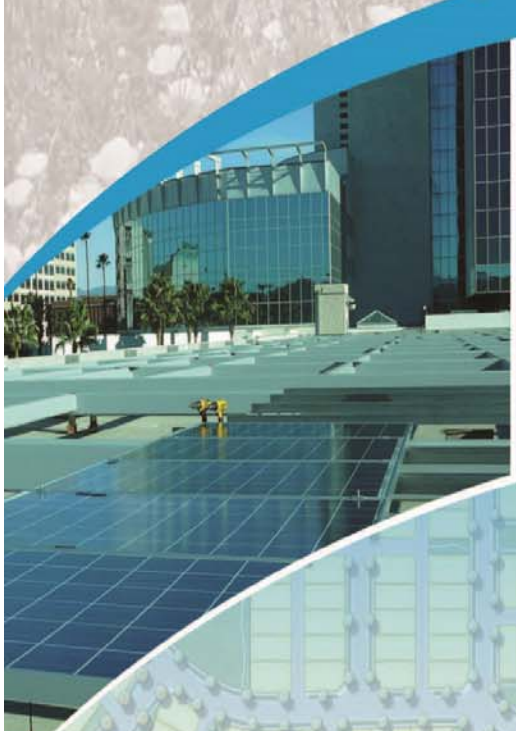
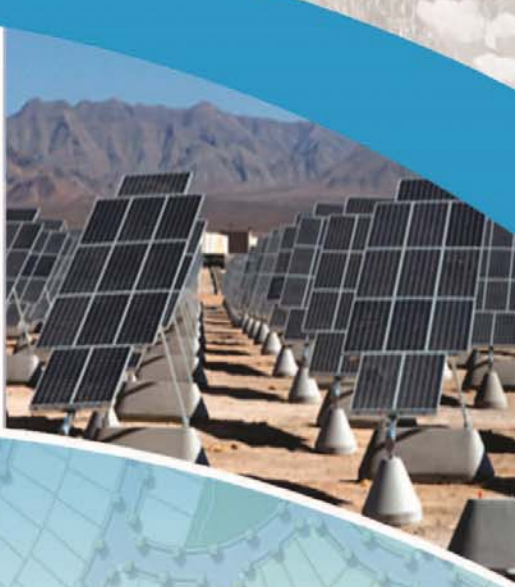
County of Riverside

Climate Action Plan

UPDATE





RIVERSIDE COUNTY
PLANNING DEPARTMENT

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ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
AB 32	Assembly Bill 32, The California Global Warming Solutions Act of 2006
ABAU	Adjusted Business-As-Usual
AEP	Association of Environmental Professionals
Anza	Anza Electric Cooperative, Inc.
ARRA	American Recovery & Reinvestment Act
BAU	Business- As- Usual
BTU	British Thermal Unit
C_2F_6	hexafluoroethane
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
CalGreen	California's Green Building Standard Code
Cal Recycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CAP Update	Riverside County Climate Action Plan Update
CARB	California Air Resources Board
CAS	California Climate Adaption Strategy
CCA	Community Choice Aggregation
CCAR	California Climate Action Registry
CCAT	California Climate Action Team
CCR	California Code of Regulations
CCTP	Climate Change Technology Program
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CF_4	carbon tetrafluoride
CFC	chlorofluorocarbons
CH_4	methane
CIWMB	California Integrated Waste Management Board
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of Riverside
CSI	California Solar Initiative
CTC	California Transportation Commission

CWSRF	Clean Water State Revolving Funds
DPM	diesel particulate matter
EECBG	Energy Efficiency Community Block Grant
eGRID	Emissions and Generation Resource Integrated Database
EMFAC2007	On-Road Emission Factors (published by CARB in 2007)
EO	Executive Order
EVs	all-electric vehicles
GCC	Global Climate Change
GHG	Greenhouse Gas
GMS	Grants Management System
GWh	gigawatt hours
GWP	Global Warming Potential
HFC	hydrofluorocarbons
HFC-134	hydrofluorocarbon 134
HFC-152a	difluoroethane
HFC-23	trifluoromethane
HERO	Home Energy Renovation Opportunity
I-10	Interstate 10
I-15	Interstate 15
I-215	Interstate 215
ICLEI	International Council of Local Environmental Initiatives
IFT	Inventory, Forecasting, and Target-Setting
IID	Imperial Irrigation District
IIP	Interregional Improvement Program
IM	Implementation Measures
IPCC	Intergovernmental Panel on Climate Change
ITS	Intelligent Transportation Systems
LCFS	low carbon fuel standard
LEED	Leadership in Energy and Environmental Design
LEV	low-emission vehicle
LGOP	Local Government Operations Protocol
MBTU	million British Thermal Units
MMT	million metric tons
mpg	miles per gallon
MT	metric tons
MWh	megawatt hours
N_2O	nitrous oxide

NSHP	New Solar Home Program
O_3	ozone
PACE	Property Assessed Clean Energy
PFCs	perfluorocarbons
ppb	parts per billion
ppm	parts per million
RCTC	Riverside County Transportation Commission
RIP	Regional Improvement Program
RIVTAM	Riverside County Traffic Analysis Model
RPS	Renewable Portfolio Standard
RTIP	Regional Transportation Improvement Program
RTPs	Regional Transportation Plans
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Communities Strategy
SoCalGas	Southern California Gas Company
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
STIP	State Transportation Improvement Plan
TLMA	Transportation Land Management Agency
URBEMIS 2007	Urban Emissions Model, Version 9.2 (published in June 2007)
USEPA	United States Environmental Protection Agency
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WRCOG	Western Riverside Council of Governments
ZEVs	zero-emission vehicles

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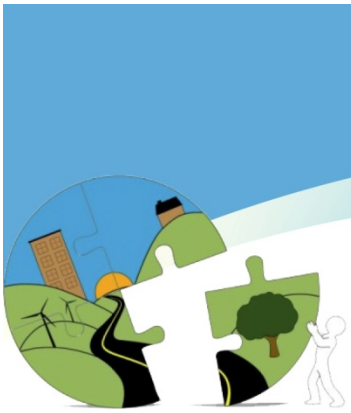

Executive Summary

Riverside County (County) is committed to planning sustainably for the future while ensuring a livable, equitable, and economically vibrant community. Planning sustainably includes acknowledging the local role in climate change and the ways in which the County can mitigate the greenhouse gas (GHG) emissions resulting from the County's growth and development in different economic sectors. By using energy more efficiently, harnessing renewable energy to power buildings, recycling waste, and enhancing access to sustainable transportation modes, Riverside County can keep dollars in its local economy, create new green jobs, and improve the community's health, safety, and welfare in addition to addressing climate change. To that end, Riverside County has implemented a number of sustainability and conservation efforts and seeks to continue those efforts through local planning and partnerships. This Riverside County Climate Action Plan (CAP) Update (CAP Update) integrates the County's past and current efforts with its future efforts to grow and thrive sustainably.

Following the State's adoption of Assembly Bill (AB) 32in 2006,[1] the California Air Resources Board (ARB) developed a climate change scoping plan that included directives for local governments to reduce GHG emissions associated with land use 15 percent below baseline levels by 2020. The County adopted its first Climate Action Plan (CAP) in 2015 that included GHG inventories of community-wide and municipal sources using the baseline data for the year 2008. The 2015 CAP included the GHG reduction target of 15 percent below 2008 levels by 2020. The inventory baseline year 2008, was established as a starting point against which other inventories may be compared and targets may be set, and was the earliest year with a full emissions inventory. As recommended in the AB 32 Scoping Plan, the County had set a target to reduce emissions back to 1990 levels by the year 2020. Based on the County's socio-economic growth projections per the 2015 General Plan Update, this target was calculated as a 15 percent decrease from 2008 levels by 2020 and was determined sufficient for the County to meet the AB 32 target. The most recent inventory has the most relevant data for planning purposes, whereas multiple inventory years provide context and may help identify trends or anomalies in the community emissions.

In 2016 the Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society, and respondents challenged particular aspects of the CAP related to commitments to solar, electric vehicles (EV), energy efficient traffic signals, and future updates of the CAP. In 2017 the County and the Petitioners entered into a Settlement

[1] The passage of AB 32, the California Global Warming Solutions Act of 2006, marked a watershed moment in California's history. By requiring in law a sharp reduction of greenhouse gas (GHG) emissions, California set the stage for its transition to a sustainable, low-carbon future. AB 32 is the first program in the country to take a comprehensive, long-term approach to addressing climate change, and does so in a way that aims to improve the environment and natural resources while maintaining a robust economy (website: https://www.arb.ca.gov/cc/ab32/ab32.htm).

Agreement[2] with commitments to solar, EV chargers, LED traffic signals and periodic updates that enhances the CAP goals and maintains the County's Land Use authority.

Since the 2015 CAP adoption and 2017 Settlement Agreement, new legislation and several policies have been proposed, such as Executive Order (EO) B-30-15[3] and SB 32[4] that extended the goals of AB 32 and set a 2030 goal of reducing emissions to 40 percent below 1990 levels by 2030. Further, the emissions reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This action keeps California on target to achieve the level of reductions scientists say is necessary to meet the Paris Agreement goals[5]. The ARB was directed to develop a climate change scoping plan update that would provide the regulations and policies to achieve the 2030 reduction target. On December 14, 2017, the ARB finalized California's 2017 Climate Change Scoping Plan, providing quantitative summaries of the regulation needed to achieve the 2030 reduction target. This CAP Update re-evaluates the County's GHG reduction targets and existing reduction strategies. The new goals and supporting measures are proposed to reflect and ensure compliance with changes in the local and State policies and regulations such as SB 32 and California's 2017 Climate Change Scoping Plan. The GHG inventories, based on the most recent data available for the year 2017, are calculated, and the future growth in emissions for the Business-As-Usual (BAU) and Adjusted BAU (ABAU) scenarios (the ABAU scenario takes into account the State policies) for the years 2020, 2030, and 2050 are projected. Sources of emissions include on-road and off-road transportation, agriculture, electricity and natural gas use, landscaping, water and wastewater pumping and treatment, and treatment and decomposition of solid waste.

Per the CAP Update, Riverside County's 2017 GHG emissions totaled 4,905,518 metric tons (MT) of carbon dioxide equivalent (CO_2e) for that year. Under the BAU forecast, emissions will be 5,158,305 MT CO_2e in 2020; 6,368,781 MT CO_2e in 2030; and 11,305,026 MT CO_2e in 2050. These emissions levels are 5.1 percent higher in 2020 than 2017, 29.8 percent higher in 2030 than 2017, and more than double 2017 emissions by 2050. Under the ABAU forecast (which represents State efforts in reducing GHG emissions within the County), emissions will be 4,861,256 MT CO_2e in 2020; 4,102,109 MT CO_2e in 2030; and 4,175,146 MT CO_2e in 2050. Compared to 2017, these emissions levels are 0.9 percent lower in 2020, 16.0 percent lower in 2030, and 14.8 percent lower in 2050. This CAP Update assesses the previous GHG reduction targets identified in the 2015 CAP and proposes new targets that are consistent with the State policies in order to meet the requirements of SB 32. The State recommends a 15 percent reduction below 2005–2008 baseline levels[6] by 2020, a 49 percent reduction below 2008 levels by 2030, and an 80 percent reduction below 2008 levels by 2050.[7] To continue reductions consistent with the State's long-term emissions reduction goals, the County would need to reduce emissions in 2030 by

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2 Partial Settlement Agreement, 2017. Petitioners: Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society and Respondents: County of Riverside and Riverside County Board of Supervisors.

3 On April 29, 2015, California Governor Jerry Brown announced through EO B-30-15 that by 2030, California shall reduce GHG emissions to 40 percent below 1990 levels. The emissions reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050 (website: https://www.climatechange.ca.gov/state/executive_orders.html).

4 Senate Bill 32 was signed by Sen. Jerry Brown on September 8, 2016 and requires that there be a reduction in GHG emissions to 40% below the 1990 levels by 2030.

5 California's 2017 Climate Change Scoping Plan Executive Summary. California Air Resources Board (website: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017_es.pdf).

6 For Riverside County, the baseline year was identified as 2008 per the 2015 Climate Action Plan.

7 State goals are to achieve 1990 levels of emissions by 2020 (15 percent below 2008 baseline levels), 40 percent below 1990 levels of emissions by 2030 (49 percent below 2008 baseline levels) and 80 percent below 1990 levels of emissions by 2050 (83 percent below 2008 baseline levels).

525,511 MT CO_2e from an ABAU forecast and by 2,982,947 MT CO_2e from an ABAU forecast by 2050. Table ES-1 (2017 and 2020 GHG Emissions Comparison), below, summarizes the community-wide emissions for 2017 and 2020, and the reduced, ABAU 2020 inventory.

The CAP Update summarizes various State and local policies that will contribute to reduced GHG emissions in Riverside County by the year 2020 and beyond. Some of these policies include updated building codes for energy efficiency, the low carbon fuel standard, Pavley (California Assembly Bill) vehicle emissions standards, and the Renewable Portfolio Standards for utility companies. By supporting the State in the implementation of these measures, Riverside County will experience substantial GHG emissions reductions. In order to reach the reduction target, the County of Riverside would also need to implement the additional local reduction measures described in this report. These measures encourage energy efficiency and renewable energy, development and penetration of zero-emission vehicles (ZEVs), water conservation, and increased waste diversion. In addition to local government, efforts at the local business and community level would be required to achieve these targets. Public education and outreach would play a crucial role in educating stakeholders about the importance of implementing these measures.

It is important to note that the post 2030 reduction targets identified in this CAP Update may need adjustments based on State updates and guidance when the State sets new reduction goals. As 2030 approaches, Riverside County would have implemented the first two phases of this CAP Update and would have a better understanding of the effectiveness and efficiency of the reduction strategies toward achieving the current 2050 GHG reduction target and may need to make adjustments. Furthermore, the federal, State, and local (County level) programs and policies for GHG reductions in the near term (2020-2030) are likely to be well underway; and continuing technological change in the fields of energy efficiency, alternative energy generation, vehicles, fuels, methane capture, and other areas will occur. Riverside County will then be able to take the local, regional, State, and federal context into account and may consider updating the GHG reduction targets for the period between 2030 and 2050.

Table ES-1 2017 and 2020 GHG Emissions Comparison

Source Category	Metric Tons of CO_2e			
	2017	2020 BAU	Reduced 2020 (ABAU)	% Change (2017-2020 ABAU)
Transportation (on-road)	1,766,784	1,999,268	1,835,938	3.9
Agriculture	1,670,954	1,565,873	1,565,873	-6.2
Electricity	712,928	774,289	653,541	-8.3
Natural Gas	475,211	515,845	510,268	7.3
Solid Waste	204,365	223,448	223,448	9.3
Water and Waster	44,606	48,771	41,377	-7.2
Aviation	26,786	26,786	26,786	0
Off-Road Sources	3,883	4,024	4,024	3.6
Total	4,905,518	5,158,305	4,861,256	-0.9
Emissions Reduction Target[1]	-	15% below 2008 levels	5,960,997 (Target met)	-

Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number. Totals shown may not add up due to rounding.
[1] The reduction target for 2020 is based on a 15% decrease from Riverside County's 2008 emissions inventory.
BAU = Business-As-Usual
ABAU = Adjusted Business-As-Usual
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas

Table ES-2 (Projected 2030 and 2050 GHG Emissions Comparison) summarizes the 2030 and 2050 emissions for Riverside County based on the anticipated growth rates included in Riverside County's General Plan update. The reductions needed to meet the County's 2030 and 2050 goals are also summarized. After 2020, GHG emissions would continue to increase; however, the growth in Riverside County's future emissions would be offset by the reductions from incorporation of the State and local policies identified in this CAP Update. The additional, reduction measures included in the CAP Update have been developed to meet the reduction targets for the year 2020 and beyond; however, the implementation of the CAP Update would require periodic updates to ensure that Riverside County is continually tracking GHG emissions and making adjustments as necessary to ensure that future targets are met. It is important to note that post 2030, the amount of reductions needed to meet the 2050 targets would be 73 percent below BAU. The proposed State and local measures that will continue beyond 2030 are expected to yield significant reductions. However, as discussed above, the policy and regulatory landscape beyond 2030 (for example, Senate Bill 100[8], which requires 100 percent renewables by 2045) and technological innovations will require a re-consideration of the future GHG reduction targets.

Table ES-2 Projected 2030 and 2050 GHG Emissions Comparison

Source Category	Metric Tons of CO_2e						
	2017	2030 BAU	2030 ABAU	% Change (2017-2030 ABAU)	2050 BAU	2050 ABAU	% Change (2017-2050 ABAU)
Transportation (on-road)	1,766,784	3,018,767	1,361,200	-22.9	6,882,509	1,174,310	-33.5
Agriculture	1,670,954	1,262,044	1,261,044	-24.5	817,858	817,858	-51.0
Electricity	712,928	1,017,153	466,971	-34.5	1,756,843	480,289	-32.6
Natural Gas	475,211	676,742	652,578	37.3	1,165,761	1,104,421	132.0
Solid Waste	204,365	298,585	298,585	46.1	533,154	533,154	160.8
Water and Waste Water	44,606	65,171	30,413	-31.8	116,370	32,584	-26.9
Aviation	26,786	26,786	26,786	0.0	26,786	26,786	0.0
Off-Road Sources	3,883	4,531	4,531	16.6	5,744	5,744	47.9
Total	4,905,518	6,368,781	4,102,109	-16.3	11,305,026	4,175,146	-14.8
Reduction Target[1]	-	49% below 2008 levels	525,511 (Reductions needed)	-	83% below 2008 levels	2,982,947 (Reductions needed)	-

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

1 The reduction targets for 2030 and 2050 are based on 49% and 83% decreases from Riverside County's 2008 emissions inventory, respectively.

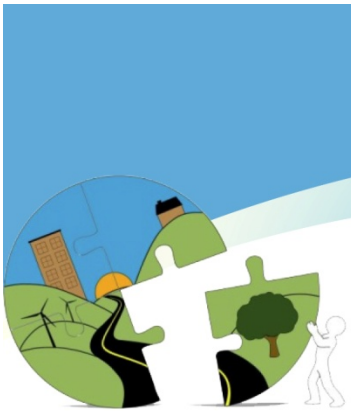
BAU = Business-as-Usual

CO_2e = carbon dioxide equivalent

GHG = greenhouse gas

This CAP Update describes Riverside County's GHG emissions for the year 2017, projects how these emissions will increase into 2020, 2030, and 2050, and includes strategies to reduce emissions to a level consistent with the State of California's emissions reduction targets. These strategies complement Riverside County's General Plan policies and are consistent with Riverside County's vision for a more sustainable community.

8 SB 100 California Renewables Portfolio Standard Program (website: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100, accessed February 2019).



Chapter 1 Introduction

The County of Riverside (County) is committed to planning sustainably for the future while ensuring a livable, equitable, and economically vibrant community. Planning sustainably includes acknowledging the local role in climate change and the ways in which the County can mitigate the greenhouse gas (GHG) emissions resulting from the County's growth and development in different economic sectors. By using energy more efficiently, harnessing renewable energy to power buildings, recycling waste, and enhancing access to sustainable transportation modes, the County can keep dollars in its local economy, create new green jobs, and improve the community's health, safety, and welfare in addition to addressing climate change. To that end, the County has implemented a number of sustainability and conservation efforts and seeks to continue those efforts through local planning and partnerships. This Riverside County Climate Action Plan (CAP) Update (CAP Update) integrates the County's past and current efforts with future efforts to grow and thrive sustainably.

1.1 Purpose

The County of Riverside CAP Update has three primary purposes:

- Present the County's Updated GHG inventory, forecasts, and target setting for achieving sustainability by utilizing resources effectively, reducing GHG emissions, and preparing for potential climate-related impacts.
- Identify how the County will effectively implement this CAP Update to comply with the State and local GHG reduction policies by promoting economic competiveness, obtaining funding for program implementation, and tracking and monitoring the progress of Plan implementation over time.
- Allow streamlined California Environmental Quality Act (CEQA) compliance for new development by completing CEQA compliance for the CAP Update and developing screening tools that provide clear guidance to developers and other project proponents.

1.2 Climate Change Science

Climate change is a term used to describe large-scale shifts in historically observed patterns in the Earth's climate system. Although the climate has historically responded to natural drivers, recent climate change has been unequivocally linked to increasing concentrations of greenhouse gases (GHGs) in the Earth's atmosphere.

Gases that trap heat in the atmosphere are called "greenhouse gases" because they transform the light of the sun into heat, similar to the glass walls of a greenhouse. Human-generated GHG emissions significantly contribute to the changes in the global climate, which have a number of physical and environmental effects. Effects associated

with global climate change include sea level rise, an increase in the frequency and intensity of droughts, and increased temperatures. Increased GHG emissions are largely the result of increasing energy consumption, particularly through the combustion of fossil fuels.

The Intergovernmental Panel on Climate Change (IPCC) assesses scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC identifies six key GHG compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and hydrofluorocarbons (HFCs). Each GHG has a different capacity to trap heat and therefore GHG emissions are generally reported in metric tons (MT) of carbon dioxide equivalents (CO_2e). Non-CO_2 emissions are converted to CO_2e using each GHG's Global Warming Potential (GWP). IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2e, which compares the gas in question to that of the same mass of CO_2 (CO_2 has a GWP of 1 by definition). Common GHGs included in the CAP Update are CO_2, CH_4, and N_2O, which are the GHGs that most commonly result from human activities, and are detailed below.[9]

- **Carbon Dioxide** is the most important anthropogenic GHG and accounts for more than 75 percent of all GHG emissions caused by humans. Its atmospheric lifetime of 50–200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades, even after mitigation efforts to reduce GHG concentrations are implemented. The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation and oxidation of elemental carbon). CO_2 can be removed from the atmosphere by photosynthetic organisms (e.g., plants and certain bacteria). Atmospheric CO_2 has increased from a pre-industrial concentration of 280 parts per million (ppm) to 408 ppm in 2018.[10]
- **Methane (CH_4)**, the main component of natural gas, is the second most abundant GHG, and has a GWP of 25. Sources of anthropogenic emissions of CH_4 include using natural gas, burning fossil fuels, landfill outgassing, certain agricultural practices, and mining coal. Certain land uses also function as both sources and sinks for CH_4. For example, the primary terrestrial source of CH_4 is wetlands, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere). Atmospheric CH_4 has increased from a pre-industrial concentration of 715 parts per billion (ppb) to 1,860 ppb in 2018.[11]
- **Nitrous Oxide (N_2O)** is a powerful GHG, with a GWP of 298. Anthropogenic sources of N_2O include combustion of fossil fuels, agricultural processes (e.g., fertilizer application), and nylon production. In the United States, more than 70 percent of N_2O emissions are related to agricultural soil management practices, particularly fertilizer applications. N_2O concentrations in the atmosphere have increased nearly 21 percent, from pre-industrial levels of 270 ppb to 330 ppb in 2018.[12]

[9] Intergovernmental Panel on Climate Change (IPCC). Website: https://www.ipcc.ch/ (accessed November 15, 2018).

[10] National Oceanographic and Atmospheric Administration (NOAA). Earth System Research Laboratory, Global Monitoring Division. Trends in Atmospheric Carbon Dioxide. Annual Greenhouse Gas Index (AGGI). Website: https://www.esrl.noaa.gov/gmd/ccgg/trends/ (accessed December 26, 2018).

[11] NOAA. Earth System Research Laboratory, Global Monitoring Division. Trends in Atmospheric Methane. Annual Greenhouse Gas Index (AGGI). Website: https://www.esrl.noaa.gov/gmd/ccgg/trends_ch4/ (accessed December 26, 2018).

[12] NOAA. Earth System Research Laboratory, Global Monitoring Division. Annual Greenhouse Gas Index (AGGI). Website: https://www.esrl.noaa.gov/gmd/aggi/aggi.fig2.png (accessed December 26, 2018).

1.3 Benefits of the CAP Update

This CAP Update, while addressing climate change, also benefits the County in many direct ways:

- **Local Control**: This CAP Update allows the County to identify strategies to reduce resource consumption, costs, and GHG emissions in all economic sectors in a way that maintains local control over the issues and fits the character of the community. It also may position the County for funding to implement programs tied to climate goals.
- **Energy and Resource Efficiency**: This CAP Update identifies opportunities for the County to increase energy efficiency and lower GHG emissions in a manner that is most feasible in the community. Reducing energy consumption through increasing the efficiency of energy technologies, reducing energy use, and using alternative sustainable sources of energy are effective ways to reduce GHG emissions. Energy efficiency also provides opportunities for cost savings.
- **Increased Public Health**: Many of the GHG reduction strategies identified in this CAP Update also have local public health benefits. Benefits include local air quality improvements, creating a more active community through implementing sustainable living practices, and reducing health risks such as heat stroke, which is elevated by climate change impacts such as increased extreme heat days.
- **Demonstrating Consistency with State GHG Reduction Goals**: A GHG reduction plan may be used as GHG mitigation in a General Plan to demonstrate that the County is aligned with State goals for reducing GHG emissions to a level considered less than cumulatively considerable.
- **Meeting California Environmental Quality Act Requirements**: CEQA requires impacts from GHG emissions to be reviewed. A qualified GHG reduction plan may be used in future development projects as the GHG analysis for their CEQA document, resulting in greater certainty for developers and cost-effectiveness for developers and County staff.

1.4 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 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.

A. Federal

Clean Air Act

In 2007, through *Massachusetts v. Environmental Protection Agency* (Docket No. 05–1120), the United States Supreme Court held that the United States Environmental Protection Agency (USEPA) has authority to regulate GHGs. As such, the United States Supreme Court ruled that the USEPA should be required to regulate CO_2 and other GHGs as pollutants under Section 202(a)(1) of the federal Clean Air Act.

B. State

California Air Resources Board Standards and Programs

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 and climate change programs within California. In this capacity, CARB conducts research, sets 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, and various types of commercial equipment.

Executive Order S-3-05

On June 1, 2005, California Governor Arnold Schwarzenegger announced through Executive Order (EO) S-3-05, the following GHG emissions targets:

- By 2010, California shall reduce GHG emissions to 2000 levels.
- By 2020, California shall reduce GHG emissions to 1990 levels.
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.
- EO S-3-05 also laid out responsibilities among the State agencies for implementation and for reporting on progress toward the targets.

Executive Order B-30-15

On April 29, 2015, California Governor Jerry Brown announced through EO B-30-15 the following GHG emissions target:

- By 2030, California shall reduce GHG emissions to 40 percent below 1990 levels.

The emissions reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050. The order directs CARB to provide a plan with specific regulations to reduce State-wide sources of GHG emissions. EO B-30-15 does not include a specific guideline for local governments.

Assembly Bill 1493, Clean Car Standards

Also known as "Pavley I," Assembly Bill (AB) 1493 standards were the nation's first GHG standards for automobiles. AB 1493 requires CARB to adopt vehicle standards that will lower GHG emissions from new light-duty automobiles to the maximum extent feasible. In January 2012, CARB adopted the Advanced Clean Cars Program to achieve additional GHG emission reductions for passenger vehicles for model years 2017–2025. That Program includes low-emission vehicle (LEV) regulations and zero-emission vehicle (ZEV) regulations. Together, the two standards are expected to increase average fuel economy to roughly 43 miles per gallon (mpg) by 2020 (and more for years beyond 2020).

Assembly Bill 32 (AB 32) and Senate Bill 32 (SB 32), California Global Warming Solutions Act

AB 32 requires CARB to reduce State-wide GHG emissions to 1990 levels by 2020. As part of this legislation, CARB was required to prepare a "Scoping Plan" that demonstrates how the State will achieve this goal. The Scoping Plan was adopted in 2011, and in it, local governments were described as "essential partners" in meeting the State-wide goal, recommending a GHG reduction level 15 percent below 2005–2008 levels (depending on when a full emissions inventory is available) by 2020.

CARB released the 2017 Scoping Plan Update on January 20, 2017. The 2017 Scoping Plan Update provides strategies for achieving the 2030 target established by EO B-30-15 and codified in Senate Bill (SB) 32 (40 percent below 1990 levels by 2030). The 2017 Scoping Plan Update recommends local plan-level GHG emissions reduction goals. CARB recommends that local governments aim to achieve emissions of no more than 6 MT CO_2e per capita by 2030 and no more than 2 MT CO_2e per capita by 2050.

Assembly Bill 341, Commercial Recycling

AB 341 sets a State-wide goal of 75 percent recycling, composting, or source reduction of solid waste by the year 2020. As required by AB 341, the California Department of Resources Recycling and Recovery (CalRecycle) adopted the Mandatory Commercial Recycling Regulation on January 17, 2012. The regulation was approved by the Office of Administrative Law on May 7, 2012. It became effective immediately and clarifies the responsibilities in implementing mandatory commercial recycling. The Mandatory Commercial Recycling Regulation focuses on increased commercial waste diversion as a method to reduce GHG emissions. The regulation is designed to achieve a reduction in GHG emissions of 5 million MT CO_2, which equates to roughly an additional 2–3 MT of currently disposed commercial solid waste being recycled by 2020 and thereafter.

Senate Bill 97

SB 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. The legislation directed the California Office of Planning and Research to develop draft CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the Resources Agency to certify and adopt the State CEQA Guidelines. CEQA Guidelines Section 15183.5, Tiering and Streamlining the Analysis of GHG Emissions, was added as part of the CEQA Guideline amendments that became effective in 2010 and describes the criteria needed in a GHG reduction plan that would allow for the tiering and streamlining of CEQA analysis for development projects.

Executive Order S-1-07, Low Carbon Fuel Standard

California EO S-01-07 mandates (1) that a State-wide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, and (2) that a low carbon fuel standard (LCFS) for transportation fuels be established in California. CARB developed the LCFS regulation pursuant to the State's authority under AB 32 and the Federal Clean Air Act and adopted it in 2009.

Executive Order S-13-08, The Climate Adaptation and Sea Level Rise Planning Directive

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

- Initiate California's first State-wide Climate Adaptation Strategy 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 on how to plan for sea level rise in designated coastal and floodplain areas for new and existing projects.
- Initiate studies on critical infrastructure and land use policies that are vulnerable to sea level rise.

California Code of Regulations Title 24, Part 6

California Code of Regulations (CCR) Title 24, Part 6 (California's Energy Efficiency Standards for Residential and Nonresidential Buildings) (Title 24), was established in 1978 to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels and natural gas use result in GHG emissions, and energy-efficient buildings require less electricity and natural gas. Therefore, increased energy efficiency will result in decreased GHG emissions.

The California Energy Commission (CEC) adopted 2008 Standards on April 23, 2008, in response to AB 32. The 2008 Standards were adopted to (a) provide California with an adequate, reasonably priced, and environmentally sound supply of energy; (b) pursue California energy policy, which states that energy efficiency is the resource of first choice for meeting California's energy needs; (c) meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of State building codes every 3 years; and (d) meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards. The latest update of CCR Title 24, Part 6, went into effect on January 1, 2017, which will significantly increase the energy efficiency of new residential buildings.

CALGreen Building Code

CCR Title 24, Part 11 (California's Green Building Standard Code [CALGreen]), was adopted in 2010 and went into effect on January 1, 2011. Further updates to CALGreen went into effect on January 1, 2017. CALGreen is the first State-wide mandatory green building code and significantly raises the minimum environmental standards for construction of new buildings in California. The mandatory provisions in CALGreen will reduce the use of volatile organic compounds (VOCs) emitting materials, will strengthen water conservation, and will require construction waste recycling.

Senate Bill x7-7

SB x7-7 requires water suppliers to reduce urban per capita water consumption 20 percent from a baseline level by 2020.

Senate Bill 375, Sustainable Communities Strategy

SB 375 provides for a new planning process that coordinates land use planning, regional transportation plans, and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires regional transportation plans, developed by Metropolitan Planning Organizations (MPOs) to incorporate a

Sustainable Communities Strategy (SCS) in their Regional Transportation Plans (RTPs). The goal of the SCS is to reduce regional vehicle miles traveled (VMT) through land use planning and consequent transportation patterns. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development.

Renewable Portfolio Standard

The Renewable Portfolio Standard (RPS) requires energy providers to derive 33 percent of their electricity from qualified renewable sources by 2020. In August 2018, the State Assembly passed SB 100, which requires energy providers to derive 60 percent of their electricity from qualified renewable sources by 2030 and 100 percent by 2045. The bill is anticipated to be passed by the Senate and signed by the Governor. The RPS is anticipated to lower emission factors (i.e., fewer GHG emissions per kilowatt-hour used) from utilities across the State, including Southern California Edison (SCE).

1.5 County Setting

Riverside County is located in the Riverside-San Bernardino-Ontario Metropolitan Statistical Area, also known as the Inland Empire, and is the fourth largest county in the State. Roughly rectangular, the County covers 7,208 square miles in Southern California, spanning from the Greater Los Angeles area to the Arizona border. Interstate 10 (I-10), Interstate 15 (I-15) and Interstate 215 (I-215) are the major freeways in the County. More than three quarters of the County's land area, and one quarter of the County's population, lie in an unincorporated County region.

The unincorporated area of Riverside County has approximately 364,413 residents (SCAG 2017). The population is diverse in age. The ethnicity is approximately 50 percent Latino, 38 percent White, and 12 percent other ethnicities. The unincorporated area of Riverside County has 112,292 households and provides a total of 81,754 jobs.

2015 CAP

Following the State's adoption of Assembly Bill (AB) 32in 2006,[13] the California Air Resources Board (ARB) developed a climate change scoping plan that included directives for local governments to reduce GHG emissions associated with land use 15 percent below baseline levels by 2020. The County adopted its first Climate Action Plan (CAP) in conjunction with a comprehensive General Plan Update (GPA No. 960) in 2015. The CAP included GHG inventories of community-wide and municipal sources using the baseline data for the year 2008. The 2015 CAP included the GHG reduction target of 15 percent below 2008 levels by 2020 and a set of reduction measures to achieve the 2020 target.

[13] The passage of AB 32, the California Global Warming Solutions Act of 2006, marked a watershed moment in California's history. By requiring in law a sharp reduction of greenhouse gas (GHG) emissions, California set the stage for its transition to a sustainable, low-carbon future. AB 32 is the first program in the country to take a comprehensive, long-term approach to addressing climate change, and does so in a way that aims to improve the environment and natural resources while maintaining a robust economy (website: https://www.arb.ca.gov/cc/ab32/ab32.htm).

Partial Settlement Agreement

In 2016 the Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society, and respondents (Petitioners) challenged particular aspects of the CAP related to commitments to solar, electric vehicles, energy efficient traffic signals, and future updates of the CAP. In 2017 the County and the Petitioners entered into a Settlement Agreement[14] that enhances the County CAP and maintains the County's Land Use authority. In the Settlement Agreement, the County agreed to update the CAP with the following enhancements:

- The County requires all new residential development to install EV charging stations in the garages of the residential units. The Settlement Agreement further states that the capacity and circuits for installation of EV charging stations to be provided in the garages of residential units and all new large-scale commercial buildings that are over 162,000 square feet.
- The County requires that on-site renewable energy production (including but not limited to rooftop photovoltaic solar panels) shall apply to any tentative tract map, plot plan, or conditional use permit that proposes to add more than 75 new dwelling units of residential development or one or more new buildings totaling more than 100,000 gross square feet of commercial, office, industrial, or manufacturing development.
- Consideration of a policy to require the use of high-efficiency bulbs at all new traffic signal lights and converting 100 percent existing traffic signal lights to high-efficiency bulbs by 2020.
- Every four years, the County must update the GHG inventory, review the effectiveness of specific measures in the CAP, and revise associated point values in the screening tables according to the available evidence. If measures included in this CAP are found to be ineffective, those measures will be removed or revised in the update.

1.6 Plan Structure

The remainder of this CAP Update includes four additional chapters:

- **Chapter 2** summarizes the methodologies used to calculate the County's GHG emissions and forecasts.
- **Chapter 3** summarizes the County's historic and future GHG emissions and the reduction targets the County has established.
- **Chapter 4** details the reduction strategies that will be implemented to meet the reduction targets identified in Chapter 3. Measures also include the potential energy savings and local co-benefits of the measures.
- **Chapter 5** includes the implementation of the measures, potential funding sources, and how the CAP Update will be monitored and updated over time. It also summarizes the outreach and CEQA review process conducted as part of this CAP Update.

[14] Partial Settlement Agreement, 2017. Petitioners: Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society and Respondents: County of Riverside and Riverside County Board of Supervisors.

Chapter 2 Methodology

2.1 Overview

The Climate Action Plan (CAP) is a comprehensive roadmap that outlines the specific activities that the County, will undertake to reduce GHG emissions. The CAP Update builds upon the information gathered by the GHG inventories and forecasts emissions for 2030 and 2050. These forecasts of emissions using the inventory and anticipated growth in population and the economy are called Business As Usual (BAU) forecasts. Since the inventories are derived from emissions data, they are the most accurate foundation to develop forecasts. Therefore, BAU forecasts are used as the first step in the forecasting process. Once the BAU forecasts were completed, the next step was to forecast anticipated future State actions that will reduce GHG emissions. These forecasts that include future State actions are called Adjusted BAU (ABAU). The CAP Update uses ABAU to determine the additional amount of GHG emissions reductions that are needed to achieve the reduction targets. The CAP Update focuses on those activities that can achieve the greatest emission reductions in the most cost effective manner in achieving the reduction targets. For these reasons GHG emissions inventories are the foundation of the CAP Update[15]. Establishing an inventory of emissions helps to identify and categorize the major sources of emissions produced over a single calendar year[16]. A community-wide inventory includes GHG emissions that result from the activities by residents and businesses within the unincorporated communities, and County government operations within Riverside County. The inventories identify the major sources of GHGs emissions caused by activities in sectors that are specific to community activities.

The County prepared community inventories for the years 2008 and 2017. The 2008 inventory is considered the baseline year. A baseline year is established as a starting point against which other inventories may be compared and targets may be set, and is generally the earliest year with a full emissions inventory. The most recent inventory (2017) has the most relevant data for planning purposes, while multiple inventory years provide context and may help identify trends or anomalies in the community emissions. The County prepared a detailed GHG Inventory, Forecasting, and Target-Setting (IFT) Report, included as Appendix A, which contains detailed methodology of the information summarized in this chapter.

The GHG inventories include all major sources of emissions attributable directly or indirectly to activities within the unincorporated communities served by the County of Riverside, as well as County government operations. The methodology for preparing the GHG inventories incorporates the protocols and methods, and emission

[15] Institute for Local Government: Climate Action Plans (website: https://www.ca-ilg.org/climate-action-plans).

[16] Importance of Climate Action Planning (CAP) for cities (website: http://e-lib.iclei.org/wp-content/uploads/2016/02/Guiding-Principles-for-City-Climate-Action-Planning.pdf).

factors found in the International Council of Local Environmental Initiatives' (ICLEI) United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Community Protocol, U.S. Community GHG Protocol Version 1.0, 2012), the Association of Environmental Professionals (AEP) California Supplement to the U.S, Community GHG Protocol (2013), The Climate Registry General Reporting Protocol (Version 2.1, 2016), and the Climate Registry Local Government Operations Protocol (LGOP, Version 1.1, 2010). The analysis herein is tailored to include all existing and projected emission sources within the unincorporated areas of Riverside County to provide, to the fullest extent feasible, a comprehensive analysis of GHG reductions. The AB 32 Scoping Plan establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of GHG emissions.

2.2 Calculation of GHGs

The coefficients, modeling inputs, and other assumptions, used in the calculations of GHGs are included in Appendix B of this report. GHG emissions are typically segregated into direct and indirect sources. However, it is important to note that direct and indirect sources are not completely independent of each other and are often combined into other more encompassing categories. For example, although natural gas combustion is a direct source and electricity generation is an indirect source, they both are typically discussed under a heading of "Energy" when policies are put in place to reduce emissions. Therefore, this CAP Update discusses emissions with respect to the general source categories of on-road and off-road transportation, energy, water and wastewater, solid waste, aviation, and agriculture sources.

A. Energy

Electricity

Emissions of CO_2, CH_4, and N_2O within Riverside County result from the use of electricity. Annual electricity usage in 2017, obtained from SCE, Imperial Irrigation District (IID), and Anza Electric Cooperative, Inc. (Anza), the three major commercial electricity providers serving Riverside County, was used in determining community-wide electricity consumption and generation emission estimates for the existing inventory. For 2020, 2030, and 2050, emissions forecasts were calculated based on the anticipated growth in population, housing, and employment for the County of Riverside. The growth projections were interpolated from the County's General Plan Update Land Use Element[17] growth rates.

Emissions from electricity were determined by multiplying annual usage in megawatt hours per year (MWh/year) by the SCE emission factors for CO_2e obtained from SCE's Corporate Responsibility & Sustainability Report[18] while CO_2, CH_4, and N_2O were obtained from the USEPA's Emissions and Generation Resource Integrated Database[19] (eGRID).

The 2008 inventory included two gas-to-energy facilities, one at the Badlands Landfill and one at the El Sobrante Landfill. However, these landfills no longer send their landfill gas to these facilities but to a flare station.[20] Flare

[17] County of Riverside. 2015. *General Plan*. December.
[18] Southern California Edison (SCE). 2016. *Corporate Responsibility & Sustainability Report.*
[19] USEPA. 2016. Emissions and Generation Resource Integrated Database (eGRID) Summary Tables.
[20] Email correspondence with Riverside County Department of Waste Resources on August 13, 2018.

burning does not contribute to GHG emissions or provide any carbon credit to the energy sector. Therefore, neither the gas-to-energy facilities nor the flare station are included in the 2017 inventory.

Natural Gas Combustion

The residents and businesses in Riverside County emit GHGs from the combustion of natural gas, most often used for heating. The annual natural gas usage for the unincorporated areas of Riverside County measured in million British Thermal Units (MBTUs) was multiplied by the respective emissions factors for CO_2, CH_4, and N_2O to determine the emissions from natural gas combustion. Existing inventory consumption levels for the community as a whole were obtained from the Southern California Gas Company (SoCalGas), and future community-wide consumption estimates were based on anticipated population and economic growth in Riverside County. These growth rates came from the Southern California Association of Governments (SCAG) statistics and the County of Riverside General Plan Update Land Use Element.

B. Water Supply

Water-related emissions are indirectly produced as a result of electrical consumption to pump and treat water imported from outside Riverside County. There are many water agencies that operate in Riverside County providing both potable and non-potable water to customers in unincorporated areas. Refer to Appendix A for a full list of agencies that provided data used in determining water-related energy consumption emission estimates for the existing inventory.

The category, "Water Supply," addresses the GHG emissions resulting from energy used to collect, treat, convey, and distribute imported sources of water from their sources to Riverside County. This separate category is necessary, as the energy used is accrued across a variety of providers and is not included in the data collected from SCE, IID, or Anza. For local water sources, the data collected from SCE and IID include associated electricity usage and, hence GHG emissions are included under the "Electricity" category described above. Showing GHG emissions associated with local water sources in the "Electricity" category avoided double counting as the electricity used to pump local water supplies was embedded in the SCE reported electrical consumption data for unincorporated Riverside County.

C. Wastewater Treatment

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

D. Solid Waste Management

The Riverside County Waste Management Department is responsible for managing the County's landfills, including both active and closed landfills, with one exception – the El Sobrante Landfill, which is privately owned and operated. The County of Riverside collects fees and has control over the portion of the El Sobrante Landfill waste collected from within Riverside County. Therefore, the emissions associated with solid waste within the inventory are limited to the portion of waste collected within Riverside County.

Emissions from solid waste result from three different waste-related sources: transportation from its source to the landfill, operation of the equipment used at the landfill, and the fugitive emissions from waste decomposition. Emissions from the transportation of solid waste are included in the transportation sector, and emissions from operation of the equipment are included in the off-road sector. Emissions from waste decomposition at all landfills located in the unincorporated areas of Riverside County are included in the solid waste sector. The operational information was collected from the Riverside County Waste Management Department.

Fugitive methane emissions from the decomposition of solid waste (typically buried) are calculated based on the annual waste generation multiplied by the applicable emission factors for waste production for CH_4. Many landfills now have a methane capture system in place; depending on the type of system, not all of the methane generated from the decomposition is included in the inventory. In Riverside County, three of the existing seven active landfills have such systems. The Community Protocol recommends using an average factor of 75 percent recovery from landfill gas, although some landfills have much higher gas recovery systems, and other landfills have lower gas recovery systems. Although CO_2 is also a by-product of organic waste decomposition, the USEPA considers these emissions to be natural and not anthropogenic. Therefore, they are not included in the emissions inventory. N_2O is not a by-product of decomposition and, therefore, no fugitive emissions of N_2O are anticipated or calculated from solid waste sources.

E. Transportation

On-Road Vehicles

For the community-wide inventory, emissions from on-road vehicles include emissions generated from trips attributable to activities taking place in the unincorporated parts of Riverside County. Carbon dioxide emissions from vehicles were calculated utilizing EMFAC2017 emission factors for the 2017 inventory and 2020, 2030, and 2050 forecasts. The Emission Factors (EMFAC) model[21] was developed by the California Air Resources Board (CARB) and is used to calculate CO_2 emission rates for on-road motor vehicles, from light-duty passenger vehicles to heavy-duty trucks that operate on highways, freeways, and local roads in California. Motor vehicle emissions of CH_4 and N_2O were calculated using USEPA emission factors for on-road vehicles based on the total annual mileage driven multiplied by their respective emission factors by year. Vehicle miles traveled (VMT) were modeled using the Riverside County Traffic Analysis Model (RIVTAM). VMT data were derived from transportation modeling of the trips entering Riverside County, trips leaving Riverside County, and trips within Riverside County. Pass-through traffic (that is, trips beginning and ending outside of Riverside County) was not included in this analysis. Since trips entering and leaving Riverside County have only one end in Riverside County, only half of these miles were included in the emissions analysis, in order to reflect the split jurisdiction of these trips.

Off-Road Sources

Off-road emissions include emissions from agriculture, construction, industrial, lawn and garden, light commercial, and recreational equipment. Annual emissions of CO_2, CH_4, and N_2O are available at the County

[21] California Air Resources Board (CARB). 2017. EMFAC Model.

level from the State's OFFROAD model.[22] County-level indicator data were obtained from SCAG's Local Profile for the County of Riverside.

Aviation Emissions

Riverside County owns and operates four airports: Blythe Airport, Jacqueline Cochran Regional Airport, Hemet-Ryan Airport, and French Valley Airport. The GHG emissions associated with aircraft trips within Riverside County were calculated based on annual fuel consumption (extrapolated from airport aviation fuel sales) and emission factors for jet fuel and aviation fuel for CO_2, CH_4, and N_2O.

F. Agriculture

Riverside County has a large amount of agricultural land with a variety of cultivation uses. 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. The use of agricultural equipment was accounted for in the off-road sources sector. Agricultural-related emissions for 2017 were based on data from SCAG and the Riverside County Agricultural Commissioner.

[22] CARB. 2007. OFFROAD Model.

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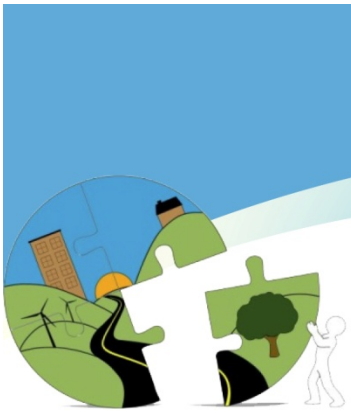


Chapter 3 GHG Emissions Inventory

The following sections describe Riverside County's 2017 community-wide GHG emissions inventory. The community-wide emissions inventory identifies and categorizes the major sources and quantities of GHG emissions produced by residents, businesses, and municipal operations in the unincorporated areas of Riverside County using the best available data.

3.1 2017 Community-Wide Emissions Inventory

The community-wide inventory represents all emissions from sources located within the unincorporated areas of Riverside County. Therefore, the government operations emissions are a subset of the community-wide inventory presented here. In Riverside County in 2017, a total of 4,905,518 MT CO_2e emissions were emitted in the community as a whole. The following sections describe the data inputs, emissions by source, and emissions by land use in 2017.

A. Data Inputs

Data for the community-wide inventory were gathered from various Riverside County departments, SCE, IID, Anza, SoCalGas, and additional reports. Table 3-1 (2017 Community-Wide Data Inputs), below, summarizes the data inputs and sources for each of the emission categories included in the inventory. Each data input was then multiplied by the associated emission factor to calculate the emissions associated with each source.

Table 3-1 2017 Community-Wide Data Inputs

Category	Data Input	Data Source
Electricity		
SCE (kWh)	2,080,338,050	SCE
IID (kWh)	829,657,212	IID
Anza (kWh)	59,236,020	Anza
Natural Gas (therms)	89,469,089	SoCalGas
Transportation		
Annual VMT	4,284,955,458	County of Riverside RIVTAM Model
Off-Road Equipment (Total County) (MT CO_2e)	12,613	CARB OFFROAD Model
Jet Fuel (gallons)	2,781,219	Riverside County Economic Development Agency
Aviation Fuel (gallons)	431,069	Riverside County Economic Development Agency
Solid Waste (tons)	389,687	Riverside County Waste Management
Water and Wastewater (Imported) (million gallons)	27,462	Water Districts

Category	Data Input	Data Source
Agriculture (acres)		
Hay	45,353	
Corn	740	
Oats	833	
Sorghum	130	
Wheat	18,394	Riverside County Agricultural Commissioner
Cotton	7,291	SCAG
Vegetable & Fruit Trees	78,688	
Animals (heads)		
Dairy Cow	21,900	
Poultry	1,893,394	
Sheep	8,300	

Anza = Anza Electric Cooperative, Inc.
CARB = California Air Resources Board
IID = Imperial Irrigation District
kWh = kilowatts
MT CO_2e = metric tons carbon dioxide equivalent
RIVTAM = Riverside County Traffic Analysis Model
SCAG = Southern California Association of Governments
SCE = Southern California Edison
SoCalGas = Southern California Gas
VMT = vehicle miles traveled

B. Emissions by Source

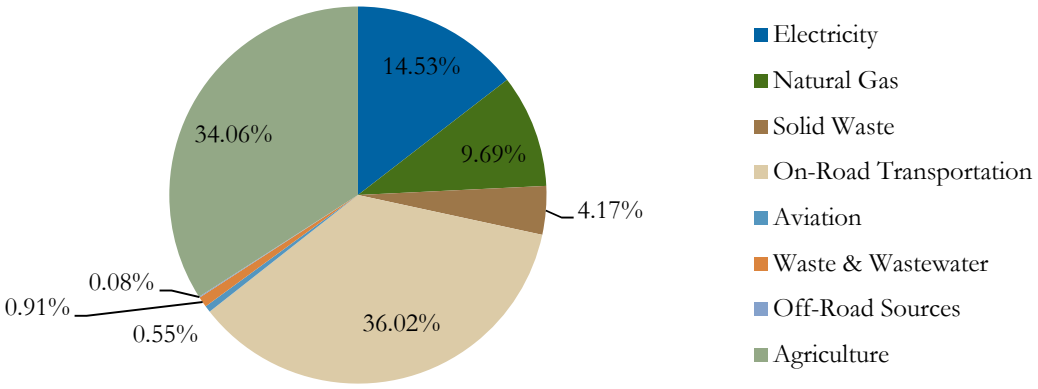
Table 3-2 (2017 Community-Wide GHG Emissions by Source) summarizes net 2017 County emissions of CO_2e as broken down by emissions category. Riverside County as a whole emitted 4,905,518 MT CO_2e in 2017. The largest portion of Riverside County's 2017 emissions were from transportation (36 percent), followed by agriculture (34 percent), and electricity and natural gas use in buildings (24 percent). Figure 3-1 (2017 Emissions Generated by Emissions Category) provides a comparison of GHG emissions by category.

Table 3-2 2017 Community-Wide GHG Emissions by Source

Emissions Category	Metric Tons of CO_2e
On-Road Transportation	1,766,784
Agriculture	1,670,954
Energy (Electricity and Natural Gas)	1,188,138
Solid Waste	204,365
Water and Wastewater	44,606
Aviation	26,786
Off-Road Sources	3,883
Total	4,905,518

CO_2e = carbon dioxide equivalent
GHG = greenhouse gas

Figure 3-1 2017 Emissions Generated by Emissions Category (Metric Tons CO_2e)



3.2 Business-As-Usual Community-Wide GHG Emissions Forecasts

The Business-As-Usual (BAU) forecasts describe emissions based on projected growth in population and employment and do not consider policies that will reduce emissions in the future (that is, the policies in place in 2017 that would remain constant through 2050). The County developed GHG reduction measures in the 2015 County of Riverside Climate Action Plan (2015 CAP) that constitute policies in place in 2017. These measures have been implemented and are reflected in the 2017 GHG emissions inventory, and will continue reducing emissions through 2020.

The BAU forecasts estimate future emissions using current (2017) consumption patterns and emission factors with the anticipated growth in the County. Anticipated growth is estimated using data from the County's 2015 General Plan and other relevant sources. The most relevant growth factors are used to project emissions by sector. For example, future Residential Energy emissions were developed using current energy use per household (from the 2017 inventory) and the anticipated number of households in 2035. Actual energy use is a function of several variables, not only the number of households; however, this approach is supported by current protocols and best practices within the State and provides a consistent approach to forecasting. Compound annual growth rates were developed using the growth projections from 2010 to 2020 and 2035. Growth rates beyond 2035 are assumed to be the same as between 2020 and 2035. In general, the County is expecting modest growth as population, housing, jobs, and vehicle miles traveled are all expected to increase.

A. Data Inputs

Data for the BAU community-wide GHG emissions forecasts were estimated based on the growth rates from Riverside County General Plan Update Land Use Element. Table 3-3 (BAU Forecasts Data Inputs), below, summarizes Riverside County's growth rates.

Table 3-3 BAU Forecasts Data Inputs

Sector	Demographic Indicator	2010	2020	2010–2020 CAGR[1] (%)	2035	2020–2035 CAGR[1] (%)
Residential Energy	Households	171,380	219,917	2.53	324,021	2.62
Commercial/ Industrial Energy	Jobs	97,210	151,034	4.50	265,688	3.84
N/A[2]	Population	467,105	608,857	2.69	908,100	2.70
Solid Waste, Water, Wastewater, and Off-Road Sources	Service Population (Population + Jobs)	564,315	759,891	3.02	1,173,788	2.94
Transportation	Vehicle Miles Traveled[3]	4,284,955,458	25,203,928,090	4.21	--	--

1 Compound annual growth rate.
2 Not Applicable. Population data are shown for informational purposes but are not used for forecasting any sector.
3 VMT was modeled for 2017 and 2060. The CAGR was calculated between 2017 and 2060 and was used for all forecast years.
BAU = Business- As- Usual
CAGR = compound annual growth rate
N/A = not applicable
VMT = vehicle miles traveled

B. BAU Forecast Emissions by Source

The County's BAU emissions in 2020 are estimated to be 5,158,305 MT CO_2e, or a 5.1 percent increase from baseline (2017) emissions. By 2030, emissions are estimated to increase 29.8 percent from the baseline level to 6,368,781 MT CO_2e. By 2050, emissions are estimated to increase 130.4 percent from the baseline level to 11,305,026 MT CO_2e. Table 3-4 (BAU Forecast Emissions by Source) shows BAU forecast emissions by source.

Table 3-4 BAU Forecast Emissions by Source

Sector	2017 (MT CO_2e)	2020 (MT CO_2e)	% Change 2017–2020	2030 (MT CO_2e)	% Change 2017–2030	2050 (MT CO_2e)	% Change 2017–2050
On-Road Transportation	1,766,784	1,999,268	13.1	3,018,767	70.0	6,882,509	289.5
Agriculture	1,670,954	1,565,873	-6.2	1,261,044	-24.5	817,858	-51.0
Electricity	712,928	774,289	8.6	1,017,153	42.6	1,756,843	146.4
Natural Gas	475,211	515,845	8.5	676,742	42.4	1,165,761	145.3
Solid Waste	204,365	223,448	9.3	298,585	46.1	533,154	160.0
Water & Wastewater	44,606	48,771	9.3	65,171	46.1	116,370	160.0
Aviation	26,786	26,786	0.0	26,786	0.0	26,786	0.0
Off-Road Sources	3,883	4,024	3.6	4531	16.6	5744	47.9
Total	4,905,518	5,158,305	5.1	6,368,781	29.8	11,305,026	130.4

BAU = Business-as-Usual
MT CO_2e = metric tons carbon dioxide equivalent

3.3 Adjusted Business-As-Usual Community-Wide GHG Emissions Forecasts

The Adjusted BAU scenario describes emissions based on projected growth *and* considers policies that will achieve GHG reductions in the future. State legislation has been approved and/or adopted that will reduce GHG emissions in the County. These policies do not require additional local action, but should be accounted for in the County's emissions forecasts to provide a more accurate picture of future emissions and the level of local action needed to reduce emissions to levels consistent with State recommendations. This forecast is called the Adjusted BAU forecast. The measures include Low Carbon Fuel Standard, Advanced Clean Cars, California Building Code Title 24, and Renewable Portfolio Standard. These measures are described in detail in Appendix A.

A. Adjusted BAU Forecast Emissions by Source

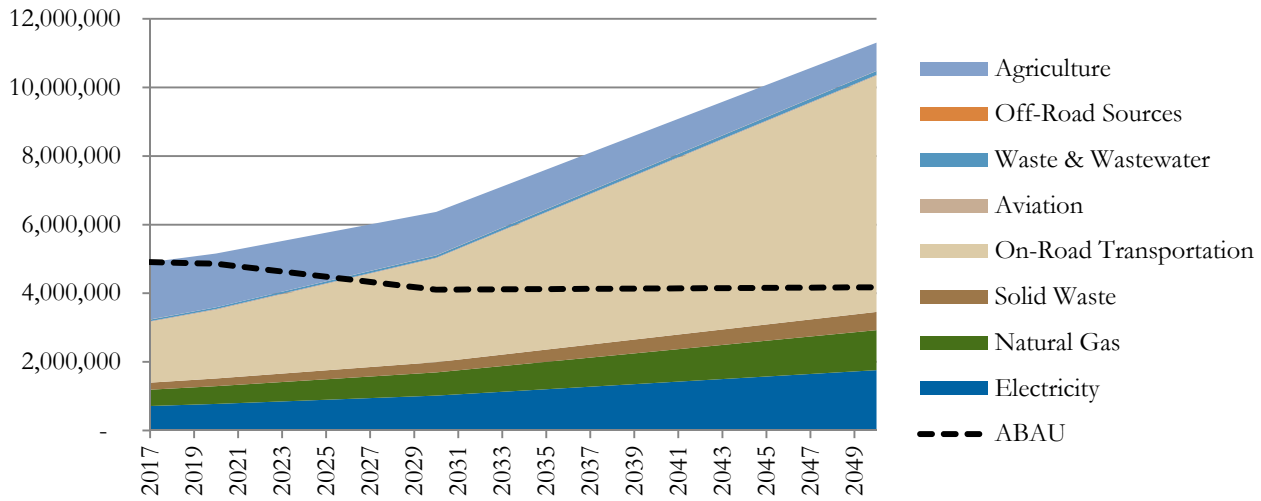
The County's Adjusted BAU emissions in 2020 are estimated to be 4,861,256 MT CO_2e, 4,102,109 MT CO_2e in 2030, and 4,175,146 MT CO_2e in 2050 (Table 9). This change represents a 0.9 percent reduction from 2017 by 2020, 16.3 percent reduction by 2030, and 14.8 percent reduction by 2050. Due to the State's stringent vehicle standards, emissions from the transportation sector are expected to decrease significantly over time. The proportion of emissions from electricity consumption is expected to decrease over time, whereas natural gas-related emissions are expected to increase. The emissions from the agriculture sector are also expected to reduce by almost half over time, mainly due to a decline in agricultural activities. The emissions from the solid waste sector are expected to increase because of the increase of population and employment. Table 3-5 (Adjusted BAU Forecast Emissions by Source) shows Adjusted BAU forecast emissions by source, and Figure 3-2 (Community BAU and Adjusted BAU Forecasts) shows the details of the community BAU and Adjusted BAU forecasts in MT CO_2e.

Table 3-5 Adjusted BAU Forecast Emissions by Source

Sector	2017 (MT CO_2e)	2020 (MT CO_2e)	% Change 2017–2020	2030 (MT CO_2e)	% Change 2017–2030	2050 (MT CO_2e)	% Change 2017–2050
On Road Transportation	1,766,784	1,835,938	3.9	1,361,200	-22.9	1,174,310	-33.5
Agriculture	1,670,954	1,565,873	-6.2	1,261,044	-24.5	817,858	-51.0
Electricity	712,928	653,541	-8.3	466,971	-34.4	480,289	-32.6
Natural Gas	475,211	510,268	7.3	652,578	37.3	1,104,421	132.0
Solid Waste	204,365	223,448	9.3	298,585	46.1	533,154	160.8
Water & Wastewater	44,606	41,377	-7.2	30,413	-31.8	32,584	-26.9
Aviation	26,786	26,786	0.0	26,786	0.0	26,786	0.0
Off-Road Sources	3,883	4,024	3.6	4,531	16.6	5,744	47.9
Total	4,905,518	4,861,256	-0.9	4,102,109	-16.3	4,175,146	-14.8

BAU = Business-as-Usual
MT CO_2e = metric tons carbon dioxide equivalent

Figure 3-2 Community Business-as-Usual (BAU) and Adjusted BAU (ABAU) Forecasts (MT CO_2e)



3.4 Reduction Targets

The State has set goals for reducing GHG emissions by the year 2020, 2030, and 2050 through AB 32, EO S-3-05, and EO B-30-15, respectively. The State has also provided guidance to local jurisdictions as "essential partners" in achieving the State's goals by identifying a 2020 recommended reduction goal. That goal, stated in the AB 32 Scoping Plan, was for local governments to achieve a 15 percent reduction below 2005 to 2008 annual emissions levels by year 2020, which aligns with the State's goal of not exceeding 1990 annual emissions levels by year 2020[23]. The State's long-term target is to emit no more than 20 percent of 1990 annual emissions levels by year 2050 (or, a reduction of 80 percent below 1990 annual emissions levels by year 2050). The State has also provided an interim target, which is 40 percent below 1990 annual emissions levels by year 2030. It is clear that the issue of climate change will not end in 2030 and continued reduction goals should be implemented to keep the State on a path toward the 2050 goal.

In order to keep the County CAP in line with the State's reduction goals the following targets are set for Riverside County. In the year 2020, the County would not need to make any additional CO_2e emissions reductions, as State and local policies will be sufficient to meet the targets. In the year 2030, the County would need to reduce emissions by 525,511 MT CO_2e annually below the ABAU scenario to meet the State-aligned target. In 2050, the County would need to reduce emissions by 2,982,947 MT CO_2e annually below the ABAU scenario to meet the State-aligned target. Table 3-6 (State-Aligned GHG Emissions Reduction Targets by Year) and Figure 3-3 (Community Emissions Inventories, Forecasts, and Targets) show reduction targets and additional reduction needed to meet the targets.

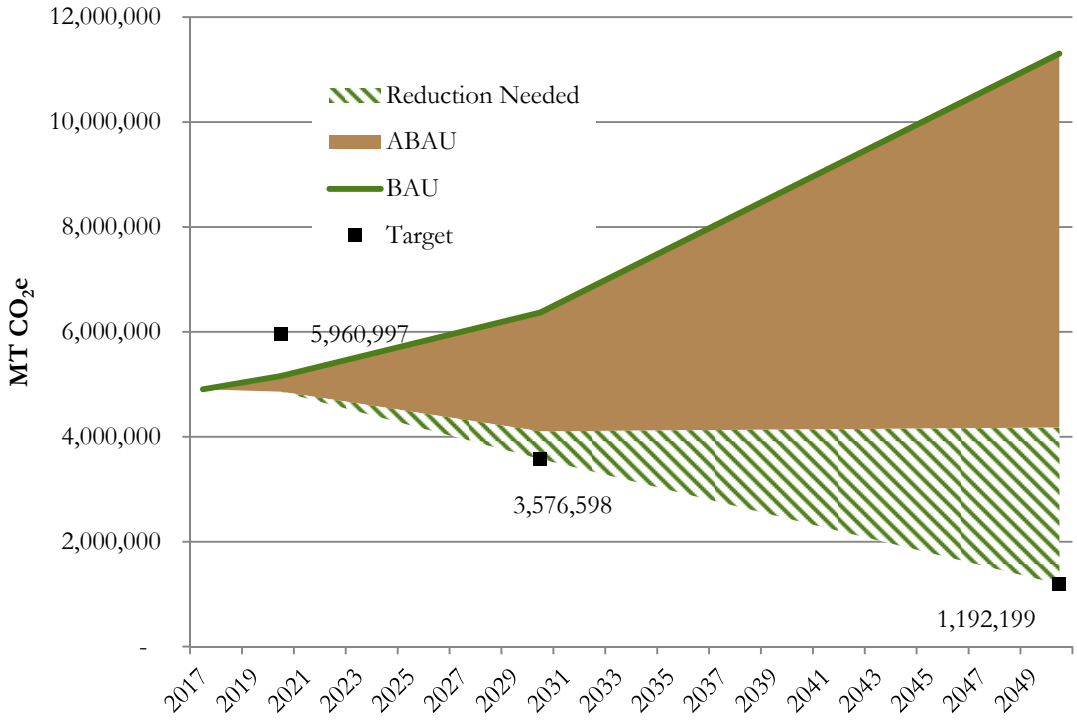
[23] In an analysis, the State concluded that a 15 percent reduction in emissions from 2005 to 2008 levels by 2020 would be equivalent to achieving 1990 emissions levels.

Table 3-6 State-Aligned GHG Emissions Reduction Targets by Year

Sector	2008	2017	2020	2030	2050
BAU Emissions (MT CO_2e)	7,012,938	4,905,518	5,185,305	6,368,781	11,305,026
ABAU Emissions (MT CO_2e)	-	-	4,861,256	4,102,109	4,175,146
State-Aligned Target (% change from 1990)	-	-	0	-40	-80
State-Aligned Target (% change from 2008)	-	-	-15	-49	-83
State-Aligned Target (MT CO_2e)	-	-	5,960,997	3,576,598	1,192,199
Reductions from ABAU needed to meet the Target (MT CO_2e)	-	-	Target Met	525,511	2,982,947

Note: [1] Baseline (2008) emissions are from the County of Riverside's 2015 Climate Action Plan GHG inventory.
[2] Reduction targets calculation details are provided in Appendix A.
ABAU = Adjusted Business-as-Usual
BAU = Business-as-Usual
GHG = greenhouse gas
MT CO_2e = metric tons of carbon dioxide equivalent

Figure 3-3 Community Emissions Inventories, Forecasts, and Targets



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Chapter 4
GHG Emissions Reduction Programs and Regulations

The GHG reduction programs and measures presented in this report build on the previous 2015 CAP and are revised and updated to reflect changes in the GHG emissions inventories and policies. The GHG reduction measures focus on different sectors including transportation, energy efficiency, clean energy, water efficiency, advanced measures, and solid waste. The measures include revisions based upon the County's input and are either new or enhancement and continuation of reduction measures proposed in the 2015 CAP. These measures would help the County achieve GHG reduction targets in 2030 and 2050.

The State of California has set specific targets for reducing GHG emissions from the burning of fossil fuels in both power plants and vehicles by adopting various regulations. In addition, State energy efficiency and renewable requirements provide another level of reductions. In order to provide credit to Riverside County for regulatory actions already taken or planned by the State of California, this CAP Update first evaluates the GHG reductions that will occur within Riverside County as a result of these actions. These are identified in the CAP as R1 reduction measures. The R1 measures do not require additional local actions but should be accounted for in the County's emissions forecasts to provide a more accurate picture of future emissions and the level of local actions needed to reduce emissions to the State-aligned target levels. The R1 measures described in this chapter have been included and accounted for in ABAU forecasts as discussed in Chapter 3. It is also important to note that some R1 measures from the 2015 CAP are no longer included in this document either because they have been fully implemented or are not applicable beyond 2020.

The R2 reduction measures will be incorporated at the County level to provide additional reductions in GHG emissions. R2 measures are those measures that either can be quantified to show the value of the reduction from the incorporation of those measures, or the supportive measures or methods of implementation for the quantifiable measures. The R2 measures correspond to the Implementation Measures (IM) included in Appendix K of the General Plan. The R3 measures proposed in the 2015 CAP are combined with R2 measures and are no longer shown as an individual category in this document. A complete list of assumptions and reductions for each of the R2 measures is included in Appendix C of this CAP Update.

The following reduction measures are organized herein by source category (transportation, energy efficiency, clean energy, advanced measures, water efficiency, and solid waste), and then by R1 and R2 measures. The method used for numbering the mitigation measures will be to list the R designation (R1 or R2) then an abbreviation of the source category, followed by the order number. Therefore, R1-EE1 is the first R1 measure within the energy efficiency category, R1-EE2 is the second measure within the energy efficiency category, and so on. The source category abbreviations are as follows: T – transportation, EE – energy efficiency, CE – clean energy, L – advanced measures, W – water efficiency, and S – solid waste.

4.1 Existing Riverside County General Plan Policies Related to GHGs

Policies to reduce GHG emissions often overlap with policies addressing energy conservation, reduced automobile use, water conservation, and many other issues. In addition to policies specifically targeting GHG emissions, Riverside County has many General Plan policies that help reduce GHG emissions while targeting other policies applicable to Riverside County. For example; the Air Quality Element of the General Plan was updated in July 2018 and specifically includes GHG reduction categories and policies. It also summarizes GHG emission reduction focus areas as a key to achieving General Pan and CAP milestones. The General Plan also includes policies that contribute indirectly to GHG emissions reductions, such as Land Use strategies for improving air quality by emphasizing alternative transportation options for communities to help improve air quality. Table 4-1 (General Plan Policies Related to Reducing GHG Emissions) below summarizes these General Plan policies that directly or indirectly contribute to GHG emissions reductions. The R-2 measures included in this CAP Update support and help implement most of these General Plan policies.

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

Sector	Element	Section	Policies
Energy Efficiency in Buildings	Land Use	Project Design	LU-4.1
	Multipurpose Open Space	Energy Conservation	OS-16.1 through OS-16.10
	Air Quality	Stationary Emissions	AQ-4.1 through AQ-4.4, AQ-4.6, and AQ-4.7
		Energy Efficiency and Conservation Objectives	AQ-4.1 through AQ-4.4, AQ-5.1, AQ-5.2, AQ-5.4, and AQ-20.10 through AQ-20.12
Regional Agency Coordination/Education and Outreach	Land Use	Administration	LU-1.5, LU-1.6, and LU-8.6
	Air Quality	Multi-Jurisdictional Cooperation, Education and Outreach	AQ-1.1 through AQ-1.4, AQ-1.6, AQ-1.10, AQ-3.2, AQ-3.3, AQ-7.1, AQ-7.5, AQ-17.6, and AQ-20.1 through AQ-20.6
Smart Growth	Land Use	Efficient Use of Land	LU-2.1
		Economic Development	LU-7.12
		Air Quality	LU-11.1 through LU-11.5
	Air Quality	Business Development	AQ-7.1 and AQ-7.3
		Job-to-Housing Ratio	AQ-8.4 through AQ-8.9
		Land Use Related Objectives	AQ-20.7 through AQ-20.9
Water Conservation	Land Use	Project Design	LU-4.1
	Circulation	Transportation System Landscaping	C-5.2
	Multipurpose Open Space	Water Conservation	OS-1.4, and OS-2.1 through OS-2.5
	Air Quality	Water Conservation Objectives	AQ-20.13 through AQ-20.17

Sector	Element	Section	Policies
Reduce Automobile Use	Land Use	Efficient Use of Land	LU-2.1
		Project Design	LU-4.1 and LU-4.2
		Air Quality	LU-11.1 through LU-11.4 and AQ-20.7 through AQ-20.9
		Circulation	LU-13.1 through LU-13.7
	Circulation	Planned Circulation Systems	C-1.2 and C-1.7
		Pedestrian Facilities	C-4.1 and C-4.9
		Transportation System Landscaping	C-5.2
		Public Transportation System	C-9.2
		Fixed Route Transit Service	C-11.2 and 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 and C-17.4
		Environmental Considerations	C-20.12
		Transportation Systems Management	C-21.1
	Multipurpose Open Space	Energy Conservation	OS-16.3 and OS-16.8
	Air Quality	Mobile Pollution Sources	AQ-3.2 and AQ-3.4
		Trip Reduction and Transportation Related Objectives	AQ-10.1 through AQ-10.4, and AQ-20.1 through AQ-20.6
Renewable Energy/Alternative Fuel	Multipurpose Open Space	Renewable Energy	OS-10.1, OS-11.1 through OS-11.3, OS-12.1, OS-12.4, and OS-13.1
	Air Quality	Transportation System Management Improvements	AQ-13.1 through AQ-13.3
		Alternative Energy Objectives	AQ-20.18 and AQ-20.19
	Land Use	Solar Energy Resources	LU-17.1 and LU-17.2
Reduce Waste	Air Quality	Energy Efficiency and Conservation	AQ-5.1
		Waste Reduction Objectives	AQ-20.20

Source: Riverside County General Plan and Elements Revised on various dates. Website: https://planning.rctlma.org/ZoningInformation/General Plan.aspx.
GHGs = greenhouse gases

4.2 Transportation

A. R1 Transportation Measures

The following list of R1 transportation-related measures are those measures that the State of California has identified in the AB 32 Scoping Plan. These measures are accounted for in the County's ABAU emissions forecasts to provide a more accurate picture of future emissions and the level of local actions needed to reduce emissions to levels consistent with the State requirements..

R1-T1: Assembly Bill 1493: Pavley I

Assembly Bill (AB) 1493 (Pavley) required CARB to adopt GHG standards for motor vehicles through model year 2015 that would result in reductions in GHG emissions by up to 25 percent in 2030.

R1-T2: Assembly Bill 1493: Pavley II

The State of California committed to further strengthening the AB 1493 standards by introducing additional components to the State's Advanced Clean Cars Program that will further reduce GHG emissions State-wide, including more stringent fuel efficiency standards for model years 2017 through 2025 and support infrastructure for the commercialization of zero-emission vehicles. CARB anticipates additional GHG reductions of 3 percent by 2020, 27 percent by 2035, and 33 percent by 2050.[24]

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

The Low Carbon Fuel Standard (LCFS) will require a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The State is currently implementing this standard, which is being phased in and will achieve full implementation in 2020. The LCFS target would be maintained beyond 2020.

B. R2 Transportation Measures

The following list of R2 measures are measures which Riverside County can incorporate into the existing land uses and new development projects for the reduction of transportation-related emissions to achieve a State-aligned reduction target. These R2 measures also support the implementation of General Plan policies related to smart growth and reducing automobile use as shown in Table 4-1, including LU-11.1 through LU-11.5, C-1.2, C-1.7, C-4.1, C-4.9, C-9.2, C-17.3, C-17.14, AQ-10.1 through 10.4, AQ 20.1 through 20.6.

R2-T1: Alternative Transportation Options

Alternative transportation includes taking transit and non-motorized transportation options, among them walking and bicycling, and variants such as small-wheeled transport such as skates, skateboards, push scooters and hand carts, and wheelchair travel. These modes provide both recreation and transportation, and can reduce VMT by removing automobiles from the road. This is an enhancement of Measures R2-T2, R2-T3, R2-T6, R2-T9, and R3-T1 proposed in the 2015 CAP. Potential actions for this measure include:

- Work with SCAG and the community to remove barriers to alternative transportation.
- Create a "bike to work day" or "car-free zone day" and other County sponsored events to promote bicycling and other non-motorized transportation.
- Create additional active transportation routes from transit centers to surrounding residential areas.
- Implement reduced parking requirement in areas served by transit.

[24] CARB. 2010. Advanced Clean Cars Summary Sheet. Website: https://www.arb.ca.gov/msprog/ clean_cars/acc%20summary-final.pdf (accessed November 10, 2018).

R2-T2: Adopt and Implement a Bicycle Master Plan to Expand Bike Routes around the County

Bicycle-friendly roads are crucial to promoting bicycle use as a transportation method. People tend to bicycle if routes are available to separate them from motor vehicles and bicyclists' safety can be ensured. Currently, Riverside County has not adopted a bicycle master plan. Thus, adopting and implementing a bicycle master plan and constructing more bicycle routes would encourage more bicycle rides and would help to reduce VMT. This is a new measure for the County's consideration. Potential action for this measure includes:

- Adopt and implement a bicycle master plan.
- Expand bicycle routes and prioritize funding for Class I bicycle lanes to improve bike transit.

R2-T3: Ride-Sharing and Bike-to-Work Programs within Businesses

Approximately 81 percent of people living in unincorporated area of Riverside County drive alone to work every day (SCAG 2017). A higher ride-sharing rate or bike-to-work rate would mean fewer VMT and GHG emissions, so encouraging carpooling and bicycling by providing incentive programs and necessary facilities can reduce GHG emissions. This is an enhancement of Measures R2-T1, R2-T4, and R2-T6 proposed in the 2015 CAP. Potential actions for this measure include:

- Promote ride-sharing and facilitate air district incentives for ride-sharing.
- Provide reserved preferential parking spaces for ride-sharing, carpooling, and ultra-low- or zero-emission vehicles.
- Zoning code update that requires businesses of a certain size to provide facilities such as bicycle racks.

R2-T4: Electrify the Fleet

Hybrid electric vehicles, plug-in hybrid electric vehicles, and all-electric vehicles (EVs) produce lower emissions than conventional vehicles. Any type of electrified vehicle emits less GHG than conventional vehicles by at least 40 percent. However, more than 95 percent of people still drive conventional gasoline or diesel vehicles, so programs to encourage the use of EV or hybrid vehicle ownership are highly needed. With the Statewide EV ownership goal and the implementation of this measure, EV ownership in Riverside County could reach 13 percent by 2030. Per the Settlement Agreement[25], for all new residential development, the County requires installation of EV charging stations in the garages of the residential units. The Settlement Agreement further states that the capacity and circuits for installation of EV charging stations to be provided in the garages of residential units and all new large-scale commercial buildings that are over 162,000 square feet. This is an enhancement of Measures R2-T7 and R3-T2 proposed in the 2015 CAP. Potential actions for this measure include:

[25] Partial Settlement Agreement, 2017. Petitioners: Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society and Respondents: County of Riverside and Riverside County Board of Supervisors.

- Require all new residential development to include EV chargers in the garages of residential units.
- Promote EV incentive programs at outreach meetings.
- Promote Neighborhood Electric Vehicle (NEV).
- Support application for grants to install e-chargers at public facilities.
- Work with community groups and businesses to install e-chargers.
- Comply with State Title 24 energy efficiency requirements for new commercial development to install e-chargers starting in 2020.

4.3 Energy Efficiency

A. R1 Energy Efficiency Measures

The following list of R1 energy efficiency related measures are those measures that California has identified in the regulations that will result in emission reductions within Riverside County and are included in the ABAU forecasts.

R1-EE1: California Building Code Title 24

California's building efficiency standards are updated regularly to incorporate new energy efficiency technologies. The code was most recently updated in 2016 and went into effect for new development in 2017. For projects implemented after January 1, 2017, the California Energy Commission estimates that the 2016 Title 24 energy efficiency standards will reduce consumption by an estimated 28 percent for residential buildings and 5 percent for commercial buildings, relative to the 2013 standards. These percentage savings relate to heating, cooling, lighting, and water heating only; therefore, these percentage savings were applied to the estimated percentage of energy use by Title 24.

B. R2 Energy Measures

The following list of R2 measures are measures related to energy efficiency Riverside County can incorporate into the existing residential and non-residential buildings or new development projects to achieve a State-aligned reduction target. These R2 energy measures also support the General Plan policies as shown in Table 4-1, particularly related to energy efficiency in buildings, regional agency coordination/education and outreach, including LU-4.1, OS-16.1 through OS-16.10, AQ-4.1 through AQ-4.4, AQ-5.2, AQ-5.4, and AQ-20.10 through AQ-20.12.

R2-EE1: Energy Efficiency Training, Education, and Recognition in the Residential Sector

Opportunities for residents to improve energy efficiency in their homes include changes to their behaviors and physical modifications or improvements to their homes. Education of the public is at the core of attaining energy efficiency goals. While most of the measures include an outreach component, creating a specific education measure would emphasize the critical role of education in achieving energy efficiency. An education measure would also provide County staff with a framework to educate community members about behavioral and technological changes that can increase energy efficiency. This is an enhancement of Measure R3-E2 proposed in the 2015 CAP. Potential actions for this measure include:

- Post energy efficiency information or links on websites and/or social media and provide materials at public events.
- Set up an email list for blasts of new information or training sessions.
- Encourage homeowners to use the SCE Energy Education Centers for energy-efficiency resources.
- Promote and manage energy-efficiency programs which are not already in the purview of Energy Service Providers.
- Require building inspectors to hold trainings semi-annually on energy efficiency and Title 24 requirements.

R2-EE2: Increase Community Participation in Existing Energy-Efficiency Programs

There are many energy efficiency opportunities that are low-cost for residents to initiate and would result in cost savings over time. These opportunities are generally from existing programs, such as SCE and SoCalGas, which offer rebates and incentives to purchase energy-efficient appliances and lights. Through this measure, the County would work to increase residents' participation in existing energy efficiency programs that are low-cost and would provide a financial benefit to the residents. As programs change over time, continued and up-to-date outreach would be necessary. This is an enhancement of Measure R3-E4 proposed in the 2015 CAP. Potential action for this measure includes:

- Partner with the Southern California Association of Governments (SCAG), Western Riverside Council of Governments (WRCOG), SCE, and SoCalGas for outreach events, such as annual energy-efficiency fair.

R2-EE3: Home Energy Evaluations

Home energy evaluations are necessary to identify cost-effective opportunities for energy savings and for residents to take practical actions to achieve energy efficiency. Home energy evaluations can be established or promoted by a variety of existing programs. This is a new measure for the County's consideration. Potential action for this measure includes:

- Promote SCE energy audits program for residents within the SCE service area and the Home Energy Saver Do It Yourself online energy audits for the IID service area.

R2-EE4: Residential Home Energy Renovations

Approximately 31 percent of the residential buildings in the unincorporated area of Riverside County were constructed before the adoption of Title 24 (SCAG 2017). Renovations to buildings constructed before the adoption of Title 24 would evidently improve energy efficiency. Many federal and State programs and incentives support home energy renovations, including County-supervised funding, permit process improvements, and County ordinances. This is an enhancement of Measures R1-E4, R1-E5, R2-E3, and R2-E4 proposed in the 2015 CAP. Potential actions for this measure include:

- Review Title 24 code compliance for existing residential buildings during code enforcement inspections of residential properties.
- Promote existing home energy-renovation programs.
- Promote participation in green building programs, such as Leadership in Energy and Environmental Design (LEED) and Energy Upgrade California.
- Promote financing programs for home upgrades, such as Home Energy Renovation Opportunity (HERO) program sponsored by the Western Riverside County Council of Governments (WRCOG) and other Property Assessed Clean Energy (PACE) programs in the IID service area.
- Establish online permitting to facilitate upgrades.

R2-EE5: Exceed Energy Efficiency Standards in New Residential Units

County planners have a unique opportunity to encourage or inform developers of new energy efficiency opportunities for new development. This measure would educate County staff to encourage and implement energy efficiency measures beyond those required in current Title 24 standards. This measure would also ensure that as Title 24 standards are updated, County staff are well informed and can implement updates quickly and effectively. This is an enhancement of Measures R2-E1 and R2-E2 proposed in the 2015 CAP. Potential actions for this measure include:

- Educate County staff and developers on future Title 24 updates and new energy efficiency opportunities for new residential development.
- Promote Tier 1 and Tier 2 green building ratings such as LEED, Build It Green, or Energy Star®-certified buildings.
- Establish online permitting to facilitate new residential building energy-efficiency programs.
- Comply with State Title 24 energy efficiency requirements on new residential buildings, such as zero net energy homes that require all new residential construction projects to achieve zero net-energy use by 2020.

R2-EE6: Energy Efficiency Training, Education and Recognition in the Commercial Sector

Education is at the core of attaining energy efficiency goals. A specific education measure would emphasize the critical role of education in achieving energy efficiency. This measure would provide County staff with a framework to interact with and educate the community about behavioral and technological changes that can

increase energy efficiency in commercial buildings. This is an enhancement of Measure R3-E2 proposed in the 2015 CAP. Potential actions for this measure include:

- Post energy-efficiency information or links on websites and/or social media and provide materials at public events
- Set up an email list for blasts of new information or training sessions.
- Encourage business owners to visit SCE Energy Education Centers for energy efficiency resources.
- Promote and manage energy efficiency programs which are not already in the purview of Energy Service Providers.
- Invite building inspectors to hold trainings semi-annually on energy efficiency and Title 24.

R2-EE7: Increase Business Participation in Existing Energy Efficiency Programs

There are many energy efficiency opportunities that are low-cost for businesses to initiate that would result in cost-savings over time. SCE and SoCalGas offer many rebates and incentives to purchasing energy-efficient appliances and lights. As many business owners may be unaware that the opportunities exist, this measure would allow for the County to increase the participation of businesses in existing energy-efficiency programs that are low-cost and would provide financial benefits. This is an enhancement of Measure R3-E4 proposed in the 2015 CAP. Potential action for this measure includes:

- Partner with SCAG, WRCOG, SCE, and SoCalGas for outreach events.

R2-EE8: Non-Residential Building Energy Audits

Commercial energy audits are necessary to identify cost-effective opportunities for energy savings and for business owners to take practical actions to increase energy efficiency. The audits can be established or promoted by various existing programs. This is a new measure for the County's consideration. The potential action for this measure is:

- Promote the SCE energy audit program for residents within the SCE service area and the Home Energy Saver Do It Yourself online energy audits for the IID service area.

R2-EE9: Non-Residential Building Retrofits

As many of commercial buildings in unincorporated area of Riverside County were constructed before the adoption of Title 24, their facilities and equipment are not considered energy efficient. Therefore, retrofits are necessary to achieve higher energy efficiency. Many federal and State programs and incentives support non-residential building energy retrofits, including County-supervised funding, permit process improvements, and County ordinances. This is an enhancement of Measures R1-E4, R1-E5, and R2-E7 proposed in the 2015 CAP. Potential actions for this measure include:

- Review Title 24 code compliance for existing non-residential buildings during code enforcement inspections.

- Promote existing non-residential building retrofits programs.
- Promote participation in green building programs, such as California Solar Initiative.
- Promote energy efficiency retrofit financing programs for non-residential buildings such as Property Assessed Clean Energy (PACE).
- Establish online permitting to facilitate retrofits.

R2-EE10: Energy Efficiency Enhancement of Existing and New Infrastructure

Enhancing energy efficiency of existing and new infrastructure presents an opportunity for energy and cost savings for the County. The County could achieve energy savings by deploying high-efficiency lighting in new traffic signals and retrofitting existing traffic signals with energy-efficient lighting. Conventional traffic signals employ incandescent lamps. They are not energy-efficient and the on-going energy charge contributes a high proportion of the recurrent cost. Comparing with the conventional traffic signals, high-efficiency traffic signals consume much less electricity (about one-third or less) and have longer design life (over 10 years). The Settlement Agreement[26] calls for consideration of a policy to require the use of high-efficiency bulbs at all new traffic signal lights and converting 100 percent existing traffic signal lights to high-efficiency bulbs by 2020. Per the Settlement Agreement, caution should be exercised while retrofitting the signals in the Mt. Palomar area to ensure the high-efficiency bulbs do not cause any interference with the night sky viewing at Palomar Observatory. The potential actions for this measure include:

- Retrofit existing traffic signals with high-efficiency Light Emitting diodes (LEDs).
- Use high-efficiency LEDs for all new traffic signals.

R2-EE11: Exceed Energy Efficiency Standards in New Commercial Units

County planners have a unique opportunity to inform and encourage developers to apply new energy efficiency opportunities in new development. This measure would educate County staff to encourage and implement energy efficiency beyond that required by current Title 24 standards. This measure would also ensure that as Title 24 standards are updated, County staff would be well informed and could implement updates quickly and effectively. This is an enhancement of Measures R2-E5 and R2-E6 proposed in the 2015 CAP. Potential actions for this measure include:

- Educate County staff and developers on future Title 24 updates and additional energy efficiency opportunities for new non-residential development.
- Promote Tier 1 and Tier 2 Green Building Ratings such as LEED, Build It Green, or Energy Star®-certified buildings.

[26] Partial Settlement Agreement, 2017. Petitioners: Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society and Respondents: County of Riverside and Riverside County Board of Supervisors.

- Establish online permitting to facilitate new non-residential building energy efficiency programs.
- Comply with State requirements on new non-residential buildings, such as Net-Zero Energy Buildings for all new non-residential development meeting zero net-energy use by 2030.

4.4 Clean Energy

A. R1 Clean Energy Measure

The following list of R1 clean energy related measures are those measures that California has identified in the regulations that will result in emission reductions within Riverside County and are included in the ABAU forecasts.

R1-CE1: Renewable Portfolio Standard

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the State's Renewable Portfolio Standard (RPS), and SB 100 (2018) further requires the energy providers to derive 33 percent, 60 percent, and 100 percent of electricity from qualified renewable sources by 2020, 2030, and 2045, respectively. The RPS is anticipated to lower emission factors (i.e., fewer GHG emissions per kWh used) State-wide. Therefore, reductions from RPS are taken for energy embedded in water, as well as commercial/industrial and residential electricity.

B. R2 Clean Energy Measure

The following list of R2 measures are measures related to clean energy Riverside County can incorporate into the existing residential and non-residential buildings or new development projects to achieve a State-aligned reduction target. These R2 Clean Energy Measures also support the implementation of General Plan policies related to Renewable/Alternative Energy as shown in Table 4-1, including LU-16.1, OS 11.1 through OS 11.3, OS-12.1, OS-12.4, OS-13.1, AQ-20.18, and AQ-20.19.

R2-CE1: Clean Energy

Clean energy includes energy efficiency and clean energy supply options such as highly efficient combined heat and power as well as renewable energy sources. Installing solar photovoltaics panels on residential and commercial building rooftops is an effective way to produce renewable energy on-site. Moreover, when combined with energy storage systems, solar panels could continuously meet residential and commercial energy demand. The Riverside County Settlement Agreement[27] requires that on-site renewable energy production (including but not limited to solar) shall apply to any tentative tract map, plot plan, or conditional use permit that proposes to add more than 75 new dwelling units of residential development or one or more new buildings totaling more than 100,000 gross square feet of commercial, office, industrial, or manufacturing development. Renewable energy production shall be onsite generation of at least 20 percent of energy demand for commercial, office, industrial or

[27] Partial Settlement Agreement, 2017. Petitioners: Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society and Respondents: County of Riverside and Riverside County Board of Supervisors.

manufacturing development, meet or exceed 20 percent of energy demand for multi-family residential development, and meet or exceed 30 percent of energy demand for single-family residential development. These renewable energy requirements should be updated with every CAP Update by the County based on most recent technology advancements.

By identifying, designing, and implementing the clean energy measures and technology solutions, Riverside County would receive environmental and economic benefits, including reductions in GHG emissions. This is an enhancement of Measures R1-E6 and R3-E3 proposed in the 2015 CAP. Potential action for this measure includes:

- Outreach to the community to promote clean energy incentives.
- Require solar panel installation on new residential buildings (per conditions of the Settlement agreement described above).
- Require solar panel installation on new commercial buildings and commercial parking lots (per conditions of the Settlement Agreement described above).
- Encourage energy storage system installation with solar panels.

R2-CE2: Community Choice Aggregation Program

Assembly Bill 117, which was signed into law in 2002, allows California cities and counties to either individually or collectively supply electricity to customers within their borders through the establishment of a Community Choice Aggregation (CCA) program. The County could assess the feasibility of initiating a CCA program. CCA programs that are currently operating have renewable energy percentages between 33 and 100, and the national opt-out rates for these programs range from 3 to 8 percent with most programs at or below 5 percent.[28] Participation in a CCA program could provide a significant source of future emission reductions to the County. The first step is to conduct a feasibility analysis to assess the benefits, costs, risks, and obstacles of a CCA program. Then the County could make a decision to whether or not implement a local CCA program or opt for a regional CCA. The advantages of regional CCAs that include participation from multiple local jurisdictions would be the creation of efficiencies. The County could seek opportunities for collaboration with other local jurisdictions to develop and implement a CCA that would produce mutually beneficial results. Developing a CCA would require a detailed analysis of energy demand, efficiency opportunities, and available clean electricity sources for purchase. Per the Settlement Agreement,[29] the County must update the CAP every four years. This allows enough time to conduct a feasibility analysis on initiating a CCA program and provide details on the reduction potential based upon the decisions of the County.

Potential action for this measure includes:

- Evaluate the potential for implementing a CCA program to meet GHG reduction targets

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[28] There are 17 operational CCA programs in California as of September 2018. Source: Local Energy Aggregation Network. Website: http://leanenergyus.org/cca-by-state/california/ (accessed September 2018).

[29] Partial Settlement Agreement, 2017. Petitioners: Sierra Club, Center for Biological Diversity, San Bernardino Audubon Society and Respondents: County of Riverside and Riverside County Board of Supervisors.

- Conduct feasibility analysis to initiate a CCA program at the County level or in cooperation with other jurisdictions.

4.5 Advanced Measures

The following measures are focused on reducing urban heat island effect and therefore indirectly reduce energy use throughout unincorporated area of Riverside County. These measures can be incorporated into development projects without additional costs.

A. R2 Advanced Measures

The following R2 measures are related to landscape strategies that will help reduce GHG emissions. These measures strategically place trees and other landscape mechanisms that create shade to reduce the heat island effect within parking lots and adjacent to buildings, which in turn, reduces the temperature of buildings and cars during the summer. The General Plan includes some of these advanced measures as part of the Municipal Operational Objectives, included in the Air Quality Element.

R2-L1: Tree Planting for Shading and Energy Saving

Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration, making vegetation a simple and effective way to reduce urban heat islands. Shaded surfaces may be 20 to 45 degrees Fahrenheit ([°F], equal to 11 to 25 degrees Celsius [°C]) cooler than the peak temperatures of unshaded materials. In addition, evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures by 2 to 9 °F (or 1 to 5 °C). Trees and vegetation that directly shade buildings can reduce energy use by decreasing demand for air conditioning. This is an enhancement of Measure R3-L1 proposed in the 2015 CAP. Potential actions for this measure include:

- Work with the community to support nonprofit tree-planting groups within the County consisting of volunteers to plant and care for trees correctly and safely.
- Develop and promote a County tree-planting program for new development at plan check.

R2-L2: Light Reflecting Surfaces for Energy Saving

Replacing surface areas with light-reflecting materials can decrease heat absorption and lower outside air temperature. Both roofs and pavements are ideal surfaces for taking advantage of this advanced technology.

A cool roof is built from materials with high thermal emittance and high solar reflectance, or albedo, to help reflect sunlight and the associated energy away from a building. These properties help roofs absorb less heat and stay up to 50 to 60 °F (or 28 to 33 °C) cooler than conventional materials during peak summer weather. Cool roofs may be installed on low-slope roofs (such as the flat or gently sloping roofs typically found on commercial, industrial, and office buildings) or the steep-sloped roofs used in many residences and retail buildings.

Cool pavement is built from materials that reflect more solar energy, enhance water evaporation, or have been otherwise modified to remain cooler than conventional pavements. Cool pavement can be created with existing

paving technologies as well as newer approaches such as the use of coatings, permeable paving, or grass paving. Cool pavements save energy by lowering the outside air temperature, allowing air conditioners to cool buildings with less energy, and reducing the need for electric street lighting at night.

This is an enhancement of Measure R3-L2 proposed in the 2015 CAP. Potential actions for this measure include:

- Comply with Title 24 requirements on installing enhanced cool roofs.
- Comply with Title 24 requirements on installing cool pavements.

4.6 Water Efficiency

While GHG emissions from consumer water use and wastewater treatment in the unincorporated area of Riverside County accounted for a very small percent of the total community emissions in 2017, water efficiency strategies assist in extending current water supplies (LSA 2018). GHG emissions are generated in the transport and consumption of water due to the energy needed to supply water to the end user. Note that the various water districts throughout the County enforce the water conservation programs. However, there are still many opportunities to reduce water consumption throughout the County during the land use approval process.

A. R1 Water Efficiency Measures

The following list of R1 water efficiency related measures are based on the State of California regulations that will result in emission reductions within Riverside County and are included in the ABAU forecasts.

R1-W1: Renewable Portfolio Standard Related to Water Supply and Conveyance

This measure would increase electricity production from eligible renewable power sources to 33 percent by 2020, 60 percent by 2030, and 100 percent by 2045. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power.

B. R2 Water Efficiency Measures

The following list of R2 measures are measures related to water efficiency that Riverside County can incorporate into the water management practices to achieve a State-aligned reduction target. These R2 measures also support the implementation of General Plan Policies related to Water Conservation as shown in Table 4-1, including LU-4.1, C-5.2, OS-1.4, OS-2.1 through 2.5, and AQ-20.13 through AQ-20.17.

R2-W1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7

SB X7-7, or The Water Conservation Act of 2009, requires all water suppliers to increase water use efficiency. The legislation set an overall goal of reducing per capita urban water consumption by 20 percent from a baseline level by 2020. While water districts are responsible for implementation of SB X7-7, the County can provide a

meaningful supporting role in the implementation of water conservation. This goal can be met by taking a variety of actions, including supporting targeted public outreach by water districts and promoting water efficiency measures such as low-irrigation landscaping. This is an enhancement of Measure R2-W1 proposed in the 2015 CAP. Potential actions for this measure include:

- Provide general water efficiency information and links to water district conservation webpages on the County's website.
- Implement the low-irrigation landscaping requirements..

R2-W2: Exceed Water Efficiency Standards

In addition to SB X7-7, more actions are being studied or have been taken to exceed water efficiency standards. These efforts include education and outreach practices that could be combined with residential and commercial actions that promote reuse or recycled water, use of grey water, and the collection and use of harvested rainwater. This is an enhancement of Measures R2-W1 and R2-W2 proposed in the 2015 CAP. Potential actions for this measure include:

- Support water districts in direct outreach to homeowner associations, businesses, and other community groups to inform them on water efficiency standards
- Promote recycled or grey water for community uses such as residential landscaping.
- Promote rainwater harvesting rebates and demonstrations.

4.7 Solid Waste

GHG emissions from unincorporated area of Riverside County's solid waste generation are the third largest emission source of the total community emissions in 2017 (LSA 2018). There are many opportunities to reduce waste disposal and increase waste recycling and composting. The R2 measures presented here also support the General Plan policies related to waste reduction as shown in Table 4-1, including AQ-5.1 and AQ-20.20.

A. R2 Solid Waste Measure

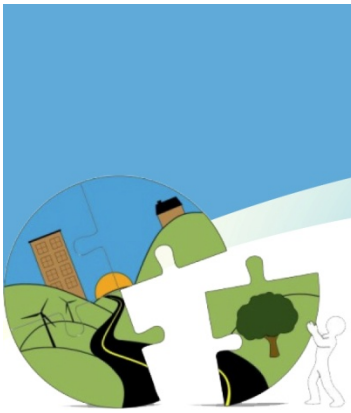
The following list of R2 measures are measures related to solid waste that Riverside County can incorporate into the waste management practices to achieve a State-aligned reduction target.

R2-S1: Reduce Waste to Landfills

According to 2014 Statewide Waste Characterization data (CalRecycle 2015), much of the waste disposed in landfills is readily recyclable. Increasing the recovery of recyclable materials will directly reduce GHG emissions. In particular, recycled materials can reduce the GHG emissions from multiple phases of product production, including extraction of raw materials, preprocessing, and manufacturing. This is

an enhancement of Measures R1-S1, R2-S1, R3-S2, and R3-S3 proposed in the 2015 CAP. Potential actions for this measure include:

- Outreach to the community to promote waste recycling and diversion.
- Add additional recycling containers in public places.
- Comply with Statewide waste reduction, recycling, and composting requirements.
- Promote community clean-up days by providing commercial containers for trash and recycling.



Chapter 5
Total Estimated Reductions

Riverside County is projected to emit a total of 5,158,305 MT CO_2e in 2020, 6,368,781 MT CO_2e in 2030, and 11,305,026 MT CO_2e in 2050 without the incorporation of reduction measures under the BAU forecast. As discussed in Chapter 3, under the ABAU forecast, the State-wide reduction measures would reduce the GHG emissions to 4,861,256 MT CO_2e in 2020, 4,102,109 MT CO_2e in 2030, and 4,175,146 MT CO_2e in 2050. Because the 2020 ABAU emissions are below the State-aligned target, no local reduction measures were proposed or quantified for 2020. With implementation of the local reduction measures (R2 measures) discussed in Chapter 4, Riverside County emissions would be reduced to 2,434,649 MT CO_2e in 2030 and 562,730 MT CO_2e in 2050.

5.1 Reductions from Local Measures

The local reduction measures (R2 measures) discussed in Chapter 4 would be implemented primarily through the Screening Tables for New Development and with General Plan policies. These measures go beyond the State measures to reduce GHG emissions in order to meet the 2030 and 2050 reduction targets. Table 5-1 (R2 Measures and Associated Emissions Reduced from 2030 and 2050 Inventories) summarizes the MT CO_2e and the corresponding percentage of emissions reduced for each of the R2 measures.

Table 5-1 R2 Measures and Associated Emissions Reduced from 2030 and 2050 Inventories

	2030 MT CO_2e Reductions	2030 % of BAU Emissions	2050 MT CO_2e Reductions	2050 % of BAU Emissions
Transportation				
R2-T1: Alternative Transportation Options	161,932	2.5	368,711	3.3
R2-T2: Adopt and Implement A Bicycle Master Plan to Expand Bike Routes Around the County	2,234	<0.1	5,086	<0.1
R2-T3: Ride-Sharing and Bike-to-Work Programs within Businesses	182,846	2.9	416,332	3.7
R2-T4: Electrify the Fleet	274,370	4.3	624,729	5.5
Transportation Total	621,382	9.8	1,414,858	12.5
Energy				
R2-EE1: Energy Efficiency Training, Education, and Recognition in the Residential Sector	-[1]	-	-	-
R2-EE2: Increase Community Participation in Existing Energy Efficiency Programs	16,845	0.3	28,091	0.2
R2-EE3: Home Energy Evaluations	-[1]	-	-	-
R2-EE4: Residential Home Energy Renovations	11,749	0.2	19,592	0.2
R2-EE5: Exceed Energy Efficiency in New Residential Units	39,408	0.6	318,632	2.8
R2-EE6: Energy Efficiency Training, Education, and Recognition in Commercial Sector	-[1]	-	-	-

	2030 MT CO_2e Reductions	2030 % of BAU Emissions	2050 MT CO_2e Reductions	2050 % of BAU Emissions
R2-EE7: Increase Business Participation in Existing Energy Efficiency Programs	31,878	0.5	67,730	0.6
R2-EE8: Non-Residential Building Energy Audits	-[1]	-	-	-
R2-EE9: Non-Residential Building Retrofits	173,554	2.7	368,747	3.3
R2-EE10: Energy Efficiency Enhancement of Existing and New Infrastructure	-[1]	-	-	-
R2-EE11: Exceed Energy Efficiency in New Commercial Units	33,418	0.5	580,161	5.1
Energy Total	306,851	4.8	1,382,953	12.2
Clean Energy				
R2-CE1: Clean Energy	34,204	0.5	34,204	0.3
R2-CE2: Community Choice Aggregation Program Reductions (If Implemented)	609,022	9.6	609,022	5.4
Clean Energy Total	643,226	10.1	643,226	5.7
Advanced Measures				
R2-L1: Tree Planting for Shading and Energy Saving	13	<0.1	22	<0.1
R2-L2: Light-Reflecting Surfaces for Energy Saving	1,845	<0.1	3,294	<0.1
Advanced Measures Total	13	<0.1	22	<0.1
Water Efficiency				
R2-W1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7	5,666	0.1	10,114	0.1
R2-W2: Exceed Water Efficiency Standards	116	<0.1	206	<0.1
Water Efficiency Total	5,781	0.1	10,320	0.1
Solid Waste				
R2-W1: Reduce Waste to Landfills	88,362	1.4	157,742	1.4
Solid Waste Total	88,362	1.4	157,742	1.4
Total Reductions	1,667,460	26.2	3,612,416	32.0

[1] Supportive measure. No GHG reductions were calculated.
BAU = business-as-usual
MT CO_2e = metric ton carbon dioxide equivalent

5.2 Reduced Community-Wide Emissions Inventory

By 2030, the State-wide and local measures together would reduce the Riverside County's community GHG emissions from the 2030 BAU level to 2,434,649 MT CO_2e, which exceeds the 49 percent below 2008 levels reduction target of 3,576,598 MT CO_2e for 2030. In 2050, implementation of State-wide and local measures together would reduce emissions from the 2050 BAU level to 562,730 MT CO_2e, which exceeds the 83 percent below 2008 levels reduction target of 1,192,199 MT CO_2e for 2050. Table 5-2 (Community-Wide Emissions and Targets Comparison) summarizes the baseline 2008 community-wide emissions, the projected 2020, 2030, and 2050 emission inventories, as well as the reduced 2030 and 2050 inventories after implementation of the reduction measures for community operations.

Table 5-2 Community-Wide Emissions and Targets Comparison

	2008 MT CO_2e	2017 MT CO_2e	2020 MT CO_2e	2030 MT CO_2e	2050 MT CO_2e
BAU Emissions	7,012,938	4,905,518	5,158,305	6,368,781	11,305,026
Reduction Target	--	--	5,960,997	3,576,598	1,192,199
State and Federal Reductions	--	--	297,049	2,266,672	7,129,879
Local Measures Reductions	--	--	--	1,667,460	3,612,416
Total Adjusted Emissions	--	--	4,861,256	2,434,649	562,730
Additional Reductions Needed	--	--	Target Met	Target Met	Target Met

BAU = Business-as-Usual
MT CO_2e = metric tons of carbon dioxide equivalent

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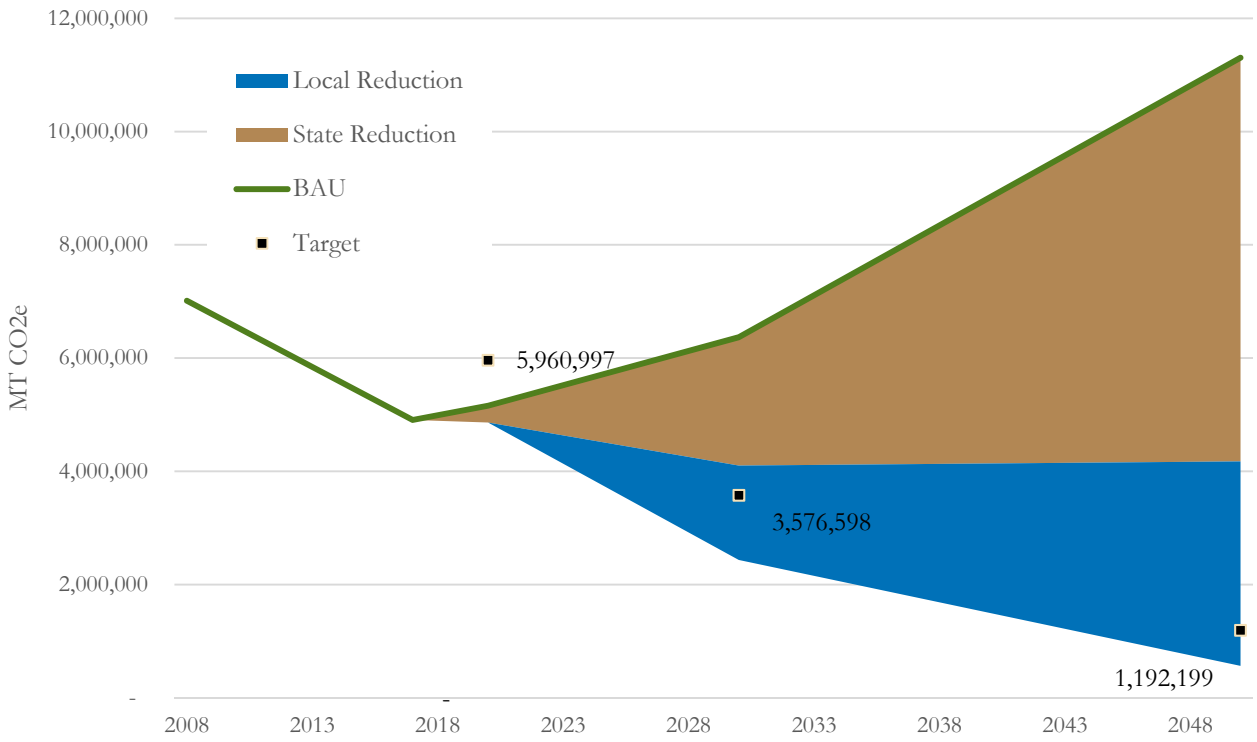
Chapter 6
Conclusions

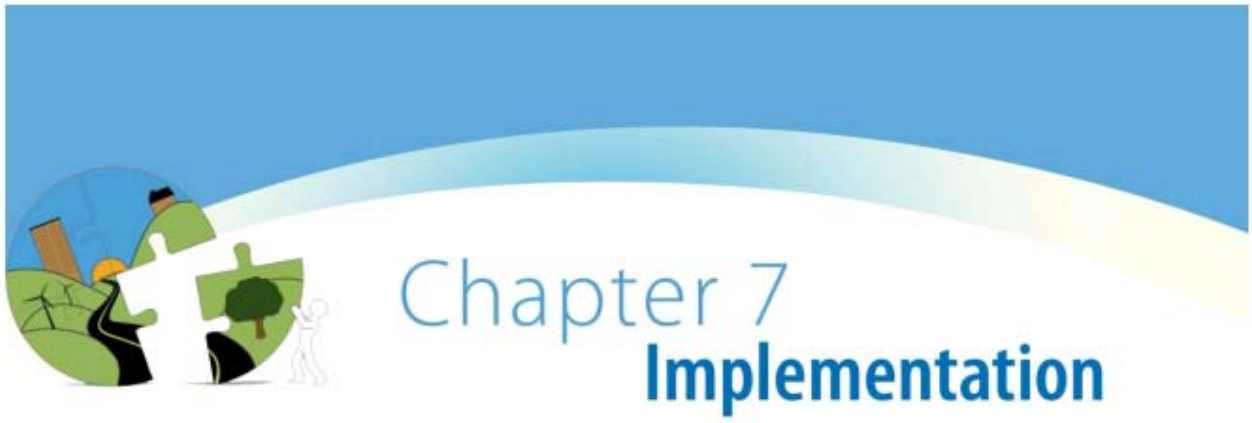
This CAP Update serves as a guide to help Riverside County implement the objectives of conserving resources and reducing GHG emissions. This document also serves as a technical resource for the proposed update of Riverside County's current General Plan and other land use related documents that may require evaluation and documentation of GHG emissions. Figure 6-1 (State and Local Reductions Comparison with Targets for Riverside County) shows a comparison between the emission inventories, including the reduced 2020, 2030, and 2050 inventories. The green line represents the GHG inventories for 2008 and 2017, and the BAU forecasts for 2020, 2030, and 2050. The brown area represents the State reductions, while the blue area shows the local reductions (R2 measures) described in Chapter 4.

Figure 6-1 State and Local Reductions Comparison with Targets for Riverside County



This CAP Update sets a target to reduce community-wide GHG emission emissions by 15 percent from 2008 levels by 2020, 49 percent by 2030, and 83 percent by 2050. The CARB Scoping Plan outlines the reduction strategies designed to meet the State-wide reduction goal of AB 32. Reduction measures provided herein would ensure that Riverside County meets the reduction target of reducing to 49 percent below 2008 levels (3,576,598 MT CO_2e) by 2030 and 83 percent below 2008 levels (1,192,199 MT CO_2e) by 2050. Such programs include strengthening Riverside County's existing programs as well as implementing the Screening Tables for New Development. In some cases, implementation will require the cooperation of other agencies, private businesses, and residents. The success of these measures will be tracked using indicators and targets such as those described in this CAP Update. Even with the anticipated growth, the modernization of vehicle fleets, combined with the continued implementation of the proposed measures, will reduce GHG emissions by approximately 3,934,131 MT CO_2e from 2030 levels and 10,742,295 MT CO_2e from 2050 levels. Therefore, the implementation of the State measures combined with Riverside County's R2 measures will reduce GHG emissions down to 2,434,649 MT CO_2e by year 2030, which is 1,141,949 MT CO_2e below the reduction target, and 562,730 MT CO_2e by 2050, which is 629,469 MT CO_2e below the reduction target.

Through 2050, Riverside County would continue implementation of the Screening Tables. During this time, the reduction measures implemented through the Screening Tables would continue to reduce GHG emissions from new development. Additionally, it is assumed that the State measures would keep being updated and reinforced to further reduce emissions. With these assumptions, Riverside County's emissions would decrease to a level below the reduction target by 2050. Continued implementation of this CAP Update is discussed in Chapter 7.



The 2015 CAP, adopted by the Riverside County included the GHG reduction target of 15 percent below 2008 levels by 2020. This entailed reducing annual emissions from 7,012,938 MT CO_2e down to 5,960,998 MT CO_2e by year 2020[30]. The County is well underway towards meeting the 2020 target and is expected to exceed the target.

This CAP Update includes reduction targets for year 2030 and year 2050. These reduction targets require the County to reduce emissions by at least 525,511 MT CO_2e below the ABAU scenario by 2030 and at least 2,982,948 MT CO_2e below the ABAU scenario by 2050. The reduction measures described in Chapter 5 are designed to meet the 2030 and 2050 reduction targets. This section describes the steps required to implement the strategies identified in the CAP Update to support the achievement of GHG reduction goals for the community at large. Success in meeting Riverside County's GHG emission reduction goals will depend on cooperation, innovation, and participation by Riverside County and residents, businesses, and government entities in Riverside County's land use jurisdictions. This section outlines key steps that the County of Riverside will follow for the implementation of this CAP Update.

7.1 STEP 1 – Administration and Staffing

The County will oversee and document implementation of the reduction measures and provide periodic monitoring of emissions with participation of the following departments, but will be expanded as needed to ensure coordinated leadership in plan implementation:

- Riverside County Executive Office – The executive office can provide economic, financial and administrative guidance and support to the Implementation Coordinator.
- Transportation Land Management Agency (TLMA) – Riverside County's Land Use umbrella agency will provide coordination between the various land use divisions, including, but not limited to Building & Safety and Transportation and will assist in the implementation of New Development Implementation Measures.

[30] Riverside County Climate Action Plan (CAP), 2015. Website: https://planning.rctlma.org/CAP.aspx.

- Riverside County Economic Development Agency-Facilities Management Division – This County division administers the energy-efficiency improvements to Riverside County-owned facilities being constructed as a result of the Energy Efficiency and Conservation Block Grant (EECBG) funding.
- Planning Division – Planning can provide expertise in the project entitlement process and provide long-term planning support.
- Interagency/Entity Coordination – Considering the multiple agencies involved in the implementation of different aspects of CAP Update. It will be essential for the County to ensure interagency coordination for effective implementation of the reduction measures and strategies.

7.2 STEP 2 – Financing and Budgeting

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

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

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

A. Energy Efficiency and Renewable Energy Financing

Federal Energy Efficiency Community Block Grants (EECBG). As part of the stimulus package (the "American Recovery and Reinvestment Act" or ARRA), signed into law by President Obama in spring 2009, block grants are available for energy efficiency planning and improvements in the building, transportation and other sectors[31]. The purpose of the EECBG Program is to assist eligible jurisdictions in creating and implementing strategies to: reduce fossil fuel emissions in a manner that is environmentally sustainable and that maximizes, to the greatest extent practicable, benefits for local and regional communities; reduce the total energy use of the eligible entities; and improve energy efficiency in the building sector, the transportation sector and other appropriate sectors. Eligible activities include: development of an energy efficiency and conservation strategy; technical consultant services; residential and commercial building energy audits; financial incentive programs; energy efficiency retrofits; energy efficiency and conservation programs for buildings and facilities; development and implementation of certain transportation programs; building codes and inspections; certain distributed energy projects; material conservation programs; reduction and capture of methane and greenhouse gases from landfills and dairies; efficiency traffic signals and street lighting; renewable energy technologies on government buildings; and other appropriate activity.

Federal Tax Credits for Energy Efficiency. On October 3, 2008, President Bush signed into law the "Emergency Economic Stabilization Act of 2008." This bill extended tax credits for energy efficient home improvements (windows, doors, roofs, insulation, HVAC and non-solar water heaters). These residential products during 2008 were not eligible for a tax credit, as previous tax credits had expired at the end of 2007. The bill also extended tax credits for solar energy systems and fuel cells to 2016. New tax credits were established for small wind energy systems and plug-in hybrid electric vehicles. Tax credits for builders of new energy-efficient homes and tax deductions for owners and designers of energy efficient commercial buildings were also extended. Under the Bipartisan Budget Act of 2018[32] which was signed in February 2018, a number of tax credits for residential energy efficiency that had expired at the end of 2016 were renewed. Tax credits for non-business energy property are now available retroactive to purchases made through December 31, 2017. Tax credits for all residential renewable energy products have been extended through December 31, 2021, and feature a gradual step down in the credit value.

SCE Energy Efficiency / Renewable Energy Incentives

The majority of the County's electricity consumption came from SCE, therefore, SCE energy efficiency and renewable energy incentives would be the main source for the County. The SCE energy efficiency and renewable energy incentives are listed below:

- Online or mail-in Home Energy Efficiency Survey. This 15-minute survey gives helpful energy-saving tips that will also help the environment. The questions and tips are tailored for residential energy usage.
- Rebate programs for residential use include lighting, appliances, heating and cooling, multifamily housing, pool, solar leadership and customer generation.

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[31] Federal Energy Efficiency Community Block Grants (EECBG). Website: https://www.energy.gov/eere/wipo/energy-efficiency-and-conservation-block-grant-program (accessed December 27, 2018).

[32] Federal Tax Credits. Website: https://www.energystar.gov/about/federal_tax_credits (accessed December 27, 2018).

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

AB 811 Financing Districts. AB 811 permits the creation of assessment districts to finance installation of distributed generation renewable energy sources or energy efficiency improvements that are permanently fixed to residential, commercial, industrial, or other real property. Riverside County's partnership with WRCOG in creation of the Energy Efficiency and Water Conservation Program allows home and business owners to utilize this type of financing program and avoid upfront costs associated with energy system installations. Financing is repaid through the property tax bill and repayment obligations remain with the property when it is sold to a new owner.

California Energy Commission (CEC) Energy Efficiency Financing. The CEC offers up to $3 million per application in energy efficiency financing and low interest loans to cities and counties for installing energy-saving projects[33]. Examples of projects include: lighting systems, pumps and motors, streetlights and LED traffic signals, automated energy management systems/controls, building insulation, energy generation including renewable and combined heat and power projects, heating and air conditioning modifications and wastewater treatment equipment.

California Energy Commission Bright Schools Program. This is a collaborative project of the CEC, California Conservation Corps, local utility companies and other qualifying energy service companies to assist schools in undertaking energy efficiency projects[34]. Project staff guides schools through identifying and determining a project's feasibility, securing financing for the project, and purchasing and installing the new energy efficient equipment.

B. Transportation Financing

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

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

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

C. Waste Reduction Financing

California Department of Resources Recycling and Recovery (CalRecycle) Funding. The CalRecycle offers funding opportunities authorized by legislation to assist public and private entities in the safe and effective management of the waste stream. Applicants can apply online for many of CalRecycle's grant programs by using

[33] California Energy Commission (CEC) Energy Efficiency Financing. Website: http://www.energy.ca.gov/efficiency/financing/ (accessed December 27, 2018).

[34] California Energy Commission Bright Schools Program. Website: http://www.energy.ca.gov/efficiency/brightschools/index.html (accessed December 27, 2018).

the Grants Management System (GMS).[35] Besides many funding opportunities for waste prevention, GHG Reduction Loan Program[36] particularly focuses on supporting the purposes of the AB 32, reducing methane emissions from landfills and further GHG reductions in upstream resource management and manufacturing processes; benefiting disadvantaged communities by upgrading existing facilities and, where warranted, establishing new facilities that reduce GHG emissions; improving air and water quality; and creating jobs.

D. Water Conservation and Treatment Financing

Clean Water State Revolving Funds (CWSRF). CWSRFs program is a federal-State partnership that provides communities a permanent, independent source of low-cost financing for a wide range of water quality infrastructure projects. CWSRFs fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management[37]. Building on a federal investment of $42 billion, the State CWSRFs have provided more than $126 billion to communities through 2017. Some key highlights of the CWSRFs program are summarized below:

- Low Interest Rates, Flexible Terms – Nationally, interest rates for CWSRF loans average 2.3 percent, compared to market rates that average 5 percent. For a CWSRF program offering this rate, a CWSRF funded project would cost 22 percent less than projects funded at the market rate. CWSRFs can fund 100 percent of the project cost and provide flexible repayment terms up to 20 years.
- Funding for Nonpoint Source Pollution Control and Estuary Protection – CWSRFs provided more than $167 million in 2009 to control pollution from nonpoint sources and for estuary protection, more than $3 billion to date.
- Assistance to a Variety of Borrowers – The CWSRF program has assisted a range of borrowers including municipalities, communities of all sizes, farmers, homeowners, small businesses, and nonprofit organizations.
- Partnerships with Other Funding Sources – CWSRFs partner with banks, nonprofits, local governments, and other federal and State agencies to provide the best water quality financing source for their communities.

7.3 STEP 3 – Timeline and Prioritization

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

- Cost effectiveness;
- GHG reduction efficiency;

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[35] California Department of Resource Recycling and Recovery (CalRecycle) Funding Opportunities. Website: https://www.calrecycle.ca.gov/funding (accessed December 27, 2018).

[36] CalRecycle. Greenhouse Gas Reduction Loan Program. Website: https://www.calrecycle.ca.gov/climate/grantsloans/ghgloans/ (accessed December 27, 2018).

[37] USEPA. Clean Water State Revolving Funds. Website: https://www.epa.gov/cwsrf.

- Availability of funding;
- Level of county control;
- Ease of implementation; and
- Time to implement.

In general consideration of these factors, the following is an outline of key priorities for three phases (also referenced in Table 7-1) starting in 2020 through 2030.

- Phase 1 (2020–2023): Development of key ordinances, completion of key planning efforts, implementation of most cost-effective measures, and support of voluntary efforts.
- Phase 2 (2023–2026): Continued implementation of reduction measures and implementation of key planning outcomes from Phase 1.

Phase 3 (2026–2030): Continued implementation of reduction measures and implementation of key planning outcomes from Phase 1 and 2. Because the goals of this CAP Update are aggressive, success in meeting the CAP Update goals depend on some flexibility in the GHG reduction actions. The County of Riverside is committed to flexibility in implementing the reduction measures and meeting the goals of this CAP Update. Many of the reduction measures in this CAP Update may be implemented through a menu of options. The goals of each reduction measure can often be achieved through a variety of means, especially those related to building energy efficiency. For example, the County of Riverside will promote residential home energy renovations (Measure R2-EE4). The implementation of this measure can be achieved through a series of potential actions such as promoting Title 24 code compliance, promoting existing home energy renovation programs, promoting participation in green building programs such as LEED and Energy Upgrade California, promoting financing programs for home upgrades such as HERO and PACE, and establishing online permitting to facilitate upgrades. Table 7-1 (GHG Reduction Measures Timeline and Phasing Schedule) presents the potential timeline and phasing schedule for the GHG reduction measures.

Table 7-1 GHG Reduction Measures Timeline and Phasing Schedule

Reduction Measure	Phase
Transportation	
R2-T1: Alternative Transportation Options	1, 2, 3
R2-T2: Adopt and Implement a Bicycle Master Plan to expand Bike Routes around the County	1, 2
R2-T3: Ride Sharing and Bike to Work Programs within Businesses	1, 2
R2-T4: Electrify the Fleet	1, 2, 3
Energy Efficiency	
R2-EE1: Energy Efficiency Training, Education, and Recognition in the Residential Sector	1, 2, 3
R2-EE2: Increase Community Participation in Existing Energy Efficiency Programs	1, 2, 3
R2-EE3: Home Energy Evaluations	1, 2
R2-EE4: Residential Home Energy Renovations	1, 2, 3
R2-EE5: Exceed Energy Efficiency Standards in New Residential Units	1, 2, 3
R2-EE6: Energy Efficiency Training, Education and Recognition in the Commercial Sector	1, 2, 3
R2-EE7: Increase Business Participation in Existing Energy Efficiency Programs	1, 2, 3
R2-EE8:Non-Residential Building Energy Audits	1, 2
R2-EE9: Non Residential Building Retrofits	1, 2, 3
R2-EE10: Exceed Energy Efficiency Standards in New Commercial Units	1, 2, 3

Reduction Measure	Phase
Clean Energy	
R2-CE1: Clean Energy	1, 2, 3
R2-CE2: Community Choice Aggregation Program	1, 2, 3
Advanced Measures	
R2-L1: Tree Planting for Shading and Energy Saving	1, 2, 3
R2-L2: Light Reflecting Surfaces for Energy Saving	1, 2, 3
Water Efficiency	
R2-W1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7	1, 2
R2-W2: Exceed Water Efficiency Standards	1, 2, 3
Solid Waste	
R2-S1: Reduce Waste to Landfills	1, 2, 3

7.4 STEP 4 – Public Participation

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

7.5 STEP 5 – Project Review

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

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

The methodology discussed above is described in more detail in the Riverside County GHG Screening Tables document, presented in Appendix F of the CAP Update and is consistent with the analysis and quantification methodology used in the CAP Update.

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

7.6 STEP 6 – Monitoring and Inventorying

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

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

The GHG inventory will be periodically updated in coordination with the three phases noted above: 2023 (to update with the Phase 1 progress); 2026 (to review Phase 2 progress, allow for course corrections to keep progress on target for 2030, and to develop post-2030 forecasts for use in planning for after 2030); and 2030 (to establish baseline for post-2030 GHG reduction planning).

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

The County of Riverside will also implement a monitoring and reporting program to evaluate the effectiveness of reduction measures with regards to progress towards meeting the goals of the CAP Update. This program will ensure that the effectiveness of all implementation measures are reviewed in advance of 2030 and adjustments to assigned point values accounting for actual effectiveness are made in the post-2030 CAP. If measures included in this CAP Update are found to be ineffective, those measures will be removed or revised in the post-2030 CAP.

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

7.7 STEP 7 – Beyond 2030

As described above under the discussion of Reduction Goals, 2030 is only a milestone in GHG reduction planning. EO S-03-05 calls for a reduction of GHG emissions to a level 80 percent below 1990 levels by 2050, and this level is consistent with the estimated reductions needed to stabilize atmospheric levels of CO_2 at 450 parts per million (ppm) (CARB 2017a). The County of Riverside has already set targets for 2050 GHG reductions in this CAP Update at approximately 83 percent below baseline (2008) by 2050. However, it is important to note that the post 2030 reduction targets might need to be adjusted based on inventory updates and resultant GHG emission reductions achieved through implementation of measures identified in the three phases above from year 2020-2030. At the approximate midway point when Riverside County will have implemented the first two phases of this CAP Update and will have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches, the current 2050 GHG reduction target and measures may need adjustments. Further the federal, State and local (County level) programs and policies for the GHG reductions for the near term (2020-2030) are likely to be well underway; and continuing technological change in the fields of energy efficiency, alternative energy generation, vehicles, fuels, methane capture and other areas will have occurred. Riverside County will then be able to take the local, regional, State and federal context into account and may consider updating the GHG reduction targets post 2030. The potential new CAP will include a specific target for GHG reductions for 2050. The targets will be consistent with broader State and federal reduction targets and will take into consideration the effectiveness and applicability of the reduction measures identified in this CAP Update.

The potential new CAP that can be adopted on or before January 1, 2030 will keep on track through 2050 to meet the 2050 GHG reduction goals by implementing the measures discussed in Chapter 4 (Reduction Measures) or potential new measures identified at the time of the future CAP Update. The measures described in Chapter 4, would produce reductions to bring the region's GHG emissions to an estimated 562,730 MT CO_2e by 2050. While the potential mix and implementation level of future GHG reduction measures is preliminary, it serves to demonstrate that the current measures in the CARB Scoping Plan and the County's CAP Update can not only move the region to its short term, 2020 and 2030 goal, but can also provide an expandable framework for much greater long-term GHG emissions reductions toward the ultimate 2050 goal.

Riverside County will develop the post-2030 CAP so that it can be ready for full implementation, including potential new policies, revisions to the General Plan (as necessary), programs, ordinances, and financing by 2030. The post-2030 CAP will update the target for GHG reductions for 2050. The target will be consistent with broader State and federal reduction targets including EO S-3-05 and with the scientific understanding of the needed reductions by 2050. The County of Riverside will adopt the new post-2030 CAP by January 1, 2030.

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APPENDIX A

GHG INVENTORY, FORECASTING, AND TARGET-SETTING REPORT

FINAL

COUNTY OF RIVERSIDE GHG INVENTORY, FORECASTING, AND TARGET-SETTING REPORT FOR THE CLIMATE ACTION PLAN UPDATE

RIVERSIDE COUNTY, CALIFORNIA

LSA

November 2018

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FINAL

COUNTY OF RIVERSIDE GHG INVENTORY, FORECASTING, AND TARGET-SETTING REPORT FOR THE CLIMATE ACTION PLAN UPDATE

RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

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Project No. COR1801

November 2018

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LIST OF ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
AEP	Association of Environmental Professionals
Anza	Anza Electric Cooperative
BAU	Business-as-Usual
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Community Protocol	United States Community Protocol for Accounting and Reporting Greenhouse Gas Emissions
County	County of Riverside
EMFAC2017	California Emission Factor Model, Version 2017
EO	Executive Order
EPA	United States Environmental Protection Agency
GHG	greenhouse gas
GWP	Global Warming Potential
I	Interstate
IFT	Inventory, Long-Term Forecasts, and Target-Setting
IID	Imperial Irrigation District
IPCC	Intergovernmental Panel on Climate Change
kWh	kilowatt-hour(s)
LCFS	Low Carbon Fuel Standard
MG	million gallons
MT	metric ton(s)
N/DN	nitrification/denitrification
N_2O	nitrous oxide
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan

SCAG	Southern California Association of Governments
SCE	Southern California Edison
VMT	vehicle miles traveled
WECC	Western Electricity Coordinating Council

KEY FINDINGS

The GHG Inventory, Forecasting, and Target-Setting (IFT) Report was developed to summarize the review of the greenhouse gas (GHG) emissions inventory and forecasts update and, based on that review, to recommend GHG reduction targets for the County of Riverside (County) to incorporate into a Climate Action Plan (CAP) Update. Key findings are summarized below.

- Riverside County's 2017 GHG emissions totaled 4,905,518 metric tons (MT) of carbon dioxide equivalent (CO_2e).
- On-road transportation was the largest contributor of emissions, representing 36 percent (1,766,784 MT CO_2e) of total emissions.
- Energy-related emissions, including residential and nonresidential electricity use and natural gas combustion, accounted for 14.5 percent (712,928 MT CO_2e) and 9.6 percent (475,211 MT CO_2e) of the total community emissions, respectively.
- The agriculture sector was the second largest contributor of carbon dioxide (CO_2) emissions, representing 34 percent (1,670,954 MT CO_2e) of total emissions.
- Under the Business-as-Usual (BAU) forecast, emissions will be 5,158,305 MT CO_2e in 2020; 6,368,781 MT CO_2e in 2030; and 11,305,026 MT CO_2e in 2050. These emissions levels are 5.1 percent higher in 2020 than 2017, 29.8 percent higher in 2030 than 2017, and more than double 2017 emissions by 2050.
- Under the Adjusted BAU forecast, emissions will be 4,861,256 MT CO_2e in 2020; 4,102,109 MT CO_2e in 2030; and 4,175,146 MT CO_2e in 2050. Compared to 2017, these emissions levels are 0.9 percent lower in 2020, 16.0 percent lower in 2030, and 14.8 percent lower in 2050. These reductions represent State efforts in reducing GHG emissions within the County.
- The County should choose a reduction target that is ambitious but feasible. The State recommends a 15 percent reduction below 2005–2008 baseline levels[1] by 2020, a 49 percent reduction below 2008 levels by 2030, and an 80 percent reduction below 2008 levels by 2050[2]. To continue reductions consistent with the State's long-term emissions reduction goals, the County would need to reduce emissions in 2030 by 525,511 MT CO_2e from an Adjusted BAU forecast and by 2,982,947 MT CO_2e from an Adjusted BAU forecast by 2050.

1 For Riverside County, the baseline year was identified as 2008 per the 2015 Climate Action Plan.

2 State goals are to achieve 1990 levels of emissions by 2020 (15 percent below 2008 baseline levels), 40 percent below 1990 levels of emissions by 2030 (49 percent below 2008 baseline levels) and 80 percent below 1990 levels of emissions by 2050 (83 percent below 2008 baseline levels).

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INTRODUCTION

This IFT Report presents Riverside County's community-wide GHG emissions inventory. The purpose of this inventory is to provide data in order to identify GHG reduction measures for the CAP update. The GHG inventory section describes historic energy use and GHG emissions, and the forecasts describe projected future emissions for the County. The Reduction Targets section describes GHG reduction recommendations that are consistent with State goals and may assist the County in establishing local GHG reduction targets. The inventories and recommended reduction targets will help the County in the next step of the CAP update, which is to identify GHG reduction measures that are relevant, meaningful, and feasible.

Specifically, this IFT Report includes the following (words and phrases in **bold** are described in Table 1):

- Historic GHG emissions in the **community inventory** for 2017;
- Future GHG emissions for 2020, 2030, and 2050 under **BAU** and **Adjusted BAU** forecast scenarios; and
- Recommended GHG **reduction targets** for 2020, 2030, and 2050.

Table 1. Key Terms in the IFT Report

Term	Definition
Adjusted Business-as-Usual	A GHG forecast scenario that accounts for known policies and regulations that will affect future emissions. Generally, these are State and federal initiatives that will reduce emissions from the Business-as-Usual scenario.
Baseline Year	The inventory year used for setting targets and against which future inventories are compared.
Business-as-Usual	A GHG forecast scenario that assumes no change in policy affecting emissions since the most recent inventory. Changes in emissions are driven primarily by changes in demographics.
Community Inventory	GHG emissions that result from the activities of residents and businesses in Riverside County. An inventory reports emissions that occur over a single calendar year.
Emission Factors	The GHG intensity of an activity.
Reduction Targets	GHG emissions levels not to be exceeded by a specific date. Local reduction targets are often informed by State recommendations, and different targets may be established for different years.
Sector	A subset of the emissions inventory classified by a logical grouping, such as an economic or municipal-specific category.

Source: *Forecasting Community-wide GHG Emissions and Setting Reduction Targets* (AEP, May 2012).
Note: A glossary of terms is also included as Appendix A.
AEP = Association of Environmental Professionals
GHG = greenhouse gas
IFT = inventory, forecasting, and target-setting

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GHG EMISSIONS INVENTORY

GHG emissions inventories are the foundation of planning for future emission reductions. Establishing an existing inventory of emissions helps to identify and categorize the major sources of emissions currently being produced. The baseline year was identified as 2008 in the County's 2015 CAP. A baseline year is established as a starting point against which other inventories may be compared and targets may be set, and is generally the earliest year with a full emissions inventory. In this report, 2017 is presented for the community inventory to show the major sources of emissions in Riverside County and the County's progress toward meeting the reduction targets from the previous CAP. This section describes the emissions reporting for economic sectors and presents the 2017 community inventory.

EMISSIONS REPORTING

The primary GHGs from the community are CO_2, methane (CH_4), and nitrous oxide (N_2O). Because each of these gases has a different capacity for trapping heat in the atmosphere (i.e., Global Warming Potential [GWP]), a method of reporting is needed to be able to compare gases in the same terms. As a result, emissions are reported in carbon dioxide equivalents, or CO_2e, with each GHG normalized and calculated relative to CO_2 using its GWP. Table 2 describes the GHGs analyzed in this report, as well as their symbol, GWP, and primary community sources of emissions. While N_2O has the highest GWP and may be considered the most dangerous on a per-molecule basis, CO_2 is by far the most prevalent, accounting for 83 percent of statewide emissions in 2016 (CARB 2018).

Table 2. Greenhouse Gases Analyzed in the Inventory

Greenhouse Gas	Symbol	Global Warming Potential	Primary Community Sources
Carbon Dioxide	CO_2	1	Fossil fuel combustion
Methane	CH_4	28	Fossil fuel combustion, landfills, wastewater treatment
Nitrous Oxide	N_2O	265	Fossil fuel combustion, wastewater treatment

Source: Fifth Assessment Report (Intergovernmental Panel on Climate Change 2014).

Emissions Sectors

The inventory identifies the major sources of GHG emissions caused by activities in sectors that are specific to community activities. A sector is a subset of the economy or society whose components share similar characteristics. An emissions sector can also contain subsectors that provide more specificity about the source of emissions (e.g., natural gas and electricity are subsectors of the energy sector).

The community inventory is categorized by sectors based on a sector's ability to be affected through regional and local programs, incentives, zoning, and other policies. The County's community inventory was divided into the following sectors:

- **Energy**, which is further broken down into two subsectors:
    - **Electricity** includes emissions from electricity consumption in nonresidential buildings and facilities (including outdoor lighting) as well as residential buildings in Riverside County.
    - **Natural Gas** includes emissions from natural gas consumption in nonresidential buildings and facilities, as well as residential buildings in Riverside County.
- **On-Road Transportation** includes emissions from vehicle fuel use in trips wholly within Riverside County ("in-boundary") and trips that either originate or end in Riverside County ("cross-boundary"). Emissions from in-boundary trips are fully accounted for in the inventory, whereas only half of the emissions from cross-boundary trips are accounted for. Trips that pass through Riverside County, (such as those on Interstate [I] 10 or I-15) are not accounted for in the inventory because the County has little or no control over these emissions. As a result, this methodology reflects only trips or parts of trips within Riverside County borders that the County has the ability to affect.
- **Solid Waste** includes emissions from waste that is generated in the community and sent to landfills.
- **Aviation** includes emissions from all aviation activities at Blythe Airport, Jacqueline Cochran Regional Airport, Hemet-Ryan Airport, and French Valley Airport.
- **Agriculture** includes emissions from enteric fermentation in domestic livestock, livestock manure management, crop cultivation, and field burning of agricultural residues.
- **Water and Wastewater** includes emissions from the electricity used to source, treat, and deliver imported water in the community that is not accounted for in the community utility data. Wastewater includes emissions from treating wastewater generated in the community.
- **Off-Road Sources** include emissions from operating equipment for construction, commercial, light industrial, and agricultural activities; lawn and garden equipment; and recreational vehicles, such as all-terrain vehicles.

Calculation Methodology

GHG emissions were calculated using available activity data (e.g., kilowatt-hours of electricity) and then follows protocols for converting activity data to emissions output using relevant emission factors. Emission factors relate the activity to GHG emissions and may vary by year (e.g., for electricity). Unlike activity data, they often are not affected by local actions or behavior. The United States Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (Community Protocol; ICLEI 2012) was the primary protocol used for developing the community inventory. Activity data are reported in the community emissions subsection below, and emission factors are detailed in Appendix B.

COMMUNITY EMISSIONS

The community inventory includes the GHG emissions that result from activities within Riverside County boundaries. This section presents the findings of the community inventory for the baseline year 2017, as well as more specific detail and findings on the energy sectors.

2017 Emissions Summary

As shown in Figure 1 and Table 3, the on-road transportation sector was the largest contributor to emissions in 2017 (36.02 percent), producing 1,766,784 MT CO_2e. The agriculture sector is the second-largest source of emissions at 34 percent (1, 670,954 MT CO_2e). Electricity consumption contributes 14.5 percent (712,928 MT CO_2e), and natural gas combustion accounts for 9.6 percent (475,211 MT CO_2e). Solid waste comprised 4.17 percent of the total (204,365 MT CO_2e) in 2017. Water, wastewater, and off-road sources made up the remaining emissions. Water and wastewater emissions accounted for 0.9 percent of the total emissions, while off-road sources comprised a very small percentage of overall emissions.

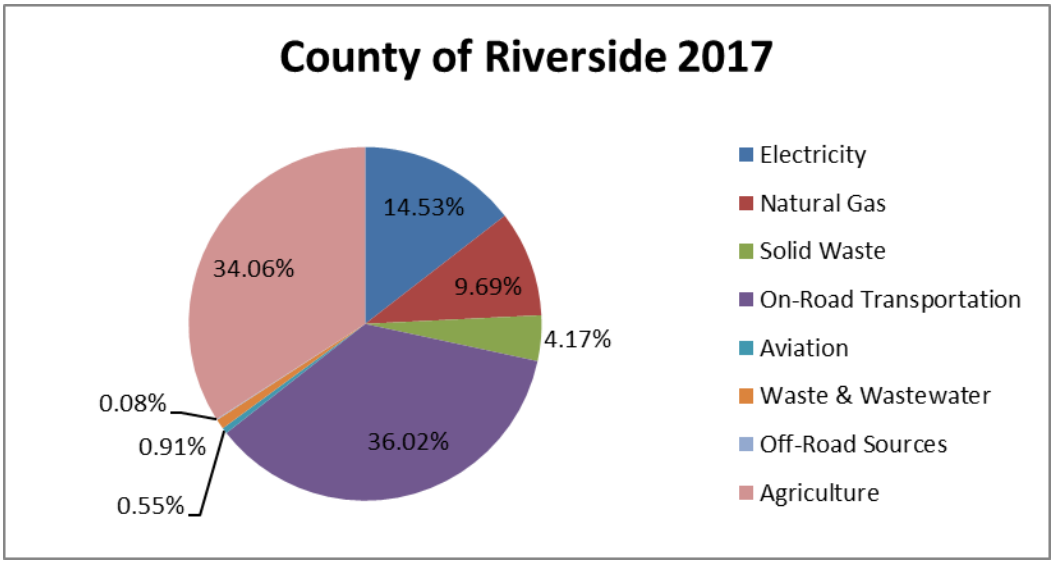

Figure 1. Communitywide Greenhouse Gas Emissions by Sector for 2017

Table 3. Communitywide Greenhouse Gas Emissions by Sector for 2017

Sector	2017 (MT CO_2e)	Percent of Total
On-Road Transportation	1,766,784	36.02
Agriculture	1,670,954	34.06
Electricity	712,928	14.53
Natural Gas	475,211	9.69
Solid Waste	204,365	4.17
Water and Wastewater	44,606	0.91
Aviation	26,786	0.55
Off-Road Sources	3,883	<1.00
Total	**4,905,518**	**100.00**

Source: Compiled by LSA (2018).
MT CO_2e = metric tons of carbon dioxide equivalent

Activity data can provide insight into behavioral choices in the community, as these data are not affected by emission factors. Table 4 summarizes activity data for each sector and subsector. Wastewater and off-road emissions were calculated based on countywide data and then proportioned to unincorporated Riverside County. These data are also shown in Table 4.

Demographic data also provide perspective to the potential changes in emissions over time. Table 5 shows the number of households, jobs, population, and service population (jobs + population) for 2016, the most recent year for which data are available.

Energy

Energy is an area over which local agencies often have the greatest opportunities for effecting change. Energy use consists of electricity and natural gas. Emissions from commercial/industrial and residential energy use account for approximately 24 percent of the total community emissions in 2017. Table 6 shows the breakdown in activity (in kilowatt-hours [kWh] or therms) and GHG emissions by sector and energy source. Figure 2 shows electricity and natural gas emissions for the commercial/industrial and residential sectors.

Table 4. Activity Data Used in 2017 Community Inventory

Sector	2017
On-Road Transportation	
Total Vehicle Miles Traveled	4,284,955,457.9
Aviation	
Jet Fuel (gallons)	2,781,219
Aviation Fuel (gallons)	431,069
Commercial/Industrial Energy	
Electricity (kWh)	1,463,821,482
Natural Gas (therms)	40,618,482
Residential Energy	
Electricity (kWh)	1,505,409,800
Natural Gas (therms)	48,850,607
Solid Waste	
Landfilled (tons)	389,687
Water and Wastewater	
Imported Water (million gallons)	27,642
Off-Road Sources[1] (% of Riverside County emissions attributed to unincorporated Riverside County)	
Lawn and Garden (% of households)	15.7
Construction (% of building permits)	29.4
Industrial (% of manufacturing jobs)	3.5
Light Commercial (% of other jobs)	11.7
Recreation (population weighted by income)	13.6
Agriculture (% of agriculture jobs)	77.2
Agriculture	
Hay (acres)	45,353
Corn (acres)	740
Oats (acres)	833
Sorghum (acres)	130
Wheat (acres)	18,394
Cotton (acres)	7,291
Vegetable and Fruit Trees (acres)	78,688
Dairy Cows (heads)	21,900
Poultry (heads)	1,893,394
Sheep (heads)	8,300

[1] Off-road emissions are available at the county (including unincorporated areas and incorporated cities) level through CARB's OFFROAD model. Emissions attributable to unincorporated Riverside County were derived using indicator data related to the off-road source. For example, the percentage of households in unincorporated Riverside County compared to the entire county (including unincorporated areas and incorporated areas) was used to attribute the same percentage of lawn and garden equipment emissions to the county. See Appendix B for more methodology details.

CARB = California Air Resources Board
kWh = kilowatt-hours

Table 5. Demographic Data for 2016

	2016
Households	112,292
Jobs[1]	81,754
Population	364,413
Service Population (Population + Jobs)	446,167

Source: *Profile of the Unincorporated Area of Riverside County* (SCAG 2017).
[1] The number of jobs is for 2015.
SCAG = Southern California Association of Governments

Table 6. Activity Data and Greenhouse Gas Emissions of Energy in 2017

Sector	2017	
	Activity (kWh or therms)	Emissions (MT CO_2e)
Commercial/Industrial Energy		
Electricity	1,463,821,482	351,463.5
Natural Gas	40,618,482	215,743.0
Residential Energy		
Electricity	1,505,409,800	361,464.0
Natural Gas	48,850,607	259,467.5
Total (MT CO_2e)		**1,188,138.0**

Source: Compiled by LSA (2018).
kWh = kilowatt-hours MT CO_2e = metric tons of carbon dioxide equivalent

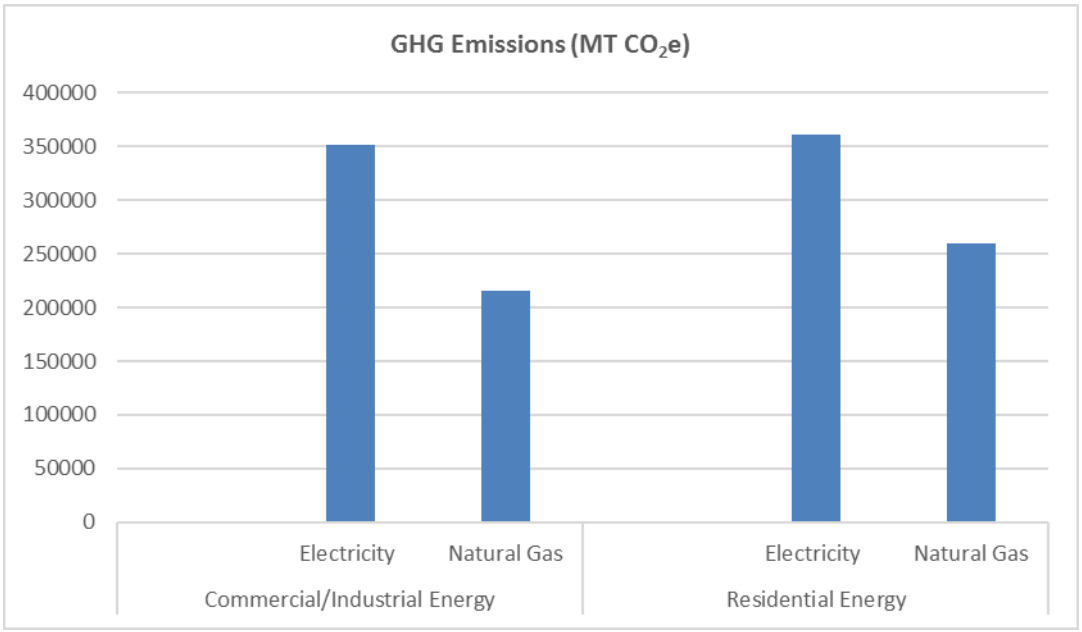

Figure 2. Greenhouse Gas Emissions for Community Electricity and Natural Gas by Sector in 2017

INVENTORY FORECASTS

The County developed two forecast scenarios for GHG emissions: a BAU scenario and an Adjusted BAU scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that will reduce emissions in the future (that is, the policies in place in 2017 would remain constant through 2050). The County developed GHG reduction measures in the 2015 CAP that constitute policies in place in 2017. These measures have been implemented and are reflected in the 2017 GHG emissions inventory, and they will continue to reduce emissions through 2020. Therefore, the BAU and Adjusted BAU forecasts included reductions from the 2015 CAP GHG reduction measures. The Adjusted BAU scenario describes emissions based on projected growth and considers policies that will achieve GHG reductions in the future. These policies, described in detail below, include State-adopted or approved legislation that will affect future emissions.

By evaluating the two forecasts, the County can determine the effect that existing policies may have on future emissions and assess what local measures can provide additional reductions. Three future years were forecasted for each scenario: 2020, 2030, and 2050. All forecast years are consistent with the goals identified in Assembly Bill (AB) 32 and the corresponding Scoping Plan (CARB 2017), which identifies Statewide GHG reduction targets for 2020, 2030, and 2050.

BUSINESS-AS-USUAL FORECAST

The BAU forecast estimated future emissions using current (2017) consumption patterns and emission factors with the anticipated growth in Riverside County. Anticipated growth is estimated using data from the County's 2015 General Plan and other relevant sources (Table 7). The most relevant growth factors are used to project emissions by sector. For example, future residential energy emissions were developed using current energy use per household (from the 2017 inventory) and the anticipated number of households in 2035. Actual energy use is a function of several variables, not only the number of households; however, this approach is supported by current protocols and best practices within the State and provides a consistent approach to forecasting. Compound annual growth rates were developed using the growth projections from 2010 to 2020 and from 2020 to 2035, as shown Table 7. Growth rates beyond 2035 are assumed to be the same as between 2020 and 2035. In general, the County is expect modest growth as population, housing, jobs, and vehicle miles traveled are all expected to moderately increase.

Community Business-as-Usual Forecast

The County's BAU Forecast emissions in 2020 are estimated to be 5,158,305 MT CO_2e, a 5 percent increase from baseline (2017) emissions. By 2030, emissions are estimated to increase 29.8 percent from the baseline level to 6,368,781 MT CO_2e. By 2050, emissions are estimated to increase 130 percent from the baseline level to 11,305,026 MT CO_2e (Table 8).

Table 7. Growth Factors for 2010, 2020, and 2035

Sector	Demographic Indicator	2010	2020	2010–2020 CAGR (percent)	2035	2020–2035 CAGR (percent)
Residential Energy	Households	171,380	220,794	2.57	324,021	2.59
Commercial/Industrial Energy	Jobs	97,210	151,034	4.50	265,688	3.84
N/A[1]	Population	467,105	608,857	2.69	908,100	2.70
Solid Waste, Water, Wastewater, and Off-road Sources	Service Population (Population + Jobs)	564,315	759,891	3.02	1,173,788	2.94

Source: County of Riverside General Plan (2015)
[1] Not Applicable. Population data are shown for informational purposes but are not used for forecasting any sector.
CAGR = compound annual growth rate

Table 8. Community Business-as-Usual Forecast Emissions

Sector	2017 (MT CO_2e)	2020 (MT CO_2e)	Percent Change 2017–2020	2030 (MT CO_2e)	Percent Change 2017–2030	2050 (MT CO_2e)	Percent Change 2017–2050
On-Road Transportation	1,766,784	1,999,268	13.1	3,018,767	70.0	6,882,509	289.5
Agriculture	1,670,954	1,565,873	-6.2	1,261,044	-24.5	817,858	-51.0
Electricity	712,928	774,289	8.6	1,017,153	42.6	1,756,843	146.4
Natural Gas	475,211	515,845	8.5	676,742	42.4	1,165,761	145.3
Solid Waste	204,365	223,448	9.3	298,585	46.1	533,154	160.0
Water and Wastewater	44,606	48,771	9.3	65,171	46.1	116,370	160.0
Aviation	26,786	26,786	0.0	26,786	0.0	26,786	0.0
Off-Road Sources	3,883	4,024	3.6	4,531	16.6	5,744	47.9
Total	**4,905,518**	**5,158,305**	**5.1**	**6,368,781**	**29.8**	**11,305,026**	**130.4**

Source: Compiled by LSA (2018).
MT CO_2e = metric tons of carbon dioxide equivalent

Adjusted Business-as-Usual Forecast

State legislation has been approved and/or adopted that will reduce GHG emissions in Riverside County. These policies do not require additional local action but should be accounted for in the County's emissions forecasts to provide a more accurate picture of future emissions and the level of local action needed to reduce emissions to levels consistent with State recommendations. This forecast is called the Adjusted BAU forecast. The measures are described briefly below.

Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS) was developed as a result of Executive Order (EO) S-1-07, which mandates that the carbon intensity of transportation fuels in California be lowered 10 percent by 2020. The State is currently implementing this standard, which is being phased in and will achieve full implementation in 2020. The LCFS target would be maintained beyond 2020.

Assembly Bill 1493 and Advanced Clean Cars

AB 1493 directed the California Air Resources Board (CARB) to adopt GHG standards for motor vehicles through model year 2015 that would result in reductions in GHG emissions by up to 25 percent in 2030. In addition, the State's Advanced Clean Cars Program includes additional components that will further reduce GHG emissions statewide, including more stringent fuel efficiency standards for model years 2017 through 2025 and support infrastructure for the commercialization of zero-emission vehicles. CARB anticipates additional GHG reductions of 3 percent by 2020, 27 percent by 2035, and 33 percent by 2050.[3] These are also known as "Pavley I" and "Pavley II" regulations.

California Building Code Title 24

California's building efficiency standards are updated regularly to incorporate new energy efficiency technologies. The code was most recently updated in 2016 and went into effect for new development in 2017. For projects implemented after January 1, 2017, the California Energy Commission estimates that the 2016 Title 24 energy efficiency standards will reduce consumption by an estimated 28 percent for residential buildings and 5 percent for commercial buildings, relative to the 2013 standards. These percentage savings relate to heating, cooling, lighting, and water heating only; therefore, these percentage savings were applied to the estimated percentage of energy use by Title 24.

Renewable Portfolio Standard

The Renewable Portfolio Standard (RPS) requires energy providers to derive 33 percent, 60 percent, and 100 percent of their electricity from qualified renewable sources by 2020, 2030, and 2045, respectively. This is anticipated to lower emission factors (i.e., fewer GHG emissions per kWh used) statewide. Therefore, reductions from RPS are taken for energy embedded in water, as well as commercial/industrial and residential electricity.

Community Adjusted Business-as-Usual Forecast

The County's Adjusted BAU forecast emissions are estimated to be 4,861,256 MT CO_2e in 2020; 4,102,109 MT CO_2e in 2030; and 4,175,146 MT CO_2e in 2050 (Table 9). This change represents a 0.9 percent reduction from 2017 by 2020, a 16.3 percent reduction by 2030, and a 14.8 percent reduction by 2050. Due to the State's stringent vehicle standards, emissions from the transportation sector are expected to decrease significantly over time. The proportion of emissions from electricity consumption are expected to decrease over time, whereas natural gas-related emissions are expected to increase over time. The emissions from the agriculture sector are also expected to reduce by almost half over time, mainly due to a decline in agricultural activities. Figure 3 shows community Business-As-Usual (BAU) and Adjusted BAU forecasts.

[3] CARB Advanced Clean Cars Summary Sheet. Accessed on November 10, 2018 https://www.arb.ca.gov/msprog/clean_cars/acc%20summary-final.pdf?_ga=2.39593376.248736436.1543349769-1056020676.1542733892.

Table 9. Community Adjusted Business-as-Usual Emissions

Sector	2017 (MT CO_2e)	2020 (MT CO_2e)	Percent Change 2017–2020	2030 (MT CO_2e)	Percent Change 2017–2030	2050 (MT CO_2e)	Percent Change 2017–2050
On-Road Transportation	1,766,784	1,835,938	3.9	1,361,200	-22.9	1,174,310	-33.5
Agriculture	1,670,954	1,565,873	-6.2	1,261,044	-24.5	817,858	-51.0
Electricity	712,928	653,541	-8.3	466,971	-34.4	480,289	-32.6
Natural Gas	475,211	510,268	7.3	652,578	37.3	1,104,421	132.0
Solid Waste	204,365	223,448	9.3	298,585	46.1	533,154	160.8
Water and Wastewater	44,606	41,377	-7.2	30,413	-31.8	32,584	-26.9
Aviation	26,786	26,786	0.0	26,786	0.0	26,786	0.0
Off-Road Sources	3,883	4,024	3.6	4,531	16.6	5,744	47.9
Total	**4,905,518**	**4,861,256**	**-0.9**	**4,102,109**	**-16.3**	**4,175,146**	**-14.8**

Source: Compiled by LSA (2018).
MT CO_2e = metric tons of carbon dioxide equivalent

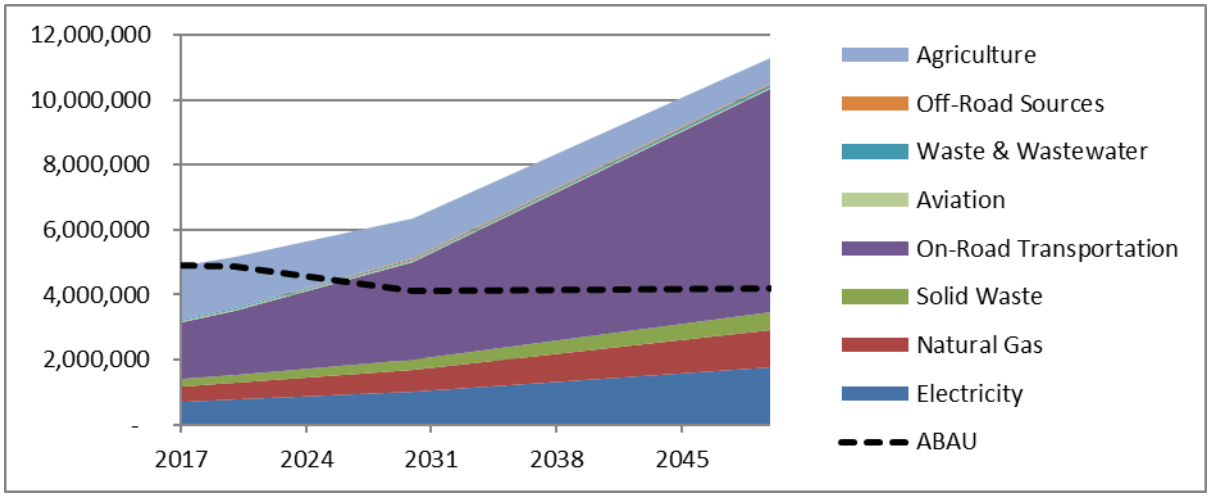

Figure 3. Community Business-as-Usual and Adjusted Business-as-Usual (ABAU) Forecasts

REDUCTION TARGETS

The State has set goals for reducing GHG emissions by 2020, 2030, and 2050 through AB 32, EO S-3-05, and EO B-30-15, respectively. The State has also provided guidance to local jurisdictions as "essential partners" in achieving the State's goals by identifying a 2020 recommended reduction goal. That goal, stated in the AB 32 Scoping Plan, was for local governments to achieve a 15 percent reduction below 2005–2008 levels by 2020, which aligns with the State's goal of not exceeding 1990 emissions levels by 2020.[4] The State's long-term target is to emit no more than 20 percent of 1990 levels by 2050 (or, a reduction of 80 percent below 1990 levels by 2050). The State has also provided an interim target, which is 40 percent below 1990 levels by 2030. It is clear that the issue of climate change will not end in 2030 and continued reduction goals should be implemented to keep the State on a path toward the 2050 goal.

Ultimately, the County will determine the level of reductions that it can feasibly achieve. The recommended targets provided below are guidelines based on consistency with the State's goals.

RECOMMENDED COMMUNITY TARGETS

The following targets are recommended to keep the County CAP in line with the State's reduction goals. In 2020, the County would not need to make any additional CO_2e emissions reductions, as State and local policies will be sufficient to meet the targets. In 2030, the County would need to reduce emissions by 525,511 MT CO_2e below the Adjusted BAU scenario to meet the State-aligned target. In 2050, the County would need to reduce emissions by 2,982,947 MT CO_2e below the Adjusted BAU scenario to meet the State-aligned target (see Table 10 and Figure 4).

Table 10. State-Aligned Emission GHG Reduction Targets by Year

Sector	2008[1]	2017	2020	2030	2050
BAU Emissions (MT CO_2e)	7,012,938	4,905,518	5,158,305	6,368,781	11,305,026
Adjusted BAU Emissions (MT CO_2e)	-	-	4,861,256	4,102,109	4,175,146
State-Aligned Target (% change from 1990)	-	-	0	-40	-80
State-Aligned Target (% change from 2008)[2]	-	-	-15	-49	-83
Reductions from Adjusted BAU Needed to Meet the Target (MT CO_2e)	-	-	-	525,511	2,982,947

Source: Compiled by LSA (2018).
[1] Baseline (2008) emissions are from the County's 2015 Climate Action Plan GHG inventory.
[2] Reduction target calculation details are provided in Appendix B.
BAU = Business-as-Usual
County = County of Riverside
GHG = greenhouse gas
MT CO_2e = metric tons of carbon dioxide equivalent
NA= Not Applicable

[4] In an analysis, the State concluded that a 15 percent reduction in emissions from 2005–2008 levels by 2020 would be equivalent to achieving 1990 emissions levels.

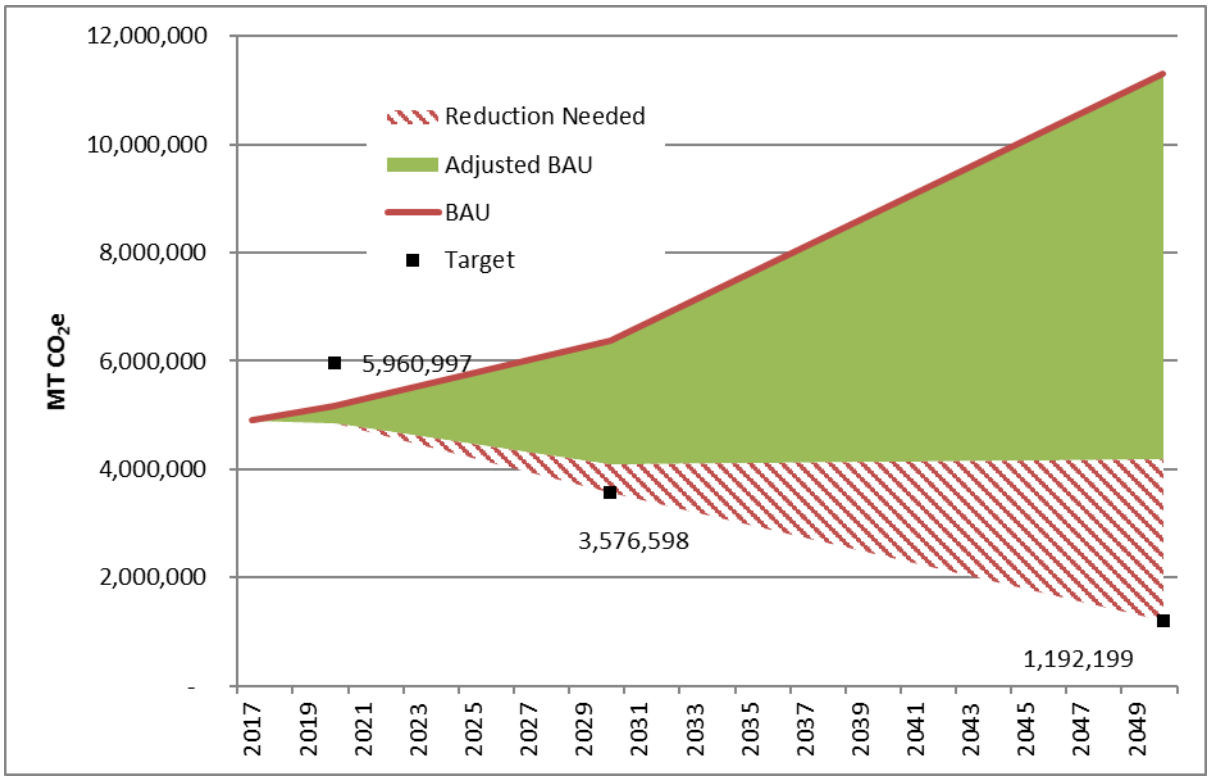

Figure 4. Community Emissions Inventories, Forecasts, and Targets

CONCLUSIONS AND NEXT STEPS

This IFT Report presents the County's community inventory, provides forecasts, and describes recommended reduction targets. It is the foundation of the CAP Update and provides the County a first look at what will be needed to meet emissions reduction targets that are aligned with State goals and would mitigate the County's impacts on climate change. This report is also intended to guide the County in determining feasible GHG reduction opportunities by detailing the sources of emissions by sector.

The next steps in the CAP process are to review the information provided in this IFT Report and to determine preliminary GHG reduction targets for community operations. The County should also begin to identify local GHG reduction measures that could be implemented to reach its emissions targets.

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APPENDIX A

GLOSSARY OF TERMS

Adjusted Business-as-Usual: A greenhouse gas forecast scenario that accounts for known policies and regulations that will affect future emissions. Generally, these are State and federal initiatives that will reduce emissions from the Business-as-Usual scenario.

Baseline Year: The inventory year used for setting targets and against which future inventories are compared.

Business-as-Usual (BAU): A greenhouse gas forecast scenario used for the estimation of greenhouse gas emissions at a future date based on current technologies and regulatory requirements and in the absence of other reduction strategies.

Carbon Dioxide Equivalent (CO_2e): A common unit for normalizing greenhouse gases with different levels of heat trapping potential. For carbon dioxide itself, emissions in tons of CO_2 and tons of CO_2e are the same, whereas 1 ton of nitrous oxide equates to 265 tons of CO_2e and 1 ton of methane equates to 28 tons of CO_2e. The values are based on the gases' global warming potentials.

Community Inventory: Greenhouse gas emissions that result from the activities of residents and businesses in the county. An inventory reports emissions that occur over a single calendar year.

Emissions Factor: A coefficient used to convert activity data into greenhouse gas emissions. The factor is a measure of the greenhouse gas intensity of an activity, such as the amount of CO_2 in 1 kilowatt-hour of electricity.

Global Warming Potential (GWP): The relative effectiveness of a molecule of a greenhouse gas at trapping heat compared with one molecule of CO_2.

Metric Ton (MT): Common international measurement for the quantity of greenhouse gas emissions. A metric ton is equal to 2,205 pounds or 1.1 short tons.

Reduction Targets: Greenhouse gas emissions levels not to be exceeded by a specific date. Reduction targets are often informed by State recommendations, and different targets may be established for different years.

Sector: A subset of the emissions inventory classified by a logical grouping, such as an economic or municipal-specific category.

State-Aligned Targets: The State's goals for reducing greenhouse gas emissions by 2020, 2030, and 2050 through Assembly Bill 32, Executive Order S-3-05, and Executive Order B-30-15, respectively.

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APPENDIX B

METHODOLOGY

This appendix provides a detailed description of the data sources, emission factors, policies, and assumptions used to develop the greenhouse gas (GHG) emissions inventories, forecasts under a Business-as-Usual (BAU) scenario, forecasts under an Adjusted BAU scenario, and the State-aligned GHG reduction targets.

PROTOCOLS

The GHG inventories were developed using tools and guidance documents developed or supported by government agencies, such as the Environmental Protection Agency. Calculation protocols have been developed to ensure consistency among community inventories. Specifically, the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Community Protocol; ICLEI 2012) and the California Supplement (AEP 2013) were used for the community inventory. These protocols often have multiple calculation methods for a single emission source depending on the data available. There are two broad approaches for calculating emissions: "bottom-up" and "top-down." A bottom-up approach relies on end-use data, such as county-level electricity usage. A top-down approach relies on aggregated data that is allocated to the county based on population, employment, or another relevant indicator. Bottom-up calculations were performed whenever possible to provide the most detailed and likely accurate picture of emissions within a jurisdiction; however, when detailed data were not available, other appropriate methods were used and are described in this appendix.

GLOBAL WARMING POTENTIAL FACTORS

The inventory includes the three GHGs most relevant to community emissions—carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O)—since they are most relevant to human activities (IPCC 2014). Each GHG differs in its ability to absorb heat in the atmosphere based on its molecular properties and expected lifetime in the atmosphere, and it is useful to describe emissions in one unit of measurement. That unit of measurement is carbon dioxide equivalent, or CO_2e, and Global Warming Potential (GWP) factors are used to standardize emissions from various GHGs. GWP factors, developed by the Intergovernmental Panel on Climate Change (IPCC), represent the heat-trapping ability of each GHG relative to that of CO_2. For example, the GWP factor of CH_4 is 28 because 1 metric ton (MT) of CH_4 has 28 times the heat-trapping capacity as 1 MT CO_2 (over a 100-year period). IPCC periodically updates the GWP factors of GHGs based on new science and updated background mixing ratios of CO_2. CO_2 always has a GWP factor of 1 and the other GHGs are calculated relative to CO_2. The GWP factors are shown in Table B-1. GWP factors are unitless. Emissions in the inventory are reported in units of CO_2e.

Table B-1. Global Warming Potentials

	CO_2	CH_4	N_2O
GWP	1	25	298

Source: *Fifth Assessment Report* (Intergovernmental Panel on Climate Change2014).

ACTIVITY DATA

Activity data is the end-use consumption amount of a sector, such as kilowatt-hours of electricity, therms of natural gas, and vehicle miles traveled for on-road transportation. In estimating the County's historical GHG emissions, activity data for unincorporated Riverside County were obtained when possible (a "bottom-up" approach). When not available, other data sources were used, generally at the county level (a "top-down" approach). Activity data were provided by the sources identified in Table B-2.

Table B-2. Activity Data Sources

Data	Data Source	Notes
Electricity	Southern California Edison, Anza Electric Cooperative, and Imperial Irrigation District	Unincorporated County area data
Natural Gas	Southern California Gas Company	Unincorporated County area data
Water	Fern Valley Water District, High Valleys Water District, Rancho California Water District, Temescal Valley Water District, Cabazon Water District, Chiriaco Summit Water District, Coachella Valley Water District, Home Gardens County Water District, Idyllwild Water District, Mission Springs Water District, Pine Cove Water District, Pinyon Pines County Water District, Yucaipa Valley Water District, Beaumont-Cherry Valley Water District, Palo Verde Irrigation District, Eastern Municipal Water District, Elsinore Valley Municipal Water District, Lake Hemet Municipal Water District, Western Municipal Water District, and Desert Water Agency	Unincorporated County area data
Vehicle Miles Traveled	County of Riverside RIVTAM Model	Origin-destination approach, described below
Aviation	Riverside County Economic Development Agency	Unincorporated County area data
Demographic Data	County of Riverside General Plan and SCAG	Unincorporated County area data
Off-Road Emissions	OFFROAD Model	County-level data
Solid Waste	Riverside County Department of Waste Resources	Unincorporated County area data
Agriculture	SCAG and Riverside County Agricultural Commissioner	Unincorporated County area data

County = County of Riverside
RIVTAM = Riverside Traffic Analysis Model)
SCAG = Southern California Association of Governments

Origin-Destination Vehicle Miles Traveled

For the community inventory, activity data—in this case, vehicle miles traveled (VMT)—were based on an origin-destination approach used by the State in developing an emissions target for metropolitan planning organizations under Senate Bill 375. This approach has also been the typical approach used in estimating emission within a county. This approach accounts for:

- All of the emissions where a trip begins and ends within the county;
- Half of the emissions where one endpoint is in the county (i.e., either the origin or destination of the trip); and
- None of the emissions that are "pass-through" (i.e., a trip passes through the county but does not begin or end within its boundary).

This approach is used to account for trips or portions of trips that the County of Riverside may have some control over. The County does not have any control over pass-through trips because both the origin and destination that generated the trip are outside of the County's jurisdiction.

Community Activity Data

Community activity data are shown in Table B-3, with the exception of off-road emissions, which are shown as the County's proportion of countywide emissions. Total countywide off-road emissions by GHG are shown in Table B-4.

EMISSION FACTORS

Emissions factors are used to convert activity data to GHG emissions. An emission factor is defined as the average emission rate of a given GHG for a given source, relative to units of activity. By definition, an emission factor is related to activity data. The emission factors used in the inventories are described by sector below.

Electricity

California utilities report the average CO_2 content per output of electricity on an intermittent basis. The CO_2 intensity of electricity varies by utility and year due to changes in supply, renewable generation, and other factors. The community within the unincorporated County area uses electricity provided by Southern California Edison (SCE), Anza Electric Cooperative (Anza), and the Imperial Irrigation District (IID), except for embedded energy in water, which travels throughout the State and therefore utilizes electricity from multiple utilities (as described in the Water and Wastewater discussion below).

Table B-3. Community Inventory Activity Data

Sector	2017
On-Road Transportation	
Total Vehicle Miles Traveled	4,284,955,458
Aviation	
Jet Fuel (gallons)	2,781,219
Aviation Fuel (gallons)	431,069
Electricity (kWh)	
Commercial	1,463,821,482
Residential	1,505,409,800
Natural Gas (therms)	
Commercial	40,618,482
Residential	48,850,607
Solid Waste	
Landfill (tons)	389,687
Water and Wastewater	
Imported Water (million gallons)	27,642
Off-Road Sources[1] (% of Riverside County emissions attributed to unincorporated Riverside County)	
Lawn and Garden (% of households)	15.7
Construction (% of building permits)	29.4
Industrial (% of manufacturing jobs)	3.5
Light Commercial (% of other jobs)	11.7
Recreation (population weighted by income)	13.6
Agriculture (% of agriculture jobs)	77.2
Agriculture	
Hay (acres)	45,353
Corn (acres)	740
Oats (acres)	833
Sorghum (acres)	130
Wheat (acres)	18,394
Cotton (acres)	7,291
Vegetable and Fruit Trees (acres)	78,688
Dairy Cow (heads)	21,900
Poultry (heads)	1,893,394
Sheep (heads)	8,300

[1] Off-road emissions are available at the county (including unincorporated areas and incorporated cities) level through CARB's OFFROAD model. Emissions attributable to unincorporated Riverside County were derived using indicator data related to the off-road source. For example, the percentage of households in unincorporated Riverside County compared to the entire County (including unincorporated areas and incorporated areas) was used to attribute the same percentage of lawn and garden equipment emissions to the County. See below for more methodology details.

CARB = California Air Resources Board
kWh = kilowatt-hours

Table B-4. Emissions from Off-Road Categories for Riverside County

Off-Road Class	GHG Type	2017 (MT CO_2e/yr)
Agricultural Equipment	CO_2	1,580
	CH_4	0.019
	N_2O	0.143
Construction and Mining Equipment	CO_2	7,438
	CH_4	0.040
	N_2O	0.634
Industrial Equipment	CO_2	728
	CH_4	0.037
	N_2O	0.245
Lawn and Garden Equipment	CO_2	790
	CH_4	0.506
	N_2O	1.154
Light Commercial Equipment	CO_2	502
	CH_4	0.080
	N_2O	0.131
Recreational Equipment	CO_2	436
	CH_4	0.659
	N_2O	1.865

Source: OFFROAD Model (CARB 2007)
CARB = California Air Resources Board
CH_4 = methane
CO_2 = carbon dioxide
GHG = greenhouse gas
MT CO_2e/yr. = metric tons of carbon dioxide equivalent per year
N_2O = nitrous oxide

Since the County obtains its electricity from multiple providers (as shown in Table B-5), multiple emission factors were used. Western Electricity Coordinating Council (WECC) California subregion emissions rates from the Environmental Protection Agency's (EPA) eGRID2016 Summary Tables (EPA 2016) were used for both Anza and IID data. SCE reported CO_2 factors for 2016 through its Corporate Responsibility and Sustainability Report (SCE 2016).

Table B-5. Electricity Emission Factors

Source	CO_2 (lbs/MWh)	CH_4 (lbs/MWh)	N_2O (lbs/MWh)	CO_2e (lbs/MWh)
EPA	527.9	0.033	0.004	-
SCE[1]	-	-	-	529.11

Sources: Emissions & Generation Resource Integrated Database (eGRID) Summary Tables (EPA 2016); *2016 Corporate Responsibility and Sustainability Report* (SCE 2016).
[1] SCE only reported CO_2e.

CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
EPA = United States Environmental Protection Agency
lbs/MWh = pounds per megawatt-hour
N_2O = nitrous oxide
SCE = Southern California Edison

Natural Gas Combustion

Emission factors for natural gas do not vary greatly over time or by supplier. Therefore, natural gas emission factors from the United States Community Protocol for Accounting and Reporting GHG Emissions, which are U.S. averages, were used (Table B-6).

Table B-6. Natural Gas Emission Factors

	CO_2	CH_4	N_2O
kg/MMBtu	53.02	0.005	0.0001

Source: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.0 (ICLEI 2012).
CH_4 = methane
CO_2 = carbon dioxide
ICLEI = Local Governments for Sustainability
kg/MMBtu = kilograms per million British thermal units
N_2O = nitrous oxide

Transportation and Mobile Sources

EMFAC Model

CO_2 emission factors for transportation and mobile sources are calculated using the State-developed Emissions Factor (EMFAC) model, version 2017, which can be accessed at http://www.arb.ca.gov/emfac/. Emissions are available at the county level, and emission factors were developed and applied to VMT for 2017. Data are aggregated as annual emissions for all vehicle model years and speeds, but are separated by vehicle class. Emission factors were developed using total CO_2 exhaust, which includes emissions from vehicles in motion, idling, and ignition. While emissions from idling and ignitions are not directly related to mileage, they were included so that reductions from measures that may decrease idling could be accounted for in future inventories.

On-Road Transportation

Emissions were converted to emission factors as grams of CO_2 per mile for gasoline, diesel, and natural gas vehicles using EMFAC and a three-step process:

1. Calculate VMT percentage for each vehicle class using EMFAC VMT.

2. Calculate CO_2 emission factor for each vehicle class using EMFAC CO_2 emissions[1] and VMT for Riverside County;

CH_4 and N_2O emission factors for gasoline, diesel, and natural gas vehicles were derived from Emission Factors for Greenhouse Gas Inventories developed by the EPA (Table B-7).

[1] The emissions factors take into account existing policies (e.g., Pavley and Low Carbon Fuel Standard).

Table B-7. On-Road Vehicle Emission Factors

Vehicle Class	Fuel Type	VMT Percentage	CO_2 Emission Factor (grams/mile)	CH_4 Emission Factor (grams/mile)	N_2O Emission Factor (grams/mile)
Passenger Cars	Gasoline	54.64	335.185	0.017	0.004
	Diesel	0.3998	242.843	0.0005	0.001
Light-Duty Trucks (ETW <= 3,750 pounds)	Gasoline	5.4589	397.184	0.016	0.007
	Diesel	0.0028	450.764	0.001	0.002
Light-Duty Trucks (ETW > 3,750 pounds)	Gasoline	17.96	437.784	0.016	0.007
	Diesel	0.0573	335.147	0.001	0.002
Light-Heavy-Duty Trucks (GVWR < 10,000 pounds)	Gasoline	1.530	914.724	0.033	0.013
	Diesel	1.451	562.207	0.005	0.005
Light-Heavy-Duty Trucks (GVWR > 10,000 pounds)	Gasoline	0.2306	1,047.891	0.033	0.013
	Diesel	0.5467	613.029	0.005	0.005
Motorcycles	Gasoline	0.5452	246.515	0.017	0.004
Medium-Duty Trucks	Gasoline	16.11	528.437	0.033	0.013
	Diesel	0.2423	441.921	0.005	0.005
Motor Homes	Gasoline	0.1273	1,897.190	0.016	0.007
	Diesel	0.0490	1,053.958	0.001	0.002
Motor Coaches	Diesel	0.0148	1,797.703	0.001	0.002
Other Buses	Gasoline	0.0615	1,926.349	0.016	0.007
Power Take-Off	Diesel	0.0706	2,337.179	0.001	0.002
School Buses	Gasoline	0.0351	1,073.062	0.016	0.007
	Diesel	0.0658	1,537.071	0.001	0.002
Urban Buses	Gasoline	0.0445	1,632.671	0.016	0.007
	Diesel	0.0001	1,314.437	0.001	0.002
	Natural Gas	0.0811	1,921.904	1.966	0.175
All Other Buses	Diesel	0.0268	1,136.311	0.001	0.002

Source: EMFAC2017 Web Database. EPA Emission Factors for Greenhouse Gas Inventories (CARB 2018).
CARB = California Air Resources Board
CH_4 = methane
CO_2 = carbon dioxide
ETW = equivalent test weight
GVWR = gross vehicle weight rating
N_2O = nitrous oxide
VMT = vehicle miles traveled

Off-Road Emissions Sources

Off-road emissions include emissions from agriculture, construction, industrial, lawn and garden, light commercial, and recreational equipment. Annual emissions of CO_2, CH_4, and N_2O are available at the county (including unincorporated areas and incorporated cities) level from the State's OFFROAD model. To estimate values for unincorporated Riverside County, relevant indicator data are used to estimate the proportion of county-level emissions attributable to unincorporated Riverside County.[1] Table B-8 lists the indicator data used to estimate unincorporated Riverside

[1] For example, the indicator for off-road emissions from construction equipment is building permits. Communities in unincorporated Riverside County issued 1,512 building permits in 2017, and 5,136 building permits were issued countywide. As such, building permits issued in unincorporated Riverside County account for 29.4 percent of the County's total building permits. It is assumed that the unincorporated area of the County's proportion of building permits is equal to the unincorporated area of the County's proportion of the entire County's off-road emissions. Based on this assumption, 29.4 percent of Riverside County's 2017 off-road CO_2 emissions are attributable to unincorporated Riverside County. Similar methodology applies to the remaining year and off-road emissions sources.

Table B-8. Off-Road Emissions Indicators

Category	Indicator
Agriculture Equipment	Agriculture Jobs
Construction Equipment	Building Permits Issued
Industrial Equipment	Manufacturing Jobs
Lawn and Garden Equipment	Households
Light Commercial Equipment	Nonmanufacturing or Agriculture Jobs
Recreational Equipment	Population, Weighted by Median Income

Sources: Profile of the Unincorporated Area of Riverside County and Profile of Riverside County (SCAG 2017).
SCAG = Southern California Association of Governments

County's portion of emissions for each category, and Table B-9 shows the data specific to unincorporated Riverside County. Indicator data were obtained from the Southern California Association of Governments' (SCAG) *Profile of the Unincorporated Area of Riverside County and Profile of Riverside County.*

Table B-9. Off-Road Emissions Indicator Data

	Agriculture Jobs	Building Permits	Manufacturing Jobs	Households	Other Jobs[1]	Population	Income ($)
Riverside County (Unincorporated Area)	8,257	1,512	3,613	112,292	69,884	364,413	50,394
Riverside County	10,700	5,136	103,633	713,205	595,607	2,347,828	57,367
% Unincorporated area of Entire County	77.2	29.4	3.5	15.7	11.7	13.6	

Source: *Profile of the Unincorporated Area of Riverside County and Profile of Riverside County* (SCAG 2017).
Note: Some percentages may appear off due to rounding.
[1] Other indicates nonmanufacturing and non-agricultural.
SCAG = Southern California Association of Governments

Water and Wastewater

Emissions from water are indirect. Water requires energy to move from its source to final treatment, and the energy used for most of these processes is not captured in local utility data (i.e., the portion that is used in a home or business and therefore contained in the owner's utility bill). This portion is termed the "embedded energy" in water. For southern California in particular, the energy embedded in water is high and should be accounted for in a community inventory. The California Energy Commission (CEC) developed a report that estimates the energy required to supply, convey, distribute, and treat water in northern and southern California (CEC 2006b). Outdoor water infiltrates the ground and therefore does not have the wastewater energy treatment component. Therefore, the emission factors are different for indoor and outdoor water. The amount of water used for indoor or outdoor use was not available at the county level. It is assumed that 50 percent of water is for outdoor use. The embedded energy in 1 million gallons (MG) of indoor and outdoor water in Riverside County is shown in Table B-10.

Table B-10. Energy Embedded in Water

	Indoor Use[1] (kWh/MG)	Outdoor Use[1] (kWh/MG)
Supply and Conveyance	9,727	9,727
Treatment	111	111
Distribution	1,272	1,272
Wastewater Treatment	1,911	–
Total	**13,022**	**11,111**

Source: *Refining Estimates for Water-Related Energy Use in California* (CEC, September 2006).
CEC = California Energy Commission kWh/MG = kilowatt-hours per million gallons

Water districts obtain water from various sources. For local water sources, the data collected from SCE, Anza, and IID include associated electricity usage; hence, GHG emissions are included under the electricity sector discussion above. Showing GHG emissions associated with local water sources in the electricity sector avoided double-counting because the electricity used to pump local water supplies was embedded in the SCE, Anza, and IID reported electrical consumption data for unincorporated Riverside County. For this reason, the percentage of imported water data for each water district was collected along with the water consumption data. Table B-11 shows water consumption and percentage of imported water data for all water districts serving unincorporated Riverside County.

Table B-11. Water Consumption and Imported Water Data

Water District	Annual Water Consumption (million gallons)	Imported Water Percentage
Fern Valley Water District	38.12	0
High Valleys Water District	24.45	100
Rancho California Water District	8,233.13	40
Temescal Valley Water District	938.78	74
Cabazon Water District	148.34	0
Chiriaco Summit Water District	9.31	100
Coachella Valley Water District	N/A[1]	0
Home Gardens County Water District	120.89	57
Idyllwild Water District	86.68	0
Mission Springs Water District	N/A[1]	0
Pine Cove Water District	29.14	0
Pinyon Pines County Water District	5.76	0
Yucaipa Valley Water District	88.31	48
Beaumont-Cherry Valley Water District	3,190.73	59
Palo Verde Irrigation District	N/A[1]	0
Eastern Municipal Water District	4,081.28	54
Elsinore Valley Municipal Water District	1,022.98	68
Lake Hemet Municipal Water District	4,056.52	70
Western Municipal Water District	5,295.52	68
Desert Water Agency	92.09	27

Source: Compiled by LSA (2018).
[1] Data are not available. However, since 100 percent of the district's water is from local sources, missing data do not affect calculation results.

For energy embedded in water, a statewide average emission factor is applied because water in Riverside County is supplied from various regions in the State. These emissions factors are listed in Table B-12.

Table B-12. California Statewide Electricity Emission Factors

Year	CO_2 (lbs/MWh)	CH_4 (lbs/MWh)	N_2O (lbs/MWh)
2016[1]	527.9	0.033	0.004

Source: Emissions & Generation Resource Integrated Database (eGRID) (EPA 2016).
[1] 2016 data is the most recent year available and is used as a proxy for 2017 inventory.
CH_4 = methane
CO_2 = carbon dioxide
EPA = United States Environmental Protection Agency
lbs/MWh = pounds per megawatt-hour
N_2O = nitrous oxide

Solid Waste

Emissions from solid waste are primarily in the form of fugitive emissions of CH_4 from decomposition, and only organic waste may decompose. Emission factors are derived from the Community Protocol based on the type of waste disposed. For the community inventory, the emission factor for mixed municipal solid waste was used. The emission factor to determine CH_4 generation varies if the landfill has a CH_4 capture system and if it operates a CH_4 flare or generates electricity from CH_4 capture. The Community Protocol recommends using an average factor of 75 percent recovery from landfill gas, although some landfills with have much higher gas recovery systems and other landfills have lower gas recovery systems. CO_2 generated by the decomposition of waste in landfills is not considered anthropogenic because it would be produced through the natural decomposition process regardless of its disposition in the landfill. N_2O is not a byproduct of decomposition; therefore, no fugitive emissions of N_2O are anticipated from this source. Table B-13 shows the waste disposal amount for all landfills that serve unincorporated Riverside County and whether each landfill has a CH_4 capture system.

Table B-13. Solid Waste Disposal

Landfill Name	Annual Waste Disposal (tons)	Has Methane Recovery System?
Badlands Landfill	77,845.00	Yes
Blythe	6,283.47	No
Desert Center	32.11	No
Lamb Canyon	92,731.44	Yes
Mecca II	3.60	No
Oasis	1,092.00	No
El Sobrante	168,791.00	Yes
Transfer Stations[1]	42,909.21	No
TOTAL	**389,687.83**	-

Source: County of Riverside, Department of Waste Resources (2018).
[1] There are multiple transfer stations serving unincorporated Riverside County. As a worst-case scenario, it is assumed that the landfills that the transfer stations send waste to do not have methane capture systems.

FORECASTS

The forecasts are an estimate of what emissions in Riverside County may be in 2020, 2030, and 2050. The forecasts were developed using standard methodologies under two scenarios: BAU and Adjusted BAU.

Business-as-Usual Forecasts

The BAU scenario uses current (2017) consumption patterns and predicted growth in Riverside County in the absence of State and federal legislation that would reduce future emissions. The growth assumptions are based on County of Riverside General Plan estimates (County of Riverside 2015b) and are applied to emissions sectors based on their relevance. For example, future residential energy emissions were developed using current energy use per household (from the 2017 inventory) and the anticipated number of households in the future. Table B-14 shows the growth factors used to project emissions in Riverside County.

Table B-14. Emissions Sectors and Demographic Growth Indicators

Sector	Demographic Indicator
Residential Energy	Households
Commercial/Industrial Energy	Jobs
Solid Waste, Water, Wastewater, and Off-Road Sources	Service Population (Population + Jobs)
Transportation	VMT
Agriculture	Change in agriculture sector between 2008 and 2017

Source: *AEP White Paper: California Community-Wide GHG Baseline Inventory Protocol* (AEP, June 2011).
AEP = Association of Environmental Professionals
VMT = vehicle miles traveled

Adjusted Business-as-Usual Forecasts

The Adjusted BAU scenario also uses growth estimates for the County but accounts for legislation that will reduce emissions in the future regardless of County actions. The legislation is detailed in the IFT Report under the Adjusted Business-as-Usual Forecast section and summarized below in Table B-15.

Low Carbon Fuel Standard, Assembly Bill 1493, and Advanced Clean Cars

Changes in on-road emissions in Riverside County were modeled using EMFAC2017, which models both the emissions with and without the Low Carbon Fuel Standard and Pavley I. Additional modeling was conducted to estimate the change in emissions due to the State's Advanced Clean Cars Program, which includes additional components that will further reduce GHG emissions statewide, including more stringent fuel efficiency standards for model years 2017–2025 and support infrastructure for the commercialization of zero-emission vehicles. The emission factors with the reductions from on-road transportation measures in 2020, 2030, and 2050 were modeled from EMFAC2017.

Table B-15. Legislation Applied to Adjusted BAU Forecasts

Legislation	Description	Emissions Sector(s) Affected
Low Carbon Fuel Standard	Reduce carbon intensity of transportation fuels 10 percent by 2020 and maintain the target beyond 2020.	On-Road Transportation, Employee Commute, and Vehicle Fleet
AB 1493 and Advanced Clean Cars	Implement GHG standards for passenger vehicles, implement a zero-emission vehicle program, and support clean fuels outlet regulation.	On-Road Transportation
California Building Code Title 24	Improved energy efficiency standards for new residential and nonresidential construction.	Residential Energy and Nonresidential Energy
Renewable Portfolio Standard	Provide 33 percent, 60 percent, and 100 percent of electricity from renewable sources by 2020, 2030, and 2045, respectively.	Residential Energy, Nonresidential Energy, and Water Energy

Sources: California Air Resources Board Low Carbon Fuel Standard Webpage: https://www.arb.ca.gov/fuels/lcfs/lcfs.htm (accessed August 13, 2018).
California Air Resources Board Clean Car Standards (AB 1493) Webpage: https://www.arb.ca.gov/cc/ccms/ccms.htm (accessed August 13, 2018).
California Air Resources Board California Green Building Standards Code Webpage: https://www.arb.ca.gov/research/indoor/greenbuildings.htm (accessed August 13, 2018).
California Air Resources Board Renewable Portfolio Standard Webpage: https://www.arb.ca.gov/energy/rps/rps.htm (accessed August 13, 2018).
Assembly Bill
BAU = Business-as-Usual
GHG = greenhouse gas

California Building Code Title 24

Title 24 updates will raise the minimum energy-efficiency standards for new buildings, thereby decreasing the expected energy consumption of future development in Riverside County. Under the Adjusted BAU scenario, it was assumed that the 2016 Title 24 standards that went into effect in 2017 will make new residential and nonresidential buildings more efficient than they would be under the 2013 Title 24 standards for new residential and nonresidential buildings. The energy savings were estimated using analyses developed by the CEC and applied to the expected new development in Riverside County from 2017 to 2050. The rate of reductions was applied to the County's 2017 energy use (kWh or therms) per household (for residential energy) or per job (for commercial/industrial energy). Savings were then applied to new development anticipated in Riverside County. Detailed energy savings assumptions are provided below.

Residential

Residential electricity is estimated to be 13.3 percent lower under the new standards (CEC 2015). This percentage savings is relative to heating, cooling, lighting, and water heating only; it does not include other appliances, outdoor lighting that is not attached to buildings, plug loads, or other energy uses. Electricity consumption due to heating, cooling, lighting, and water heating accounts for 34 percent of total household electricity use (CEC 2009). Therefore, the percentage of total residential electricity that will be reduced as a result of the 2016 Title 24 standards is 4.5 percent.

Residential natural gas savings under the new standards are estimated to be 25.1 percent. Again, this percentage savings pertains only to the energy sources affected by Title 24 standards. Natural

gas consumption due to space and water heating accounts for 86 percent of total household natural gas use (CEC 2009). Therefore, the percentage of total residential natural gas that will be reduced as a result of the 2016 Title 24 standards is 21.6 percent.

Commercial

Commercial Electricity savings were estimated to be 4.6 percent lower under the new standards. Title 24-related measures would impact 77.2 percent of total electricity use in commercial buildings (CEC 2006a); therefore, a 3.6 percent reduction in electricity consumption may be expected in new commercial development.

Natural gas savings were estimated to be 0.5 percent under the new standards compared to the previous standards. Heating and cooling account for 69.7 percent of natural gas consumption in commercial facilities; therefore, a 0.35 percent reduction in natural gas consumption may be expected from the 2016 Title 24 standards applied to new commercial development.

Renewable Portfolio Standard

The Renewable Portfolio Standard (RPS) requires energy providers to derive 33 percent, 60 percent, and 100 percent of their electricity from qualified renewable sources by 2020, 2030, and 2045, respectively. The level of implementation varies by utility. As the largest electricity provider for the County, SCE's implementation of the RPS was assumed to represent the County. As reported in SCE's 2016 Corporate Responsibility and Sustainability Report, approximately 28 percent of the electricity SCE provided to customers in 2016 came from eligible renewable sources. Therefore, to achieve the RPS goals, the emission factors in 2020, 2030, and 2050 would decrease by 15.2 percent, 53.3 percent, and 72.0 percent, respectively. The reduction is taken for electricity used within Riverside County, as well as the delivery and treatment of water.

TARGET SETTING

The State-aligned targets are provided to assist the County in determining appropriate emission reduction goals. Recommended targets are based on existing California climate change legislation and State guidance relevant to establishing a GHG reduction target. While State goals are based on a 1990 baseline year, the County's baseline year is 2008. Therefore, the reduction targets are expressed as a percentage reduction below 2008 levels. Targets are recommended for 2020 and 2050 to align with AB 32 and for 2030 to align with EO B-30-15.

Table B-16 provides a summary of the State's goals and guidance to local governments regarding GHG reduction targets. This guidance applies to communitywide emissions reductions efforts.

Table B-17 demonstrates how the recommendations for local targets that do not have a 1990 emissions inventory were derived and how they align with State targets.

Table B-16. Summary of State Reduction Targets and Guidance on Local Government Targets Aligned with State Targets

	2020	2030	2050
State Targets (AB 32 and EO B-30-15)	1990 levels	40 percent below 1990 levels	80 percent below 1990 levels
State Guidance on Local Government Targets (AB 32 Scoping Plan)	15 percent below current levels	Demonstrate a trajectory toward statewide 2050 levels	N/A

Sources: AB 32 Scoping Plan Update (California Air Resources Board 2013); California's 2017 Climate Change Scoping Plan (CARB 2017); EO B-30-15 (Office of Governor Edmund G. Brown Jr. 2015)
AB = Assembly Bill
CARB = California Air Resources Board
EO = Executive Order
N/A = not available

Table B-17. Comparison of 1990 Baseline Targets vs. 2008 Baseline Targets

Target Year	Percent Below 1990 Emission Levels	Percent Below 2008 Emission Levels
2020	**0.0**	**15.0**
2021	4.0	18.4
2022	8.0	21.8
2023	12.0	25.2
2024	16.0	28.6
2025	20.0	32.0
2026	24.0	35.4
2027	28.0	38.8
2028	32.0	42.2
2029	36.0	45.6
2030	**40.0**	**49.0**
2031	42.0	50.7
2032	44.0	52.4
2033	46.0	54.1
2034	48.0	55.8
2035	50.0	57.5
2036	52.0	59.2
2037	54.0	60.9
2038	56.0	62.6
2039	58.0	64.3
2040	60.0	66.0
2041	62.0	67.7
2042	64.0	69.4
2043	66.0	71.1
2044	68.0	72.8
2045	70.0	74.5
2046	72.0	76.2
2047	74.0	77.9
2048	76.0	79.6
2049	78.0	81.3
2050	**80.0**	**83.0**

Source: Compiled by LSA (2018).

APPENDIX B

GHG INVENTORY AND FORECASTS CALCULATIONS

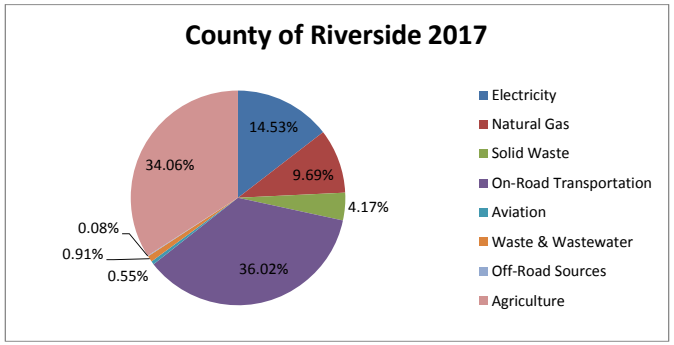
County of Riverside GHG Inventory

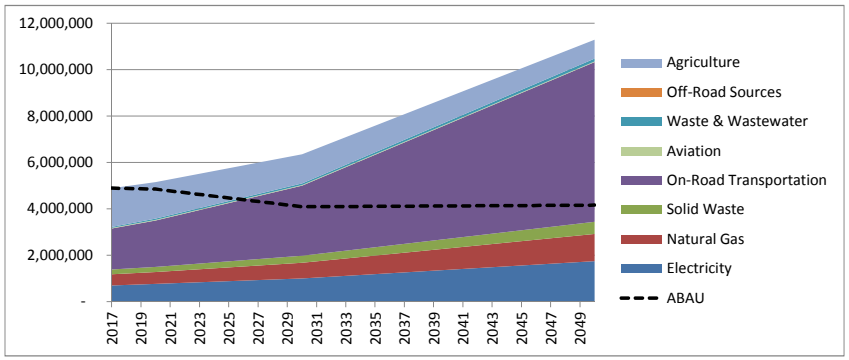
Breakdown of Emissions (BAU)

	2017	2020	2030	2050
Source	**MT CO2e**	**MT CO2e**	**MT CO2e**	**MT CO2e**
Electricity	712,928	774,289	1,017,153	1,756,843
Natural Gas	475,211	515,845	676,742	1,165,761
Solid Waste	204,365	223,448	298,585	533,154
On-Road Transportation	1,766,784	1,999,268	3,018,767	6,882,509
Aviation	26,786	26,786	26,786	26,786
Waste & Wastewater	44,606	48,771	65,171	116,370
Off-Road Sources	3,883	4,024	4,531	5,744
Agriculture	1,670,954	1,565,873	1,261,044	817,858
Total	4,905,518	5,158,305	6,368,781	11,305,026

Breakdown of Emissions (ABAU)

	2017	2020	2030	2050
Source	**MT CO2e**	**MT CO2e**	**MT CO2e**	**MT CO2e**
Electricity	712,928	653,541	466,971	480,289
Natural Gas	475,211	510,268	652,578	1,104,421
Solid Waste	204,365	223,448	298,585	533,154
On-Road Transportation	1,766,784	1,835,938	1,361,200	1,174,310
Aviation	26,786	26,786	26,786	26,786
Waste & Wastewater	44,606	41,377	30,413	32,584
Off-Road Sources	3,883	4,024	4,531	5,744
Agriculture	1,670,954	1,565,873	1,261,044	817,858
Total	4,905,518	4,861,256	4,102,109	4,175,146





Electricity

Emissions Coefficients

	CO2	CH4	N2O		
IID	2.39E-04	1.50E-08	1.81E-09	metric tons/kWh	*EPA 2016 Data - h29*
SCE	2.40E-04	0.00E+00	0.00E+00	metric tons/kWh	*SCE 2016 Data - https://www.edison.com/content/dam/eix/documents/investors/corporate_responsibility/2016-eix-corpo*
ANZA	2.39E-04	1.50E-08	1.81E-09	metric tons/kWh	*EPA 2016 Data - hhttps://www.epa.gov/sites/production/files/2018-02/documents/egrid2016_summarytables.pdf*

GWP (5th Assessment)

CH4	28
N2O	265

Inventory

			Metric Tons			
Utility Provider		Annual kWh	CO2	CH4	N2O	CO2e
IID	Residential	424,752,054	101,707.49	6.36	0.77	102,089.73
IID	Non-Residential	404,905,158	96,955.12	6.06	0.73	97,319.50
SCE	Residential	1,033,261,556	247,982.77	-	-	247,982.77
SCE	Non-Residential	1,047,076,494	251,298.36	-	-	251,298.36
ANZA	Residential	47,396,190.00	11,349.09	0.71	0.09	11,391.74
ANZA	Non-Residential	11,839,830.00	2,835.06	0.18	0.02	2,845.72
TOTAL	**Residential**	**1,505,409,800**	**361,039.34**	**7.07**	**0.86**	**361,464.24**
	Non-Residential	**1,463,821,482**	**351,088.54**	**6.24**	**0.76**	**351,463.58**
	All	**2,969,231,282**	**712,127.89**	**13.31**	**1.61**	**712,927.83**

Forecast

	Forecast Indicator	2017 (MT CO2e)	2017-2020 CAGR	2020 (MT CO2e)	2020-2035 CAGR	2030 (MT CO2e)	2050 (MT CO2e)
Residential	Households	361,464.24	0.025658333	390,007.97	0.025901645	503,652.21	839,934.20
Non-Residential	Service Population	351,463.58	0.030203381	384,281.29	0.029411995	513,501.23	916,908.44
Total		**712,927.83**		**774,289.26**		**1,017,153.43**	**1,756,842.64**

	CO2	CH4	N2O	
IID	527.9	0.033	0.004	lbs/MWh
SCE	529.11			lbs/MWh
ANZA	527.9	0.033	0.004	lbs/MWh

1 lb 0.0004535924 metric ton
1 MWh 1000 kWh

CO2e

SCE 0.24 MT CO2e/MWh
529.1093942 lbs CO2e/Mwh

	2008 kWh	2017 kWh	Growth Rate
SCE	2,593,455,382	2,080,338,050.00	0.80215
IID Residential	529,517,547	424,752,054.27	
IID Non-Residential	504,775,395	404,905,157.89	

Note: 2008 kWh data is from 2015 CAP inventory spreadsheet.

Electricity Reduction

	2010-2020 CAGR	2010	2017	2035
Households	0.025658333	171,380	204,635	324,021
Jobs	0.045048336	97,210	132,332	265,688

	2017 (kWh)	2017-2020 CAGR	2020 (kWh)	2020-2035 CAGR	2030 (kWh)	2050 (kWh)
Residential	1,505,409,800	0.025658333	1,624,287,408	0.025901645	2,097,587,750	3,498,119,640
Non-Residential	1,463,821,482	0.030203381	1,600,504,974	0.029411995	2,138,697,054	3,818,860,173

SCE	0.00024	MT CO2e/kWh

Title 24

kWh per household x 4.5% (residential savings from Title 24)	331.05	Impact Analysis, California Energy Commission
kWh per job x 3.6% (commercial savings from Title 24)	398.22	2016 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings
Primary Driver_Household_2017-2035 (units/yr)	6,633	
Primary Driver_Total Jobs_2017-2035 (jobs/yr)	7,409	

RPS

Renewable Portfolio Standards_2017-2020 (Change Carbon Intensity)	84.8%	28% renewable in 2016 based on SCE report, 33% goal by 2020
Renewable Portfolio Standards_2020-2030 (Change Carbon Intensity)	46.7%	Renewable energy 60% by 2030
Renewable Portfolio Standards_2030-2050 (Change Carbon Intensity)	28.0%	Renewable energy 100% by 2045

	2020	2030	2050
Title 24 Residential Reduction (kWh)	6,587,060	28,543,927	72,457,661
Title 24 Non-Residential Reduction (kWh)	8,850,863	38,353,741	97,359,495

	2020	2030	2050
BAU	774,289	1,017,153	1,756,843
ABAU	653,541	466,971	480,289

Natural Gas

Emissions Coefficients

	CO2	CH4	N2O		
SCG	53.06	0.001	0.0001	kg/MMBTU	*CO2 weighted national average- https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf*

GWP (5th Assessment)

CH4	28
N2O	265

Inventory

	Utility Provider	Land Use	Annual Therms	CO2	CH4	N2O	CO2e
				Metric Tons			
	SCG	Residential	48,850,607	259,201.32	4.89	0.49	259,467.55
	SCG	Non-residential	40,618,482	215,521.67	4.06	0.41	215,743.04
TOTAL			**89,469,088.72**	**474,722.98**	**8.95**	**0.89**	**475,210.59**

Forecast

	Forecast Indicator	2017 (MT CO2e)	2017-2020 CAGR	2020 (MT CO2e)	2020-2035 CAGR	2030 (MT CO2e)	2050 (MT CO2e)
Residential	Households	259,467.55	0.025658333	279,956.91	0.025901645	361,533.43	602,924.57
Non-Residential	Service Population	215,743.04	0.030203381	235,887.92	0.029411995	315,208.52	562,836.73
Total		**475,210.59**		**515,844.83**		**676,741.94**	**1,165,761.29**

1 lb	0.4535924	kg
1 therm	0.1	MMBTU
	10000	kg/MMBTU to MT/therm

Natural Gas Reduction

	2010-2020 CAGR	2010	2017	2035
Households	0.025658333	171,380	204,635	324,021
Jobs	0.045048336	97,210	132,332	265,688

	2017 (therms)	2017-2020 CAGR	2020 (therms)	2020-2035 CAGR	2030 (therms)	2050 (therms)
Residential	48,850,607	0.025658333	52,708,190	0.025901645	68,066,804	113,514,119
Non-Residential	40,618,482	0.030203381	44,411,210	0.029411995	59,345,097	105,966,681

	CO2	CH4	N2O	
SCG	53.06	0.001	0.0001	kg/MMBTU

Title 24

therm per household x 21.6% (residential savings from Title 24)	51.56	Impact Analysis, California Energy Commission
therm per job x 0.35% (commercial savings from Title 24)	1.07	2016 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings
Primary Driver_Household_2017-2035 (units/yr)	6,633	
Primary Driver_Total Jobs_2017-2035 (jobs/yr)	7,409	

	2020	2030	2050
Title 24 Residential Reduction (therms)	1,026,002	4,446,007	11,286,019
Title 24 Non-Residential Reduction (therms)	23,877	103,469	262,651

	2020	2030	2050
BAU	515,845	676,742	1,165,761
ABAU	510,268	652,578	1,104,421

Transportation

On-Road Transportation

Inventory

Vehicle Category	Fuel	VMT %	CO2 (g/mile)	CH4 (g/mile)	N2O (g/mile)	VMT (mile)	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)
All Other Buses	DSL	0.0268%	1136.310911	0.001	0.0015	1149102.184	1305.73735	0.001149102	0.001723653	1306.226293
LDA	GAS	54.6410%	335.1849048	0.0173	0.0036	2341343607	784783.034	40.50524441	8.428836986	788150.8227
LDA	DSL	0.3998%	242.8427106	0.0005	0.001	17130113.09	4159.923096	0.008565057	0.017130113	4164.702397
LDA	ELEC	0.2242%	0	0	0	9606438.542	0	0	0	0
LDT1	GAS	5.4589%	397.1838452	0.0163	0.0066	233912061.2	92906.09193	3.812766598	1.543819604	93421.96159
LDT1	DSL	0.0028%	450.7642356	0.001	0.0015	118468.9705	53.40157492	0.000118469	0.000177703	53.45198347
LDT1	ELEC	0.0025%	0	0	0	107635.9053	0	0	0	0
LDT2	GAS	17.9605%	437.7843688	0.0163	0.0066	769597904.6	336917.9329	12.54444584	5.07934617	338615.2041
LDT2	DSL	0.0573%	335.1468908	0.001	0.0015	2454135.929	822.496026	0.002454136	0.003681204	823.5402608
LDT2	ELEC	0.0215%	0	0	0	919916.9092	0	0	0	0
LHD1	GAS	1.5298%	914.7238407	0.0333	0.0134	65549815.77	59959.97924	2.182808865	0.878367531	60253.86528
LHD1	DSL	1.4508%	562.2074067	0.0051	0.0048	62166943.31	34950.71598	0.317051411	0.298401328	35038.66977
LHD2	GAS	0.2306%	1047.891406	0.0333	0.0134	9879189.314	10352.31758	0.328977004	0.132381137	10396.60994
LHD2	DSL	0.5467%	613.0286826	0.0051	0.0048	23426792.33	14361.29564	0.119476641	0.112448603	14394.43987
MCY	GAS	0.5452%	246.5148793	0.0173	0.0036	23362638.83	5759.238092	0.404173652	0.0841055	5792.842911
MDV	GAS	16.1063%	528.4366685	0.0333	0.0134	690148155.7	364699.5921	22.98193358	9.247985286	367793.8024
MDV	DSL	0.2423%	441.921389	0.0051	0.0048	10384478.57	4589.123194	0.052960841	0.049845497	4603.815154
MDV	ELEC	0.0027%	0	0	0	115999.8889	0	0	0	0
MH	GAS	0.1273%	1897.189821	0.0163	0.0066	5453507.054	10346.33807	0.088892165	0.035993147	10358.36523
MH	DSL	0.0490%	1053.95778	0.001	0.0015	2098762.596	2212.007167	0.002098763	0.003148144	2212.90019
Motor Coach	DSL	0.0148%	1797.702614	0.001	0.0015	633211.1006	1138.325251	0.000633211	0.000949817	1138.594682
OBUS	GAS	0.0615%	1926.348783	0.0163	0.0066	2637056.57	5079.890714	0.042984022	0.017404573	5085.706479
PTO	DSL	0.0706%	2337.179307	0.001	0.0015	3024593.133	7069.016481	0.003024593	0.00453689	7070.303446
SBUS	GAS	0.0351%	1073.061844	0.0163	0.0066	1505788.761	1615.804465	0.024544357	0.009938206	1619.125331
SBUS	DSL	0.0658%	1537.071186	0.001	0.0015	2819337.329	4333.522173	0.002819337	0.004229006	4334.721802
UBUS	GAS	0.0445%	1632.671346	0.0163	0.0066	1906112.486	3112.055239	0.031069634	0.012580342	3116.25898
UBUS	DSL	0.0001%	1314.437251	0.001	0.0015	6361.092159	8.361256491	6.36109E-06	9.54164E-06	8.363963136
UBUS	ELEC	0.0005%	0	0	0	23011.83773	0	0	0	0
UBUS	NG	0.0811%	1921.904328	1.966	0.175	3474317.694	6677.306211	6.830508586	0.608005596	7029.681934
Total						4284955458	**1757213.506**	**90.28870664**	**26.57504558**	**1766783.977**

Forecast

	2017 (MT CO2e)	2017-2060 CAGR	2020 (MT CO2e)	2030 (MT CO2e)	2050 (MT CO2e)	2017 VMT	2060 VMT
Total	1,766,783.98	0.0420675	1,999,268.06	3,018,767.14	6,882,508.97	4,284,955,457.91	25,203,928,089.77

2030 VMT
7321371995

Aviation

CO2	8.31 kg/gallon	*EPA Emission Factors for Greenhouse Gas Inventories - https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf*
CH4	0.36 g/gallon	
N2O	0.07 g/gallon	

		Metric Tons			
	Annual Gallons	CO2	CH4	N2O	CO2e
Jet Fuel	2,781,219	23,111.93	1.00	0.19	23,191.56
Aviation Fuel	431,069	3,582.18	0.16	0.03	3,594.52
Total	**3,212,288**	**26,694.11**	**1.16**	**0.22**	**26,786.08**

Emission Coefficients

	GWP (5th Assessment)
CH4	28
N2O	265

CH4	g/mile	
Passenger Car	Gasoline	0.0173
Passenger Car	Diesel	0.0005
Light-Duty Truck	Gasoline	0.0163
Light-Duty Truck	Diesel	0.001
Heavy-Duty Truck	Gasoline	0.0333
Heavy-Duty Truck	Diesel	0.0051
Buses	CNG	1.966

N2O	g/mile	
Passenger Car	Gasoline	0.0036
Passenger Car	Diesel	0.001
Light-Duty Truck	Gasoline	0.0066
Light-Duty Truck	Diesel	0.0015
Heavy-Duty Truck	Gasoline	0.0134
Heavy-Duty Truck	Diesel	0.0048
Buses	CNG	0.175

EPA Emission Factors for Greenhouse Gas Inventories - https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Transportation Reduction

2020 ABAU

Vehicle Category	Fuel	VMT %	CO2 (g/mile)	CH4 (g/mile)	N2O (g/mile)	VMT (mile)	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)
All Other Buses	DSL	0.0302%	1085.676537	0.001	0.0015	1462807.405	1588.13568	0.001462807	0.002194211	1588.7581
LDA	GAS	55.5738%	312.2848118	0.0173	0.0036	2694658441	841500.904	46.61759103	9.700770388	845376.901
LDA	DSL	0.5031%	225.5701497	0.0005	0.001	24396689.26	5503.16485	0.012198345	0.024396689	5509.97152
LDA	ELEC	0.5838%	0	0	0	28309357.98	0	0	0	0
LDT1	GAS	5.6057%	368.5351479	0.0163	0.0066	271807788.2	100170.723	4.430466947	1.793931402	100770.168
LDT1	DSL	0.0019%	442.4649996	0.001	0.0015	93714.20537	41.4652558	9.37142E-05	0.000140571	41.5051312
LDT1	ELEC	0.0129%	0	0	0	626172.0581	0	0	0	0
LDT2	GAS	18.0063%	398.3884857	0.0163	0.0066	873090642.6	347829.259	14.23137747	5.762398241	349754.773
LDT2	DSL	0.0981%	304.7201361	0.001	0.0015	4754687.687	1448.84908	0.004754688	0.007132032	1450.8722
LDT2	ELEC	0.0741%	0	0	0	3592374.749	0	0	0	0
LHD1	GAS	1.3435%	895.1683233	0.0333	0.0134	65141484.63	58312.5936	2.169211438	0.872895894	58604.6489
LHD1	DSL	1.3332%	545.8221175	0.0051	0.0048	64644015.82	35284.1336	0.329684481	0.310291276	35375.592
LHD2	GAS	0.2093%	1025.787333	0.0333	0.0134	10150776.32	10412.5378	0.338020851	0.136020403	10458.0478
LHD2	DSL	0.5108%	595.5254904	0.0051	0.0048	24766733.21	14749.2209	0.126310339	0.118880319	14784.2609
MCY	GAS	0.5096%	246.9361868	0.0173	0.0036	24707143.75	6101.08786	0.427433587	0.088945718	6136.62662
MDV	GAS	14.7566%	493.01707	0.0333	0.0134	715515954.2	352761.579	23.82668127	9.587913786	355969.523
MDV	DSL	0.3041%	411.3825709	0.0051	0.0048	14744289.84	6065.54386	0.075195878	0.070772591	6086.40408
MDV	ELEC	0.0261%	0	0	0	1266064.937	0	0	0	0
MH	GAS	0.1016%	1870.732594	0.0163	0.0066	4924879.639	9213.13286	0.080275538	0.032504206	9223.99419
MH	DSL	0.0420%	1044.886575	0.001	0.0015	2037612.914	2129.07438	0.002037613	0.003056419	2129.94138
Motor Coach	DSL	0.0153%	1721.823799	0.001	0.0015	741842.3504	1277.32181	0.000741842	0.001112764	1277.63747
OBUS	GAS	0.0531%	1888.093453	0.0163	0.0066	2574765.21	4861.39734	0.041968673	0.01699345	4867.07573
PTO	DSL	0.0790%	2278.313122	0.001	0.0015	3828160.056	8721.74729	0.00382816	0.00574224	8723.37617
SBUS	GAS	0.0357%	1065.419723	0.0163	0.0066	1731751.702	1845.04242	0.028227553	0.011429561	1848.86162
SBUS	DSL	0.0669%	1506.648397	0.001	0.0015	3241955.247	4884.48668	0.003241955	0.004862933	4885.86613
UBUS	GAS	0.0435%	1536.934409	0.0163	0.0066	2108996.262	3241.38892	0.034376639	0.013919375	3246.0401
UBUS	DSL	0.0001%	1257.891569	0.001	0.0015	5398.664839	6.79093499	5.39866E-06	8.098E-06	6.79323212
UBUS	ELEC	0.0005%	0	0	0	25027.38542	0	0	0	0
UBUS	NG	0.0793%	1931.862443	1.966	0.175	3846192.188	7430.31424	7.561613841	0.673083633	7820.40659
Total						4,848,795,719.53	**1825379.9**	**100.3468001**	**29.2393962**	**1835938.05**

2030 ABAU

Vehicle Category	Fuel	VMT %	CO2 (g/mile)	CH4 (g/mile)	N2O (g/mile)	VMT (mile)	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)
All Other Buses	DSL	0.0369%	893.3998319	0.001	0.0015	1791263.858	1600.31483	0.001791264	0.002686896	1601.07701
LDA	GAS	55.4282%	244.3691056	0.0173	0.0036	2687601174	656766.695	46.49550031	9.675364227	660632.541
LDA	DSL	0.6556%	179.8926099	0.0005	0.001	31787992.69	5718.42497	0.015893996	0.031787993	5727.29382
LDA	ELEC	2.6151%	0	0	0	126801262.6	0	0	0	0
LDT1	GAS	5.8392%	289.4321659	0.0163	0.0066	283128613.6	81946.5279	4.614996401	1.86864885	82570.9397
LDT1	DSL	0.0007%	343.7193606	0.001	0.0015	35272.2483	12.1237546	3.52722E-05	5.29084E-05	12.138763
LDT1	ELEC	0.1517%	0	0	0	7356529.039	0	0	0	0
LDT2	GAS	18.0764%	292.2394867	0.0163	0.0066	876488991.3	256144.693	14.28677056	5.784827343	258077.702
LDT2	DSL	0.1679%	240.0300016	0.001	0.0015	8142435.141	1954.42872	0.008142435	0.012213653	1957.89333
LDT2	ELEC	0.3994%	0	0	0	19364474.72	0	0	0	0
LHD1	GAS	1.0696%	783.2496262	0.0333	0.0134	51864757.51	40623.0519	1.727096425	0.694987751	40855.5824
LHD1	DSL	1.1204%	471.3010344	0.0051	0.0048	54326999.28	25604.371	0.277067696	0.260769597	25681.2328
LHD2	GAS	0.1695%	902.9127779	0.0333	0.0134	8219338.033	7421.34534	0.273703956	0.11013913	7458.19592
LHD2	DSL	0.4411%	517.0721919	0.0051	0.0048	21389130.34	11059.7245	0.109084565	0.102667826	11089.9858
MCY	GAS	0.4527%	248.5075292	0.0173	0.0036	21951481.81	5455.10851	0.379760635	0.079025335	5486.68352
MDV	GAS	12.2269%	364.2269632	0.0333	0.0134	592857401.6	215934.651	19.74215147	7.944289181	218592.668
MDV	DSL	0.3990%	321.033346	0.0051	0.0048	19345476.28	6210.54298	0.098661929	0.092858286	6237.91296
MDV	ELEC	0.2858%	0	0	0	13856714.84	0	0	0	0
MH	GAS	0.0613%	1630.55243	0.0163	0.0066	2973536.096	4848.50651	0.048468638	0.019625338	4855.06434
MH	DSL	0.0298%	950.9374066	0.001	0.0015	1446243.413	1375.28696	0.001446243	0.002169365	1375.90234
Motor Coach	DSL	0.0156%	1437.906085	0.001	0.0015	756116.4465	1087.22444	0.000756116	0.001134175	1087.54617
OBUS	GAS	0.0411%	1603.539026	0.0163	0.0066	1994504.627	3198.26601	0.032510425	0.013163731	3202.66469
PTO	DSL	0.0933%	1938.320407	0.001	0.0015	4525344.437	8771.56747	0.004525344	0.006788017	8773.49301
SBUS	GAS	0.0382%	999.7292236	0.0163	0.0066	1853761.28	1853.25932	0.030216309	0.012234824	1857.34761
SBUS	DSL	0.0701%	1324.587338	0.001	0.0015	3396797.595	4499.35508	0.003396798	0.005095196	4500.80042
UBUS	GAS	0.0403%	1367.24777	0.0163	0.0066	1952024.188	2668.90072	0.031817994	0.01288336	2673.20571
UBUS	NG	0.0740%	1920.425423	0.001	0.0015	3588082.494	6890.64484	0.003588082	0.005382124	6892.17157
Total						7,321,371,994.74	**1351645.01**	**88.18738287**	**26.7387951**	**1361200.04**

2050 ABAU

Vehicle Category	Fuel	VMT %	CO2 (g/mile)	CH4 (g/mile)	N2O (g/mile)	VMT (mile)	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)
All Other Buses	DSL	0.0412%	822.3565464	0.001	0.0015	1999744.306	1644.50282	0.001999744	0.002999616	1645.35371
LDA	GAS	54.6425%	219.0783546	0.0173	0.0036	2649501859	580448.508	45.83638216	9.538206692	584259.551
LDA	DSL	0.6816%	163.7588653	0.0005	0.001	33048923.29	5412.05418	0.016524462	0.033048923	5421.27483
LDA	ELEC	3.4540%	0	0	0	167477615.5	0	0	0	0
LDT1	GAS	6.0597%	252.1884794	0.0163	0.0066	293821534.9	74098.4061	4.789291018	1.93922213	74746.4001
LDT1	DSL	0.0008%	310.0937713	0.001	0.0015	40989.20048	12.7104958	4.09892E-05	6.14838E-05	12.7279367
LDT1	ELEC	0.2283%	0	0	0	11067894.41	0	0	0	0
LDT2	GAS	18.1324%	249.3901861	0.0163	0.0066	879203742	219264.785	14.33102099	5.802744697	221203.781
LDT2	DSL	0.1882%	217.214917	0.001	0.0015	9124804.955	1982.04375	0.009124805	0.013687207	1985.92636
LDT2	ELEC	0.5534%	0	0	0	26830836.57	0	0	0	0
LHD1	GAS	1.0244%	699.9014162	0.0333	0.0134	49669239.45	34763.571	1.653985674	0.665567809	34986.2581
LHD1	DSL	1.0574%	412.1765481	0.0051	0.0048	51270958.94	21132.6869	0.261481891	0.246100603	21205.225
LHD2	GAS	0.1591%	802.7750214	0.0333	0.0134	7715293.613	6193.645	0.256919277	0.103384934	6228.23574
LHD2	DSL	0.4193%	454.2069155	0.0051	0.0048	20329564.51	9233.82879	0.103680779	0.09758191	9262.59106
MCY	GAS	0.4360%	250.9743194	0.0173	0.0036	21140542.96	5305.73338	0.365731393	0.076105955	5336.14194
MDV	GAS	11.6436%	301.3800882	0.0333	0.0134	564576484.6	170152.111	18.80039694	7.565324894	172683.333
MDV	DSL	0.4244%	281.7292936	0.0051	0.0048	20578052.49	5797.44019	0.104948068	0.098774652	5826.55402
MDV	ELEC	0.4169%	0	0	0	20215676.62	0	0	0	0
MH	GAS	0.0499%	1415.362346	0.0163	0.0066	2420444.807	3425.80644	0.03945325	0.015974936	3431.14449
MH	DSL	0.0223%	817.4728382	0.001	0.0015	1082707.934	885.084328	0.001082708	0.001624062	885.54502
Motor Coach	DSL	0.0161%	1270.690317	0.001	0.0015	781105.882	992.543681	0.000781106	0.001171659	992.876041
OBUS	GAS	0.0388%	1438.519807	0.0163	0.0066	1883156.324	2708.95767	0.030695448	0.012428832	2713.11078
PTO	DSL	0.1027%	1625.315816	0.001	0.0015	4980309.455	8094.57573	0.004980309	0.007470464	8096.69485
SBUS	GAS	0.0305%	824.2936259	0.0163	0.0066	1480454.432	1220.32915	0.024131407	0.009770999	1223.59415
SBUS	DSL	0.0697%	1041.52683	0.001	0.0015	3380725.691	3521.11651	0.003380726	0.005071089	3522.55501
UBUS	GAS	0.0376%	1211.29407	0.0163	0.0066	1822696.72	2207.82173	0.029709957	0.012029798	2211.8415
UBUS	NG	0.0691%	1918.54007	0.001	0.0015	3350361.249	6427.8023	0.003350361	0.005025542	6429.22788
Total						16,692,048,802.44	**1164926.06**	**86.66909346**	**26.25337889**	**1174309.94**

2017 VMT	2060 VMT	2017-2060 CAGR	2020 VMT	2030 VMT	2050 VMT
4,284,955,457.91	25,203,928,089.77	0.0420675	4,848,795,719.53	7,321,371,994.74	16,692,048,802.44

Solid Waste

Inventory

Landfill Name	Tons Waste/Year	Methane Recovery System	CH4 Emissions Coefficient (metric tons CH4/ton waste)	Total CH4 Emissions (metric tons)	Total CO2e (metric tons)	Sources
Badlands Landfill	77,845.00	Yes	0.0135	1,050.91	29,425.41	http://www.rcwaste.org/disposal/hours
Blythe	6,283.47	No	0.054	339.31	9,500.61	https://www.epa.gov/lmop/landfill-gas-energy-project-data
Desert Center	32.11	No	0.054	1.73	48.55	
Lamb Canyon	92,731.44	Yes	0.0135	1,251.87	35,052.48	
Mecca II	3.60	No	0.054	0.19	5.44	
Oasis	1,092.00	No	0.054	58.97	1,651.10	
El Sobrante	168,791.00	Yes	0.0135	2,278.68	63,803.00	
Transfer Stations	42,909.21	No	0.054	2,317.10	64,878.73	
TOTAL	**389,687.83**			**7,298.76**	**204,365.32**	

Forecast

	Forecast Indicator	2017 (MT CO2e)	2017-2020 CAGR	2020 (MT CO2e)	2020-2035 CAGR	2030 (MT CO2e)	2050 (MT CO2e)
Total	Service population	204,365.32	0.03020338	223,447.82	0.02941199	298,585.26	533,154.21

Emission Coefficients

ICLEI 2012 - U.S. Community Protocol

Methane Recovery Systems	metric tons CH4/ton waste
No	0.054
Yes	0.0135

*MT CH4/ton = Emission Factor for Mixed Municipal Solid Waste * (1-Collection Efficiency) * (1-Oxidation Rate)*
Assumes 75% recovery rate and 100% mixed municipal solid waste
U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, October 2012, Appendix E

GWP (5th Assessment)

CH4	28
N2O	265

Water & Wastewater

Emissions Coefficients

	CO2	CH4	N2O	
State-wide	2.39E-04	1.50E-08	1.81E-09	metric tons/kWh

	GWP (5th Assessment)
CH4	28
N2O	265

Inventory

Water District	Annual Water Usage (million gallons)	Imported Water Percentage	Imported Water Volume (million gallons)	Indoor Water Use Intensity Factor (kWh/MG)	Outdoor Water Use Intensity Factor (kWh/MG)	Indoor Water Energy (kWh)	Outdoor Water Energy (kWh)	Total Energy (kWh)	Metric Tons CO2	CH4	N2O	CO2e	Sources
Fern Valley Water District	38.12	0%	-	13,022	11,111	-	-	-	-	-	-	-	
High Valleys Water District	24.45	100%	24.45	13,022	11,111	159,193.95	135,831.98	295,025.93	70.64	0.00	0.00	70.91	
Rancho California Water District	8,233.13	40%	3,293.25	13,022	11,111	21,442,363.77	18,295,661.49	39,738,025.26	9,515.33	0.59	0.07	9,551.09	
Temescal Valley Water District	938.78	74%	694.70	13,022	11,111	4,523,173.47	3,859,390.29	8,382,563.76	2,007.22	0.13	0.02	2,014.76	
Cabazon County Water District	148.34	0%	-	13,022	11,111	-	-	-	-	-	-	-	
Chiriaco Summit Water District	9.31	100%	9.31	13,022	11,111	60,617.41	51,721.71	112,339.12	26.90	0.00	0.00	27.00	
Coachella Valley Water District		0%	-	13,022	11,111	-	-	-	-	-	-	-	
Home Gardens County Water District	120.89	57%	68.91	13,022	11,111	448,655.43	382,814.51	831,469.94	199.10	0.01	0.00	199.84	
Idyllwild Water District	86.68	0%	-	13,022	11,111	-	-	-	-	-	-	-	https://www.idyllwildwater.com/solar
Mission Springs Water District		0%	-	13,022	11,111	-	-	-	-	-	-	-	
Pine Cove Water District	29.14	0%	-	13,022	11,111	-	-	-	-	-	-	-	https://www.idyllwildwater.com/solar
Pinyon Pines County Water District	5.76	0%	-	13,022	11,111	-	-	-	-	-	-	-	
Yucaipa Valley Water District	88.31	48%	42.39	13,022	11,111	275,987.23	235,485.65	511,472.87	122.47	0.01	0.00	122.93	http://documents.yvwd.dst.ca.us/programs/uwmp/sbv_ruwmp.pdf
Beaumont-Cherry Valley Water District	3,190.73	59%	1,882.53	13,022	11,111	12,257,157.39	10,458,399.30	22,715,556.69	5,439.27	0.34	0.04	5,459.71	https://bcvwd.org/wp-content/uploads/2017/09/January-2017-Urban-Water-Management-Plan-Final.pdf
Palo Verde Irrigation District		0%	-	13,022	11,111	-	-	-	-	-	-	-	
Eastern Municipal Water District	4,081.28	54%	2,203.89	13,022	11,111	14,349,535.60	12,243,717.56	26,593,253.16	6,367.79	0.40	0.05	6,391.72	
Elsinore Valley Municipal Water District	1,022.98	68%	695.63	13,022	11,111	4,529,223.49	3,864,552.47	8,393,775.96	2,009.90	0.13	0.02	2,017.46	
Lake Hemet Municipal Water District	4,056.52	70%	2,839.56	13,022	11,111	18,488,401.20	15,775,197.80	34,263,599.01	8,204.47	0.51	0.06	8,235.30	
Western Municipal Water District	5,295.52	68%	3,600.95	13,022	11,111	23,445,808.89	20,005,097.72	43,450,906.61	10,404.38	0.65	0.08	10,443.48	
Desert Water Agency	92.09	27%	24.86	13,022	11,111	161,891.46	138,133.62	300,025.08	71.84	0.00	0.00	72.11	
TOTAL			**27,462.03**					185,588,013.38	**44,439.31**	**2.78**	**0.34**	**44,606.33**	

Forecast

	Forecast Indicator	2017 (MT CO2e)	2017-2020 CAGR	2020 (MT CO2e)	2020-2035 CAGR	2030 (MT CO2e)	2050 (MT CO2e)
Total	Service population	44,606.33	0.03020338	48,771.42	0.02941199	65,171.49	116,370.30

AF	325,851	Gallon
AF	435	CCF
CCF	748	Gallon

Table ES-1. Recommended revised water-energy proxies

	Indoor Uses		Outdoor Uses	
	Northern California kWh/MG	Southern California kWh/MG	Northern California kWh/MG	Southern California kWh/MG
Water Supply and Conveyance	2,117	9,727	2,117	9,727
Water Treatment	111	111	111	111
Water Distribution	1,272	1,272	1,272	1,272
Wastewater Treatment	1,911	1,911	0	0
Regional Total	5,411	13,022	3,500	11,111

General Southern California energy intensity can be used if there is no available information from water district
CEC, Refining Estimates of Water-related Energy Use in California, December 2006

Water & Wastewater Reduction

	2017 (kWh)	2017-2020 CAGR	2020 (kWh)	2020-2035 CAGR	2030 (kWh)	2050 (kWh)
Residential	185,588,013	0.030203381	202,917,188	0.029411995	271,150,917	484,167,422

	CO2	CH4	N2O	
State-wide	2.39E-04	1.50E-08	1.81E-09	metric tons/kWh

RPS

Renewable Portfolio Standards_2017-2020 (Change Carbon Intensity)	84.8%	28% renewable in 2016 based on SCE report, 33% goal by 2020
Renewable Portfolio Standards_2020-2030 (Change Carbon Intensity)	46.7%	Renewable energy 60% by 2030
Renewable Portfolio Standards_2030-2050 (Change Carbon Intensity)	28.0%	Renewable energy 100% by 2045

	2020	2030	2050
BAU	48,771	65,171	116,370
ABAU	41,377	30,413	32,584

Off-Road

Inventory

	CO_2	CH_4	N_2O	MT CO_2e
Agricultural Equipment	1,219	0.0147	0.1102	1,248.88
Construction and Mining Equipment	2,190	0.0116	0.1866	2,240
Industrial Equipment	25	0.0013	0.0085	28
Lawn and Garden Equipment	124	0.0797	0.1817	175
Light Commercial Equipment	59	0.0094	0.0154	63
Recreational Equipment	59	0.0898	0.2543	129
	3,677	***0.2066***	***0.7567***	***3,883***

	GWP (5th Assessment)
CH4	28
N2O	265

Forecast

	2017 (MT CO2e)	2017-2035 CAGR	2020 (MT CO2e)	2030 (MT CO2e)	2050 (MT CO2e)
Total	3,883.50	0.011934	4,024.20	4,531.06	5,744.36

Class	Values	2017	2035
Agricultural Equipment	Sum of Annual_MT_CO2 Exhaust	1579.970	1444.740194
	Sum of Annual_MT_CH4 Exhaust	0.019	0.057473649
	Sum of Annual_MT_N2O Exhaust	0.143	0.019883643
Construction and Mining Equipment	Sum of Annual_MT_CO2 Exhaust	7438.485	9319.949865
	Sum of Annual_MT_CH4 Exhaust	0.040	0.39051232
	Sum of Annual_MT_N2O Exhaust	0.634	0.042840813
Industrial Equipment	Sum of Annual_MT_CO2 Exhaust	727.996	922.6096656
	Sum of Annual_MT_CH4 Exhaust	0.037	0.342661552
	Sum of Annual_MT_N2O Exhaust	0.245	0.040977154
Lawn and Garden Equipment	Sum of Annual_MT_CO2 Exhaust	789.819	1878.01504681
	Sum of Annual_MT_CH4 Exhaust	0.506	2.70208787
	Sum of Annual_MT_N2O Exhaust	1.154	1.19115217
Light Commercial Equipment	Sum of Annual_MT_CO2 Exhaust	502.421	561.35075861
	Sum of Annual_MT_CH4 Exhaust	0.080	0.11382673
	Sum of Annual_MT_N2O Exhaust	0.131	0.08487068
Recreational Equipment	Sum of Annual_MT_CO2 Exhaust	435.736	658.25561230
	Sum of Annual_MT_CH4 Exhaust	0.659	3.42918678
	Sum of Annual_MT_N2O Exhaust	1.865	1.09256148

For Projections	2017 MT	2035 MT
Sum of Annual_MT_CO2 Exhaust	1579.970313	1444.740194
Sum of Annual_MT_CH4 Exhaust	0.019096789	0.057473649
Sum of Annual_MT_N2O Exhaust	0.142820075	0.019883643
Sum of Annual_MT_CO2 Exhaust	7438.484758	9319.949865
Sum of Annual_MT_CH4 Exhaust	0.039509247	0.39051232
Sum of Annual_MT_N2O Exhaust	0.633786559	0.042840813
Sum of Annual_MT_CO2 Exhaust	727.9961887	922.6096656
Sum of Annual_MT_CH4 Exhaust	0.036877734	0.342661552
Sum of Annual_MT_N2O Exhaust	0.244674703	0.040977154
Sum of Annual_MT_CO2 Exhaust	789.8193644	1878.015047
Sum of Annual_MT_CH4 Exhaust	0.506337835	2.702087873
Sum of Annual_MT_N2O Exhaust	1.153857547	1.191152172
Sum of Annual_MT_CO2 Exhaust	502.4208143	561.3507586
Sum of Annual_MT_CH4 Exhaust	0.080141009	0.113826727
Sum of Annual_MT_N2O Exhaust	0.131122241	0.084870677
Sum of Annual_MT_CO2 Exhaust	435.7356939	658.2556123
Sum of Annual_MT_CH4 Exhaust	0.658586568	3.429186777
Sum of Annual_MT_N2O Exhaust	1.865233757	1.092561476
Total MT CO2e	12613.38701	15615.97064
CAGR_Offroad_2017-2035	0.011933725	

	Unincorporated County	County	Sources:
BuildingPermits	1512	5,136	US Census Bureau https://www2.census.gov/econ/bps/
Population	364,413	2,347,828	SCAG 2017 Local Profile
Portion Population weighted by Inco	13.63%		
Households	112,292	713,205	SCAG 2017 Local Profile
Portion Households	15.74%		
Jobs_Total	81,754	709,940	SCAG 2017 Local Profile (2015 Number of Jobs)
Portion Other Jobs	11.73%		
Jobs_Agriculture	8,257	10,700	SCAG 2017 Local Profile (2015 Jobs in Agriculture 10.1%)
Portion Ag jobs	77.17%		
Jobs_Manufacturing	3,613	103,633	SCAG 2017 Local Profile (2015 Jobs in Manufacturing)
Portion Manufacturing Jobs	3.49%		
Median_Income	50,394	57,367	SCAG 2017 Local Profile
Portion Building Permits	29.44%		
Other Jobs	69,884	595,607	

		Unincorporated County
Offroad_Agriculture_2017	CO2	1219.25777486
	CH4	0.01473693
	N2O	0.11021377
Offroad_Construction_2017	CO2	2189.83429802
	CH4	0.01163123
	N2O	0.18658202
Offroad_Industrial_2017	CO2	25.38043123
	CH4	0.00128568
	N2O	0.00853020
Offroad_Lawn&Garden_2017	CO2	124.35470316
	CH4	0.07972138
	N2O	0.18167143
Offroad_Commercial_2017	CO2	58.95011109
	CH4	0.00940312
	N2O	0.01538485
Offroad_Recreation_2017	CO2	59.41107541
	CH4	0.08979603
	N2O	0.25431826

Agriculture

Annual Crop Growth

	Acres Harvested	Annual Yield (tons)
Hay (including Alfalfa)	45,353	306,199
Corn	740	19,936
Oats	833	2,318
Sorghum	130	1,943
Wheat	18,394	91,937
Cotton	7,291	9,041
Vegetable Crops & Fruit Trees	78,688	1,005,572

Annual Animal head

	#
Dairy Cow	21,900
Poultry	1,893,394
Sheep	8,300

	GWP (5th Assessment)
CH4	28
N2O	265

Inventory

	CO_2	CH_4	N_2O	MT CO_2e
Enteric Fermentation	-	2,769	-	77,539
Manure Management	-	3,886	99	135,152
Rice Cultivation	-	-	-	-
Agriculture ResidueBurning	-	8	0	289
Annimals and Runoff	-	-	713	188,951
Fertilizer Use	-	-	794	210,428
Crop Growth	-	-	3,995	1,058,594
	-	***6,664***	***5,601***	***1,670,954***

Forecast

	Forecast Indicator	2008 (MT CO2e)	2017 (MT CO2e)	2008-2017 CAGR	2020 (MT CO2e)	2030 (MT CO2e)	2050 (MT CO2e)
Total	2008-2017 Growth	2,030,430.81	1,670,954.14	-0.02141767	1,565,873.39	1,261,044.33	817,857.74

Sources:

EPA. 2015. State Inventory Tool - Methane and Nitrous Oxide Emissions from Agricultural Model. Website: https://www.epa.gov/statelocalenergy/download-state-inventory-and-projection-tool (accessed August 20, 2018)

State of California Department of Conservation. 2016. Important Farmland GIS Data for Riverside County. Website: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/ (accessed August 20, 2018)

Riverside County Agricultural Comissioner's Office. 2017. Riverside County Agricultural Production Report. Website: http://www.rivcoawm.org/Resources/Publications.aspx (accessed August 20, 2018).

California Department of Food and Agriculture. California Agricultural Statistics Review 2016-2017. Website: https://www.cdfa.ca.gov/statistics/

APPENDIX C

REDUCTION MEASURES, ASSUMPTIONS, AND ATTRIBUTED REDUCTIONS

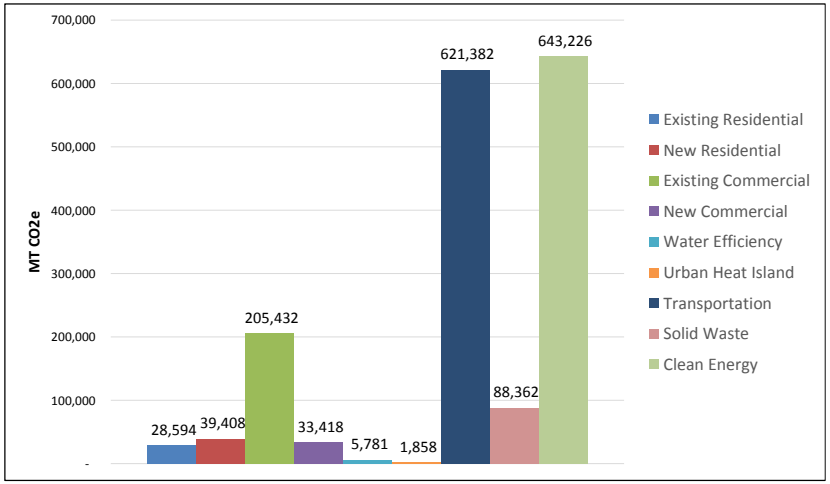
County of Riverside Community Reduction Measures

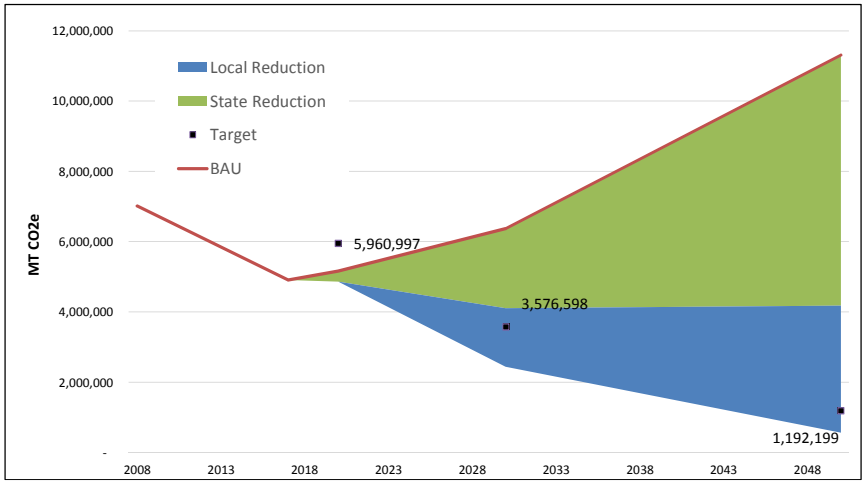
Goal	Measure	Action	Level of Participation	2030 GHG Reductions Achieved (MT CO2e)		2050 GHG Reductions Achieved (MT CO2e)		GHG Reduction Potential
				No Enhancing	With Enhancing	No Enhancing	With Enhancing	
Goal 1.	**Increase Energy Efficiency in Existing Residential**							
	Measure 1.1	**Energy Efficiency Training, Education, and Recognition in the Residential Sector**		The actions taken by the County can increase participation levels of other measures.				Supporting Measure
		Actions Post energy efficiency information links on website and/or social media and provide materials at public events	High					
		Set up email list for email blasts of new information or trainings	Medium					
		~~Establish an annual energy efficiency fair~~	Not Selected					
		Encourage Homeowners to use the SCE Energy Education Centers for energy efficiency resources	Medium					
		Designate an energy advocate to promote and manage energy efficiency programs	High					
		Invite building inspectors to hold trainings semi-annually on energy efficiency and Title 24 requirements	High					
	Measure 1.2	**Increase Community Participation in Existing Energy Efficiency Programs**		16,844.9	16,845	28,091	28,091	Low
		Actions Partner with SCAG, WRCOG, SCE, and SoCalGas for outreach events such as annual energy efficiency fair.	High					
	Measure 1.3	**Home Energy Evaluations**		The actions taken by the County can increase participation levels of other measures.				Supporting Measure
		Actions Promote SCE energy audits program for residents within the SCE service area and promote similar programs through the Energy Upgrade California for the IID service area	Medium					
		~~Present to the City Council for consideration of a residential Energy Conservation and Disclosure Ordinance~~	Not Selected					
	Measure 1.4	**Residential Home Energy Renovations**		7,839.7	11,749	13,074	19,592	Medium-High
		Actions Promote Title 24 code compliance for exisitng residential buildings during code enforcement inspections of residential properties	High					
		Promote existing home energy renovation programs	High					
		Promote participation in green building programs, such as Leadership in Energy and Environmental Design (LEED) and Energy Upgrade California	High					
		Promote financing programs for home upgrades, such as Home Energy Renovation Opportunity (HERO) program sponsored by the Western Riverside Couny Council of Governments (WRCOG) and other Property Assessed Clean Energy (PACE) programs in the IID srvice area.	Medium					
		Establish online permitting to facilitate upgrades	Medium					
		~~Reduce or waive permit fees for upgrades~~	Not Selected					
		~~Establish a Residential Energy Conservation Ordinance (RECO) requiring time-of-sale energy rating~~	Not Selected					
Goal 2.	**Increase Energy Efficiency in New Residential Units**							
	Measure 2.1	**Exceed Energy Efficiency Standards**		37,532	39,408	303,459	318,632	Medium-High
		Actions Educate City staff and developers on future Title 24 updates and new energy efficiency opportunities for new residential development	Low					
		Promote Tier 1 and Tier 2 green building ratings such as LEED, Build It Green, or Energy Star® certified buildings	Medium					
		~~Waive or reduce permit fees for new energy efficiency opportunities~~	Not Selected					
		Establish online permitting to facilitate new residential building energy efficiency programs.	High					
		~~Create an energy award program for zero-net-energy homes~~	Not Selected					
		Comply with State Title 24 energy efficiency requiremenst on new residential buildings, such as zero net energy homes that require all new residential construction projects to achieve zero net-energy use by 2020	Low					

Goal	Measure	Action	Level of Participation	2030 GHG Reductions Achieved (MT CO2e)		2050 GHG Reductions Achieved (MT CO2e)		GHG Reduction Potential
Goal 3.	**Increase Energy Efficiency in Existing Commercial Units**							
	Measure 3.1	**Energy Efficiency Training, Education, and Recognition in Commercial Sector**		The actions taken by the County may increase participation levels of other programs by up to 85%				Supporting Measure
		Actions Post links on website and/or social media and provide materials at public events	High					
		Set up email list for email blasts of new information or trainings	Medium					
		~~Establish an annual energy efficiency fair~~	Not Selected					
		Encourage buisness owners to visit SCE Energy Education Centers for energy efficiency resources	Low					
		Designate an Energy Advocate to promote and manage energy efficiency programs	High					
		Invite building inspectors to hold trainings semi-annually on energy efficiency and Title 24	Medium					
	Measure 3.2	**Increase Business Participation in Existing Energy Efficiency Programs**		31,877.5	31,878	67,730	67,730	Medium
		Actions Partner with SCAG, WROG, SCE, and SoCalGas for outreach events	High					
	Measure 3.3	**Non-Residential Building Energy Audits**		The actions taken by the County can increase participation levels of other measures.				Supporting Measure
		Actions ~~Promote the SCE energy audit program for residents within the SCE service aea and~~ promote similar programs through the Energy Upgrade California for the Imperial	Medium					
		~~Require energy disclosure for small buildings (5,000 – 10,000 square feet)~~	Not Selected					
	Measure 3.4	**Non-Residential Building Retrofits**		90,973.3	173,554	193,289	368,747	Medium-High
		Actions Promote Title 24 compliance for existing non-residential buildings during code enforcement inspections	Medium					
		Promote existing non-residential building retrofits programs	Medium					
		Promote participation in green building programs, such as California Solar Initiative	Medium					
		Promote energy efficiency retrofit financing programs for non-residential buildings such as PACE	Medium					
		Establish online permitting to facilitate retrofits	Medium					
		~~Reduce or waive permit fees for retrofits~~	Not Selected					
		~~Establish a Commercial Energy Conservation Ordinance (CECO)~~	Not Selected					
Goal 4.	**Increase Energy Efficiency in New Commercial Units**							
	Measure 4.1	**Exceed Energy Efficiency Standards**		33,567	33,418	554,274	580,161	Medium-High
		Actions Educate City staff and developers on future Title 24 updates and additional energy efficiency opportunities for new non-residential development	Low					
		Promote Tier 1 and Tier 2 Green Building Ratings such as LEED, Build It Green, or Energy Star® certified buildings	Medium					
		~~Waive or reduce permit fees for new energy efficiency opportunities~~	Not Selected					
		Establish online permitting to facilitate new non residential building energy efficiency programs	High					
		~~Create an energy award program for zero-net-energy businesses~~	Not Selected					
		~~Adopt a local ordinance to exceed Title 24~~	Not Selected					
		Comply with State requirements on new non-residential buildings, such as Net-Zero Energy Buildings for all new non-residential constructions zero-net-energy by 2030	Low					

Goal	Measure	Action	Level of Participation	2030 GHG Reductions Achieved (MT CO2e)		2050 GHG Reductions Achieved (MT CO2e)		GHG Reduction Potential
Goal 5.	**Reduce Energy Use through Increased Water Efficiency**							
	Measure 5.1	**Water Efficiency through Enhanced Implementation of SB X7-7**		4,091.8	5,666	7,305	10,114	
		Actions Provide general water efficiency information and links to water district conservation webpages on the county's website	High					Medium
		~~Set up email list for email blasts of new information or trainings~~	Not Selected					
		Implement the low-irrigation landscaping requirements as part of plan check	Medium					
	Measure 5.2	**Exceed Water Efficiency Standards**		63.6	116	114	206	
		Actions Support water districts in direct outreach to HOA, businesses, and other community groups	Medium					Low-Medium
		Promote recycled or grey water for community uses	Low					
		Promote rainwater harvesting rebates and demonstrations	Medium					
Goal 6.	**Decrease Energy Demand through Reducing Urban Heat Island Effect**							
	Measure 6.1	**Tree Planting for Shading and Energy Saving**		6.5	13	12	22	
		Actions ~~Promote tree planting at plan check~~	Not Selected					
		Work with community to support nonprofit tree-planting groups within the county consisiting of volunteers to plant and care for tress correctly and safely	Medium					Low
		Develop and promote a County tree-planting program for new development at plan check	Medium					
	Measure 6.2	**Light-Reflecting Surfaces for Energy Saving**		1,537.5	1,845	2,745	3,294	
		Actions Comply with Title 24 requirements on installing enhanced cool roofs	Low					Medium
		Comply with Title 24 requirements on installing cool pavements	Low					
Goal 7.	**Decrease GHG Emissions through Reducing Vehicle Miles Traveled**							
	Measure 7.1	**Alternative Transportation Options**		129,545	161,932	294,969	368,711	
		Actions						
		Work with SCAG and the community to remove barriers to alternative transportation	High					
		Create a “bike to work day” or “car free zone day” and other sponsored events to promote biking and other non-motorized transportation	Medium					Low-Medium
		Create additional active transportation routes from Corona Transit Center to surrounding residential areas	Medium					
		Implement reduced parking requirement in areas served by transit	Low					
		~~Replace stop signs with roundabouts at selected intersections~~	Not Selected					
	Measure 7.2	**Adopt & Implement Bicycle Master Plan to Expand Bike Routes around the County**		2,234	2,234	5,086	5,086	
		Action Expand bicycle routes and prioritize funding for Class I bicycle lanes to improve bike transit.	High					Low-Medium
	Measure 7.3	**Ride-Sharing and Bike-to-Work Programs within Businesses**		182,846	182,846	416,332	416,332	Low-Medium
		Action Promote ride-sharing and facilitate air district incentives for ride-sharing	Medium					
		Provide reserved preferential parking spaces for ride-sharing, carpooling, and ultra-low or zero-emission vehicles	Medium					
		Require businesses of a certain size to provide facilities such as bike racks	Low					
	Measure 7.4	**Electrify the Fleet**		268,025	274,370	610,281	624,729	
		Actions Promote electrical vehicle incentive programs at outreach meetings	Low					
		Promote neighborhood electric vehicles (NEV)	Low					
		Support application for grants to install e-chargers at public facilities	Low					Medium-High
		Work with community groups and businesses to install e-chargers	Low					
		Comply with State Title 24 energy efficiency requirements that require new commercial development to install e-chargers starting 2020	Medium					

Goal	Measure	Action		Level of Participation	2030 GHG Reductions Achieved (MT CO2e)		2050 GHG Reductions Achieved (MT CO2e)		GHG Reduction Potential
Goal 8.	**Decrease GHG Emissions through Reducing Solid Waste Generation**								
	Measure 8.1	**Reduce Waste to Landfills**			88,362	88,362	157,742	157,742	
		Actions	Outreach to community to promote waste recycling and diversion	Medium					Low-Medium
			Add additional recycling containers in public places	Low					
			Comply with Statewide waste reduction, recycling, and composting requirements	High					
Goal 9.	**Decrease GHG Emissions through Increasing Clean Energy Use**								
	Measure 9.1	**Promote Clean Energy**			24,431	34,204	24,431	34,204	
		Actions	Outreach to the community to promote clean energy incentives	Low					
			~~Reduce or waive permit fees for solar permits~~	Not Selected					
			Encourage solar panels installation on existing residential buildings	Medium					Medium-High
			Encourage solar panels installation on existing commercial buildings and commercial parking lots	Medium					
			Encourage energy storage systems installation with solar panels	Medium					
	Measure 9.2	**Join Community Choice Aggregation Program**			624,955	609,022	624,955	609,022	Medium-High
		Action	Explore opportunities to join a regional CCA program	Low					
				Total	**1,544,732**	**1,667,460**	**3,303,889**	**3,612,416**	





APPENDIX D

SCREENING TABLES

GREENHOUSE GAS EMISSIONS

Screening Tables
County of Riverside, California

March 2019

Prepared for:

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CONTENTS

TABLES

Introduction

The County of Riverside Climate Action Plan Update (CAP Update) includes reducing 525,511 metric tons of carbon dioxide equivalents (MT CO_2e) by 2030 and 2,982,947 MT CO_2e by 2050 from an Adjusted Business As Usual (ABAU) forecast.[1] These targets are consistent with the State's recommended emission reduction goals of 40 percent reduction below 2008 levels by 2030, and an 83 percent reduction below 2008 levels by 2050. Reductions related to transportation, water, solid waste, energy, and renewable energy sources all play a part in gaining the level of efficiency needed within new development.

Mitigation of greenhouse gas (GHG) emissions impacts during the development review process of projects provides one cost-effective way of implementing the GHG reduction strategies for reducing community-wide emissions associated with new development. The development review process procedures for evaluating GHG impacts and determining significance for California Environmental Quality Act (CEQA) purposes will be streamlined by (1) applying an emissions level that is determined to be less than significant for small projects, and (2) utilizing Screening Tables to mitigate project GHG emissions that exceed the threshold level. Projects will have the option of preparing a project-specific technical analysis to quantify and mitigate GHG emissions. A threshold level above 3,000 MT CO_2e per year will be used to identify projects that require the use of Screening Tables or a project-specific technical analysis to quantify and mitigate project emissions.

CEQA requires the assessment of environmental impacts for proposed projects, including the assessment of GHG emissions. The purpose of this document is to provide guidance on how to analyze GHG emissions and determine the significance of those emissions during CEQA review of proposed development projects within the County of Riverside (County). The analysis, methodology, and significance determination (thresholds) are based upon the County of Riverside GHG Inventory, Forecasting, and Target-Setting (IFT) Report, the GHG emission inventory within the IFT Report, and the GHG reduction measures that reduce emissions to the Assembly Bill (AB) 32, Senate Bill (SB) 32, and Executive Order (EO) S-3-05 compliant reduction targets in the CAP Update. The Screening Tables can be used by the County of Riverside Planning Department for review of development projects in order to ensure that the specific implementation measures in the CAP Update are applied as part of the CEQA process for development projects. The Screening Tables provide a menu of options that ensures both implementation of the measures and flexibility on how development projects will implement the measures to achieve an overall reduction of emissions, consistent with the reduction targets in the CAP Update.

[1] An Adjusted Business As Usual Forecast (ABAU) refers to the emissions that include State policies and measures. The County of Riverside will be required to reduce additional emissions to meet the State goals. These reduction measures are detailed in the CAP Update, Chapter 4, GHG Emissions Reduction Programs and Regulations.

California Environmental Quality Act

CEQA Mandates for Analysis of Impacts

CEQA requires that Lead Agencies inform decision makers and the public regarding the following: potential significant environmental effects of proposed projects; feasible ways that environmental damage can be avoided or reduced through the use of feasible mitigation measures and/or project alternatives; and the reasons why the Lead Agency approved a project if significant environmental effects are involved (CEQA Guidelines §15002). CEQA also requires Lead Agencies to evaluate potential environmental effects based to the fullest extent possible on scientific and factual data (CEQA Guidelines §15064[b]). A determination of whether or not a particular environmental impact would be significant shall be based on substantial evidence, which includes facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines §15064f[5]).

The recently amended CEQA Guidelines (CEQA Guidelines §15064.4[a] [b]) explicitly require Lead Agencies to evaluate GHG emissions during CEQA review of potential environmental impacts generated by a proposed project. To assist in this effort, two questions were added to Appendix G of the CEQA Guidelines:

- Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Finally, under the "rule of reason," an Environmental Impact Report (EIR) is required to evaluate impacts to the extent that is reasonably feasible (CEQA Guidelines § 15151; *San Francisco Ecology Center v. City and County of San Francisco* [1975] 48 Cal.App.3rd 584). While CEQA does require Lead Agencies to make a good faith effort to disclose what they reasonably can, CEQA does not demand what is not realistically possible (*Residents at Hawks Stadium Committee v. Board of Trustees* [1979] 89 Cal.App.3rd 274, 286).

Greenhouse Gas Impact Determination

Statewide or Regional Thresholds of Significance

There are currently no published Statewide or regional thresholds of significance for measuring the impact of GHG emissions generated by a proposed project. CEQA Guidelines §15064.7 indicates only that, "each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects." The County of Riverside CAP Update addresses cumulative GHG emissions, has reduction targets that reduce the cumulative GHG impacts to less than significant, has a set of reduction measures that achieves the reduction

targets, and provides an implementation plan to implement the reduction measures. This document provides guidance in how to address GHG emissions in CEQA analysis and determine the significance of project-generated GHG emissions.

Quantitative Analysis Relative to the Riverside County Climate Action Plan Update

METHODOLOGY OVERVIEW

An individual project cannot generate enough GHG emissions to influence global climate change. The project participates in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together may have a significant impact on global climate change (AEP 2007). To address the State's requirements to reduce GHG emissions, the County of Riverside adopted the CAP in 2015 with the target of reducing GHG emissions within the unincorporated County by 15 percent below 2008 levels by the year 2020. The CAP Update sets new targets of 49 percent below 2008 baseline levels by year 2030 and 83 percent below the 2008 baseline levels by 2050. The County's GHG reduction targets are consistent with the AB 32, SB 32, and EO S-3-05, and ensure that the County is providing GHG reductions locally that will complement the State and international efforts of stabilizing climate change.

Because the County's CAP Update addresses GHG emissions reduction, in concert with AB 32, SB 32, EO S-3-05, and international efforts to address global climate change, and includes specific local requirements that would substantially lessen the cumulative problem, the CAP Update fulfills the description of mitigation found in CEQA Guidelines §15130(a)(3) and §15183.5.

No single project has the ability to generate GHG emissions in sufficient quantities to change the global climate. Rather, it is the incremental contribution of all past, present, and future projects that when combined with all other anthropogenic sources of GHG emissions globally generates climate change impacts. Because GHG emissions are only important in the context of cumulative emissions, the focus of the analysis is on answering the question of whether incremental contributions of GHGs are a cumulatively considerable contribution to climate change impacts. The CAP Update includes a set of mitigation measures designed to substantially lessen cumulative impacts associated with GHG emissions as described in CEQA Guidelines §15130(a)(3), in determining if a project's effects would result in significant impacts. The CAP Update has the following components that fulfill cumulative mitigation for GHG emissions:

1. Provides community-wide GHG emissions reduction targets that would substantially lessen the cumulative impact;
2. Provides measures that new development projects shall follow to meet the County's reduction targets and substantially lessen the cumulative impact;

3. Provides a set of GHG emission inventories that provide quantitative facts and analysis for how the measures within the CAP Update meet the reduction targets that substantially lessen the cumulative impact; and
4. Provides an implementation, monitoring, and update program to ensure that the reduction targets are met.

The CAP Update satisfies the first condition by adopting targets of reducing GHG emissions down to 15 percent below 2008 baseline levels within the County of Riverside by 2020, 49 percent below 2008 levels by 2030, and 83 percent below 2008 levels by 2050. These reduction targets are compliant with AB 32. The AB 32 Climate Change Scoping Plan states: "In recognition of the critical role local governments will play in the successful implementation of AB 32, ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target" (Scoping Plan page ES-5, CARB, December 2008). The 2030 and 2050 reduction targets are compliant with SB 32 and EO S-3-05 and continue the GHG reduction trends (AEP 2012). In this way, the County is teaming with the State's efforts to reduce GHG emissions globally and substantially lessen cumulative emissions.

The CAP Update satisfies the second condition through the implementation of the reduction measures for new development. This document supplies the specific criteria that new development shall follow to ensure that the reduction measures associated with new development are implemented and the reduction targets are met.

The CAP Update satisfies the third criteria by providing an update of community-wide GHG emissions inventory for existing conditions (2017); and future 2020, 2030, and 2050 GHG emissions that are anticipated with Statewide reduction measures that are already in place but without the local reduction measures (ABAU). The CAP Update also supports reduced levels of 2030 and 2050 GHG emissions, which demonstrate how the implementation of local reduction measures helps to achieve the reduction targets.

The CAP Update satisfies the fourth criteria through the implementation and monitoring program described in detail in Chapter 7 of the CAP Update.

The Development Review Process

Integrating the reduction measures of the CAP Update into the CEQA development review process is the first step in determining how a proposed project will implement the GHG reduction measures within the CAP Update. The GHG emissions development review process is predicated on responses to several identified questions. Appendix A of this document contains a flow chart that diagrams this development review process. The questions are as follows:

Question 1: Is the project exempt under CEQA? If so, then the South Coast Air Quality Management District (SCAQMD) and the County would determine that GHG emissions are less than significant, and no

additional GHG reductions are needed. A list of CEQA Exemptions are found in CEQA Guidelines §15300 through §15332. There are exemption opportunities associated with transit-oriented development (TOD) associated with the Sustainable Communities Strategy (SCS) for the region developed by the Southern California Association of Governments (SCAG) and first introduced in the 2012 Regional Transportation Plan (RTP). Exemptions associated with TOD are divided into two categories: transit priority projects (TPP) and Sustainable Community Projects (SCP). A TPP and SCP Checklist is provided in Appendix B of this document to assist project applicants in determining if a project qualifies for these Exemptions under CEQA. If the project does not qualify for a CEQA exemption, then the applicant can move on to Question 2.

Question 2: Are project GHG emissions less than 3,000 MT CO_2e per year? To assist applicants in answering this question, Appendix C of this document includes a table showing various sizes of typical land use development projects that are typically at or below that level of emissions threshold. Applicants can also calculate emissions using the methodology described below to answer this question. Additional information is provided below on how this level of emissions was determined and the next steps to take if a project is at or below this level. If the project's emissions are above 3,000 MT CO_2e, then the applicant needs to either use the Screening Tables or analyze the GHG emissions and provide additional mitigation as shown in Appendix A.

3,000 MT CO_2e Emission Level

The County has determined the development size that would be too small to be able to provide the level of GHG emission reductions expected from the Screening Tables or the alternative emission analysis method. To do this the County determined the GHG emissions allowed by a project such that 90 percent of the emissions on average from all projects would exceed that level and be "captured" by the Screening Tables or alternative emission analysis method.

In determining this level of emissions, SCAQMD used the database of projects kept by the Governor's Office of Planning and Research (OPR). That database contained 798 projects, 60 of which were extremely large General Plan Updates, Master Plans, or Specific Plan Projects. The 60 very large projects were removed from the database in order not to skew the emissions value, leaving a net of 738 projects. In addition, 27 projects were found to be outliers that would skew the emission value too high, leaving 711 as the sample population to use in determining the 90^{th} percentile capture rate.

The analysis of the 711 projects within the sample population combined commercial, residential, and mixed-use projects. Also, note that the sample of projects included warehouses and other light industrial land uses but did not include industrial processes (i.e., oil refineries, heavy manufacturing, electric generating stations, mining operations, etc.). Emissions from each of these projects were calculated by SCAQMD to provide a consistent method of emissions calculations across the sample population and further reduce potential errors in the statistical analysis. In calculating the emissions

from projects within the sample population, construction period GHG emissions were amortized over 30 years (the average economic life of a development project).

This analysis determined that the 90th percentile ranged from 2,983 to 3,143 MT CO_2e per year. The 3,000 MT CO_2e per year value is the low end value within that range rounded to the nearest hundred tons of emissions and is used in defining small projects that are considered less than significant and do not need to use the Screening Tables or alternative GHG mitigation analysis described below.

The 3,000 MT CO_2e per year value is used in defining small projects that, when combined with the modest efficiency measures shown in the bullet points below are considered less than significant and do not need to use the Screening Tables or alternative GHG mitigation analysis described below. The efficiency measures required of small projects are summarized below:

- Energy efficiency matching or exceeding the Title 24 requirements in effect as of January 2017, and
- Water conservation measures that match the California Green Building Standards Code in effect as of January 2017.

Projects that Exceed 3,000 MT CO_2e Emission Level

Methodology for the Calculation of GHG Emissions

Development projects that are determined to be above the 3,000 MT CO_2e emissions level shall quantify and disclose the anticipated GHG emissions of the proposed development.

Total GHG emissions are the sum of emissions from both direct and indirect sources. Direct sources include mobile sources such as construction equipment, motor vehicles, landscape equipment; and stationary sources such as cooling and heating equipment. Indirect sources are comprised of electrical and potable water use, and the generation of solid waste and wastewater.

Direct GHG emissions from mobile and stationary sources are determined as the sum of the annual GHG emissions from construction equipment, motor vehicles, landscape equipment, and heating and cooling equipment.

Indirect sources are determined based on source as follows. Electrical usage is reported as annual emissions from electrical usage. Potable water usage is reported as the annual emissions from electricity used for potable water treatment and transportation. Solid waste is reported as the sum of annual emissions from solid waste disposal treatment, transportation, and fugitive emissions of methane at the solid waste facilities. Wastewater usage is reported as the annual emissions from wastewater transport and treatment.

Analysis of development projects not using the Screening Tables should use the emission factors found in the latest version of the California Climate Action Registry (CCAR) General Reporting Protocol (CCAR,

January 2009) and guidance in the Association of Environment Professionals' (AEP) *White Paper: Community-Wide Greenhouse Gas Emissions Inventory Protocols* (AEP 2010). Quantification of emissions from electricity used for potable water treatment and transportation as well as wastewater transport and treatment can be found in the California Energy Commission (CEC) document titled *Refining Estimates of Water-Related Energy Use in California* (CEC, December 2006).

Analysis of development projects not using the Screening Tables should use the latest version of the California Emissions Estimator Model (CalEEMod). Two modeling runs should be completed. The first modeling run calculates GHG emissions at 2017 levels of efficiency using energy efficiency standards (2016 Title 24, in effect January 2017) and the California Air Resources Board (CARB) on-road vehicle emissions factors (EMFAC 2017) set at 2017. A second modeling run calculates GHG emissions at project buildout year levels of efficiency and includes project design features and/or mitigation measures to reduce GHG emissions.

For analysis of development projects using the Screening Tables, please refer to the process described below.

Screening Tables

The purpose of the Screening Tables is to provide guidance in measuring the reduction of GHG emissions attributable to certain design and construction measures incorporated into development projects. The analysis, methodology, and significance determination (thresholds) are based upon the County of Riverside CAP Update, which includes GHG emission inventory updates; the 2020, 2030, and 2050 emission reduction targets; and the reduction measures to reach the targets. The methodology for the development and application of the Screening Tables is set forth in Appendix D, attached hereto.

Instructions for Project Application

The Screening Tables assign points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as "feature"). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the County's CAP Update. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Those projects that do not garner 100 points using the Screening Tables will need to provide additional analysis to determine the significance of GHG emissions. Nothing in this guidance shall be construed as limiting the County's authority to adopt a statement of overriding consideration for projects that require the preparation of an EIR due to significant GHG impacts. The following tables provide a menu of performance standards/options related to GHG mitigation measures and design features that can be

used to demonstrate consistency with the implementation measures and GHG reduction quantities in the CAP Update.

Mixed-use projects provide additional opportunities to reduce emissions by combining complementary land uses in a manner that can reduce vehicle trips. Mixed-use projects also have the potential to complement energy-efficient infrastructure in a way that reduces emissions. For mixed-use projects, both Table 1 and Table 2 should be filled out, but the points should be proportionally identical to the proportioning of the mix of uses. For example, a mixed-use project that is 50 percent commercial uses and 50 percent residential uses will show ½ point for each assigned point value in Table 1 and Table 2, and the points will be added from both tables. Mixed-use projects that garner at least 100 points will be consistent with the reduction quantities in the County's CAP Update and would be considered less than significant for GHG emissions.

Table 1: Screening Table for GHG Implementation Measures for Residential Development

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2-EE5: Exceed Energy Efficiency Standards in New Residential Units			
EE5.A Building Envelope			
EE5.A.1 Insulation	• 2016 Title 24 Requirements (walls R-13, roof/attic R-30) • Modestly Enhanced Insulation (walls R-15, roof/attic R-38) • Enhanced Insulation (rigid wall insulation R-13, roof/attic R-38) • Greatly Enhanced Insulation (spray foam wall insulated walls R-18 or higher, roof/attic R-38 or higher)	0 points 7 points 9 points 11 points	
EE5.A.2 Windows	• 2016 Title 24 Windows (0.57 U-factor, 0.4 solar heat gain coefficient [SHGC]) • Modestly Enhanced Window (0.4 U-Factor, 0.32 SHGC) • Enhanced Window (0.32 U-Factor, 0.25 SHGC) • Greatly Enhanced Window (0.28 or less U-Factor, 0.22 or less SHGC)	0 points 3 points 4 points 5 points	
EE5.A.3 Cool Roofs	• Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance) • Enhanced Cool Roof (CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance) • Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	6 points 7 points 8 points	
EE5.A.4 Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage. • Air barrier applied to exterior walls, caulking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent) • Blower Door HERS Verified Envelope Leakage or equivalent	 6 points 5 points	
EE5.A.5 Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls. • Modest Thermal Mass (10% of floor or 10% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials) • Enhanced Thermal Mass (20% of floor or 20% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials)	 1 points 2 points	

Feature	Description	Assigned Point Values	Project Points
EE5.B Indoor Space Efficiencies			
EE5.B.1 Heating/ Cooling Distribution System	• Minimum Duct Insulation (R-4.2 required) • Modest Duct insulation (R-6) • Enhanced Duct Insulation (R-8) • Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	0 points 4 points 5 points 7 points	
EE5.B.2 Space Heating/ Cooling Equipment	• 2016 Title 24 Minimum HVAC Efficiency (SEER 13/75% AFUE or 7.7 HSPF) • Improved Efficiency HVAC (SEER 14/78% AFUE or 8 HSPF) • High Efficiency HVAC (SEER 15/80% AFUE or 8.5 HSPF) • Very High Efficiency HVAC (SEER 16/82% AFUE or 9 HSPF)	0 points 2 points 4 points 5 points	
EE5.B.3 Water Heaters	• 2016 Title 24 Minimum Efficiency (0.57 Energy Factor) • Improved Efficiency Water Heater (0.675 Energy Factor) • High Efficiency Water Heater (0.72 Energy Factor) • Very High Efficiency Water Heater (0.92 Energy Factor) • Solar Pre-heat System (0.2 Net Solar Fraction) • Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	0 points 7 points 9 points 11 points 2 points 5 points	
EE5.B.4 Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours. • All peripheral rooms within the living space have at least one window (required) • All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.) • All rooms daylighted	 0 points 1 point 1 point	
EE5.B.5 Artificial Lighting	• Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficiency is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt) • High Efficiency Lights (50% of in-unit fixtures are high efficiency) • Very High Efficiency Lights (100% of in-unit fixtures are high efficiency)	5 points 6 points 7 points	
EE5.B.6 Appliances	• Energy Star Refrigerator (new) • Energy Star Dishwasher (new) • Energy Star Washing Machine (new)	1 point 1 point 1 point	
EE5.C Miscellaneous Residential Building Efficiencies			
EE5.C.1 Building Placement	North/south alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	3 points	
EE5.C2 Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on June 21st.	2 points	
EE5.C3 Energy Star Homes	EPA Energy Star for Homes (version 3 or above)	15 points	
EE5.C.4 Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
EE5.C.5 Other	This allows innovation by the applicant to provide design features that increase the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	

Feature	Description	Assigned Point Values	Project Points
EE5.C.6 Existing Residential Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing residential dwelling units within the unincorporated County is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case-by-case basis and shall have the approval of the Riverside County Planning Department. The decision to allow applicants the ability to participate in this program will be evaluated based upon, but not limited to, the following: • Will the energy efficiency retrofit project benefit low income or disadvantaged residents? • Does the energy efficiency retrofit project provide co-benefits important to the County? • Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.	TBD	
Reduction Measure R2-CE1: Clean Energy			
CE1.A Residential Renewable Energy Generation			
CE1.A.1 Photovoltaic	Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 9 points 12 points 17 points 20 points 23 points 25 points 28 points 31 points	
CE1.A.2 Wind Turbines	Some areas of the County lend themselves to wind turbine applications. Analysis of the areas' capability to support wind turbines should be evaluated prior to choosing this feature. Individual wind turbines at homes or collective neighborhood arrangements of wind turbines such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 9 points 12 points 17 points 21 points 23 points 25 points 28 points 31 points	
CE1.A.3 Off-site Renewable Energy Project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes. These off-site renewable energy retrofit project proposals will be determined on a case-by-case basis and shall be accompanied by a detailed plan that documents the quantity of renewable energy the proposal will generate. Point values will be determined based upon the energy generated by the proposal.	TBD	
CE1.A.4 Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2-W2: Exceed Water Efficiency Standards			
W2.A Residential Irrigation and Landscaping			
W2.A.1 Water Efficient Landscaping	• Limit conventional turf to < 25% of required landscape area • Limit conventional turf to < 50% of required landscape area • No conventional turf (warm season turf to < 50% of required landscape area and/or low water using plants are allowed) • Only California Native Plants that requires no irrigation or some supplemental irrigation	0 points 2 points 4 points 5 points	
W2.A.2 Water Efficient irrigation systems	• Low precipitation spray heads < .75”/hr or drip irrigation • Weather based irrigation control systems or moisture sensors (demonstrate 20% reduced water use)	1 point 2 points	
W2.A.3 Storm water Reuse Systems	Innovative on-site stormwater collection, filtration, and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
W2.B Residential Potable Water			
W2.B.1 Showers	Water Efficient Showerheads (2.0 gpm)	2 points	
W2.B.2 Toilets	Water Efficient Toilets (1.5 gpm)	2 points	
W2.B.3 Faucets	Water Efficient faucets (1.28 gpm)	2 points	
W2.B.4 Dishwasher	Water Efficient Dishwasher (6 gallons per cycle or less)	1 point	
W2.B.5 Washing Machine	Water Efficient Washing Machine (Water factor <5.5)	1 point	
W2.B.6 WaterSense	EPA WaterSense Certification	7 points	
W2.C Increase Residential Reclaimed Water Use			
W2.C.1 Recycled Water	5% of the total project’s water use comes from recycled/reclaimed water	5 points	
Reduction Measure R2-T1: Alternative Transportation Options			
T1.A Increase Residential Density			
T1.A.1 Residential Density	Designing the project with increased densities, where allowed by the General Plan and/or Zoning Ordinance, reduces GHG emissions associated with traffic in several ways. Increased densities affect the distance people travel and provide greater options for the modes of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities. • 1 point is allowed for each 10% increase in density beyond 7 units/acre, up to 500% (50 points)	1–50 points	

Feature	Description	Assigned Point Values	Project Points
T1.B Mixed-Use Development			
T1.B.1 Mixed-Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed-use projects will be determined based upon a Transportation Impact Analysis (TIA) demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges: • Diversity of land uses complementing each other (2–28 points) • Increased destination accessibility other than transit (1–18 points) • Increased Transit Accessibility (1–25 points) • Infill location that reduces vehicle trips or VMT beyond the measures described above (points TBD based on traffic data).	TBD	
T1.B.2 Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distances of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT) The suburban project will have at least three of the following on site and/or off site within ¼-mile: Residential Development, Retail Development, Park, Open Space, or Office. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial locations (and vice versa). The project should minimize the need for external trips by including services/facilities for daycare, banking/ATM, restaurants, vehicle refueling, and shopping.	1–16 points	
T1.C Traffic Flow Management Improvements			
T1.C.1 Signal Synchronization	Techniques for improving traffic flow include: traffic signal coordination to reduce delay, incident management to increase response time to breakdowns and collisions, Intelligent Transportation Systems (ITS) to provide real-time information regarding road conditions and directions, and speed management to reduce high free-flow speeds. • Signal synchronization • Traffic signals connected to existing ITS	1 point/signal 3 points/signal	
T1.D Increase Public Transit			
T1.D.1 Public Transit Access	The point value of a projects ability to increase public transit use will be determined based upon a Transportation Impact Analysis (TIA) demonstrating decreased use of private vehicles and increased use of public transportation. • Increased transit accessibility (1–15 points)	TBD	
Reduction Measure R2-T2: Adopt and Implement a Bicycle Master Plan to Expand Bike Routes around the County			
T2.A.1 Sidewalks	• Provide sidewalks on one side of the street (required) • Provide sidewalks on both sides of the street • Provide pedestrian linkage between residential and commercial uses within 1 mile	0 points 1 point 3 points	
T2.A.2 Bicycle paths	• Provide bicycle paths within project boundaries • Provide bicycle path linkages between residential and other land uses • Provide bicycle path linkages between residential and transit	TBD 2 points 5 points	

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2-T4: Electrify the Fleet			
T4.A.1 Electric Vehicle Recharging	• Provide circuit and capacity in garages of residential units for use by an electric vehicle. Charging stations are for on-road electric vehicles legally able to drive on all roadways including Interstate Highways and freeways. • Install electric vehicle charging stations for each residential unit included in the project. Projects that include charging stations for fewer than all units shall receive points on a proportional basis.	1 point 8 points	
T4.A.2 Neighborhood Electric Vehicle (NEV) Infrastructure	NEVs are electric vehicles usually built to have a top speed of 25 miles per hour, and a maximum loaded weight of 3,000 pounds. • Provide NEV safe routes within project site. • Provide NEV safe routes between the project site and other land uses.	4 points 5 points	
Reduction Measure R2-S1: Reduce Waste to Landfills			
S1.A.1 Recycling	County initiated recycling program diverting 100% of waste requires coordination in neighborhoods to realize this goal. The following recycling features will help the County fulfill this goal: • Provide green waste composting bins at each residential unit • Multi-family residential projects that provide dedicated recycling bins separated by types of recyclables combined with instructions/education program explaining how to use the bins and the importance or recycling	4 points 3 points	
Other GHG Reduction Feature Implementation			
O.A.1 Other GHG Emissions Reduction Features	This allows innovation by the applicant to provide residential design features for the GHG emissions from construction and/or operation of the project not provided in the table. Note that engineering data will be required documenting the GHG reduction amount and point values given based upon emission reductions calculations using approved models, methods, and protocols.	TBD	
Total Points Earned by Residential Project:			

Table 2: Screening Table for GHG Implementation Measures for Commercial Development and Public Facilities

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2-EE10: Exceed Energy Efficiency Standards in New Commercial Units			
EE10.A Building Envelope			
EE10.A.1 Insulation	• 2017 Title 24 Requirements (walls R-13; roof/attic R-30) • Modestly Enhanced Insulation (walls R-13, roof/attic R-38) • Enhanced Insulation (rigid wall insulation R-13, roof/attic R-38) • Greatly Enhanced Insulation (spray foam insulated walls R-15 or higher, roof/attic R-38 or higher)	0 points 9 points 11 points 12 points	
EE10.A.2 Windows	• 2016 Title 24 Windows (0.57 U-factor, 0.4 SHGC) • Modestly Enhanced Window Insulation (0.4 U-factor, 0.32 SHGC) • Enhanced Window Insulation (0.32 U-factor, 0.25 SHGC) • Greatly Enhanced Window Insulation (0.28 or less U-factor, 0.22 or less SHGC)	0 points 4 points 5 points 7 points	
EE10.A.3 Cool Roofs	• Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance) • Enhanced Cool Roof (CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance) • Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	7 points 8 points 10 points	
EE10.A.4 Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage. • Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent) • Blower Door HERS Verified Envelope Leakage or equivalent	7 points 6 points	
EE10.A.5 Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls. • Modest Thermal Mass (10% of floor or 10% of walls 12” or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials) • Enhanced Thermal Mass (20% of floor or 20% of walls 12” or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials) • Enhanced Thermal Mass (80% of floor or 80% of walls 12” or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials)	2 points 4 points 14 points	

Feature	Description	Assigned Point Values	Project Points
EE10.B Indoor Space Efficiencies			
EE10.B.1 Heating/ Cooling Distribution System	• Minimum Duct Insulation (R-4.2 required) • Modest Duct insulation (R-6) • Enhanced Duct Insulation (R-8) • Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	0 points 5 points 6 points 8 points	
EE10.B.2 Space Heating/ Cooling Equipment	• 2016 Title 24 Minimum HVAC Efficiency (EER 13/75% AFUE or 7.7 HSPF) • Improved Efficiency HVAC (EER 14/78% AFUE or 8 HSPF) • High Efficiency HVAC (EER 15/80% AFUE or 8.5 HSPF) • Very High Efficiency HVAC (EER 16/82% AFUE or 9 HSPF)	0 points 4 points 5 points 7 points	
EE10.B.3 Commercial Heat Recovery Systems	Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.	TBD	
EE10.B.4 Water Heaters	• 2016 Title 24 Minimum Efficiency (0.57 Energy Factor) • Improved Efficiency Water Heater (0.675 Energy Factor) • High Efficiency Water Heater (0.72 Energy Factor) • Very High Efficiency Water Heater (0.92 Energy Factor) • Solar Pre-heat System (0.2 Net Solar Fraction) • Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	0 points 8 points 10 points 11 points 2 points 5 points	
EE10.B.5 Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours. • All peripheral rooms within building have at least one window or skylight • All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.) • All rooms daylighted	 0 points 1 point 1 point	
EE10.B.6 Artificial Lighting	• Efficient Lights (25% of in-unit fixtures considered high efficiency. High efficiency is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt) • High Efficiency Lights (50% of in-unit fixtures are high efficiency) • Very High Efficiency Lights (100% of in-unit fixtures are high efficiency)	5 points 7 points 8 points	
EE10.B.7 Appliances	• Energy Star Commercial Refrigerator (new) • Energy Star Commercial Dishwasher (new) • Energy Star Commercial Clothes Washer	2 points 2 points 2 points	
EE10.C Miscellaneous Commercial Building Efficiencies			
EE10.C.1 Building Placement	North/south alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	4 points	
EE10.C.2 Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on Jun 21st.	6 points	
EE10.C.3 Other	This allows innovation by the applicant to provide design features that increase the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	

Feature	Description	Assigned Point Values	Project Points
EE10.C.4 Existing Commercial Buildings Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing commercial buildings to further the point value of their project. Retrofitting existing commercial buildings within the unincorporated County is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case-by-case basis and shall have the approval of the Riverside County Planning Department. The decision to allow applicants to participate in this program will be evaluated based upon, but not limited to, the following: • Will the energy efficiency retrofit project benefit low income or disadvantaged communities? • Does the energy efficiency retrofit project provide co-benefits important to the County? • Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.	TBD	
Reduction Measure R2-CE1: Clean Energy			
CE1.B Commercial/Industrial Renewable Energy Generation			
CE1.B.1 Photovoltaic	Solar Photovoltaic panels installed on commercial buildings or in collective arrangements within a commercial development such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 8 points 12 points 16 points 19 points 23 points 26 points 30 points 34 points	
CE1.B.2 Wind Turbines	Some areas of the County lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Wind turbines as part of the commercial development such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 8 points 12 points 16 points 19 points 23 points 26 points 30 points 34 points	
CE1.B.3 Off-site Renewable Energy Project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing residential or existing commercial/industrial. These off-site renewable energy retrofit project proposals will be determined on a case-by-case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.	TBD	

Feature	Description	Assigned Point Values	Project Points
CE1.A.4 Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure R2-W2: Exceed Water Efficiency Standards			
W2.D Irrigation and Landscaping			
W2.D.1 Water Efficient Landscaping	• Eliminate conventional turf from landscaping • Only moderate water using plants • Only low water using plants • Only California Native landscape that requires no or only supplemental irrigation	0 points 2 points 3 points 5 points	
W2.D.2 Water Efficient Irrigation Systems	• Low precipitation spray heads< .75”/hr or drip irrigation • Weather based irrigation control systems combined with drip irrigation (demonstrate 20% reduced water use)	1 point 3 points	
W2.D.3 Stormwater Reuse Systems	Innovative on-site stormwater collection, filtration, and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
W2.E Potable Water			
W2.E.1 Showers	Water Efficient Showerheads (2.0 gpm)	2 points	
W2.E.2 Toilets	• Water Efficient Toilets/Urinals (1.5 gpm) • Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	3 points 3 points	
W2.E.3 Faucets	Water Efficient faucets (1.28 gpm)	2 points	
W2.E.4 Commercial Dishwashers	Water Efficient dishwashers (20% water savings)	2 points	
W2.E.5 Commercial Laundry Washers	• Water Efficient laundry (15% water savings) • High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	2 points 4 points	
W2.E.6 Commercial Water Operations Program	Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.	TBD	
W2.F Increase Commercial/Industrial Reclaimed Water Use			
W2.F.1 Recycled Water	Graywater (purple pipe) irrigation system on site	5 points	

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2-T3: Ride-Sharing and Bike-to-Work Programs within Businesses			
T3.A.1 Alternative Scheduling	Encouraging telecommuting and alternative work schedules reduces the number of commute trips and therefore VMT traveled by employees. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks. • Provide flexibility in scheduling such that at least 30% of employees participate in 9/80 work week, 4-day/40-hour work week, or telecommuting 1.5 days/week.	5 points	
T3.A.2 Car/Vanpools	• Car/vanpool program • Car/vanpool program with preferred parking • Car/vanpool with guaranteed ride home program • Subsidized employee incentive car/vanpool program *Note: combine all applicable points for total value*	1 point 2 points 3 points 5 points	
T3.A.3 Employee Bicycle/ Pedestrian Programs	• Complete sidewalk to residential within ½ mile • Complete bike path to residential within 3 miles • Bike lockers and secure racks • Showers and changing facilities • Subsidized employee walk/bike program *Note: combine all applicable points for total value*	1 point 1 point 1 point 2 points 3 points	
T3.A.4 Shuttle/Transit Programs	• Local transit within ¼ mile • Light rail transit within ½ mile • Shuttle service to light rail transit station • Guaranteed ride home program • Subsidized Transit passes *Note: combine all applicable points for total value*	1 point 3 points 5 points 1 points 2 points	
T3.A.5 Commute Trip Reduction	Employer based Commute Trip Reduction (CTR). CTRs apply to commercial, offices, or industrial projects that include a reduction of vehicle trip or VMT goal using a variety of employee commutes trip reduction methods. The point value will be determined based upon a TIA that demonstrates the trip/VMT reductions. Suggested point ranges: • Incentive based CTR Programs (1–8 points) • Mandatory CTR programs (5–20 points)	TBD	
T3.A.6 Other Trip Reduction Measures	Point values for other trip or VMT reduction measures not listed above may be calculated based on a TIA and/or other traffic data supporting the trip and/or VMT reductions.	TBD	
Reduction Measure R2-T1: Alternative Transportation Options			
T1.E Mixed-Use Development			
T1.E.1 Mixed-Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed-use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled.	TBD	
T1.E.2 Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled.	TBD	

Feature	Description	Assigned Point Values	Project Points
T1.F Preferential Parking			
T1.F.1 Parking	• Provide reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles. • Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools and include adequate passenger waiting/loading areas.	1 point 1 point	
T1.G Signal Synchronization and Intelligent Traffic Systems			
T1.G.1 Signal Improvements	Techniques for improving traffic flow include: traffic signal coordination to reduce delay, incident management to increase response time to breakdowns and collisions, Intelligent Transportation Systems (ITS) to provide real-time information regarding road conditions and directions, and speed management to reduce high free-flow speeds. • Synchronize signals along arterials used by project. • Connect signals along arterials to existing ITS.	 1 point/signal 3 points/signal	
T1.H Increase Public Transit			
T1.H.1 Public Transit	The point value of a projects ability to increase public transit use will be determined based upon a Transportation Impact Analysis (TIA) demonstrating decreased use of private vehicles and increased use of public transportation. • Increased transit accessibility (1-15 points)	TBD	
Reduction Measure R2-T2: Adopt and Implement a Bicycle Master Plan to Expand Bike Routes around the County			
T2.B.1 Sidewalks	• Provide sidewalks on one side of the street (required) • Provide sidewalks on both sides of the street • Provide pedestrian linkage between commercial and residential land uses within 1 mile	0 points 1 point 3 points	
T2.B.2 Bicycle Paths	• Provide bicycle paths within project boundaries • Provide bicycle path linkages between commercial and other land uses • Provide bicycle path linkages between commercial and transit	1 point 2 points 5 points	
Reduction Measure R2-T4: Electrify the Fleet			
T4.B.1 Electric Vehicle Recharging	• Provide circuit and capacity in garages/parking areas for installation of electric vehicle charging stations. • Install electric vehicle charging stations in garages/parking areas	2 points/area 8 points/station	
T4.B.2 Neighborhood Electric Vehicle (NEV) Infrastructure	NEVs are electric vehicles usually built to have a top speed of 25 miles per hour, and a maximum loaded weight of 3,000 pounds. • Provide NEV safe routes within the project site. • Provide NEV safe routes between the project site and other land uses.	 3 points 5 points	
Reduction Measure R2-S1: Reduce Waste to Landfills			
S1.B.1 Recycling	County initiated recycling program diverting 80% of waste requires coordination with commercial development to realize this goal. The following recycling features will help the County fulfill this goal: • Provide separated recycling bins within each commercial building/floor and provide large external recycling collection bins at central location for collection truck pick-up • Provide commercial/industrial recycling programs that fulfills an on-site goal of 80% diversion of solid waste	 2 points 5 points	

Feature	Description	Assigned Point Values	Project Points
Other GHG Reduction Feature Implementation			
O.B.1 Other GHG Emissions Reduction Features	This allows innovation by the applicant to provide commercial design features that the GHG emissions from construction and/or operation of the project not provided in the table. Note that engineering data will be required documenting the GHG reduction amount and point values given based upon emission reductions calculations using approved models, methods, and protocols.	TBD	
Total Points Earned by Commercial/Industrial Project:			

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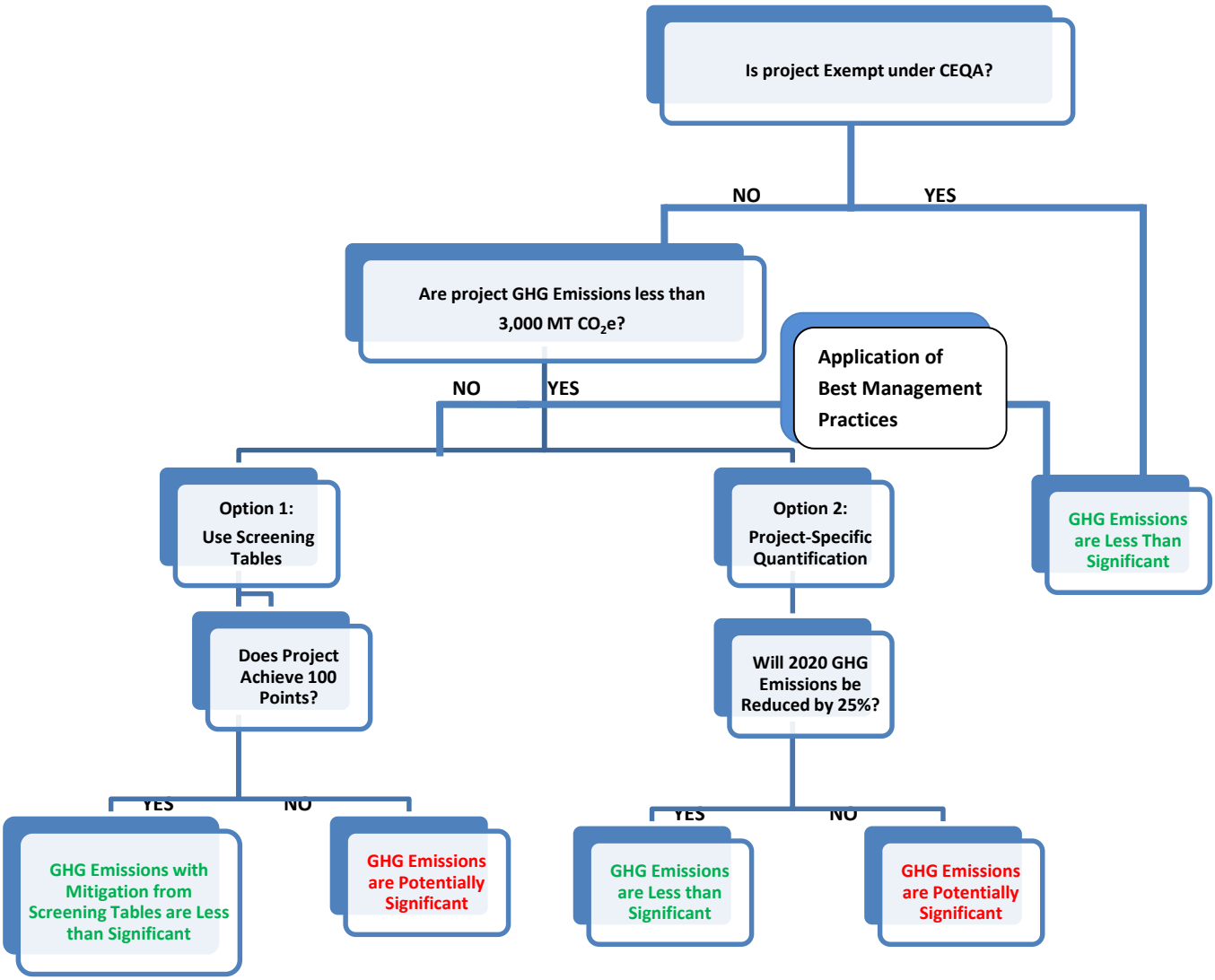
APPENDIX A: GHG DEVELOPMENT REVIEW PROCESS FLOW CHART DIAGRAM

Approach to Implementation of GHG Development Review



APPENDIX B: TRANSIT PRIORITY PROJECT AND SUSTAINABLE COMMUNITY PROJECT CHECKLIST

COUNTY OF RIVERSIDE TRANSIT PRIORITY PROJECT CHECKLIST

The following checklist will assist in determining if your project qualifies as a Transit Priority Project (TPP) and a Sustainable Community Project (SCP) as defined in PRC 21155(a), (b), and PRC 21152.

Yes	No	Is the project:	
☐	☐	1.	Located within ½ mile of an existing or future Metrolink Station?
☐	☐	2.	At least 50% residential use, based upon total square footage, and non-residential use within the project between 26% and 50% of total square footage with FAR of not less than 0.75?
☐	☐	3.	At or above a minimum net density of at least 20 dwelling units per acre?
☐	☐	4.	Is your project consistent with the general land use designations in the SCP (if you answered Yes to questions 1 through 3, then answer yes to this one)?

If you answered **Yes** to questions 1 through 4 then your project is a Transit Priority Project (TPP) as defined by PRC Section 21155(b). Continue with the next list of environmental questions:

Yes	No	Does the project:	
☐	☐	5.	Contain sites on the Cortese List?
☐	☐	6.	Site contain any hazardous substances, contaminated soil, or hazardous material?
☐	☐	7.	Site include historical resources?
☐	☐	8.	Have an unusually high risk of fire or explosion from material stored or used at properties within ¼ mile of the project site?
☐	☐	9.	Site currently include areas developed as Open Space (parks, habitat, etc.)?

Continue with the next list of land use questions below:

Yes	No		
☐	☐	10.	Does the project design have all the buildings at least 15% more efficient than Title 24 energy standards and uses 25% or less water than average households?
☐	☐	11.	Is the project site eight acres or less in size?
☐	☐	12.	The project does not include any single level of a building exceeding 75 TSF?
☐	☐	13.	The project does not conflict with nearby industrial uses?
☐	☐	14.	The project will sell at least 20% of housing to families of moderate income, or 10% of housing will be rented to families of low income, or at least 5% of housing will be rented to families of very low income, or the project provides open space equal or greater than 5 acres per 1,000 residents, or the developer will pay in-lieu fees sufficient to result in the development of affordable housing meeting one of the criteria described above?

Determining Eligibility based upon the answers:

Full CEQA Exemption for Sustainable Community Projects (SCPs)

If you answered **Yes** to all the TPP questions 1 through 4, **No** to all the environmental questions 5 through 9, and **Yes** to all the land use questions 10 through 14, then your project is an SCP and is eligible for a full CEQA Exemption under SB 375.

Transit Priority Projects (TPP)

If you answered **Yes** to all the TPP questions 1 through 4, but did not qualify as an SCP then your project is a TPP. Your TPP needs to incorporate all appropriate mitigation measures required by an applicable prior CEQA document (such as an adopted EIR for a Specific Plan) for your project location. If your TPP meets these two criteria then your TPP does not need to analyze the following impacts in the Sustainable Communities Environmental Assessment (SCEA) or CEQA analysis:

- Growth-inducing impacts,
- Regional transportation impacts, and
- GHG emissions related to passenger cars and light-duty trucks.

The impacts listed above are considered less than significant because the project is a TPP and the SCEA or CEQA document should reference PRC Section 21155.2(c)

Other Residential and Mixed-Use Projects

If you answered Yes to question 4, but did not qualify as an SCP or TPP, your project may not need to analyze some of the impacts in the CEQA analysis if your project is a **residential project or mixed-use project with 75%** of the total building square footage of the project is residential units. In addition, your project needs to incorporate all appropriate mitigation measures required by an applicable prior CEQA document (such as an adopted EIR for a Specific Plan) for your project location. If your project meets these criteria, then the CEQA analysis of your project does not need to analyze the following impacts:

- Growth-inducing impacts,
- Regional transportation impacts, and
- GHG emissions related to passenger cars and light-duty trucks.

The impacts listed above are considered less than significant because the project meets the criteria in PRC Section 21155.2(c)

APPENDIX C:
LAND USE DEVELOPMENT TABLES

Table C-A: Sample Project Sizes by Land Use Category that are below 3,000 MT CO_2e

Project Type	Project Size that Generates 3,000 Metric Tons of CO_2e
Single Family Residential (Single Family Detached)	80 units
Apartments/Condominiums/Townhouse	120 units
Retirement Community (Senior Housing Age 50 or older)	150 units
General Commercial/Retail/Office (refrigeration not to exceed 10% of total square footage)	160,000 square feet
Supermarket/Grocery/Discount Club (refrigeration exceed 10% of total square footage)	36,000 square feet
Restaurants (sit down)	8,200 square feet
Fast-Food Restaurants (Fast Food with or without /drive thru)	5,300 square feet
Gas Station	7,200 square feet
Industrial	53,000 square feet
Wireless Communication Towers	2,400 kw
Passive Park	200 acres
Active Park	60 acres

Note: Based upon statistical analysis of projects run in the CalEEMod model. Definitions are provided below in Table C-B.

Table C-B: Sample Project Sizes by Land Use Category that are below 3,000 MT CO_2e Definitions

Single Family Residential
Apartments/Condominiums/Townhouse Apartments High Rise: High-rise apartments are units located in rental buildings that have more than 10 levels and most likely have one or more elevators. Apartments Low Rise: Low-rise apartments are units located in rental buildings that have 1-2 levels. Apartments Mid Rise: Mid-rise apartments in rental buildings that have between 3 and 10 levels. Condo/Townhouse: These are ownership units that have at least one other owned unit within the same building structure.
Retirement Community Senior Housing (age 50 or older) These communities provide multiple elements of senior adult living. Housing options may include various combinations of senior adult housing single-family and/or multi-family, in support of assisted living, and skilled nursing care aimed at allowing the residents to live in one community as their medical needs change.
General Commercial/Retail/Office (refrigeration not to exceed 10% of total square footage) Home Improvement Super Store, Auto Care Center, Electronic Superstore, Hardware store, Pharmacy/Drugstore with & without drive thru, General Office Building, Bank with & without drive thru, Gov. Civic Center, Gov. Office Building, Medical Office, Office Park, Health Club, and Strip Mall (small strip shopping centers contain a variety of retail shops and specialize in quality apparel, hard goods and services such as real estate offices, dance studios, florists, and small restaurants) or Convenience Store not to exceed 5,000 square feet.
Supermarket/Grocery/Discount Club (refrigeration exceeds 10% of total square footage) Supermarkets: free-standing retail stores selling a complete assortment of food: food preparation and wrapping materials; and household, cleaning items. Supermarkets may also contain the following products and services: ATMs, automobile supplies, bakeries, books and magazines, dry cleaning, floral arrangements, greeting cards, limited-service banks, photo centers, pharmacies and video rental areas. Discount Club: a discount or warehouse store where shoppers pay a membership fee in order to take advantage of discounted prices on a wide variety of items such as food, clothing, tires, and appliances. Many items are sold in large quantities or in bulk.
Restaurants (sit down) Full-service eating establishments with typical turnover rates of at least one hour or longer. Patrons commonly wait to be seated, are served by a waiter, order from menus and pay for meals after they eat.

Fast-Food Restaurants (with or without drive thru)
Gas Station Gas Station includes the building square footage and excludes the canopy. Gas/Service Stations Projects that include “One building” with two to three ancillary uses: Fast Food with drive thru, Convenience Market 24-hour.
Industrial Warehouse with or without refrigeration, storage, distribution, manufacturing, research and development with exception to those uses that require Title 5 Permit from the AQMD (i.e., paint booths).
Wireless Communication Towers Cell Towers-freestanding
Passive Park Amenities include tot lots, picnic tables, and non-programmed open space.
Active Park Amenities include one of the following: game fields lighted, pool facility, and community center (as per the Comprehensive Park and Recreation Master Plan for Old Model Colony).

APPENDIX D: METHODOLOGY FOR THE DEVELOPMENT AND APPLICATION OF THE SCREENING TABLES

METHODS SUMMARY

The point values in the Screening Tables were derived from the projected emissions reductions that each of the Reduction Measures within the Riverside County CAP Update would achieve. The total emission reductions offered by each measure are based on both changes in existing land use activities as well as how new development is designed and built. In order to correctly allocate the emission reductions within the Screening Tables, the amount of emission reductions afforded new development had to be segregated from the aggregate total in a manner that is described below. Once the process of segregating new development from the aggregate reduction totals was completed, the points were then proportioned by residential unit or square footage of commercial/industrial uses. This was accomplished by taking the predicted growth in households and commercial/industrial uses by the year 2030 and proportioning the appropriate measures reduction quantities for new development to the residential and commercial/industrial land use sectors within the Screening Tables. These calculations result in point values that are allocated by residential unit or commercial/industrial square footage (measured in 1,000 square feet). Because of this outcome, the size of the project is not relevant to the Screening Tables. Regardless of size, each project needs to garner 100 points to demonstrate consistency with the CAP Update. Efficiency, not size of the project is critical. The following emission factors can be used in determining the amount of emissions reduced per point in the Screening Tables:

The respective calculated emission values are in metric tons of carbon dioxide equivalents (MT CO_2e)

For Residential Projects:

0.0389 MT CO_2e per Point per Residential Unit

For Commercial and Industrial Projects:

0.0322 MT CO_2e per Point per 1,000 Square Feet of Gross Commercial/Industrial Building Area

Note that the Screening Tables and point values are best used for typical development projects processed by the County. Examples of typical development projects include residential subdivisions, multi-family residential apartments, condominiums and townhouses, retail commercial, big box retail, office buildings, business parks, and typical warehousing. Mixed-use projects can use the Screening Tables following the instructions. Transit-oriented development (TOD), and infill projects are able to use the Screening Tables; however, the Screening Table points are likely to underestimate total emission reductions afforded these types of projects. Note that the Screening Tables include the opportunity to custom develop points (using the formula above) in order to account for the predicted reductions in vehicle trips and vehicle miles traveled within a project-specific traffic study and GHG analysis. TOD and infill projects can be more accurately assessed and points allocated using this method.

However, more unusual types of industrial projects, such as cement manufacturing, metal foundries, refrigerant manufacturing, electric generating stations, and oil refineries, cannot use the Screening Tables because the emission sources for those types of uses were not contemplated in the CAP Update.

DEVELOPMENT OF THE POINT VALUES

The first step in developing the point system is the need to determine the total reductions afforded the CAP Update. Figure D-1 below shows the total emission reductions achieved by the CAP Update. In total, 1,667,460 MT CO_2e would be reduced by the County's local measures as a result of the CAP Update by 2030. This amount includes reductions afforded existing building retrofits and other changes to activities associated with existing land uses, as well as reductions associated with new development.

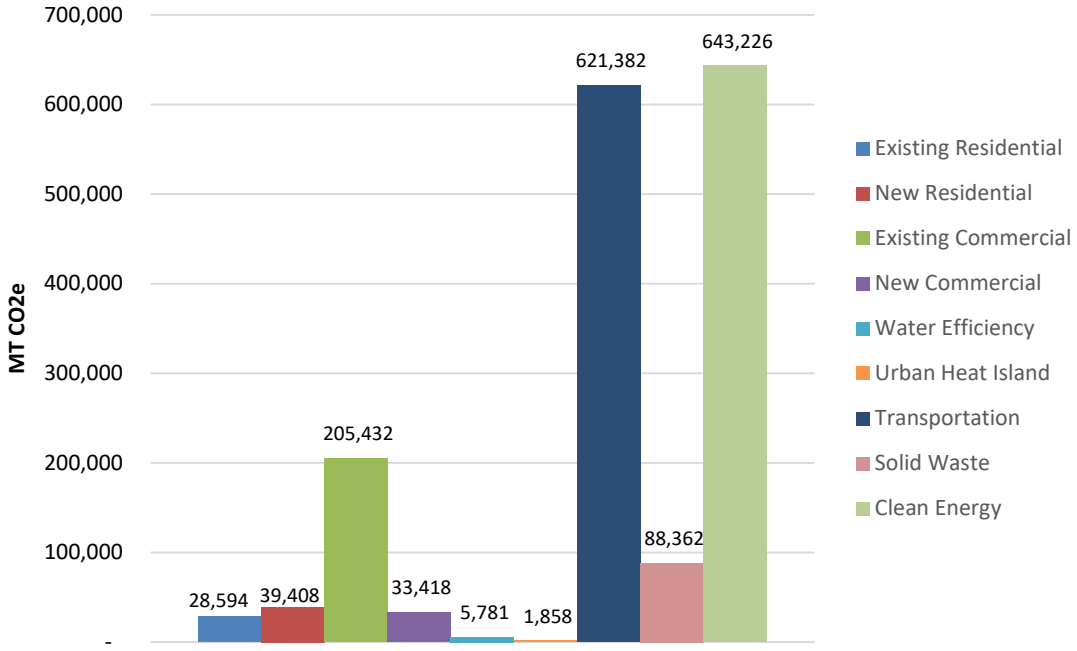


Figure D-1: GHG Emission Reductions by Sector in 2030

The next step is to segregate the amount of emissions that would be reduced within new development from the County strategies total.

Table D-A summarizes the reduction in emissions afforded new development from the reduction measures. Table D-A shows 752,217 MT CO_2e being reduced from new development as a result of the County strategies. Within the 752,217 MT CO_2e of new development reductions afforded County strategies, 439,023 MT CO_2e of emissions reduced is accomplished through new commercial and industrial projects, and 313,194 MT CO_2e of emissions reduced is accomplished through new residential projects.

The next step in allocating point values is to determine the number of new homes and commercial buildings that are anticipated by year 2030. The County predicts that 80,491 new residential units will be needed by 2030 to accommodate the population growth by 2030. A total of approximately 136,414,585 square feet of new commercial and industrial buildings within the unincorporated County area is needed

Table D-A: GHG Reductions from New Development

Reduction Number	Reduced Emissions (MT CO_2e)		
	Reduction Measure Name	Commercial/ Industrial	Residential
R2-EE5	Exceed Energy Efficiency Standards in New Residential Units		39,408
R2-EE10	Exceed Energy Efficiency Standards in New Commercial Units	33,418	
R2-W1	Water Efficiency through Enhanced Implementation of Senate Bill X7-7	1,689	1,140
R2-W2	Exceed Water Efficiency Standards	34	23
R2-L1	Tree Planting for Shading and Energy Saving	4	3
R2-L2	Light Reflecting Surfaces for Energy Saving	550	371
R2-T1	Alternative Transportation Options	48,273	32,584
R2-T2	Adopt and Implement a Bicycle Master Plan to Expand Bike Routes around the County	666	449
R2-T3	Ride-Sharing and Bike-to-Work Programs within Businesses	54,507	36,793
R2-T4	Electrify the Fleet	81,791	55,210
R2-S1	Reduce Waste to Landfills	26,341	17,780
R2-CE1	Clean Energy	10,196	6,883
R2-CE3	Community Choice Aggregation Program	181,553	122,549
Total Reductions for New Development		**439,023**	**313,194**

Source: Compiled by LSA (March 2019).
County = County of Riverside
GHG = greenhouse gases
MT CO_2e = metric tons of carbon dioxide equivalents

to accommodate anticipated job growth. This estimate is based on the relationship between past growth in employment and the average growth in commercial/industrial building area for Riverside County.

Dividing the 313,194 MT CO_2e reductions of emissions afforded the reduction measures for new residential development by the anticipated 80,491 new residential units that will be built yields 3.89 MT CO_2e per residential unit that needs to be reduced to fulfill the anticipated reductions of the CAP Update. That amount equals 100 points, producing the following for the point values:

0.0389 MT CO_2e per Point per Residential Unit

A similar process was used to derive the point value for new commercial/Industrial development. Because commercial/industrial land uses are typically described in thousand square feet of building space, the point value was calculated as follows:

0.0322 MT CO_2e per Point per 1,000 Square Feet of Gross Commercial/Industrial Building Area