

RIVERSIDE COUNTY GREENHOUSE GAS TECHNICAL REPORT

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LIST OF 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
CAFE	Corporate Average Fuel Economy
Cal EPA	California Environmental Protection Agency
Cal Recycle	California Department of Resources Recycling and Recovery
CANHP	California New Home Program
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
CEO	County Executive Officer
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbons
C ₂ F ₆	Hexafluoroethane
CF ₄	Carbon Tetrafluoride
CH ₄	Methane
CIWMB	California Integrated Waste Management Board
CO ₂	Carbon Dioxide
CO ₂ e	Equivalent Carbon Dioxide
CREB	Clean Renewable Energy Bonds
CSI	California Solar Initiative
CTC	California Transportation Commission
CWSRF	Clean Water State Revolving Funds
DKM	Dekatherm
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
GRT	GHG Reduction Team

GWhs	Gigawatt Hours
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
HFC-23	Trifluoromethane
HFC-134	Hydrofluorocarbon 134
HFC-152a	Difluoroethane
IIP	Interregional Improvement Program (IIP)
IPCC	Intergovernmental Panel on Climate Change
ITS	Intelligent Transportation Systems
LEED	Leadership in Energy and Environmental Design
MMBTU	Million BTUs (British Thermal Units)
MMT	Million Metric Tons
MMT CO ₂ e	Million Metric Tons Carbon Dioxide Equivalent
MT	Metric Tons
MT CO ₂ e	Metric Tons Carbon Dioxide Equivalent
MWh	Megawatt Hours
MWh/year	Megawatt Hours per Year
N ₂ O	Nitrous Oxide
NHTSA	National Highway Transportation Safety Administration
NSHP	New Solar Home Program
O ₃	Ozone
RCRA	Resource Conservation and Recovery Act
RIP	Regional Improvement Program
RTIP	Regional Transportation Improvement Program
SCAG	Southern California Association of Governments
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

Section 1 Introduction

The County of Riverside is committed to reducing greenhouse gas (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 our waste, Riverside County can keep dollars in the local economy, create new green jobs and improve community quality of life.

GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities, primarily through the combustion of fossil fuels. The State of California has been at the forefront of developing solutions to address global climate change and reduce anthropogenic GHG emissions.

State law defines GHG to include the following compounds: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) (Health and Safety Code, section 38505(g)). The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide. Because GHGs have variable potencies, a common metric of carbon dioxide equivalents (CO₂e) is used to report their combined potency. The potency each GHG has in the atmosphere is measured as a combination of the volume of its emissions and its global warming potential (GWP)¹, and is expressed as a function of the potency with respect to the same mass of CO₂. Methane, for example has a GWP of 21, while nitrous oxide has a GWP of 310. Thus, by multiplying the amount in metric tons of each individual gas by their respective GWP, all GHGs can be reported in the common unit of metric tons² of CO₂e (MT CO₂e).

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. The same has occurred for other synthesized gases such as hydrofluorocarbons (HFCs) and carbon tetrafluoride (CF₄) which have been banned and are no longer available on the market. Because of the ban, the Riverside County will not generate emissions of

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

² One metric ton (MT) equals 1,000 kilograms or 2,204 pounds. Note, one 'short ton' is 2,000 pounds.

these GHGs and therefore, they are not considered any further in this document. Sulfur hexafluoride (SF₆) is another GHG with a high GWP (23,900 times that of CO₂); 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, SF₆ is not released to the atmosphere and therefore, it is not considered further in this document.

The GHG inventory focuses on the sources and amounts of GHG emissions generated from activities associated with land uses and related activities within the unincorporated areas under the jurisdictional control of the County. The purpose of the inventory is to create a clear picture of how these unincorporated communities use fossil fuels and other forms of energy, and how these communities generate GHG pollutants and waste. The inventory also helps to pinpoint the activities and sectors generating the most GHGs.

1.1 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.

1.1.1 International and Federal

1.1.1.1 Kyoto Protocol

The United States participated in the United Nations Framework Convention on Climate Change (UNFCCC) (signed on March 21, 1994). 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 percent 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 anticipation of providing an updated international treaty for the reduction of GHG emissions, representatives from 170 countries met in Copenhagen in December 2009 to ratify

an updated UNFCCC agreement (Copenhagen Accord). The Copenhagen Accord, a voluntary agreement between the United States, China, India, and Brazil, 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 reinforces and builds 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 and technology support and coordination among all nations. The next conference of the parties is scheduled for December 2011 in South Africa.

1.1.1.2 Climate Change Technology Program

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

1.1.1.3 United States Environmental Protection Agency

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address global climate change. The federal government administers a wide array of public-private partnerships to reduce GHG intensity generated by the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO₂ gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA implements several voluntary programs that substantially contribute to the reduction of GHG emissions. Programs include: the State Climate and Energy Partner Network that allows for 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.

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 the USEPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the USEPA should be required to regulate CO₂ and other greenhouse gases as pollutants under Section 202(a)(1) of the federal Clean Air Act (CAA).

The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October of 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufactures of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. The Final Rule was effective December 29, 2009, with data collection beginning January 1, 2010, and the first annual reports 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). USEPA adopted a Final Endangerment Finding for the six defined GHGs on December 7, 2009. The Endangerment Finding is required before USEPA can regulate GHG emissions under Section 202(a)(1) of the CAA in fulfillment of the U.S. Supreme Court decision.

On May 13, 2010, the USEPA issued a Final Rule that establishes a common sense approach to addressing greenhouse gas emissions from stationary sources under the CAA permitting programs. In the first phase of the Rule (January 2011-June 2011), only sources currently subject to the New Source Review Prevention of Significant Deterioration (PSD) permitting program (i.e., those that are newly-constructed or modified in a way that significantly increases emissions of a pollutant other than GHGs) are subject to permitting requirements for their GHG emissions under PSD. For these projects, only GHG increases of 75,000 tons³ per year (tpy) CO₂e or more need to determine the Best Available Control Technology (BACT) for their GHG emissions. Similarly for the operating permit program, only sources currently subject to the program are subject to title V requirements for GHG. In the second phase of the rule (July 2011-June 2013) new construction projects that exceed a threshold of 100,000 tpy and modifications of existing facilities that increase emissions by at least 75,000 tpy will be subject to permitting requirements. Additionally, operating facilities that emit at least 100,000 tpy will be subject to title V permitting requirements (USEPA 2010a). This rule took effect January 2, 2011.

³ EPA thresholds are presented in tons (or short tons), not metric tons. 1 short ton is equivalent to approximately 0.907 metric tons.

1.1.2 State

1.1.2.1 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 state ambient air quality standards (California Ambient Air Quality Standards (CAAQS)), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts. The SIP is required for the State to take over implementation of the Clean Air Act.

1.1.2.2 Executive Order S-3-05

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

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

The first California Climate Action Team (CCAT) Report to the Governor in 2006 contained recommendations and strategies to help meet the targets in Executive Order S-3-05. The 2010 CCAT Biennial Report, finalized in December 2010, expands on the policy oriented 2006 assessment. The new information detailed in the CCAT Biennial 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). The action items in the report focus on the preparation of the Climate Change Adaptation Strategy, required by Executive Order S-13-08, described below.

1.1.2.3 Assembly Bill 32, The Global Warming Solutions Act of 2006.

In 2006, the California State Legislature adopted AB 32, the *Global Warming Solutions Act of 2006*, focusing on reducing GHG in California. GHGs as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 required CARB to adopt rules and regulations directing State actions that would achieve greenhouse gas emissions equivalent to 1990 statewide levels by 2020. On or before June 30, 2007, CARB was required to publish a list of discrete early action GHG emission reduction measures to 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.

CARB published its Final Report for Proposed Early Actions to Mitigate Climate Change in California in October 2007. This report described recommendations for discrete early action measures to reduce GHG emissions as part of California's AB 32 GHG reduction strategy. Resulting from this are three new regulations proposed to meet the definition of "discrete early action greenhouse gas reduction measures," including the following: a low carbon fuel standard; reduction of HFC-134a emissions from non-professional servicing of motor vehicle air conditioning systems; and improved landfill methane capture (CARB 2007d). CARB estimates that by 2020, the reductions from those three measures would be approximately 13-26 million metric tons (MMT) CO₂e.

Under AB 32, CARB has the primary responsibility for reducing GHG emissions. In 2007, CARB released a report, *California 1990 GHG Emissions Level and 2020 Emissions Limit* (CARB 2007a), that determined the statewide levels of GHG emissions in 1990 to be 427 MMT CO₂e. Additionally, in December 2008, CARB adopted the *Climate Change Scoping Plan*, which outlines the State's strategy to achieve the 2020 GHG limit. This Scoping Plan proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. The plan emphasizes a cap-and-trade program, but also includes the discrete early actions (CARB 2008).

1.1.2.4 Senate Bill 97 (SB 97)

SB 97, enacted in 2007, amended the California Environmental Quality Act (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. The revisions were completed March 2010 and codified into the California Code of Regulations and became effective within 120 days pursuant to CEQA. The amendments provide regulatory guidance for the analysis and mitigation of the potential effects of GHG emissions.

Among the changes resulting from SB 97, CEQA Guidelines Section 15183.5 (Tiering and Streamlining the Analysis of GHG Emissions), was added to describe the criteria needed in a Climate Action Plan to allow for the tiering and streamlining of CEQA analysis of GHGs for subsequent development projects. Specifically, the section reads:

§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.

1.1.2.5 Senate Bill 375

Senate Bill 375 (SB 375), which establishes mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions, was adopted by the State on September 30, 2008. On September 23, 2010, CARB adopted the vehicular greenhouse gas emissions reduction targets that had been developed in consultation with the metropolitan planning organizations (MPOs); the targets require a 7 to 8 percent reduction by 2020 and between 13 to 16 percent reduction by 2035 for each MPO. SB 375 recognizes the importance of achieving significant greenhouse gas reductions by working with cities and counties to change land use patterns and improve transportation alternatives. Through the SB 375 process, MPOs, such as the Southern California Council of Governments (SCAG), which includes Riverside

County, will work with local jurisdictions in the development of sustainable communities strategies (SCS) designed to integrate development patterns and the transportation network in a way that reduces greenhouse gas emissions while meeting housing needs and other regional planning objectives. SCAG's reduction target for per capita vehicular emissions is 8 percent by 2020 and 13 percent by 2035 (CARB 2010). The MPOs will prepare their first SCS according to their respective regional transportation plan (RTP) update schedule; to date, no region has adopted an SCS. The first of the RTP updates with SCS strategies are expected in 2012.

1.1.2.6 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, to provide clear direction on how the State should plan for future climate impacts. Executive Order S-13-08 calls for the implementation of four key actions to reduce the vulnerability of California to climate change:

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

The 2009 CAS Report summarizes the best known science on climate change impacts in the state to assess vulnerability, and outlines possible solutions that can be implemented within and across state agencies to promote resiliency. This is the first step in an ongoing, evolving process to reduce California's vulnerability to climate impacts (California Natural Resources Agency 2009a).

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

CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Non-residential 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.

Since use of fossil fuels to produce energy results in GHG emissions, energy efficient buildings that use less energy result in less GHG emissions as well.

The California Energy Commission (CEC) adopted Updated Title 24 Standards in 2008 and they went into effect on August 1, 2009. These changes affect Building Energy Efficiency Standards, in order to:

- Provide California with an adequate, reasonably priced, and environmentally sound supply of energy;
- 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;
- Pursue California energy policy, which states that energy efficiency is the resource of first choice for meeting California's energy needs;
- 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;
- Meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes; and
- 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.

1.1.3 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 the 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 through 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 source⁴ control measures designed to bring the area into compliance with the state ozone standards.

After AB 32 was passed, SCAQMD formed a Climate Change Committee along with a 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 the District will take to assist businesses and local governments in implementing climate change measures, decrease the agency's carbon emissions, and provide information to the public regarding climate change. On December 5, 2008, the Board approved interim CEQA GHG significance thresholds for stationary sources, and related rules, and plans. The District also adopted a tiered approach for determining significance. Projects that are exempt from CEQA or consistent with an approved local GHG reduction plan can be found to be less than significant. Tier 3, the primary tier the Board will use for determining significance, has a screening significance threshold designed to capture 90 percent of sector GHG emissions (SCAQMD 2008).

1.1.4 Local

In light of State and regional efforts to reduce GHGs, there are several avenues of opportunity Riverside County faces. In preparing this technical report and the forthcoming CAP, the County 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 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's emissions. The County 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

⁴ 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.

enough GHG-reducing elements), then the project is consistent with the County's plan for reducing emissions. This streamlined process relieves the County 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.

Section 2 Methodology

2.1 Overview

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 and the Draft Community-wide GHG Emissions Protocols 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 emissions⁵ from sources within the jurisdictional boundaries of the County. This includes fuel burned onsite in buildings and equipment such as natural gas or diesel fuel; transportation fuels burned in motor vehicles and airplanes; and wood-burning emissions from household hearths. For inventories of only municipal operations, these emissions are limited to activities under the operational control of the local government.

⁵ A direct source is one where the action and the associated emissions are in the same location. For example, when a homeowner burns wood in his fireplace, he releases GHGs directly from his fireplace. An "indirect" source is one where the action that generates GHGs is separated from the where the GHGs are actually emitted. For example, when a building uses electricity, it necessitates the burning of coal (and resultant release of GHGs) by a coal-fired electricity generating station located elsewhere.

- 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’s facilities in the unincorporated areas. These emissions are “indirect” as the GHG emissions arise distantly, for example at an electric generating station in another county or even state. Thus they are distinguished from *direct* emissions (i.e., Scope 1 emissions), which are reported by the utility itself, in order to avoid double counting.
- Scope 3 Emissions is an optional reporting category that encompasses all other “indirect emissions” that are a consequence of activities of the County’s residents and businesses, but occur from sources out of the jurisdictional control of the local government. For example, emissions from trucks hauling waste under a County contract. 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)

Because Scope 3 emissions are indirect emissions that are attributable to emissions sources that are not owned or controlled by Riverside County, they are not considered in this report. Scope 1 emissions are characterized and named in this report as “direct emissions.” Scope 2 emissions are characterized and named as “indirect source emissions.”

The analysis herein is tailored to include all existing and projected emission sources within the County to provide, to the fullest extent feasible, a comprehensive analysis of GHG impacts. The Global Warming Solutions Act of 2006 (AB 32) established a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gas emissions. The law mandates the reduction of CO₂e emissions in California to 1990 levels by 2020.

2.2 GHG Emissions in Riverside County

The purpose of this inventory is to identify and categorize the major sources and quantities of GHG emissions currently being produced by the unincorporated County’s residents, businesses and municipal (i.e., County) operations (referred to collectively as “Riverside County,” herein). The existing emissions are based on 2008 activities since that is the most recent year for which complete and up-to-date data are available. The inventory provides a framework on which to design programs and actions that specifically target reductions by

emissions sources. The inventory also serves as a reference against which to measure the County's progress towards reducing GHG emissions over time, and documentation for potential emission trading opportunities.

In estimating Riverside County's total greenhouse gas emissions, data from County, regional, and State agencies were used. For community energy statistics, the following agencies and 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 Geronio 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 forecast data was not available, estimates were made by extrapolating from existing land use data based on growth assumptions. General estimate calculations and assumptions are compiled in Appendix B. All of the greenhouse gas emission contributions (such as, kilowatt-hours of electricity generated by fossil fuel combustion in power plants, therms of natural gas combusted, vehicle miles traveled, and tons of solid waste) have been converted through various factors into the common unit of metric tons of CO₂e released into the atmosphere (MTCO₂e) in a given year.

The main GHG generated by Riverside County's activities is carbon dioxide. In particular, the County directly generates CO₂ in the form of vehicle exhaust, consumption of natural gas for heating, and agriculture production. Riverside County also generates emissions of methane and nitrous oxide. Methane is directly generated from agricultural production, combustion of fossil fuels, and solid waste decomposition. Nitrous oxide results predominately from agricultural production and motor vehicle use.

2.3 Calculation of GHGs

The following summarizes the methodology used for GHG calculations for each category of emission source. The emissions calculations follow the California Climate Action Registry (CCAR) General Reporting Protocol, version 3.1 (January 2009); the Local Government Protocol, version 1.1 (May 2010); the Urban Forestry Protocol, version 1.1 (Climate Action Reserve, March 2010) and CARB's Mandatory GHG Reporting Regulations (CARB 2007c). These protocols are consistent with the methodology and emission factors endorsed by South Coast Air Quality Management District, CARB, and USEPA. In cases where the various protocols do not contain specific source emission factors, current industry standards or "AP 42," emission factors published by USEPA were used (USEPA 1985). Equations and modeling assumption used in the calculations of GHGs are included in Appendix B.

In this report, "Business As Usual" (BAU) refers to the continued operations and development of the County without the inclusion of recently-adopted sustainability initiatives. The BAU scenario describes how emissions would be in year 2020, if the emissions inventory continued to grow strictly based upon the socioeconomic and land use growth projections for the County and the naturally-occurring events that might change the character of emissions. Therefore, the BAU scenario follows a fairly linear growth pattern of emissions, with minor changes, as expected to result from the normally-occurring process of urbanization within the County. Because urbanization tends to result in the provision of more commercial and job opportunities near homes, compared to undeveloped areas, continued urbanization also yields a modest reduction in vehicle miles traveled (VMT) outside the influence of any programs or focused VMT reduction policies. As defined, the BAU does not include any specific programs to reduce VMT.

GHG emissions are typically segregated into direct and indirect sources as discussed earlier. However, direct and indirect sources are not completely independent of each other and may often be combined into other more encompassing categories or "sectors." For example, although natural gas combustion is a direct source and electricity generation is an indirect source, they both are typically discussed under the "Energy" sector when policies are put in place to reduce emissions. Thus, each sector represents a variety of emissions that generally result from activities that may all be influenced through similar measures, despite their varying sources. Accordingly, this inventory presents and discusses emissions as associated with five

key sectors: Energy, Solid Waste, Landscape Emissions, Transportation, and Agriculture. Each is discussed individually below.

2.3.1 Energy

2.3.1.1 Electricity:

Emissions of CO₂, CH₄, and N₂O within Riverside County result from the use of electricity. Annual electricity usage in 2008, obtained from SCE and the Imperial Irrigation District (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 2020, emissions estimates were based on the anticipated growth in population, housing and employment for the County. The 2020 growth projections were interpolated from the General Plan Update build-out conditions.

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 CO₂, CH₄, and N₂O obtained from EPA's Emissions and Generation Resource Integrated Database (eGRID) (USEPA 2007).

2.3.1.2 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 the County in million British Thermal Units (MMBTUs) was multiplied by the respective emissions factors for CO₂, CH₄, and N₂O to determine the emissions from natural gas combustion. Existing inventory consumption levels were obtained from the Southern California Gas Company (SCG) and future consumption estimates were based on anticipated growth in the County.

2.3.1.3 Water Supply:

Electricity is needed to move and treat water. 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/wholesalers serving Riverside County are: Coachella Valley Water District, Desert Water Agency, Eastern Municipal Water District, Western Municipal Water District, Palo Verde Irrigation District, and San Geronio Pass Water Agency. 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.

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 (Section 2.3.1.1.) described above.

2.3.1.4 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 "Electricity," Section 2.3.1.1.

2.3.2 Solid Waste Management

Riverside County Waste Management Department is responsible for managing the County's landfills, including both active and closed landfills. Table 2-1, 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. All

of the landfills are managed by the County with the exception of El Sobrante, which is privately owned and operated.

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	-

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 is determined based on the average number of miles traveled by each truck and the CO₂, CH₄, and N₂O emissions generated per mile traveled. These emissions are accounted for under “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 CO₂, CH₄, and N₂O, 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 CH₄. 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, all of the landfills have such systems with the exception of Desert Center, Mecca II, and Oasis landfills; these three landfills are the smallest in the County with limited waste disposal. Although CO₂ 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.

2.3.3 Area Source Emissions

2.3.3.1 Landscaping Emissions

Emissions of CO₂, CH₄, and N₂O are generated by the use of landscape equipment that runs on gasoline. CO₂ emissions were determined directly through URBEMIS2007 for the existing (2008) and 2020 inventories. URBEMIS2007 is a computer software package that is used for modeling projected emissions of air quality pollutants including carbon dioxide. From the CO₂ 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 CH₄ and N₂O emissions.

2.3.3.2 Wood Burning Emissions

Direct CO₂ 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 sub-category; they have already been accounted for under “Energy,” Section 2.3.1.1. Carbon dioxide, CH₄, and N₂O 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 EPA’s AP-42 document (USEPA 1985).

2.3.4 Transportation

2.3.4.1 On-Road Vehicles

Emissions from on-road vehicles include all generated from trips attributable to activities taking place in the unincorporated parts of the 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 CO₂ 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 CH₄ and N₂O 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 County Transportation Department. VMTs were derived from a transportation model count of the trips entering the County, trips leaving the County, and trips within the County. Pass-through traffic (that is, trips beginning and ending outside of the County) is not included in this analysis. Since trips entering and leaving the 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 the County will be accounted for under electrical usage, i.e., "Energy," Section 2.3.1.1. Predicted 2020 BAU vehicle trips were estimated by using Riverside County General Plan build-out (approximately Year 2060) conditions and interpolating back to year 2020.

2.3.4.2 Aviation Emissions

Riverside County owns and operates five airports: Hemet-Ryan, French Valley, Chiriaco Summit, Desert Center and Jacqueline Cochran Regional Airport. The GHG emissions associated with aircraft trips within the County were calculated based on annual fuel consumption (extrapolated from airport aviation fuel sales) and emission factors for jet fuel and aviation fuel for CO₂, CH₄, and N₂O. 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.

2.3.5 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 procedures 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 are the primary greenhouse gases emitted from crop cultivation and associated activities. Rice cultivation and field burning of agricultural residues are contributing sources of CH₄ (USEPA 2009b). Agricultural related emissions for 2008 were based on data from SCAG and the Riverside County Agricultural Commissioner.

2.3.6 Municipal Operations

In addition to the community-wide emissions presented in this report, Riverside County's forthcoming Climate Action Plan will include an inventory of the County's municipal operations. This inventory will only include emissions from fuel used in buildings, vehicles, and facilities that are under the operational control of the local government. Although most of the emissions from the municipal operations are included in the community-wide inventory, the two emissions inventories are developed differently and cannot simply be subtracted from or added to one another. The government operations inventory will provide Riverside County the opportunity to

evaluate its progress in implementing emission reduction strategies on a municipal level and set an example for the implementation of reduction strategies throughout the County.

Section 3 Greenhouse Gas Emissions Inventory

The emissions inventory identifies and categorizes the major sources and quantities of GHG emissions being produced by County residents, businesses, and municipal (County) operations based on the best available data. Using historic emissions and business-as-usual (BAU) practices as a basis, the inventory includes GHG emissions from 2008 (baseline) and projected for 2020. In terms of land use, GHG emissions are predicted based on the types of activities associated with the given use and may span a number of sectors. For example, a single-family home would be associated with GHG emissions from transportation (commuting to work, say), waste generation (trash and lawn clippings) and energy consumption (used to run appliances, heat and light the house).

3.1 2008 Emissions Inventory

For 2008, activities within unincorporated Riverside County resulted in the emission of approximately 1.2 MMT of CO₂e. Table 3-1 through Table 3-7 and Figure 3-1, below, summarize the 2008 emissions by emissions category, as follows:

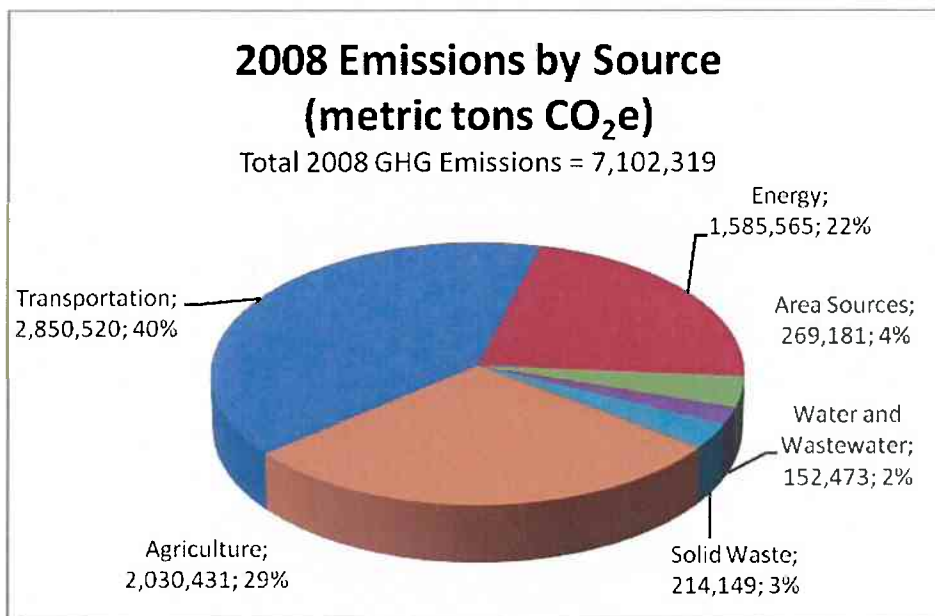
3.1.1 2008 Net Total Emissions

Table 3-1 summarizes net 2008 County emissions of CO₂e as broken down by emissions category. Each of these categories is further broken down in Tables 3-2 through 3-7, below. Figure 3-1 is a graphical representation of Table 3-1. A detailed breakdown of 2008 emissions by category is available in Appendix A.

Table 3-1: 2008 Net Total Emissions

Net Total Emissions	
Emissions Category	Metric tons of CO ₂ e
Transportation	2,850,520
Energy	1,585,565
Area Source Emissions	269,181
Purchased Water	152,473
Solid Waste	214,149
Agriculture	2,030,431
Total	7,102,319

Figure 3-1: 2008 Emissions Generated by Emissions Category (MT CO₂e)



3.1.2 2008 Energy Emissions

Table 3-2 summarizes the emissions from energy generation and/or consumption with respect to electricity and natural gas used within the County. Energy-related emissions represent approximately twenty-two percent of the total GHG emissions generated by the County in 2008. A detailed breakdown of 2008 energy emissions is available in Appendix A.

Table 3-2: 2008 Energy Emissions

Energy Emissions	
Sources:	Metric tons of CO ₂ e
Electric	1,075,316
Natural Gas	510,249
Total	1,585,565

3.1.3 2008 Solid Waste Emissions

Table 3-3 summarizes the 2008 County emissions from the disposal and decomposition of solid waste generated within the County. Solid waste-related emissions represent approximately

three percent of the total GHG emissions generated by the County in 2008. A detailed breakdown of 2008 solid waste emissions is available in Appendix A.

Table 3-3: 2008 Solid Waste Emissions

Solid Waste	
Source	Metric tons of CO₂e
Landfill Offgasing	209,097
Onsite Equipment	5,052
Total	214,149

3.1.4 2008 Area Source Emissions

Table 3-4 summarizes the 2008 County area source emissions from landscaping and wood-burning activities. Landscape and wood-burning related area source emissions represent approximately five percent of the total GHG emissions generated by Riverside County in 2008. A detailed breakdown of 2008 Landscape emissions is available in Appendix A.

Table 3-4: 2008 Area Source Emissions

Area Source Emissions	
Sources:	Metric tons of CO₂e
Landscape Emissions	150,639
Wood burning	118,543
Total	269,181

3.1.5 2008 Purchased Water Emissions

Table 3-5 summarizes the 2008 County indirect emissions from purchased water. Water-related emissions included in this section are indirectly produced as a result of electrical consumption to pump and treat water imported from outside the County. Indirect emissions from the purchasing of water from the State Water Project and the Colorado River represent approximately two percent of the total GHG emissions generated by Riverside County in 2008. A detailed breakdown of 2008 purchased water emissions is available in Appendix A.

Table 3-5: 2008 Purchased Water Emissions

Purchased Water Emissions	
Sources:	Metric tons of CO₂e
Purchased Water	152,473
Total	152,473

3.1.6 2008 Agricultural Emissions

Table 3-6 summarizes the 2008 County emissions with respect to agricultural activities within the County. Agricultural emissions represent approximately twenty-eight percent of the total GHG emissions generated by the County in 2008. Table 3-6 shows the breakdown of agricultural emissions by activity. A detailed breakdown of 2008 Agricultural emissions is available in Appendix A.

Table 3-6: 2008 Agricultural Emissions

Agriculture	
Sources:	Metric tons of CO₂e
Enteric Fermentation	115,584
Manure Management	199,873
Agricultural Residue Burning	166
Crop Growth	1,233,081
Animals and Runoff	235,565
Fertilizer Use	246,162
Total	2,030,431

3.1.7 2008 Transportation Emissions

Table 3.7 summarizes the 2008 County emissions with respect to airport operations and vehicle miles traveled. Transportation emissions do not include pass-through traffic on the freeways within Riverside County and only account for vehicle trips with starting points and/or destinations related to land uses within unincorporated areas that are within the jurisdictional control of the County. Transportation-related emissions represent the largest emission source at approximately forty percent of the total GHG emissions generated within Riverside County. A detailed breakdown of 2008 transportation emissions is available in Appendix A.

Table 3-7: 2008 Transportation Emissions

Transportation Emissions	
Sources:	Metric tons of CO₂e
On-Road Vehicles	2,819,456
Airport Operations	21,162
Total	2,850,520

3.2 2020 Business as Usual (BAU) Emissions Inventory

In 2020, Riverside County is projected to emit a total of 10.9 MMT of CO₂e from business-as-usual operations. Business-as-usual refers to continued operations and development of the County according to 2008 policies, without the inclusion of proposed reduction or sustainability initiatives as part of the forthcoming Climate Action Plan. 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 Section 4. The following tables and figures (Table 3-8 through Table 3-12; and Figure 3-2) summarize the 2020 BAU emissions by emissions category.

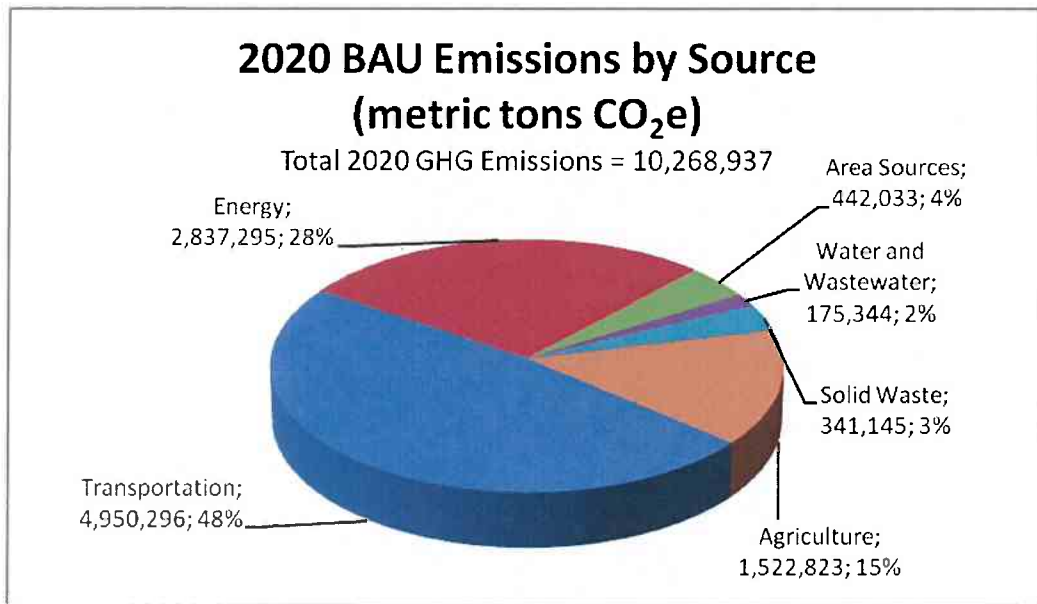
3.2.1 2020 BAU Net Total Emissions

Table 3-8 summarizes the net 2020 County emissions of CO₂e as broken down by emissions source category. Each of these categories is further broken down in Tables 3-9 through 3-14 below. Figure 3-2 is a graphical representation of Table 3-8. A detailed breakdown of 2020 emissions by category is available in Appendix A.

Table 3-8: 2020 BAU Net Total Emissions

Net Total Emissions	
Emissions Category	Metric tons of CO₂e
Transportation	4,950,296
Energy	2,837,295
Area Source Emissions	442,033
Purchased Water	175,344
Solid Waste	341,145
Agriculture	1,522,823
Total	10,268,937

Figure 3-2: 2020 BAU Emissions Generated by Source (MT CO₂e)



3.2.2 2020 BAU Energy Emissions

Table 3-9 summarizes the forecasted emissions from energy generation and/or consumption with respect to electricity and natural gas. The total also includes indirect energy emissions associated with local pumping and treating potable water and wastewater. Energy related emissions represent approximately twenty-seven percent of the total BAU GHG emissions generated by Riverside County in 2020. A detailed breakdown of 2020 BAU energy emissions is available in Appendix A.

Table 3-9: 2020 BAU Energy Emissions

Energy Emissions	
Sources:	Metric tons of CO ₂ e
Electric	1,930,555
Natural Gas	906,740
Total	2,837,295

3.2.3 2020 BAU Solid Waste Emissions

Table 3-10 summarizes the forecasted 2020 BAU County emissions from the transportation, disposal, and decomposition of solid waste generated within the County. Solid-waste-related emissions represent approximately three percent of the total GHG emissions generated by

Riverside County in 2020. A detailed breakdown of 2020 BAU solid waste emissions is available in Appendix A.

Table 3-10: 2020 BAU Solid Waste Emissions

Solid Waste	
Source	Metric tons of CO₂e
Landfill Offgasing	335,336
Onsite Equipment	5,810
Total	341,145

3.2.4 2020 BAU Area Source Emissions

Table 3-11 summarizes the 2020 BAU County emissions from area source activities. The primary source of emissions results from wood burning and the use of landscape equipment. Area Source emissions represent approximately five percent of the total GHG emissions generated by Riverside County in 2020. A detailed breakdown of 2020 BAU landscape emissions is available in Appendix A.

Table 3-11: 2020 BAU Area Source Emissions

Area Source Emissions	
Sources:	Metric tons of CO₂e
Landscape Emissions	250,426
Wood Burning	191,607
Total	442,033

3.2.5 2020 Purchased Water

Table 3-12 summarizes the 2020 BAU County indirect emissions from purchased water. Water-related emissions included in this section are indirectly produced as a result of electrical consumption to pump and treat water imported from outside the County. Indirect emissions from the purchasing of water from the State Water Project and the Colorado River represent approximately two percent of the total GHG emissions generated by Riverside County in 2020. A detailed breakdown of forecasted 2020 BAU purchased water emissions is available in Appendix A.

Table 3-12: 2020 Purchased Water Emissions

Purchased Water Emissions	
Sources:	Metric tons of CO₂e
Purchased Water	175,344
Total	175,344

3.2.6 2020 BAU Agricultural Emissions

Table 3-13 summarizes the forecasted 2020 BAU County emissions with respect to agricultural activities within the County. Agricultural emissions represent approximately nineteen percent of the total County emissions. Table 3-13 represent the breakdown of agricultural emissions by activity. A detailed breakdown of 2020 BAU agricultural emissions is available in Appendix A.

Table 3-13: 2020 BAU Agricultural Emissions

Agriculture	
Sources:	Metric tons of CO₂e
Enteric Fermentation	86,688
Manure Management	149,905
Agricultural Residue Burning	124
Crop Growth	924,811
Animals and Runoff	176,674
Fertilizer Use	184,621
Total	1,522,823

3.2.7 2020 BAU Transportation Emissions

Table 3-14 summarizes the forecasted 2020 BAU County emissions with respect to airport operations and vehicle miles traveled. Transportation emissions do not include pass-through traffic on the freeways within Riverside County and only account for vehicle trips related to Riverside County land uses as starting points and destinations. Transportation-related emissions represent approximately forty-eight percent of the total GHG emissions generated by Riverside County in 2020 under the BAU scenario. Transportation emissions are anticipated to be both the largest source of emissions and have the highest growth of emissions within the County. A detailed breakdown of 2020 BAU transportation emissions is available in Appendix A.

Table 3-14: 2020 BAU Transportation Emissions

Transportation Emissions	
Sources:	Metric tons of CO₂e
On-Road Vehicles	4,929,135
Airport Operations	21,162
Total	4,950,296

Section 4 GHG Emissions Regulations and Implementation Measures

The State of California has set specific targets for reducing greenhouse gas emissions from the burning of fossil fuels in both power plants and vehicles by adopting various regulations, however, these State strategies will complement the local initiatives in Riverside County as they work to reach their 2020 reduction target. This technical report evaluates the greenhouse gas reductions that will occur within the County as a result of the State actions; then, reductions from additional County implementation measures are analyzed. The State measures are identified as R1 reduction measures in this report. 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 greenhouse gas emissions at the County level. The R1 measures are not administered or enforced by the County, but the County - by describing them herein- substantiates the reductions applied in association with these State Measures. New development in the County offers an opportunity to incorporate GHG reduction measures into the planning of projects; thus, the IMs described in this section are targeted toward new development.

The Riverside County General Plan has policies that will reduce GHG emissions. The following section describes Riverside County's General Plan policies that will reduce GHG emissions that are currently in place. Subsequent sections are organized by GHG emissions sector and describe both the R1 reduction measures and County IMs that reduce emissions from that specific sector.

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 issue. Table 4-1 below summarizes these General Plan policies.

Table 4-1: 2020 BAU Transportation 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

The following sections are divided by emissions sectors (energy, solid waste, agriculture, transportation, area sources, and industrial point sources). For each emission sector, the section starts with the R1 State Measures that will reduce emissions within that sector. The R1 measures are followed by recommended County Implementation Measures (IMs) relevant to that emission sector. The IMs include measures for both new development and existing development in the County and include a list of General Plan Policies that each IM will implement. Note that the IMs are not prescriptive and heavily rely upon the Screening Table menu of options concept. The Screening Tables have point values assigned to each menu option. As long as a development project meets the required point allotment (100 points) as a whole the development will meet the requirements of the IM process. This system will assure flexibility in the implementation of the measures.

4.2 Energy

4.2.1 R1 Energy Reduction Measures

The following list of R1 building energy efficiency related measures are those measures that California has identified in the CARB Scoping Plan that will result in emission reductions within the 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 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 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 1109 mandated that the California Energy Commission (CEC) adopt energy efficiency standards for general purpose lighting by the end of 2008. These regulations, combined with other State efforts, are structured to reduce State-wide electricity consumption in the following ways:

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

R1-E4: Electricity Energy Efficiency (AB32)

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's Scoping Plan that are not attributed to other R1 or R2 reductions as described in this report. This includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and that 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 California Green Building Standards Code (Title 24, Part 11 of the California Code of Regulations; hereinafter referred to as, "CALGreen Building Standards")(effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 21.3 MMTCO₂e, 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 the high upfront cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation. Split incentives happen particularly in rental properties where the owner has no interest in energy improvements because they don't pay the energy bills and tenants have no interest because they do not own the property;

- 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 State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in the Title 24 Energy Efficiency Standards, CALGreen Building Standards (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 4.3 MMTCO₂e, representing 6.2 percent of emissions from all natural gas combustion in the State. This measure includes the following strategies:

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

R1-E6: Increased Combined Heat and Power (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 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 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 percent of emissions from all electricity in the State.

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 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.

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 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 (including the “purchased water” in this inventory) by approximately 21.3 MMTCO_{2e}, representing 15.2 percent of emissions from electricity generation (in-State and imports).

4.2.2 Energy Reduction Implementation Measures

The following list of implementation measures (IM) are candidate measures related to building energy efficiency the 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.

IM-E1: Residential Energy Efficiency Program

This IM 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 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 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. 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, the 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 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.

IM-E2: Residential Renewable Energy Program

This IM 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.

IM-E3: Residential Retrofit Implementation Program

This IM would implement General Plan Policies OS 16.5, OS 16.7, and OS 16.9 and 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 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.

IM-E4: Residential Renewable Retrofit Program

This IM 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.

IM-E5: Commercial Energy Efficiency Program

This IM 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 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 the 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 IM-E1 above, the 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 the County's GHG reduction plan. This system will provide flexibility in the implementation of all 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 and 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.

IM-E6: Commercial/Industrial Renewable Energy Program

This IM 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.

IM-E7: Commercial/Industrial Retrofit Program

This IM 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

IM-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 the County's Mt. Palomar Lighting Ordinance, which requires use of LPSV street lighting within 15 miles of Mt. Palomar Observatory.

IM-E9: Water Use Reduction Initiative

This IM 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 IM is provided here to enable its implementation and ensure points are allocated from the Screening Tables in accordance with the resultant benefits.

4.3 Solid Waste

4.3.1 R1 Solid Waste Measure

As described below, 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 the County:

R1-W1: 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 MMTCO₂e 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 CO₂ reduced.

4.3.2 Implementation Measures to Reduce Solid Waste

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

IM-W1: County Diversion Program

This IM would implement General Plan Policy AQ 4.1 and AQ 5.1 through a County-wide 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 bins for each type of recycled material) within residential, commercial, and industrial development;
- 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.

IM-W2: 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 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.

4.4 Agriculture

4.4.1 R1 Agriculture Measure

The following R1 agriculture related measure identified by the State in the AB 32 Scoping Plan would serve to help reduce emissions 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 1.0 MMTCO₂e, representing 7.8 percent of the CH₄ and N₂O emissions from manure management and enteric fermentation at dairies across the State.

4.4.2 Implementation Measures to Reduce Agricultural Source Emissions

Agriculture is an important, but separate, economic sector from new development projects within the County. Because of the difference between agricultural activities and new resi-

dential, commercial and industrial development within the County, IMs for agricultural source emissions are not recommended at this time.

4.5 Transportation

4.5.1 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 the County.

R1-T1: Assembly Bill 1493: Pavley I

Assembly Bill 1493 (Pavley) required CARB to adopt regulations that will reduce GHG emissions from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016, effective with 2009 models. By 2020, this requirement will reduce emissions in California by approximately 16.4 MMTCO₂e, representing 17.3 percent of emissions from passenger/light-duty vehicles in the State.

R1-T2: Assembly Bill 1493: Pavley II

California committed to further strengthening the AB 1493 standards beginning in 2017 to achieve a 45 percent GHG reduction from 2020 model year vehicles. This requirement will reduce emissions in California by approximately 4.0 MMTCO₂e, representing 2.5 percent of emissions from passenger/light-duty vehicles in the State.

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

The Low Carbon Fuel Standard (LCFS) will require a reduction of at least ten percent in the carbon intensity of California's transportation fuels by 2020. By 2020, this requirement will reduce emissions in California by approximately 15 MMTCO₂e, representing 6.9 percent of emissions from passenger/light-duty vehicles in the State.

R1-T4: Tire Pressure Program

The AB 32 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 MMTCO₂e, representing 0.3 percent of emissions from passenger/light-duty vehicles in the State.

R1-T5: Low Rolling Resistance Tires

This AB 32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 MMTCO₂e, representing 0.2 percent of emissions from passenger/light-duty vehicles in the State.

R1-T6: Low Friction Engine Oils

This AB 32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce emissions in California by approximately 2.8 MMTCO₂e, representing 1.7 percent of emissions from passenger light-duty vehicles in the State.

R1-T7: Goods Movement Efficiency Measures

This AB 32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this requirement will reduce emissions in California by approximately 3.5 MMTCO₂e, representing 1.6 percent of emissions from all mobile sources (on-road and off-road) in the State.

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

This AB 32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 MMTCO₂e, representing 1.9 percent of emissions from heavy-duty vehicles in the State.

R1-T9: Medium and Heavy-Duty Vehicle Hybridization

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 MMTCO₂e, representing 0.2 percent of emissions from all on-road mobile sources in the State; and equivalent to a 1.0 percent reduction of emissions from all heavy-duty trucks in the State.

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 MMTCO₂e, which is equivalent to 2 percent 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.

4.5.2 Implementation Measures to Reduce Transportation Related Emissions

The following list of Implementation Measures (IM) are candidate measures the County can incorporate into the new development projects for the reduction of transportation related emissions to achieve an AB 32 compliant reduction target.

IM-T1: Employment Based Trip and VMT Reduction

This IM 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. To gain points within the Screening Table, employers with more than 100 employees within the unincorporated 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.

IM-T2: Land Use-Based Trip and VMT Reduction Policies

The demand for transportation is influenced by the density and geographic distribution of people and places. Factors like, whether or not neighborhoods have sidewalks or bike paths, and whether or not homes are within walking distance of shops or transit stops, will influence the type and amount of transportation that is utilized. Hence, changing the focus of land use from automobile-centered transportation can result in a reduction in vehicle miles traveled. This IM would implement General Plan Policies LU 4.1p and t, LU 10.4, LU 12.1, LU 12.3, LU 12.4, C 1.2, C 1.7, C 4.1 through C 4.7, C 4.9, C 11.13, C 15.1, C 15.3, C 17.1 through C 17.4, C 18.1, and C 20.12. Although not limited to the below actions, this reduction goal can be achieved through the incorporation of the following into new development proposals:

- Sidewalks on both sides of the streets;
- Pases or other types of pedestrian pathways connecting residential development with pocket parks, neighborhood parks and local community centers;
- Dedicated multipurpose pedestrian and bicycle trails linking land uses;
- Pedestrian and bicycle pathways with linkages to transit stops and other complementary land uses within walking and biking distance of the project;
- Secure bicycle parking areas within development; and
- Transit stop infrastructure (benches, bus stop canopies, bus turnouts).

IM-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 in density (and hence 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.

IM-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-auto modes of transport. 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 a diversity of land uses within a ¼ mile. Due to the variations available in implementing a mixed use project, the reductions associated will be determined on a case-by-case basis.

IM-T4: Preferential Parking

This IM 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.

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

This IM 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 IM. 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 IM.

IM-T6: Provide a Comprehensive System of facilities for Non-motorized Transportation

This IM is similar to IM-T2 in that it implements the same General Plan Policies, but this IM emphasizes alternative non-motorized transportation hubs. This IM 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.

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

Implementation of the following IM 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 electric vehicle charging stations within the development.

IM-T8: Anti-Idling Enforcement

This IM 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 unincorporated 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.

IM-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.

IM-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.

4.6 Industrial

4.6.1 R1 Industrial Measures

The following list of R1 industrial related measures are those from the CARB 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 County action.

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 CO₂e, representing 13 percent of combustion emissions from oil and gas extraction in the State.

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 MMTCO₂e, representing 0.5 percent of combustion emissions from non-coal burning industrial sources in the State.

4.6.2 Implementation Measures for Point Source Emissions

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 the 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 IMs described throughout this document.