management department emissions result from the utility consumption, mobile source emissions and waste generation associated with the everyday operations of the department. The sheriff's department accounts for the greatest energy costs primarily due to the numerous vehicles used by the sheriff's fleet.

Table 3-3 2008 Government Emissions and Costs by Department

Category	Metric Tons of CO_2e	Energy Cost ($)
Waste Management	4,421	$1,405,038
Landfill Offgassing	127,850	N/A
Airports	21,250	$ 253,676
Sheriff	15,039	$ 5,008,600
Public Safety and Justice	12,981	$ 4,223,789
Administrative	9,259	$ 3,033,217
Leased Buildings	8,753	$ 2,848,502
Community Health	7,780	$ 2,540,726
Transportation/Land Use/Environment	7,493	$ 2,201,486
Fire	6,541	$ 1,975,982
Social Services	5,206	$ 1,719,473
Parks	179	$ 59,011
Total	**226,753**	**$25,269,501**

Note: Emission sources include electricity, natural gas, vehicle fuels, and solid waste decomposition. Costs include electricity, natural gas, and transportation fuels.

Figure 3-2 2008 Government Emissions by Department (metric tons CO_2e)



D. 2008 Total Government Cost Estimates

The costs associated with the inventory represent the municipal energy and fuel use costs. These cost estimates give the County of Riverside a perspective on where Riverside County is spending the most money and help to prioritize reduction measures toward the sectors that have the potential to both reduce emissions and costs. Riverside County's fuel purchases for the vehicle fleet made up the largest cost in 2008, followed closely by electricity costs. Table 3-4 (Estimated Government Energy Costs), below, summarizes the cost estimates for 2008.

Table 3-4 Estimated Government Energy Costs

Source	Energy Cost
Vehicle Fleet	$ 11,433,028
Electricity	$10,033,552
Natural Gas	$ 989,547
Off-Road Vehicles	$2,813,374
Total	**$25,269,501**

3.2 2008 Community-Wide Emissions Inventory

The community-wide inventory represents all emissions from sources located with the unincorporated areas of Riverside County. Therefore, the government operations emissions described in the previous section are a subset of the community-wide inventories presented here. In 2008, Riverside County emitted a total of 7,012,938 MT CO_2e from the community as a whole. The following sections describe the data inputs, emissions by source and emissions by land use in 2008.

A. Data Inputs

Data for the community-wide inventory was gathered from various Riverside County departments, SCE, IID, SCG, and reports. Table 3-5 (2008 Community-Wide Data Inputs), below, summarizes the data inputs and sources for each of the emission categories included in the inventory. Each data input was then multiplied by the associated emission factor to calculate the emissions associated with each source.

Table 3-5 2008 Community-Wide Data Inputs

Category	Data Input	Data Source
Electricity		
SCE (kWh)	2,580,439,739	SCE
IID (kWh)	1,034,292,942	IID
Generation*	13,015,643	Riverside County Waste Management
Natural Gas (therms)	95,918,639	SCG
Transportation		
Annual VMT	5,161,531,679	Riverside County Traffic Modeling
Annual Trips	862,485,528	
Area Source (based on land use)		
SFR (units)	112,132	
MFR (units)	48,854	Riverside County Planning
Commercial (ksf)	169,585	
Industrial (ksf)	33,905	
Solid Waste Landfill Gas (SCFM) (In County)	4,910	Riverside County Waste Management

Category	Data Input	Data Source
Purchased Water (acre-feet)	193,802	Water Agency Reports
Agriculture (acres)		
Hay	29,648	Riverside County Agricultural Commissioner
Corn	497	
Oats	1,150	
Sorghum	3,197	
Wheat	14,817	
Cotton	6,901	
Vegetable & Fruit Trees	43,898	SCAG
Animals (head)		
Dairy Cow	43,773	
Poultry	5,260,914	
Sheep	12,700	

* El Sobrante is a privately operated landfill; all others are operated by Riverside County Waste Management Department. Electrical Generation for Riverside County reflects the Badlands facility and the portion of cogeneration at El Sobrante landfill associated with in-County disposal (or 49 percent) of the total generation at the El Sobrante facility.

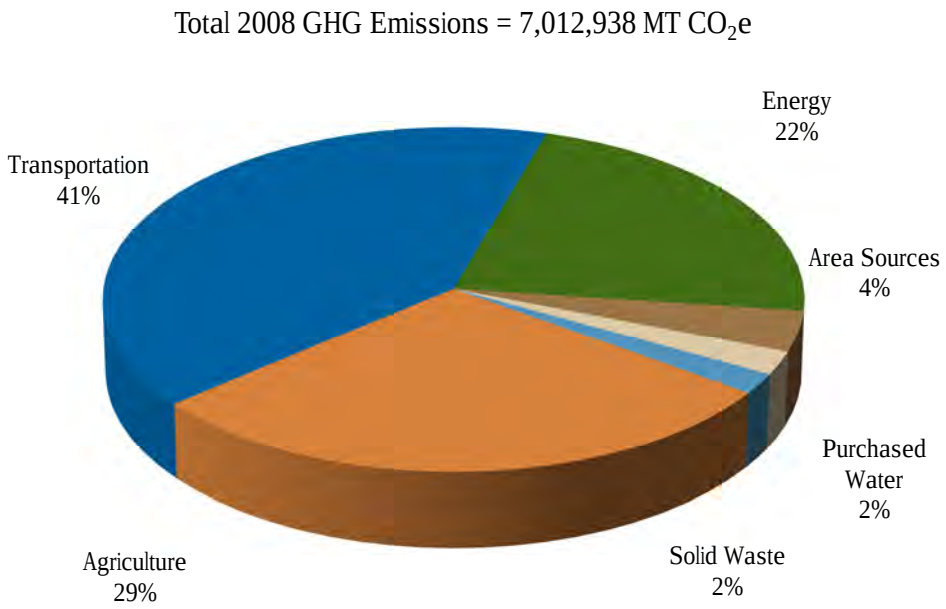
B. Emissions by Source

Table 3-6 (2008 Community-wide GHG Emissions by Source) summarizes net 2008 County emissions of CO_2e as broken down by emissions category. Riverside County as a whole emitted 7,012,938 MMT CO_2e in 2008. The largest portion of Riverside County's 2008 emissions were from transportation (41%), followed by agriculture (29%), and electricity and natural gas use in buildings (22%). Figure 3-3 (2008 Emissions Generated by Emissions Category) provides a comparison of GHG emissions by category.

Table 3-6 2008 Community-wide GHG Emissions by Source

Emissions Category	Metric tons of CO_2e
Transportation	2,850,520
Energy	1,577,667
Area Sources	269,181
Purchased Water	152,473
Solid Waste	132,666
Agriculture	2,030,431
Total	**7,012,938**

Figure 3-3 2008 Emissions Generated by Emissions Category (metric tons CO_2e)



3.3 2020 Business as Usual Community-Wide Emissions Inventory

In 2020, Riverside County is projected to emit a total of approximately 12.1 MMT CO_2e from BAU operations. BAU refers to continued operations and development of Riverside County according to 2008 policies, without the inclusion of proposed reduction or sustainability initiatives as part of this CAP. Reduction initiatives coming from the state or other agencies are not included in the BAU scenario; these reduction measures and their anticipated emission reductions in Riverside County are discussed in Chapter 4.

A. Data Inputs

Data for the 2020 BAU community-wide GHG inventory was estimated based on the General Plan growth rates for Riverside County. Table 3-7 (2020 BAU Community-Wide Data Inputs), below, summarizes Riverside County's socioeconomic growth rates.

Table 3-7 2020 BAU Community-Wide Data Inputs

Category	Data Input	Data Source
Growth Rates (based on General Plan Update) [a]		Riverside County TLMA/IT/GIS/ Demographics
Households	62.4%	
Employment	96.1%	

a Note: The growth rates represent the overall growth from 2008 to 2020 and are derived from the socioeconomic and land use factors used for the proposed General Plan Update.

The socioeconomic growth rates were used to estimate the emissions associated with transportation, electricity, natural gas, water, area source, and solid waste.

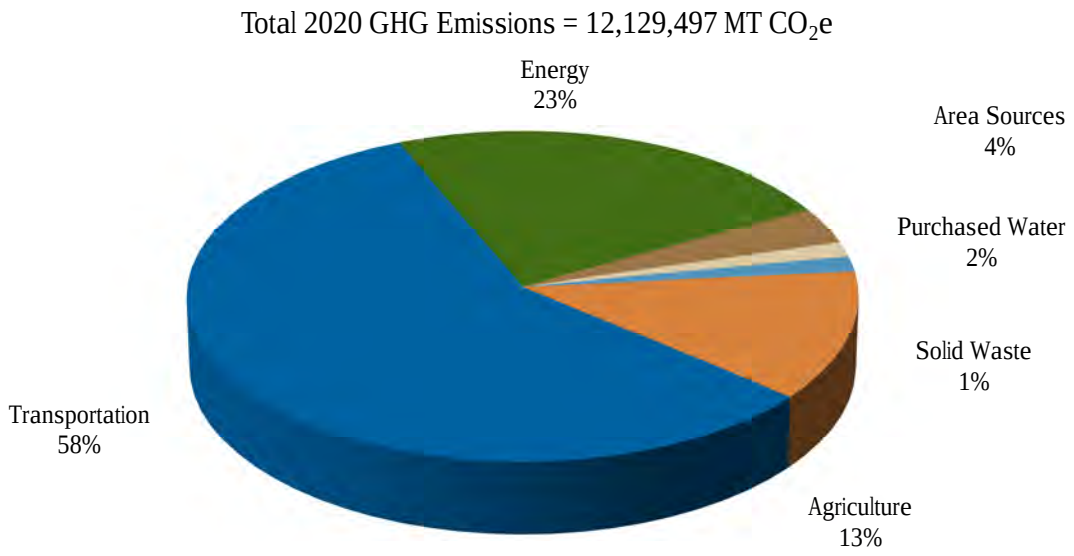
B. 2020 BAU Emissions by Source

The 2020 BAU emissions are estimated based on the projected growth in Riverside County from 2008 to 2020. These projections include a 62.4% increase in households and a 96.1% increase in employment; these growth rates were applied, respectively, to residential and non-residential 2008 emissions in order to estimate 2020 BAU emissions. Table 3-8 (2020 GHG Emissions by Source) summarizes the net 2020 County emissions of CO_2e as broken down by emissions category. Figure 3-4 (2020 BAU Emissions Generated by Source) is a graphical representation of Table 3-8. A detailed breakdown of 2020 emissions by category is available in Appendix D of this CAP.

Table 3-8 2020 GHG Emissions by Source

Emissions Category	Metric tons of CO_2e
Transportation	6,977,331
Energy	2,830,246
Area Sources	442,024
Purchased Water	175,344
Solid Waste	181,728
Agriculture	1,522,823
Total	**12,129,497**

Figure 3-4 2020 BAU Emissions Generated by Source (metric tons CO_2e)



3.4 2035 Business As Usual Community-Wide Emissions Inventory

In 2035, Riverside County is projected to emit a total of 15.5 MMT CO_2e based on the growth rates associated with the proposed General Plan Update and without the inclusion of the proposed reduction measures presented in this CAP.

A. Data Inputs

Data for the 2035 BAU community-wide GHG inventory was estimated based on the General Plan socioeconomic growth rates for the County. Table 3-9 (2035 BAU Community-Wide Data Inputs), below, summarizes Riverside County's growth rates.

Table 3-9 2035 BAU Community-Wide Data Inputs

Category	Data Input	Data Source
Growth Rates (based on General Plan Update) [a]		Riverside County TLMA/IT/GIS/ Demographics
Households	92.6%	
Employment	165.1%	

a Note: The growth rates represent the overall growth from 2008 to 2035 and are derived from the socioeconomic and land use factors used for the proposed General Plan Update.

The socioeconomic growth rates were used to estimate the emissions associated with transportation, electricity, natural gas, water, area source, and solid waste.

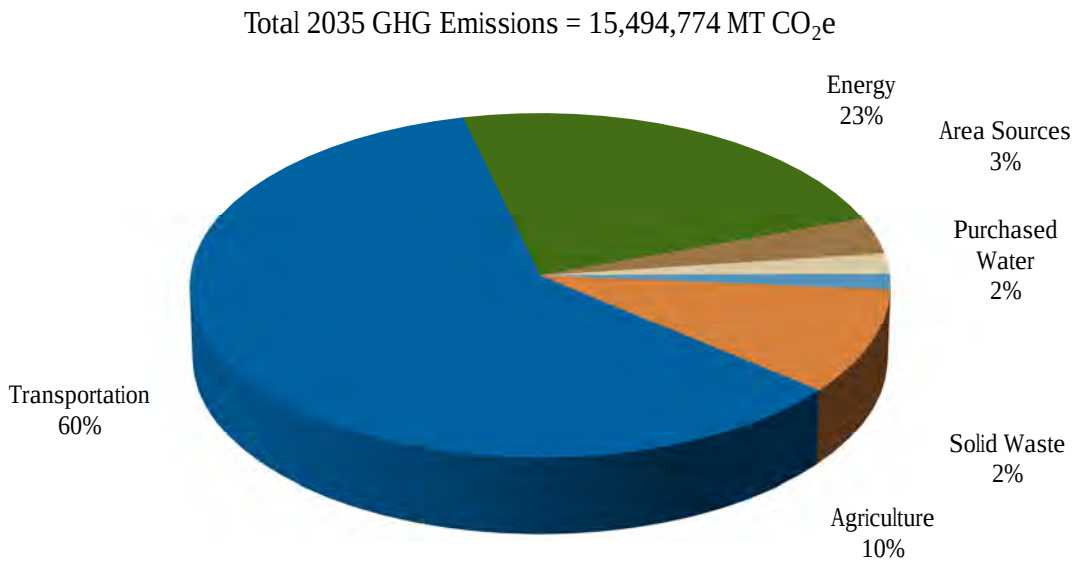
B. 2035 BAU Emissions by Source

The 2035 BAU emissions are estimated based on the projected growth in Riverside County from 2008 to 2035. These projections include a 92.6% increase in households and a 165.1% increase in employment; these growth rates were applied, respectively, to residential and non-residential 2008 emissions in order to estimate 2035 BSU emissions. Table 3-10 (2035 BAU GHG Emissions by Source) summarizes the net 2035 County emissions of CO_2e as broken down by emissions category. Figure 3-5 (2035 BAU GHG Emissions by Source) is a graphical representation of Table 3-10. A detailed breakdown of 2035 emissions by category is available in Appendix D of this CAP.

Table 3-10 2035 BAU GHG Emissions by Source

Category	Metric tons of CO_2e
Transportation	9,318,041
Energy	3,610,701
Areas	529,384
Purchased Water	293,077
Solid Waste	220,747
Agriculture	1,522,823
Total	**15,494,774**

Figure 3-5 2035 BAU GHG Emissions by Source



3.5 2020 Reduction Target

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

Consistent with the State of California's adopted AB 32 GHG reduction target, Riverside County has set a goal to reduce GHG emissions back to 1990 levels by the year 2020. This target was calculated as a 15% decrease from 2008 levels, as recommended in the AB 32 Scoping Plan. The reduction target is displayed in Table 3-11 (2020 GHG Emissions Reduction Target). Having one overall reduction target, as opposed to targets for each sector, allows the County of Riverside the flexibility to reduce emissions from the sector with the most cost-effective reduction strategies (i.e., the greatest reduction in emissions at the least cost).

Table 3-11 2020 GHG Emissions Reduction Target

	Metric Tons CO_2e
2008 Emissions	7,012,938
% Reduction	15%
2020 Reduction Target	5,960,998

3.6 Emissions Comparison by Year

This report analyzes GHG emissions from the most current year with data available (2008) and estimates the future emissions for Riverside County in 2020 and 2035.

The 12.1 MMT CO_2e of GHG emissions for 2020 is an estimated increase of 5.1 MMT CO_2e above 2008 levels. The growth in emissions from 2008 to 2020 is a 73.0%. Table 3-12 (GHG Emissions by Source) shows a comparison of total emissions for 2008, 2020, and 2035 emissions.

Table 3-12 GHG Emissions by Source

	Metric Tons CO_2e		
Source	**2008**	**2020 BAU**	**2035 BAU**
Transportation	2,850,520	6,977,331	9,318,041
Energy	1,577,667	2,830,246	3,614,223
Area Sources	269,181	442,024	529,384
Purchased Water	152,473	175,344	293,077
Solid Waste	132,666	181,728	220,747
Agriculture*	2,030,431	1,522,823	1,522,823
Total	**7,012,938**	**12,129,497**	**15,494,774**

*Note that Agriculture is assumed to decline between 2008 and 2020 as development of the unincorporated Riverside County area continues and then remain the same between 2020 through 2035 as the County of Riverside increases density of developed areas in order to maintain the remaining open spaces and agricultural lands.

The AB 32 Scoping Plan suggests local governments estimate a reduction target for 2020 that is 15% below current emissions. Table 3-13 (2020 GHG Emissions Reduction Target) shows the 2020 reduction target for Riverside County's community-wide emissions, the 2020 emissions projected for Riverside County, and the difference between the two. This difference represents the total emissions that Riverside County will need to reduce in order to meet the target by 2020.

Table 3-13 2020 GHG Emissions Reduction Target

	Metric Tons CO_2e
2020 Emissions	12,129,497
2020 Reduction Target	5,960,998
Amount to Reduce by 2020	6,168,500

With the reduction target set at 5,960,998 MT CO_2e, the County of Riverside will need to reduce emissions by 6,168,500 MT CO_2e from the BAU 2020 emissions. Chapter 4 describes the efforts currently underway in Riverside County and the reduction strategies that would be implemented to reduce emissions in Riverside County in order to reach the 2020 reduction target.

Chapter 4
GHG Emissions Reduction Programs and Regulations

This page intentionally left blank

Chapter 4
GHG Emissions Reduction Programs and Regulations

The State of California has set specific targets for reducing GHG emissions from the burning of fossil fuels in both power plants and vehicles by adopting various regulations. In addition, state energy efficiency and renewable requirements provide another level of reductions. In order to provide credit to Riverside County for regulatory actions already taken or planned by the State of California, this CAP first evaluates the greenhouse gas reductions that will occur within Riverside County as a result of these actions. These will be identified in the CAP as R1 reduction measures. The R1 measures are included here 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 county level. The R1 measures are not administered or enforced by Riverside County, but Riverside County - by describing them herein- substantiates the reductions applied in association with these statewide measures.

R2 and R3 reduction measures will be incorporated at the county level to provide additional reductions in GHG emissions. R2 measures are those measures that can be quantified to show the value of the reduction from the incorporation of those measures; the R2 measures correspond to the Implementation Measures (IM) included in Appendix N of the General Plan. R3 measures are measures that, although they provide a vehicle through which reductions in emissions will occur, cannot be quantified at this time. The R3 measures are supportive measures or methods of implementation for the R2 measures. A complete list of assumptions and reductions for each of the R1 and R2 measures is included in Appendix E of this CAP.

The following reduction measures are organized herein by source category (energy, solid waste, area source emissions, agriculture, transportation, and industrial) then by R1, R2, and R3 measure. The method to be used for numbering the mitigation measures will be to list the R designation (R1, R2, or R3) then an abbreviation of the source category, followed by the order number. So, R1-E1 is the first R1 measure within the energy category, R1-E2 is the second measure within the energy category, and so on. The source category abbreviations are as follows: T – transportation; E – energy; S – solid waste; L – area source (landscaping) emissions; W – purchased water; A – agriculture; and I – industrial.

4.1 Existing Riverside County General Plan Policies Related to GHG

Policies to reduce GHG emissions often overlap with policies addressing energy conservation, reduced automobile use, water conservation and many other issues. Riverside County has many General Plan policies that

help to reduce GHG emissions while targeting another policy applicable to Riverside County. Table 4-1 (General Plan Policies Related to Reducing GHG Emissions) below summarizes these General Plan policies.

Table 4-1 General Plan Policies Related to Reducing GHG Emissions

Sector	Element	Section	Policies
Energy Efficiency in Buildings	Land Use	Project Design	LU-4.1
	Multipurpose Open Space	Energy Conservation	OS-16.1 through OS-16.10
	Air Quality	Stationary Emissions	AQ-4.1, AQ-4.1, AQ-4.4
		Energy Efficiency and Conservation	AQ-5.1, AQ-5.2, AQ-5.4
Regional Agency Coordination	Land Use	Administration	LU-1.5
	Air Quality	Multi-Jurisdictional Cooperation	AQ-1.1 through AQ-1.4, AQ-1.7
Smart Growth	Land Use	Efficient Use of Land	LU-2.1
		Economic Development	LU-7.12
		Air Quality	LU-10.1
	Air Quality	Business Development	AQ-7.1, AQ-7.3
		Job-to-Housing Ratio	AQ-8.4 through AQ-8.9
Water Conservation	Land Use	Project Design	LU-4.1
	Circulation	Transportation System Landscaping	C-5.2
	Multipurpose Open Space	Water Conservation	OS-2.1 through OS-2.5
Reduce Automobile Use	Land Use	Efficient Use of Land	LU-2.1
		Project Design	LU-4.1
		Air Quality	LU-10.3, LU-10.4
		Circulation	LU-12.1, LU-12.3, LU-12.4
	Circulation	Planned Circulation Systems	C-1.2, C-1.7
		Pedestrian Facilities	C-4.1, C-4.9
		Transportation System Landscaping	C-5.2
		Public Transportation System	C-9.2
		Fixed Route Transit Service	C-11.2, C-11.4 through C-11.7
		Transit Oasis and Transit Centers	C-12.1 through C-12.3
		Passenger Rail	C-13.1 through C-13.3
		Bikeways	C-17.3, C-17.4
		Environmental Considerations	C-20.12
		Transportation Systems Management	C-21.1, C-21.9
	Multipurpose Open Space	Energy Conservation	OS-16.3, OS-16.8
	Air Quality	Mobile Pollution Sources	AQ-3.2, AQ-3.4
		Trip Reduction	AQ-10.1 through AQ-10.4
Renewable Energy/Alternative Fuel	Multipurpose Open Space	Renewable Energy	OS-10.1, OS-11.1 through OS-11.3, OS-12.1
	Air Quality	Transportation System Management Improvements	AQ-13.1
Reduce Waste	Air Quality	Energy Efficiency and Conservation	AQ-5.1

4.2 Transportation

A. R1 Transportation Measures

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

R1-T1: Assembly Bill 1493: Pavley I

Assembly Bill (AB) 1493 (Pavley) required CARB to adopt regulations that will reduce GHG from automobiles and light-duty trucks by 30% below 2002 levels by the year 2016, effective with 2009 models. By 2020, this requirement will reduce emissions in California by approximately 16.4 MMT of carbon dioxide equivalents ($MMTCO_2e$), representing 17.3% of emissions from passenger/light-duty vehicles in the State of California.

R1-T2: Assembly Bill 1493: Pavley II

California committed to further strengthening the AB1493 standards beginning in 2017 to obtain a 45% GHG reduction from 2020 model year vehicles. This requirement will reduce emissions in California by approximately 4.0 $MMTCO_2e$, representing 2.5% of emissions from passenger/light-duty vehicles in the State of California.

R1-T3: Executive Order S-1-07 (Low Carbon Fuel Standard)

The Low Carbon Fuel Standard (LCFS) will require a reduction of at least 10% in the carbon intensity of California's transportation fuels by 2020. By 2020, this requirement will reduce emissions in California by approximately 15 $MMTCO_2e$, representing 6.9% of emissions from passenger/light-duty vehicles in the State of California.

R1-T4: Tire Pressure Program

The AB32 early action measure involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. By 2020, this requirement will reduce emissions in California by approximately 0.55 $MMTCO_2e$, representing 0.3% of emissions from passenger/light-duty vehicles in the State of California.

R1-T5: Low Rolling Resistance Tires

This AB32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 $MMTCO_2e$, representing 0.2% of emissions from passenger/light-duty vehicles in the State of California.

R1-T6: Low Friction Engine Oils

This AB32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce emissions in California by approximately 2.8 $MMTCO_2e$, representing 1.7% of emissions from passenger light-duty vehicles in the State of California.

R1-T7: Goods Movement Efficiency Measures

This AB32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this requirement will reduce emissions in California by approximately 3.5 $MMTCO_2e$, representing 1.6% of emissions from all mobile sources (on-road and off-road) in the State of California.

R1-T8: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This AB32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 $MMTCO_2e$, representing 1.9% of emissions from heavy-duty vehicles in the State of California.

R1-T9: Medium and Heavy-Duty Vehicle Hybridization

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduces the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 $MMTCO_2e$, representing 0.2% of emissions from all on-road mobile sources in the State of California. This reduction is also equivalent to a 1.0% reduction of emissions from all heavy-duty trucks in the State of California.

R1-T10: Regional SB 375 Targets

Regional transportation emission reduction targets have been established pursuant to SB 375. Statewide, this requirement is expected to reduce emissions by 5 $MMTCO_2e$, which is equivalent to 2% of emissions from all mobile emission sources. These emissions will be reduced through the implementation of Sustainable Community Strategies developed by the Metropolitan Planning Organizations (MPOs) throughout the state, SCAG for Riverside County. CARB, in conjunction with SCAG, has adopted a target of an 8% decrease in transportation emissions by 2020 for the region. The reductions from SB 375 overlap with many of the state transportation reduction measures described above. Therefore, this R1 measure is expected to reduce Riverside's transportation emissions by 6% (rather than the 8% target) beyond what the other state-level transportation measures will reduce.

B. R2 Transportation Measures

The following list of R2 measures are measures Riverside County can incorporate into the new development projects for the reduction of transportation-related emissions to achieve an AB 32 compliant reduction target.

R2-T1: Employment Based Trip and VMT Reduction

This R2 measure would implement General Plan Policies AQ 3.3, AQ 10.1, AQ 10.3, and AQ 10.4 through the adoption of a voluntary trip reduction program for new commercial and industrial development that promotes commuter choices, employer transportation management, guaranteed ride home programs and commuter assistance and outreach type programs intended to reduce commuter vehicle miles traveled. A guaranteed ride home program is a program that ensures employees that take advantage of carpooling opportunities are guaranteed a safe ride home should the employee miss the carpool pick-up time due to work-related activities. This could be as simple as the employer paying for taxi service for the employee. Surveys within California have shown that ridesharing increases by 5% when a guaranteed ride home program is available (FTA 2006). To gain points within the Screening Table, employers with more than 100 employees within unincorporated Riverside County would need to establish a trip reduction plan that would incorporate annual employee commute surveys, marketing of commute alternatives, ride matching assistance, and transit information at a minimum.

R2-T2: Increased Residential Density

Designing proposed projects with increased densities, where allowed by the General Plan and/or County zoning, could reduce GHG emissions associated with traffic in several ways. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. The reductions in GHG emissions are quantified based on reductions to VMT; the relationship between density and VMT is described by its elasticity. If a new development project demonstrates an increase is density (and hence a corresponding decrease VMT) beyond the average value for that particular land use type, then the project can garner points in the screening tables for new development. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities. New development projects earn points for residential projects that increase housing density.

R2-T3: Mixed Use Development

Having different types of land uses near one another can decrease VMT since trips between land use types are shorter and may be accommodated by non-motorized methods of transportation. For example, when residential areas are in the same neighborhood as retail and office buildings, a resident does not need to travel outside of the neighborhood to meet his/her trips needs. A new development project will earn points in the screening tables by including diversity of land uses within a ¼ mile. Due to the variations available in implementing a mixed use project, the reductions, and applicable points associated, will be determined on a case-by-case basis.

R2-T4: Preferential Parking

This R2 measure would implement General Plan Policies AQ 3.3 and AQ 10.3 by encouraging proposed development projects to incorporate a comprehensive parking program for public and private parking lots to facilitate carpooling and alternate transportation. Incentives to encourage carpooling and the use of alternate transportation methods could include:

- Providing reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles;
- Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools; and include adequate passenger waiting/loading areas;

- Restricting the number of parking spaces within the development by sharing parking among different land uses where feasible. For example, in areas where there are multiple land uses, provide resident restricted parking during nighttime hours (7pm to 7am) and open the parking lot for use by patrons of the surrounding commercial buildings during daytime hours; and
- Provide convenient pedestrian pathways through parking areas.

R2-T5: Roadway Improvements including Signal Synchronization and Transportation Flow Management

This R2 measure would implement General Plan Policies AQ 12.1 and AQ 12.3. Proposed development projects that pay fare-share fees toward signal synchronization improvements or construct signalized intersections within a traffic signal synchronization system would gain points within the Screening Table through this R2 Measure. These modifications include, but are not limited to, synchronization of signals, improvement of traffic flow, the development of parallel roadways and support for the extension of freight rail into Riverside County's industrial areas. Even when required for other reasons, such as warranted by project traffic study results, such circulation improvements may still qualify for Screening Table points under this measure.

R2-T6: Provide a Comprehensive System of Facilities for Non-motorized Transportation

This measure emphasizes alternative non-motorized transportation hubs and encourages the creation of bike lanes and walking paths connecting to schools and other public facilities, provision of adequate bicycle parking; and encouragement of bicycle stations, attended parking, and other attended bicycle support facilities at intermodal hubs. Bicycle stations are full-service bicycle facilities that, in addition to providing secure, guarded bicycle parking, could include other amenities such as "valet" bicycle service, showers, bicycle rentals, or repair services. These types of facilities are intended for large residential and non-residential development as well as large employers (e.g., of 500 or more employees). In addition, the establishment of multi-use trails that promote off-street bicycle and pedestrian travel, as well as provision of secure bicycle racks, along these pathways would also promote their use.

R2-T7: Expand Renewable Fuel/Low-Emission Vehicle Use

Implementation of the following R2 measure would promote the expanded use of renewable fuel and low-emission vehicles within proposed projects. The project will earn points in the screening table by making low-emissions or electric vehicle use more accessible by including one or both of the following project components:

- Providing preferential parking for ultra-low emission, zero-emission, and alternative-fuel vehicles;
- Provide circuit and capacity in all garages of residential units and all new large-scale commercial buildings, over 162,000 square feet for installation of electric vehicle charging stations
  - Install electric vehicle charging stations in all the garages of residential units for new development projects
  - Install electric vehicle charging stations in garages or secure areas of parking for new large-scale commercial buildings over 162,000 square feet of floor space.

R2-T8: Anti-Idling Enforcement

This R2 measure involves the adoption and enforcement of an Anti-Idling Policy for heavy-duty diesel trucks, including local delivery trucks and long-haul truck transport within unincorporated Riverside County. This policy would prohibit idling of on- and off-road heavy duty diesel vehicles for more than five minutes. This policy would be implemented by new commercial and industrial projects with loading docks or delivery trucks. Such projects would be required to post signage at all loading docks and/or delivery areas directing drivers to shut down their trucks after five minutes of idle time. Also, employers who own and operate truck fleets would be required to inform their drivers of the anti-idling policy.

R2-T9: Increase Public Transit

New development projects will expand the local transit network by coordinating with regional transit authorities to include bus turnouts and other transit accommodations in design plans. This will encourage the use of transit and therefore reduce VMT. Unincorporated Riverside County hosts one Metrolink transit station; expanding connections to this station as well as other Metrolink stations in the neighboring cities will increase ridership and decrease VMT.

R2-T10: Employee Commute Alternative Schedule

Encouraging telecommuting and alternative work schedules reduces the number of commute trips and therefore VMT traveled by employees. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks. Employers are encouraged to offer enough flexibility for employees to adopt these alternative schedules.

C. R3 Transportation Measures

The following R3 measure enhances and ensures the reductions accounted for within the R2 measures through education programs or are measures that will reduce emissions but cannot be quantified.

R3-T1: Regional Land Use & Transportation Coordination

This R3 measure promotes the development and use of transit between the incorporated and unincorporated portions of Riverside County as well as within unincorporated Riverside County. This reduction measure will also be enhanced by the implementation of SCAG's RTP and SCS.

R3-T2: Government Fleet Alternative Vehicles

Riverside County municipal fleet consists of vehicles ranging from small passenger cars to large trucks and fire engines. As older vehicles retire, the new replacement vehicles will continue to increase the fuel efficiency of Riverside County's fleet. Riverside County's use of fuel efficient and alternative fuel vehicles helps to promote their use by local residents.

4.3 Energy

A. R1 Energy Measures

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

R1-E1: Renewable Portfolio Standard for Building Energy Use

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the State's Renewable Portfolio Standard (RPS), with an initial goal of 20% renewable energy production by 2010. Executive Order (EO) 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. The 33% RPS by 2020 goal is supported by CARB, though its feasibility is not certain due to current limitations in production and transmission of renewable energy.

R1-E2 and R1-E3: AB1109 Energy Efficiency Standards for Lighting (Residential and Commercial Indoor and Outdoor Lighting)

Assembly Bill (AB1109) mandated that the California Energy Commission (CEC) on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other state efforts, shall be structured to reduce 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.

R1-E4: Electricity Energy Efficiency (AB32)

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the 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 California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), Riverside County's adopted Green Building ordinance (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 21.3 $MMTCO_2e$, representing 17.5% of emissions from all electricity in the State of California. This measure includes the following strategies:

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

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

R1-E5: Natural Gas Energy Efficiency (AB32)

This measure captures the emission reductions associated with natural gas energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the 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 California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), Riverside County's adopted Green Building ordinance (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 4.3 $MMTCO_2e$, representing 6.2% of emissions from all natural gas combustion in the State of California. This measure includes the following strategies:

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

R1-E6: Increased Combined Heat and Power (AB32)

This measure captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 GWh statewide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible combined heat and power portfolio standard, transmission and distribution support systems, or the use of feed-in tariffs. By 2020, this requirement will reduce emissions in California by approximately 6.7 $MMTCO_2e$, representing 7.6% of emissions from all electricity in the State of California.

R1-E7: Industrial Efficiency Measures (AB32)

This measure captures the reduction in industrial building energy emissions associated with the energy efficiency measures for industrial sources included in CARB's AB32 Scoping Plan. By 2020, this requirement will reduce emissions in California by approximately 1.0 $MMTCO_2e$, representing 3.9% of emissions from all industrial natural gas combustion in the State of California. CARB proposes the following possible statewide measures:

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

R1-E8: Renewable Portfolio Standard (33 percent by 2020) Related to Water Supply and Conveyance

This measure would increase electricity production from eligible renewable power sources to 33% 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 $MMTCO_2e$, representing 15.2% of emissions from electricity generation (in-state and imports).

B. R2 Energy Measures

The following list of R2 measures are measures related to building energy efficiency Riverside County can incorporate into the new development projects are to achieve an AB 32 compliant reduction target of 15% below existing emissions levels by the year 2020.

R2-E1: Residential Energy Efficiency Program

This R2 measure would implement General Plan Policies AQ 5.2, AQ 5.4, LU 4.1e, OS 16.1 and OS 16.9, and involves the adoption of a program that facilitates energy efficient design for new residential buildings such that the residential units are 5% to 20% more efficient than the current Title 24 Standards. The high end of this energy efficiency program is equal to that of the LEED for Homes and ENERGY STAR programs; aspects of these programs are included as options for new development in the screening table, but attaining LEED or

ENERGY STAR certification is not an explicit requirement. The County of Riverside energy efficiency program is a voluntary program with a flexible menu of options for compliance included in the screening table.

The 2008 Title 24 Energy Standards were adopted by the Energy Commission in April 2008 and compliance with the 2008 standards went into effect January 1, 2010. In an effort to meet the overall goal of the California Energy Efficiency Strategic Plan of reaching zero net energy for residential buildings by 2020, the stringency of the Title 24 Energy Standards as regulated and required by the State of California will continue to increase every three years. As energy efficiency standards increase, Riverside County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal. Residential developments within the unincorporated portions of Riverside County are encouraged to participate in the volunteer Residential Energy Efficiency Program. This voluntary program would set a minimum goal of achieving energy efficiency of 5% greater than current Title 24 Standards. Incentives to participate in this volunteer program include prioritization and streamlining of the application process for residential projects that achieve the minimum goal. Towards this end, Riverside County's screening tables for new development include a menu of options with points assigned to each option. As long as the proposed project meets the required point allotment (100 points total) the project will be deemed consistent with the Riverside County plan for reducing GHG emissions. This system will assure flexibility in the implementation of this reduction measure. This reduction goal can be achieved through the incorporation of the strategies outlined in the bullet points below, although the list is not exclusive and other actions are also feasible:

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

R2-E2: Residential Renewable Energy Program

This R2 measure would implement General Plan Policies OS 10.1, OS 11.2, and OS 11.3, and facilitate the voluntary incorporation of renewable energy (such as photovoltaic panels) into new residential developments. For participating developments, the use of onsite renewable energy should be sufficient to reduce the new home's projected use of grid energy by 50%.

The California Energy Commissions' New Solar Homes Partnership is a component of the California Solar Initiative and provides rebates to developers of 6 or more units where 50% of the units include solar power. In addition, this measure would encourage that all residents be equipped with "solar ready" features where feasible, to encourage future installation of solar energy systems. Such features would include the proper solar orientation (south facing roof sloped at 20˚ to 55˚ 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. The incentive program should provide enough incentives to result in approximately 50% of new residential development participation in this program, thereby resulting in a 25% reduction in electrical consumption from new residential developments.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent could also buy into a purchased energy offset program through the South Coast Air Quality Management District (SCAQMD), Southern California Edison (SCE), Mission Energy or others that will allow for the purchase of electricity generated from renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal to 25% of the total projected energy consumption for the development.

R2-E3: Residential Retrofit Implementation Program

This R2 measure would implement General Plan Policies OS 16.5, OS 16.7, and OS 16.9 and initiate a Riverside County program that facilitates the incorporation of energy reduction measures for residential buildings undergoing major renovations. AB 811 is a potential funding source to Riverside County for implementing incentive programs to encourage residences within Riverside County to undertake energy efficiency retrofitting and reducing energy consumption in retrofitted homes by a minimum of 15%. As with the new development, residential retrofits will comply with a menu of options of points assigned to them. As long as a developer meets the required total point allotment (100 points) the developer will meet the requirements to have the project deemed consistent with this plan. This system will be provided to assure flexibility in the implementation of all reduction measures. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Replace inefficient air conditioning and heating units with 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
- Weatherize the existing building to increase energy efficiency

R2-E4: Residential Renewable Retrofit Program

This R2 measure would implement General Plan Policies OS 10.1, OS 11.2, and OS 11.3 and initiate an incentive program that encourages residents to retrofit their homes with photovoltaic panels such that 50% of all of the home's electrical usage is offset. The CEC's Solar Initiative has incentives available to homeowners.

R2-E5: Commercial Energy Efficiency Program

This R2 measure would implement General Plan Policies AQ 5.2, AQ 5.4, LU 4.1e, OS 16.1 and OS 16.9, and involves the adoption of a Riverside County Program that facilitates the energy efficient design for new commercial buildings so that new commercial buildings are 5% to 20% more efficient than the current Title 24 Standards. The high end of this voluntary energy efficiency program is 10% greater than the minimum requirements of the LEED and ENERGY STAR programs. As energy efficiency standards increase, Riverside

County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

Commercial developments within the unincorporated portions of Riverside County are encouraged to participate in the voluntary Commercial Energy Efficiency Program. This voluntary program would set a minimum goal of achieving energy efficiency of 5% greater than current Title 24 Standards. Incentives to participate in this volunteer program would include prioritization and streamlining of the application process for commercial projects that achieve the minimum goal. As described in R2-E1 above, the Riverside County screening tables provide all developers with a list of potentially feasible GHG reduction measures that reflect the current state of the regulatory environment. The menu of options have points assigned to them and as long as the proposed project meets the required point allotment (100 points) it will be deemed to be consistent with Riverside County's GHG reduction plan. This system will provide flexibility in the implementation of all reduction measures. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

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

R2-E6: Commercial/Industrial Renewable Energy Program

This R2 measure would implement General Plan Policies OS 10.1, OS 11.2 and OS 11.3, and facilitate the voluntary incorporation of onsite renewable (solar or other renewable) energy generation into the design and construction of new commercial, office and industrial development. A project can earn points in the screening table for renewable energy generation if it is incorporated such that a minimum of 20% of the proposed project's total energy needs are offset. In addition this measure would encourage all facilities be equipped with "solar ready" features where feasible, to facilitate future installation of solar energy systems. These features should include the proper solar orientation (south-facing roof sloped at 20˚ to 55˚ 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.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent could buy into a purchased energy offset program through the South Coast Air Quality Management District (SCAQMD), Southern California Edison (SCE) or others that will allow for the purchase of electricity generated from renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) should equal 20% of the total projected energy consumption for the development.

R2-E7: Commercial/Industrial Retrofit Program

This R2 measure would implement General Plan Policies AQ 5.2, AQ 5.4, OS 16.1, OS 16.7 and OS 16.9 and encourage all commercial or industrial buildings undergoing major renovations to reduce their energy consumption by a minimum of 20%. As with the new development, a menu of options will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following energy efficiency and renewable energy technologies:

- 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
- Weatherize the existing building to increase energy efficiency
- Install solar panels

R2-E8: Induction Streetlight Retrofits

New induction street lamps are estimated to last five times longer and consume 50% less energy than the traditional high pressure sodium (HPS) lamps. Changing out old lamps for new ones reduces electricity use and saves money in the long-run. Retrofitting streetlights shall be done in accordance with Riverside County's Mt. Palomar Lighting Ordinance, which requires use of low pressure sodium vapor (LPSV) street lighting within 15 miles of Mt. Palomar Observatory and Riverside County Ordinance No. 915 regulating light pollution countywide.

R2-E9: Increase Gas to Energy Production from Landfills

This R2 measure would implement General Plan Policies OS-10.1, OS-11.1 through OS-11.3 and OS-12 by increasing Riverside County's generation of electricity from waste-generated methane. Currently, the Badlands Landfill operates a 1.3 MW generation facility with a capacity for approximately 8,200 mWh annual generation. The El Sobrante Landfill currently operates a 3.8 MW generation facility with a capacity for generating 24,000 mWh annually. Under this measure, Riverside County will increase gas-to-energy generation by: (1) increasing the capacity at the Badlands to a 4 MW system and increasing operation to 90% by 2020; (2) increasing the El Sobrante's facility operation to 90%; and (3) installing a 1.3 MW system at the Lamb Canyon Landfill and having that facility in operation 90% of the year.

C. R3 Energy Measures

The following R3 measures enhance and/or ensure the reductions accounted for within the R2 measures through education programs or are measures that will reduce emissions but cannot be quantified.

R3-E1: Energy Efficient Development, and Renewable Energy Deployment Facilitation and Streamlining

This measure would encourage Riverside County to identify and remove regulatory and procedural barriers to the implementation of green building practices and the incorporation of renewable energy systems. This includes the General Plan Energy Element Policies. Implementation of the Energy Element Policies includes updating of codes and zoning requirements and guidelines among others to facilitate renewable energy deployment and streamlining. 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 permit streamlining and CEQA streamlining in exchange for incorporating green building practices or renewable energy systems.

R3-E2: Energy Efficiency Training & Public Education

This measure would provide public education and publicity about energy efficiency measures and reduction programs available within Riverside County, including rebates and incentives available for residences and businesses. In addition, this measure would provide training in green building materials, techniques, and practices for all plan review and building inspection staff.

R3-E3: Energy Efficiency and Solar Energy Financing

This measure would facilitate the incorporation of innovative, grant funded or low-interest financing programs for energy efficiency and renewable energy projects for both existing and new developments. This would include financing for heating, ventilation, air conditioning, lighting, water heating equipment, insulation, weatherization and residential and commercial renewable energy. A few potential options for funding this measure include:

- Use the money from offset purchases to provide grants to allow for the offset of some of the cost to existing residents in making energy efficiency upgrades.
- Target local funds to assist affordable housing developers to incorporate renewable energy sources and energy efficiency design features into low-income housing during development or through retrofit programs.
- Establish a Finance District, approve a bond purchase, and administer agreements to allow property owners to implement energy efficiency retrofits or designs and/or install renewable systems. Under this provision, repayment could be incorporated as a special tax on the property owner's property tax bill.
- Funding of other incentives to encourage the use of renewable energy sources and energy efficient equipment and lighting.

R3-E4: Cross-Jurisdictional Coordination

Under this reduction measure, Riverside County would coordinate with other local governments, special districts, nonprofit, and other organizations in order to optimize energy efficiency and renewable resource development and usage throughout Riverside County. This would allow for economies of scale and shared resources to more effectively implement these environmental enhancements.

4.4 Area Source Emissions

Area source emissions make up a small portion of Riverside County's total emissions; however, the following reduction measures can contribute toward reducing emissions in order to meet the AB 32 2020 reduction target. No statewide measures are related to area source emissions; however, the R2 measures are from the SCAQMD.

A. R2 Area Source Measures

R2-L1: Electric Landscaping Equipment

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

R2-L2 & R2-L3: SCAQMD Healthy Hearths

AQMD's Rule 445-Wood Burning Devices, adopted on March 7, 2008, applies to residents in the South Coast Air Basin and includes the following key components:

- R2-L2: No permanently installed indoor or outdoor wood burning devices in new developments;
- R2-L3: Establishes a mandatory wood burning curtailment program on high pollution days during November through February, beginning November 1, 2011. Based on current air quality conditions, there may be 10 to 25 mandatory curtailment days in specific areas (AQMD 2008).

B. R3 Area Source Measures

The following R3 measures are related to landscape strategies that will help reduce GHG emissions and can be incorporated into development projects without additional cost. These measures strategically place trees and other landscape mechanisms that create shade to reduce the heat island effect within parking lots and adjacent to buildings, which in turn, reduces the temperature of buildings and cars during the summer.

R3-L1: Expand County Tree Planting

This program evaluates the feasibility of expanding tree planting within Riverside County. This includes the evaluation of potential carbon sequestration from different tree species, potential reductions of building energy use from shading and GHG emissions associated with pumping water used for irrigation. Commercial and retail development should be encouraged to exceed shading requirements by a minimum of 10% and to plant low emission trees. All future development would be encouraged to preserve native trees and vegetation to the furthest extent possible.

R3-L2: Heat Island Plan

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

- Strategically placed shade trees;
- Paving materials with a Solar Reflective Index (SRI) of at least 29;
- Open grid pavement system; or
- Covered parking (with shade or cover having an SRI of at least 29).

4.5 Purchased Water

The purchased water imported from the State Water Project or from the Colorado River uses a large amount of energy for transportation. The following measures help to reduce the need for imported water and, therefore, reduce GHG emissions from the energy associated with water.

A. R1 Water Measures

R1-W1: Renewable Portfolio Standard 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 MMT CO_2e, representing 15.2% of emissions from electricity generation (in-state and imports).

B. R2 Water Measures

R2-W1: Water Use Reduction Initiative

This initiative would reduce emissions associated with electricity consumption for water treatment and transportation. This measure encourages Riverside County to adopt a per capita water use reduction goal in support of the Governor's Executive Order S-14-08 which mandates the reduction of water use of 20% per capita. Riverside County's adoption of a water use reduction goal would introduce requirements for new development and would provide cooperative support for water purveyors that are required to implement these reductions for existing developments. Riverside County would also provide internal reduction measures such that

County of Riverside facilities will support this reduction requirement. New development projects will be able to earn points in the Screening Tables for New Development by incorporating design features that reduce water use.

In addition, this R2 measure would implement General Plan Policies LU 4.1d and f, C 5.2 and OS 2.1 through OS 2.4 and provide incentives for all new proposed development projects to comply with the California Green Building Standards Code. Under the California Green Building Code, new developments are required to reduce indoor potable water use by 20% beyond the Energy Policy Act of 1992 fixture performance requirements, and to reduce outdoor potable water use by 50% from a mid-summer baseline average consumption through irrigation efficiency, native plant selection, the use of recycled water and/or captured rainwater, for example. The state is dependent upon local water purveyors and jurisdictions to implement these new requirements. This R2 measure is provided here to enable its implementation and ensure points are allocated from the Screening Tables in accordance with the resultant benefits.

R2-W2: Increase Reclaimed Water Use

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

4.6 Solid Waste

A. R1 Solid Waste Measure

The following R1 solid waste related measure is a measure that California has identified in the AB 32 Scoping Plan that will result in emission reductions within Riverside County.

R1-S1: Solid Waste Measures

The CARB Scoping Plan recommends three measures for reducing emissions from Municipal Solid Waste at the state level, including: 1) landfill methane control; 2) increase the efficiency of landfill methane capture; and 3) high recycling/zero waste. CARB is in the process of developing a discrete early action program for methane recovery (1), which was adopted in early 2010. This measure is expected to result in a 1.0 MMT CO_2e reduction by 2020. Other measures proposed by CARB include increasing efficiency of landfill methane capture (2) and instituting high recycling/zero waste policies (3). Potential reductions associated with these measures are still to be determined. CARB estimates a preliminary one-time cost for adoption of these measures to be approximately $70 per ton of CO_2 reduced.

B. R2 Solid Waste Measures

The following list of R2 measures are candidate measures Riverside County can incorporate into the development review process related to solid waste to achieve an AB 32 compliant reduction target.

R2-S1: County Diversion Program

This R2 measure would implement General Plan Policy AQ 4.1 and AQ 5.1 through a countywide waste diversion plan to further exceed the state requirements by diverting 75% of all waste from landfills by 2020. The following is a potential list of waste reduction measures that can be incorporated into development projects that will further strengthen existing waste reduction/diversion programs:

- Encourage commercial, office, and industrial development to adopt a voluntary procurement standard and prioritize those products that have less packaging, are reusable, recyclable, or compostable;
- Include recycling and green waste collection infrastructure (assigned areas with separate designated bens for each type of recycled material) within residential, commercial, and industrial development;
- Require a minimum of 15% of materials used in construction be sourced locally, as feasible; and
- Encourage the use of recycled building materials and cement substitutes for new developments.

R2-S2: Construction Diversion Program

This R2 measure also implements General Plan Policies AQ 4.1 and AQ 5.1 by giving incentives through points within the Screening Table to new development projects that provide diversion of 60% of construction waste. This provides a 10% increase in diversion beyond the AB 2176, Section 42911, requirement that dictates that development projects provide adequate areas for collecting and loading recyclable materials and requires a 50% diversion rate prior to being issued a building permit.

C. R3 Solid Waste Measures

The following R3 measures enhance and/or ensure the reductions accounted for within the R2 measures through education programs that help participation and compliance of the R2 measures identified above.

R3-S1: Encourage Increased Efficiency of the Gas to Energy System at Landfills.

This R3 measure would encourage the landfills operated by Riverside County Waste Management to keep current with upgrades in efficiencies to landfill gas capture and gas to energy systems and to upgrade as feasible when significant increases in conversion efficiencies are available.

R3-S2: Waste Education Program

This R3 measure would provide countywide public education and increased publicity about commercial and residential recycling. This measure would educate the public about waste reduction options available at both

residential and commercial levels, including composting, grass recycling, waste prevention and available recycling services.

R3-S2: On-Site Diversion and Conversion at County Landfills

This R3 measure would upgrade existing active Riverside County landfills to an integrated waste management operation that includes onsite recycling and reuse, in-situ composting, alternative landfill technology, such as bioreactor, as well as, waste conversion technologies, such as Anaerobic Digestion, Gasification, Pyrolysis, Hydrolysis, etc. Besides the direct benefits of fugitive LFG emission reductions and energy conversion, this landfill-based integrated waste management approach will have the additional environmental benefits of reducing regional VMT from waste material hauling and using existing permitted solid waste facilities equipped with compliant environmental protection systems.

4.7 Agriculture

A. R1 Agriculture Measure

The following R1 agriculture-related measure is a measure that California has identified in the AB 32 Scoping Plan that will result in emission reductions within Riverside County.

R1-A1: Methane Capture at Large Dairies

This is an AB 32 voluntary measure to encourage the installation of methane digesters to capture methane emissions at large dairies. By 2020, this requirement will reduce emissions in California by approximately one MMT CO_2e, representing 7.8% of CH_4 and N_2O emissions from manure management and enteric fermentation at dairies in the State of California.

B. R2 Agriculture Measures

Agriculture is an important, but separate, economic sector from new development projects within Riverside County. Because of the difference between agricultural activities and new residential, commercial and industrial development within Riverside County, IMs for agricultural source emissions are not recommended at this time.

C. R3 Agriculture Measure

The following R3 measure enhances and/or insures the reductions accounted for within the R2 measures through education programs that help participation and compliance of the R2 measures identified above.

R3-A1: Promote Soil Management Practices

Under this reduction measure, Riverside County would promote soil management practices that reduce nitrogen dioxide emissions through strategies such as fertilizer management, nitrification inhibitors, water management, and efficient use of fossil fuels.

4.8 Industrial

The following list of R1 industrial related measures are those measures that CARB has identified in the AB 32 Scoping Plan that will result in emission reductions within Riverside County. This section describes GHG emission reductions for the existing and proposed national, state, or regional industrial fuel combustion measures that will result in future GHG reductions for the industrial sector and do not require significant county action.

A. R1 Industrial Measures

R1-I1: Oil and Gas Extraction Combustion Related GHG Emission Reduction

This AB 32 measure would reduce combustion emissions from oil and gas extraction. By 2020, this requirement will reduce emissions in California by approximately 1.8 MMT CO_2e, representing 13% of combustion emissions from oil and gas extraction in the State of California.

R1-I2: Stationary Internal Combustion Engine Electrification

This AB 32 measure would affect owners and operators of industrial and commercial engines over 50 horsepower used as primary power sources by replacing internal combustion engines with electric motors. By 2020, this requirement will reduce emissions in California by approximately 0.3 MMT CO_2e, representing 0.5% of combustion emissions from industrial sources (non-coal) in the State of California.

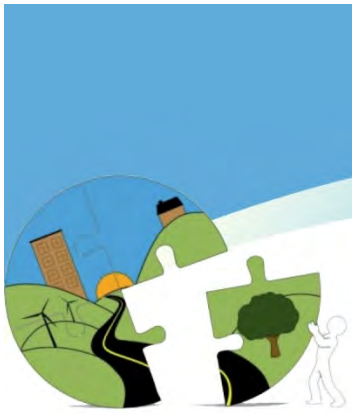
B. R2 Industrial Measures

Industrial point source emitters of GHGs are required to comply with Title V Permits under the federal Clean Air Act. As such, these types of emissions are not under the jurisdiction of Riverside County and, hence, no IMs were developed or are proposed for point source emitters. Other types of industrial emissions (mobile source, energy, etc.) are reduced through R1 measures and the measures described throughout this document.

This page intentionally left blank.

Chapter 5
Total Estimated Reductions

This page intentionally left blank



Chapter 5
Total Estimated Reductions

In 2020, Riverside County is projected to emit a total of 12,129,497 MT CO_2e without the incorporation of reduction measures. With implementation of the reduction measures discussed in Chapter 4, Riverside County emissions for 2020 would be reduced to 5,534,113 MT CO_2e. The statewide reduction measures (the R1 Measures in Chapter 4) would reduce close to half of Riverside County's emissions and make a substantial contribution toward reaching the 2020 reduction target. However, Riverside County would need to supplement the state measures with the implementation of the local implementation measures (IM measures) discussed in Chapter 4.

5.1 Reductions from Statewide Measures

The following tables summarize the GHG reductions afforded to Riverside County from the implementation of the statewide R1 reduction measures. Table 5-1 (Statewide Measures and Associated Emissions Reduced from the 2020 Inventory) shows the annual MT CO_2e and the corresponding percent of emissions reduced for each of the R1 statewide measures described in Chapter 4 during the year 2020. Note that some R1 measures are not quantifiable and are not included in Table 5-1.

Table 5-1 Statewide Measures and Associated Emissions Reduced from the 2020 Inventory

Transportation	MT CO_2e Reduced	% of Transportation Emissions
R1-T1 & R1-T2: Pavley Vehicle Efficiency*	257,519	3.7%
R1-T3: Low Carbon Fuel Standard	188,757	2.7%
R1-T4: Tire Pressure	14,167	0.2%
R1-T5: Low Rolling Resistance Tires	9,417	0.1%
R1-T6: Low Friction Oils	80,248	1.2%
R1-T7: Goods Movement Efficiency	35,394	0.5%
R1-T8: Aerodynamic Efficiency	41,357	0.6%
R1-T9: Medium/Heavy Duty Hybridization	30,634	0.4%
R1-T10: Regional SB 375 Targets	404,697	5.8%
Transportation Total	**1,062,190**	15.2%
Energy	**MT CO_2e Reduced**	**% of Energy Emissions**
R1-E1: RPS – 33% Renewable by 2020	365,239	12.9%
R1-E2 & R1-E3: Lighting	161,400	5.7%
R1-E4: Electrical Energy Efficiency	127,288	4.5%
R1-E5: Natural Gas Energy Efficiency	24,631	0.9%
R1-E6: Increased Combined Heat and Power	96,397	3.4%
R1-E7: Industrial Efficiency	80,180	2.8%
Energy Total	**855,135**	**30.2%**
Purchased Water	**MT CO_2e Reduced**	**% of Water Emissions**
R1-W1: RPS – 33% Renewable by 2020	33,315	19.0%
Purchased Water Total	**33,315**	**19.0%**

Agriculture	MT CO_2e Reduced	% of Agriculture Emissions
R1-A1: Methane Capture at Dairies	15,604	1.0%
Agriculture Total	**15,604**	**1.0%**
Total Reductions	**1,966,245**	16.2%

* Because Pavely I and Pavely II work in tandem for total reductions and would not have equivalent reductions if implemented independently of one another, they are shown together in this table

Table 5-2 (Statewide Reduction Summary for 2020 Inventory) compares the 2020 inventory (without the incorporation of any reduction measures) to the community-wide emissions with the statewide reductions. As shown in the table, the statewide reduction measures would reduce 16.2% of Riverside County's total community wide annual emissions by the year 2020.

Table 5-2 Statewide Reduction Summary for 2020 Inventory

	2020 BAU MT CO_2e	State Reductions MT CO_2e	2020 Reduced MT CO_2e	% Reduction
Transportation	6,977,331	1,062,190	5,915,141	15.2%
Energy	2,830,246	855,135	1,975,111	30.2%
Area Sources	442,024	0	442,024	0.0%
Purchased Water	175,344	33,315	142,029	19.0%
Solid Waste	181,728	0	181,728	0.0%
Agriculture	1,522,823	15,604	1,507,220	1.0%
Total	12,129,497	**1,966,245**	**10,163,253**	16.2%

Although the statewide measures would significantly reduce Riverside County's emissions, they would not be enough to reach the established 2020 reduction target. Riverside County's reduction target was calculated as 15% below 2008 levels, which equates to 5,960,998 MT CO_2e. The statewide reduction measures would bring Riverside County down to 10,163,253 MT CO_2e, which leaves 4,202,255 MT CO_2e to be reduced by measures implemented at the community level, see Table 5-3 (Comparison to Reduction Target).

Table 5-3 Comparison to Reduction Target

	MT CO_2e
2020 with State Reductions	10,163,253
2020 Reduction Target	5,960,988
Amount left to Reduce	**4,202,255**

The measures described in Chapter 4 would be implemented to reduce the remaining 4,202,255 MT CO_2e in order to reach the 2020 reduction target for Riverside County. The 2020 Reduction Target is an estimated 50.9% below the 2020 inventory. The statewide reduction measures work to reduce Riverside County's emissions by 16.2% from the 2020 inventory, as shown in Table 5-4 (Percentage Reduction from 2020 Inventory).

Table 5-4 Percentage Reduction from 2020 Inventory

	% from 2020 Inventory
2020 Reduction Target	50.9%
State Reduction Measures	16.2%
Amount left to Reduce	**34.7%**

The remaining 34.7% of emissions would be reduced through the implementation of the measures described in Chapter 4. Measures include several categories of reductions: the energy-efficiency measures that Riverside County has incorporated since 2008; measures that implement policies included in the proposed General Plan Update; and additional measures that applicants could include as part of their project when filling out the Screening Tables.

5.2 Reductions from Implementation Measures

The IMs discussed in Chapter 4 would be implemented primarily through the Screening Tables for New Development and with General Plan policies. The measures go beyond the state measures to reduce GHG emissions in order to meet the 2020 reduction target. Table 5-5 (R2 Measures and Associated Emissions reduced from 2020 Inventory) summarizes the MT CO_2e and the corresponding percentage of emissions reduced for each of the R2 measures.

Table 5-5 R2 Measures and Associated Emissions Reduced from 2020 Inventory

Transportation	MT CO_2e Reduced	% of Transportation Emissions
R2-T1: Employment Based Trip and VMT Reduction	870,619	12.5%
R2-T2: Increased Residential Density	470,134	6.7%
R2-T3: Mixed Use Development	451,851	6.5%
R2-T4: Preferential Parking	15,293	0.2%
R2-T5: Roadway Improvements – Signals, Flow	304,019	4.4%
R2-T6: Non-Motorized Transportation Facilities	328,333	4.7%
R2-T7: Expand Alternative Fuel Vehicle Use	451,928	6.5%
R2-T8: Anti-Idling Enforcement	71,736	1.0%
R2-T9: Increase Public Transit	382,918	5.5%
R2-T10: Employee Commute Alternative Schedules	114,277	1.6%
Transportation Total	**3,461,109**	49.6%
Energy	**MT CO_2e Reduced**	**% of Energy Emissions**
R2-E1: Residential Energy Efficiency Program	72,480	2.6%
R2-E2: Residential Renewable Energy Program	108,728	3.8%
R2-E3: Residential Retrofit Implementation Program	70,365	2.5%
R2-E4: Residential Renewable Retrofit Program	83,026	2.9%
R2-E5: Commercial Energy Efficiency Program	182,796	6.4%
R2-E6: Commercial/Industrial Renewable Program	261,923	9.3%
R2-E7: Commercial/Industrial Retrofit Program	25,948	0.9%
R2-E8: Induction Streetlight Retrofits	12,793	0.5%
R2-E9: Increase Gas-To-Energy Production	15,672	0.6%
Energy Total	**833,731**	29.5%
Area Source	**MT CO_2e Reduced**	**% of Area Source Emissions**
R2-L1: Electric Landscape Equipment	123,959	28.0%
R2-L2: No New Wood-burning Devices	75,241	17.0%
R2-L3: Mandatory Curtailment Days	12,637	2.9%
Area Source Total	**211,837**	47.9%
Water	**MT CO_2e Reduced**	**% of Water Emissions**
R2-W1: Water Use Reduction Initiative	28,406	16.2%
R2-W2: Increase Reclaimed Water Use	4,602	2.6%
Water Total	**33,007**	**18.8%**
Solid Waste	**MT CO_2e Reduced**	**% of Solid Waste Emissions**
R2-W1: County Diversion Program	82,371	45.3%
R2-W2: Construction Diversion Program	7,058	3.9%
Solid Waste Total	**89,455**	49.2%
Total Reductions	**4,629,410**	38.2%

With the statewide reduction measures and the implementation of the IMs, Riverside County would reduce its community-wide emissions to a level below the established 2020 reduction target. Table 5-6 (IM Reduction Summary for 2020 Inventory) summarizes the 2020 inventory emissions, the GHG reductions associated with the statewide and IMs, and the reduced 2020 emissions.

Table 5-6 IM Reduction Summary for 2020 Inventory

	2020 MT CO_2e	State Reductions MT CO_2e	IM Reductions MT CO_2e	Reduced 2020 MT CO_2e	% Reduction
Transportation	6,977,331	1,062,190	3,461,109	2,454,032	64.8%
Energy	2,830,246	855,135	833,731	1,141,380	59.7%
Area Sources	442,024	0	211,837	230,188	47.9%
Purchased Water	175,344	33,315	33,007	109,021	37.8%
Solid Waste	181,728	0	89,455	92,273	49.2%
Agriculture	1,522,823	15,604	0	1,507,220	1.0%
TOTAL	**12,129,497**	**1,966,245**	**4,629,140**	**5,534,113**	**54.4%**

5.3 Reduced 2020 Community-Wide Emissions Inventory

With the implementation of GHG reduction measures, Riverside County is projected to reduce its emissions to a total of 5,534,113 MT CO_2e, which is 426,884 MT CO_2e below the 2020 reduction target. This is a decrease of 54.4% from Riverside County's 2020 BAU emissions inventory and 15% from the 2008 emissions. The reduction measures reduce GHG emissions from all sources of community-wide GHG emissions including transportation, energy, area sources, water, solid waste and agriculture. The following section describes the reduced emissions by source for the year 2020.

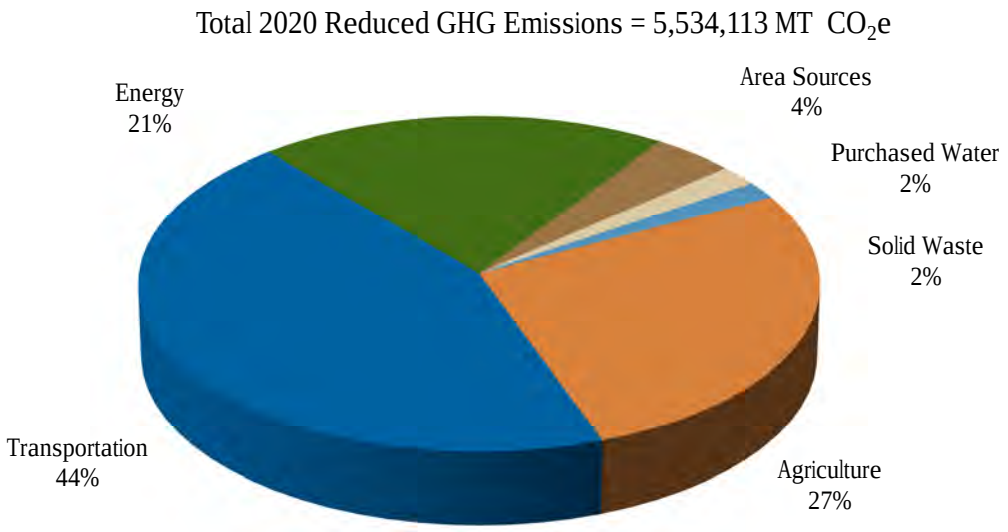
A. Emissions by Source

The emissions by source for the reduced 2020 inventory were calculated by applying a percent reduction to the 2020 emissions for each reduction measure. Table 5-7 (Reduced 2020 GHG Emissions by Source) summarizes the reduced 2020 County emissions of CO_2e as broken down by emissions category. Figure 5-1 (Reduced 2020 GHG Emissions Generated by Source) is a graphical representation of Table 5-7. A detailed breakdown of reduced 2020 emissions by category is available in Appendix D of this CAP.

Table 5-7 Reduced 2020 GHG Emissions by Source

Category	Metric tons of CO_2e
Transportation	2,454,032
Energy	1,141,380
Area Sources	230,188
Purchased Water	109,021
Solid Waste	92,273
Agriculture	1,507,220
Total	**5,534,113**

Figure 5-1 Reduced 2020 GHG Emissions Generated by Source



5.4 Reduced 2035 Community-Wide Emissions Inventory

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

- Pavley vehicle efficiency standards would continue beyond 2035 at a similar rate.
- The low carbon fuel standard would increase from 10% to 12%.
- Continued expansion of medium and heavy duty vehicle hybridization.
- Expanded SB 375 target with SCAG RTP/SCS implementation.
- 0.4% reduction in transportation emissions associated with CA High Speed Rail project.
- 30% increase in residential density post 2020.
- 10% increase in mixed use development post 2020.
- Expanded preferential parking programs.
- Expanded signal synchronization and traffic flow management programs.
- 60% increase in facilities for bicycle and pedestrian transportation post 2020.
- Double the number of electric vehicles post 2020.

- Expanded transportation network post 2020.
- Increased percent of RPS to 39% by 2035.
- Continued regulations for energy efficient lighting.
- Increased electrical and natural gas energy efficiency post 2020.
- Expanded combined heat and power systems.
- Increased industrial efficiency by 60% post 2020.
- New homes achieve energy efficiency 25% beyond current Title 24.
- 65% participation of new home with renewable energy systems.
- 50% of existing homes undergo energy efficiency and/or renewable energy retrofits.
- 25% of new commercial development installs renewable energy systems.
- 60% of existing commercial developments undergo energy efficiency retrofits.
- Water conservation expands to 30%.
- Reclaimed water use increases to 10%.
- Construction waste diversion doubles post 2020.
- Methane capture at dairies doubles post 2020.

With the continued implementation of the Screening Tables for New Development and predicted future developments at the state level, Riverside County's 2035 emissions would be reduced down to a total GHG emissions inventory of approximately 5,937,658 MT CO_2e, this represents a 61.7% decrease from the 2035 BAU emissions inventory and is below the 2020 reduction target. The assumptions described above represent one possible scenario for achieving reductions beyond 2020. Future inventory updates, monitoring of reduction measures, and updating policies will be necessary to create a successful post 2020 plan.

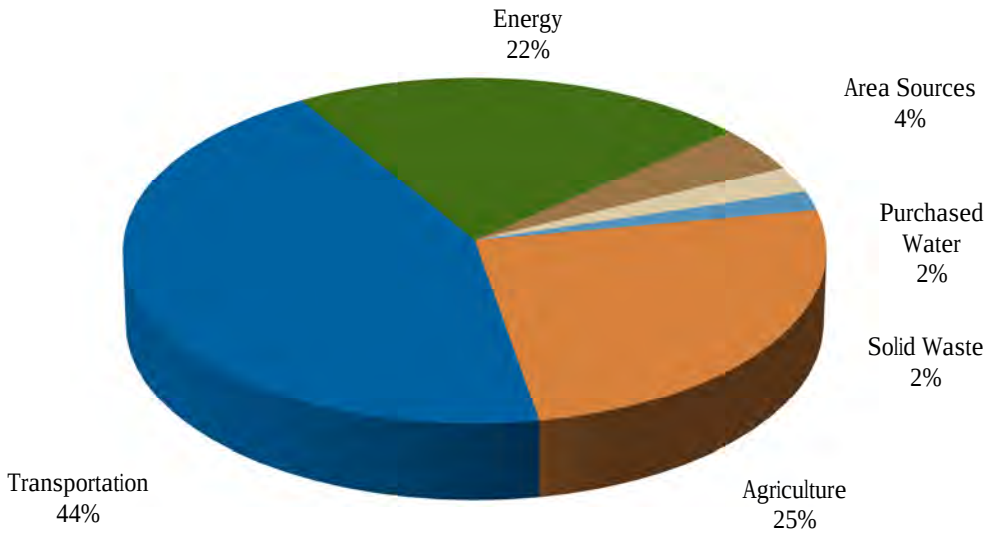
A. Emissions by Source

The emissions by source for the 2035 reduced inventory were calculated by applying a percent reduction to the 2035 emissions inventory for each reduction measure. Table 5-8 (Reduced 2035 GHG Emissions by Source) summarizes the 2035 County emissions of CO_2e as broken down by emissions category. Figure 5-3 (Reduced 2035 GHG Emissions by Source) is a graphical representation of Table 5-8. A detailed breakdown of the reduced 2035 emissions by category is available in Appendix D of this CAP.

Table 5-8 Reduced 2035 GHG Emissions by Source

Category	Metric tons of CO_2e
Transportation	2,617,363
Energy	1,323,685
Area Sources	256,478
Purchased Water	146,118
Solid Waste	107,198
Agriculture	1,485,815
Total	**5,937,658**

Figure 5-3 Reduced 2035 GHG Emissions by Source



5.5 Emissions Summary

With the implementation of the reduction measures outlined in Chapter 4, Riverside County would reduce its emissions to a level below the 2020 reduction target calculated in Chapter 3. This represents a 54.3% decrease from the 2020 BAU inventory and is consistent with the State of California's GHG reduction goals. Table 5-9 (2020 GHG Emissions Comparison) summarizes the existing 2008 emissions, the 2020 BAU emissions inventory, and the reduced 2020 emissions.

Table 5-9 2020 GHG Emissions Comparison

Source Category	Metric tons of CO_2e			
	2008	2020 BAU	Reduced 2020	% Reduced
Transportation	2,850,520	6,977,331	2,454,032	64.8%
Energy	1,577,667	2,830,246	1,141,380	59.7%
Area Sources	269,181	442,024	230,188	47.9%
Purchased Water	152,473	175,344	109,021	37.8%
Solid Waste	132,666	181,728	92,273	49.2%
Agriculture	2,030,431	1,522,823	1,507,220	1.0%
Total	**7,012,938**	**12,129,823**	**5,534,113**	**54.4%**
Emission Reduction Target		**5,960,998**	**5,960,998**	
Below Reduction Target?		**No**	**Yes**	

Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.

Beyond 2020, these reduction measures would continue to reduce emissions particularly from new development projects and transportation. Without reduction measures, Riverside County's growth beyond 2020 would result in more GHG emissions; however, these emissions can be offset with the implementation of the Screening Tables for New Development and the General Plan's policies to reduce GHG emissions. Table 5-10 (2035 GHG

Emissions Comparison) summarizes Riverside County's existing 2008 emissions, anticipated 2035 emissions inventory, and reduced 2035 emissions.

Table 5-10 2035 GHG Emissions Comparison

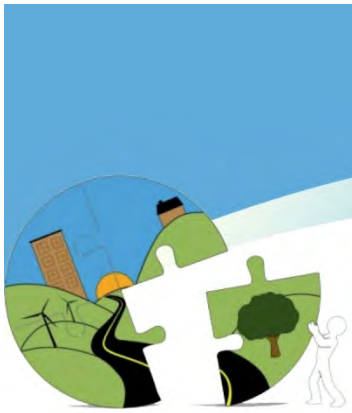
Source Category	Metric tons of CO_2e			
	2008	BAU 2035	Reduced 2035	% Reduced
Transportation	2,850,520	9,318,041	2,617,363	71.9%
Energy	1,577,667	3,610,701	1,323,685	63. 3%
Area Sources	269,181	529,384	256,478	51.6%
Purchased Water	152,473	293,077	146,118	50.1%
Solid Waste	132,666	220,747	107,198	51.4%
Agriculture	2,030,431	1,522,823	1,486,815	2.4%
Total	**7,012,938**	**15,494,774**	**5,937,658**	**61.7%**
Emission Reduction Target		**5,960,998**	**5,960,998**	
Below Reduction Target?		**No**	**Yes**	

Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.

Table 5-10 shows that the continued implementation of the reduction measures combined with the anticipated increased stringency of state reduction measures would reduce 2035 emissions by 61.7%, which is below the 2020 reduction target. The State of California's ambitious reduction target for the year 2050 is to reduce emissions 80% below 1990 emissions. In order to reach this target, technology must advance significantly and more stringent measures for building and vehicle efficiency must be implemented. While the measures included in this CAP would provide a plan for Riverside County to reduce emissions enough to meet the 2020 target and experience further reductions through to 2035, the CAP would need to be updated periodically in the future in order to update these measures.

Chapter 6
Conclusions

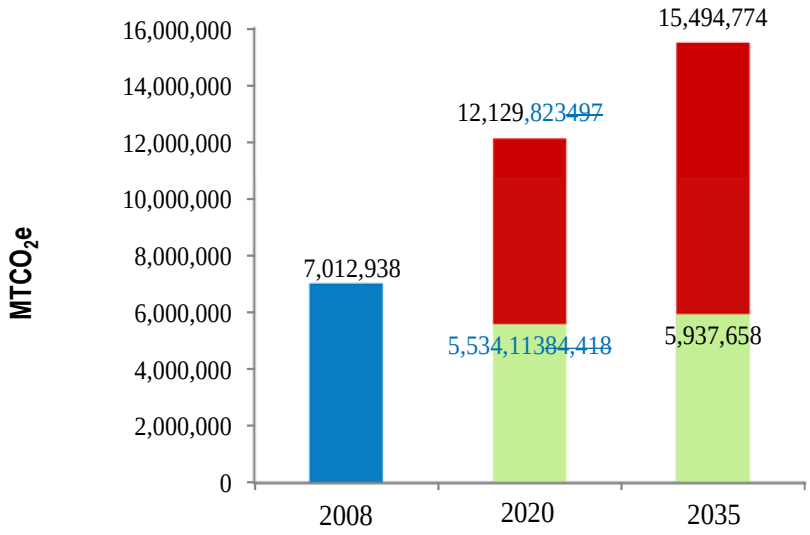
This page intentionally left blank



Chapter 6 Conclusions

This CAP serves as a guide to help Riverside County implement the objectives of conserving resources and reducing GHG emissions. This document also serves as a technical resource for the proposed update of Riverside County's current General Plan and other land use related documents that may require evaluation and documentation of GHG emissions. Figure 6-1 (Riverside County GHG Emissions by Year) shows a comparison between the emission inventories, including the reduced 2020 BAU and 2035 BAU inventories. The blue bar represents the calculated GHG inventory for Riverside County for 2008. The red bars show the projected growth in GHG emissions in 2020 BAU and 2035 BAU based on the General Plan growth rates. The green bars demonstrate the reduced inventories after the implementation of the statewide and community reduction measures described in Chapter 4.

Figure 6-1 Riverside County GHG Emissions by Year



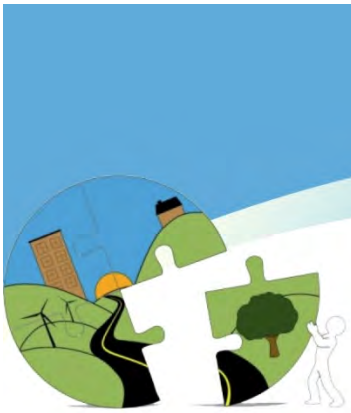
This CAP sets a target to reduce community-wide GHG emission emissions by 15% from 2008 levels by 2020 consistent with the state reduction goals in AB 32. The CARB Scoping Plan outlines the reduction strategies designed to meet the statewide reduction goal of AB 32. Riverside County has a reduction strategy as described in Chapter 4 that would meet the state reduction goal. Reduction measures provided herein would ensure that Riverside County meets the AB 32 reduction target of reducing to 15% below 2008 levels (reduce down to

5,964,354 MT CO_2e) by 2020. Such programs include strengthening Riverside County's existing programs as well as implementing the Screening Tables for New Development. In some cases, implementation will require the cooperation of other agencies, private businesses, and residents. The success of these measures will be tracked using indicators and targets such as those described in this CAP. Even with the anticipated growth, the modernization of vehicle fleets, combined with the continued implementation of the proposed measures, will reduce GHG emissions by approximately 6,595,384 MT CO_2e from 2020 levels. Therefore, the implementation of the state (R1) measures combined with Riverside County's R2 and R3 measures will reduce GHG emissions down to 5,534,113 MT CO_2e by year 2020, which is 426,884 MT CO_2e below the reduction target.

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

Chapter 7
Implementation

This page intentionally left blank



Chapter 7 Implementation

This section describes implementation steps for the CAP to support achievement of the GHG reduction goals for the community at large. Success in meeting Riverside County's GHG emission reduction goal will depend on cooperation, innovation and participation by Riverside County and residents, businesses, and government entities in Riverside County's land use jurisdiction with regards to implementing the CAP. This section outlines key steps that the County of Riverside will follow for the implementation of this CAP.

7.1 STEP 1 – Administration and Staffing

The County of Riverside will appoint an Implementation Coordinator to coordinate implementation of this CAP. The Implementation Coordinator will oversee and document implementation of the reduction measures and provide periodic monitoring of emissions.

The Implementation Coordinator will, at a minimum, include the following departments, but will be expanded as needed to ensure coordinated leadership in plan implementation:

- Riverside County Executive Office (EO) – the executive office can provide economic, financial and administrative guidance and support to the Implementation Coordinator.
- Transportation Land Management Agency (TLMA) – Riverside County's Land Use umbrella agency will provide coordination between the various land use divisions, including, but not limited to Building & Safety and Transportation and will assist in the implementation of New Development Implementation Measures.
- Riverside County Economic Development Agency-Facilities Management Division – this county division administers the energy efficiency improvements to Riverside County owned facilities being constructed as a result of the Energy Efficiency and Conservation Block Grant (EECBG) funding.
- Planning Division – Planning can provide expertise in the project entitlement process and provide long-term planning support.

7.2 STEP 2 – Financing and Budgeting

The Implementation of the CAP will require creative, continuing and committed financing in order to work. Local, regional, state and federal public sources of funding will be needed along with the substantial involvement of the private sector. The Riverside County Implementation Plan will take into account the costs and staff resources throughout implementation of the plan as well as the financial benefits and cost savings. The following different financing options will be explored by the County of Riverside:

- State and Federal Grants and Low-interest Loans – As described below, there are a variety of grant and loan programs that exist in various sectoral areas.
- 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 CAP including energy efficiency retrofits, waste minimization, transit promotion and education.
- Self-Funding and Revolving Fund Programs – Innovative programs to fund residential solar investments.
- Agreements with Private Investors – Energy service companies and other private companies can finance up-front investments in energy efficiency and then be reimbursed through revenues from energy savings.
- Taxes and Bonds – Various local governments have used targeted finance instruments for solar, transportation, vehicle improvements and landfill methane controls.

Given that financing is vital to implementing many of the CAP measures, a review of current and potential funding sources was completed for the different sectors covered in this CAP and is presented below to help early phase implementation of the CAP. Whether at the federal, western regional or state level, it appears likely that there will be some form of a "cap and trade" system in place within several years. This system, depending on its particular character, is likely to influence energy prices (such as for electricity, natural gas, and vehicle fuels), and may make currently cost-ineffective measures more economically feasible in the medium term and allow the financing of a broader range of plan measures.

A. Energy Efficiency and Renewable Energy Financing

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

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

See: http://www.energystar.gov/index.cfm?c=products.pr_tax_credits.

SCE Energy Efficiency / Renewable Energy Incentives

- Online or mail-in Home Energy Efficiency Survey. This 15-minute survey gives helpful energy-saving tips that will also help the environment. The questions and tips are tailored for residential energy usage.
- Rebate programs for residential use include lighting, appliances, heating and cooling, multifamily housing, pool, solar leadership and customer generation.
- Energy Centers provide free information, training and support to make important Energy Management and energy efficiency choices.
- SCE Energy Manager offers online access to usage information and detailed cost analyses business energy use.
- Financial Offerings include on-Bill Financing, Zero-interest financing towards the purchase and installation of qualifying energy efficient equipment for commercial, industrial and agricultural customers.
- Regulation & Compliance Support "The Cool Planet Project" assists customers with recent installations or efficiency projects resulting in excess of one million kWh of energy in joining the Climate Registry.
- Solar Leadership helps create a cleaner energy future with innovative solutions that make it possible for you to join the solar movement.
- Self-Generation provides financial incentives for installing self-generation equipment to meet all or a portion of facility's energy needs.
- Specialized Services for Facilities:
  - New Buildings – Receive technical assistance in the design and construction of new energy efficient buildings.
  - Savings by Design: New construction builders and buyers can receive design assistance, owner incentives, and design team incentives.
  - California Advanced Homes - Incentives, design assistance, and technical education and services to encourage home builders to build homes that exceed California's Title 24 code standards by at least 15%.
  - Full-service solutions are available to qualifying customers to receive assistance in identifying and evaluating energy efficiency opportunities within existing buildings.
  - Retro Commissioning - Receive assistance to improve the bottom line in existing building's operations through specialized services to detect inefficiencies in complex building systems, and to determine optimum operating conditions.
- Heating Ventilation & Air Conditioning - Lower operating costs and increase equipment life through proper HVAC installation and regular maintenance. Future programs will focus on two key components:
  - A/C Quality Maintenance, and
  - A/Q Quality Installation.

AB 811 Financing Districts. AB 811 permits the creation of assessment districts to finance installation of distributed generation renewable energy sources or energy efficiency improvements that are permanently fixed to residential, commercial, industrial, or other real property. Riverside County's partnership with WRCOG in creation of the Energy Efficiency and Water Conservation Program allows home and business owners to utilize

this type of financing program and avoid upfront costs associated with energy system installations. Financing is repaid through the property tax bill and repayment obligations remain with the property when it is sold to a new owner.

California Energy Commission (CEC) Energy Efficiency Financing. The CEC offers up to $3 million per application in energy efficiency financing and low interest loans to cities and counties for installing energy-saving projects. Examples of projects include: lighting systems, pumps and motors, streetlights and LED traffic signals, automated energy management systems/controls, building insulation, energy generation including renewable and combined heat and power projects, heating and air conditioning modifications and 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

B. Transportation Financing

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

Regional Transportation Improvement Program (RTIP). The Regional Transportation Improvement Program (RTIP) is funded from 75% of the funds made available for transportation capital improvement projects under the State Transportation Improvement Program (STIP). This program targets urban projects that are needed to improve transportation within the region. The Southern California Association of Governments (SCAG) and RCTC recommends to the California Transportation Commission (CTC) the selection of these projects, which can include state highway improvements, local roads, public transit, intercity rail, grade separations, and more.

Interregional Improvement Program (IIP). The Interregional Improvement Program (IIP) is funded from 25% of the funds made available for transportation capital improvement projects under the STIP. This program targets projects that are needed to improve interregional movement of people and goods. Caltrans recommends to the CTC the selection of these projects, which can include state highway improvements, intercity passenger rail, mass transit guide ways, or grade separation projects.

C. Waste Reduction Financing

California Integrated Waste Management Board Grants and Loans. The CIWMB offers funding opportunities authorized by legislation to assist public and private entities in the safe and effective management of the waste stream. See http://www.ciwmb.ca.gov/grants/ for more details.

D. Water Conservation and Treatment Financing

Clean Water State Revolving Funds. 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.

See http://www.epa.gov/owm/cwfinance/cwsrf/index.htm for more details.

CWSRF's offer:

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

7.3 STEP 3 – Timeline and Prioritization

The County of Riverside will develop an implementation schedule based on the completion of the full cost effectiveness analysis. Prioritization will be based on the following factors:

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

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

- Phase 1 (2012-2014): Development of key ordinances, completion of key planning efforts, implementation of most cost-effective measures, and support of voluntary efforts.

- Phase 2 (2014–2017): Continued implementation of first tier measures, implementation of second tier measures, and implementation of key planning outcomes from Phase 1.
- Phase 3 (2017–2020): Continued implementation of first and second tier measures, implementation of third tier of measures.

Because the goals of this CAP are aggressive, success in meeting the CAP goals depend on some flexibility in the GHG reduction actions. The County of Riverside is committed to flexibility in implementing the reduction measures and meeting the goals of this CAP. Many of the reduction measures in this Plan may be implemented through a menu of options. 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 County of Riverside will develop energy efficient design programs (measures R2-E3 and R2-E4). 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 panels and solar water heaters; siting and orienting buildings to optimize conditions for natural heating, cooling, and lighting; installing top-quality windows and insulation; and incorporating natural shading, skylights, and reflective surfaces. Table 7-1 (GHG Reduction Measure Timeline and Phasing Schedule) presents the potential timeline and phasing schedule for the GHG reduction measures.

Table 7-1 GHG Reduction Measure Timeline and Phasing Schedule

Reduction Measure	Phase
Transportation	
R2-T1: Employment Based Trip and VMT Reduction	1, 2, 3
R2-T2: Increased Residential Density	1, 2, 3
R2-T3: Mixed Use Development	1, 2, 3
R2-T4: Preferential Parking	1, 2, 3
R2-T5: Roadway Improvements – Signals, Flow	1
R2-T6: Non-Motorized Transportation Facilities	1, 2, 3
R2-T7: Expand Alternative Fuel Vehicle Use	1, 2, 3
R2-T8: Anti-Idling Enforcement	2
R2-T9: Increase Public Transit	2
R2-T10: Employee Commute Alternative Schedules	1, 2, 3
Energy	
R2-E1: Residential Energy Efficiency Program	1
R2-E2: Residential Renewable Energy Program	1
R2-E3: Residential Retrofit Implementation Program	2
R2-E4: Residential Renewable Retrofit Program	2
R2-E5: Commercial Energy Efficiency Program	1
R2-E6: Commercial/Industrial Renewable Program	1
R2-E7: Commercial/Industrial Retrofit Program	2
R2-E8: Induction Streetlight Retrofits	1
Area Source	
R2-L1: Electric Landscape Equipment	1
R2-L2: No New Wood-burning Devices	1
R2-L3: Mandatory Curtailment Days	1
Water	
R2-W1: Water Use Reduction Initiative	1
R2-W2: Increase Reclaimed Water Use	2, 3

Reduction Measure	Phase
Solid Waste	
R2-W1: County Diversion Program	2
R2-W2: Construction Diversion Program	2

7.4 STEP 4 – Public Participation

The citizens and businesses in Riverside County are integral to the success of GHG reduction efforts. Their involvement is essential in order to reach the reduction goals because this CAP depends on a combination of state and local government efforts, public and private sources of finance and the voluntary commitment, creativity, and participation of the community at large. The County of Riverside must strike a balance between development and environmental stewardship to keep the economy strong and, at the same time, protect the environment. The County of Riverside will educate stakeholders such as businesses, business groups, residents, developers, and property owners about the CAP and encourage participation in efforts to reduce GHG emissions in all possible sectors.

7.5 STEP 5 – Project Review

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

The County of Riverside will implement the reduction measures for new development during the CEQA review, through the use of a Riverside County GHG Screening Table document based upon the CAP. The Riverside County GHG Screening Table document will provide guidance for the analysis of development projects and divide projects into two broad categories based upon the CEQA review they are going through. The screening table will provide a menu of reduction options. If a project can obtain 100 points from the screening table, the mitigated project will implement pertinent reduction measures such that it meets the reduction goals of the CAP and a less than significant finding can be made for the project. The menu of options in the screening table is tied to the R2 Measures in the CAP and the IMs in the General Plan such that 100 points will meet the emission reductions associated with the R2 Measures and IMs. This menu allows for maximum flexibility for projects to meet its reduction allocation.

The methodology discussed above is described in more detail in the Riverside County GHG Screening Table document, presented in Appendix N of the General Plan and is consistent with the analysis and quantification methodology used in the CAP.

The Screening Tables also serve to document the implementation of reduction measures. Using the screening tables as a reduction measure monitoring tool is described in more detail in Section 7.6 below.

7.6 STEP 6 – Monitoring and Inventorying

The County of Riverside will create a system for monitoring the implementation of this CAP and adjusting the plan as opportunities arise. As the plan is implemented and as technology changes, the CAP should be revised to take advantage of new and emerging technology. If promising new strategies emerge, the County of Riverside will evaluate how to incorporate these strategies into the CAP. Further, state and federal action will also result in changes which will influence the level of Riverside County emissions.

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

The GHG inventory will be periodically updated in coordination with the three phases noted above: 2013 (to update with the Regional Transportation Plan outputs and Phase 1 progress); 2017 (to review Phase 2 progress, allow for course corrections to keep progress on target for 2020, and to develop post-2020 forecasts for use in planning for after 2020); and 2020 (to establish baseline for post-2020 GHG reduction planning). The County of Riverside will also implement a monitoring and reporting program to evaluate the effectiveness of reduction measures with regards to progress towards meeting the goals of the CAP.

To provide periodic updates to the CAP inventory of GHG emissions, Riverside County will use a Microsoft (MS) Excel format emissions inventory tool developed by the CAP consultant. This tool will include all the emission factors and emission sources specific to Riverside County. The tool will be designed such that Riverside County staff can input VMT, water use, solid waste and energy consumption data and the tool will quantify emissions for the unincorporated areas.

The CAP Implementation Coordinator shall be responsible for maintaining records of reduction measure implementation and insuring that the periodic updates to the emissions inventory are completed using the MS Excel based emission inventory tool.

7.7 STEP 7 – Beyond 2020

As described above under the discussion of Reduction Goals, 2020 is only a milestone in GHG reduction planning. Executive Order S-03-05 calls for a reduction of GHG emissions to a level 80 percent below 1990 levels by 2050, and this level is consistent with the estimated reductions needed to stabilize atmospheric levels of CO2 at 450 parts per million (ppm). Thus, there will be a need to start planning ahead for the post-2020 period. The County of Riverside will commence planning for the post-2020 period starting in 2017, at the approximate midway point between plan implementation and the reduction target and after development of key ordinances and implementation of cost-effective measures. At that point, Riverside County will have implemented the first two phases of this CAP and will have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches. Further, the state's regulations under AB 32 would have been fully in force since 2012; federal programs and policies for the near term are likely to be well underway; market mechanisms like a cap and trade system are likely to be in force and will be influencing energy and fuel prices; and continuing technological change in the fields of energy efficiency, alternative energy generation, vehicles, fuels, methane

capture and other areas will have occurred. Riverside County will then be able to take the local, regional, state and federal context into account. Further, starting in 2017 will allow for development of the post-2020 plan so that it can be ready for full implementation, including potential new policies, revisions to the General Plan (as necessary), programs, ordinances, and financing by 2020. The new plan will include a specific target for GHG reductions for 2035 and 2050. The targets will be consistent with broader state and federal reduction targets and with the scientific understanding of the needed reductions by 2050. The County of Riverside will adopt the new plan by January 1, 2020.

The new CAP adopted on or before January 1, 2020 will keep on track through 2035 to meet the 2050 goal by implementing the following.

- Increase energy efficiency and green building efforts (for County municipal facilities as well as private buildings within the unincorporated areas) so that the savings achieved in the 2020 to2035 timeframe are approximately 69% those accomplished in 2020.
- Continue to implement land use and transportation measures to lower VMT and shift travel modes (assumed improvement of 8% compared to the unmitigated condition, which is within SCAG's assumed range of 8% to 12% of GHG reductions for 2035).
- Capture more methane from landfills receiving regional waste, move beyond 75% local waste diversion goal for 2020, and utilize landfill gas further as an energy source.
- Continue to improve local water efficiency and conservation.
- Continue to support and leverage incentive and rebate and other financing programs for residential and commercial energy efficiency and renewable energy installations to shorten payback period and costs and to develop programs that encourage increased use of small-scale renewable power as it becomes more economically feasible.

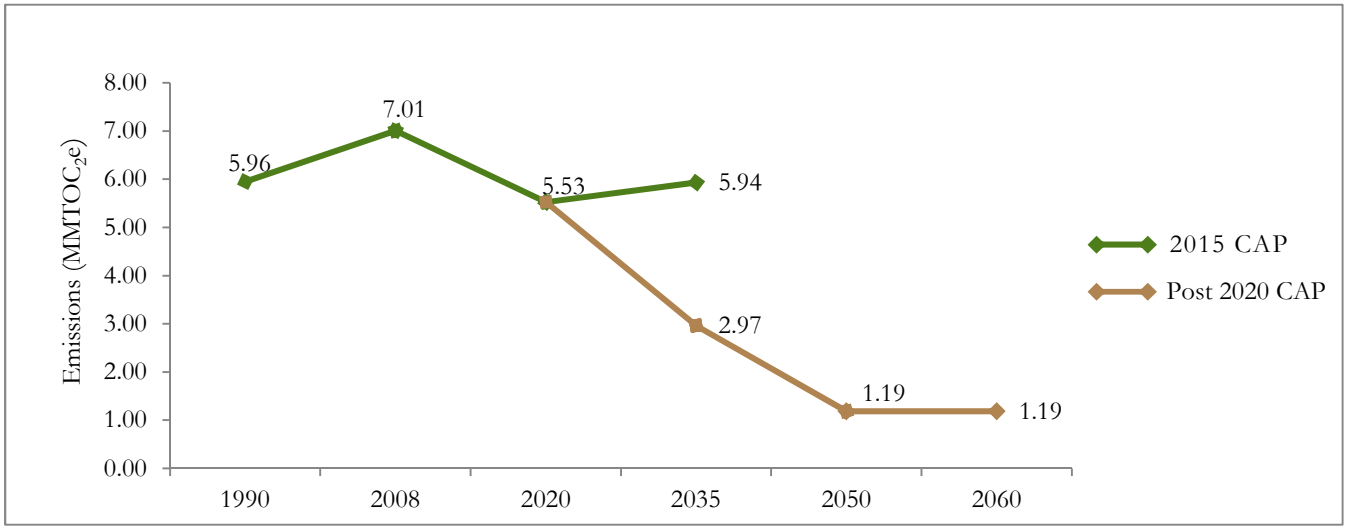
The conceptual effects of these strategies are presented in Table 7-2 and would represent an approximate doubling of effort from that planned at the state and County level for 2020. In total, the measures described above would produce reductions to bring the region's GHG emissions to an estimated 3 MMTCO2e by 2035. While the potential mix of future GHG reduction measures presented in this section is preliminary, it serves to demonstrate that the current measures in the CARB Scoping Plan and the County's CAP can not only move the region to its 2020 goal, but can also provide an expandable framework for much greater long-term greenhouse gas emissions reductions toward the ultimate 2050 goal.

Table 7-2. Potential Reduction Measures to Reach a 2035 Goal of 2.3 $MMTCO_2e$

	Reductions by 2035 in CAP				Scenario for Additional Reductions by 2035		
	State	County	TOTAL	% BAU Reduction	Additional Reductions 2020–2035	Effort Relative to this CAP	Notes
	$MTCO_2e$	$MTCO_2e$	$MTCO_2e$	%	$MTCO_2e$	%	
Building Energy (Residential, Commercial, Industrial)	855,135	1,431,881	2,287,016	63.3%	1,486,205	65%	CARB Scoping Plan calls for doubling of energy efficiency reductions between 2020 and 2030 (i.e., 100% effort relative to the period 2008–2020). The County would have to do 5% more in this sector to be on target. Additional GHG reductions during this period will come from a continued de-carbonization of electricity at the public utility level, more aggressive retrofitting of existing buildings and greatly increased use of small scale renewables.
Transportation	1,062,190	5,638,488	6,700,678	71.9%	1,713,327	25.6%	CARB Scoping Plan calls for a doubling of GHG reductions from vehicle fleet by 2030 compared to 2020 and more than doubling reduction of carbon intensity of transportation fuels (i.e., 100% effort relative to the period 2008–2020). The region would need to do about 8% more in this sector to stay on target. SCAG assumes between 8% and 12% in GHG reductions after 2020 for 2035 for VMT reduction. This analysis assumes 8% for local reductions.
Solid Waste Management	0	113,549	113,549	51.4%	23,733	20.9%	Assumed the County continue further efforts at methane control, waste diversion, and potential waste to energy projects to result in modest further reductions in sector (7%). Once capture technology is installed, additional reductions in this sector are somewhat limited.
Agriculture	36,008	0	36,008	2.4%	0	0%	No assumed change.
Wastewater Treatment	0	0	0	NA	8,132	100%	Assumed additional 3% in reduction in sector due to installation of fugitive emission capture technology and additional water conservation.
Purchased Water	33,315	113,644	146,959	50.1%	12,023	8.1%	Assumed additional 5% in reduction in sector due to continued effort to conserve water at a similar rate as 2008-2020.
TOTAL			**9,284,210**		**3,243,420**		

Figure 7-1 below shows the trajectory of emissions within this Draft 2015 CAP that achieves an AB 32 compliant reduction target of 5.96 million metric tons (MMT) CO_2e and the conceptual 2035 and 2050 reductions in a post 2020 CAP needed to reduce emissions down to 80% below 1990 levels by 2050 outlined in Executive Order S-3-05. Riverside County will develop the post-2020 CAP so that it can be ready for full implementation, including potential new policies, revisions to the General Plan (as necessary), programs, ordinances, and financing by 2020. The Post 2020 CAP will include a specific target for GHG reductions for 2035 and 2050. The targets will be consistent with broader state and federal reduction targets including Executive Order S-3-05 and with the scientific understanding of the needed reductions by 2050. The County of Riverside will adopt the new Post 2020 CAP by January 1, 2020.

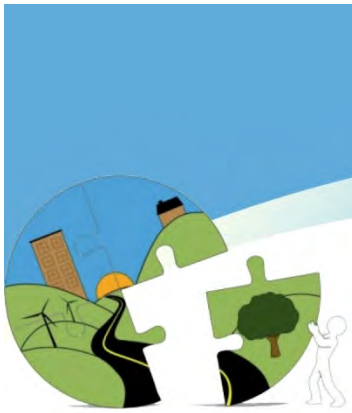
Figure 7-1 Riverside County GHG Emissions by Year



This page intentionally left blank.

Chapter 8
References

This page intentionally left blank



Chapter 8 References

Association of Environmental Professionals (AEP) White Paper: Alternative Approaches to Analyzing Greenhouse Gases and Global Climate Change Impacts in CEQA Documents, June 2007.

Association of Environmental Professionals (AEP) White Paper: Community-wide Greenhouse Gas Emission Protocols, March 2011.

Association of Environmental Professionals (AEP) White Paper: Forecasting Community-wide Greenhouse Gas Emissions and Target Setting, May 2012.

California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures, August 2010.

California Air Pollution Control Officers Association (CAPCOA), White Paper: CEQA and Climate Change, January 2008.

California Air Resources Board (CARB), Climate Change Scoping Plan, December 2008.

California Air Resources Board (CARB), EMFAC2007, 2007. [2007b]

California Air Resources Board (CARB), Mandatory Reporting of Greenhouse Gas Emissions, December 6, 2007. [2007c]

California Air Resources Board (CARB), Proposed Early Actions to Mitigate Climate Change in California December 20, 2007. [2007d]

California Air Resources Board (CARB), Proposed SB 375 Greenhouse Gas Targets: Documentation of the Resulting Emission Reductions based on MPO Data, August 9, 2010. [2010a]

California Air Resources Board, Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375, September 23, 2010. [2010b]

California Air Resources Board, URBEMIS2007 for Windows Version 9.2.4, 2007. [2007e]

California Building Standards Commission (CBSC), 2010 California Green Building Standards Code, January 2010.

California Climate Action Team (CCAT), Climate Action Biannual Report, April 2010.

California Climate Action Team (CCAT), California Climate Action Team's Final Report to the Governor and Legislature, March 2006.

California Climate Action Registry (CCAR), General Reporting Protocol, Version 3.1, January 2009.

California Climate Action Registry (CCAR), Local Government Protocol, Version 1.1, May 2010.

California Department of Finance, E-4 Population Estimates, http://www.dof.ca.gov/research/demographic/reports/estimates/e-4_2001-07/, accessed August 2010.

California Energy Commission (CEC), Refining Estimates of Water Related Energy Use in California: CEC-500-2006-118, December 2006. [2006a]

California Energy Commission (CEC), California's Energy Efficiency Standards for Residential and Nonresidential Buildings, Title 24, Part 6, of the California Code of Regulations, 2008 Standards, April 23, 2008.California Health and Safety Code Section 38505 (g), Greenhouse Gas Definitions, http://law.onecle.com/california/health/38505.html, accessed February 11 2011.

California Natural Resources Agency, 2009 California Climate Adaptation Strategy, December 2, 2009. [2009a]

California Natural Resources Agency, CEQA Guidelines Amendments, December 30, 2009. [2009b]

Energy Information Administration (EIA), 2005 Residential Energy Consumption Survey, 2005.

Federal Transit Administration (FTA), Guaranteed Ride Home Programs, A Study of Program Characteristics, Utilization, and Costs. May 16, 2006.

Intergovernmental Panel on Climate Change (IPCC), Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate, 2001.

South Coast Air Quality Management District (SCAQMD), Greenhouse Gas CEQA Significance Thresholds, December 5, 2008.

United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, December 11, 1997.

U.S. Environmental Protection Agency (USEPA), AP-42, Compilation of Air Pollutant Emission Factors, Fourth Edition, September 1985.

U.S. Environmental Protection Agency (USEPA), Emissions and Generation Resource Integrated Database (eGRID2007), version 1.1, December 31 2007.

U.S. Environmental Protection Agency, Final GHG Tailoring Rule, 40 CFR Parts 51, 52, 70, et al., May 2010. [2010a]

U.S. Environmental Protection Agency, Mandatory Reporting of Greenhouse Gases Rule, 40 CFR Part 98, October 2009.

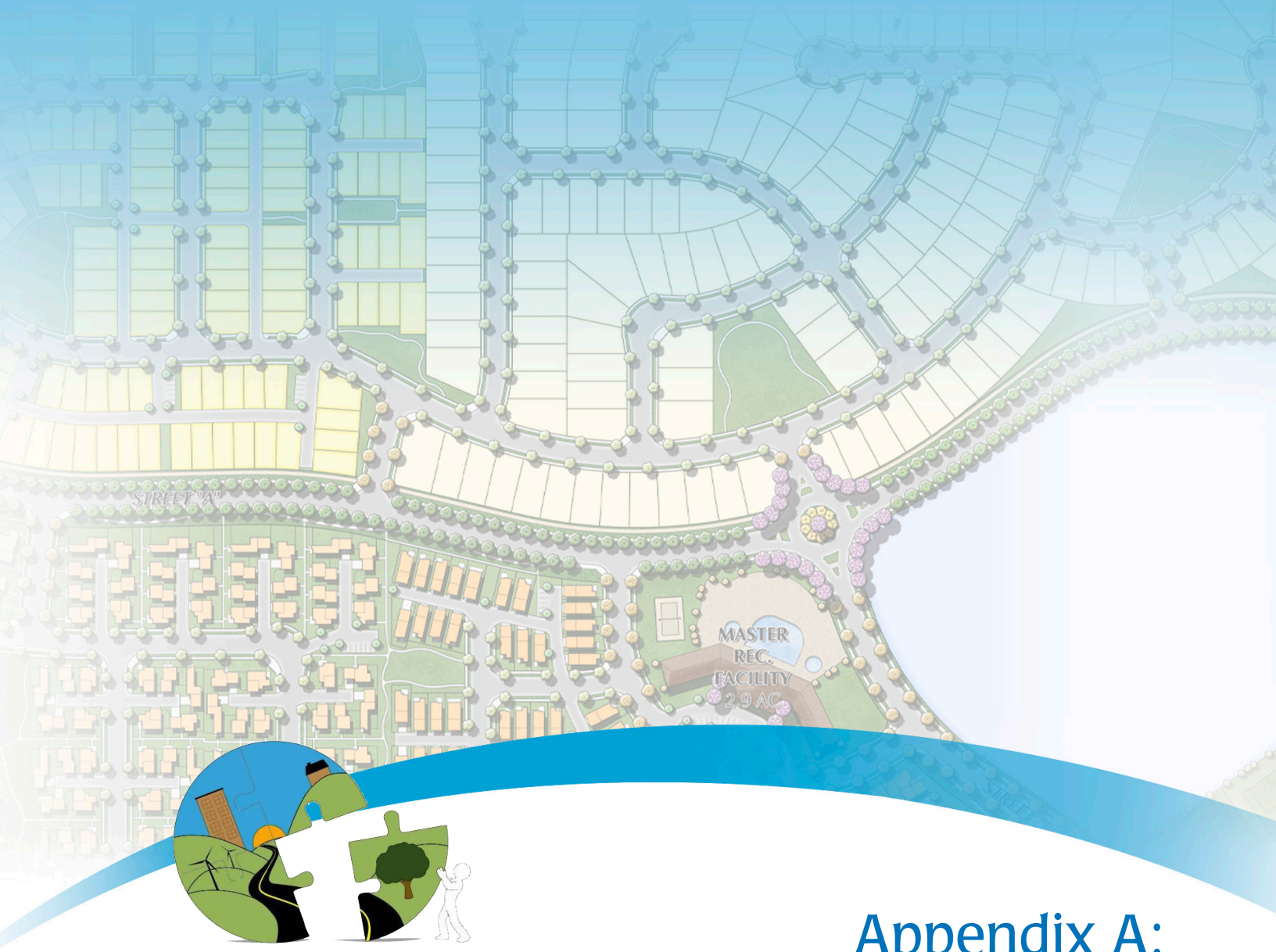
U.S. Environmental Protection Agency, Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks, Third Edition, September 2006.

Chapter 8 References

U.S. Environmental Protection Agency, U.S. Greenhouse Gas Inventory Report, Section 6 Agriculture, http://www.epa.gov/climatechange/emissions/downloads09/Agriculture.pdf, accessed February 2010. [2010b]

U.S. Supreme Court, Massachusetts et al. v. Environmental Protection Agency et al., No. 05-1120, Decided April 2, 2007.

This page intentionally left blank



Appendix A:

The Greenhouse Effect, Greenhouse Gases, and Climate Change Impacts

This page intentionally left blank

GLOBAL CLIMATE CHANGE

Parts of the Earth's atmosphere act as an insulating blanket of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. The 'blanket' is a collection of atmospheric gases called 'greenhouse gases' (GHGs) based on the idea that the gases also 'trap' heat like the glass walls of a greenhouse. These gases, mainly water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, and chloroflurocarbons (CFCs) all act as effective global insulators, reflecting back to earth visible light and infrared radiation. Human activities such as producing electricity and driving vehicles have contributed to the elevated concentration of these gases in the atmosphere. This in turn, is causing the Earth's temperature to rise. A warmer Earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Leading scientists around the world agree that Global Warming Potential is a reality and that human activities are disrupting the earth's climate by intensifying the greenhouse effect.

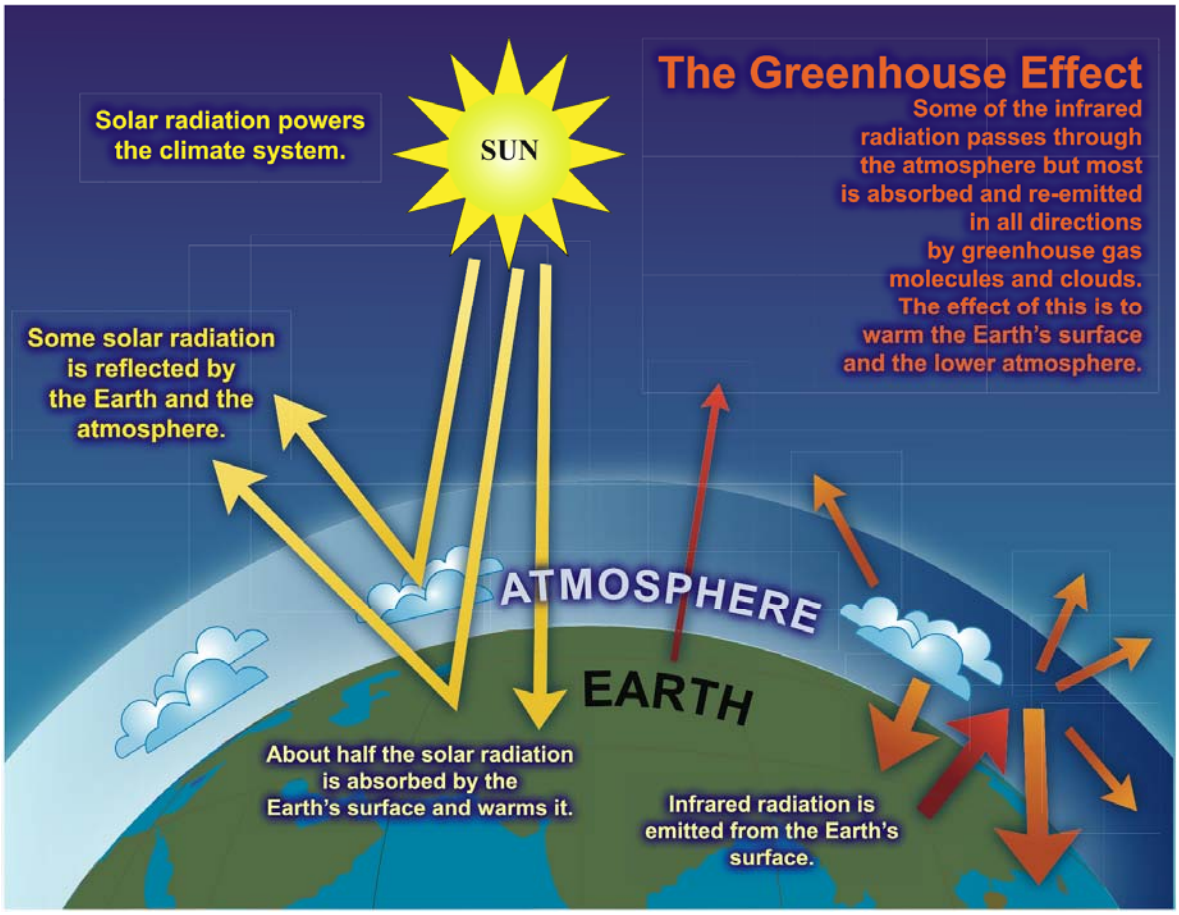
1. THE GREENHOUSE EFFECT

A balance of naturally occurring gases dispersed in the atmosphere determines the Earth's climate by trapping solar heat. This phenomenon is known as the greenhouse effect. As sunlight passes through our atmosphere, the incoming solar radiation is eradiated from the earth's surface as heat energy. Greenhouse gases like carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and water vapor trap some of this reradiated energy. This trapped heat warms the earth, much as the glass of a greenhouse traps reradiated energy from sunlight and thereby warms the interior of the structure. Figure 1-1 illustrates the Greenhouse Gas Effect.

2. GLOBAL WARMING

The natural "greenhouse effect" allows the earth to remain warm and sustain life. Greenhouse gases trap the sun's heat in the atmosphere, like a blanket, and help determine the existing climate. The increased consumption of fossil fuels (wood, coal, gasoline, etc.) has substantially increased atmospheric levels of greenhouse gases. As atmospheric concentrations of greenhouse gases rise, so do temperatures. Over time this rise in temperatures would result in climate change. Theories concerning climate change and global warming existed as early as the late 1800s. By the late 1900s the understanding of the earth's atmosphere had advanced to the point where many climate scientists began to accept that the earth's climate is changing. Today, many climate scientists agree that some warming has occurred over the past century and will continue through this century.

Figure A.1 - The Greenhouse Gas Effect



Source: IPPC, 2008

The United Nations Intergovernmental Panel on Climate Change predicts that changes in the earth's climate will continue through the 21st century and that the rate of change may increase significantly in the future because of human activity. Many researchers studying California's climate believe that changes in the earth's climate have already affected California and will continue to do so in the future.

3. GREENHOUSE GASES

Parts of the Earth's atmosphere act as an insulating blanket of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. The 'blanket' is a collection of atmospheric gases called 'greenhouse gases' (GHGs) based on the idea that the gases also 'trap' heat like the glass walls of a greenhouse. These gases, mainly water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols all act as effective global insulators, reflecting back to earth visible light and infrared radiation.

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHGs, the earth's surface would be about 34 degrees Centigrade (°C) cooler (CAT 2006). However, it is believed that emissions from human activities have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. This in turn is causing the Earth's temperature to rise. A warmer Earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Individual GHGs have varying global warming potential (GWP) and atmospheric lifetimes. The reference gas for GWP is carbon dioxide; carbon dioxide has a GWP of one. Compared to methane's GWP of 21 it is clear that methane has a greater global warming effect than carbon dioxide on a molecule per molecule basis (EPA 2006b). As shown below in Table 1.1 GWP ranges from 1 (carbon dioxide) to 23,900 (sulfur hexafluoride).

Atmospheric lifetimes vary from 1.5 (HFC-152a) to 50,000 years (tetrafluoromethane). One teragram (equal to one million metric tons) of carbon dioxide equivalent (Tg CO_2 Eq.) is the mass emissions of an individual GHG multiplied by its GWP. The atmospheric lifetime and GWP of selected greenhouse gases are also summarized in Table 1.1.

Table A.1 Global Warming Potentials and Atmospheric Lifetimes

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide	50 - 200	1
Methane	12 ± 3	21
Nitrous Oxide	120	310
HFC-23 264		11,700
HFC-134a 14.6		1,300
HFC-152a 1.5		140
PFC: Tetrafluoromethane (CF4)	50,000	6,500
PFC: Hexafluoroethane (C2F6)	10,000	9,200
Sulfur Hexafluoride (SF6)	3,200	23,900
Source: U.S. Environmental Protection Agency, 2006.		

Of all greenhouse gases in the atmosphere, water vapor is the most abundant, important, and variable. It is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from ice and snow, and transpiration from plant leaves.

Ozone is also a greenhouse gas; however, unlike other GHGs, ozone in the troposphere is relatively short-lived and therefore is not global in nature. It is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global climate change (GCC) (CARB 2004b).

Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning and incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

Carbon Dioxide

The natural production and absorption of carbon dioxide (CO_2) is achieved through the terrestrial biosphere and the ocean. However, humankind has contributed to the alteration of the natural carbon cycle by burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid 1700s, each of these human-caused activities has increased in scale and distribution. Carbon dioxide was the first GHG demonstrated to be increasing in atmospheric concentration with the first conclusive measurements being made in the last half of the 20th century. Prior to the industrial revolution, concentrations were fairly stable at 280 ppm. Today, they are around 370 ppm, an increase of well over 30 percent (EPA 2006). Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (IPCC 2001). This will result in an average global temperature rise of at least two degrees Celsius (3.6 ^{O}F) (IPPCC 2001).

Carbon dioxide emissions are directly generated primarily in the form of vehicle exhaust and in the consumption of natural gas for heating. Carbon dioxide emissions are also generated from natural gas combustion and indirectly through the use of electricity. Other indirect sources of carbon dioxide include the use of potable water and generation of wastewater (potable water and wastewater treatment generates greenhouse gases), and the generation of solid waste.

Methane

Methane (CH_4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to some other GHGs (such as carbon dioxide, nitrous oxide, and CFCs). Methane has both natural and anthropogenic (human) sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using

natural gas and mining coal have added to the atmospheric concentration of methane (EPA 2006b).

Nitrous Oxide

Concentrations of nitrous oxide (N_2O) also began to rise at the beginning of the industrial revolution. Microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen, produce nitrous oxide. The use of fertilizers has increased over the last century. Global concentration for nitrous oxide in 1998 was 314 ppb, and in addition to agricultural sources for the gas, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load (EPA 2006b).

Chlorofluorocarbons

Chlorofluorocarbons (CFCs) have no natural source, but were synthesized for use as refrigerants, aerosol propellants and cleaning solvents. Since their creation in 1928, concentrations of CFCs in the atmosphere have been rising. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs in the atmosphere are now remaining static or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years. Since they are also a GHG, along with such other long-lived synthesized gases as CF_4 (carbontatrafuoride) and SF_6 (sulfurhexafluoride), they are of concern. Another set of synthesized compounds called HFCs (hydroflurocarbons) are also considered GHGs, though they are less stable in the atmosphere and therefore have a shorter lifetime and less of an impact (EPA 2006b). CFCs, CF_4, SF_6 and HFCs have been banned and are no longer available on the market.

4. HUMAN AND CULTURAL CAUSES OF CLIMATE CHANGE

Like all other animals, humans participate in the natural carbon cycle, but there are important differences between human and animal activities. By burning coal, oil, and natural gas, humans are adding carbon dioxide (CO_2) to the atmosphere much faster than the carbon in rocks is released through natural processes. Clearing and burning forests to create agricultural land converts organic carbon to carbon dioxide gas. The oceans and land plants are absorbing a portion, but not nearly all of the CO_2 added to the atmosphere by human activities. Human climate drivers include heat-trapping emissions from cars and power plants, aerosols from pollution, and soot particles.

5. IMPACTS FROM GREENHOUSE GAS EMISSIONS

Global Impacts

While in some cases global climate change may temporarily improve certain aspects of a region, such as lengthening the growing season, it is estimated that the ecology of the natural world will not be able to adjust quickly enough to prevent widespread environmental degradation (IPCC, 2001). In California, it is likely that warmer temperatures will result in frequent and longer periods of drought (UCS 1999). The majority of the scientific community has stated that beyond doubt, global climate change will be one of the most significant challenges the globe will face in the twenty-first century, and will impact almost every system we depend upon for survival.

Just as humans are affected by climate change, so too are plants and animals. Animals must breathe the same air and are subject to the same types of negative health effects as humans. Certain plants and trees may absorb air pollutants that can stunt their development or cause premature death.

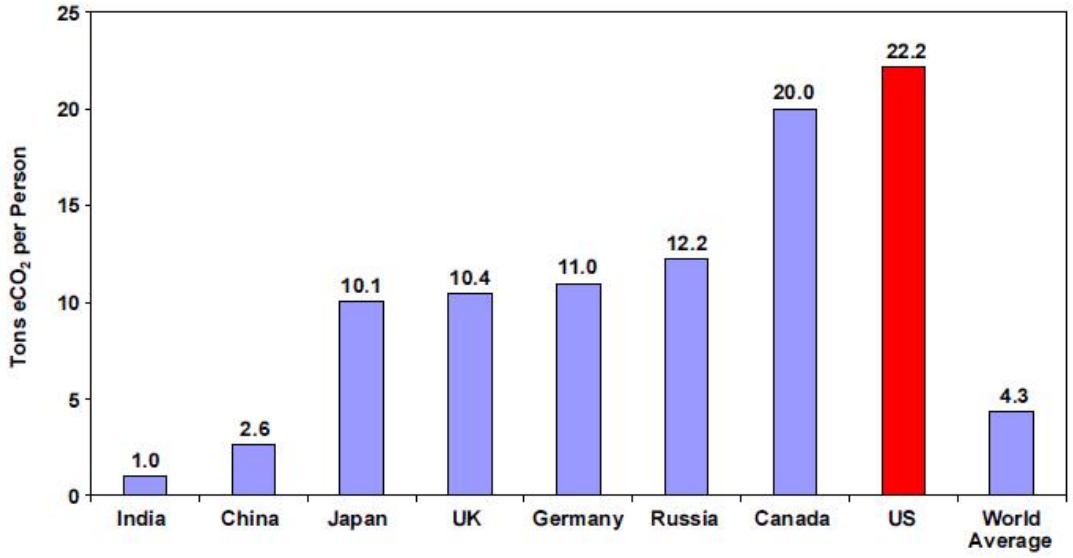
There are also numerous impacts to the human economy including lost workdays due to illness, a desire on the part of business to locate in areas with a healthy environment, and increased expenses from medical costs. Pollutants may also lower visibility and cause damage to property. Certain air pollutants are responsible for discoloring painted surfaces, eating away at stones used in buildings, dissolving the mortar that holds bricks together, and cracking tires and other items made from rubber.

The United States has the highest per capita emissions of GHGs in the world, 22 tons of CO_2 per person per year (see figure 1-2). With only five percent of the world's population, the United States is responsible for 24 percent of the world's CO_2 emissions. California, despite its strong environmental regulations, is the second largest greenhouse gas polluting state in the nation, and emits 2% of global human-generated emissions. Its largest contribution of CO_2 is from vehicle emissions.

According to the International Panel on Climate Change (IPCC), the following are current worldwide statistics for CO_2 concentrations (IPCC, 2008):

- The atmospheric concentration of carbon dioxide (CO_2) during the last two decades has increased at the rate of 0.4% every year.
- Current CO_2 concentrations are higher than they have been in the last 420,000 years, and according to some research, the last 20 million years.
- About three-quarters of the CO_2 emissions produced by human activity during the past 20 years are due to the burning of fossil fuels.

Figure A-2 – Per Capita CO_2 Emissions from 2001



Source: Energy Information Administration, 2001.

Human Health

According to the Pew Center's report on Human Health and Climate Change, health threats may depend on surpassing a threshold level of a climate factor such as significant change in temperature, precipitation, or storm frequency. Once that threshold has passed, the incidence of disease may drastically increase.

Environmental factors play a significant role in some diseases carried by insects. Warming could make tick-borne Lyme disease more prevalent. Mosquito-borne diseases such as West Nile virus, Dengue Fever, and Malaria could acquire new ranges and access to previously unexposed populations (IPCC, 2001). For example, the temperature range at which the malaria-carrying mosquito lives is sensitive to a mere one-degree in temperature change; thus an overall increase in global temperatures will increase the land areas where it may spread disease. These temperature changes affect not only the mosquitoes, but also disturb and in some cases decrease the habitats of its natural predators (Rogers, 2002).

Ecosystems

Scientists predict serious consequences of global warming. The rapid, unprecedented increase in temperatures accelerates the water cycle, which then increases the occurrence, variability, and severity of storms and drought (IPCC, 2008). Such extreme climate events will potentially disrupt ecosystems and damage food and water supplies. In addition, increased temperatures cause thermo-expansion of the oceans and accelerate the melting of the icecaps, thereby raising the overall level of the oceans. The sea-level rise may have multiple outcomes, including significant

environmental disturbances, coastline destruction, major population displacement and economic disruption.

While there is some degree of uncertainty, scientists are able to predict many of the challenges that climate change presents to ecosystems. Warmer temperatures may force some species to higher altitudes or more northern latitudes. This migration may be prevented by human developments that literally block the path as well as non-native species that can out-compete native plants and animals in new locations or make those areas uninhabitable. For example, there is evidence that certain butterflies, often a species that is used to indicate the health of an ecosystem, are moving further north, and are seldom seen in the southern reaches of their range. In addition, warmer temperatures have enabled the Jeffrey pine beetle to have more than one birth cycle per season, lengthening the amount of time this pest is able to damage trees (USC, 200 Pg 1-6). Furthermore, human impact other than greenhouse gas emissions will exacerbate challenges to ecosystems attempting to reestablish at higher elevations or new locations. According to the UCS report, "In many parts of California, fragmentation of the landscape by human developments, invasions by nonnative species, and air pollution may limit the reestablishment of native ecosystems." (UCS, 200 Pg 1-6).

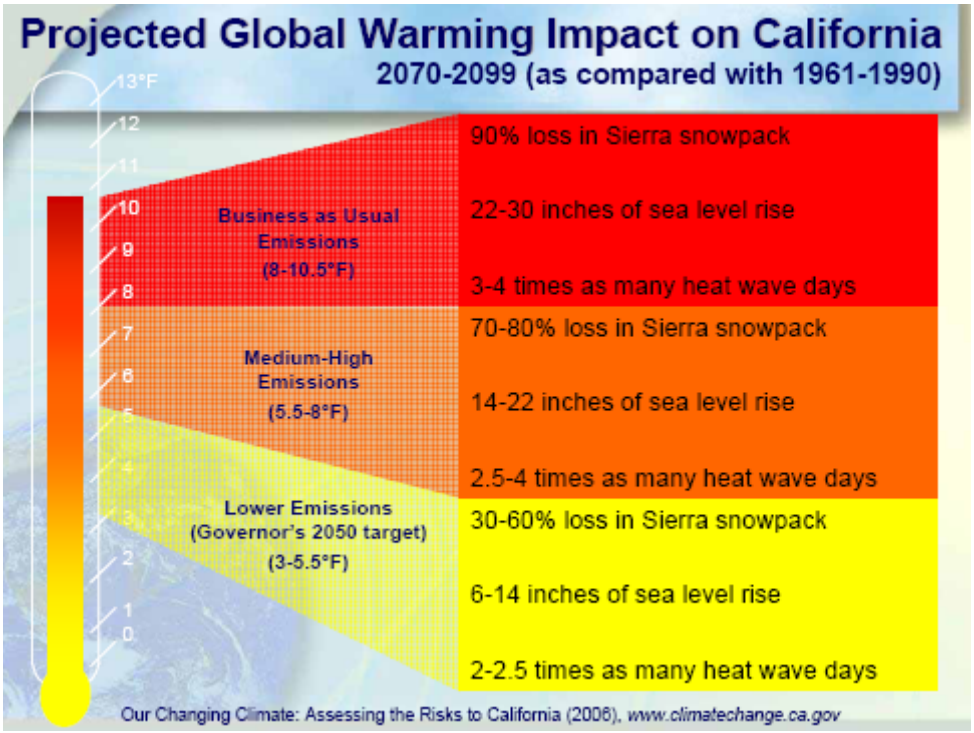
Impacts to California

While it is a global problem, influenced by an array of interrelated factors, climate change is also a regional and local problem, with serious impacts foreseen for California, the Southern California Area.

The impacts of climate change will be variable and widespread. Global and local climate change will impact weather, sea-level rise, water resources, ecosystems, human health, economy, and infrastructure.

Projected future climate change may affect California in a variety of ways. Public health can suffer due to greater temperature extremes and more frequent extreme weather events, increases in transmission of infectious disease, and increases in air pollution. Agriculture is especially vulnerable to altered temperature and rainfall patterns, and new pest problems. Forest ecosystems would face increased fire hazards and would be more susceptible to pests and diseases. The Sierra snowpack that functions as the state's largest reservoir could shrink by one third by 2060, and to half its historic size by 2090. Run off that fills reservoirs will start in midwinter, not spring, and rain falling on snow will trigger more flooding. The California coast is likely to face a rise in sea level that could threaten its shorelines. Sea level rise and storm surges could lead to flooding of low-lying property, loss of coastal wetlands, erosion of cliffs and beaches, saltwater contamination of drinking water, and damage to roads, causeways, and bridges. Figure 1-3 illustrates potential impacts from global warming on California (2070-2099).

Figure A- 3 – Projected Global Warming Impacts on California (2070-2099)



Ultimately, in the next few decades, the impacts of climate change on weather in California will see warmer overall temperatures and an increase in precipitation events, with an increase of intensity and frequency of rainstorms.

Climate and Weather

There is a key difference between climate and weather. According to the National Science Foundation report on climate change in California, "Weather is the day-to-day phenomena we experience—sun, rain, fog, warm, cold, wind—that vary greatly. Climate is long term statistical patterns of weather…and is reflected in average temperatures, rainfall, and other weather events at a given location, and climate change is signaled by long-term changes in those averages" (CRA, 2002).

In 1999, the Union of Concerned Scientists and the Ecological Society of America published a report called *Confronting Climate Change in California*, which describes the predicted impacts of climate change in California. According to this report, California has had a 2 °F increase in temperature over the past 100 years, and annual precipitation has decreased by 10-25% in some regions The report also noted that most climate change models predict a temperature increase of 4° F in California in the next 20 to 40 years. These models also projected a decrease in the

number of long dry spells, and an annual precipitation increase of 20-30% (with a range of 10-50%) in spring and fall, with somewhat larger increases in winter. One model reveals a large increase in precipitation over California, particularly in the form of rain, but with dry areas to the east of the Sierra. This regional model projects that winter precipitation over the coastal areas and the Sierra will increase by 25% or more, with an associated risk of increases in winter mud slides and flooding (UCS, 1999).

Much of the anticipated changes in climate will depend on the frequency and strength of the El Niño-Southern Oscillation phenomenon (ENSO). Most global climate change models indicate the possibility of more frequent ENSO events. El Niño historically happens every two to seven years off the west coast of South America, as a result of changes in ocean currents and prevailing winds over the Pacific Ocean. These changes bring warm water from the western oceans, displacing the nutrient-rich cold water that normally wells up on the western coasts of the Americas from deep in the ocean. These changes bring more frequent and extreme weather anomalies, including severe droughts and floods, hurricanes and winter storms. According to the National Science Foundation, "the invasion of warm water disrupts both the marine food chain and the economies of coastal communities that are based on fishing and related industries" (CAR, 2002). The effects of El Niño in California vary across the state, but in the past have included abnormally frequent winter rains and storms, and abnormally dry summers and associated wildfires (UCS, 1999). The 1982-83 El Niño, the strongest event in recorded history, brought $8 billion in economic impacts and $100 million in California alone (CAR, 2002).

Water Resources

Climate change impacts will bring an additional burden to California's already over-taxed water supply system. According to the IPCC there will be an increase in the number of intense precipitation days and flood frequencies in basins driven by snowmelt, such as California's Central Valley (IPCC, 2001). For this type of basin, the accumulation of snow in winter is the essential "water tower" that stores water until the spring's warmer temperatures begins to melt the snow, forming the streams and rivers that supply the entire watershed with water for the duration of the summer.

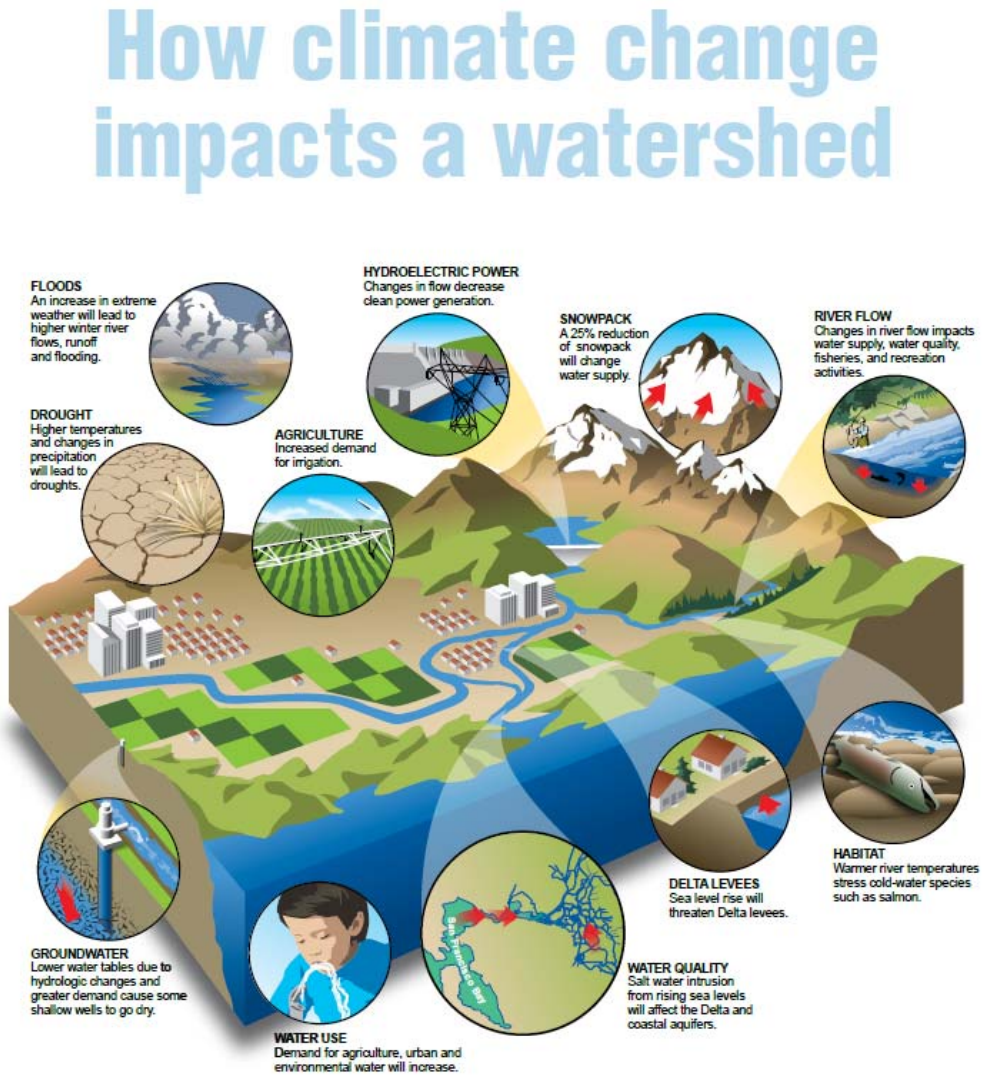
Even under normal climatic conditions, 80% of California's annual rainfall occurs in the winter and is stored in the snowpacks of the various mountain ranges (UCS, 2005). The warmer temperatures associated with climate change will increase rainstorms and decrease snowstorms, shorten the overall snowfall season, and accelerate the rate of spring snowmelt, ultimately leading to more rapid, earlier, and greater spring runoff (Frederick, 1999). The anticipated early spring floods are likely to be followed by excessively dry summers.

California's water supply is already under stress. According to the National Science Foundation report on climate change in California, "Every major water supply source in California is [decreasing in capacity and] currently over-allocated (CRA, 200 Pg 1-5). A combination of natural and human activities is causing this depletion of California water supplies as well as water intrusion and chemical contamination. According to the Union of Concerned Scientists (UCS), 95% of the state's wetlands have already been destroyed.

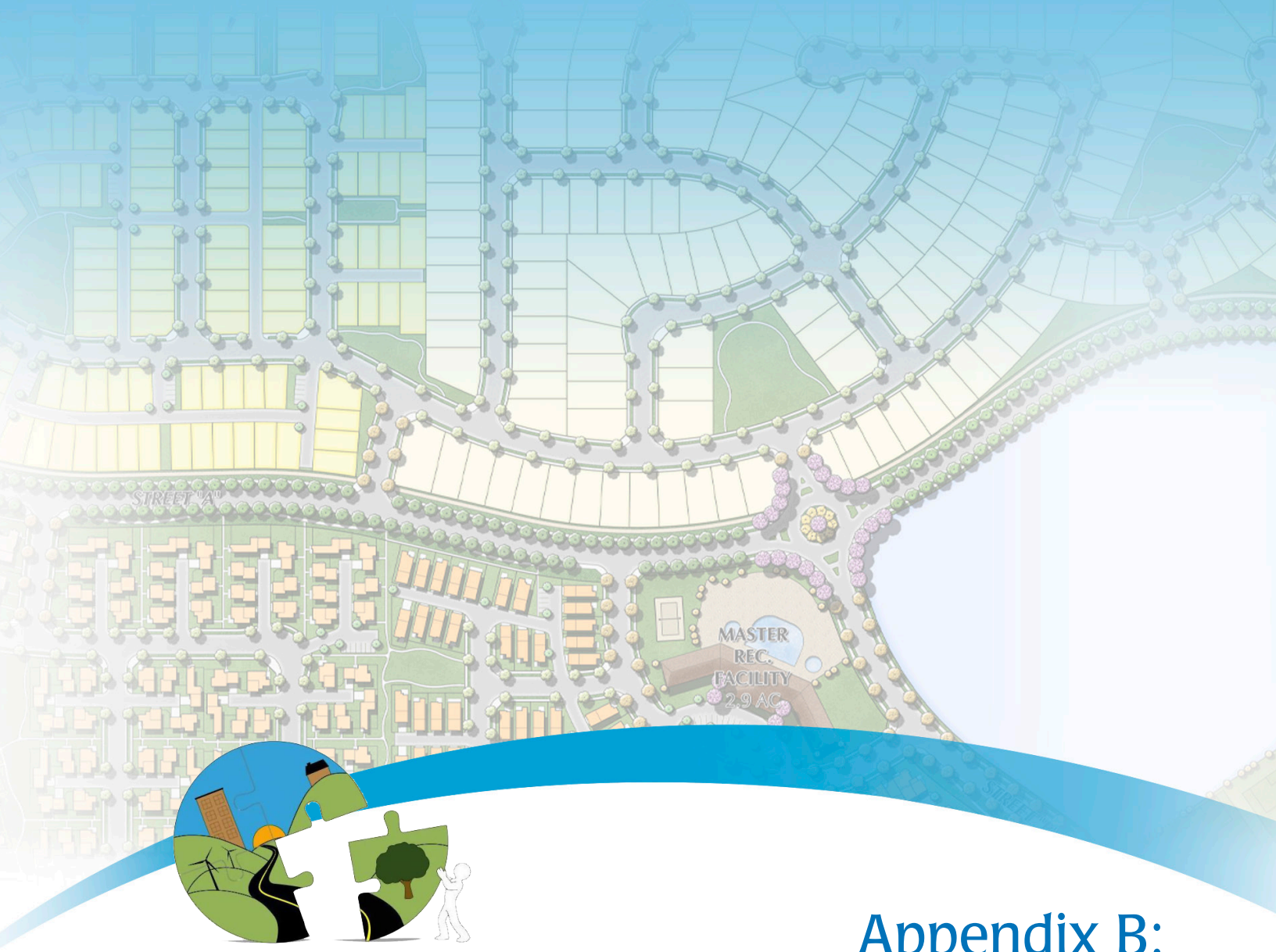
In the past, California Water Resources on a statewide basis has allowed California to meet most of its agricultural and urban water management objectives and flood management objectives in most years. Generally, during a single dry year or two, surface and groundwater storage can maintain most water deliveries, but can result in critically low water reserves. Longer droughts can create numerous problems, including extreme fire danger, economic harm to urban and rural communities, loss of crops, and the potential for species collapse and degraded water quality in some regions. Water demand in California is already increasing because of population expansion. In addition, demand for water for irrigation rises with warmer temperatures. Summers with higher temperatures and even less rainfall and runoff than usual will exacerbate demands for water in California.

Climate change magnifies the problems that exist with an aging water infrastructure and growing population. While recent bond measures have provided a down payment for improving California's water and flood systems, climate change presents an ongoing risk that requires a long-term commitment of funding that is properly matched to anticipated expenditures, beneficiaries and responsible parties.

Figure A-4 – How Climate Change Impacts a Watershed



Source: California Department of Water Resources 2008



Appendix B:
Modeling Coefficients and Data Assumptions

This page intentionally left blank

RIVERSIDE COUNTY
Greenhouse Gas Emissions Inventory
Modeling Assumptions

Assumptions

[1] Electricity providers for Riverside County unincorporated are Southern California Edison and Imperial Irrigation Distrtict. Both companies provided electricity usage organized by rate code for accounts within the unincorporated areas.

[2] Natural gas is serviced to Riverside County by the Southern California Gas Company. The Gas Company provided annual totals of residential, commercial, and industial natural gas use for the unincorporated areas of Riverside County for the year 2008.

[3-11] Riverside County receives water from a number of agencies and water districts, however, all of the water comes from either local sources (groundwater, surface water, or recycled water) or imported sources (The State Water Project or Colorado River Water). The energy associated with local sources is already included in the electricity data provided by the utilities. Imported water data was collected from Coachella Valley Water District, Desert Water Agency, Eastern Municipal Water District, Western Municipal Water District, Rancho California Water District, Palo Verde Irrigation District, Elsinore Valley Municipal Water Distrcit, and San Gorgonio Pass Water Agency.

[12] Riverside County Waste Management operates six active landfills: Badlands, Blythe, Desert Center, Lamb Canyon, Mecca II, and Oasis. El Sobrante Landfill is privately operated in the County. There are also closed landfills that continue to off gas methane as the waste decomposes. Waste Management provided fugitive methane emissions and onsite equipment fuel usage data for each active and closed landfill.

[13] Annual VMT for Riverside County accounts for miles traveled on trips with at least one end point in the unincorporated areas of the County. For this analysis, the total miles traveled for trips with both end points in the County was added to half of the miles traveled for trips with one end point in the County since those miles are shared with another jurisdiction.

[14] Emissions from aviation activities were based on aviation and jet fuel consumption from airport fueling stations in the unincorporated areas of Riverside County.

[15] Population, housing, and land use data was used to estimate landscaping and woodburning emissions, project future business as usual emissions, and categorize emissions as residential vs. non-residential.

[16] Emissions from agricultural activities vary depending on the type of crop or animal managed on the land. Southern California Association of Governments prepared CA GIS data detailing the acreage of each type of agricultural land use for the unincorporated areas of Riverside County.

Data Sources

[1] *Source: Southern California Edison, Electricity Use Report for the Unincorporated Area of Riverside County, July 2009-June 2010.*

[2] *Source: Imperial Irrigation District, kWh Billing Summary, 2008.*

[3] *Source: Southern California Gas Company, Riverside County Summary Data, 2008.*

[4] *Source: Coachella Valley Water District, Urban Water Management Plan, 2005 (Appendix E).*

[5] *Source: Desert Water Agency, Urban Water Management Plan, 2005.*

[6] *Source: Eastern Municipal Water District, Urban Water Management Plan, 2005.*

[7] *Source: Western Municipal Water District, Integrated Regional Water Management Plan, May 2008 (Section 4.1.2.2).*

[8] *Source: Western Municipal Water District, Comprehensive Annual Financial Report,2009.*

[9] *Source: Western Municipal Water District, Urban Water Management Plan, 2005.*

[10] *Source: Rancho California Water District, Urban Water Management Plan, 2005.*

[11] *Source: Elsinore Valley Municipal Water District, Financial Report 2007-2008.*

[12] *Source: San Gorgonio Pass Water Agency, Supplemental Water Supply Planning Study, October 2009.*

[13] *Source:* Riverside County Waste Management, 2008.

[14] *Source:* Riverside County Transportation and Land Management Agency, RivTAM Base Year Model for 2007 Socio-Economic Data.

[15] *Source:* Riverside County Economic Development Agency, airport fuel records, 2008.

[16] *Source:* CA Department of Finance, Population and Housing Estimates, 2008.

[17] *Source:* CA Department of Conservation, Division of Land Resource Protection, 2008 farmland GIS data. Prepared by Southern California Association of Governments (SCAG).

RIVERSIDE COUNTY
Greenhouse Gas Emissions Inventory
Modeling Assumptions

Mobile Source Emissions

	CO_2	CH_4	N_2O	Not Gas Dependent
Onroad Emission Factors (g/mile)				
Non Cat passenger Car [18]	469.64	-	-	
Cat passenger Car [18]	340.71	-	-	
Diesel Passenger Car [18]	359.47	-	-	
Non cat light-duty truck [18]	470.04	-	-	
Cat light duty truck [18]	424.04	-	-	
Diesel Light duty Truck [18]	346.44	-	-	
Non Cat light-duty truck 2 [18]	470.42	-	-	
Cat light duty truck 2 [18]	424.09	-	-	
Diesel Light duty truck 2 [18]	351.88	-	-	
Non Cat Medium duty Truck [18]	580.07	-	-	
Cat med duty truck [18]	580.46	-	-	
Diesel Med duty truck [18]	346.44	-	-	
Non Cat lite-heavy duty truck [18]	567.9	-	-	
Cat Light-heavy duty truck [18]	567.9	-	-	
Diesel Lite-heavy duty truck [18]	519.7	-	-	
Non Cat lite-heavy duty truck 2 [18]	567.9	-	-	
Cat Light-heavy duty truck 2 [18]	567.9	-	-	
Diesel Lite-heavy duty truck 2 [18]	528.63	-	-	
Non Cat med-heavy duty truck [18]	567.9	-	-	
Cat med-heavy duty truck [18]	567.9	-	-	
Diesel med-heavy duty truck [18]	1505	-	-	
Non cat Heavy Duty truck [18]	567.9	-	-	
Cat heavy duty truck [18]	567.9	-	-	
Diesel heavy duty truck [18]	1924.2	-	-	
Non Cat Other Bus [18]	567.9	-	-	
Cat other bus [18]	567.9	-	-	
Diesel Other Bus [18]	1505	-	-	
Non Cat Urban Bus [18]	567.9	-	-	
Cat Urban Bus [18]	567.9	-	-	
Diesel Urban Bus [18]	2779.2	-	-	
Non cat motorcycle [18]	121.23	-	-	
Cat motorcycle [18]	138.33	-	-	
Diesel Motorcycle [18]	0	-	-	
Non Cat School Bus [18]	567.9	-	-	
Cat School Bus [18]	567.9	-	-	
Diesel School Bus [18]	1505	-	-	
Non Cat Motor home [18]	567.9	-	-	
Cat Motor home [18]	567.9	-	-	
Diesel Motor home [18]	1505	-	-	
CO2 to CO2e multiplier [19]	-	-	-	1.0526
Aviation Gasoline (kg/gal) [20]	8.32	-	-	
Aviation Gasoline (gr/gal) [21]	-	7.04	0.11	
Jet Fuel (kg/gal)	9.57			
Jet Fuel (gr/gal)		0.27	0.31	

[18] *Source: Emissions Factors Software (EMFAC2007), California Air Resources Board, Version 2.3, November 2006.*

[19] *Source: Bay Area Air Quality Management District Greenhouse Gas Model (BGM) version 1.1.9 Beta. April 29, 2010.*

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

[21] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.6)*

RIVERSIDE COUNTY
Greenhouse Gas Emissions Inventory
Modeling Assumptions

Landscape and Wood Burning Hearth Emissions

	CO_2	CH_4	N_2O	Not Gas Dependent
Mutifamily acres/property [22]				24.55
Multifamily landscaping tons/property/day [22]	0.25			
Multifamily average units/acre [22]				24.44
Single family tons/acre/day [22]	0.0193			
Single family average units/acre [22]				3.00
Non-Residential acres-to-building sq ft ratio [22]				1/2
Non-Residential tons/acre/day [22]	0.0102			
Woodburning emissions (lbs/ton of wood) [23]	3400			
Woodburning emissions (g/MMBTU) [23]		316.000	4.2000	
lbs/cord of wood [23]				2458
Energy Intensity of wood (MMBTU/ton) [23]				15.38

[22] *Source: URBEMIS2007 Emissions Estimation for Land Use Development Projects, Version 9.2*

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

Natural Gas

	CO_2	CH_4	N_2O
Natural Gas Emissions (kg/MMBtu) [24]	53.06	0.005	0.0001

[24] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.7) - Kg/MMBtu*

Electricity

	CO_2	CH_4	N_2O
Southern California Edison 2005 (lbs/MWh) [25]	665.26	0.0076	0.0113
California Average 2005 (lbs/MWh) [25]	724.12	0.003	0.0081
Imperial Irrigation District 2005 (lbs/MWh) [25]	612.12	0.0314	0.0064

[25] *Source: Source: EPA Emission & Generation Resource Integrated Database (eGRID) Version 1.1*

Solid Waste

	CO_2	CH_4	N_2O
Density (g/cubic meter) [26]		662	

[26] *Source: USEPA (2007). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005. United States Environmental Protection Agency. EPA 430-R-07-002. and Annex 3.10: Methodology for Estimating CH4 and N2O Emissions from Manure Management. April 15, 2007. Washington DC. http://www.epa.gov/climatechange/emissions/usgginv_archive.html*

RIVERSIDE COUNTY
Greenhouse Gas Emissions Inventory
Modeling Assumptions

Imported Water

	CO_2	CH_4	N_2O	Not Gas Dependent
Energy Intensity of Water Use (kWh/MG)				
Water Treatment [27]				111
Water Distribution [27]				1272
Wastewater Treatment [27]				1911
CA State Water Project Supply and Conveyance [27]				8325
Colorado River Water Supply and Conveyance [27]				6140

[27] *Source: CAPCOA Quantifying Greenhouse Gas Emissions, August 2010. Energy Intensity of Water Use to LA Basin (TableWSW-3.1)*

Standard Conversion Rates

	CO_2	CH_4	N_2O	Not Gas Dependent
gr/lb [28]				453.59291
lbs/short ton [28]				2000
metric tons/short ton [28]				0.907185
kg/ short ton [28]				907.18474
kg/metric ton [28]				1000
g/metric ton [28]				1,000,000
lbs/metric ton [28]				2204.62
therms per MMBTU [28]				0.10
kWh/MWh [28]				1000
kWh/GWh [28]				1,000,000
scf/Mcf [28]				1,000
Mcf/MMBTU [28]				0.9649
Gallons/Acre foot [29]				325,851.43
Gallons/ccf [29]				748.00

[28] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Appendix B)*

[29] *Source:* http://onlineconversion.com/volume.htm

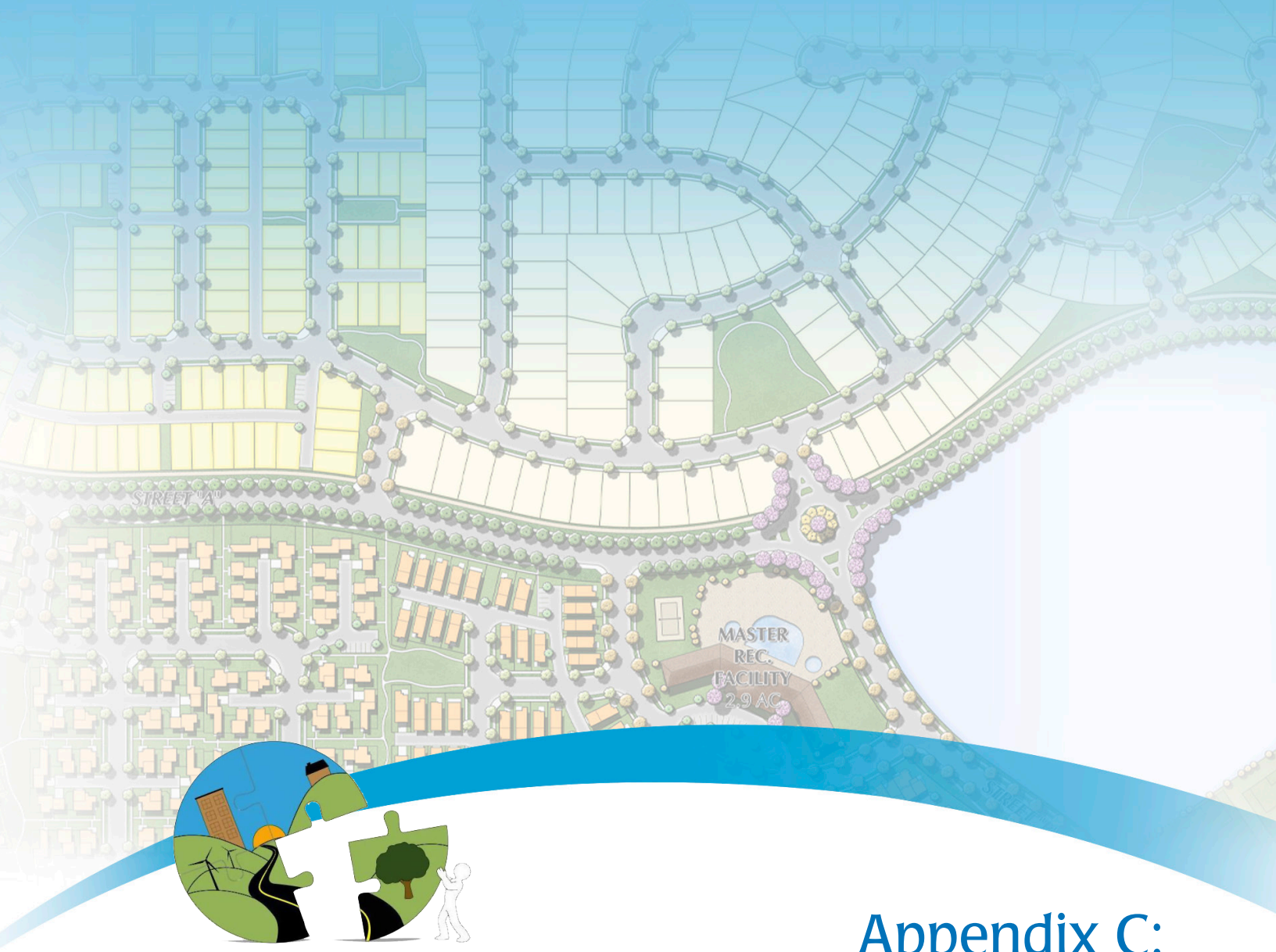
RIVERSIDE COUNTY
Greenhouse Gas Emissions Inventory
Modeling Assumptions

Agricultural

	CO_2	CH_4	N_2O	Not Gas Dependent	
# of hectares/acre [30]				0.4046945	
Ratio CH_4-C [30]				0.005	
Conversion CH_4-C to Full Mol. Wt. [30]				1.33	
Emission factor for liquid systems (kg N_2O-N/kg N) [30]				0.001	
Emission factor for solid systems (kg N_2O-N/kg N) [30]				0.02	
Ratio N_2O:N_2 [C_{10}] [30]				1.5714286	
Volitazition percent for all non-PRP ag soils [30]				0.2	
Volitazition percent for manure management [30]				0	
Rate NH_3-NO_X [30]				0.01	
Emission Factor for pastures, ranges, and paddocks [30]				0.02	
Emission factor for ground application [30]				0.0125	
Cwt (hundred weight) [30]				100	lbs
Volitazition of synthetic fertilizers [30]				0.1	
Volitazition of organic fertilizers [30]				0.2	
% leached from soils [30]				0.3	
Leaching Factor (kg N_2O-N / kg N) [30]				0.025	
Nitrogen Content of Non-manure Organics [30]				0.041	
Emission factor for soils (kg N2O-N/kgN) [30]				0.01	
N2O Emissions from Volitazition [30]				0.01	
N content of aboveground biomass for N-fixing crop production [30]				0.03	
Emission Factor for Temperate zone Histols (kg N2O-N / ha_yr) [30]				8	
Emission Factor for Subtropic zone Histols (kg N_2O-N / ha_yr) [30]				12	
N_2O-N Emissions Ratio [R_{N20_N}] [30]				0.007	
% of target year applied [30]				0.65	
% of following year applied [30]				0.35	

[30] *Source:* EPA State Inventory Tool for Agriculture, July 2008.

This page intentionally left blank



Appendix C:
Data Inputs

This page intentionally left blank

RIVERSIDE COUNTY
Greenhouse Gas Emission Inventory
Annual Usage and Generation

Inventory Year: 2008

Growth Rates	to 2020	to 2035
Residential	62.41%	92.55%
Non-Residential	96.10%	165.12%

Transportation

On-road Transportation

Annual Vehicle Miles Traveled	5,161,531,679
Annual Residential Trips	590,542,591
Annual Non-Residential Trips	271,942,936
Average $/gallon Gasoline:	$3.56
Average $/gallon Diesel:	$3.93

Aviation

	Annual Gallons	$/gallon
Jet Fuel	1,832,210	$0.10
Aviation Fuel	404,676	$0.10

Electricity and Natural Gas

Electricity

Socal Edison Electricity

Rate Code	Annual kWh	$/kWh	$
AG TOU	112,208,191	$0.09875	$11,080,513.98
Domestic	1,256,041,296	$0.11795	$148,144,544.28
GS-1	82,884,759	$0.17841	$14,787,469.85
GS-2	262,676,044	$0.08121	$21,332,341.81
PA-1	16,947,950	$0.13312	$2,256,145.00
PA-2	12,945,067	$0.11644	$1,507,266.64
Street Lighting	98,026,610	$0.07921	$7,764,923.04
TOU-8	596,794,701	$0.08680	$51,800,825.18
TOU-GS	154,930,764	$0.18348	$28,426,510.66
TOTAL	**2,593,455,382**		**$287,100,540.45**

SoCal Edison Emission Factors	
Default (2005)	Units
665.2607	lbs CO_2/MWh
7.5986	lbs CH_4/GWh
11.3094	lbs N_2O/GWh

2005 California Emission Factors	
Default (2005)	Units
724.12	lbs CO_2/MWh
30.24	lbs CH_4/GWh
8.08	lbs N_2O/GWh

Imperial Irrigation District

Rate Code	Annual kWh	$/kWh	$
Residential	450,673,960	$0.0784	$35,332,838.46
Energy Assistance	41,236,677	$0.0549	$2,263,068.83
Mobile Home	37,606,910	$0.0676	$2,542,227.12
Agricultural	62,987,028	$0.0618	$3,892,598.33
Small Commercial	101,736,856	$0.0820	$8,342,422.19
Large Commercial	321,462,730	$0.0659	$21,184,393.91
Industrial	266,000	$0.0628	$16,704.80
Street Lights	4,298,352		$0.00
Area Lighting	83,496		$0.00
Public Authority	12,398,373	$0.0732	$907,560.90
Interdepartmental	1,542,560		$0.00
TOTAL	**1,034,292,942**		**$74,481,814.55**

Imperial Irrigation District Emission Factors	
Default (2005)	Units
612.12	lbs CO_2/MWh
31.41	lbs CH_4/GWh
6.37	lbs N_2O/GWh

Cogeneration

	Annual mWh
Badlands	5,351.15
El Sorbante	15,641.82

Natural Gas

	therms	$/therms
Residential	52,372,096	$0.80
Commercial/Industrial	43,546,543	$0.61
TOTAL	**95,918,639**	**$68,461,068.03**

Area Source Emissions: Landscaping and Woodburning Emissions

Landscaping Emissions

Land use:

Single Family Residential Units:	112,132	units
Multi-family Residential Units:	48,854	units
Commercial Building Space:	169,585	1000 square feet
Industrial Building Space:	33,905	1000 square feet

Woodburning Emissions

Homes with wood stoves:	35%	% of residential homes
Amount of wood burned:	0.80	cords/unit
Homes with fireplaces:	10%	% of residential homes
Price of wood:	$3.50	$/cord of wood

Water

Imported Water

	Treated (acre-feet)		Untreated (acre-feet)	
	State Water Project	Colorado River Water	State Water Project	Colorado River Water
Coachella Valley Water District		14,338.01		
Desert Water Agency		18,347.58		
Eastern Municipal Water District	38,396.92	33,412.70	313.27	272.60
Elisinore Valley Municipal Water District	7,055.06	6,139.26		
Rancho California Water District	12,311.55	10,713.41	6,484.35	5,642.63
San Gorgonio Water Agency	2,175.10			
Western Municipal Water District	28,650.00	9,550.00		
Total Imported Water	**88,588.63**	**92,500.96**	**6,797.62**	**5,915.24**

Solid Waste

Onsite Equipment

Total Diesel Use (gal)	487,768
Total LNG Use (gal)	368,838

Waste Sources

% Residential	35%
% Non-Residential	65%

Fugitive Methane Emissions

	Measured LFG Flow (SCFM)	% LFG as CH_4	Destruction Efficiency	Methane Capture in 1990?
BADLANDS (flare alone)	639	43.7%	99.999629%	
BADLANDS (flare w/engine)	189	43.7%	99.999629%	
BADLANDS (engine)	450	44.0%	99.700000%	
BLYTHE	20	8.0%	0.000000%	
COACHELLA (1997)	346	36.8%	99.999644%	
CORONA (1986)	225	37.6%	99.900000%	Y
DOUBLE BUTTE (1994)	190	31.8%	99.999708%	
EDOM HILL (1997)	700	49.7%	99.999785%	
ELSINORE (1965)	70	19.3%	99.900060%	
EL SOBRANTE (Total)	3014	45.0%	99.900000%	Y
HIGHGROVE (1998)	310	46.7%	99.999781%	
LAMB CANYON	642	37.8%	99.999697%	
MEAD VALLEY (1997)	225	28.7%	99.999513%	
W. RIVERSIDE (1993)	66	26.2%	99.999149%	Y

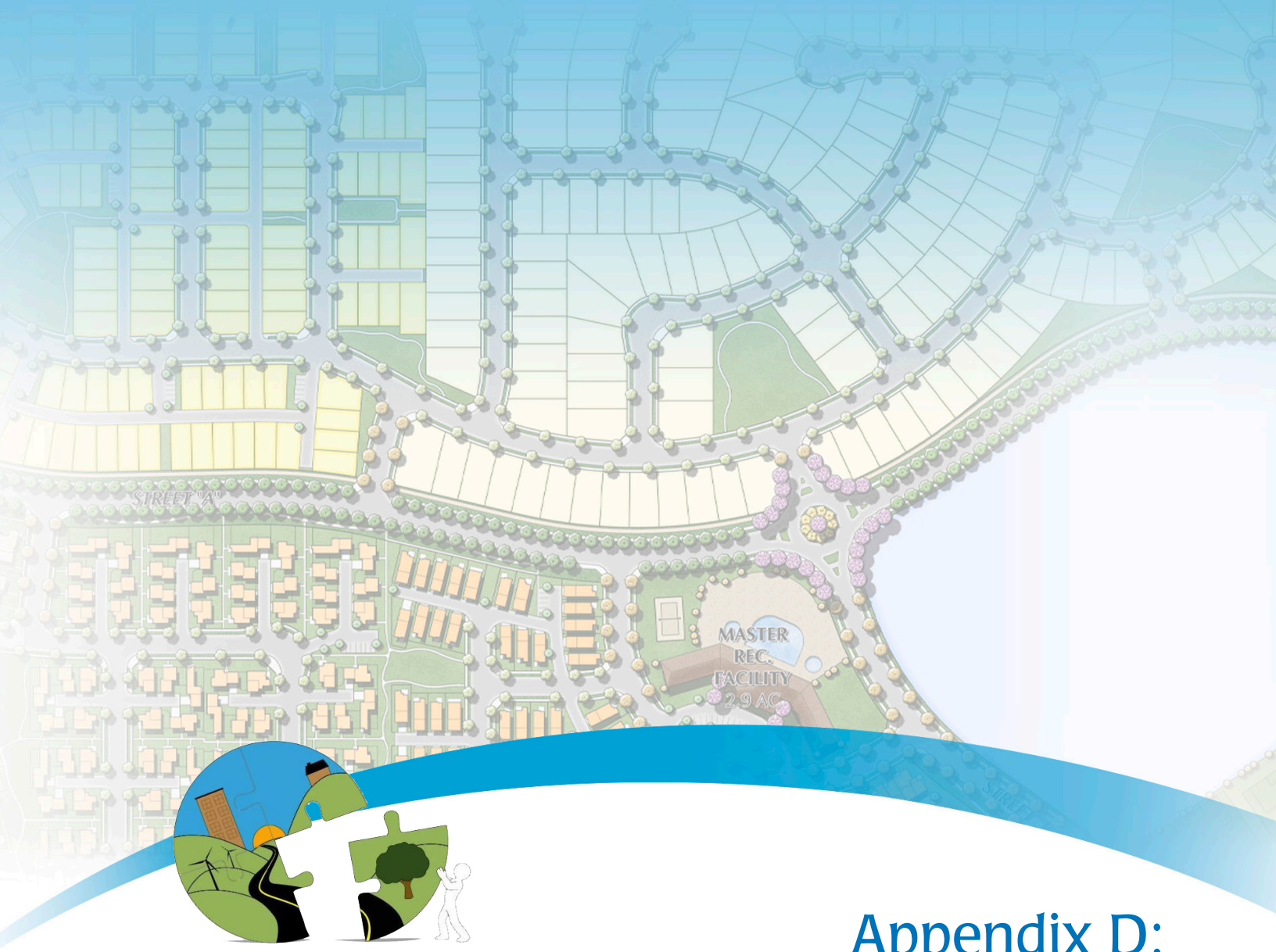
Agriculture

Annual Crop Growth

	Acres Harvested	Annual Yield (tons)
Hay (including Alfalfa)	29648	257608
Corn	497	24827
Oats	1150	3329
Sorghum	3197	22942
Wheat	14817	55589
Cotton	6901	7073
Vegetable Crops & Fruit Trees	43898	289710

Annual Animal head

	#
Dairy Cow	43,773
Poultry	5,260,914
Sheep	12,700



Appendix D:
GHG Inventory Calculations

This page intentionally left blank

RIVERSIDE COUNTY
Greenhouse Gas Emission Inventory
Climate Action Plan Comparison Summary

	2008	1990	2020	Reduced 2020
Transportation				
Mobile Source Emissions	2,829,359	2,404,955	6,956,170	2,432,871
Jet Fuel	17,721	15,063	17,721	17,721
Aviation Fuel	3,441	2,924	3,441	3,441
Sub Total	***2,850,520***	***2,422,942***	***6,977,331***	***2,454,032***
Energy				
Electrical Consumption	1,068,946	908,604	1,924,185	638,235
Natural Gas	510,249	433,711	906,738	504,737
Sub Total	***1,579,195***	***1,342,316***	***2,830,923***	***1,142,973***
Area Sources				
Landscaping	150,639	128,043	250,422	126,463
Woodburning	118,543	100,761	191,603	103,725
Sub Total	***269,181***	***228,804***	***442,024***	***230,188***
Water and Wastewater				
Water consumption	152,473	129,602	175,344	109,021
Sub Total	***152,473***	***129,602***	***175,344***	***109,021***
Solid Waste				
Landfill Offgasing	170,929	145,290	269,993	133,217
Onsite Equipment	6,755	5,741	7,768	7,768
Sub Total	***177,684***	***151,031***	***277,761***	***140,985***
Agriculture				
Enteric Fermentation	115,584	98,246	86,688	80,051
Manure Management	199,873	169,892	149,905	140,938
Rice Cultivation	0	0	0	0
Agriculture ResidueBurning	166	141	124	124
Annimals and Runoff	235,565	200,230	176,674	176,674
Fertilizer Use	246,162	209,237	184,621	184,621
Crop Growth	1,233,081	1,048,119	924,811	924,811
Sub Total	***2,030,431***	***1,725,866***	***1,522,823***	***1,507,220***
TOTAL	**7,059,485**	**6,000,562**	**12,226,206**	**5,584,418**

Source	2008	1990	2020	Reduced 2020
Transportation	2,850,520	2,422,942	6,977,331	2,454,032
Energy	1,579,195	1,342,316	2,830,923	1,142,973
Area Sources	269,181	228,804	442,024	230,188
Water and Wastewater	152,473	129,602	175,344	109,021
Solid Waste	177,684	151,031	277,761	140,985
Agriculture	2,030,431	1,725,866	1,522,823	1,507,220
Total	7,059,485	6,000,562	12,226,206	5,584,418
2020 Reduction Target	11,268,449	9,578,182	6,036,971	6,036,971

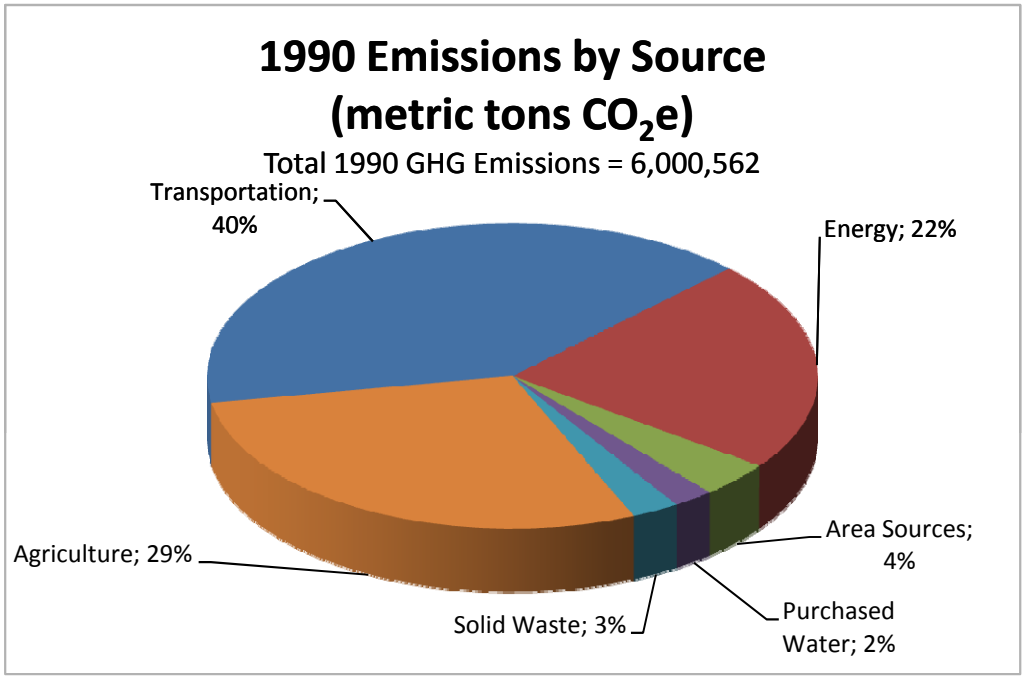
RIVERSIDE COUNTY
Greenhouse Gas Emission Inventory
2008 Emission Inventory

	CO_2	CH_4	N_2O	Total MT CO_2e	Annual Cost
Transportation					
Mobile Source Emissions	2,687,891	18,391	113,174	2,819,456	$1,291,364,434
HFC's from mobile sources	-	-	-	9,903	
Jet Fuel	17,534	10	176	17,721	$183,221
Aviation Fuel	3,367	60	14	3,441	$40,468
Sub Total	*2,708,792*	*18,461*	*113,364*	***2,850,520***	***$1,291,547,655***
Energy					
Electrical Consumption	1,063,434	496	5,017	1,068,946	$287,100,540
Electrical Generation					$35,332,838
Natural Gas	508,944	1,007	297	510,249	$68,461,068
Sub Total	*1,572,378*	*1,503*	*5,315*	***1,579,195***	***$390,894,447***
Area Sources					
Landscaping	150,639	-	-	128,043	
Woodburning	109,847	7,270	1,426	118,543	$202,842
Sub Total	*260,485*	*7,270*	*1,426*	***269,181***	***$202,842***
Water					
Water consumption	151,815	133	525	152,473	
Sub Total	*151,815*	*133*	*525*	***152,473***	
Solid Waste					
Landfill Offgasing	-	170,929	-	170,929	
Onsite Equipment	6,596	5	154	6,755	
Sub Total	*6,596*	*170,934*	*154*	***177,684***	
Agriculture					
Enteric Fermentation	-	115,584	-	115,584	
Manure Management	-	169,058	30,815	199,873	
Agriculture ResidueBurning	-	124	42	166	
Annimals and Runoff	-	-	235,565	235,565	
Fertilizer Use	-	-	246,162	246,162	
Crop Growth	-	-	1,233,081	1,233,081	
Sub Total	*0*	*284,766*	*1,745,665*	***2,030,431***	
Total	**4,700,066**	**483,067**	**1,866,449**	**7,059,485**	**$1,682,644,944**

ATTACHMENT C-2

1990

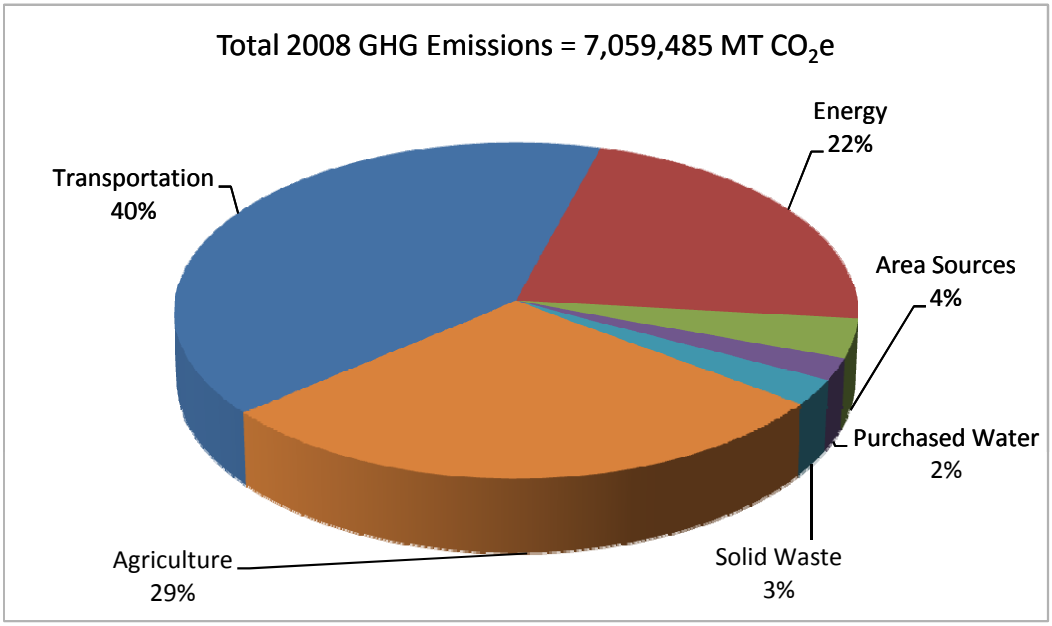
Net Total Emissions	
Category	**Metric tons of CO_2e**
Transportation	2,422,942
Energy	1,342,316
Area Sources	228,804
Purchased Water	129,602
Solid Waste	151,031
Agriculture	1,725,866
Total	6,000,562



ATTACHMENT C-2

2008

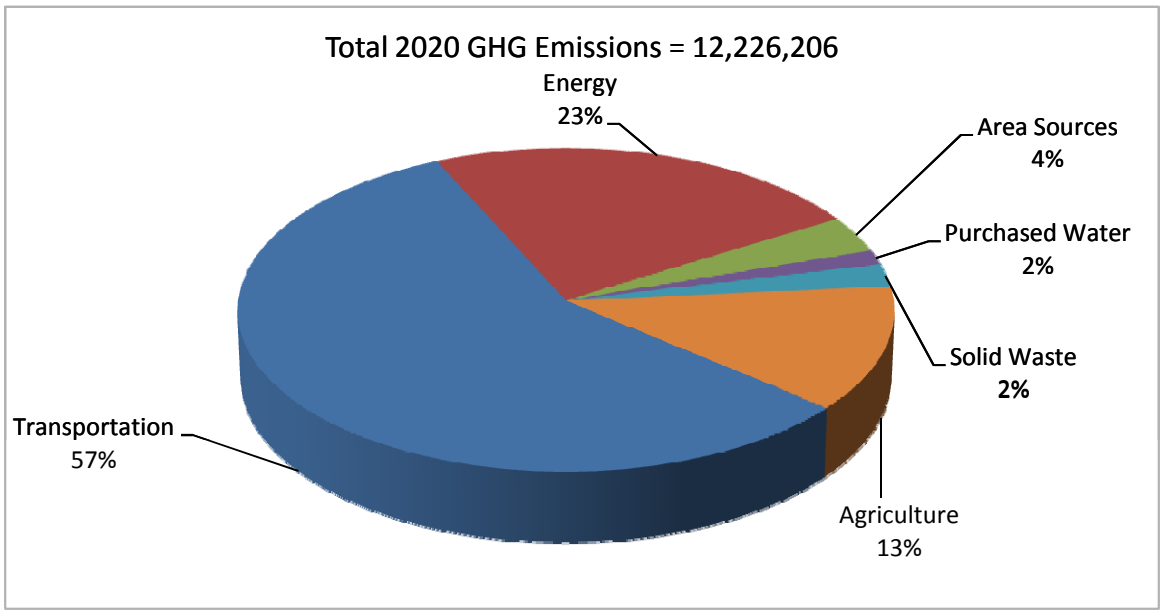
Net Total Emissions	
Category	**Metric tons of CO_2e**
Transportation	2,850,520
Energy	1,579,195
Area Sources	269,181
Purchased Water	152,473
Solid Waste	177,684
Agriculture	2,030,431
Total	7,059,485



ATTACHMENT C-2

2020 BAU

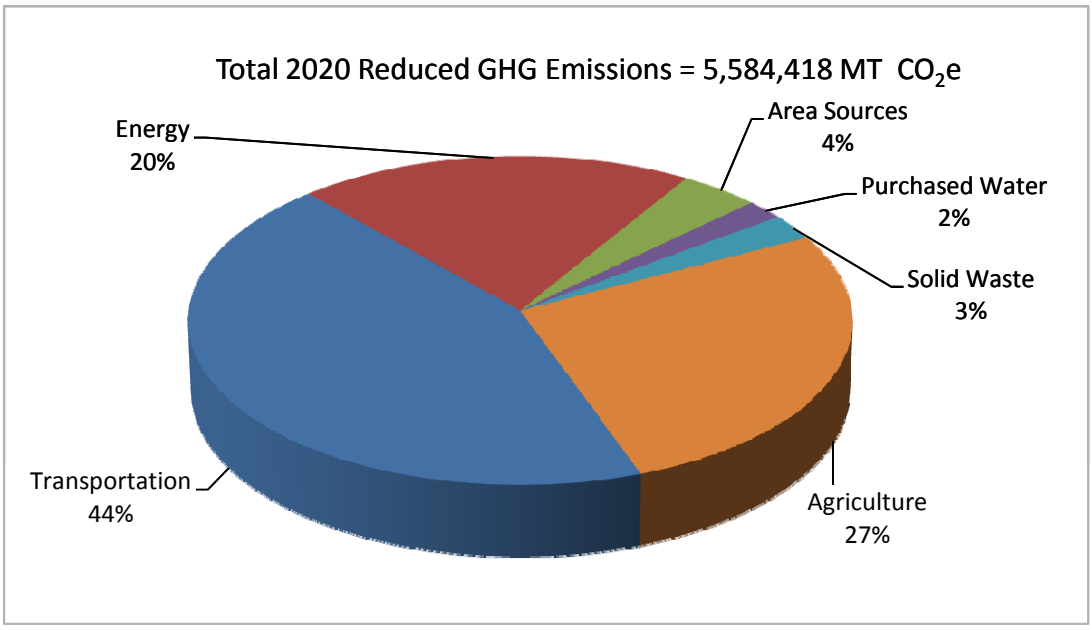
Net Total Emissions	
Category	**Metric tons of CO_2e**
Transportation	6,977,331
Energy	2,830,923
Area Sources	442,024
Purchased Water	175,344
Solid Waste	277,761
Agriculture	1,522,823
Total	12,226,206



ATTACHMENT C-2

2020 Reduced

Net Total Emissions	
Category	**Metric tons of CO_2e**
Transportation	2,454,032
Energy	1,142,973
Area Sources	230,188
Purchased water	109,021
Solid Waste	140,985
Agriculture	1,507,220
Total	5,584,418



RIVERSIDE COUNTY
Greenhouse Gas Emission Inventory
Annual Usage and Generation

Inventory Year: 2008

Growth Rates	to 2020	to 2035
Residential	62.41%	92.55%
Non-Residential	96.10%	165.12%

Transportation

On-road Transportation

Annual Vehicle Miles Traveled	5,161,531,679
Annual Residential Trips	590,542,591
Annual Non-Residential Trips	271,942,936
Average $/gallon Gasoline:	$3.56
Average $/gallon Diesel:	$3.93

Aviation

	Annual Gallons	$/gallon
Jet Fuel	1,832,210	$0.10
Aviation Fuel	404,676	$0.10

Electricity and Natural Gas

Electricity

Socal Edison Electricity

Rate Code	Annual kWh	$/kWh	$
AG TOU	112,208,191	$0.09875	$11,080,513.98
Domestic	1,256,041,296	$0.11795	$148,144,544.28
GS-1	82,884,759	$0.17841	$14,787,469.85
GS-2	262,676,044	$0.08121	$21,332,341.81
PA-1	16,947,950	$0.13312	$2,256,145.00
PA-2	12,945,067	$0.11644	$1,507,266.64
Street Lighting	98,026,610	$0.07921	$7,764,923.04
TOU-8	596,794,701	$0.08680	$51,800,825.18
TOU-GS	154,930,764	$0.18348	$28,426,510.66
TOTAL	**2,593,455,382**		**$287,100,540.45**

SoCal Edison Emission Factors	
Default (2005)	Units
665.2607	lbs CO_2/MWh
7.5986	lbs CH_4/GWh
11.3094	lbs N_2O/GWh

2005 California Emission Factors	
Default (2005)	Units
724.12	lbs CO_2/MWh
30.24	lbs CH_4/GWh
8.08	lbs N_2O/GWh

Imperial Irrigation District

Rate Code	Annual kWh	$/kWh	$
Residential	450,673,960	$0.0784	$35,332,838.46
Energy Assistance	41,236,677	$0.0549	$2,263,068.83
Mobile Home	37,606,910	$0.0676	$2,542,227.12
Agricultural	62,987,028	$0.0618	$3,892,598.33
Small Commercial	101,736,856	$0.0820	$8,342,422.19
Large Commercial	321,462,730	$0.0659	$21,184,393.91
Industrial	266,000	$0.0628	$16,704.80
Street Lights	4,298,352		$0.00
Area Lighting	83,496		$0.00
Public Authority	12,398,373	$0.0732	$907,560.90
Interdepartmental	1,542,560		$0.00
TOTAL	**1,034,292,942**		**$74,481,814.55**

Imperial Irrigation District Emission Factors	
Default (2005)	Units
612.12	lbs CO_2/MWh
31.41	lbs CH_4/GWh
6.37	lbs N_2O/GWh

Cogeneration

	Annual mWh
Badlands	5,351.15
El Sorbante	15,641.82

Natural Gas

	therms	$/therms
Residential	52,372,096	$0.80
Commercial/Industrial	43,546,543	$0.61
TOTAL	**95,918,639**	**$68,461,068.03**

Area Source Emissions: Landscaping and Woodburning Emissions

Landscaping Emissions

Land use:

Single Family Residential Units:	112,132	units
Multi-family Residential Units:	48,854	units
Commercial Building Space:	169,585	1000 square feet
Industrial Building Space:	33,905	1000 square feet

Woodburning Emissions

Homes with wood stoves:	35%	% of residential homes
Amount of wood burned:	0.80	cords/unit
Homes with fireplaces:	10%	% of residential homes
Price of wood:	$3.50	$/cord of wood

Water

Imported Water

	Treated (acre-feet)		Untreated (acre-feet)	
	State Water Project	Colorado River Water	State Water Project	Colorado River Water
Coachella Valley Water District		14,338.01		
Desert Water Agency		18,347.58		
Eastern Municipal Water District	38,396.92	33,412.70	313.27	272.60
Elisinore Valley Municipal Water District	7,055.06	6,139.26		
Rancho California Water District	12,311.55	10,713.41	6,484.35	5,642.63
San Gorgonio Water Agency	2,175.10			
Western Municipal Water District	28,650.00	9,550.00		
Total Imported Water	**88,588.63**	**92,500.96**	**6,797.62**	**5,915.24**

Solid Waste

Onsite Equipment

Total Diesel Use (gal)	487,768
Total LNG Use (gal)	368,838

Waste Sources

% Residential	35%
% Non-Residential	65%

Fugitive Methane Emissions

	Measured LFG Flow (SCFM)	% LFG as CH_4	Destruction Efficiency	Methane Capture in 1990?
BADLANDS (flare alone)	639	43.7%	99.999629%	
BADLANDS (flare w/engine)	189	43.7%	99.999629%	
BADLANDS (engine)	450	44.0%	99.700000%	
BLYTHE	20	8.0%	0.000000%	
COACHELLA (1997)	346	36.8%	99.999644%	
CORONA (1986)	225	37.6%	99.900000%	Y
DOUBLE BUTTE (1994)	190	31.8%	99.999708%	
EDOM HILL (1997)	700	49.7%	99.999785%	
ELSINORE (1965)	70	19.3%	99.900060%	
EL SOBRANTE (Total)	3014	45.0%	99.900000%	Y
HIGHGROVE (1998)	310	46.7%	99.999781%	
LAMB CANYON	642	37.8%	99.999697%	
MEAD VALLEY (1997)	225	28.7%	99.999513%	
W. RIVERSIDE (1993)	66	26.2%	99.999149%	Y

Agriculture

Annual Crop Growth

	Acres Harvested	Annual Yield (tons)
Hay (including Alfalfa)	29648	257608
Corn	497	24827
Oats	1150	3329
Sorghum	3197	22942
Wheat	14817	55589
Cotton	6901	7073
Vegetable Crops & Fruit Trees	43898	289710

Annual Animal head

	#
Dairy Cow	43,773
Poultry	5,260,914
Sheep	12,700

RIVERSIDE COUNTY
Greenhouse Gas Emission Inventory
Climate Action Plan Comparison Summary

	2008	2035	Reduced 2035
Transportation			
Mobile Source Emissions	2,829,359	9,296,880	2,596,201
Jet Fuel	17,721	17,721	17,721
Aviation Fuel	3,441	3,441	3,441
Sub Total	***2,850,520***	***9,318,041***	***2,617,363***
Energy			
Electrical Consumption	1,068,946	2,460,785	679,976
Natural Gas	510,249	1,150,593	644,658
Sub Total	***1,579,195***	***3,611,378***	***1,324,634***
Area Sources			
Landscaping	150,639	302,483	152,754
Woodburning	118,543	226,902	103,725
Sub Total	***269,181***	***529,384***	***256,478***
Water and Wastewater			
Water consumption	152,473	293,077	146,118
Sub Total	***152,473***	***293,077***	***146,118***
Solid Waste			
Landfill Offgasing	170,929	335,104	157,155
Onsite Equipment	6,755	11,595	11,595
Sub Total	***177,684***	***346,699***	***168,750***
Agriculture			
Enteric Fermentation	115,584	86,688	71,372
Manure Management	199,873	149,905	129,213
Rice Cultivation	0	0	0
Agriculture ResidueBurning	166	124	124
Annimals and Runoff	235,565	176,674	176,674
Fertilizer Use	246,162	184,621	184,621
Crop Growth	1,233,081	924,811	924,811
Sub Total	***2,030,431***	***1,522,823***	***1,486,815***
TOTAL	**7,059,485**	**15,621,403**	**6,000,158**

Source	2008	2035	Reduced 2035
Transportation	2,850,520	9,318,041	2,617,363
Energy	1,579,195	3,611,378	1,324,634
Area Sources	269,181	529,384	256,478
Water and Wastewater	152,473	293,077	146,118
Solid Waste	177,684	346,699	168,750
Agriculture	2,030,431	1,522,823	1,486,815
Total	7,059,485	15,621,403	6,000,158
2020 Reduction Target	6,000,562	6,000,562	6,000,562

Municipal GHG Inventory

Municipality: Riverside County
Inventory Year: 2008

Departmental Breakdown of Emissions

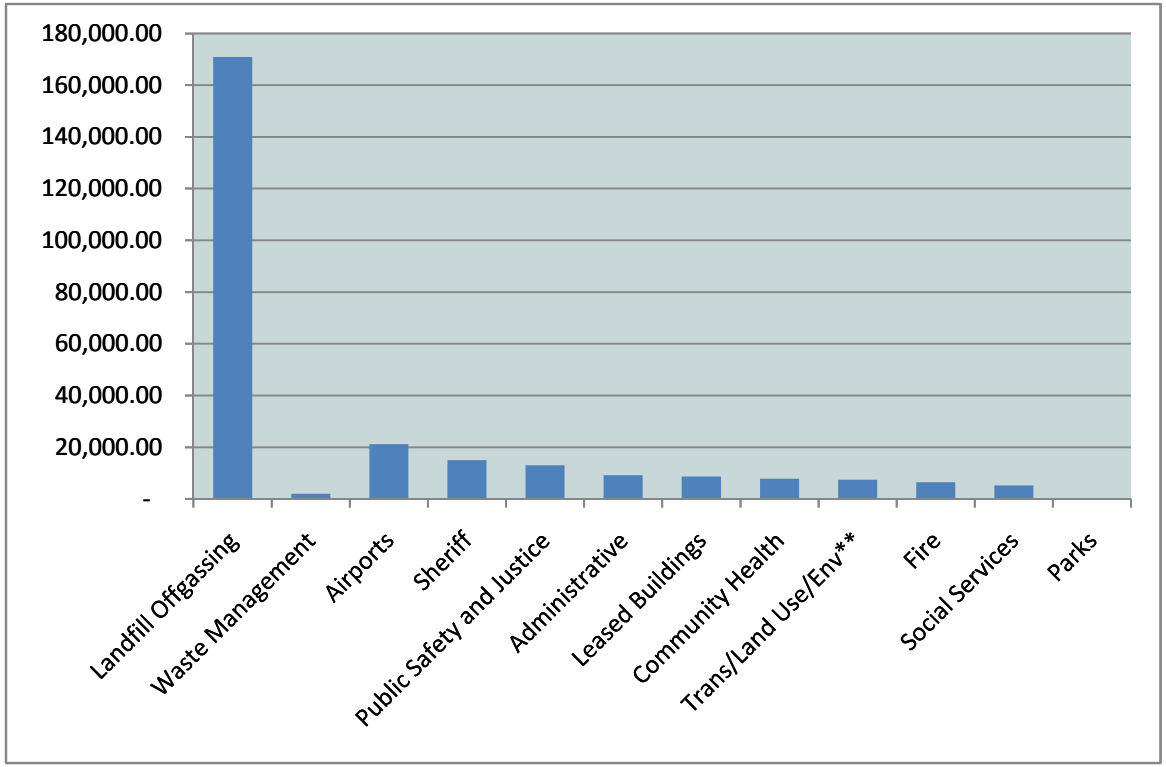
	Electricity		Natural Gas		Vehicle Fleet		Non-Highway Vehicles		**TOTAL**	
Government Department	MT CO_2e	$	MT CO_2e	$	MT CO_2e	$	MT CO_2e	$	MT CO_2e	$
Administrative	4,799.01	$ 1,561,862	178.04	$ 57,489	4,282.00	$ 1,413,845	0.07	$ 22	9,259.11	$ 3,033,217
Health Care	4,500.68	$ 1,464,769	393.03	$ 126,912	2,886.70	$ 949,046	-	$ -	7,780.41	$ 2,540,726
Public Safety and Justice	10,244.05	$ 3,333,978	1,946.92	$ 628,672	790.17	$ 261,140	-	$ -	12,981.15	$ 4,223,789
Social Services	1,952.45	$ 635,436	102.21	$ 33,005	3,151.04	$ 1,050,915	0.41	$ 117	5,206.12	$ 1,719,473
Parks	-	$ -	-	$ -	178.82	$ 59,011	-	$ -	178.82	$ 59,011
Waste Management	(6,031.26)	($1,962,903)	0.87	$ 282	1,303.98	$ 421,657	6,726.83	$ 2,158,244	2,000.43	$ 617,280
Sheriff	1,781.17	$ 579,692	160.69	$ 51,888	13,093.63	$ 4,376,235	3.18	$ 785	15,038.67	$ 5,008,600
Airports	-	$ -	-	$ -	88.69	$ 29,987	21,161.33	$ 223,689	21,250.02	$ 253,676
*Trans/Land Use/Env***	1,139.91	$ 370,990	-	$ -	4,596.25	$ 1,399,979	1,756.80	$ 430,517	7,492.96	$ 2,201,486
Leased Buildings	8,628.63	$ 2,808,230	124.72	$ 40,272	-	$ -	-	$ -	8,753.35	$ 2,848,502
Fire	1,423.53	$ 453,740	158.03	$ 51,028	4,959.76	$ 1,471,214	-	$ -	6,541.32	$ 1,975,982
Department 12	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -
Department 13	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -
Department 14	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -
Department 15	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -
Department 16	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -
Department 17	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -
Department TOTAL	**28,438.19**	**$ 9,245,794**	**3,064.51**	**$ 989,547**	**35,331.05**	**$ 11,433,028**	**29,648.61**	**$ 2,813,374**	**96,482**	**$ 24,481,743**
Solid Waste									170,929	
Grand TOTAL									**267,412**	

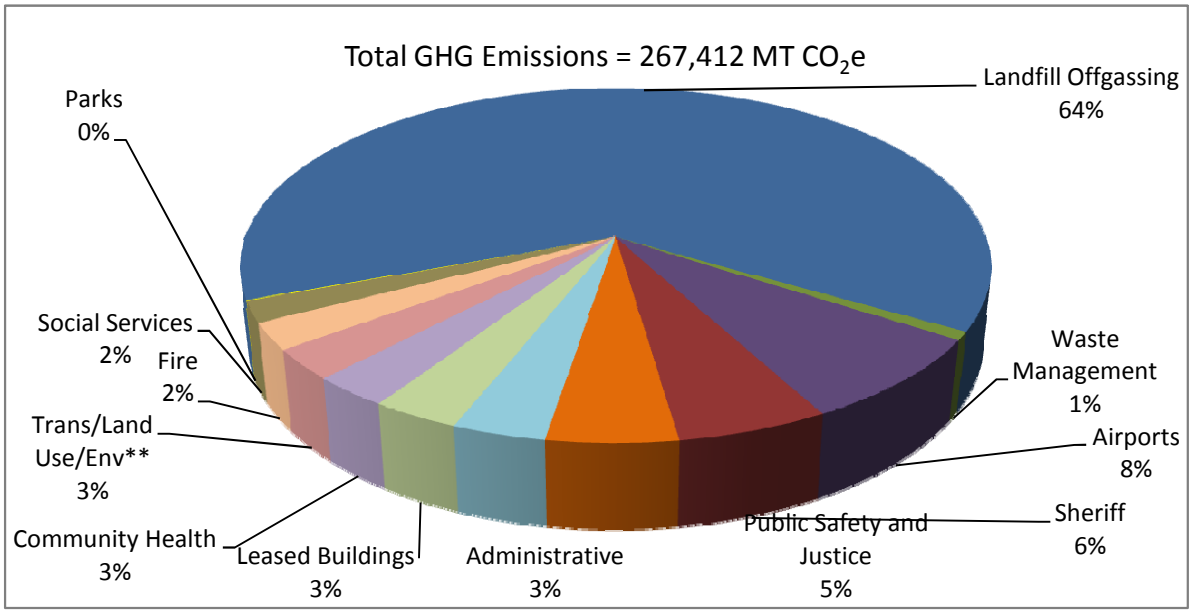
**Electricity is all streetlights

Other Sources

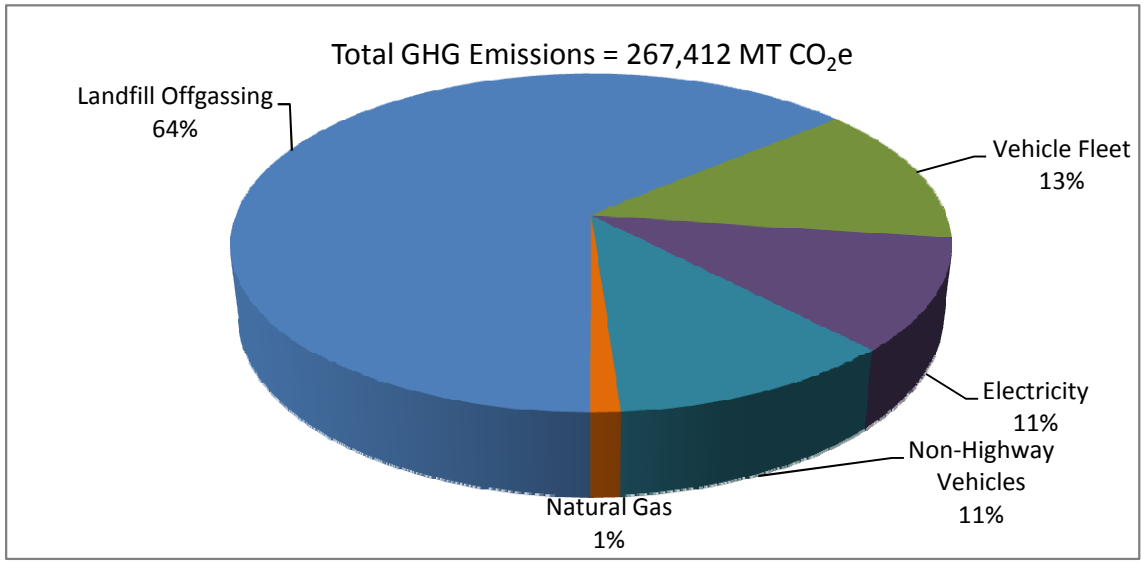
Solid Waste	CH_4 (MT)	CO_2e (MT)
Generated	0	0
Owned Landfills	8,139.50	170,929.49
TOTAL	8,139.50	170,929.49

Department	Total CO2e
Landfill Offgassing	170,929.49
Waste Management	2,000.43
Airports	21,250.02
Sheriff	15,038.67
Public Safety and Justice	12,981.15
Administrative	9,259.11
Leased Buildings	8,753.35
Community Health	7,780.41
Trans/Land Use/Env**	7,492.96
Fire	6,541.32
Social Services	5,206.12
Parks	178.82
TOTAL	**267,411.85**





Emissions Source	MT CO2e
Landfill Offgassing	170,929.49
Vehicle Fleet	35,331.05
Electricity	28,438.19
Non-Highway Vehicles	29,648.61
Natural Gas	3,064.51
TOTAL	**267,411.85**



Electricity

Instructions: Insert electricity use data for all facilities, streetlights, buildings, and other electric accounts owned/operated by the local government for each department. Also enter the emissions factors for CO^2, CH_4, and N_2O obtained from EPA eGrid or directly from the utility provider. Entering the rate code and associated cost per kWh of gas will allow the calculation of the total cost for each department's electricity use.

Utility Provider: Southern California Edison

Emissions Coefficients

CO_2	0.000301758	metric tons/kWh
CH_4	3.44667E-09	metric tons/kWh
N_2O	5.12986E-09	metric tons/kWh

GWP

CH_4	21
N_2O	310

Department	Annual kWh	Rate Code	$/kWh	Metric Tons CO_2	CH_4	N_2O	CO_2e	$
Administrative	15,816,385	AG TOU	$ 0.10	4,772.71	0.05	0.08	4,799.01	$ 1,561,862
Health Care	14,833,161	AG TOU	$ 0.10	4,476.02	0.05	0.08	4,500.68	$ 1,464,769
Public Safety and Justice	33,761,938	AG TOU	$ 0.10	10,187.92	0.12	0.17	10,244.05	$ 3,333,978
Social Services	6,434,821	AG TOU	$ 0.10	1,941.76	0.02	0.03	1,952.45	$ 635,436
Parks		AG TOU	$ 0.10	-	-	-	-	$ -
Waste Management	1,115,393	AG TOU	$ 0.10	336.58	0.00	0.01	338.43	$ 110,145
Waste Management (Cogen)	-20,992,973		$ 0.10	(6,334.79)	(0.07)	(0.11)	(6,369.69)	$ (2,073,048)
Sheriff	5,870,325	AG TOU	$ 0.10	1,771.41	0.02	0.03	1,781.17	$ 579,692
Airports		AG TOU	$ 0.10	-	-	-	-	$ -
Trans/Land Use/Env**	3,756,877	AG TOU	$ 0.10	1,133.67	0.01	0.02	1,139.91	$ 370,990
Leased Buildings	28,437,889	AG TOU	$ 0.10	8,581.35	0.10	0.15	8,628.63	$ 2,808,230
Fire	4,710,834	see below		1,416.25	0.03	0.02	1,423.53	$ 453,740
TOTAL	**93,744,650**			**28282.8796**	**0.33259**	**0.47846**	**28,438.19**	**$ 9,245,794**
	114,737,623							

**Electricity is all streetlights

Notes: Used average rate of $0.10/kWh. Taken from community inventory spreadsheet. Fire Department received electricity from SCE, Imperial Irrigation District, and Anza Electric Cooperative.

Cogen is listed as a Negative value because they are generating the electricity and not consuming it.

	Annual KWh	$/kWh	Metric Tons CO_2	CH_4	N_2O	CO_2e	$
Fire (SCE)	3752160.5	0.09875	1132.24271	0.01293	0.01925	1138.48119	370524.3485
Fire (IID)	819644.8087	0.0732	227.577079	0.01168	0.00237	228.556476	59998
Fire (Anza)	139028.503	0.167	56.4348188	0.00111	0.00011	56.4923468	23217.76
Total	**4710833.812**		**1416.25461**	**0.02572**	**0.02173**	**1423.53002**	**453740.1085**

IID

612.12 lbs CO_2/MWh	0.000277653
31.41 lbs CH_4/GWh	1.42474E-08
6.37 lbs N_2O/GWh	2.88939E-09

Anza

894.9052 lbs CO_2/MWh	0.000405923
17.5432 lbs CH_4/GWh	7.95747E-09
1.7543 lbs N_2O/GWh	7.95738E-10

Natural Gas

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

Utility Provider: Southern California Gas Company

Emissions Coefficients

						GWP	
CO2	52.91	g/MMBTU	0.0005291	metric tons/therm		CH4	21
CH4	5	g/MMBTU	0.00005	metric tons/therm		N2O	310
N2O	0.1	g/MMBTU	0.000001	metric tons/therm			

				Metric Tons				
Department	Annual therms	Rate Code	$/therm	CO_2	CH_4	N_2O	CO_2e	$
Administrative	94243.91	Commercial	$ 0.61	49.86	4.71	0.09	178.04	$ 57,488.79
Health Care	208052.55	Commercial	$ 0.61	110.08	10.40	0.21	393.03	$ 126,912.06
Public Safety and Justice	1030609.33	Commercial	$ 0.61	545.30	51.53	1.03	1,946.92	$ 628,671.69
Social Services	54107.13	Commercial	$ 0.61	28.63	2.71	0.05	102.21	$ 33,005.35
Parks		Commercial	$ 0.61	-	-	-	-	$ -
Waste Management	462.13	Commercial	$ 0.61	0.24	0.02	0.00	0.87	$ 281.90
Sheriff	85061.57	Commercial	$ 0.61	45.01	4.25	0.09	160.69	$ 51,887.56
Airports		Commercial	$ 0.61	-	-	-	-	$ -
Trans/Land Use/Env**		Commercial	$ 0.61	-	-	-	-	$ -
Leased Buildings	66019	Commercial	$ 0.61	34.93	3.30	0.07	124.72	$ 40,271.59
Fire	83652.48	Commercial	$ 0.61	44.26	4.18	0.08	158.03	$ 51,028.01
Department 12				-	-	-	-	$ -
Department 13				-	-	-	-	$ -
Department 14				-	-	-	-	$ -
Department 15				-	-	-	-	$ -
Department 16				-	-	-	-	$ -
Department 17				-	-	-	-	$ -
TOTAL	**1,622,208**			**858.3103**	**81.1104**	**1.622208**	**3,064.51**	**$ 989,546.94**

Notes: Used average commerical rate for cost estimate.

Vehicle Fleet

Instructions: For each department, choose a vehicle type from the drop down menu and enter the total fuel used by that vehicle. For multiple vehicles of the same type in one department, total the fuel use for all like vehicles. If specifc MPG is known, override the default value. For the Fire Department, miles driven by vehicle was unknown, emissions calculated are from total fuel use.

Emissions Coefficients	**$/gal**					
Gasoline	$ 3.00	8.81	kg CO_2/gallon	0.00881	metric tons CO_2/gallon	
Diesel	$ 2.50	10.15	kg CO_2/gallon	0.01015	metric tons CO_2/gallon	
E85		6.05	kg CO_2/gallon	0.00605	metric tons CO_2/gallon	
CNG		6.84	kg CO_2/GGE	0.00684	metric tons CO_2/GGE	GGE=Gallon of Gasoline Equivalent
LPG (Propane)		5.74	kg CO_2/gallon	0.00574	metric tons CO_2/gallon	

	GWP
CH4	21
N2O	310

	Metric Tons				Fuel Use (gal)		
Department	**CO_2**	**CH_4**	**N_2O**	**CO_2e**	**Diesel**	**Gasoline**	$
Administrative	4,221.95	0.20	0.18	4,282.00	9,338.82	463,499	1,413,845
Health Care	2,849.22	0.13	0.11	2,886.70	17,683.55	301,612	949,046
Public Safety and Justice	780.57	0.03	0.03	790.17	517.65	86,615	261,140
Social Services	3,113.00	0.12	0.11	3,151.04	5,859.20	345,422	1,050,915
Parks	174.75	0.01	0.01	178.82	516.30	19,240	59,011
Waste Management	1,284.33	0.05	0.06	1,303.98	16,403.85	126,882	421,657
Sheriff	12,975.19	0.48	0.35	13,093.63	30,775.69	1,433,099	4,376,235
Airports	88.06	0.00	0.00	88.69		9,996	29,987
Trans/Land Use/Env**	4,564.74	0.10	0.09	4,596.25	160,912.06	332,566	1,399,979
Leased Buildings				-			-
Fire	4,959.76			4,959.76	227,642.00	300,703	1,471,214
TOTAL	**35,011.57**	**1.13**	**0.95**	**35,331.05**	**469,649**	**3,419,635**	**11,433,028**

Administrative

Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	Emission Factors CO_2 (MT/gal)	Emission Factors CH_4 (g/mile)	Emission Factors N_2O (g/mile)	Total Emissions (metric tons) CO_2	Total Emissions (metric tons) CH_4	Total Emissions (metric tons) N_2O
Diesel Heavy Duty	3	3706.65	5.8	0.01015	0.0051	0.0048	37.62	0.00	0.00
Diesel Light Trucks 1983-1995	1	302.75	17	0.01015	0.0009	0.0014	3.07	0.00	0.00
Diesel Light Trucks 1996-Present	1	5143.22	19.1	0.01015	0.001	0.0015	52.20	0.00	0.00
Diesel Passenger Cars 1983-Pres	1	186.2	25.8	0.01015	0.0005	0.001	1.89	0.00	0.00
Gasoline Heavy Duty 2005	3	336.957	8	0.00881	0.0326	0.0177	2.97	0.00	0.00
Gasoline Light Trucks 1993	23	6183.8	17.5	0.00881	0.0813	0.1035	54.48	0.01	0.01
Gasoline Light Trucks 1994	8	2638.37	17.2	0.00881	0.0646	0.0982	23.24	0.00	0.00
Gasoline Light Trucks 1995	8	2039.675	17	0.00881	0.0517	0.0908	17.97	0.00	0.00
Gasoline Light Trucks 1996	1	467.2	17.2	0.00881	0.0452	0.0871	4.12	0.00	0.00
Gasoline Light Trucks 1997	6	3018.05	17	0.00881	0.0452	0.0871	26.59	0.00	0.00
Gasoline Light Trucks 1998	8	4276.59	17.1	0.00881	0.0391	0.0728	37.68	0.00	0.01
Gasoline Light Trucks 1999	41	21742.12	16.7	0.00881	0.0321	0.0564	191.55	0.01	0.02
Gasoline Light Trucks 2000	30	18726.595	16.9	0.00881	0.0346	0.0621	164.98	0.01	0.02
Gasoline Light Trucks 2001	27	15351.155	16.7	0.00881	0.0151	0.0164	135.24	0.00	0.00
Gasoline Light Trucks 2002	26	15359.792	16.7	0.00881	0.0178	0.0228	135.32	0.00	0.01
Gasoline Light Trucks 2003	18	14934.15	16.9	0.00881	0.0155	0.0114	131.57	0.00	0.00
Gasoline Light Trucks 2004	2	2196.85	16.7	0.00881	0.0152	0.0132	19.35	0.00	0.00
Gasoline Light Trucks 2005	12	12710.46	17.2	0.00881	0.0157	0.0101	111.98	0.00	0.00
Gasoline Light Trucks 2006	24	24737.697	17.5	0.00881	0.0157	0.0101	217.94	0.01	0.00
Gasoline Light Trucks 2007	53	36405.385	17.7	0.00881	0.0157	0.0101	320.73	0.01	0.01
Gasoline Light Trucks 2008	54	38500.309	18.2	0.00881	0.0157	0.0101	339.19	0.01	0.01
Gasoline Light Trucks 2009	10	490.22	19	0.00881	0.0157	0.0101	4.32	0.00	0.00
Gasoline Passenger Cars 1993	1	29.5	23.5	0.00881	0.0704	0.0647	0.26	0.00	0.00
Gasoline Passenger Cars 1994	4	422.4	23.3	0.00881	0.0531	0.056	3.72	0.00	0.00
Gasoline Passenger Cars 1995	2	316.44	23.4	0.00881	0.0358	0.0473	2.79	0.00	0.00
Gasoline Passenger Cars 1996	5	1446.75	23.3	0.00881	0.0272	0.0426	12.75	0.00	0.00
Gasoline Passenger Cars 1997	4	1057.22	23.4	0.00881	0.0268	0.0422	9.31	0.00	0.00
Gasoline Passenger Cars 1998	9	2297.993	23.4	0.00881	0.0249	0.0393	20.25	0.00	0.00
Gasoline Passenger Cars 1999	47	15458.149	23	0.00881	0.0216	0.0337	136.19	0.01	0.01
Gasoline Passenger Cars 2000	35	13466.965	22.9	0.00881	0.0178	0.0273	118.64	0.01	0.01
Gasoline Passenger Cars 2001	34	12413.825	23	0.00881	0.011	0.0158	109.37	0.00	0.00
Gasoline Passenger Cars 2002	25	12990.27	23.1	0.00881	0.0107	0.0153	114.44	0.00	0.00
Gasoline Passenger Cars 2003	19	6869.815	23.3	0.00881	0.0114	0.0135	60.52	0.00	0.00
Gasoline Passenger Cars 2004	14	8463.706	23.1	0.00881	0.0145	0.0083	74.57	0.00	0.00
Gasoline Passenger Cars 2005	60	37523.12	23.5	0.00881	0.0147	0.0079	330.58	0.01	0.01
Gasoline Passenger Cars 2006	86	53586.75	23.3	0.00881	0.0147	0.0079	472.10	0.02	0.01
Gasoline Passenger Cars 2007	101	50217.165	24.1	0.00881	0.0147	0.0079	442.41	0.02	0.01
Gasoline Passenger Cars 2008	56	26100.52	24.3	0.00881	0.0147	0.0079	229.95	0.01	0.01
Gasoline Passenger Cars 2009	7	723.22	25.4	0.00881	0.0147	0.0079	6.37	0.00	0.00
E85 Light Duty	27	5073.52	12.75	0.0065	0.055	0.067	32.98	0.00	0.00
CNG Light Duty	7	1573.01	23	0.00684	0.737	0.05	10.76	0.03	0.00
TOTAL	**903**	**479,485**					**4,221.95**	**0.20**	**0.18**

Health Care

Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	Emission Factors			Total Emissions (metric tons)		
				CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Diesel Light Trucks 1983-1995	1	59.1	17	0.01015	0.0009	0.0014	0.60	0.00	0.00
Diesel Light Trucks 1996-Present	14	17624.45	19.1	0.01015	0.001	0.0015	178.89	0.00	0.00
Gasoline Heavy Duty 2005	1	1118.8	8	0.00881	0.0326	0.0177	9.86	0.00	0.00
Gasoline Light Trucks 1993	7	1752.6	17.5	0.00881	0.0813	0.1035	15.44	0.00	0.00
Gasoline Light Trucks 1994	3	673.775	17.2	0.00881	0.0646	0.0982	5.94	0.00	0.00
Gasoline Light Trucks 1995	5	1633.9	17	0.00881	0.0517	0.0908	14.39	0.00	0.00
Gasoline Light Trucks 1996	1	141.715	17.2	0.00881	0.0452	0.0871	1.25	0.00	0.00
Gasoline Light Trucks 1997	6	3187.55	17	0.00881	0.0452	0.0871	28.08	0.00	0.00
Gasoline Light Trucks 1998	1	77.5	17.1	0.00881	0.0391	0.0728	0.68	0.00	0.00
Gasoline Light Trucks 1999	20	10490.08	16.7	0.00881	0.0321	0.0564	92.42	0.01	0.01
Gasoline Light Trucks 2000	14	6948.375	16.9	0.00881	0.0346	0.0621	61.22	0.00	0.01
Gasoline Light Trucks 2001	19	25976.95	16.7	0.00881	0.0151	0.0164	228.86	0.01	0.01
Gasoline Light Trucks 2002	47	44278.225	16.7	0.00881	0.0178	0.0228	390.09	0.01	0.02
Gasoline Light Trucks 2003	14	13477.49	16.9	0.00881	0.0155	0.0114	118.74	0.00	0.00
Gasoline Light Trucks 2004	5	5671.11	16.7	0.00881	0.0152	0.0132	49.96	0.00	0.00
Gasoline Light Trucks 2005	12	7426.73	17.2	0.00881	0.0157	0.0101	65.43	0.00	0.00
Gasoline Light Trucks 2006	14	19643.11	17.5	0.00881	0.0157	0.0101	173.06	0.01	0.00
Gasoline Light Trucks 2007	15	17689.15	17.7	0.00881	0.0157	0.0101	155.84	0.00	0.00
Gasoline Light Trucks 2008	60	52392.86	18.2	0.00881	0.0157	0.0101	461.58	0.01	0.01
Gasoline Light Trucks 2009	2	177.13	19	0.00881	0.0157	0.0101	1.56	0.00	0.00
Gasoline Passenger Cars 1993	2	296.4	23.5	0.00881	0.0704	0.0647	2.61	0.00	0.00
Gasoline Passenger Cars 1994	4	499.25	23.3	0.00881	0.0531	0.056	4.40	0.00	0.00
Gasoline Passenger Cars 1995	8	838.475	23.4	0.00881	0.0358	0.0473	7.39	0.00	0.00
Gasoline Passenger Cars 1997	1	445.125	23.4	0.00881	0.0268	0.0422	3.92	0.00	0.00
Gasoline Passenger Cars 1998	3	759.265	23.4	0.00881	0.0249	0.0393	6.69	0.00	0.00
Gasoline Passenger Cars 1999	47	15611.219	23	0.00881	0.0216	0.0337	137.53	0.01	0.01
Gasoline Passenger Cars 2000	27	9668.965	22.9	0.00881	0.0178	0.0273	85.18	0.00	0.01
Gasoline Passenger Cars 2001	9	2243.51	23	0.00881	0.011	0.0158	19.77	0.00	0.00
Gasoline Passenger Cars 2002	15	6281.285	23.1	0.00881	0.0107	0.0153	55.34	0.00	0.00
Gasoline Passenger Cars 2003	10	4338.16	23.3	0.00881	0.0114	0.0135	38.22	0.00	0.00
Gasoline Passenger Cars 2004	5	1532.2	23.1	0.00881	0.0145	0.0083	13.50	0.00	0.00
Gasoline Passenger Cars 2005	23	15786.69	23.5	0.00881	0.0147	0.0079	139.08	0.01	0.00
Gasoline Passenger Cars 2006	19	6232.13	23.3	0.00881	0.0147	0.0079	54.91	0.00	0.00
Gasoline Passenger Cars 2007	17	6802.625	24.1	0.00881	0.0147	0.0079	59.93	0.00	0.00
Gasoline Passenger Cars 2008	52	16696.955	24.3	0.00881	0.0147	0.0079	147.10	0.01	0.00
Gasoline Passenger Cars 2009	5	822.95	25.4	0.00881	0.0147	0.0079	7.25	0.00	0.00
E85 Light Duty	4	148.73	12.75	0.0065	0.055	0.067	0.97	0.00	0.00
CNG Light Duty	6	1689.75	23	0.00684	0.737	0.05	11.56	0.03	0.00
TOTAL	**518**	**321,134**					**2,849.22**	**0.13**	**0.11**

Public Safety and Justice

				Emission Factors			Total Emissions (metric tons)		
Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Diesel Heavy Duty	1	374.75	5.8	0.01015	0.0051	0.0048	3.80	0.00	0.00
Diesel Light Trucks 1983-1995	1	142.9	17	0.01015	0.0009	0.0014	1.45	0.00	0.00
Gasoline Light Trucks 1993	2	287.55	17.5	0.00881	0.0813	0.1035	2.53	0.00	0.00
Gasoline Light Trucks 1995	1	67.95	17	0.00881	0.0517	0.0908	0.60	0.00	0.00
Gasoline Light Trucks 1999	1	479.11	16.7	0.00881	0.0321	0.0564	4.22	0.00	0.00
Gasoline Light Trucks 2000	1	31.4	16.9	0.00881	0.0346	0.0621	0.28	0.00	0.00
Gasoline Light Trucks 2001	8	4558.9	16.7	0.00881	0.0151	0.0164	40.16	0.00	0.00
Gasoline Light Trucks 2002	5	2749.03	16.7	0.00881	0.0178	0.0228	24.22	0.00	0.00
Gasoline Light Trucks 2005	2	737	17.2	0.00881	0.0157	0.0101	6.49	0.00	0.00
Gasoline Light Trucks 2006	4	6448.95	17.5	0.00881	0.0157	0.0101	56.82	0.00	0.00
Gasoline Light Trucks 2007	7	1966	17.7	0.00881	0.0157	0.0101	17.32	0.00	0.00
Gasoline Light Trucks 2008	8	1590.2	18.2	0.00881	0.0157	0.0101	14.01	0.00	0.00
Gasoline Passenger Cars 1993	3	61.2	23.5	0.00881	0.0704	0.0647	0.54	0.00	0.00
Gasoline Passenger Cars 1994	1	159.975	23.3	0.00881	0.0531	0.056	1.41	0.00	0.00
Gasoline Passenger Cars 1995	9	648.975	23.4	0.00881	0.0358	0.0473	5.72	0.00	0.00
Gasoline Passenger Cars 1998	5	919.4	23.4	0.00881	0.0249	0.0393	8.10	0.00	0.00
Gasoline Passenger Cars 1999	26	3713.014	23	0.00881	0.0216	0.0337	32.71	0.00	0.00
Gasoline Passenger Cars 2000	23	6376.325	22.9	0.00881	0.0178	0.0273	56.18	0.00	0.00
Gasoline Passenger Cars 2001	25	9272.27	23	0.00881	0.011	0.0158	81.69	0.00	0.00
Gasoline Passenger Cars 2002	16	5382.61	23.1	0.00881	0.0107	0.0153	47.42	0.00	0.00
Gasoline Passenger Cars 2003	4	1584.5	23.3	0.00881	0.0114	0.0135	13.96	0.00	0.00
Gasoline Passenger Cars 2004	3	528.8	23.1	0.00881	0.0145	0.0083	4.66	0.00	0.00
Gasoline Passenger Cars 2005	10	3528.725	23.5	0.00881	0.0147	0.0079	31.09	0.00	0.00
Gasoline Passenger Cars 2006	37	15541.785	23.3	0.00881	0.0147	0.0079	136.92	0.01	0.00
Gasoline Passenger Cars 2007	14	6261.12	24.1	0.00881	0.0147	0.0079	55.16	0.00	0.00
Gasoline Passenger Cars 2008	57	13720.35	24.3	0.00881	0.0147	0.0079	120.88	0.00	0.00
E85 Light Duty	7	1882.48	12.75	0.0065	0.055	0.067	12.24	0.00	0.00
Choose Vehicle Type			0	0	0	0	-	-	-
TOTAL	**281**	**89,015**					**780.57**	**0.03**	**0.03**

Social Services

				Emission Factors			Total Emissions (metric tons)		
Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Diesel Heavy Duty	3	3465.6	5.8	0.01015	0.0051	0.0048	35.18	0.00	0.00
Diesel Light Trucks 1996-Present	4	2393.595	19.1	0.01015	0.001	0.0015	24.29	0.00	0.00
Gasoline Heavy Duty 2005	1	726.3	8	0.00881	0.0326	0.0177	6.40	0.00	0.00
Gasoline Light Trucks 1993	1	37.35	17.5	0.00881	0.0813	0.1035	0.33	0.00	0.00
Gasoline Light Trucks 1995	1	238.9	17	0.00881	0.0517	0.0908	2.10	0.00	0.00
Gasoline Light Trucks 1998	1	401.825	17.1	0.00881	0.0391	0.0728	3.54	0.00	0.00
Gasoline Light Trucks 1999	22	8218.94	16.7	0.00881	0.0321	0.0564	72.41	0.00	0.01
Gasoline Light Trucks 2000	14	5756.212	16.9	0.00881	0.0346	0.0621	50.71	0.00	0.01
Gasoline Light Trucks 2001	9	5633.04	16.7	0.00881	0.0151	0.0164	49.63	0.00	0.00
Gasoline Light Trucks 2002	14	6315.055	16.7	0.00881	0.0178	0.0228	55.64	0.00	0.00
Gasoline Light Trucks 2004	2	1055.775	16.7	0.00881	0.0152	0.0132	9.30	0.00	0.00
Gasoline Light Trucks 2003	1	853.725	16.9	0.00881	0.0155	0.0114	7.52	0.00	0.00
Gasoline Light Trucks 2006	13	19054.885	17.5	0.00881	0.0157	0.0101	167.87	0.01	0.00
Gasoline Light Trucks 2007	67	56986.43	17.7	0.00881	0.0157	0.0101	502.05	0.02	0.01
Gasoline Light Trucks 2008	54	34936.285	18.2	0.00881	0.0157	0.0101	307.79	0.01	0.01
Gasoline Passenger Cars 1995	3	532.2	23.4	0.00881	0.0358	0.0473	4.69	0.00	0.00
Gasoline Passenger Cars 1997	3	356.9	23.4	0.00881	0.0268	0.0422	3.14	0.00	0.00
Gasoline Passenger Cars 1998	39	6260.945	23.4	0.00881	0.0249	0.0393	55.16	0.00	0.01
Gasoline Passenger Cars 1999	84	19297.875	23	0.00881	0.0216	0.0337	170.01	0.01	0.01
Gasoline Passenger Cars 2000	96	31237.881	22.9	0.00881	0.0178	0.0273	275.21	0.01	0.02
Gasoline Passenger Cars 2001	24	6841.985	23	0.00881	0.011	0.0158	60.28	0.00	0.00
Gasoline Passenger Cars 2002	38	13410.27	23.1	0.00881	0.0107	0.0153	118.14	0.00	0.00
Gasoline Passenger Cars 2003	25	10871.68	23.3	0.00881	0.0114	0.0135	95.78	0.00	0.00
Gasoline Passenger Cars 2004	8	2002.94	23.1	0.00881	0.0145	0.0083	17.65	0.00	0.00
Gasoline Passenger Cars 2005	48	22912.04	23.5	0.00881	0.0147	0.0079	201.86	0.01	0.00
Gasoline Passenger Cars 2006	14	6032.49	23.3	0.00881	0.0147	0.0079	53.15	0.00	0.00
Gasoline Passenger Cars 2007	118	64996.06	24.1	0.00881	0.0147	0.0079	572.62	0.02	0.01
Gasoline Passenger Cars 2008	38	20432.275	24.3	0.00881	0.0147	0.0079	180.01	0.01	0.00
Gasoline Passenger Cars 2009	1	22.15	25.4	0.00881	0.0147	0.0079	0.20	0.00	0.00
E85 Light Duty	6	1557.74	12.75	0.0065	0.055	0.067	10.13	0.00	0.00
Propane Light Duty	1	40.4	23	0.00574	0.037	0.067	0.23	0.00	0.00
TOTAL	**753**	**352,880**					**3,113.00**	**0.12**	**0.11**

Parks

Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	Emission Factors			Total Emissions (metric tons)		
				CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Diesel Heavy Duty	1	68.3	5.8	0.01015	0.0051	0.0048	0.69	0.00	0.00
Diesel Light Trucks 1996-Present	1	448	19.1	0.01015	0.001	0.0015	4.55	0.00	0.00
Gasoline Light Trucks 1993	3	1087.8	17.5	0.00881	0.0813	0.1035	9.58	0.00	0.00
Gasoline Light Trucks 1995	3	1165.925	17	0.00881	0.0517	0.0908	10.27	0.00	0.00
Gasoline Light Trucks 1998	1	279.73	17.1	0.00881	0.0391	0.0728	2.46	0.00	0.00
Gasoline Light Trucks 1999	7	3390.715	16.7	0.00881	0.0321	0.0564	29.87	0.00	0.00
Gasoline Light Trucks 2000	3	1594.58	16.9	0.00881	0.0346	0.0621	14.05	0.00	0.00
Gasoline Light Trucks 2001	2	551.17	16.7	0.00881	0.0151	0.0164	4.86	0.00	0.00
Gasoline Light Trucks 2002	7	6349.955	16.7	0.00881	0.0178	0.0228	55.94	0.00	0.00
Gasoline Light Trucks 2003	3	3208.75	16.9	0.00881	0.0155	0.0114	28.27	0.00	0.00
Gasoline Light Trucks 2005	2	749.79	17.2	0.00881	0.0157	0.0101	6.61	0.00	0.00
Gasoline Light Trucks 2008	1	654.55	18.2	0.00881	0.0157	0.0101	5.77	0.00	0.00
Gasoline Passenger Cars 1999	1	90.775	23	0.00881	0.0216	0.0337	0.80	0.00	0.00
Gasoline Passenger Cars 2002	1	116.29	23.1	0.00881	0.0107	0.0153	1.02	0.00	0.00
TOTAL	**36**	**19,756**					**174.75**	**0.01**	**0.01**

Waste Management

Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	Emission Factors			Total Emissions (metric tons)		
				CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Diesel Heavy Duty	12	10331.5	5.8	0.01015	0.0051	0.0048	104.86	0.00	0.00
Diesel Light Trucks 1983-1995	2	197.7	17	0.01015	0.0009	0.0014	2.01	0.00	0.00
Diesel Light Trucks 1996-Present	7	5874.65	19.1	0.01015	0.001	0.0015	59.63	0.00	0.00
Gasoline Light Trucks 1993	4	1634.9	17.5	0.00881	0.0813	0.1035	14.40	0.00	0.00
Gasoline Light Trucks 1994	4	2230.2	17.2	0.00881	0.0646	0.0982	19.65	0.00	0.00
Gasoline Light Trucks 1995	2	784.55	17	0.00881	0.0517	0.0908	6.91	0.00	0.00
Gasoline Light Trucks 1996	6	1977.05	17.2	0.00881	0.0452	0.0871	17.42	0.00	0.00
Gasoline Light Trucks 1997	5	3698.45	17	0.00881	0.0452	0.0871	32.58	0.00	0.01
Gasoline Light Trucks 1998	7	3344.69	17.1	0.00881	0.0391	0.0728	29.47	0.00	0.00
Gasoline Light Trucks 1999	9	8762.695	16.7	0.00881	0.0321	0.0564	77.20	0.00	0.01
Gasoline Light Trucks 2000	7	8248.3	16.9	0.00881	0.0346	0.0621	72.67	0.00	0.01
Gasoline Light Trucks 2001	10	10934.975	16.7	0.00881	0.0151	0.0164	96.34	0.00	0.00
Gasoline Light Trucks 2002	7	7148.4	16.7	0.00881	0.0178	0.0228	62.98	0.00	0.00
Gasoline Light Trucks 2003	15	11309.71	16.9	0.00881	0.0155	0.0114	99.64	0.00	0.00
Gasoline Light Trucks 2004	11	19253.71	16.7	0.00881	0.0152	0.0132	169.63	0.00	0.00
Gasoline Light Trucks 2005	12	17132.28	17.2	0.00881	0.0157	0.0101	150.94	0.00	0.00
Gasoline Light Trucks 2006	4	3911.8	17.5	0.00881	0.0157	0.0101	34.46	0.00	0.00
Gasoline Light Trucks 2007	5	8133.005	17.7	0.00881	0.0157	0.0101	71.65	0.00	0.00
Gasoline Light Trucks 2008	12	14687.97	18.2	0.00881	0.0157	0.0101	129.40	0.00	0.00
Gasoline Light Trucks 2009	2	554.7	19	0.00881	0.0157	0.0101	4.89	0.00	0.00
Gasoline Passenger Cars 1993	2	707	23.5	0.00881	0.0704	0.0647	6.23	0.00	0.00
Gasoline Passenger Cars 1995	1	322	23.4	0.00881	0.0358	0.0473	2.84	0.00	0.00
Gasoline Passenger Cars 2001	1	606.4	23	0.00881	0.011	0.0158	5.34	0.00	0.00
Gasoline Passenger Cars 2002	1	789.22	23.1	0.00881	0.0107	0.0153	6.95	0.00	0.00
Gasoline Passenger Cars 2007	1	517.675	24.1	0.00881	0.0147	0.0079	4.56	0.00	0.00
Gasoline Passenger Cars 2009	2	127.1	25.4	0.00881	0.0147	0.0079	1.12	0.00	0.00
Gasoline Heavy Duty 2005	1	65.7	8	0.00881	0.0326	0.0177	0.58	0.00	0.00
TOTAL	**152**	**143,286**					**1,284.33**	**0.05**	**0.06**

Sheriff

Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	Emission Factors CO_2 (MT/gal)	Emission Factors CH_4 (g/mile)	Emission Factors N_2O (g/mile)	Total Emissions (metric tons) CO_2	Total Emissions (metric tons) CH_4	Total Emissions (metric tons) N_2O
Diesel Heavy Duty	22	17264.2	5.8	0.01015	0.0051	0.0048	175.23	0.00	0.00
Diesel Light Trucks 1983-1995	2	50.2	17	0.01015	0.0009	0.0014	0.51	0.00	0.00
Diesel Light Trucks 1996-Present	9	13461.29	19.1	0.01015	0.001	0.0015	136.63	0.00	0.00
Gasoline Heavy Duty 2003	1	613.94	8	0.00881	0.0533	0.124	5.41	0.00	0.00
Gasoline Heavy Duty 2005	5	1169.15	8	0.00881	0.0326	0.0177	10.30	0.00	0.00
Gasoline Light Trucks 1993	19	2066.76	17.5	0.00881	0.0813	0.1035	18.21	0.00	0.00
Gasoline Light Trucks 1994	3	1995.916	17.2	0.00881	0.0646	0.0982	17.58	0.00	0.00
Gasoline Light Trucks 1995	1	155.75	17	0.00881	0.0517	0.0908	1.37	0.00	0.00
Gasoline Light Trucks 1996	3	585.55	17.2	0.00881	0.0452	0.0871	5.16	0.00	0.00
Gasoline Light Trucks 1997	8	2732.932	17	0.00881	0.0452	0.0871	24.08	0.00	0.00
Gasoline Light Trucks 1998	1	190	17.1	0.00881	0.0391	0.0728	1.67	0.00	0.00
Gasoline Light Trucks 1999	26	7032.431	16.7	0.00881	0.0321	0.0564	61.96	0.00	0.01
Gasoline Light Trucks 2000	25	7664.229	16.9	0.00881	0.0346	0.0621	67.52	0.00	0.01
Gasoline Light Trucks 2001	23	10092.503	16.7	0.00881	0.0151	0.0164	88.91	0.00	0.00
Gasoline Light Trucks 2002	8	3757.447	16.7	0.00881	0.0178	0.0228	33.10	0.00	0.00
Gasoline Light Trucks 2003	43	22577.96	16.9	0.00881	0.0155	0.0114	198.91	0.01	0.00
Gasoline Light Trucks 2004	15	18023.01	16.7	0.00881	0.0152	0.0132	158.78	0.00	0.00
Gasoline Light Trucks 2005	29	26041.216	17.2	0.00881	0.0157	0.0101	229.42	0.01	0.00
Gasoline Light Trucks 2006	52	72035.312	17.5	0.00881	0.0157	0.0101	634.63	0.02	0.01
Gasoline Light Trucks 2007	48	53307.399	17.7	0.00881	0.0157	0.0101	469.64	0.01	0.01
Gasoline Light Trucks 2008	56	33794.918	18.2	0.00881	0.0157	0.0101	297.73	0.01	0.01
Gasoline Light Trucks 2009	2	177.55	19	0.00881	0.0157	0.0101	1.56	0.00	0.00
Gasoline Passenger Cars 1993	1	328.75	23.5	0.00881	0.0704	0.0647	2.90	0.00	0.00
Gasoline Passenger Cars 1994	1	101.75	23.3	0.00881	0.0531	0.056	0.90	0.00	0.00
Gasoline Passenger Cars 1995	5	701	23.4	0.00881	0.0358	0.0473	6.18	0.00	0.00
Gasoline Passenger Cars 1996	5	415.77	23.3	0.00881	0.0272	0.0426	3.66	0.00	0.00
Gasoline Passenger Cars 1997	4	1138.695	23.4	0.00881	0.0268	0.0422	10.03	0.00	0.00
Gasoline Passenger Cars 1998	29	4084.669	23.4	0.00881	0.0249	0.0393	35.99	0.00	0.00
Gasoline Passenger Cars 1999	49	7922.365	23	0.00881	0.0216	0.0337	69.80	0.00	0.01
Gasoline Passenger Cars 2000	105	27456.141	22.9	0.00881	0.0178	0.0273	241.89	0.01	0.02
Gasoline Passenger Cars 2001	108	29501.911	23	0.00881	0.011	0.0158	259.91	0.01	0.01
Gasoline Passenger Cars 2002	95	32172.648	23.1	0.00881	0.0107	0.0153	283.44	0.01	0.01
Gasoline Passenger Cars 2003	218	145632.65	23.3	0.00881	0.0114	0.0135	1,283.02	0.04	0.05
Gasoline Passenger Cars 2004	25	17308.032	23.1	0.00881	0.0145	0.0083	152.48	0.01	0.00
Gasoline Passenger Cars 2005	173	162424.492	23.5	0.00881	0.0147	0.0079	1,430.96	0.06	0.03
Gasoline Passenger Cars 2006	392	376236.371	23.3	0.00881	0.0147	0.0079	3,314.64	0.13	0.07
Gasoline Passenger Cars 2007	221	178615.23	24.1	0.00881	0.0147	0.0079	1,573.60	0.06	0.03
Gasoline Passenger Cars 2008	413	179598.692	24.3	0.00881	0.0147	0.0079	1,582.26	0.06	0.03
Gasoline Passenger Cars 2009	91	5445.501	25.4	0.00881	0.0147	0.0079	47.97	0.00	0.00
E85 Light Duty	85	5726.06	12.75	0.0065	0.055	0.067	37.22	0.00	0.00
TOTAL	**2421**	**1,469,600**					**12,975.19**	**0.48**	**0.35**

Airports

Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	Emission Factors			Total Emissions (metric tons)		
				CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Gasoline Light Trucks 1996	1	28.66	17.2	0.00881	0.0452	0.0871	0.25	0.00	0.00
Gasoline Light Trucks 2005	1	658.27	17.2	0.00881	0.0157	0.0101	5.80	0.00	0.00
Gasoline Light Trucks 2006	2	4382.27	17.5	0.00881	0.0157	0.0101	38.61	0.00	0.00
Gasoline Light Trucks 2007	1	1608.95	17.7	0.00881	0.0157	0.0101	14.17	0.00	0.00
Gasoline Light Trucks 2008	2	2822.05	18.2	0.00881	0.0157	0.0101	24.86	0.00	0.00
Gasoline Passenger Cars 2009	2	495.51	25.4	0.00881	0.0147	0.0079	4.37	0.00	0.00
TOTAL	**9**	**9,996**					**88.06**	**0.00**	**0.00**

Trans/Land Use/Env**

Vehicle	Number of Vehicles	Fuel Use (gal)	MPG	Emission Factors CO_2 (MT/gal)	Emission Factors CH_4 (g/mile)	Emission Factors N_2O (g/mile)	Total Emissions (metric tons) CO_2	Total Emissions (metric tons) CH_4	Total Emissions (metric tons) N_2O
Diesel Heavy Duty	84	116489	5.8	0.01015	0.0051	0.0048	1,182.36	0.00	0.00
Diesel Light Trucks 1983-1995	8	3888.195	17	0.01015	0.0009	0.0014	39.47	0.00	0.00
Diesel Light Trucks 1996-Present	50	40223.67	19.1	0.01015	0.001	0.0015	408.27	0.00	0.00
Diesel Passenger Cars 1983-Pres	1	311.19	25.8	0.01015	0.0005	0.001	3.16	0.00	0.00
Gasoline Heavy Duty 2005	5	4978.85	8	0.00881	0.0326	0.0177	43.86	0.00	0.00
Gasoline Light Trucks 1993	1	472.53	17.5	0.00881	0.0813	0.1035	4.16	0.00	0.00
Gasoline Light Trucks 1995	3	1359.95	17	0.00881	0.0517	0.0908	11.98	0.00	0.00
Gasoline Light Trucks 1996	1	610.125	17.2	0.00881	0.0452	0.0871	5.38	0.00	0.00
Gasoline Light Trucks 1998	4	1961.45	17.1	0.00881	0.0391	0.0728	17.28	0.00	0.00
Gasoline Light Trucks 1999	15	8949.08	16.7	0.00881	0.0321	0.0564	78.84	0.00	0.01
Gasoline Light Trucks 2000	17	7857.143	16.9	0.00881	0.0346	0.0621	69.22	0.00	0.01
Gasoline Light Trucks 2001	12	6840.765	16.7	0.00881	0.0151	0.0164	60.27	0.00	0.00
Gasoline Light Trucks 2002	55	34442.42	16.7	0.00881	0.0178	0.0228	303.44	0.01	0.01
Gasoline Light Trucks 2003	28	25617.69	16.9	0.00881	0.0155	0.0114	225.69	0.01	0.00
Gasoline Light Trucks 2004	16	20259.35	16.7	0.00881	0.0152	0.0132	178.48	0.01	0.00
Gasoline Light Trucks 2005	24	32439.475	17.2	0.00881	0.0157	0.0101	285.79	0.01	0.01
Gasoline Light Trucks 2006	39	46012.685	17.5	0.00881	0.0157	0.0101	405.37	0.01	0.01
Gasoline Light Trucks 2007	92	88267.13	17.7	0.00881	0.0157	0.0101	777.63	0.02	0.02
Gasoline Light Trucks 2008	38	32924.03	18.2	0.00881	0.0157	0.0101	290.06	0.01	0.01
Gasoline Passenger Cars 1993	1	13.594	23.5	0.00881	0.0704	0.0647	0.12	0.00	0.00
Gasoline Passenger Cars 1995	1	13.754	23.4	0.00881	0.0358	0.0473	0.12	0.00	0.00
Gasoline Passenger Cars 1998	2	96.95	23.4	0.00881	0.0249	0.0393	0.85	0.00	0.00
Gasoline Passenger Cars 1999	8	1054.216	23	0.00881	0.0216	0.0337	9.29	0.00	0.00
Gasoline Passenger Cars 2000	10	2628.35	22.9	0.00881	0.0178	0.0273	23.16	0.00	0.00
Gasoline Passenger Cars 2001	2	676.05	23	0.00881	0.011	0.0158	5.96	0.00	0.00
Gasoline Passenger Cars 2002	2	1494.75	23.1	0.00881	0.0107	0.0153	13.17	0.00	0.00
Gasoline Passenger Cars 2003	4	796.07	23.3	0.00881	0.0114	0.0135	7.01	0.00	0.00
Gasoline Passenger Cars 2005	3	1887.25	23.5	0.00881	0.0147	0.0079	16.63	0.00	0.00
Gasoline Passenger Cars 2006	15	5100.095	23.3	0.00881	0.0147	0.0079	44.93	0.00	0.00
Gasoline Passenger Cars 2007	9	4303.315	24.1	0.00881	0.0147	0.0079	37.91	0.00	0.00
Gasoline Passenger Cars 2008	5	1509.125	24.3	0.00881	0.0147	0.0079	13.30	0.00	0.00
E85 Light Duty	2	74.83	12.75	0.0065	0.055	0.067	0.49	0.00	0.00
Propane Light Duty	1	51.65	23	0.00574	0.037	0.067	0.30	0.00	0.00
Propane Heavy Duty	3	138.15	8	0.00574	0.197	0.175	0.79	0.00	0.00
TOTAL	**561**	**493,743**					**4,564.74**	**0.10**	**0.09**

Fire

	Total Use (gal)	CO_2 (MT)
Gasoline	300,703	2649.19
Diesel	227,642	2310.57
		4959.76

Non-Highway Vehicles and Equipment

Instructions: For each department, choose an equipment type from the drop down menu and enter the total fuel used by that piece of equipment. For multiple vehicles of the same type in one department, total the fuel use for all like pieces of equipment.

Emissions Coefficients

	$/gal					
Gasoline	$	3.00	8.81	kg CO_2/gallon	0.00881	metric tons CO_2/gallon
Diesel	$	2.50	10.15	kg CO_2/gallon	0.01015	metric tons CO_2/gallon
Propane	$	2.55			0.00574	metric tons CO_2/gallon

	GWP
CH_4	21
N_2O	310

	Metric Tons				Fuel Use (gal)			
Department	**CO_2**	**CH_4**	**N_2O**	**CO_2e**	**Diesel**	**Gasoline**	**Propane**	$
Administrative	0.06	0.00	0.00	0.07		7.35		$ 22
Health Care	-	-	-	-				$ -
Public Safety and Justice	-	-	-	-				$ -
Social Services	0.40	0.00	0.00	0.41	21.2	21.20		$ 117
Parks	-	-	-	-				$ -
Waste Management	6,646.60	0.50	0.22	6,726.83	859425.8	160.65	3606.95	$ 2,158,244
Sheriff	3.15	0.00	0.00	3.18	299.09	12.45		$ 785
Airports	20,901.24	3.34	0.61	21,161.33				$ 223,689
Trans/Land Use/Env**	1,740.36	0.12	0.04	1,756.80	171270.17	780.56		$ 430,517
Leased Buildings				-				$ -
Fire				-				$ -
TOTAL	**29,291.81**	**3.97**	**0.88**	**29,648.61**	**1,031,016**	**982.21**		**$ 2,813,374**

Administrative

		Emission Factors			Total Emissions (metric tons)		
Vehicle	**Fuel Use (gal)**	**CO_2 (MT/gal)**	**CH_4 (g/mile)**	**N_2O (g/mile)**	**CO_2**	**CH_4**	**N_2O**
Other Large Utility (Gasoline)	7.35	0.00881	0.5	0.22	0.0647535	3.68E-06	1.62E-06
Choose Equipment		0	0	0	0	0	0
Choose Equipment		0	0	0	0	0	0
Choose Equipment		0	0	0	0	0	0
Choose Equipment		0	0	0	0	0	0
TOTAL	**7.35**				**0.0647535**	**3.68E-06**	**1.62E-06**

Social Services

		Emission Factors			Total Emissions (metric tons)		
Vehicle	**Fuel Use (gal)**	**CO_2 (MT/gal)**	**CH_4 (g/mile)**	**N_2O (g/mile)**	**CO_2**	**CH_4**	**N_2O**
Other Large Utility (Gasoline)	21.2	0.00881	0.5	0.22	0.186772	1.06E-05	4.66E-06
Other Large Utility (Diesel)	21.2	0.01015	0.58	0.26	0.21518	1.23E-05	5.51E-06
TOTAL	**42.4**				**0.401952**	**2.29E-05**	**1.02E-05**

Waste Management

		Emission Factors			Total Emissions (metric tons)		
Vehicle	Fuel Use (gal)	CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Agricultural Equipment Diesel Fue	889.95	0.01015	1.44	0.26	9.0329925	0.001282	0.000231
Construction Diesel	487768	0.01015	0.58	0.26	4950.8452	0.282905	0.12682
Construction LNG	368838	0.00446	0.58	0.26	1645.01748	0.213926	0.095898
Other Large Utility (Diesel)	1929.85	0.01015	0.58	0.26	19.5879775	0.001119	0.000502
Other Small Utility (Gasoline)	157.2	0.00881	0.5	0.22	1.384932	7.86E-05	3.46E-05
Propane (all)	3606.95	0.00574	0.09	0.41	20.703893	0.000325	0.001479
Agricultural Equipment Gasoline	3.45	0.00881	1.26	0.22	0.0303945	4.35E-06	7.59E-07
Choose Equipment		0	0	0	0	0	0
TOTAL	**863193.4**				**6646.60287**	**0.49964**	**0.224965**

*With the inclusion of equipment from the El Sobrante Landfill, total construction fuel usage (Diesel and LNG) is 856,606 gallons.

Sheriff

		Emission Factors			Total Emissions (metric tons)		
Vehicle	Fuel Use (gal)	CO_2 (MT/gal)	CH_4 (g/mile)	N_2O (g/mile)	CO_2	CH_4	N_2O
Agricultural Equipment Diesel Fue	51	0.01015	1.44	0.26	0.51765	7.34E-05	1.33E-05
Other Large Utility (Diesel)	248.09	0.01015	0.58	0.26	2.5181135	0.000144	6.45E-05
Other Small Utility (Gasoline)	12.45	0.00881	0.5	0.22	0.1096845	6.23E-06	2.74E-06
Choose Equipment		0	0	0	0	0	0
Choose Equipment		0	0	0	0	0	0
TOTAL	**311.54**				**3.145448**	**0.000224**	**8.05E-05**

Airports

		Emission Factors			Total Emissions (metric tons)		
Vehicle	**Fuel Use (gal)**	**CO_2 (MT/gal)**	**CH_4 (g/mile)**	**N_2O (g/mile)**	**CO_2**	**CH_4**	**N_2O**
Jet Fuel	1832210	0.00957	0.27	0.31	17534.2497	0.494697	0.567985
Aviation Gasoline	404686	0.00832	7.04	0.11	3366.98752	2.848989	0.044515
Choose Equipment		0	0	0	0	0	0
Choose Equipment		0	0	0	0	0	0
Choose Equipment		0	0	0	0	0	0
TOTAL	**2,236,896**				**20901.23722**	**3.343686**	**0.612501**

Trans/Land Use/Env**

		Emission Factors			Total Emissions (metric tons)		
Vehicle	**Fuel Use (gal)**	**CO_2 (MT/gal)**	**CH_4 (g/mile)**	**N_2O (g/mile)**	**CO_2**	**CH_4**	**N_2O**
Agricultural Equipment Diesel Fue	29503.07	0.01015	1.44	0.26	299.4561605	0.042484	0.007671
Construction Diesel	77280.89	0.01015	0.58	0.26	784.4010335	0.044823	0.020093
Other Large Utility (Diesel)	64486.21	0.01015	0.58	0.26	654.5350315	0.037402	0.016766
Other Large Utility (Gasoline)	22.94	0.00881	0.5	0.22	0.2021014	1.15E-05	5.05E-06
Other Small Utility (Gasoline)	557.32						
Agricultural Equipment Gasoline	200.295	0.00881	1.26	0.22	1.76459895	0.000252	4.41E-05
TOTAL	**172,051**				**1740.358926**	**0.124973**	**0.044579**

Solid Waste

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

Owned/Operated Landfills

Landfill Name	Annual LFG Gas Collected (MMSCF)	Fraction of CH_4 in LFG (%)	CH_4 Destruction Efficiency (%)	Collection Efficiency (%)	Oxidation Factor	CH4 Emitted (metric tons)	Total CO2e (metric tons)
BADLANDS (flare alone)	447.8112	44%	99.99963%	75%	0.1	1,122.81	23,578.91
BADLANDS (flare w/engine)	132.4512	44%	99.99963%	75%	0.1	332.10	6,974.04
BADLANDS (engine)	315.36	44%	99.70000%	75%	0.1	804.09	16,885.84
BLYTHE	14.016	8%	0.00000%	75%	0.1	27.88	585.43
COACHELLA (1997)	242.4768	37%	99.99964%	75%	0.1	511.97	10,751.40
CORONA (1986)	157.68	38%	99.90000%	75%	0.1	341.30	7,167.24
DOUBLE BUTTE (1994)	133.152	32%	99.99971%	75%	0.1	242.94	5,101.77
EDOM HILL (1997)	490.56	50%	99.99979%	75%	0.1	1,398.86	29,376.07
ELSINORE (1965)	49.056	19%	99.90006%	75%	0.1	54.50	1,144.55
HIGHGROVE (1998)	217.248	47%	99.99978%	75%	0.1	582.10	12,224.13
LAMB CANYON	449.9136	38%	99.99970%	75%	0.1	975.77	20,491.20
MEAD VALLEY (1997)	157.68	29%	99.99951%	75%	0.1	259.65	5,452.65
W. RIVERSIDE (1993)	46.2528	26%	99.99915%	75%	0.1	69.53	1,460.14
		50%	99%	75%	0.1	-	-
		50%	99%	75%	0.1	-	-
		50%	99%	75%	0.1	-	-
TOTAL	**2405.8464**					**5,600.69**	**117,614.46**

Notes:

MMSCF = Million Standard Cubic Feet

Average values for Fraction of CH_4 in LFG, CH_4 Destruction Efficiency, Collection Efficiency, and Oxidation Factor are present. Numbers should be changed if facility-specific factors exist.

Emissions from on-site equipment and hauling trucks are included in mobile emissions sources

	Measured LFG Flow (SCFM)	% LFG as CH_4	Destruction Efficiency	Estimated Fugitive CH_4 (SCFM)	Estimated Fugitive CH_4 (MT/yr)	Methane Capture in 1990?
BADLANDS (flare w/engine)	189	43.7%	99.9996%	24.78	244.13	
BADLANDS (engine)	450	44.0%	99.7000%	59.99	591.10	
BLYTHE	20	8.0%	0.0000%	2.08	20.49	
COACHELLA (1997)	346	36.8%	99.9996%	38.20	376.36	
CORONA (1986)	225	37.6%	99.9000%	25.46	250.89	Y
DOUBLE BUTTE (1994)	190	31.8%	99.9997%	18.13	178.59	
EDOM HILL (1997)	700	49.7%	99.9998%	104.37	1028.33	
ELSINORE (1965)	70	19.3%	99.9001%	4.07	40.07	
EL SOBRANTE (Total)	3014	45.0%	99.9000%	408.25	4022.32	Y
HIGHGROVE (1998)	310	46.7%	99.9998%	43.43	427.91	
LAMB CANYON	642	37.8%	99.9997%	72.80	717.31	
MEAD VALLEY (1997)	225	28.7%	99.9995%	19.37	190.87	
W. RIVERSIDE (1993)	66	26.2%	99.9991%	5.19	51.11	Y
					8,139.50	
					170,929.49	

Waste data provided by Riverside County Waste Management

35.315 cubic feet/cubic meter

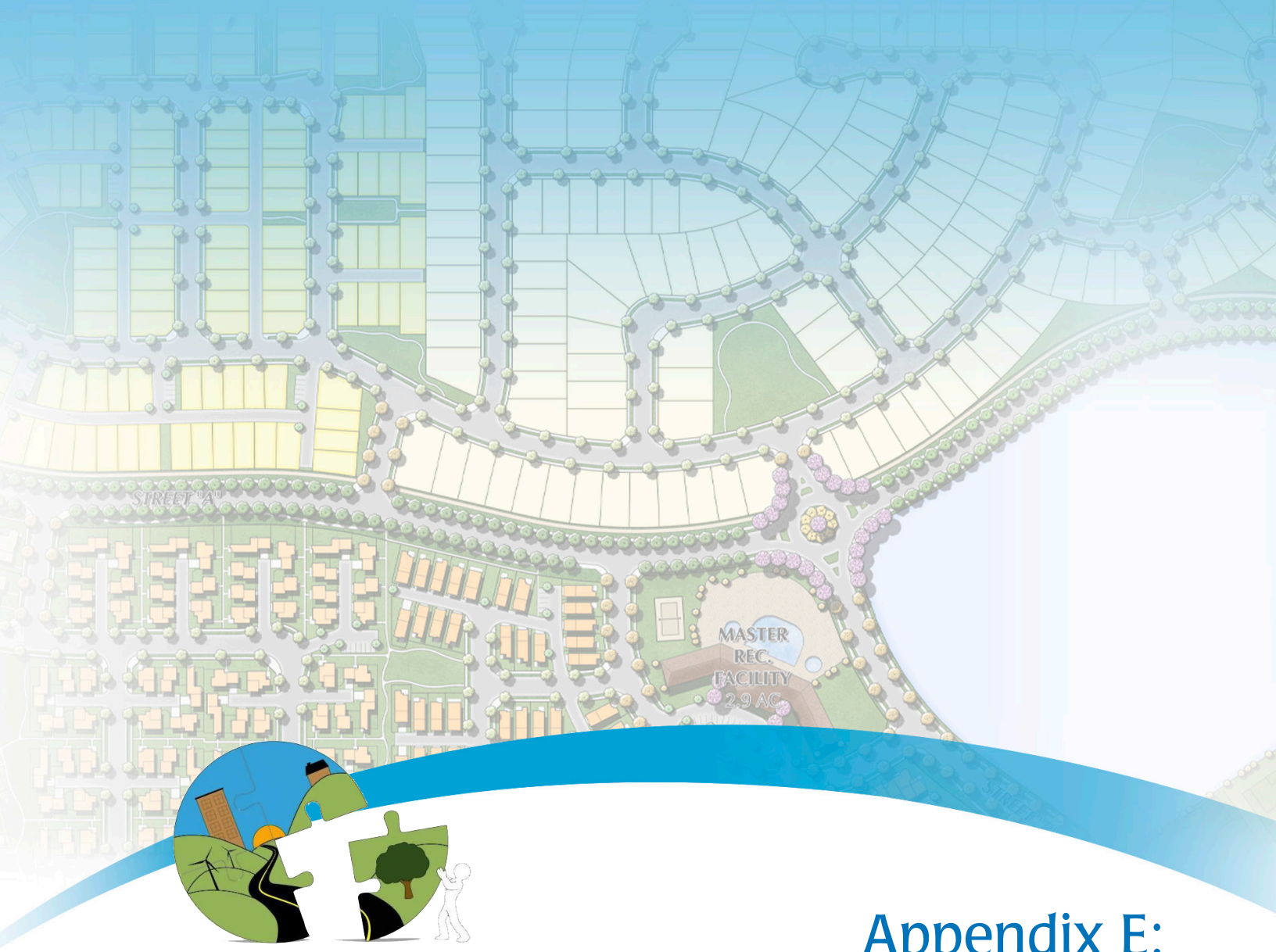
1000000 g/metric ton

Methane density

662 g/m^3

USEPA (2007). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005. United States Environmental Protection Agency. EPA 430-R-07-002. and Annex 3.10: Methodology for Estimating CH4 and N2O Emissions from Manure Management. April 15, 2007. Washington DC.

525,600 minutes per year



Appendix E:
Reduction Measures, Assumptions and Attributed Reductions

This page intentionally left blank

APPENDIX E1: 2020

Transportation Reduction Measures 2020

Pavley I and II and Low Carbon Fuel Standard Calculated on Transportation Tab

R1-T 4 Tire Pressure Program

The AB32 early action measure involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. By 2020, this requirement will reduce emissions in California by approximately 0.55 $MMTCO_2e$, representing 0.3 percent of emissions from passenger/light-duty vehicles in the State.

Reduction to automobiles & light duty Trucks	=	0.30%

R1-T 5 Low Rolling Resistance Tires

This AB32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 $MMTCO_2e$, representing 0.2 percent of emissions from passenger/light-duty vehicles in the State.

Reduction to automobiles & light duty Trucks	=	0.20%

R1-T 6 Low Friction Engine Oils

This AB32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce emissions in California by approximately 2.8 $MMTCO_2e$, representing 1.7 percent of emissions from passenger light-duty vehicles in the State.

Reduction to automobiles & light duty Trucks	=	1.70%

R1-T 7 Goods Movement Efficiency Measures

This AB32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this requirement will reduce emissions in California by approximately 3.5 $MMTCO_2e$, representing 1.6 Percent of emissions from all mobile sources (on-road and off-road) in the State.

Reduction afforded to Medium and Heavy Duty Vehicle emissions	=	1.60%

R1-T 8 Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This AB32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 $MMTCO_2e$, representing 1.9 percent of emissions from heavy-duty vehicles in the State.

Reduction afforded to Heavy Duty Vehicles emissions	=	1.90%

R1-T 9 Medium and Heavy Duty Vehicle Hybridization

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 $MMTCO_2e$, representing 0.2 percent of emissions from all on-road mobile sources in the State. This reduction is also equivalent to a 1.0 percent reduction of emissions from all heavy-duty trucks in the State.

Reduction afforded to passenger cars	=	0.20%
Reduction afforded to heavy duty trucks	=	1.00%

R1-T 10 Regional SB 375 Targets

Regional transportation emission reduction targets have been established. Statewide, this requirement is expected to reduce emissions by 5 MMTCO2e, which is equivalent to 2 percent of emissions from all mobile emission sources. ARB, in conjunction with SCAG, has adopted a target of an 8% decrease in transportation emissions by 2020 for the region. Many of the other reduction strategies included will work toward acheiving this target.

Reduction afforded to mobile emission sources = 6.00%

R1-T 11 CA High Speed Rail

California's planned high speed rail system is anticipated to reduce transportation emissions by 1 MMTCO2e. This amounts to 0.4% of the State's transportation emissions. There are stations planned in or near Riverside County, so the County will experience a similar reduction in emissions.

Reduction afforded to mobile emission sources = 0.00%

IM-T 1 Employment Based Trip and VMT Reduction

Implementation of this measure would require adopting a voluntary trip reduction ordinance that promotes commuter-choice programs, employer transportation management, guaranteed ride home programs and commuter assistance and outreach type programs intended to reduce commuter vehicle miles traveled. A guaranteed ride home program is a program that ensures employees that take advantage of carpooling opportunities are guaranteed a safe ride home should the employee miss the carpool pick-up time due to work related activities. This could be as simple as the employer paying for taxi service for the employee. This measure would require employers with more than 100 employees within the unincorporated County to establish a trip reduction plan that would incorporate annual employee commute surveys, marketing of commute alternatives, ride matching assistance, and transit information at a minimum. This reduction measure adds to and enhances Mobility Policies 2.G-2 and 2.G-3.

Assumptions:

* By 2020, this measure results in a 0.2% reduction in passenger/light-duty VMT in the County.

  The percentage reduction reflects growing decentralized & geographically extensive transportation network in the County.
* Measures R1-T1 through R1-T7 are implemented

IM-T1 Reductions:

Reduction afforded to passenger/light duty VMT in county	=	25.00%	
% Eligible Employees	=	80.00%	(CAPCOA estimate)
% Reduction Afforded	=	20.00%	

IM-T 2 Increased Residential Density

Designing the Project with increased densities, where allowed by the General Plan and/or Zoning Ordinance reduces GHG emissions associated with traffic in several ways. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities

From CAPCOA: % VMT reduction = A * B where: A is the % increase in housing density and B is the elasticity of VMT to housing density.

Assumptions:

* Assume housing density increases by 150%
* Elasticity of VMT w.r.t. housing density is 0.07
* Measures R2-T2, R2-T3, R2-T5, R2-T6, R2-T8, and R3-T1 are implemented.

Reductions:

Reduction afforded to passenger/light duty VMT in county	=	13.50%

IM-T 3 Mixed Use Development

The demand for transportation is influenced by the density and geographic distribution of people and places. Whether neighborhoods have sidewalks or bike paths, whether homes are within walking distance of shops or transit stops will influence the type and amount of transportation that is utilized. By changing the focus of land use from automobile centered transportation, a reduction in vehicle miles traveled will occur. Implementation of Policies LU1.2 (Balanced Land Use Pattern), LU1.3 (Adequate Land Use Supply), LU 3.5 (Infill Development), LU 3.9 (Rural Hubs), LU 3.12 (Mixed Use); Mobility Policies M 3.1 (Transit Service for Residents), M 3.2 (Transit in New Development), M 3.3 (Transit Integration); and Agricultural Policies AG 4.4 (Farm worker Housing), AG 4.6 (Local Processing), AG 4.7 (Local Purchasing), and AG 4.12 (Support Uses) will all work together to provide a reduction in VMT for the County, by changing the

focus of land use away from vehicle centered transportation to the increased densities and lay-outs that foster the implementation and use of alternate modes of transportation.

Assumptions:

* Assumes low range VMT reduction of 9%.
* Measures R2-T2, R2-T3, R2-T5, R2-T6, R2-T8, and R3-T1 are implemented.

Reductions:

Reduction afforded to passenger/light duty VMT in county = 15.00%

IM-T 4 Preferential Parking

Implementation of this reduction measure would encourage the County to adopt a comprehensive parking program for public and private parking lots that facilitate carpooling and alternate transportation. Incentives to encourage carpooling and the use of alternate transportation methods could include:

- Providing reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles;
- Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools; and include adequate passenger waiting/loading areas;
- Consider restricting the number of parking spaces within the County by sharing parking among different land uses where feasible. For example in areas where there are multiple land uses provide resident restricted parking during nighttime hours (7pm to 7am) and open the parking lot for use by patrons of the surrounding commercial buildings during daytime hours; and
- Provide convenient pedestrian pathways through parking areas.

Assumptions:

* The percentage reduction reflects growing decentralized & geographically extensive transportation network in the County.
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T2 are implemented
* Reduction is equal to 0.6% from all vehicle miles traveled by passenger and light duty vehicles in the County.

Reductions:

Reduction afforded to passenger/light duty

VMT in county = 0.60%

IM-T 5

Roadway Improvements Including Signal Synchronization and Transportation Flow Management

A study examined traffic conditions in Southern California using energy and emissions modeling and calculated the impacts of 1) congestion mitigation strategies to smooth traffic flow, 2) speed management techniques to reduce high free-flow speeds, and 3) suppression techniques to eliminate acceleration/deceleration associated with stop-and-go traffic. Using typical conditions on Southern California freeways, the strategies could reduce emissions by 7 to 12 percent. (from CAPCOA) Emissions reductions are highly dependent on current level of congestion on roadways.

Assumptions:

* Results in a 7-12% reduction in emissions (From CAPCOA)
* 12% reduction in emissions used as a conservative estimate
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T3 are implemented

Reductions:

Reduction afforded to passenger/light duty VMT in county = 12.00%

IM-T 6 Provide a Comprehensive System of Facilities for Non-motorized Transportation

Mobility Goal M 5, and land use policies LU 1.10 (Efficient Land Use Patterns) and LU 4.8 (Quality New Development) require the County to address bicycle and pedestrian facilities. These goals and policies should: encourage the creation of bike lanes and walking paths directed to the location of schools, provide adequate bicycle parking; and encourage the development of bicycle stations, attended parking, and other attended bicycle support facilities at intermodal hubs. Bicycle stations are full-service bicycle facilities that in addition to providing secure, guarded bicycle parking could include other amenities such as “valet” bicycle service, showers, bicycle rentals, or repair services. These types of requirements are intended for large residential and non-residential development as well as large employers (500 or more employees). In addition, the establishment of multi-use trails that promote off-street bicycle and pedestrian travel as well as secure bicycle racks along these pathways will encourage their use.

- Proximity to bike lanes;
- Elimination of impediments to bicycle and pedestrian circulation;
- Secure bicycle storage;
- Bicycle and pedestrian incentive programs; and
- Showers and lockers.

Assumptions:

* The percentage reduction reflects growing decentralized & geographically extensive transportation network in the County.

* Measures R1-T1 through R1-T7 and R2-T1 - R2-T5 are implemented are implemented
* Results in a 0.65% reduction in vehicle miles traveled by passenger cars and light duty trucks

Reductions:

Reduction afforded to passenger/light duty VMT County from bike facilities at non-residential	=	0.65%
% Reduction from pedestrian facilities	=	14.00%

IM-T 7 Expand Renewable Fuel/Low-Emission Vehicle Use

Implementation of the following would promote the expanded use of renewable fuel and low-emission vehicles:

- Collaboration between local and regional governments and business to foster the increased use of renewable fuels. This can be accomplished by coordinating the siting of new alternative fueling/recharging locations for example.
- Providing preferential parking for ultra low-, zero- emission, and alternative fuel vehicles;
- Collaboration with energy providers to ensure the availability of necessary facilities and infrastructure to encourage the use of privately owned zero emission vehicles. This can be accomplished by having conveniently located charging and fueling stations for these vehicles.

- Provide incentives for taxicabs to use gas-electric hybrid vehicles or, at a minimum, smaller more fuel-efficient vehicles.

Assumptions:

* Each passenger vehicle (27.5 mpg avg) is replaced with similar electric vehicle
* 95% decrease in emissions is afforded for each vehicle
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T6 are implemented are implemented

Reductions:

Emissions Reduction from each vehicle exchanged for electric vehicle	=	95.0%
% of electric vehicles in 2020	=	25.00%
Reduction afforded to passenger/light duty VMT (	=	23.75%

IM-T 8 Anti-Idling Enforcement

This measure involves the adoption and enforcement of an Anti-Idling Policy for heavy-duty diesel trucks, including local delivery trucks and long-haul truck transport within the County. This policy would prohibit idling of on and off-road heavy duty diesel vehicles for more than 5 minutes. This policy would be implemented by requiring signage at all loading docks and along truck routes informing drivers of the requirement to shut down their trucks after five minutes of idle time at loading docks and parking areas. By 2020 a 100% compliance with the anti-idling rules will reduce emissions in California by approximately 0.7 $MMTCO_2e$, representing 1.9 percent of emissions from heavy-duty diesel vehicles.

Assumptions:

* By 2020, this measure results in a 1.9% reduction in VMT from Medium Duty Vehicles in the County.
* By 2020, this measure results in a 1.9% reduction in VMT from Heavy Duty Vehicles in the County.
* Measures R1-T1 through R1-T7 are implemented

Reductions:

Reduction afforded to Medium and Heavy Duty Vehicle Emissions	=	3.61%

IM-T 9 Increase Public Transit

Assumes an increase in pulic transit coverage to expand upon Riverside County's one exisitng metrolink station.
Estimated increase of 15 percent

Assumptions:

* All default values fro CAPCOA
*
* Measures R1-T1 through R1-T7 are implemented

Reductions:

% increase in transit coverage	=	30.00%
city or transit ridership with respect to service coverage	=	1.01
Existing transit mode share (default for suburban area)	=	1.30%
Adjustments from transit ridership increase to VMT	=	0.67
Total Reductions afforded to passenger vehicles	=	26.391%

IM-T 10 Employee Commute Alternative Schedule

Assumes 30% of employees are eligible.
The 30% are evenly split between 9/80 schedule, 4 day-40 hour work week, and 1.5 days of telecommuting
Numbers from CAPCOA

10% 9/80: 0.7% VMT reduction
10% 4day: 1.5% VMT reduction
10% 1.5 day tele commute: 2.2% VMT reduction

Total reduction afforded to passenger vehicles: = 10.7%

Energy Reduction Measures 2020

R1-E 1 Renewable Portfolio Standard for Building Energy Use

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the State's Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order (EO) S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires State agencies to take all appropriate actions to ensure the target is met. The 33 percent RPS by 2020 goal is supported by the California Air Resources Board (CARB), though its feasibility is not certain due to current limitations in production and transmission of renewable energy.

Assumptions:

* Southern California Edison reaches its 33% goal for 2020.
* Assumes that in 2008 SCE's renewable portfolio was at 14% with respect to California's RPS.
* Assumes a 19% reduction in emissions from existing kWHs used.
* Assumes R1-E2 through R1-E6 have been implemented.

Reductions:

% Reduction Afforded	=	19.00%

R1-E 2 & 3 AB1109 Energy Efficiency Standard for Lighting

Assembly Bill (AB1109) mandated that the California Energy Commission (CEC) on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other State efforts, shall be structured to reduce State-wide electricity consumption in the following ways:

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

Assumptions:

* Assumes 20% of residential electrical use is from lighting.
* Assumes 37.14% of commercial/industrial electrical usage is from lighting.
* Assumes 5.5% of commercial electrical usage is from outdoor streetlights and area lights.

Reductions:

% reduction from residential electrical use	=	10.00%
% reduction from commercial/industrial electrical use	=	10.66%

R1-E 4 Electrical Energy Efficiency

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 21.3 $MMTCO_2e$, representing 17.5 percent of emissions from all electricity in the State. This measure includes the following strategies:

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

Assumptions:

* The percent reduction from California's emissions from various energy efficiency measures is equal to the County's emissions from this measures or 17.5%.
* Assumes application only to New development

Reductions:

% reduction afforded	=	17.50%
% New Residential	=	38.43%
% New Commercial	=	62.98%
% reduction applied to residential	=	6.72%
% reduction applied to commercial	=	11.02%

R1-E 5 Natural Gas Energy Efficiency

This measure captures the emission reductions associated with natural gas energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance(effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 4.3 $MMTCO_2e$, representing 6.2 percent of emissions from all natural gas combustion in the State. This measure includes the following strategies:

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

Assumptions:

* The percent reduction from California's emissions from various energy efficiency measures is equal to the County's emissions from this measures or 6.2%.
* Assumes application only to New development

Reductions:

% reduction afforded	=	6.20%
% New Residential	=	38.43%
% New Commercial	=	49.01%
% reduction applied to residential	=	2.38%
% reduction applied to commercial	=	3.04%

R1-E 6 Increased Combined Heat and Power

This measure captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 GWh State-wide 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 $MMTCO_2e$, representing 7.6 percent of emissions from all electricity in the State.

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from this measures or 7.6%.

Reductions:

% reduction afforded	=	7.60%

R1-E 7 Industrial Efficiency Measures

This measure captures the reduction in industrial building energy emissions associated with the energy efficiency measures for industrial sources included in CARB's AB32 Scoping Plan. By 2020, this requirement will reduce emissions in California by approximately 1.0 $MMTCO_2e$, representing 3.9 percent of emissions from all industrial natural gas combustion in the State. CARB proposes the following possible State-wide measures:

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

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from this measures or 3.9%.
* Assumes applies to all residential, commercial, and industrial land uses.

Reductions:

% reduction afforded	=	3.90%

R2-E 1 Residential Energy Efficiency Program

This measure involves the adoption of a program that facilitates energy efficient design for all new residential buildings to be 20% beyond the current Title 24 Standards . This energy efficiency requirement is equal to that of the LEED for Homes and ENERGY STAR programs.

The 2008 Title 24 Energy Standards were adopted by the Energy Commission on April 23, 2008, with the 2008 Residential Compliance Manual adopted by the Commission on December 17, 2008. Compliance with the 2008 standards went into effect January 1, 2010. In an effort to meet the overall goal of the California Energy Efficiency Strategic Plan of reaching zero net energy for residential buildings by 2020, the stringency of the Title 24 Energy Standards as regulated and required by the State will continue to increase every three years. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

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

The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (33 points) the developer will meet the requirements of this measure. This system will assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the strategies outlined in the bullet points above.

Assumptions:

* Applies to new development only.
* Assumes new development to be 20% beyond current Title 24.

Reductions:

% of new residential development	=	38.43%
% reduction afforded	=	20.00%
Total % reduction	=	7.69%

R2-E 2 Residential Renewable Energy Program

This measure facilitates the voluntary incorporation of renewable energy (such as photovoltaic panels) into new residential developments. For participating developments, renewable energy application should be such that the new home's projected energy use from the grid is reduced by 50%. The California Energy Commissions' New Solar Homes Partnership is a component of the California Solar Initiative and provides rebates to developers of 6 or more units where 50% of the units include solar power. In addition this measure would encourage that all residents be equipped with "solar ready" features where feasible, to encourage future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} 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. The incentive program should provide enough funding and other incentives as shown in the R3 measures to result in approximately fifty percent of new residential development participation in this program, thereby resulting in a 25% reduction in electrical consumption from new residential developments.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into a purchased energy offset program that will allow for the purchase of electricity generated from renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal to 25% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

Assumptions:

* Applies to new development only.
* Assumes that 50% of new development will participate.
* Assumes that those developments participating will reduce electrical use by 50%.

Reductions:

% of residential that is new	=	38.43%
% reduction from energy use	=	65.00%
% participating	=	50.00%
Total % reduction	=	12.49%

R2-E 3 Residential Retrofit Implementation Program

This measure would initiate a County program that facilitates the incorporation of energy reduction measures for residential buildings undergoing major renovations. AB 811 is a potential funding source to the County for implementing incentive programs to encourage residences within the County to undertake energy efficiency retrofitting and reducing energy consumption in retrofitted homes by a minimum of 15%. As with the new development, the County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- 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.

Assumptions:

* Applies to existing development only.
* Assumes that30% of existing development will participate.
* Assumes that those developments participating will increase efficiency by 20%.
* Assumes reduction from electrical and natural gas.

Reductions:

% of 2020 that is existing residential development	=	61.57%
% reduction applied	=	50.00%
% existing homes participating	=	30.00%
Total % reduction	=	9.24%

R2-E 4 Residential Renewable Retrofit Program

This measure will initiate an incentive program that encourages residents to retrofit their homes with photovoltaic panels such that 50% of all of the home's electrical usage is offset. The California Energy Commission's Solar Initiative has incentives available to home owners.

Assumptions:

* Applies to existing development only.
* Assumes that 25% of existing development will participate.
* Assumes that those developments participating will reduce emissions from electricity by60%.
* Assumes reduction from electricity.

Reductions:

% of 2020 that is existing residential development	=	61.57%
% reduction applied	=	65.00%
% existing homes participating	=	30.00%
Total % reduction	=	12.01%

R2-E 5 Commercial Energy Efficiency Program

This measure involves the adoption of a County Program that facilitates the energy efficient design for all new commercial buildings within Sutter Pointe to be 20% beyond the current Title 24 Standards which expands the new development requirements set forth in the Sutter Pointe Specific Plan EIR. This voluntary energy efficiency requirement is 10% greater than the minimum requirements of the LEED and ENERGY STAR programs. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

As described in R2-E1 above, the County could provide all developers with a list of potentially feasible GHG reduction measures that reflect the current state of the regulatory environment. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will provide flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Install energy efficient appliances, including air conditioning and heating units, dishwashers, water heaters, etc.;
- Install solar water heaters;
- Install top quality windows and insulation;
- Install energy efficient lighting;
- Optimize conditions for natural heating, cooling and lighting by building siting and orientation.
- Use features that incorporate natural ventilation;
- Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes; and

- ❖ Incorporate skylights; reflective surfaces, and natural shading in buildings design and layouts.

Assumptions:

- * Applies to new development only.
- * Assumes new development to be 28% beyond current Title 24.

Reductions:

% new com/ind that is new	=	62.98%
% reduction afforded	=	28.00%
Total % reduction	=	17.63%

R2-E 6 Commercial/Industrial Renewable Energy Program

This measure would facilitate the voluntary incorporation of renewable (solar or other renewable) energy generation into the design and construction of new commercial, office, and industrial developments. Renewable energy generation shall be incorporated such that a minimum of 20% of the project's total energy needs are offset. In addition this measure would encourage all facilities be equipped with "solar ready" features where feasible, to facilitate future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} 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.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into an offset program that will allow for the purchase of renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal 20% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

Assumptions:

- * Applies to new development only.
- * Assumes that 75% of new development will participate.
- * Assumes that those developments participating will reduce electrical use by 65%.

Reductions:

% of com/ind development from growth	=	62.98%
% reduction from program	=	65.00%
% of participation	=	75.00%
Total % reduction	=	30.70%

R2-E 7 Commercial/Industrial Retrofit Program

This measure encourages all commercial or industrial buildings undergoing major renovations to reduce their energy consumption by a minimum of 20%. As with the new development, a menu of options will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following: (Includes both energy efficiency and renewable energy technologies)

- 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.

Assumptions:

* Applies to existing development only.
* Assumes that 25% of existing development will participate.
* Assumes that those developments participating will increase efficiency by 25%.
* Assumes reduction from electrical and natural gas.

Reductions:

% from existing com/ind development	=	37.02%
% reduction applied	=	40.00%
% of participation	=	30.00%
Total % reduction	=	4.44%

R2-E 8 **Induction Streetlight Retrofits**

The new lamps are estimated to last 5 times longer and consume 50% less energy than the HPS lamps.

Assumptions:

* Applies to streetlight electricity consumption
* Assumes 20% of lamps will be retrofitted
* Retrofitted lamps will use 50% less energy

Reductions:

% reduction applied	=	50.00%
% streetlights retrofitted	=	100.00%
% 2020 comm electricity use from streetlights	=	7.65%
Total % reduction	=	3.83%

Area Source Reduction Measures 2020

R2-L1 Electric Landscaping Equipment

49.5% % reduction *CAPCOA report*

SCAQMD Healthy Hearths Program

R2-L2 No new wood burning devices in homes

R2-L3 10 to 25 Mandatory Curtailment days

Total Heating Days	120	(November-February)
% Reduction	0.125	

Purchased Water Reduction Measures 2020

R1-W 1 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 percent by 2020. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 $MMTCO_2e$, representing 15.2 percent of emissions from electricity generation (in-State and imports).

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from electricity used for water supply and conveyance or 21%.
* Assumes applies to all residential, commercial, and industrial land uses.

Reductions:

% reduction afforded = 19.00%

R2-W 1 Water Use Reduction Initiative

This initiative would reduce emissions associated with electricity consumption for water treatment and reduction and therefore are included with the energy reductions. This measure encourages the County to adopt a per capita water use reduction goal in support of the Governors Executive Order S-14-08 which mandates the reduction of water use of 20 percent per capita. The County's adoption of a water use reduction goal would introduce requirements for new development and would provide cooperative support for water purveyors that are required to implement these reductions for existing developments. The County would also provide internal reduction measures such that County facilities will support this reduction requirement. The following represent potential programs that can be implemented to attain this reduction goal.

Water Conservation Program:

Under this program the excessive watering of landscaping, excessive fountain operation, watering during peak daylight hours, water of non-permeable surfaces, excessive water use for noncommercial washing, and water use resulting in flooding or runoff would be prohibited. In addition the program

would encourage efficient water use for construction activities, the installation of low-flow toilets and showerheads for all new developments, use of drought-tolerant plants with efficient landscape watering systems for all new developments, recycling of water used for cooling systems, use of pool covers, and the posting of water conservation signage at all hotels.

New Development Incentives:

Provide incentives for developers to comply with the California Green Building Standards Code as requirements for all new development. Under this Code new developments are required to reduce indoor potable water use by 20% beyond the Energy Policy Act of 1992 fixture performance requirements, and to reduce outdoor potable water use by 50% from a mid-summer baseline average consumption through irrigation efficiency, native plant selection, the use of recycled water and/or captured rainwater for example.

Water Meter Program:

Encourage water providers to install water meters for all County homes not using wells. This would provide for a better accounting of County water usage and provide potential costing per usage to help offset costs of the implementation of water conservation programs.

Water Efficiency Pricing Program

Under this program, the County would encourage water suppliers to adopt a water conservation pricing schedule (i.e. tiered rate) to encourage efficient water use. Notices could be provided in each billing showing water use budgets and the relationship between the budget and the actual usage.

Water Efficiency Retrofit Program:

This program would encourage upgrades in water efficiency for renovations or additions of residential, commercial, office, and industrial properties equivalent to that of new developments. The County would work with local water purveyors to achieve consistent standards, and to develop, approve, and review procedures for implementation.

Water Efficiency Training and Education:

Under this measure the County, in coordination with local water purveyors would implement a public information and education program that promotes water conservation. The program could include certification programs for irrigation designers, installers, and managers, as well as classes to promote the use of drought tolerant, native species and xeriscaping.

R2-W 1 Water Use Reduction Initiative

Increased Recycled Water Use:

Promote the use of municipal wastewater and graywater for agricultural, industrial and irrigation purposes. This measure would be subject to approval of the State Health Department and compliance with Title 22 provisions. This measure would facilitate the following:

- Inventory of non-potable water uses that could be substituted with recycled or graywater;
- Determination of the feasibility of producing and distributing recycled water for groundwater replenishment;
- Determine the associated energy/GHG tradeoffs for treatment/use vs. out of basin water supply usage; and
- Cooperation and coordination with responsible agencies to encourage the use of recycled water where energy tradeoffs are favorable.

Assumptions:

* Applies to all land uses (existing and new development)
* Assumes emission reduction of 20%.
* Assumes reduction to electricity used to treat and convey water and wastewater.
* Assumes that approximately 14% of the electricity usage is used to pump water from wells.

Reductions:

% reduction applied to water usage directly = 20.00%

IM-W 1 Increase Reclaimed Water Use

This measure would increase electricity production from eligible renewable power sources to 33 percent by 2020. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 $MMTCO_2e$, representing 15.2 percent of emissions from electricity generation (in-State and imports).

Assumptions:

* Percent of total water use coming from reclaimed is 5%
* Percentage reduction GHG by using reclaimed rather than potable water is 81%

Reductions:

% reduction afforded = 4.05%

Solid Waste Reduction Measures 2020

IM-W 1 County Diversion Program

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

- Provide outreach and education programs for residential, commercial, and industrial land uses in order to further promote existing County diversion programs;
- Increase disposal fees and/or reduce residential pick-up frequency;
- Encourage businesses to adopt a voluntary procurement standard and prioritize those products that have less packaging, are reusable, recyclable, or compostable;
- Support State level policies that provide incentives for efficient and reduced packaging waste for commercial products;

- Expand list of recyclable materials;
- Work with Recology to develop and provide waste audits;
- Make recycling and composting opportunities mandatory at all public events;
- Establish an appliance end-of-life requirement;
- For new developments, require the use of recycled-content materials, or recycled materials;
- Require a minimum of 15% of materials used in construction be sourced locally, as feasible; and
- Encourage the use of recycled building materials and cement substitutes for new developments.

Assumptions:

- Assumes an existing diversion rate of 53%
- Assumes 2020 goal of 80% diversion rate.
- Does not apply to construction activities
- % reduction applied is equivalent to: (80-53)/47

Reductions:

% reduction applied	=	57.45%
% not from construction activities	=	81.20%
% reduction applied	=	46.65%

IM-W 2 Construction Diversion Program

This IM also implements General Plan Policies AQ 4.1 and AQ 5.1 by giving incentives through points within the Screening Table to new development that provided diversion of 70% of construction waste. This provides a 20% increase in diversion beyond AB2176, § 42911, that requires development projects to provide adequate areas for collecting and loading recyclable materials and ensures a 50% diversion rate prior to being issued a building permit.

% reduction applied is equivalent to: 20/50

Reductions:

% reduction applied	=	40%
% from construction activities	=	18.80%
% reduction applied	=	7.52%

APPENDIX E2: 2035

Transportation Reduction Measures 2035

Pavley I and II and Low Carbon Fuel Standard Calculated on Transportation Tab

R1-T 4 Tire Pressure Program

The AB32 early action measure involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. By 2020, this requirement will reduce emissions in California by approximately 0.55 $MMTCO_2e$, representing 0.3 percent of emissions from passenger/light-duty vehicles in the State.

Reduction to automobiles & light duty Trucks	=	0.30%

R1-T 5 Low Rolling Resistance Tires

This AB32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 $MMTCO_2e$, representing 0.2 percent of emissions from passenger/light-duty vehicles in the State.

Reduction to automobiles & light duty Trucks	=	0.20%

R1-T 6 Low Friction Engine Oils

This AB32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce emissions in California by approximately 2.8 $MMTCO_2e$, representing 1.7 percent of emissions from passenger light-duty vehicles in the State.

Reduction to automobiles & light duty Trucks	=	1.70%

R1-T 7 Goods Movement Efficiency Measures

This AB32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this requirement will reduce emissions in California by approximately 3.5 $MMTCO_2e$, representing 1.6 Percent of emissions from all mobile sources (on-road and off-road) in the State.

Reduction afforded to Medium and Heavy Duty Vehicle emissions	=	1.60%

R1-T 8 Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This AB32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 $MMTCO_2e$, representing 1.9 percent of emissions from heavy-duty vehicles in the State.

Reduction afforded to Heavy Duty Vehicles emissions	=	1.90%

R1-T 9 Medium and Heavy Duty Vehicle Hybridization

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 $MMTCO_2e$, representing 0.2 percent of emissions from all on-road mobile sources in the State. This reduction is also equivalent to a 1.0 percent reduction of emissions from all heavy-duty trucks in the State.

Reduction afforded to passenger cars	=	1.00%
Reduction afforded to heavy duty trucks	=	2.00%

R1-T 10 Regional SB 375 Targets

Regional transportation emission reduction targets have been established. Statewide, this requirement is expected to reduce emissions by 5 MMTCO2e, which is equivalent to 2 percent of emissions from all mobile emission sources. ARB, in conjunction with SCAG, has adopted a target of an 8% decrease in transportation emissions by 2020 for the region. Many of the other reduction strategies included will work toward acheiving this target.

Reduction afforded to mobile emission sources = 8.00%

R1-T 11 CA High Speed Rail

California's planned high speed rail system is anticipated to reduce transportation emissions by 1 MMTCO2e. This amounts to 0.4% of the State's transportation emissions. There are stations planned in or near Riverside County, so the County will experience a similar reduction in emissions.

Reduction afforded to mobile emission sources = 0.00%

IM-T 1 Employment Based Trip and VMT Reduction

Implementation of this measure would require adopting a voluntary trip reduction ordinance that promotes commuter-choice programs, employer transportation management, guaranteed ride home programs and commuter assistance and outreach type programs intended to reduce commuter vehicle miles traveled. A guaranteed ride home program is a program that ensures employees that take advantage of carpooling opportunities are guaranteed a safe ride home should the employee miss the carpool pick-up time due to work related activities. This could be as simple as the employer paying for taxi service for the employee. This measure would require employers with more than 100 employees within the unincorporated County to establish a trip reduction plan that would incorporate annual employee commute surveys, marketing of commute alternatives, ride matching assistance, and transit information at a minimum. This reduction measure adds to and enhances Mobility Policies 2.G-2 and 2.G-3.

Assumptions:

* By 2035, this measure results in a 25% reduction in passenger/light-duty VMT in the County. The percentage reduction reflects a growing decentralized and geographically extensive transportation network in the County.
* Measures R1-T1 through R1-T7 are implemented

Reductions:

Reduction afforded to passenger/light duty VMT in county	=	25.00%
% Eligible Employees	=	80.00%
% Reduction Afforded	=	20.00%

IM-T 2 Increased Residential Density

Designing the Project with increased densities, where allowed by the General Plan and/or Zoning Ordinance reduces GHG emissions associated with traffic in several ways. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities

From CAPCOA: % VMT reduction = A * B where: A is the % increase in housing density and B is the elasticity of VMT with respect to housing density.

Assumptions:

* Assume housing density increases by 150%
* Elasticity of VMT w.r.t. housing density is 0.07
* Measures R2-T2, R2-T3, R2-T5, R2-T6, R2-T8, and R3-T1 are implemented.

Reductions:

Reduction afforded to passenger/light duty VMT in county	=	17.50%

IM-T 3 Mixed Use Development

The demand for transportation is influenced by the density and geographic distribution of people and places. Whether neighborhoods have sidewalks or bike paths, whether homes are within walking distance of shops or transit stops will influence the type and amount of transportation that is utilized. By changing the focus of land use from automobile centered transportation, a reduction in vehicle miles traveled will occur. Implementation of Policies LU1.2 (Balanced Land Use Pattern), LU1.3 (Adequate Land Use Supply), LU 3.5 (Infill Development), LU 3.9 (Rural Hubs), LU 3.12 (Mixed Use); Mobility Policies M 3.1 (Transit Service for Residents), M 3.2 (Transit in New Development), M 3.3 (Transit Integration); and Agricultural Policies AG 4.4 (Farm worker Housing), AG 4.6 (Local Processing), AG 4.7 (Local Purchasing), and AG 4.12 (Support Uses) will all work together to provide a reduction in VMT for the County, by changing the focus of land use away from vehicle centered transportation to the increased densities and lay-outs that foster the implementation and use of alternate modes of transportation.

Assumptions:

* Assumes low range VMT reduction of 9%.
* Measures R2-T2, R2-T3, R2-T5, R2-T6, R2-T8, and R3-T1 are implemented.

Reductions:

Reduction afforded to passenger/light duty VMT in county	=	12.00%

IM-T 4 Preferential Parking

Implementation of this reduction measure would encourage the County to adopt a comprehensive parking program for public and private parking lots that facilitate carpooling and alternate transportation. Incentives to encourage carpooling and the use of alternate transportation methods could include:

- Providing reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles;
- Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools; and include adequate passenger waiting/loading areas;
- Consider restricting the number of parking spaces within the County by sharing parking among different land uses where feasible. For example in areas where there are multiple land uses provide resident restricted parking during nighttime hours (7pm to 7am) and open the parking lot for use by patrons of the surrounding commercial buildings during daytime hours; and

- Provide convenient pedestrian pathways through parking areas.

Assumptions:

* 0
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T2 are implemented
* Reduction is equal to 0.1% from all vehicle miles traveled by passenger and light duty vehicles in the County.

Reductions:

Reduction afforded to passenger/light duty VMT in county	=	1.00%

IM-T 5

Roadway Improvements Including Signal Synchronization and Transportation Flow Management

A study examined traffic conditions in Southern California using energy and emissions modeling and calculated the impacts of 1) congestion mitigation strategies to smooth traffic flow, 2) speed management techniques to reduce high free-flow speeds, and 3) suppression techniques to eliminate acceleration/deceleration associated with stop-and-go traffic. Using typical conditions on Southern California freeways, the strategies could reduce emissions by 7 to 12 percent. (from CAPCOA) Emissions reductions are highly dependent on current level of congestion on roadways.

Assumptions:

* Results in a 7-12% reduction in emissions (From CAPCOA)
* 12% reduction in emissions used as a conservative estimate
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T3 are implemented

Reductions:

Reduction afforded to passenger/light duty VMT in county	=	12.00%

IM-T 6 Provide a Comprehensive System of Facilities for Non-motorized Transportation

Mobility Goal M 5, and land use policies LU 1.10 (Efficient Land Use Patterns) and LU 4.8 (Quality New Development) require the County to address bicycle and pedestrian facilities. These goals and policies should: encourage the creation of bike lanes and walking paths directed to the location of schools, provide adequate bicycle parking; and encourage the development of bicycle stations, attended parking, and other attended bicycle support facilities at intermodal hubs. Bicycle stations are full-service bicycle facilities that in addition to providing secure, guarded bicycle parking could include other amenities such as "valet" bicycle service, showers, bicycle rentals, or repair services. These types of requirements are intended for large residential and non-residential development as well as large employers (500 or more employees). In addition, the establishment of multi-use trails that promote off-street bicycle and pedestrian travel as well as secure bicycle racks along these pathways will encourage their use.

- Proximity to bike lanes;
- Elimination of impediments to bicycle and pedestrian circulation;
- Secure bicycle storage;
- Bicycle and pedestrian incentive programs; and
- Showers and lockers.

Assumptions:

* 0

* Measures R1-T1 through R1-T7 and R2-T1 - R2-T5 are implemented are implemented
* Results in a 0.65% reduction in vehicle miles traveled by passenger cars and light duty trucks

Reductions:

Reduction afforded to passenger/light duty VMT County from bike facilities at non-residential	=	6.00%
% Reduction from pedestrian facilities	=	4.50%

IM-T 7 Expand Renewable Fuel/Low-Emission Vehicle Use

Implementation of the following would promote the expanded use of renewable fuel and low-emission vehicles:

- Collaboration between local and regional governments and business to foster the increased use of renewable fuels. This can be accomplished by coordinating the siting of new alternative fueling/recharging locations for example.
- Providing preferential parking for ultra low-, zero- emission, and alternative fuel vehicles;
- Collaboration with energy providers to ensure the availability of necessary facilities and infrastructure to encourage the use of privately owned zero emission vehicles. This can be accomplished by having conveniently located charging and fueling stations for these vehicles.
- Provide incentives for taxicabs to use gas-electric hybrid vehicles or, at a minimum, smaller more fuel-efficient vehicles.

Assumptions:

* Each passenger vehicle (27.5 mpg avg) is replaced with similar electric vehicle
* 79% decrease in emissions is afforded for each vehicle
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T6 are implemented

Reductions:

Emissions Reduction from each vehicle exchanged for electric vehicle	=	98.0%
% of electric vehicles in 2035	=	69.00%
Reduction afforded to passenger/light duty VMT Coun	=	67.62%

IM-T 8 Anti-Idling Enforcement

This measure involves the adoption and enforcement of an Anti-Idling Policy for heavy-duty diesel trucks, including local delivery trucks and long-haul truck transport within the County. This policy would prohibit idling of on and off-road heavy duty diesel vehicles for more than 5 minutes. This policy would be implemented by requiring signage at all loading docks and along truck routes informing drivers of the requirement to shut down their trucks after five minutes of idle time at loading docks and parking areas. By 2020 a 100% compliance with the anti-idling rules will reduce emissions in California by approximately 0.7 $MMTCO_2e$, representing 1.9 percent of emissions from heavy-duty diesel vehicles.

Assumptions:

* By 2020, this measure results in a 1.9% reduction in VMT from Medium Duty Vehicles in the County.
* By 2020, this measure results in a 1.9% reduction in VMT from Heavy Duty Vehicles in the County.
* Measures R1-T1 through R1-T7 are implemented

Reductions:

Reduction afforded to Medium and Heavy Duty Vehicle Emissions	=	2.66%

IM-T 9 Increase Public Transit

Assumes an increase in pulic transit coverage to expand upon Riverside County's one exisitng metrolink station. Estimated increase of 15 percent

Assumptions:

* All default values fro CAPCOA
*
* Measures R1-T1 through R1-T7 are implemented

Reductions:

% increase in transit coverage	=	30.00%
Elasticity or transit ridership with respect to service coverage	=	1.01
Existing transit mode share (default for suburban area)	=	1.30%
Adjustments from transit ridership increase to VMT	=	0.67
Total Reductions afforded to passenger vehicles	=	26.391%

IM-T **10 Employee Commute Alternative Schedule**

Assumes 30% of employees are eligible.

The 30% are evenly split between 9/80 schedule, 4 day-40 hour work week, and 1.5 days of telecommuting

Numbers from CAPCOA

10% 9/80: 0.7% VMT reduction

10% 4day: 1.5% VMT reduction

10% 1.5 day tele commute: 2.2% VMT reduction

Total reduction afforded to passenger vehicles: = 4.4%

Energy Reduction Measures 2035

R1-E 1 Renewable Portfolio Standard for Building Energy Use

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the State's Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order (EO) S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires State agencies to take all appropriate actions to ensure the target is met. The 33 percent RPS by 2020 goal is supported by the California Air Resources Board (CARB), though its feasibility is not certain due to current limitations in production and transmission of renewable energy.

Assumptions:

* Southern California Edison reaches its 33% goal for 2020.
* Assumes that in 2008 SCE's renewable portfolio was at 14% with respect to California's RPS.
* Assumes a 19% reduction in emissions from existing kWHs used.
* Assumes R1-E2 through R1-E6 have been implemented.

Reductions:

% Reduction Afforded	=	25.00%

R1-E 2 & 3 AB1109 Energy Efficiency Standard for Lighting

Assembly Bill (AB1109) mandated that the California Energy Commission (CEC) on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other State efforts, shall be structured to reduce State-wide electricity consumption in the following ways:

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

Assumptions:

* Assumes 20% of residential electrical use is from lighting.
* Assumes 37.14% of commercial/industrial electrical usage is from lighting.
* Assumes 5.5% of commercial electrical usage is from outdoor streetlights and area lights.

Reductions:

% reduction from residential electrical use	=	15.00%
% reduction from commercial/industrial electrical use	=	21.32%

R1-E 4 Electrical Energy Efficiency

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 21.3 $MMTCO_2e$, representing 17.5 percent of emissions from all electricity in the State. This measure includes the following strategies:

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

Assumptions:

* The percent reduction from California's emissions from various energy efficiency measures is equal to the County's emissions from this measures or 17.5%.
* Assumes application only to New development

Reductions:

% reduction afforded	=	20.00%
% New Residential	=	48.07%
% New Commercial	=	72.62%
% reduction applied to residential	=	9.61%
% reduction applied to commercial	=	14.52%

R1-E 5 Natural Gas Energy Efficiency

This measure captures the emission reductions associated with natural gas energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance(effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 4.3 $MMTCO_2e$, representing 6.2 percent of emissions from all natural gas combustion in the State. This measure includes the following strategies:

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

Assumptions:

* The percent reduction from California's emissions from various energy efficiency measures is equal to the County's emissions from this measures or 6.2%.
* Assumes application only to New development

Reductions:

% reduction afforded	=	8.00%
% New Residential	=	48.07%
% New Commercial	=	62.28%
% reduction applied to residential	=	3.85%
% reduction applied to commercial	=	4.98%

R1-E 6 Increased Combined Heat and Power

This measure captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 GWh State-wide 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 $MMTCO_2e$, representing 7.6 percent of emissions from all electricity in the State.

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from this measures or 7.6%.

Reductions:

% reduction afforded	=	10.00%

R1-E 7 Industrial Efficiency Measures

This measure captures the reduction in industrial building energy emissions associated with the energy efficiency measures for industrial sources included in CARB's AB32 Scoping Plan. By 2020, this requirement will reduce emissions in California by approximately 1.0 $MMTCO_2e$, representing 3.9 percent of emissions from all industrial natural gas combustion in the State. CARB proposes the following possible State-wide measures:

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

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from this measures or 3.9%.
* Assumes applies to all residential, commercial, and industrial land uses.

Reductions:

% reduction afforded	=	5.00%

R2-E 1 Residential Energy Efficiency Program

This measure involves the adoption of a program that facilitates energy efficient design for all new residential buildings to be 20% beyond the current Title 24 Standards . This energy efficiency requirement is equal to that of the LEED for Homes and ENERGY STAR programs.

The 2008 Title 24 Energy Standards were adopted by the Energy Commission on April 23, 2008, with the 2008 Residential Compliance Manual adopted by the Commission on December 17, 2008. Compliance with the 2008 standards went into effect January 1, 2010. In an effort to meet the overall goal of the California Energy Efficiency Strategic Plan of reaching zero net energy for residential buildings by 2020, the stringency of the Title 24 Energy Standards as regulated and required by the State will continue to increase every three years. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

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

The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (33 points) the developer will meet the requirements of this measure. This system will assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the strategies outlined in the bullet points above.

Assumptions:

* Applies to new development only.
* Assumes new development to be 20% beyond current Title 24.

Reductions:

% of new residential development	=	48.07%
% reduction afforded	=	25.00%
Total % reduction	=	12.02%

R2-E 2 Residential Renewable Energy Program

This measure facilitates the voluntary incorporation of renewable energy (such as photovoltaic panels) into new residential developments. For participating developments, renewable energy application should be such that the new home's projected energy use from the grid is reduced by 50%. The California Energy Commissions' New Solar Homes Partnership is a component of the California Solar Initiative and provides rebates to developers of 6 or more units where 50% of the units include solar power. In addition this measure would encourage that all residents be equipped with "solar ready" features where feasible, to encourage future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} 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. The incentive program should provide enough funding and other incentives as shown in the R3 measures to result in approximately fifty percent of new residential development participation in this program, thereby resulting in a 25% reduction in electrical consumption from new residential developments.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into a purchased energy offset program that will allow for the purchase of electricity generated from renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal to 25% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

Assumptions:

* Applies to new development only.
* Assumes that 50% of new development will participate.
* Assumes that those developments participating will reduce electrical use by 50%.

Reductions:

% of residential that is new	=	48.07%
% reduction from energy use	=	50.00%
% participating	=	65.00%
Total % reduction	=	15.62%

R2-E 3 Residential Retrofit Implementation Program

This measure would initiate a County program that facilitates the incorporation of energy reduction measures for residential buildings undergoing major renovations. AB 811 is a potential funding source to the County for implementing incentive programs to encourage residences within the County to undertake energy efficiency retrofitting and reducing energy consumption in retrofitted homes by a minimum of 15%. As with the new development, the County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- 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.

Assumptions:

* Applies to existing development only.
* Assumes that 25% of existing development will participate.
* Assumes that those developments participating will increase efficiency by 20%.

* Assumes reduction from electrical and natural gas.

Reductions:

% of 2020 that is existing residential development	=	51.93%
% reduction applied	=	40.00%
% existing homes participating	=	50.00%
Total % reduction	=	10.39%

R2-E 4 Residential Renewable Retrofit Program

This measure will initiate an incentive program that encourages residents to retrofit their homes with photovoltaic panels such that 50% of all of the home's electrical usage is offset. The California Energy Commission's Solar Initiative has incentives available to home owners.

Assumptions:

* Applies to existing development only.
* Assumes that 25% of existing development will participate.
* Assumes that those developments participating will reduce emissions from electricity by 50%.
* Assumes reduction from electricity.

Reductions:

% of 2020 that is existing residential development	=	51.93%
% reduction applied	=	50.00%
% existing homes participating	=	50.00%
Total % reduction	=	12.98%

R2-E 5 Commercial Energy Efficiency Program

This measure involves the adoption of a County Program that facilitates the energy efficient design for all new commercial buildings within Sutter Pointe to be 20% beyond the current Title 24 Standards which expands the new development requirements set forth in the Sutter Pointe Specific Plan EIR. This voluntary energy efficiency requirement is 10% greater than the minimum requirements of the LEED and ENERGY STAR programs. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

As described in R2-E1 above, the County could provide all developers with a list of potentially feasible GHG reduction measures that reflect the current state of the regulatory environment. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will provide flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

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

Assumptions:

* Applies to new development only.
* Assumes new development to be 20% beyond current Title 24.

Reductions:

% new com/ind that is new	=	72.62%
% reduction afforded	=	30.00%
Total % reduction	=	21.78%

R2-E 6 Commercial/Industrial Renewable Energy Program

This measure would facilitate the voluntary incorporation of renewable (solar or other renewable) energy generation into the design and construction of new commercial, office, and industrial developments. Renewable energy generation shall be incorporated such that a minimum of 20% of the project's total energy needs are offset. In addition this measure would encourage all facilities be equipped with "solar ready" features where feasible, to facilitate future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} 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.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into an offset program that will allow for the purchase of renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal 20% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

Assumptions:

* Applies to new development only.
* Assumes that 25% of new development will participate.
* Assumes that those developments participating will reduce electrical use by 25%.

Reductions:

% of com/ind development from growth	=	72.62%
% reduction from program	=	25.00%
% of participation	=	60.00%
Total % reduction	=	10.89%

R2-E 7 Commercial/Industrial Retrofit Program

This measure encourages all commercial or industrial buildings undergoing major renovations to reduce their energy consumption by a minimum of 20%. As with the new development, a menu of options will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following: (Includes both energy efficiency and renewable energy technologies)

- 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.

Assumptions:

- Applies to existing development only.
- Assumes that 25% of existing development will participate.
- Assumes that those developments participating will increase efficiency by 25%.
- Assumes reduction from electrical and natural gas.

Reductions:

% from existing com/ind development	=	27.38%
% reduction applied	=	40.00%
% of participation	=	60.00%
Total % reduction	=	6.57%

R2-E 8 Induction Streetlight Retrofits

The new lamps are estimated to last 5 times longer and consume 50% less energy than the HPS lamps.

Assumptions:

- Applies to streetlight electricity consumption
- Assumes 20% of lamps will be retrofitted
- Retrofitted lamps will use 50% less energy

Reductions:

% reduction applied	=	50.00%
% streetlights retrofitted	=	100.00%
% 2020 comm electricity use from streetlights	=	7.65%
Total % reduction	=	3.83%

Area Source Reduction Measures

2035

R2-L1 Prohibit Gas Powered Landscape Equipment

49.5% % reduction *CAPCOA report*

SCAQMD Healthy Hearths Program

R2-L2 No new wood burning devices in homes

R2-L3 10 to 25 Mandatory Curtailment days

Total Heating Days	120	(November-February)
% Reduction	0.125	

Purchased Water Reduction Measures 2035

R1-W 1 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 percent by 2020. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 $MMTCO_2e$, representing 15.2 percent of emissions from electricity generation (in-State and imports).

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from electricity used for water supply and conveyance or 21%.
* Assumes applies to all residential, commercial, and industrial land uses.

Reductions:

% reduction afforded = 21.00%

R2-W 1 Water Use Reduction Initiative

This initiative would reduce emissions associated with electricity consumption for water treatment and reduction and therefore are included with the energy reductions. This measure encourages the County to adopt a per capita water use reduction goal in support of the Governors Executive Order S-14-08 which mandates the reduction of water use of 20 percent per capita. The County's adoption of a water use reduction goal would introduce requirements for new development and would provide cooperative support for water purveyors that are required to implement these reductions for existing developments. The County would also provide internal reduction measures such that County facilities will support this reduction requirement. The following represent potential programs that can be implemented to attain this reduction goal.

Water Conservation Program:

Under this program the excessive watering of landscaping, excessive fountain operation, watering during peak daylight hours, water of non-permeable surfaces, excessive water use for noncommercial washing, and water use resulting in flooding or runoff would be prohibited. In addition the program would encourage efficient water use for construction activities, the installation of low-flow toilets and showerheads for all new developments, use of drought-tolerant plants with efficient landscape watering systems for all new developments, recycling of water used for cooling systems, use of pool covers, and the posting of water conservation signage at all hotels.

New Development Incentives:

Provide incentives for developers to comply with the California Green Building Standards Code as requirements for all new development. Under this Code new developments are required to reduce indoor potable water use by 20% beyond the Energy Policy Act of 1992 fixture performance requirements, and to reduce outdoor potable water use by 50% from a mid-summer baseline average consumption through irrigation efficiency, native plant selection, the use of recycled water and/or captured rainwater for example.

Water Meter Program:

Encourage water providers to install water meters for all County homes not using wells. This would provide for a better accounting of County water usage and provide potential costing per usage to help offset costs of the implementation of water conservation programs.

Water Efficiency Pricing Program

Under this program, the County would encourage water suppliers to adopt a water conservation pricing schedule (i.e. tiered rate) to encourage efficient water use. Notices could be provided in each billing showing water use budgets and the relationship between the budget and the actual usage.

Water Efficiency Retrofit Program:

This program would encourage upgrades in water efficiency for renovations or additions of residential, commercial, office, and industrial properties equivalent to that of new developments. The County would work with local water purveyors to achieve consistent standards, and to develop, approve, and review procedures for implementation.

Water Efficiency Training and Education:

Under this measure the County, in coordination with local water purveyors would implement a public information and education program that promotes water conservation. The program could include certification programs for irrigation designers, installers, and managers, as well as classes to promote the use of drought tolerant, native species and xeriscaping.

Increased Recycled Water Use:

Promote the use of municipal wastewater and graywater for agricultural, industrial and irrigation purposes. This measure would be subject to approval of the State Health Department and compliance with Title 22 provisions. This measure would facilitate the following:

- Inventory of non-potable water uses that could be substituted with recycled or graywater;
- Determination of the feasibility of producing and distributing recycled water for groundwater

replenishment;

- Determine the associated energy/GHG tradeoffs for treatment/use vs. out of basin water supply usage; and
- Cooperation and coordination with responsible agencies to encourage the use of recycled water where energy tradeoffs are favorable.

Assumptions:

* Applies to all land uses (existing and new development)
* Assumes emission reduction of 20%.
* Assumes reduction to electricity used to treat and convey water and wastewater.
* Assumes that approximately 14% of the electricity usage is used to pump water from wells.

Reductions:

% reduction applied to water usage directly = 30.00%

IM-W 1 Increase Reclaimed Water Use

This measure would increase electricity production from eligible renewable power sources to 33 percent by 2020. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 $MMTCO_2e$, representing 15.2 percent of emissions from electricity generation (in-State and imports).

Assumptions:

* Percent of total water use coming from reclaimed is 5%
* Percentage reduction GHG by using reclaimed rather than potable water is 81%

Reductions:

% reduction afforded = 10.00%

Solid Waste Reduction Measures 2035

IM-W 1 County Diversion Program

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

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

Assumptions:

* Assumes an existing diversion rate of 53%
* Assumes 2020 goal of 80% diversion rate.
* Does not apply to construction activities
* % reduction applied is equivalent to: (80-53)/47

Reductions:

% reduction applied	=	57.45%
% not from construction activities	=	81.20%
% reduction applied	=	46.65%

IM-W 2 Construction Diversion Program

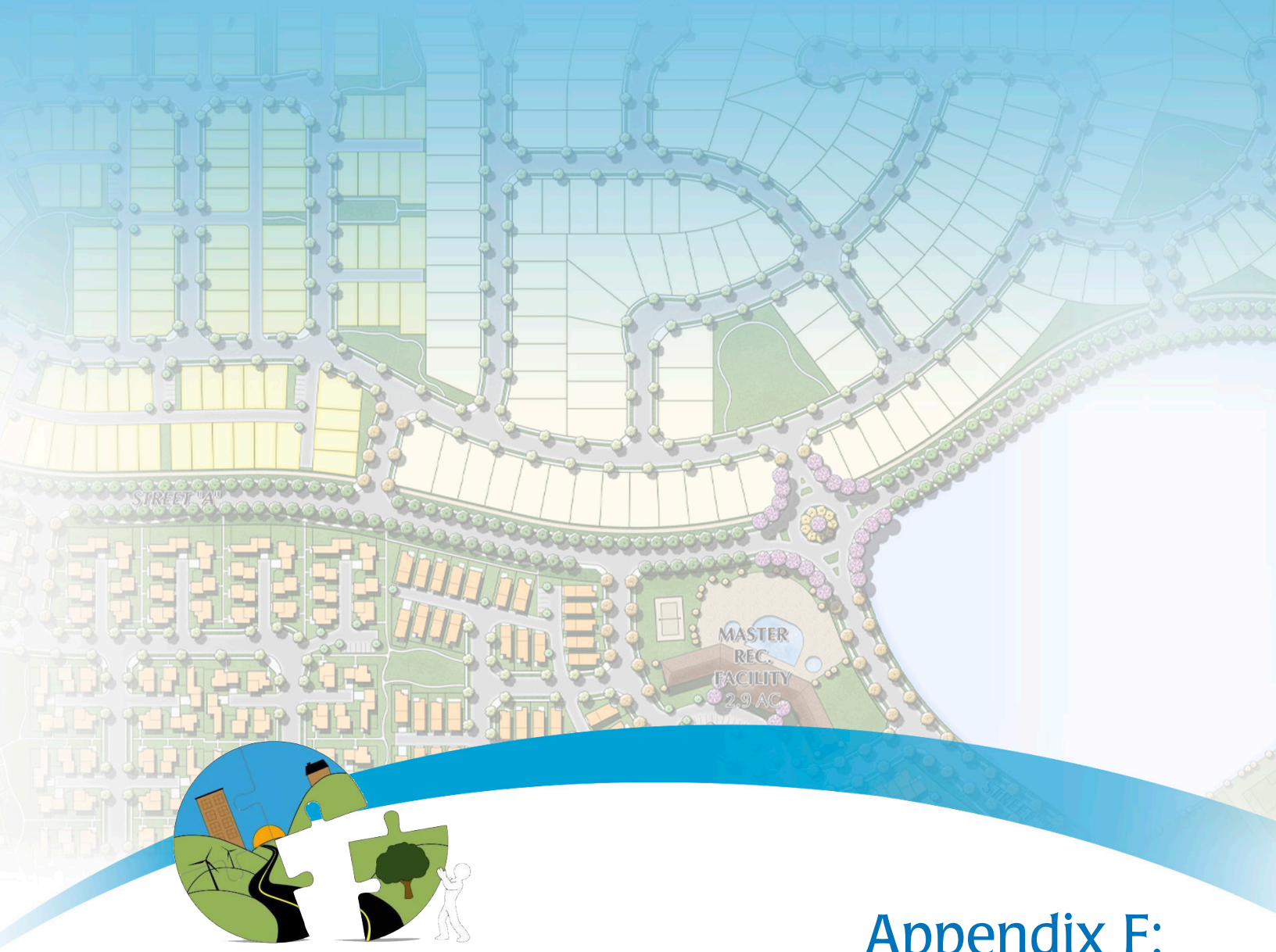
This IM also implements General Plan Policies AQ 4.1 and AQ 5.1 by giving incentives through points within the Screening Table to new development that provided diversion of 70% of construction waste. This provides a 20% increase in diversion beyond AB2176, § 42911, that requires development projects to provide adequate areas for collecting and loading recyclable materials and ensures a 50% diversion rate prior to being issued a building permit.

% reduction applied is equivalent to: 20/50

Reductions:

% reduction applied	=	80%
% from construction activities	=	18.80%
% reduction applied	=	15.04%

This page intentionally left blank



Appendix F:
Screening Tables

This page intentionally left blank

GREENHOUSE GAS EMISSIONS

Screening Tables
County of Riverside, California

May 2011

Prepared for:

COUNTY OF RIVERSIDE
4080 Lemon Street
Riverside, California 92501

Prepared by:

ATKINS
650 East Hospitality Lane, Suite 450
San Bernardino, California 92408

CONTENTS

TABLES

Introduction

The California Environmental Quality Act ("CEQA") requires assessment of the environmental impacts of proposed projects including the impacts of greenhouse gas emissions. The purpose of this document is to provide guidance on how to analyze greenhouse gas (GHG) emissions and determine the significance of those emissions during CEQA review of proposed development projects within the County of Riverside. The analysis, methodology, and significance determination (thresholds) are based upon the Riverside County GHG Technical Report, the GHG emission inventories within the Technical Report, and the GHG implementation measures that reduce emissions to the AB-32 compliant reduction target of the Technical Report. The screening tables can be used by the County of Riverside Planning Department for review of development projects in order to insure that the specific implementation measures in the Technical Report are applied as part of the CEQA process for development projects. The screening tables provide a menu of options that both insures implementation of the measures and flexibility on how development projects will implement the measures to achieve an overall reduction of emissions, consistent with the reduction target of the Technical Report.

California Environmental Quality Act

CEQA MANDATES FOR ANALYSIS OF IMPACTS

CEQA requires that Lead Agencies inform decision makers and the public regarding the following: potential significant environmental effects of proposed projects; feasible ways that environmental damage can be avoided or reduced through the use of feasible mitigation measures and/or project alternatives; and the reasons why the Lead Agency approved a project if significant environmental effects are involved (CEQA Guidelines §15002). CEQA also requires Lead Agencies to evaluate potential environmental effects based to the fullest extent possible on scientific and factual data (CEQA Guidelines §15064[b]). A determination of whether or not a particular environmental impact will be significant must be based on substantial evidence, which includes facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines §15064f[5]).

The recently amended CEQA Guidelines (CEQA Guidelines §15064.4[a] [b]) explicitly require Lead Agencies to evaluate GHG emissions during CEQA review of potential environmental impacts generated by a proposed project. To assist in this effort, two questions were added to Appendix G of the CEQA Guidelines:

- Would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

- Would the Project conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

Finally, under the "rule of reason," an EIR is required to evaluate impacts to the extent that is reasonably feasible ([CEQA Guideline § 15151; *San Francisco Ecology Center v. City and County of San Francisco* (1975) 48 Cal.App.3rd 584]). While CEQA does require Lead Agencies to make a good faith effort to disclose what they reasonably can, CEQA does not demand what is not realistically possible ([*Residents at Hawks Stadium Committee v. Board of Trustees* (1979) 89 Cal.App.3rd 274, 286]).

Greenhouse Gas Impact Determination

STATEWIDE OR REGIONAL THRESHOLDS OF SIGNIFICANCE

There are currently no published statewide or regional thresholds of significance for measuring the impact of GHG emissions generated by a proposed project. CEQA Guidelines §15064.7 indicates only that, "each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects."

QUANTITATIVE ANALYSIS RELATIVE TO THE RIVERSIDE GHG TECHNICAL REPORT

METHODOLOGY OVERVIEW

An individual project cannot generate enough GHG emissions to influence global climate change. The project participates in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together may have a significant impact on global climate change. To address the State's requirement to reduce GHG emissions, the County prepared the Technical Report with the target of reducing GHG emissions within the unincorporated County by 15% below 2008 levels by the year 2020. The County's target is consistent with the AB 32 target and ensures that the County is providing GHG reductions locally that will complement the State and international efforts of stabilizing climate change.

Because the County's Technical Report addresses GHG emissions reduction, the Report is in concert with AB 32 and international efforts to address global climate change. The Technical Report includes specific local requirements that will substantially lessen the cumulative contribution attributed to activities under the County's land use control. Compliance with the Report fulfills the approach found in CEQA Guidelines §15130(a)(3) for determining whether a project's contribution is cumulatively considerable.

Because GHG emissions are only important in the context of cumulative emissions, the focus of the analysis is on answering the question of whether incremental contributions of GHGs are a cumulatively considerable contribution to climate change impacts. The GHG Technical Report, in determining if the Project's effects will result in significant impacts, includes a set of implementation measures designed to substantially lessen cumulative impacts associated with GHG emissions as described in CEQA Guidelines §15130(a)(3). The Technical Report has the following components that fulfill mitigation for cumulative GHG emissions:

- The Report provides a countywide GHG emissions reduction target that will substantially lessen the cumulative problem;
- The Report provides Implementation Measures that new development projects must follow to meet the County's reduction target and substantially lessen the cumulative impact; and
- The Report provides a set of GHG emission inventories that provides quantitative facts and analysis of how the County implementation measures combined with the State reduction strategies reduce emissions to the reduction target that substantially lessens the cumulative impact.

The Technical Report satisfies the first condition because it includes a reduction target of reducing GHG emissions down to 15% below existing levels within the unincorporated County by 2020. This reduction target is compliant with AB 32. The AB 32 Climate Change Scoping Plan states: "In recognition of the critical role local governments will play in the successful implementation of AB 32, ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target" (Scoping Plan page ES-5, CARB, December 2008). The County's Plan matches the State's reduction target, which also coincides with the reduction targets of the Kyoto Protocol. In this way, the County is teaming with the State and international efforts to reduce GHG emissions globally and substantially lessen the cumulative problem.

The Technical Report satisfies the second condition through the implementation measures for new development. This document supplies the specific criteria for new development to follow to insure that the implementation measures associated with new development are applied and the reduction target is met.

The Technical Report satisfies the third criteria by providing a set of countywide GHG emissions inventories for existing conditions, for future 2020 GHG emissions that are anticipated without the reduction measures (Business As Usual; BAU), and reduced levels of 2020 GHG emissions that will result from the implementation of the reduction measures. Finally, the reduced 2020 GHG emissions inventory quantitatively demonstrates that implementation of the reduction measures achieves the

reduction target (15% below existing GHG emission levels by 2020). These Countywide GHG emission inventories are found in Appendix A of the Technical Report.

METHODOLOGY FOR THE CALCULATION OF GHG EMISSIONS

Analysis of development projects can either be done through emissions calculations or by using the screening tables beginning on Page 6.

Total GHG emissions are the sum of emissions from both direct and indirect sources. Direct sources include mobile sources such as construction equipment, motor vehicles, landscape equipment; and stationary sources such as cooling and heating equipment. Indirect sources are comprised of electrical and potable water use, and the generation of solid waste and waste water.

Direct GHG emissions from mobile and stationary sources are determined as the sum of the annual GHG emissions from construction equipment, motor vehicles, landscape equipment, and heating and cooling equipment.

Indirect sources are determined based on source as follows. Electrical usage is reported as annual emissions from electrical usage. Potable water usage is reported as the annual emissions from electricity used for potable water treatment and transportation. Solid waste is reported as the sum of annual emissions from solid waste disposal treatment, transportation, and fugitive emissions of methane at the solid waste facilities. Wastewater usage is reported as the annual emissions from wastewater transport and treatment.

Analysis of development projects not using the screening tables should use the emission factors found in the latest version of the California Climate Action Registry (CCAR) General Reporting Protocol. Quantification of emissions from electricity used for potable water treatment and transportation as well as wastewater transport and treatment can be found in the California Energy Commission (CEC) document titled “Refining Estimates of Water-Related Energy Use in California (CEC December 2006).
For analysis of development projects using the screening tables, please refer to the process described on page 6.

Screening Tables

The purpose of the Screening Tables is to provide guidance in measuring the reduction of greenhouse gas emissions attributable to certain design and construction measures incorporated into development projects. The analysis, methodology, and significance determination (thresholds) are based upon the Riverside County GHG Technical Report, which includes GHG emission inventories, a year 2020 emission reduction target, and the goals and policies to reach the target. The methodology for the development and application of the Screening Table is set forth in Appendix A, attached hereto.

Instructions for Application to Projects

The Screening Table assigns points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as "feature"). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the County's GHG Technical Report. As such, those projects that garner a total of 100 points or greater would not require quantification of project specific GHG emissions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Those Projects that do not garnish 100 points using the screening tables will need to provide additional analysis to determine the significance of GHG emissions. Nothing in this guidance shall be construed as limiting the County's authority to adopt a statement of overriding consideration for projects with requiring the preparation of an EIR due to a project's significant GHG impacts. The following tables provide a menu of performance standards/options related to GHG mitigation measures and design features that can be used to demonstrate consistency with the implementation measures and GHG reduction quantities in the GHG Technical Report.

Mixed use projects provide additional opportunities to reduce emissions by combining complimentary land uses in a manner that can reduce vehicle trips. Mixed use projects also have the potential to complement energy efficient infrastructure in a way that reduces emissions. For mixed use projects fill out both Screening Table 1 and Table 2, but proportion the points identical to the proportioning of the mix of uses. As an example, a mixed use project that is 50% commercial uses and 50% residential uses will show ½ point for each assigned point value in Table 1 and Table 2. Add the points from both tables. Mixed use projects that garner at least 100 points will be consistent with the reduction quantities in the County's GHG Plan and are considered less than significant for GHG emissions.

Table 1: Screening Table for GHG Implementation Measures for Residental Development

Feature	Description	Assigned Point Values	Project Points
Implementation Measure IM RE1: Energy Efficiency for New Residential			
E1.A Building Envelope			
E1.A.1 Insulation	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	1 point	
	Enhanced Insulation (15%> Title 24)	3 points	
	Greatly Enhanced Insulation (20%> Title 24)	5 points	
E1.A.2 Windows	Title 24 standard (required)	0 points	
	Modestly Enhanced Window Insulation (5% > Title 24)	1 point	
	Enhanced Window Insulation (15%> Title 24)	3 points	
	Greatly Enhanced Window Insulation (20%> Title 24)	5 points	
E1.A.3 Doors	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	1 point	
	Enhanced Insulation (15%> Title 24)	3 points	
	Greatly Enhanced Insulation (20%> Title 24)	5 points	
E1.A.4 Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		
	Title 24 standard (required)	0 points	
	Modest Building Envelope Leakage (5% > Title 24)	1 point	
	Reduced Building Envelope Leakage (15%> Title 24)	3 points	
	Minimum Building Envelope Leakage (20% > Title 24)	5 points	
E1.A.5 Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Thermal storage designed to reduce heating/cooling by 5^{o}F within the building	3 points	
	Thermal storage to reduce heating/cooling by 10^{o}F within the building	6 points	
	Note: Engineering details must be provided to substantiate the efficiency of the thermal storage device.		

Feature	Description	Assigned Point Values	Project Points
E1.B Indoor Space Efficiencies			
E1.B.1 Heating/ Cooling Distribution System	Title 24 standard (required)	0 points	
	Modest Distribution Losses (5% > Title 24)	1 point	
	Reduced Distribution Losses (15%> Title 24)	3 points	
	Greatly Reduced Distribution Losses (15%> Title 24)	5 points	
E1.B.2 Space Heating/ Cooling Equipment	Title 24 standard (required)	0 points	
	Efficiency HVAC (5% > Title 24)	1 point	
	High Efficiency HBAC (15%> Title 24)	3 points	
	Very High Efficiency HBAC (20%> Title 24)	5 points	
E1.B.3 Water Heaters	Title 24 standard (required)	0 points	
	Efficiency Water Heater (Energy Star conventional that is 5% > Title 24)	1 point	
	High Efficiency Water Heater (Conventional water heater that is 15%> Title 24)	3 points	
	High Efficiency Water Heater (Conventional water heater that is 20%> Title 24)	5 points	
	Solar Water Heating System	7 points	
E1.B.4 Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within the living space have at least one window (required)	0 points	
	All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.) such that each room has at least 800 lumens of light during a sunny day	1 points	
	All rooms daylighted to at least 1,000 lumens	3 points	
E1.B.5 Artificial Lighting	Title 24 standard (required)	0 points	
	Efficient Lights (5% > Title 24)	1 point	
	High Efficiency Lights (LED, etc. 15%> Title 24)	3 points	
	Very High Efficiency Lights (LED, etc. 20%> Title 24)	5 points	
E1.B.6 Appliances	Title 24 standard (required)	0 points	
	Efficient Appliances (5% > Title 24)	1 point	
	High Efficiency Energy Star Appliances (15%> Title 24)	3 points	
	Very High Efficiency Appliances (20%> Title 24)	5 points	

Feature	Description	Assigned Point Values	Project Points
E1.C Miscellaneous Residential Building Efficiencies			
E1.C.1 Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	3 points	
E1.C.2 Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the Project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
E1.C.3 Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
E1.C.4 Existing Residential Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing residential dwelling units within the unincorporated County is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the Riverside County Planning Department. The decision to allow applicants to ability to participate in this program will be evaluated based upon, but not limited to the following; Will the energy efficiency retrofit project benefit low income or disadvantaged residents? Does the energy efficiency retrofit project provide co-benefits important to the County? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.	TBD	
Implementation Measure IM E2: New Home Renewable Energy			
E2.A.1 Photovoltaic	Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments:		
	Solar Ready Homes (sturdy roof and electric hookups)	2 points	
	10 percent of the power needs of the project	4 points	
	20 percent of the power needs of the project	6 points	
	30 percent of the power needs of the project	8 points	
	40 percent of the power needs of the project	10 points	
	50 percent of the power needs of the project	12 points	
	60 percent of the power needs of the project	14 points	
	70 percent of the power needs of the project	16 points	
	80 percent of the power needs of the project	18 points	
	90 percent of the power needs of the project	20 points	
	100 percent of the power needs of the project	22 points	

Feature	Description	Assigned Point Values	Project Points
E2.A.2 Wind turbines	Some areas of the County lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Individual wind turbines at homes or collective neighborhood arrangements of wind turbines such that the total power provided augments:		
	10 percent of the power needs of the project	4 points	
	20 percent of the power needs of the project	6 points	
	30 percent of the power needs of the project	8 points	
	40 percent of the power needs of the project	10 points	
	50 percent of the power needs of the project	12 points	
	60 percent of the power needs of the project	14 points	
	70 percent of the power needs of the project	16 points	
	80 percent of the power needs of the project	18 points	
	90 percent of the power needs of the project	20 points	
	100 percent of the power needs of the project	22 points	
E2.A.3 Off-site renewable energy project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes. These off-site renewable energy retrofit project proposals will be determined on a case by case basis and must be accompanied by a detailed plan that documents the quantity of renewable energy the proposal will generate. Point values will be determined based upon the energy generated by the proposal.	TBD	
E2.A.4 Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Implementation Measure IM W1: Water Use Reduction Initiative			
W1.A Residential Irrigation and Landscaping			
W1.A.1 Water Efficient Landscaping	Limit conventional turf to < 20% of each lot (required)	0 points	
	Eliminate conventional turf from landscaping	3 points	
	Eliminate turf and only provide drought tolerant plants	4 points	
	Xeroscaping that requires no irrigation	6 points	
W1.A.2 Water Efficient irrigation systems	Drip irrigation	1 point	
	Smart irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)	3 points	

Feature	Description	Assigned Point Values	Project Points
W1.A.3 Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
W1.A.4 Recycled grey water	Grey water (purple pipe) irrigation system on site	5 points	
W1.B Residential Potable Water			
W1.B.1 Showers	Title 24 standard (required) EPA High Efficiency Showerheads (15% > Title 24)	0 points 1 points	
W1.B.2 Toilets	Title 24 standard (required) EPA High Efficiency Toilets (15% > Title 24)	0 points 1 points	
W1.B.3 Faucets	Title 24 standard (required) EPA High Efficiency faucets (15% > Title 24)	0 points 1 points	
Implementation Measure IM W2: Increase Reclaimed Water Use			
W2.A.1 Recycled Water	5% of the total project's water use comes from recycled/reclaimed water	5 points	
Implementation Measure IM T2: Increase Residential Density			
T2.A.1 Residential Density	Designing the Project with increased densities, where allowed by the General Plan and/or Zoning Ordinance reduces GHG emissions associated with traffic in several ways. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities. 1 point is allowed for each 10% increase in density beyond 7 units/acre, up to 500% (50 points)	1-50 points	
Implementation Measure IM T3: Mixed Use Development			
T3.A.1 Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon a Transportation Impact Analysis (TIA) demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges: Diversity of land uses complementing each other (2-28 points) Increased destination accessibility other than transit (1-18 points) Infill location that reduces vehicle trips or VMT beyond the measures	TBD	

Feature	Description	Assigned Point Values	Project Points
	described above (points TBD based on traffic data).		
T3.A.2 Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT) The suburban project will have at least three of the following on site and/or offsite within ¼-mile: Residential Development, Retail Development, Park, Open Space, or Office. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial locations (and vice versa). The project should minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.	1-16 points	
Implementation Measure IM T5: Traffic Flow Management Improvements			
T5.A.1 Signal Synchronization	Techniques for improving traffic flow include: traffic signal coordination to reduce delay, incident management to increase response time to breakdowns and collisions, Intelligent Transportation Systems (ITS) to provide real-time information regarding road conditions and directions, and speed management to reduce high free-flow speeds. Signal synchronization Traffic signals connected to existing ITS	 1 point/signal 3 points/signal	
Implementation Measure IM T6: Bicycle/Pedestrian Infrastructure			
T6.A.1 Sidewalks	Provide sidewalks on one side of the street (required) Provide sidewalks on both sides of the street Provide pedestrian linkage between residential and commercial uses within 1 mile	0 points 1 point 3 points	
T6.A.2 Bicycle paths	Provide bicycle paths within project boundaries Provide bicycle path linkages between residential and other land uses Provide bicycle path linkages between residential and transit	TBD 2 points 5 points	
Implementation Measure IM T7: Electric Vehicle Use			
T7.A.1 Electric Vehicle Recharging	Provide circuit and capacity in garages of residential units for installation of electric vehicle charging stations Install electric vehicle charging stations in the garages of residential units	1 point 8 points	

Feature	Description	Assigned Point Values	Project Points
Implementation Measure IM T9: Increase Public Transit			
T9.A.1 Public Transit Access	The point value of a projects ability to increase public transit use will be determined based upon a Transportation Impact Analysis (TIA) demonstrating decreased use of private vehicles and increased use of public transportation. Increased transit accessibility (1-15 points)	TBD	
Implementation Measure IM L1: SCAQMD No New Wood Burning Stoves			
L1.A.1 Wood Burning	As part of Rule 445 and the Healthy Hearths™ initiative, the South Coast Air Quality Management District adopted a rule for no permanently installed indoor or outdoor wood burning devices in new development. Project contains no wood burning stoves or fireplaces	10 points	
Implementation Measure IM L2: Prohibit Gas-Powered Equipment			
L2.A.1 Landscape Equipment	Electric lawn equipment including lawn mowers, leaf blowers and vacuums, shredders, trimmers, and chain saws are available. When electric landscape equipment is used in place of conventional gas-powered equipment, direct GHG emissions from natural gas combustion are replaced with indirect GHG emissions associated with the electricity used to power the equipment. Project provides electrical outlets on the exterior of all building walls so that electric landscaping equipment is compatible with all built facilities.	8 points	
Implementation Measure IM SW1: 80 Percent Solid Waste Diversion Program			
SW1.A.1 Recycling	County initiated recycling program diverting 80% of waste requires coordination in neighborhoods to realize this goal. The following recycling features will help the County fulfill this goal: Provide green waste composing bins at each residential unit Multi-family residential projects that provide dedicated recycling bins separated by types of recyclables combined with instructions/education program explaining how to use the bins and the importance or recycling.	4 points 3 points	
Implementation Measure IM SW2: Construction and Demolition Debris Diversion Program			
SW2.A.1 Recycling of Construction/ Demolition Debris	50% of construction waste recycled (required) Recycle 55% of debris Recycle 60% of debris Recycle 65% of debris Recycle 70% of debris Recycle 75% of debris	0 points 2 points 3 points 4 points 5 points 6 points	
Total Points Earned by Residential Project:			

Table 2: Screening Table for GHG Implementation Measures for Commercial Development and Public Facilities

Feature	Description	Assigned Point Values	Project Points
Implementation Measure IM E5: Energy Efficiency for Commercial/Public Development			
E5.A Building Envelope			
E5.A.1 Insulation	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	4 points	
	Enhanced Insulation (15%> Title 24)	8 points	
	Greatly Enhanced Insulation (20%> Title 24)	12 points	
E5.A.2 Windows	Title 24 standard (required)	0 points	
	Modestly Enhanced Window Insulation (5% > Title 24)	4 points	
	Enhanced Window Insulation (15%> Title 24)	8 points	
	Greatly Enhanced Window Insulation (20%> Title 24)	12 points	
E5.A.3 Doors	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	4 points	
	Enhanced Insulation (15%> Title 24)	8 points	
	Greatly Enhanced Insulation (20%> Title 24)	12 points	
E5.A.4 Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		
	Title 24 standard (required)	0 points	
	Modest Building Envelope Leakage (5% > Title 24)	4 points	
	Reduced Building Envelope Leakage (15%> Title 24)	8 points	
	Minimum Building Envelope Leakage (20% > Title 24)	12 points	
E5.A.5 Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Thermal storage designed to reduce heating/cooling by 5^{o}F within the building	6 points	
	Thermal storage to reduce heating/cooling by 10^{o}F within the building	12 points	
	Note: Engineering details must be provided to substantiate the efficiency of the thermal storage device.		

Feature	Description	Assigned Point Values	Project Points
E5.B Indoor Space Efficiencies			
E5.B.1 Heating/ Cooling Distribution System	Title 24 standard (required)	0 points	
	Modest Distribution Losses (5% > Title 24)	4 points	
	Reduced Distribution Losses (15%> Title 24)	8 points	
	Greatly Reduced Distribution Losses (15%> Title 24)	12 points	
E5.B.2 Space Heating/ Cooling Equipment	Title 24 standard (required)	0 points	
	Efficiency HVAC (5% > Title 24)	4 points	
	High Efficiency HVAC (15%> Title 24)	8 points	
	Very High Efficiency HVAC (20%> Title 24)	12 points	
E5.B.3 Commercial Heat Recovery Systems	Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.	TBD	
E5.B.4 Water Heaters	Title 24 standard (required)	0 points	
	Efficiency Water Heater (Energy Star conventional that is 5% > Title 24)	4 points	
	High Efficiency Water Heater (Conventional water heater that is 15%> Title 24)	8 points	
	High Efficiency Water Heater (Conventional water heater that is 20%> Title 24)	12 points	
	Solar Water Heating System	14 points	
E5.B.5 Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within building have at least one window or skylight	1 point	
	All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.) such that each room has at least 800 lumens of light during a sunny day	5 points	
	All rooms daylighted to at least 1,000 lumens	7 points	
E5.B.6 Artificial Lighting	Title 24 standard (required)	0 points	
	Efficient Lights (5% > Title 24)	4 points	
	High Efficiency Lights (LED, etc. 15%> Title 24)	6 points	
	Very High Efficiency Lights (LED, etc. 20%> Title 24)	8 points	

Feature	Description	Assigned Point Values	Project Points
E5.B.7 Appliances	Title 24 standard (required)	0 points	
	Efficient Appliances (5% > Title 24)	4 points	
	High Efficiency Energy Star Appliances (15%> Title 24)	8 points	
	Very High Efficiency Appliances (20%> Title 24)	12 points	
E5.C Miscellaneous Commercial Building Efficiencies			
E5.C.1 Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	4 points	
E5.C.2 Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
E5.C.3 Existing Commercial building Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing commercial buildings within the unincorporated County is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the Riverside County Planning Department. The decision to allow applicants to participate in this program will be evaluated based upon, but not limited to the following: Will the energy efficiency retrofit project benefit low income or disadvantaged communities? Does the energy efficiency retrofit project provide co-benefits important to the County? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.	TBD	
Implementation Measure IM E6: New Commercial/Industrial Renewable Energy			
E6.A.1 Photovoltaic	Solar Photovoltaic panels installed on commercial buildings or in collective arrangements within a commercial development such that the total power provided augments:		
	Solar Ready Roofs (sturdy roof and electric hookups)	2 points	
	10 percent of the power needs of the project	8 points	
	20 percent of the power needs of the project	14 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	26 points	
	50 percent of the power needs of the project	32 points	
	60 percent of the power needs of the project	38 points	

Feature	Description	Assigned Point Values	Project Points
	70 percent of the power needs of the project	44 points	
	80 percent of the power needs of the project	50 points	
	90 percent of the power needs of the project	56 points	
	100 percent of the power needs of the project	62 points	
E6.A.2 Wind turbines	Some areas of the County lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Wind turbines as part of the commercial development such that the total power provided augments:		
	10 percent of the power needs of the project	8 points	
	20 percent of the power needs of the project	14 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	26 points	
	50 percent of the power needs of the project	32 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	44 points	
	80 percent of the power needs of the project	50 points	
	90 percent of the power needs of the project	56 points	
	100 percent of the power needs of the project	62 points	
E6.A.3 Off-site renewable energy project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing residential or existing commercial/industrial. These off-site renewable energy retrofit project proposals will be determined on a case by case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.	TBD	
E6.A.4 Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Implementation Measure IM W1: Water Use Reduction Initiative			
W1.C Irrigation and Landscaping			
W1.C.1 Water Efficient Landscaping	Limit conventional turf to < 20% of each lot (required)	0 points	
	Eliminate conventional turf from landscaping	3 points	
	Eliminate turf and only provide drought tolerant plants	4 points	
	Xeroscaping that requires no irrigation	6 points	

Feature	Description	Assigned Point Values	Project Points
W1.C.2 Water Efficient irrigation systems	Drip irrigation Smart irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)	1 point 5 points	
W1.C.3 Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
W1.D Potable Water			
W1.D.1 Showers	Title 24 standard (required) EPA High Efficiency Showerheads (15% > Title 24)	0 points 3 points	
W1.D.2 Toilets	Title 24 standard (required) EPA High Efficiency Toilets/Urinals (15% > Title 24) Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	0 points 3 points 3 points	
W1.D.3 Faucets	Title 24 standard (required) EPA High Efficiency faucets (15% > Title 24)	0 points 3 points	
W1.D.4 Commercial Dishwashers	Title 24 standard (required) EPA High Efficiency dishwashers (20% water savings)	0 points 4 points	
W1.D.5 Commercial Laundry Washers	Title 24 standard (required) EPA High Efficiency laundry (15% water savings) EPA High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	0 points 3 points 6 points	
W1.D.6 Commercial Water Operations Program	Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.	TBD	
Implementation Measure IM W2: Increase Reclaimed Water Use			
W2.A.1 Recycled Water	Graywater (purple pipe) irrigation system on site	5 points	

Feature	Description	Assigned Point Values	Project Points
Implementation Measure IM T1: Employment Based Trip and VMT Reduction Policy			
T1.A.1 Alternative Scheduling	Encouraging telecommuting and alternative work schedules reduces the number of commute trips and therefore VMT traveled by employees. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks. Provide flexibility in scheduling such that at least 30% of employees participate in 9/80 work week, 4-day/40-hour work week, or telecommuting 1.5 days/week.	5 points	
T1.A.2 Car/Vanpools	Car/vanpool program Car/vanpool program with preferred parking Car/vanpool with guaranteed ride home program Subsidized employee incentive car/vanpool program Combination of all the above	1 point 2 points 3 points 5 points 6 points	
T1.A.3 Employee Bicycle/ Pedestrian Programs	Complete sidewalk to residential within ½ mile Complete bike path to residential within 3 miles Bike lockers and secure racks Showers and changing facilities Subsidized employee walk/bike program Note: combine all applicable points for total value	1 point 1 point 1 point 2 points 3 points	
T1.A.4 Shuttle/Transit Programs	Local transit within ¼ mile Light rail transit within ½ mile Shuttle service to light rail transit station Guaranteed ride home program Subsidized Transit passes Note: combine all applicable points for total value	1 point 3 points 5 points 1 points 2 points	
T1.A.5 CTR	Employer based Commute Trip Reduction (CTR). CTRs apply to commercial, offices, or industrial projects that include a reduction of vehicle trip or VMT goal using a variety of employee commutes trip reduction methods. The point value will be determined based upon a TIA that demonstrates the trip/VMT reductions. Suggested point ranges: Incentive based CTR Programs (1-8 points) Mandatory CTR programs (5-20 points)	TBD	
T1.A.6 Other Trip Reduction Measures	Point values for other trip or VMT reduction measures not listed above may be calculated based on a TIA and/or other traffic data supporting the trip and/or VMT reductions.	TBD	

Feature	Description	Assigned Point Values	Project Points
Implementation Measure IM T3: Mixed Use Development			
T3.B.1 Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
T3.B.2 Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled.	TBD	
Implementation Measure IM T4: Preferential Parking			
T4.A.1 Parking	Provide reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles. Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools and include adequate passenger waiting/loading areas.	1 point 1 point	
Implementation Measure IM T5: Signal Synchronization and Intelligent Traffic Systems			
T5.B.1 Signal improvements	Techniques for improving traffic flow include: traffic signal coordination to reduce delay, incident management to increase response time to breakdowns and collisions, Intelligent Transportation Systems (ITS) to provide real-time information regarding road conditions and directions, and speed management to reduce high free-flow speeds. Synchronize signals along arterials used by project. Connect signals along arterials to existing ITS.	1 point/signal 3 points/ signal	
Implementation Measure IM T6: Bicycle and Pedestrian Infrastructure			
T6.B.1 Sidewalks	Provide sidewalks on one side of the street (required) Provide sidewalks on both sides of the street Provide pedestrian linkage between commercial and residential land uses within 1 mile	0 points 1 point 3 points	
T6.B.2 Bicycle paths	Provide bicycle paths within project boundaries Provide bicycle path linkages between commercial and other land uses Provide bicycle path linkages between commercial and transit	TBD 2 points 5 points	

Feature	Description	Assigned Point Values	Project Points
Implementation Measure IM T7: Electric Vehicle Use			
T7.B.1 Electric Vehicle Recharging	Provide circuit and capacity in garages/parking areas for installation of electric vehicle charging stations. Install electric vehicle charging stations in garages/parking areas	2 points/area 8 pts/station	
Implementation Measure IM T8: Anti-Idling Enforcement			
T8.A.1 Commercial Vehicle Idling Restriction	All commercial vehicles are restricted to 5-minutes or less per trip on site and at loading docks.	2 points Required of all Commercial	
Implementation Measure IM T9: Increase Public Transit			
T9.B.1 Public Transit	The point value of a projects ability to increase public transit use will be determined based upon a Transportation Impact Analysis (TIA) demonstrating decreased use of private vehicles and increased use of public transportation. Increased transit accessibility (1-15 points)	TBD	
Implementation Measure IM L2: Prohibit Gas-Powered Landscaping Equipment			
L2.B.1 Landscaping Equipment	Electric lawn equipment including lawn mowers, leaf blowers and vacuums, shredders, trimmers, and chain saws are available. When electric landscape equipment is used in place of conventional gas-powered equipment, direct GHG emissions from natural gas combustion are replaced with indirect GHG emissions associated with the electricity used to power the equipment. Project provides electrical outlets on the exterior of all buildings so that electric landscaping equipment is compatible with all built facilities.	2 points	
Implementation Measure IM SW1: 80 Percent Solid Waste Diversion Program			
SW1.B.1 Recycling	County initiated recycling program diverting 80% of waste requires coordination with commercial development to realize this goal. The following recycling features will help the County fulfill this goal: Provide separated recycling bins within each commercial building/floor and provide large external recycling collection bins at central location for collection truck pick-up Provide commercial/industrial recycling programs that fulfills an on-site goal of 80% diversion of solid waste	2 points 5 points	

Feature	Description	Assigned Point Values	Project Points
Implementation Measure IM SW2: Construction and Demolition Debris Diversion Program			
SW2.B.1 Recycling of Construction/ Demolition Debris	Recycle 2% of debris (required) Recycle 5% of debris Recycle 8 % of debris Recycle 10% of debris Recycle 12% of debris Recycle 15% of debris Recycle 20% of debris	0 points 1 point 2 points 3 points 4 points 5 points 6 points	
Total Points Earned by Commercial/Industrial Project:			

References

Association of Environmental Professionals (AEP) White Paper: Alternative Approaches to Analyzing Greenhouse Gases and Global Climate Change Impacts in CEQA Documents, June 2007.

Association of Environmental Professionals (AEP) White Paper: Community-wide Greenhouse Gas Emission Inventory Protocols, September 2010.

Association of Environmental Professionals (AEP) California Environmental Quality Act 2010 Statute & Guidelines, March 2010.

California Air Pollution Control Officers Association (CAPCOA), White Paper: CEQA and Climate Change, January 2008

California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures, August 2010

California Air Resources Board, AB 32 Scoping Plan, December 2009

California Climate Action Team's Final Report to the Governor and Legislature, March 2007

California Climate Action Registry, General Reporting Protocol, Version 2.2, March 2007

Riverside County, Draft Greenhouse Gas Technical Report, November 2010

South Coast Air Quality Management District, Rules and Regulations, 2010

U.S. Environmental Protection Agency, AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, September 1995

U.S. Environmental Protection Agency, AP-42, Final Rule on Update to the Compilation of Air Pollutant Emission Factors, October 2009

APPENDIX A: METHDOLOLGY FOR THE DEVELOPMENT AND APPLICATION OF THE SCREENING TABLES

METHODS SUMMARY

The point values in the Screening Tables were derived from the projected emissions reductions that each of the Implementation Measures (IM) within the Riverside County GHG Technical Report would achieve. The total emission reductions offered by each measure is based on both changes in existing land use activities as well as how new development is designed and built. In order to correctly allocate the emission reductions within the Screening Table, the amount of emission reductions afforded new development had to be segregated out of the aggregate total in a manner that is described below. Once the process of segregating new development out of the aggregate reduction totals was completed, the points were then proportioned by residential unit or square feet of commercial/industrial uses. This was accomplished by taking the predicted growth in households and commercial/industrial uses by the year 2020 and proportioning the appropriate IM reduction quantities for new development to the residential and commercial/industrial land use sectors within the Screening Table. These calculations result in point values that are allocated by residential unit or commercial/industrial square footage (measured in 1000 sq.ft.). Because of this, the size of the project is not relevant to the Screening Table. Regardless of size, each project needs to garnish 100 points to demonstrate consistency with the Technical Report. Efficiency, not size of the Project is critical. The following emission factor can be used in determining the amount of emissions reduced per point in the Screening Table:

The respective calculated emission values are in metric tons of carbon dioxide equivalents (MTCO2e)

For Residential Projects:

0.069 MTCO2e per Point per Residential Unit

For Commercial and Industrial Projects:

0.031 MTCO2e per Point per 1,000 Square Feet of gross Commercial/Industrial building area

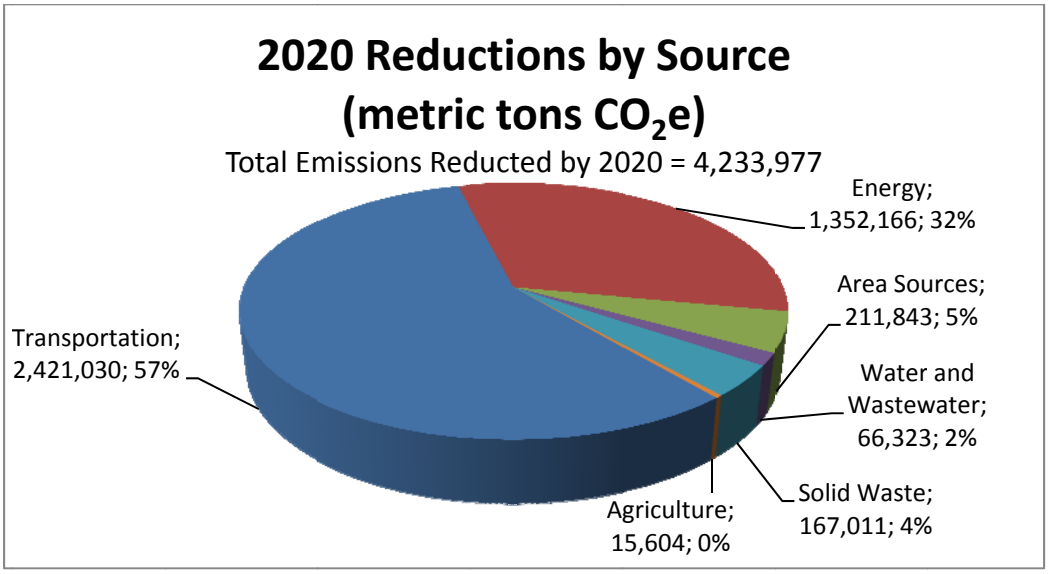
Note that the Screening Table and point values are best used for typical development projects processed by the County. Examples of typical development projects include residential subdivisions, multi-family residential apartments, condominiums and townhouses, retail commercial, big box retail, office buildings, business parks, and typical warehousing. Mixed use projects can use the Screening Tables following the instructions. Transit oriented development (TOD), and infill projects are able to use the Screening Tables, but the Screening Table points are likely to underestimate total emission reductions afforded these types of projects. Note that the Screening Tables include the opportunity to custom develop points (using the formula above) in order to account for the predicted reductions in vehicle trips and vehicle miles traveled within a project specific traffic study and GHG analysis. TOD and infill projects can be more accurately assessed and allocated points using this method.

However, more unusual types of industrial projects such as cement manufacturing, metal foundries, refrigerant manufacturing, electric generating stations, and oil refineries cannot use the Screening Tables because the emission sources for those types of uses were not contemplated in the table.

DEVELOPMENT OF THE POINT VALUES

The first step in developing the point system was the need to determine the total reductions afforded the GHG Plan. Figure 1 below shows the total emission reductions achieved by the GHG Plan. In total 4,288,863 MTCO2e will be reduced as a result of the GHG Plan.

Figure 1



The next step in developing the point system is to segregate out the State efforts in reducing GHG emissions within the County. Table 1 shows the reductions allocated to State measures and County strategies.

Table 1

Sector	2020 Reduction ($MTCO_2e$)		
	State Strategies	County Strategies	Total
Transportation and Land Use	914,490	1,506,540	2,421,030
Building Energy -Energy Efficiency and Alternative Energy	860,205	491,962	1,352,166
Area Sources	0	211,843	211,843
Water Conservation	33,172	33,151	66,323
Solid Waste/Landfills	0	167,011	167,011
Agriculture	0	15,573	15,573
Total	**1,807,866**	**2,426,111**	**4,233,977**

As shown in Table 1, 2,426,111 MTCO2e are reduced by the County's Implementation Measure. This amount includes reductions afforded existing building retrofits, other changes to activities associated with existing land uses, as well as reductions associated with new development.

The next step is to segregate out of the County strategies total the amount of emissions that will be reduced within new development.

Table 2 on the next page summarizes the reduction in emissions afforded new development from the Implementation measures. Table 2 shows 2,228,440 MTCO2e being reduced from new development as a result of the County strategies. Within the 1,302,569 MTCO2e of new development reductions afforded County strategies, 619,336 MTCO2e of emissions reduced is accomplished through new Commercial and Industrial Projects, and 683,233 MTCO2e of emissions reduced is accomplished through new residential projects.

The next step in allocating point values is to determine the number of new homes and commercial buildings that are anticipated by year 2020. The County predicts that 100,477 new residential units will be needed by 2020 to accommodate the population growth by 2020. A total of approximately 195,547,000 square feet of new commercial and industrial buildings within the unincorporated County area is needed to accommodate anticipated job growth. This estimate is based on the relationship between past growth in employment to the average growth in commercial/industrial building area for Riverside County.

Dividing the 683,233 MTCO2e reductions of emissions afforded the Implementation Measures for new residential development by the anticipated 100,477 new residential units that will be built yields 6.80 MTCO2e per residential unit that needs to be reduced to fulfill the anticipated reductions of the GHG Technical Report. That amount equals 100 points, producing the following for the point values:
0.0680 MTCO2e per Point per Residential Unit

A similar process was used to derive the point value for new commercial/Industrial development. Because commercial/industrial land uses are typically described in thousand square feet of building space, the point value was calculated as follows: **0.031 MTCO2e per 1,000 Sq. Ft. of gross Commercial/Industrial building area.**

The final step was to allocate points to each of the reduction measures in order to provide the menu of point values. The spreadsheet on the next page shows emission reductions afforded each measure. Note that emissions associated with new development are reduced by the State's measures, as well as the County's Implementation measures. The Screening Tables focus on those measures the County is implementing associated with new development within the unincorporated County area. For this reason, the menu of options pertains to all of the Implementation Measures pertaining to new development.

Table 2

Reduction Number	Reduction Measure Name	Reduced Emissions($MTCO_2e$) Commercial/Industrial	Residential
IM-E1	New Residential Energy Efficiency		72,228.9
IM-E2	New Residential Renewable Energy		83,347.0
IM-E5	New Commercial Energy Efficiency	126,589.3	
IM-E6	New Commercial/Industrial Renewable Energy	34,576.5	
IM-T1	Employer VMT Reduction	150,960.2	
IM-T2	Increased Residential Density		109,947.0
IM-T3	Mixed Use Development	108,134.7	108,134.7
IM-T4	Preferential Parking	848.9	
IM-T5	Road Imp/Sig.Sync/TFM	18,718.0	40,647.4
IM-T6	Bicycle/Ped Infrastructure	4,123.5	8,954.5
IM-T7	Electric Vehicle Use	8,537.0	18,538.7
IM-T8	Anti-Idling Enforcement	14,552.0	
IM-T9	Increase Public Transit	31,147.2	67,638.3
IM-T10	Employee Commute Alt. Schedule	28,592.8	
IM-L1	SCAQMD No New Woodburning Stoves		68,559.3
IM-L2	Prohibit Gas-Powered Equipment	6,483.1	41,861.6
IM-W1	Water Use Reduction Initiative	6,118.6	4,911.8
IM-W2	Increase Reclaimed Water Use	991.2	795.7
IM-SW1	County Diversion Program	46,140.0	24,844.6
IM-SW2	Construction Diversion Program	32,823.3	32,823.3
Total IM Reductions for New Development		**619,336.4**	**683.233.0**