RANCHO CUCAMONGA

PLAN RC

Rancho Cucamonga
CLIMATE ACTION PLAN

Adopted December 2021

CITY OF RANCHO CUCAMONGA CLIMATE ACTION PLAN

PREPARED BY:

The City of Rancho Cucamonga

IN CONSULTATION WITH:

Ascent Environmental, Inc.

Adopted December 2021

TABLE OF CONTENTS

TABLES

LIST OF ABBREVIATIONS

2017 Scoping Plan	2017 Climate Change Scoping Plan
AB	Assembly Bill
ABAU	Legislative-Adjusted BAU
BAU	business-as-usual
CAP	Climate Action Plan
CARB	California Air Resources Board
CCA	Community Choice Aggregation
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbon
CH_4	methane
Checklist	Climate Action Plan Consistency Review Checklist
City	City of Rancho Cucamonga
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
EO	Executive Order
EV	electric vehicle
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
MPO	metropolitan planning organization
$MTCO_2e$	metric tons of carbon dioxide equivalent
N_2O	nitrous oxide
O_3	ozone
OPR	California Governor's Office of Planning and Research
PFC	perfluorocarbon
RCMU	Rancho Cucamonga Municipal Utility
RTP	regional transportation plan
SANBAG	San Bernardino Associated Governments
SAP	Sustainable Community Action Plan

SB	Senate Bill
SBCOG	San Bernardino Council of Governments
SBCTA	San Bernardino County Transportation Authority
SCAG	Southern California Association of Governments
SCE	Southern California Edison
SCS	sustainable communities strategy
SF_6	sulfur hexafluoride
SOI	Sphere of Influence
VMT	vehicle miles traveled

1. INTRODUCTION

The City has prepared this Climate Action Plan (CAP) as a companion to the General Plan, which articulates the City's vision of a 21st century world-class community, and lays out a set of strategies to achieve the community's vision for the future. The General Plan envisions a world-class community, in part, as one that reduces its contributions to a changing climate, and commits the City to doing so through preparing, maintaining, and implementing this CAP. This CAP also helps implement the General Plan by including the elements of a "qualified" plan under State regulations (CCR Section 15183.5[b]), which unlocks project-level environmental review streamlining benefits for development consistent with the General Plan.

As a companion document, this CAP's measures to reduce the community's contributions to climate change are grounded in the General Plan's core community values of Health, Equity, and Stewardship. This CAP also builds on the broad climate change policies set forth in the General Plan. Overall, the General Plan directs the City to reduce its climate change-causing greenhouse gas (GHG) emission in alignment with statewide reduction goals, and to prioritize CAP measures that also achieve economic, health, social, environmental, and other co-benefits for the City and its residents and businesses. Structural equity is a priority, and CAP measures involving physical improvements will be used to improve areas of the city where existing improvements are lacking.

The General Plan recognizes that nearly all of the community's climate change contributions are from vehicle travel and building energy uses, and therefore the largest reductions will also need to come from these activities (refer to Figure 2-1). The development envisioned by the General Plan is intended to reduce the need to drive by improving access by sidewalk, pathway, and trail, and by encouraging a more compact urban form that arranges land uses close to where people live to give them options for moving around with or without their vehicle. It promotes maintaining an urban forest of trees, parks, and landscaping, connecting pedestrian paths and bikeways throughout the city to encourage active transportation, giving priority to transit, incentives for telecommuting and carpooling. The General Plan also recognizes that changes in vehicle technology will reduce GHG emissions, and includes policies to increase the use of electric or zero emissions vehicles in the City's vehicle fleet and by residents and businesses. Transit services are also envisioned as being powered by electricity or zero emissions technologies.

The General Plan also envisions a community of energy-efficient buildings that rely primarily on renewable and non-polluting sources of energy. This means more high-tech changes like promoting renewable energy installations, facilitating green technology and business, using sustainable design in new construction, and retrofitting existing homes and businesses to improve efficiency and use the latest technologies. Low-tech methods are also part of the vision, including passive building design suited to the local arid environment, building materials that avoid contributing to the urban heat island effect, and cooling strategies that provide shading in public spaces throughout the city.

To supplement its focus on vehicle travel and building energy use, the General Plan also lays out policies to reduce GHG emissions that result from how the community sources and consumes water, uses off-road equipment, and creates and disposes of solid waste.

This CAP channels the General Plan's vision and policies into a detailed plan of action for Rancho Cucamonga, as follows:

Chapter 2 Greenhouse Gas Emissions Inventory, Forecasts, and Targets

This chapter sets the groundwork for this CAP by documenting the sources of the community's contributions to climate change, including an existing communitywide GHG emissions inventory (2018), and future forecasts under implementation of the General Plan (2030 and 2040). Data for 2018 are used to represent the existing conditions because that was the most recent year for which relevant data were available. Two future emissions forecasts are provided: one depicting a "business-as-usual" (BAU) scenario in which no future action is taken by the City, State, or federal government to reduce emissions; and a second "legislatively-adjusted" BAU depicting the effects of existing State and federal law and regulations on future communitywide emissions for the city. The legislatively-adjusted BAU also shows the GHG reductions that would result from the regional and local public transit improvements identified in the General Plan, including the Boring Tunnel to Ontario Airport, Brightline-West High-Speed Rail, Metro Gold Line extension, SBCTA Bus Rapid Transit along Foothill Boulevard and Haven Avenue, and a City-operated circulator shuttle system. The data supporting the inventory and forecasts are included in **Appendix A**.

This chapter also sets forth numeric GHG reduction targets for the City for 2030 and 2040, in alignment with the statewide target for 2030 and statewide goal for 2050. Senate Bill 32 (2016) requires the statewide emissions level to be reduced to 40% below 1990 levels by 2030, while Executive Orders B-30-15 (2015) and S-3-05 (2005) provide a statewide goal of reducing emissions to 80% below 1990 levels by 2050. The City has established a target for 2040 because that is the horizon year of the General Plan. Because there is no State GHG reduction target or goal for 2040, an 2040 interim target was established based on the trend in reductions the City needs to achieve by 2040 to be on pace to achieve the 2050 goal. The target setting calculations are included in **Appendix A**.

This CAP has established GHG reduction targets for the City that align with the State's targets and goals by taking into account statewide sources of GHG emissions relevant to the city and the State's existing progress toward its GHG targets and goals. The City's targets are to reduce communitywide GHG emissions to:

- 31% below 2018 levels by 2030; and
- 47% below 2018 levels by 2040.[1]

The results demonstrate that now and in the future, vehicle travel and building energy use are responsible for nearly all communitywide GHG emissions. Moreover, they show that State and federal actions significantly reduce future communitywide emissions for the city, but not enough for the city to achieve its targets. Additional actions are needed to close this "gap," and are described in detail in Chapter 3.

Chapter 3 Greenhouse Gas Reduction Measures

Informed by the results of Chapter 2, this chapter presents an ambitious set of measures that the City has identified in an effort to close the emissions gap and achieve its 2030 and 2040 targets. The measures predominantly focus on vehicle travel and building energy use, and are targeted at both new development, the existing built environment, and City government operations. This chapter presents the quantified GHG emissions reduction potential in 2030 and 2040 for each measure, and also presents total GHG emissions reduction potential in 2030 and 2040 for all measures. Supporting measures with benefits that cannot be quantified at this time are also presented.

[1] While this CAP does not establish a City GHG reduction target for 2050, the City's communitywide GHG emissions would need to be 62% below 2018 levels by 2050 to be in alignment with the statewide goal of EO B-30-15 and EO S-3-05.

The results demonstrate that set of measures are able to meet and exceed the 2030 target and make substantial progress toward the 2040 target. Detailed calculations for each individual measure showing exceedance of the 2030 target and substantial progress toward the 2040 target are included in **Appendix B**. Chapter 4 describes implementation and monitoring activities to realize the GHG emissions reduction potential presented in Chapter 3.

Chapter 4 Implementation and Monitoring

This chapter describes how this CAP will be implemented through a phased approach in which implementation actions for CAP measures are adopted by 2025. Chapter 4 also sets forth City's commitment to regularly monitor implementation progress and to adjust the measures and update this CAP as needed to maintain progress toward achieving the City's GHG reduction targets. It also describes how new development will be required to implement CAP measures identified in the City's CAP Consistency Checklist (**Appendix C**), and identifies potential funding sources to support CAP implementation (**Appendix D**).

This page intentionally left blank.

2. GREENHOUSE GAS EMISSIONS INVENTORY, FORECASTS, AND TARGETS

This chapter sets the groundwork for this CAP by documenting the sources of the community's contributions to climate change, including an existing communitywide GHG emissions inventory (2018), and future forecasts under implementation of the General Plan (2030 and 2040). This chapter also sets forth numeric GHG reduction targets for the City, in alignment with the statewide target for 2030 and statewide goal for 2050. The City has established a target for 2040 because that is the horizon year of the General Plan. Because there is no State GHG reduction target or goal for 2040, an 2040 interim target was established based on the trend in reductions the City needs to achieve by 2040 to be on pace to achieve the 2050 goal.

2.1 Existing Communitywide GHG Emissions Inventory (2018)

For this CAP the City prepared an inventory of existing communitywide GHG emissions for 2018, which accounts for the most recently available data for all community emissions sectors. This 2018 inventory provides more recent information and methods than the previous 2008 inventory prepared by San Bernardino Associated Governments (SANBAG; now San Bernardino Council of Governments [SBCOG]/San Bernardino County Transportation Authority [SBCTA]) and the 2016 inventory prepared for the City by SBCOG/SBCTA. The 2008 inventory was utilized in the City's Sustainable Community Action Plan (SAP), a visionary document that identified a menu of goals and actions the City could take to reduce communitywide GHG emissions to 15 percent below 2008 levels by 2020.

The 2018 inventory serves as a reference point for the City in preparing emissions forecasts and setting reduction targets for 2030 and 2040 as part this CAP. By preparing an inventory for 2018, the City is honoring its commitment in the Rancho Cucamonga SAP to update the GHG emissions inventory periodically to reflect changes in methodology, technology, and to set the baseline from which emissions will be forecasted and reduction targets set based on updated State guidance (City 2017). Having an up-to-date inventory aligns this CAP with the most recent available data, methodologies, and science. The modeling supporting the inventory is included in **Appendix A**.

The emissions categories are on-road transportation, building energy, solid waste, water, wastewater, off-road transportation, and agriculture. A description of emissions associated with each category (organized by total contribution to communitywide GHG emissions, from biggest to smallest) and the relationship between the categories identified in this inventory and categories are defined below.

- **On-road transportation:** fuel combustion in on-road vehicles, which include passenger vehicles (i.e., cars and light-duty trucks), and medium- and heavy-duty trucks. Fuel consumption is generally tied to the fuel efficiency and fuel source of vehicles, along with number of miles driven.
- **Building Energy:** electricity and natural gas use from all residential and non-residential buildings.
- **Solid waste:** fuels combusted in the equipment used to process waste, and from gases released as waste in landfills decays over time.

- **Water:** consumption of water in buildings and landscaped areas, the conveyance, treatment, and distribution of water from its source to the end user.
- **Wastewater:** generation and treatment of wastewater.
- **Off-road transportation:** fuel combustion associated with vehicles, heavy equipment, and machinery operating off paved roads.
- **Agriculture:** application of fertilizer for crop cultivation, off-road agriculture equipment, and emissions generated by livestock.

Results from the City's GHG emissions inventory are shown in **Figure 2-1** and **Table 2-1** below. The total GHG emissions from existing communitywide activities in 2018 were estimated at 1,426,757 $MTCO_2e$. Nearly all (96 percent) communitywide GHG emissions were attributable to on-road transportation and building energy consumption. On-road transportation, which includes emissions from vehicular gasoline and diesel consumption, was calculated based on estimated vehicle miles traveled (VMT) for vehicles traveling within and to/from the city and accounted for approximately 51 percent of communitywide emissions in 2018.

Emissions from existing communitywide activities are equivalent to the emissions from consuming **over 160 million gallons of gasoline** (EPA 2021).

Existing emissions from on-road transportation are equivalent to the emissions from consuming **over 1.6 million barrels of oil** (EPA 2021).

Emissions generated from building energy account for about 45 percent of the City's 2018 GHG emissions inventory and are equivalent to the emissions from powering over 76,000 homes for one year (EPA 2021). Emissions from solid waste, water, off-road transportation, wastewater, and agriculture collectively account for about 4 percent of the City's 2018 baseline emissions which is equivalent to over 6,000 passenger vehicles driven for one year (EPA 2021).

Figure 2-1. City of Rancho Cucamonga Existing Communitywide Greenhouse Gas Emissions by Sector (2018)

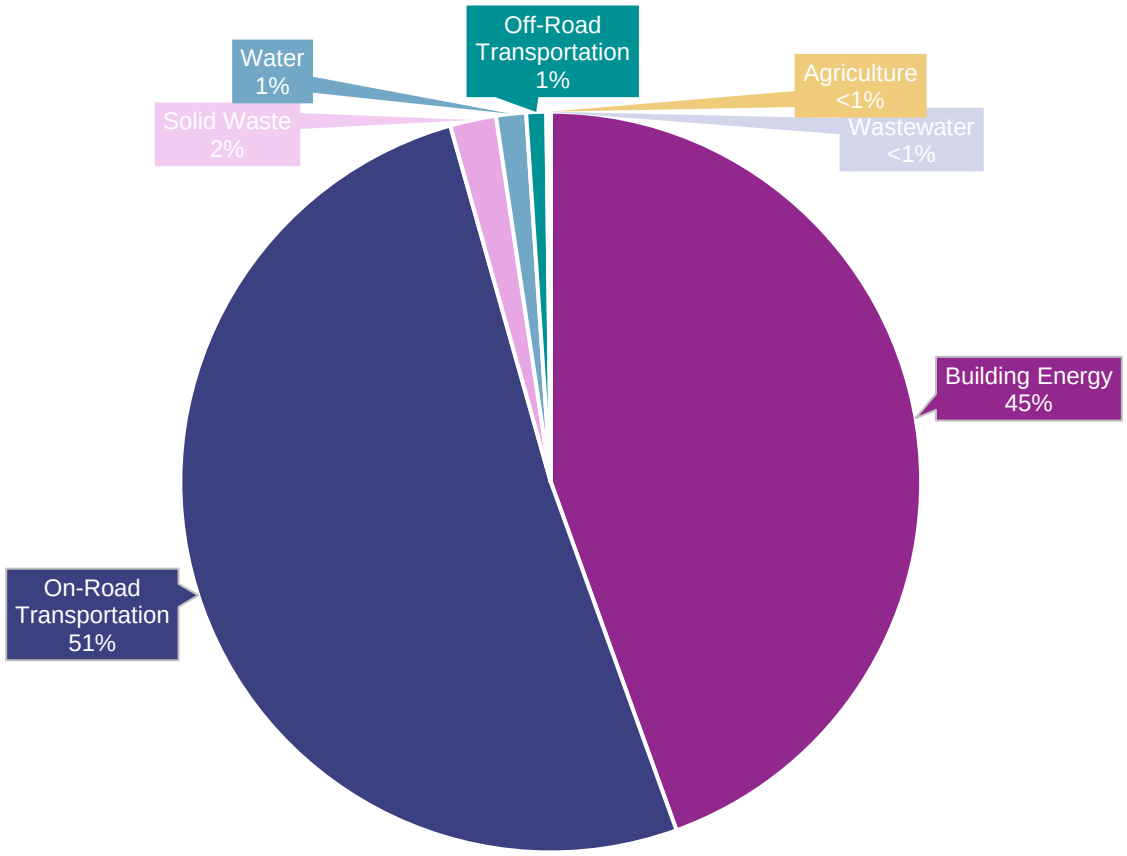


Table 2-1 City of Rancho Cucamonga Existing Communitywide Greenhouse Gas Emissions Inventory (2018)

Emissions Sector	Annual GHG Emissions ($MTCO_2e$)	Percent of Annual Total (%)
On-Road Transportation	729,617	51
Building Energy	634,699	45
Solid Waste	28,632	2
Water	18,650	1
Off-Road Transportation	12,405	1
Wastewater	2,454	<1
Agriculture	300	<1
Total	1,426,757	100

GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Columns may not equal the exact value summed due to rounding.

Source: Ascent Environmental, Inc. 2021

2.2 Emissions Forecasts

Estimates of future emissions levels are based on a continuation of current trends in activity and population growth. These forecasts also account for legislation in effect at the time of the CAP that could affect emissions in the future. Forecasts provide insights into the scale of local reductions needed ("local gap") to achieve GHG emissions reduction targets, as well as the local effects legislative actions will have on emissions.

The first forecast scenario used in the CAP, referred to as the "business-as-usual" (BAU) forecast, assumes that no additional State or federal legislative actions, beyond what have already been adopted, will be made to reduce GHG emissions in the future. They do not account for any GHG emissions reductions associated with the implementation of the CAP, or legislative actions. The BAU forecast is based on the population, employment, housing, non-residential development, and vehicle miles traveled projections of the General Plan. The second forecast scenario, referred to as a Legislative-Adjusted BAU (ABAU) forecast, accounts for the effects of existing State and federal law and regulations on future communitywide emissions for the city. **Table 2-2** provides the legislative actions considered in the ABAU forecast. Both forecast scenarios reflect levels of future growth and development under the General Plan. The modeling supporting the forecasts is included in **Appendix A**.

Table 2-2 Relevant Federal and State Regulations

Federal	Federal Clean Air Act (CAA)	In 2007, the U.S. Supreme Court ruled that CO_2 is an air pollutant as defined under the CAA, and the U.S. Environmental Protection Agency has the authority to regulate emissions of GHG.
Federal[1]	Corporate Average Fuel Economy (CAFE) Standards	The federal CAFE Standards determine the fuel efficiency of certain vehicle classes in the U.S.
State	Executive Order S-01-07	Executive Order S-01-07 set forth a low carbon fuel standard for California, whereby the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.
State	AB 1493	AB 1493 (Pavley) required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks.
State	AB 197	AB 197 creates a legislative committee to oversee CARB and requires CARB to take specific actions when adopting plans and regulations pursuant to SB 32 related to disadvantaged communities, identification of specific information regarding reduction measures, and information regarding existing GHGs at the local level.
State	SB 350	SB 350 requires the State to set GHG emission reduction targets for the load serving entities through Integrated Resource Planning. SB 350 requires an increase in the Renewable Portfolio Standard to 50 percent by 2030 and doubling energy savings in electricity and natural gas end uses.
State	RPS	Requires California energy utilities to procure 33 percent of electricity from renewable sources by 2020.
State	SB 100	Requires California energy utilities to procure 60 percent of electricity from renewable sources by 2030 and 100 percent from renewable and zero-carbon sources by 2045.
State	California Building Efficiency Standards (Title 24, Part 6)	Requires all new buildings in California to comply with energy efficiency standards established by CEC.
State	AB 341	California target to achieve a 75 percent solid waste diversion target by 2020.

Table 2-2 Relevant Federal and State Regulations

State	Pavley Clean Car Standards	Establishes GHG emission reduction standards for model years 2009 through 2016 that are more stringent than federal CAFE standards.
State[1]	Advanced Clean Car Standards	Establishes GHG emission reduction standards for model years 2017 through 2025 that are more stringent than federal CAFE standards.
State	SBX7-7	Requires a 20 percent reduction in per capita water usage by 2020.
Federal	Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles	Establishes fuel efficiency standards for medium- and heavy-duty engines and vehicles.

Notes: AB = Assembly Bill; CAFE = Corporate Average Fuel Economy; CEC = California Energy Commission; EPA = Environmental Protection Agency; GHG = greenhouse gas; RPS = Renewables Portfolio Standard; SB = Senate Bill; VMT = vehicle miles traveled.

Source: Ascent Environmental, Inc. 2021

1. On March 31, 2020, the National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (EPA) finalized the Safer Affordable Fuel-Efficient Vehicles Rule (SAFE Rule), which sets fuel economy and carbon dioxide standards for passenger cars and light trucks for model years 2021 through 2026.

Growth and Development Assumptions used in this Climate Action Plan

The emissions forecasts are based on growth in the city's population, jobs, housing, vehicle miles traveled, and non-residential development informed by and consistent with the assumptions used in the General Plan, between 2018 and 2040. The factors for population and jobs were interpolated for 2030 assuming linear annual change between 2018 and 2040. The 2040 growth factors from the General Plan for housing and the non-residential land uses were split evenly to estimate growth in 2030. **Table 2-3** shows the 2040 General Plan growth and development assumptions used in the BAU and ABAU scenario forecasts.

Table 2-3 Growth and Development Assumptions Used in this Climate Action Plan

Factor	2018	2030		2040	
	Total	Total	% Change (from 2018)	Total	% Change (from 2018)
Population	175,679	207,429	18%	233,887	33%
Jobs	85,379	94,299	10%	103,368	21%
Housing Units	60,795	73,638	21%	86,480	42%
Retail Square Footage	14,317,200	16,390,800	14%	18,464,400	29%
Hotel Rooms	1,161	1,751	51%	2,340	102%
Office Square Footage	7,868,383	9,186,719	17%	10,505,055	34%
Industrial/Flex Square Footage	15,937,600	18,001,200	13%	20,064,800	26%
Art, Entertainment, & Recreation Square Footage	5,456,800	5,534,800	1%	5,612,800	3%
Annual Vehicle Miles Traveled	1,829,880,199	1,957,077,965	7%	2,063,076,104	13%

Source: Fehr & Peers 2021; General Plan 2021

Forecast Results

As shown in **Table 2-4**, annual GHG emissions would increase by 11 percent from 2018 levels under BAU conditions. With application of the adopted legislative actions under the ABAU forecast, GHG emissions would decrease by 277,959 $MTCO_2e$ in 2030 (19 percent) relative to 2018 emissions. By 2040, GHG emissions under the ABAU forecast would decrease by 364,294 $MTCO_2e$ (26 percent) relative to 2018 emissions. Similar to the existing condition, vehicle travel and building energy use are responsible for nearly all communitywide GHG emissions in both future scenarios (approximately 95 percent) for 2030 and 2040.

GHG reductions in 2030 under the ABAU forecast are equivalent to **removing over 60,000 passenger vehicles** from the road for one year; 2040 reductions under ABAU are equivalent to **removing over 79,000 passenger vehicles** from the road for one year (EPA 2021).

Table 2-4 Emissions Forecasts ($MTCO_2e$)

Emissions Sector	2018	2030		2040	
		BAU	ABAU	BAU	ABAU
On-Road Transportation	729,617	813,424	562,416	873,287	559,169
Building Energy	634,699	728,552	522,132	808,735	437,801
Solid Waste	28,632	33,806	33,806	38,118	38,118
Water	18,650	21,956	12,916	24,716	7,948
Off-Road Transportation	12,405	14,647	14,647	16,515	16,515
Wastewater	2,454	2,898	2,581	3,267	2,612
Agriculture	300	300	300	300	300
Total	1,426,757	1,615,583	1,148,798	1,764,938	1,062,462
Percent change from 2018 (%)	-	*13*	*-19*	*24*	*-26*

ABAU = adjusted business-as-usual; BAU = business-as-usual; MTCO2e = metric tons of carbon dioxide equivalent

Source: Ascent Environmental, Inc. 2021

The ABAU emissions inventory is utilized as the underlying basis to determine reduction targets and the level of reduction needed from the CAP measures. The legislative actions applied to estimate the ABAU are included in **Table 2-2**.

2.3 Reductions Targets

This chapter also sets forth numeric GHG reduction targets for the City for 2030 and 2040, in alignment with the statewide target for 2030 and statewide goal for 2050. Senate Bill 32 (2016) requires the statewide emissions level to be reduced to 40% below 1990 levels by 2030, while Executive Orders B-30-15 (2015) and S-3-05 (2005) provide a statewide goal of reducing emissions to 80% below 1990 levels by 2050. The City has established a target for 2040 because that is the horizon year of the General Plan. Because there is no State GHG reduction target or goal for 2040, an 2040 interim target was established based on the trend in reductions the City needs to achieve by 2040 to be on pace to achieve the 2050 goal. The target setting calculations are included in **Appendix A**.

Because the necessary data are not available to estimate the City's 1990 emission levels, proportional targets for the CAP were developed that express the level of GHG emissions reductions that would be needed locally between 2018 and future target years to demonstrate consistency with statewide targets and goals.

To determine an equivalent reduction target at the local level, CARB's 2017 Scoping Plan recommends communitywide GHG reduction goals for local CAPs that will help the State achieve its 2030 target and longer-term 2050 goal. CARB recommends that local governments evaluate and adopt robust and quantitative locally appropriate goals that align with the statewide per capita targets and the State's sustainable development objectives to develop plans to achieve local goals (CARB 2017). The 2017 Scoping Plan clarifies that an evidence-based local per capita goal, or some other metric that the local jurisdiction deems appropriate (e.g., mass emission, per service population), may be used (CARB 2017).

With CARB's recommendations in mind, reduction targets were derived using a mass emissions approach from the 2018 baseline. Equivalent targets were calculated for the CAP relative to the California Greenhouse Gas 2000-2018 Emissions Trends and Indicators Report (CARB 2020). Specifically, the State's 2018 GHG emissions inventory was compared to the State's 2030 target mass emissions targets relative to its 1990 inventory, from which specific percent reductions relative to 2018 were developed.

When developing the CAP's GHG reduction targets, the analysis includes adjustments to the State's 2018 GHG emissions inventory and statewide targets to exclude GHG emissions sectors that are being regulated at the State-level or sectors not located in the City and, therefore, local jurisdictions are not responsible for helping to reduce emissions from these sectors to reach the statewide targets. Specifically, this analysis excludes emissions from the Cap-and-Trade program and emissions from the Agricultural sector accounted for in the statewide inventory. As a result of these adjustments and consistent with the State's targets relative to 2018 levels, the CAP's targets are expressed according to the percentage reductions in GHG emissions relative to the City's 2018 community-wide GHG emissions levels. The following adjusted reduction targets should be achieved in the city to achieve GHG emissions reductions in alignment with State targets and goals:

- 31 percent below 2018 levels by 2030 and
- 47 percent below 2018 levels by 2040.[2]

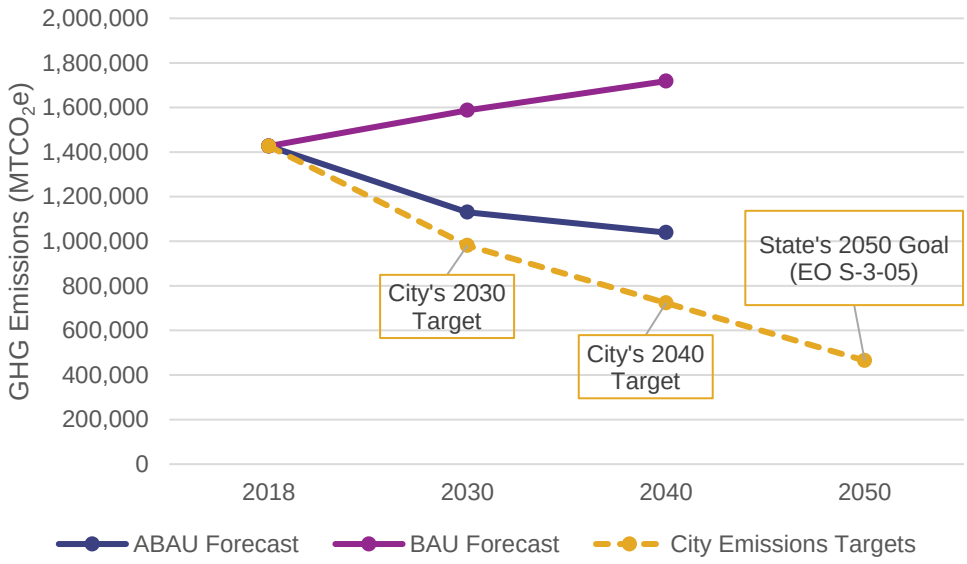
The City's 2030 goal to reduce emissions to 31 percent below 2018 levels is equivalent to 140,641 $MTCO_2e$ and is based on the State's reduction target identified in Senate Bill 32. The City's 2040 goal to reduce emissions to 47 percent below 2018 levels is equivalent to 306,244 $MTCO_2e$ and is set based on the state goals by year 2050. The GHG reduction targets also take into account statewide sources of GHG emissions relevant to sources within the city and the State's existing progress toward its GHG targets and goals.

The Role of Local Action

Figure 2-2 shows that State and federal actions would significantly reduce future communitywide emissions in the city, but not enough for the city to achieve its targets. Additional actions are needed to close this "gap." The City has identified an ambitious set of measures in an effort to close this emissions gap and achieve its 2030 and 2040 targets.

[2] While this CAP does not establish a City GHG reduction target for 2050, the City's communitywide GHG emissions would need to be 62% below 2018 levels by 2050 to be in alignment with the statewide goal of EO B-30-15 and EO S-3-05.

Figure 2-2. Business-As-Usual and Legislative-Adjusted (ABAU) Forecast Emissions Relative to the City's Emission Reduction Targets



ABAU = legislative-adjusted business-as-usual; BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent
Source: Ascent Environmental, Inc. 2021

California has a legislatively adopted 2030 GHG emission reduction target for 2030 and the State's 2050 goal, established by executive order S-3-05, provides a guide for long-term planning. While the City has elected to establish a long-term 2040 target aligned with the 2040 horizon year of the General Plan, it would be speculative to demonstrate achievement of a 2040 goal with information known today. CARB's 2017 Scoping Plan focuses on meeting the statewide 2030 reduction target, as directed in SB 32. Therefore, the CAP aligns with the state in proposing measures to meet the 2030 target and has set a 2040 target based upon an emissions reductions trajectory in alignment with the State's 2050 goal. To the extent climate change science, policy, technology, and other factors continue to advance, the City will be able to apply new reductions toward reducing emissions on a trajectory consistent with the statewide 2050 goal in future CAP updates.

3. GREENHOUSE GAS REDUCTION MEASURES

This chapter presents an ambitious set of measures that the City has identified in an effort to close the emissions gap and achieve its 2030 and 2040 targets. The measures predominantly focuses on vehicle travel and building energy use, and are targeted at both new development, the existing built environment, and City government operations. This chapter presents the quantified GHG emissions reduction potential in 2030 and 2040 for each measure, and also presents total GHG emissions reduction potential in 2030 and 2040 for all measures. Supporting measures with benefits that cannot be quantified at this time are also presented.

3.1 Summary of GHG Reduction Measures

Table 3-1 shows that the set of measures identified in this CAP are able to meet and exceed the 2030 target and make substantial progress toward the 2040 target. Detailed calculations for each individual measure and showing exceedance of the 2030 target and substantial progress toward the 2040 target are included in **Appendix B**.

The emissions reduced by the CAP measures in 2030 are equivalent to the emissions removed from the atmosphere by **over 228,000 acres (about 358 square miles) of U.S. forests in one year** (EPA 2021).

Table 3-1 Contributions of City CAP Measures Toward Meeting the City's GHG Reduction Targets ($MTCO_2e$)

Emissions	2030	2040
Forecasted Total Communitywide Emissions		
BAU Forecasts	1,615,583	1,764,938
Reductions from Federal and State Legislative Actions (relative to BAU Forecasts)	466,785	702,476
ABAU Forecasts (BAU Forecasts minus Federal and State Legislative Actions)	1,148,798	1,062,462
The City's GHG Reduction Targets		
Total Emissions Allowed to Achieve City's Targets (Total Communitywide Emissions) *(percent reduction from 2018 levels)*	980,934 *(31 percent lower than 2018 levels[1])*	722,985 *(47 percent lower than 2018 levels)*
Additional emissions reductions needed to achieve City's Targets ("the emissions gap")	167,864	339,478
The City's CAP Measures		
Reductions from City CAP Measures	186,840	199,709
Emissions After CAP Measure Implementation (Total Communitywide Emissions) (ABAU Forecasts minus CAP Measure Reductions)	961,957	862,754
Percentage (%) of gap closed through CAP Measures	111%	59%
City Target Achieved?	Yes	No

1. The City's communitywide GHG emissions level in 2018 was 1,426,757 $MTCO_2e$.

ABAU = legislative-adjusted business-as-usual; BAU = business-as-usual; CAP = Climate Action Plan; GHG = greenhouse gas emissions; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Figures shown are annual emissions values forecasted to occur in a single year (2030 and 2040).

Source: Ascent Environmental, Inc. 2021

3.2 Goals, Strategies, and Measures

This CAP proposes goals, strategies, and measures to reduce communitywide and municipal GHG emission reductions in the categories of zero emission and clean fuels, efficient and carbon free buildings, renewable energy and zero carbon electricity, carbon sequestration, local food supply, efficient water use, waste reductions, and sustainable transportation. Each measure is described in detail in this chapter, including the full description of each measure, key performance metrics, and their estimated GHG emissions reduction potential. Measures, implementation assumptions, and GHG reduction potential are defined below.

Goal: The desired end-state for a given activity or sector within the community.

Strategy: A strategy is a high-level plan the City will implement to achieve GHG reductions. Each emission category may have one or more associated strategies.

Measure: A measure is a program, policy, or project the City will implement that will cause a direct and measurable reduction in GHG emissions.

Performance Metric: Each measure has a performance metric that serves as the goal by which achievement will be measured in target years. Performance metrics identified in this CAP provide timeframes for implementation of specific activities and identify target years for implementation to track progress towards measure implementation.

GHG Reduction Potential: The GHG reduction potential represents the estimated reduction in GHG emissions from a specific measure if its performance metric is met. All GHG reduction potential values are shown in terms of annual $MTCO_2e$ reduced in the target years of 2030 and 2040.

Supporting Strategies and Measures: Additional actions that are proposed in the city that would support the GHG reduction potential of other strategies and measures within the same GHG emission reduction area.

Zero Emission and Clean Fuels

Fuel use associated with vehicle travel in the city is one of the largest contributors of GHG emissions. The following strategies and measures encourage the decrease in fossil fuel use and use of zero emission and clean fuels. **Table 3-2** provides the strategies, measures, performance metrics, and additional strategies and measures associated with this sector.

Table 3-2 Goal 1: Zero Emissions and Clean Fuels. A community that uses zero emission vehicles and clean vehicles to move people and goods.

Strategy 1.1: EV Charging at Existing Developments
Measure(s): ■ Use EV Readiness Plan to determine the most appropriate and efficient location to install Level II EV chargers at public facilities and non-residential uses. ■ Develop an outreach and education program to inform residents and business owners about available incentives to encourage the installation of Level II EV charging stations at existing private residential development and commercial and retail development. ■ Consider development of City-administered and funded incentive program to encourage the installation of Level II EV charging stations at existing private residential development and commercial and retail development.

Table 3-2 Goal 1: Zero Emissions and Clean Fuels. A community that uses zero emission vehicles and clean vehicles to move people and goods.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Install 380 publicly available Level II EV charging station plugs and 35 DC fast charging station plugs. ▪ Install 500 charging stations in existing single-family and multi-family units.	3,928
2040	▪ Install 720 publicly available Level II EV charging station plugs and 50 DC fast charging station plugs. ▪ Install 1,000 charging stations in existing single-family and multi-family units.	7,778
Strategy 1.2: EV Charging at New Development		
Measure(s): ▪ Adopt an ordinance or update the development code that is consistent with and goes beyond requirements in the 2019 California Green Building Standards Code ("CALGreen", Title 24, Part 11) requiring new construction and major alterations to provide "EV Ready" and "EV Installed" parking spaces according to land use type. • For one- and two-family dwelling units and townhouses, all parking spaces would be "EV Installed" • For multifamily dwelling units, 15 percent of parking spaces provided would be "EV Ready" and an additional 5 percent would be "EV Installed" • For Office land uses, 10 percent of parking spaces would be "EV Ready" and an additional 5 percent would be "EV Installed" • For Industrial land uses, 10 percent of parking spaces provided for the project would be "EV Ready" and an additional 5 percent of the projects parking spaces would be "EV Installed" ▪ As part of the EV Charging ordinance or code requirements, projects with the potential for on-street EV charging should include a minimum of 2 EV charging stations as on-street parking. ▪ Encourage future industrial projects to install EV charging infrastructure for medium and heavy-duty trucks.		
Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Single-family residential: 1,972 "EV Ready" spaces and 493 "EV Installed" spaces (25 percent of "EV Ready" spaces) ▪ Multi-family residential: 1,631 "EV Ready" spaces and 408 "EV Installed" spaces (25 percent of "EV Ready" spaces) ▪ Office: 528 "EV Ready" spaces and 264 "EV Installed" spaces ▪ Industrial: 412 "EV Ready" spaces and 206 "EV Installed" spaces	4,040
2040	▪ Single-family residential: 3,944 "EV Ready" spaces and 1,972 "EV Installed" spaces (50 percent of "EV Ready" spaces) ▪ Multi-family residential: 4,892 "EV Ready" spaces and 2,446 "EV Installed" spaces (50 percent of "EV Ready" spaces) ▪ Office: 1,054 "EV Ready" spaces and 527 "EV Installed" spaces ▪ Industrial: 826 "EV Ready" spaces and 413 "EV Installed" spaces	7,419
Strategy 1.3: Zero Emission and Clean Equipment		
Measure(s): ▪ Develop an incentive program to support the replacement of heavy-duty equipment operating at existing industrial and commercial development with zero emissions technology.		

Table 3-2 Goal 1: Zero Emissions and Clean Fuels. A community that uses zero emission vehicles and clean vehicles to move people and goods.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	■ Replace 5 pieces of heavy-duty industrial equipment and 95 pieces of heavy-duty commercial equipment.	590
2040	■ Replace 8 pieces of heavy-duty industrial equipment and 192 pieces of heavy-duty commercial equipment.	1,081

Strategy 1.4: New Off-Road Equipment

Measure(s):

- Adopt an ordinance or update development code requiring off-road equipment (e.g., forklifts, generators) associated with the operation of new commercial and industrial development to be electric or fueled using zero emission fuels such as renewable diesel.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	■ Require new development projects to use electric or other zero emissions fuel or operational equipment.	205
2040	■ Require new development projects to use electric or other zero emissions fuel or operational equipment.	406

Strategy 1.5: Municipal Vehicle Fleet

Measure(s):

- Transition 50 percent of the City's light- and medium-duty vehicle fleet to electric or zero emissions by 2030 and transition 100 percent of the City's light- and medium-duty vehicle fleet, and fire trucks to electric or zero emissions by 2040.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	■ Convert 50 percent of the City and Fire fleet to zero emission vehicles.	234
2040	■ Convert 100 percent of the City fleet and Fire trucks to zero emissions vehicles.	793

Strategy 1.6: Construction Vehicle Fleets

Measure(s):

- Adopt an ordinance or update development code that requires 50 percent of heavy-duty construction equipment and vehicles to be electric or use other zero emissions technology or fuels by 2030, and 75 percent by 2040.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	■ Convert 50 percent of construction vehicles and equipment to zero emission technology or fuels.	342
2040	■ Convert 75 percent of construction vehicles and equipment to zero emission technology or fuels.	522

Additional Strategies and Measures:

- EV Readiness
  - Implement an EV Readiness Plan.
  - Increase the use of zero emissions heavy-duty trucks by industrial development.
- Clean Transit

Table 3-2 Goal 1: Zero Emissions and Clean Fuels. A community that uses zero emission vehicles and clean vehicles to move people and goods.

- Support the conversion of all Omnitrans buses operating within the city to 100 percent battery electric or zero emissions technology.
- Support Metrolink in the conversion of passenger trains operating in the city to be powered by Tier 4 clean technology (as defined by CARB), or zero emissions fuel (i.e., hybrid, battery, or hydrogen powered).
- Support Metrolink in the conversion of passenger trains operating in the city to be zero emissions trains (i.e., hybrid, battery, or hydrogen powered).
- Support the Brightline – West high speed rail project to operate using zero emission trains.
- Support the development of a zero emission technology City-operated shuttle system to provide for increased access to key destinations within the city to reduce the use of single-occupancy vehicles.
- Coordinate with school districts to encourage the use of zero emissions buses to transport students to and from school.

CARB = California Air Resources Board; City = City of Rancho Cucamonga; EV = electric vehicle; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: Ascent Environmental, Inc. 2021

Efficient and Carbon Free Buildings

Emissions associated with buildings are the second largest contributor to the City's emissions profile. The following strategies and measures would promote GHG emission reductions through improving energy efficiency of existing and new developments beyond state requirements. The following measures encourage the increase in building energy efficiency and renewable energy use to promote a zero net increase in carbon emissions from both community and municipal buildings. **Tables 3-3, 3-4, and 3-5** provides the strategies, measures, performance metrics, and additional strategies and measures associated with this sector.

Table 3-3 Goal 2: Efficient and Carbon Free Buildings. An existing building stock that is energy efficient and net zero carbon.

Strategy 2.1: Energy Efficiency Retrofit Program

Measure(s):

- Reduce energy use (i.e., electricity and natural gas) in the City's existing residential and nonresidential building stock by 10 percent by 2030 and 20 percent by 2040 through energy retrofit projects.
- Leverage Regional Energy Networks to reduce energy use from existing residential and nonresidential buildings.
- Create a City program that provide financial incentives or financing to implement energy retrofit projects.
- Work with a Regional Energy Network to promote the benefits of energy efficiency retrofits to residents and businesses owners in the City through the City's website as well as promotional materials developed by the City.
- Conduct analysis to understand the feasibility of achieving funding for energy efficiency retrofit program through City-administered GHG mitigation banking or fee program supported by mitigation fee funding from new development projects.
- Adopt an ordinance that requires major renovations to include energy efficiency upgrades that would reduce building energy consumption in existing residential and nonresidential buildings.
- Adopt an ordinance or update the development code to require energy efficiency improvements at the point of sale.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Achieve a 10 percent reduction in existing residential and nonresidential energy use (i.e., electricity and natural gas).	36,078

Table 3-3 Goal 2: Efficient and Carbon Free Buildings. An existing building stock that is energy efficient and net zero carbon.

2040	■ Achieve a 20 percent reduction in existing residential and nonresidential energy use (i.e., electricity and natural gas).	80.642

Strategy 2.2: Solar at Existing Warehouses and Commercial Land Uses

Measure(s):

- Develop an incentive program to install PV solar panels on existing nonresidential rooftops.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	■ Install PV solar panels on 15 percent of exiting nonresidential rooftops (total generation of 55,886,504 kWh)	569
2040	■ Install PV solar panels on 30 percent of exiting nonresidential rooftops (total generation of 111,773,009 kWh)	669

Strategy 2.3: Renewable Energy Retrofits

Measure(s):

- Continue to implement the RCMU Renewable Energy Program and work with SCE to provide incentives for existing private residential development to install on-site PV solar systems

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	■ 14 existing homes with PV systems in RCMU territory. ■ 3,778 existing homes with PV systems in SCE territory. ■ Generation of 36,222,139 kWh (RCMU and SCE)	5,469
2040	■ 36 existing homes with PV systems in RCMU territory. ■ 9,444 existing homes with PV systems in SCE territory. ■ Generation of 90,555,348 kWh (RCMU and SCE)	6,854

Additional Strategies and Measures:

- For CAP measures addressing installation of on-site PV solar systems, study whether wind power systems could feasibly provide equivalent or greater GHG reduction benefits relative to PV solar systems, for any areas within the city.
- Energy Efficiency Outreach
  - Develop an outreach plan that sets timelines for energy- or climate change-themed publications and workshops, identifies relevant stakeholder groups to facilitate outreach and information sharing, and identifies funding sources for outreach efforts.
  - Expand the RCMU Energy Audit program that provides free energy audits to existing single-family and multi-family homes, which identify energy efficiency measures that could be implemented to reduce energy consumption and costs and identify potential incentive or rebate programs available to make energy efficiency upgrades.
- Battery Storage
  - When implementing CAP measures designed to increase installation of on-site solar and/or renewable energy generation, the City will include provisions to increase and support the installation of battery storage systems.

City = City of Rancho Cucamonga; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; PV = photovoltaic; RCMU = Rancho Cucamonga Municipal Utility; SCE = Southern California Edison

Source: Ascent Environmental, Inc. 2021

Table 3-4 Goal 3: Green Building. Development practices that demonstrate high environmental performance through decarbonization, sustainable design, and zero net carbon buildings.

Strategy 3.1: Zero Net Electricity for New Residential Buildings

Measure(s):

- Adopt an ordinance or update development code requiring that new single- and multi-family residential development to meet a standard of zero net energy (i.e., on-site generation of energy is equal to on-site energy consumption).
- Encourage future residential development projects to be designed as Net Positive Energy Homes and take advantage of the State's Net Energy Metering 2.0 policy, allowing customers to receive credits on their electricity bills for excess electricity generated by photovoltaic systems.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Install on-site generation of electricity that is equal to on-site electricity consumption for the development or through the purchase of electricity that is generated from 100 percent renewable energy from SCE, RCMU, or through a CCA program.	4,646
2040	▪ Install on-site generation of electricity that is equal to on-site electricity consumption for the development or through the purchase of electricity that is generated from 100 percent renewable energy from SCE, RCMU, or through a CCA program.	3,380

Strategy 3.2: Zero Net Energy for New Nonresidential Buildings

Measure(s):

- Adopt an ordinance or update development code requiring new non-residential development to meet a standard of zero net energy.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Install on-site generation of electricity that is equal to on-site electricity consumption for the development or through the purchase of electricity that is generated from 100 percent renewable energy from SCE, RCMU, or through a CCA program.	8,591
2040	▪ Install on-site generation of electricity that is equal to on-site electricity consumption for the development or through the purchase of electricity that is generated from 100 percent renewable energy from SCE, RCMU, or through a CCA program.	19,043

Strategy 3.3: On-Site Renewable Energy Systems for New Industrial Buildings

Measure(s):

- Require new development in the Neo-Industrial (NI) and Industrial Employment (IE) Zoning Districts provide an on-site renewable energy system pursuant to (reference to industrial code to be inserted here).

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ 310,494 square feet of new industrial space with on-site renewable energy systems in RCMU territory. ▪ 1,753,107 square feet of new industrial space with on-site renewable energy systems in SCE territory.	3,084
2040	▪ 620,987 square feet of new industrial space with on-site renewable energy systems in RCMU territory. ▪ 3,506,213 square feet of new industrial space with on-site renewable energy systems in SCE territory.	3,096

Additional Strategies and Measures:

- For CAP measures addressing installation of on-site PV solar systems, study whether wind power systems could feasibly provide equivalent or greater GHG reduction benefits relative to PV solar systems, for any areas within the city.

Table 3-4 Goal 3: Green Building. Development practices that demonstrate high environmental performance through decarbonization, sustainable design, and zero net carbon buildings.

- Sustainable Design
  - Encourage new development projects to meet or exceed standards of LEED, Sustainable Sites, Living Building Challenge, or similar certification.

CCA = Community Choice Aggregation; City = City of Rancho Cucamonga; GHG = greenhouse gas; LEED = Leadership in Energy and Environmental Design; MTCO2e = metric tons of carbon dioxide equivalent; PV = photovoltaic; RCMU = Rancho Cucamonga Municipal Utility; SCE = Southern California Edison

Source: Ascent Environmental, Inc. 2021

Table 3-5 Goal 4: Sustainable City-Facilities. City-facilities that achieve high levels of sustainable design.

Strategy 4.1: Municipal Energy Conservation

Measure(s):

- Prepare an Energy Action Plan that lays out strategies to reduce energy consumed at existing City-facilities by 15 percent below baseline energy consumption levels by 2030, and 20 percent below baseline energy consumption levels by 2040.
- Complete the ongoing replacement of halogen light bulbs used in outdoor lighting with LED technology.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Reduce 2,806,684 kWh of electricity. ▪ Reduce 55,008 therms of natural gas.	718
2040	▪ Reduce 3,609,931 kWh of electricity. ▪ Reduce 70,751 therms of natural gas.	650

Strategy 4.2: Renewable Energy at Municipal Facilities

Measure(s):

- Install PV solar at City-owned facilities to provide electricity equal to 30 percent of City-facility consumption by 2030, and 50 percent of City-facility consumption by 2040.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Reduce 2,806,684 kWh of electricity.	722
2040	▪ Reduce 3,609,931 kWh of electricity.	546

- Green Procurement Plan
  - Strengthen the existing green procurement plan for City facilities that identifies actions the City can implement to procure products and services from manufacturers and suppliers that demonstrate a high level of environmental and social responsibility.

City = City of Rancho Cucamonga; GHG = greenhouse gas; kWh = kilowatt-hour; LED = light emitting diode; $MTCO_2e$ = metric tons of carbon dioxide equivalent; PV = photovoltaic

Source: Ascent Environmental, Inc. 2021

Renewable and Zero Carbon Electricity

GHG emissions reductions would be achieved through reducing the amount of electricity generated from fossil fuels and transitioning to renewable and carbon free electricity sources. Installing more renewable energy systems will provide a reliable local energy supply that is a more sustainable source of electricity. **Table 3-6** provides the strategies, measures, and performance metrics associated with this sector.

Table 3-6 Goal 5: Zero Emission Electricity. A city powered by carbon free electricity.

Strategy 5.1: RCMU Renewable Electricity Supply

Measure(s):

- Procure carbon free sources for 51 percent of electricity supplied by RCMU by 2025.
- Procure carbon free sources for 75 percent of electricity supplied by RCMU by 2030.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ 75 percent of electricity supplied by RCMU from carbon free sources	2,693

Strategy 5.2: Electricity Supply Choice

Measure(s)

- Join an existing CCA or develop a City-administered CCA program and provide electricity purchasing options for residents and businesses in the city that are generated from renewable or carbon free resources. The CCA should provide at least two purchasing plan options for customers:
  - A basic plan would include electricity generated from renewable or carbon free resources consistent or above the levels required by the Renewable Portfolio Standard.
  - A 100 percent renewable option with electricity generated from 100 percent renewable or carbon free resources.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Achieve an opt-in rate of 75 percent of existing residential SCE customers and 75 percent of nonresidential SCE customers. ▪ Achieve an opt-in rate of 10 percent of participating customers who choose the 100 percent renewable electricity option.	99,499
2040	▪ Achieve an opt-in rate of 95 percent of existing residential SCE customers and 95 percent of nonresidential SCE customers. ▪ Achieve an opt-in rate of 50 percent of participating customers who choose the 100 percent renewable electricity option.	29,343

CCA = Community Choice Aggregation; City = City of Rancho Cucamonga; GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent; RCMU = Rancho Cucamonga Municipal Utility; SCE = Southern California Edison

Source: Ascent Environmental, Inc. 2021

Carbon Sequestration

Increasing the city's urban forests would sequester carbon and would reduce communitywide GHG emissions locally. The following strategies and measures would promote the implementation of increasing the number of trees in new development and in public and private development. **Table 3-7** provides the strategies, measures, performance metrics, and additional strategies and measures associated with this sector.

Table 3-7 Goal 6: Thriving Urban Forests. A community with significant urban forestry resources.

Strategy 6.1: Tree Planting at Existing Development and Municipal Facilities

Measure(s):

- Strengthen the City's existing tree planting program to incentivize planting new trees within the public right-of-way and maintained by private single-family and multi-family residential property owners, and new trees planted on existing private residential property.
- Ensure that the location and species of new trees planted at existing development and municipal facilities is appropriate and consistent with the city's adopted master list of street trees and parking lot trees.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	■ Plant 50 new trees annually in the public right-of-way or other appropriate locations. ■ Plant trees at municipal facilities.	14
2040	■ Plant 50 new trees annually in the public right-of-way or other appropriate locations. ■ Plant 200 trees at municipal facilities by 2040.	44

Supporting Strategies and Measures:

- Retain Mature Trees
  - Develop a program that identifies and retains significant and mature trees in the city and actions to support continued maintenance.
  - Ensure that preservation of existing trees does not conflict the City's Community Wildfire Protection Plan or with other vegetation management efforts to reduce wildfire risk in the city.

City = City of Rancho Cucamonga; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: Ascent Environmental, Inc. 2021

Local Food Supply

Encouraging a local food supply supports local farmers and reduces the GHG emissions associated with the transportation of goods. The following strategies and measures do not have an associated GHG reduction potential (due to lack of available data sources needed for performing calculations) but they are supportive of GHG emissions reductions related to the growing and transport of food products. **Table 3-8** provides the strategies and measures associated with this sector.

Table 3-8 Goal 7: Local Food. A community with locally grown and affordable food.

Supporting Strategies and Measures:

- Local Food Supply
  - Develop a local food strategy that supports small-scale, locally grown food that identifies policy and regulation updates, and implementation actions for the permitting of community gardening in the city.
  - Ensure the local food strategy supports and encourages the purchasing of locally sourced foods and produce at local food vendors (e.g., restaurants and grocery stores).

Water Efficiency and Management

By reducing the amount of water used through efficiency measures, the City would reduce GHG emissions associated with the energy used to supply, treat, and deliver water. The following strategies and measures would reduce emissions from both communitywide and municipal water use. **Table 3-9** and **Table 3-10** provides the strategies, measures, performance metrics, and additional strategies and measures associated with this sector.

Table 3-9 Goal 8: Water Conservation. A community that conserves and recycles water.

Strategy 8.1: Water Efficient Landscaping Retrofits

Measure(s):

- Support local and regional efforts to increase participation in the installation of water efficient landscapes (e.g., drought tolerant plants, artificial turf) to reduce outdoor water consumption at existing private development by 20 percent.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Encourage 15 percent of existing single-family households to participate in program and to reduce their landscaping water by 20 percent.	57
2040	▪ Encourage 30 percent of existing single-family households to participate in program and to reduce their landscaping water by 20 percent.	32

Supporting Strategies and Measures:

- Recycled Water
  - Support CVWD efforts to increase the amount of recycled water in the City's water supply to six (6) percent recycled water by 2030, and 12 percent by 2040.
- Greywater for Landscaping
- Support the installation of greywater systems at existing single-family homes by providing informational materials and resources to residents on the City website.
  - Water Efficient Municipal Landscaping
  - Use drought-tolerant, native, or low-water plant species and landscape materials at existing and new City facilities.
- Regional Collaboration
  - Encourage CVWD to identify and purchase water from sources with minimal embedded GHG emissions.
  - Develop a local water consumption plan that identifies actions the City can take to increase the consumption and use of recycled water sources to reduce communitywide consumption of conveyed water sources.

City = City of Rancho Cucamonga; Cucamonga Valley Water District's (CVWD); GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent

Source: Ascent Environmental, Inc. 2021

Table 3-10 Goal 9: Efficient Wastewater Management. A city that generates minimal wastewater through sustainable treatment and reuse.

Supporting Strategies and Measures:

- Wastewater Reduction
  - Promote existing incentive programs provided by CVWD and support outreach and educational efforts to increase waste reduction practices at existing residential and non-residential development.
  - Support Inland Empire Utilities Agency (IEUA) in the implementation of sustainable treatment practices at RP-1 and RP-4 to minimize off-gassing associated with the wastewater treatment process.

CVWD = Cucamonga Valley Water District

Source: Ascent Environmental, Inc. 2021

Waste Reduction

Diverting organic material from a landfill reduces GHG emissions that are released when organic materials decompose. Increased recycling and composting locally can lead to additional benefits such as increased products created from locally recycled material and fertilizer and organic waste covering for local agricultural use. **Table 3-11** provides the strategies, measures, performance metrics, and additional strategies and measures associated with this sector.

Table 3-11 Goal 10: Zero-Waste. A community that produces minimal solid waste.

Strategy 10.1: Organics Recycling

Measure(s):

- Develop a waste reduction plan that identifies activities the City could implement to work with Burrtec (or another contract waste hauler) to divert 60 percent of organic solid waste generated by existing commercial and residential development by 2030, and 75 percent by 2040.
- Develop a waste reduction plan that identifies food waste actions the City can implement to recycle 60 percent of organic food waste generated at City facilities by 2030, and 75 percent by 2040.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Divert or recover 60 percent of organic solid waste.	6,298
2040	▪ Divert or recover 75 percent of organic solid waste.	21,541

Supporting Strategies and Measures:

- Waste Reduction Requirements
  - Use existing outreach program to inform residents of composting and recycling practices available in the city.

City = City of Rancho Cucamonga; GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent

Source: Ascent Environmental, Inc. 2021

Sustainable Transportation

The City is able to reduce GHG emissions associated with vehicle travel by increasing the use of alternative transportation modes, reduce vehicle trips through transportation demand management (TDM) programs, and increase connectivity between major commercial, retail, and residential areas in the city. The strategies and measures under this strategy would benefit from or require collaboration from local and regional agencies, residents, and businesses. **Tables 3-12, 3-13, and 3-14** provide the strategies, measures, performance metrics, and additional strategies and measures associated with this sector.

Table 3-12 Goal 11: Regional Mobility Hub. A multimodal transportation hub that connects regional and local destinations through a symbiotic relationship with regional partners.

Strategy 11.1: Local Mobility Hubs

Measure(s):

- Develop a mobility hub plan that increases transit mode share by three (3) percent by 2030, and 10 percent by 2040.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Reduce commute related VMT by six (6) percent.	6,880
2040	▪ Reduce commute related VMT by 10 percent.	10,885

Strategy 11.2: Pedestrian and Bicycle Network

Measure(s):

- Increase the proportion of City street's with bike lanes to 30 percent by 2030 and 40 percent by 2040 through the development of a bicycle network.
- Develop a bicycle network throughout the city that provides continuous bicycle infrastructure between key destinations by 2030.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Add 16 miles of new bike lanes to the City's roadway network.	670
2040	▪ Add 60 miles of new bike lanes to the City's roadway network.	1,614

City = City of Rancho Cucamonga; GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent

Source: Ascent Environmental, Inc. 2021

Table 3-13 Goal 12: Active Transportation. A first-class pedestrian and bicycle network that fosters safe and connected access to non-motorized travel and recreation.

Strategy 12.1: Transportation Demand Management

Measure(s):

- Adopt an ordinance or update development code requiring new development to implement TDM strategies that reduce VMT by 5 percent in new development by 2030 and 10 percent by 2030 or later.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Reduce 1,144,621 miles of vehicle travel	258
2040	▪ Reduce 4,578,484 miles of vehicle travel	939

Supporting Strategies and Measures:

- Increase carpooling rates using zero emissions vehicles by employees of industrial development.
- Regional and Local Public Transit and Mobility Services
  - Support the completion of the Boring Tunnel to Ontario Airport by 2030. (Not a quantified measure)
  - Support the completion of the Brightline – West High-Speed Rail development between Las Vegas and the city by 2025. (Not a quantified measure)
  - Support the completion of the Gold Metro Line extension to the city by 2030. (Not a quantified measure)

Table 3-13 Goal 12: Active Transportation. A first-class pedestrian and bicycle network that fosters safe and connected access to non-motorized travel and recreation.

- Support the completion of SBCTA's Bus Rapid Transit Connections along Foothill Boulevard and Haven Avenue by 2030. (Not a quantified measure)
- Develop a City-operated shuttle system by 2030 that provides access between key destinations in the city such as the Metrolink station, City and County Government Centers, and Victoria Gardens. (Not a quantified measure)

- Safe Routes to School (SRTS)
  - Expand the Healthy RC SRTS program to develop a SRTS plan for each public school district operating within the city.
  - Through the SRTS program perform commute surveys to identify the mode of transportation used by students to get to and from public school facilities and identify barriers for students to walk or bike to school.
  - Complete the development of 75 percent of the bicycle and pedestrian routes identified in the SRTS program by 2030, and 100 percent of the routes by 2040.
- Trail System
  - Develop 20 miles of new off-street trails by 2030, and an additional 20 miles by 2040.
- Amenities
  - Encourage new residential and nonresidential development to include bike and pedestrian amenities consistent with those include in CalGreen Tier 1 and Tier 2 requirements.

City = City of Rancho Cucamonga; GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent; TDM = Transportation Demand Management; SRTS = Safe Routes to School; VMT = vehicle miles traveled

Source: Ascent Environmental, Inc. 2021

Table 3-14 Goal 13: Sustainable Transportation. A transportation network that adapts to changing mobility needs while preserving sustainable community values.

Strategy 13.1: Emerging Technologies

Measure(s):

- Complete signal timing improvements along 50 percent of key commute corridors by 2030, and 100 percent of key commute corridors by 2040.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	▪ Reduce 122,850 gallons of fuel consumption due to improved traffic flow	1,254
2040	▪ Reduce 238,044 gallons of fuel consumption due to improved traffic flow	2,430

Supporting Strategies and Measures:

- Coordinate with other local and regional agencies to evaluate and implement a regional or multi-jurisdictional VMT impact fee program, bank, or exchange starting in 2030.

City = City of Rancho Cucamonga; GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent

Source: Ascent Environmental, Inc. 2021

4. IMPLEMENTATION AND MONITORING

This chapter addresses how the City will implement and monitor the CAP measures. To achieve the GHG emissions reductions described in **Chapter 3**, measures should be continuously assessed and monitored to verify that: (1) the measures are effective; (2) the City is on track to achieve its GHG reduction targets; and (3) the community's overall vision is being attained and values are being respected.

4.1 Implementation Strategy

After this CAP has been adopted, the City will develop an implementation strategy for the CAP measures. The City is planning a phased approach to CAP implementation beginning as soon as the CAP is adopted, and ending with adoption of CAP implementation actions (e.g., development code updates, launch of new programs) no later than 2025. The implementation plan will be based on a number of factors such as budget capacity and availability of funding opportunities. Potential funding opportunities to support CAP implementation are identified in **Appendix D**.

The purpose of the implementation strategy is to translate the CAP measures into City and community actions. Implementation of the CAP will involve participation from City Council, Planning Commission, other boards and commissions, and City departments. While this CAP focuses on measures in which the City has a lead role, many of the measures require partnerships and collaboration. Coordination with other agencies, such as SBCOG/SBCTA and neighboring jurisdictions, will be important . Implementation of the CAP will also involve the participation of City residents and businesses. Engagement and education are critical for effective implementation of the CAP. This includes involvement with residents and businesses, community organizations, developers, property owners, and other local and regional government agencies and organizations.

The City will implement the measures of the CAP through several types of programs and activities that may include: changes in municipal operations; new ordinances or code updates; development conditions of approval; advanced planning efforts; provision of incentives or financing; public agency or private partnerships; and education and outreach. While each measure identified in the CAP would fall into these categories, some measures overlap and belong to more than one category. Detailed descriptions of each type of implementation category are provided below.

- **Municipal Operations**: City specific actions to update and make municipal operations more efficient. These measures would be implemented by the City and would reduce emissions specifically related to municipal operations.
- **New Ordinances and Code Updates**: Implementation of several measures in the CAP would occur through new ordinances adopted by the City or through amendments to the Municipal Code.
- **Planning**: The CAP identifies measures that are more programmatic in nature and require visioning and long-term planning efforts to allow for GHG reductions.
- **Financing and Incentives**: Successful implementation of CAP measures requires identifying mechanisms for funding and allocating resources. Further, several measures identified in the CAP would be implemented by community residents, business owners, other local agencies, and developers.

- **Partnerships**: Interagency coordination and collaboration with other organizations are critical to ensuring implementation of certain measures.
- **Education and Outreach**: Education and outreach efforts about the goals of the CAP will help create support for the CAP and involve the community in its implementation. These efforts would be intended to increase participation and awareness and could include informing residents about potential GHG reductions and co-benefits of various measures.

Full implementation of the GHG reduction measures in this CAP will require City staff to further evaluate the cost, effectiveness, and benefits of each individual measure. Evaluating CAP measure performance entails monitoring the level of community participation, costs, and potential barriers to implementation, as well as actual reductions in fuel consumption, vehicle miles traveled, energy usage, water usage, landfilled waste, or other activities that result in GHG emissions reductions. This evaluation of measure effectiveness in reducing local GHG emissions will assist the City when it updates this CAP to maintain successful measures and reevaluate or replace under-performing ones.

4.2 Monitoring and Updates

Regularly monitoring implementation progress and performing periodic updates are needed for this CAP to remain effective and relevant over time. Changing circumstances, such as State and federal laws and programs, updates to climate science, changes in technology, or evolving local, State, federal or even global economic and social conditions, may necessitate changes to the CAP. For these reasons the City will regularly evaluate and monitor CAP implementation. Doing so will provide transparency in CAP implementation and allow the City opportunities to evaluate changing circumstances, analyze measure performance, and make adjustments as necessary to stay on track toward achieving its emissions reduction targets. Regularly preparing up-to-date emissions inventories for existing conditions and future forecasts will also be necessary.

At least every two years, beginning in 2023, City staff will prepare a summary report of CAP implementation progress to date. Progress may be evaluated using emissions reductions, activity data, percent work completed, or other metrics. These reports will be used to track progress and identify measures that need to be improved, adjusted, or removed. The report will also serve to inform the City's elected and appointed officials, stakeholders, and the community about implementation progress on measures and overall progress towards the City's GHG reduction targets. If the monitoring reports demonstrate that the plan is not achieving the City's GHG reduction targets, or is not on track to do so, the City shall prepare an amendment to the CAP. At minimum, the City shall amend the CAP in a manner that demonstrates the City will achieve its GHG reduction targets, or be on track to do so. At minimum, the report prepared every two years will include:

- Metrics illustrating CAP measure performance, individually and in aggregate (e.g., GHG emissions reductions, participation rates, activity data, percent work completed);
- Implementation costs and funding needs;
- Community benefits realized;
- Any barriers to implementation;
- Recommendations, if any, for removal or changes to individual measures or identification of new measures; and
- Recommendations, if any, for changes to this CAP and/or preparation of a new CAP.

4.3 CAP Consistency Checklist for New Development

The California Environmental Quality Act (CEQA) is a statute that requires local agencies to identify significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. This CAP has been prepared consistent with the standards of CEQA Guidelines Section 15183.5 ("Qualified Plan"). Pursuant to this section, the CAP affords development applicants the opportunity to use CEQA streamlining tools for analysis of GHG emissions and related impacts for projects that are consistent with the CAP. The CAP Consistency Checklist contains measures that are required to be implemented on a project-by-project basis to achieve the City's 2030 reduction target. By implementing the measures in the Checklist, a development project would demonstrate its consistency with this CAP. The Checklist is provided in **Appendix C**.

This page intentionally left blank.

5. REFERENCES

California Air Resources Board (CARB). 2017 (November). *California's 2017 Climate Change Scoping Plan.* Available: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf. Accessed July 6, 2021.

———. 2020. *California Greenhouse Gas Emissions for 2000 to 2018*: *Trends of Emissions and Other Indicators.* Available: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf. Accessed July 6, 2021.

City of Rancho Cucamonga (City). 2017 (April). *Sustainable Community Action Plan.*

United States Environmental Protection Agency (EPA). 2021. *Greenhouse Gas Equivalencies Calculator*. Available https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. Accessed June 22, 2021.

This page intentionally left blank.

Appendix A

City of Rancho Cucamonga Greenhouse Gas Emissions Inventory and Forecasts

City of Rancho Cucamonga Greenhouse Gas Inventory for 2018

A workbook for estimating greenhouse gas emissions generated by activities in the city in 2018.

Last Updated:
September 1, 2021

Prepared for the City of Rancho Cucamonga
By Ascent Environmental

About this Workbook

This workbook was developed to estimate total greenhouse gas (GHG) emissions generated in the City of Rancho Cucamonga (City) in 2018. This accounting of emissions is referred to as the "GHG Inventory." The emissions estimates span various sectors covering activities occurring in the city. Based on activity data provided by City staff and regional and state agencies, GHG emissions were estimated for the following sources: on- and off-road transportation, building energy, solid waste, water, wastewater, and agriculture. This GHG Inventory provides the City with up-to-date and more recent information than the City's previous GHG inventory estimating communitywide emissions in 2008. This inventory will be used to forecast future GHG emissions consistent with State milestone years and the General Plan Update horizon year, and set emissions reductions targets consistent with State goals. The ultimate purpose of the GHG inventory will be to inform the development of policies and programs in the City's General Plan Update and associated Climate Action Plan (CAP).

How to Use this Workbook

This GHG Inventory workbook includes tabs (located along the lower border of the workbook) for each of the quantifiable GHG emissions sectors in the city and sphere of influence (SOI). Each calculation tab includes background information, specific to 2018, that is used to estimate GHG emissions generated in that sector. Within these calculation tabs, data and calculations are presented in color coded tabs (described below) that reflect if the information was calculated within the workbook, is an assumption necessary for the calculation, or are data provided from sources specific to the city for that year (i.e., input data). As the city adjusts this workbook for subsequent inventory years, emission factors and assumptions may need to be updated to account for changes, and updated input data may need to be provided by a specific City department or regional/state agency.

Cell Color Legend (applies to calculation tabs)

Input Data Cells	*Information in these cells is provided by City departments or regional and state agencies.*
Calculation Assumption	*Calculation assumptions include values that are linked to the "Assumptions" tab.*
Emission Factor	*Emission factor used to estimate GHG emissions based on local, regional, or state data.*
Calculations	*Calculation cells include formulas for emissions estimates based on information shown in that tab or in Background Data tabs.*
GHG Emissions Estimate	*GHG emissions estimate cells provide the total annual GHG emissions estimated for that sector.*
Source Information	*Source information cells provide links or references to data sources.*

Tab Descriptions		
Tab Name	**Description**	**Type of Information**
GHG Summary	This tab provides consolidated results from all emissions sectors for the GHG Inventory, and includes tables and charts that may be used for reporting inventory results.	Summary of All Calculations
Demographics	Population, housing, and employment data used for the 2018 GHG inventory are included on this tab. Demographic information for the City and San Bernardino County was obtained from the U.S. Census Bureau American Community Survey (ACS) five-year estimates.	Background Data
On-Road Transportation	GHG emissions generated from the operation of vehicles on roadways and freeways to and from land uses and destinations within the city and SOI. GHG emissions are based on estimated vehicle miles traveled (VMT) associated with communitywide activities. VMT data was provided by Fehr & Peers.	Calculations
Building Energy	GHG emissions generated from residential, commercial, and industrial energy use (i.e. electricity and natural gas consumption) are calculated on this tab. Electricity consumption data were provided by Southern California Edison (SCE) and the Rancho Cucamonga Municipal Utility (RCMU). Natural gas consumption data were provided by the Southern California Gas Company (SoCalGas).	Calculations
Off-Road	GHG emissions from the use of off-road equipment are calculated on this tab. Emissions associated with off-road equipment are generated by the use of construction equipment, light- and heavy-industrial equipment, and landscaping equipment.	Calculations
Solid Waste	GHG emissions from the generation, transport, and decomposition of solid waste are calculated on this tab. Solid waste generated by residential, commercial, and industrial uses in the city and SOI is transported to landfills throughout the county. Solid waste generation and waste stream characterization data for the city were obtained from the California Department of Resources Recycling and Recovery (CalRecycle) and adjusted to account for the SOI.	Calculations
Water	GHG emissions from the conveyance, delivery, and treatment of water are calculated on this tab. Emissions from this sector are generated from electricity consumed to convey, deliver, and treat water consumed in the city and SOI. Water consumption data in the city in 2018 were provided by the Cucamonga Valley Water District (CVWD) and adjusted to account for uses in the SOI.	Calculations

Tab Descriptions		
Tab Name	**Description**	**Type of Information**
Wastewater	GHG emissions from the generation and treatment of wastewater are calculated in this tab. Emissions in this sector are generated through wastewater treatment processes and electricity consumed for treatment and conveyance. Wastewater treatment plant information for facilities serving the city and SOI were provided by the Inland Empire Utilities Agencies (IEUA).	Calculations
Agriculture	GHG emissions from agricultural activities in the city are calculated on this tab. Emissions in the agriculture sector are generated from the application of fertilizer to crops and enteric fermentation associated with livestock. Information for the size and use of various agricultural parcels in the city were provided by City staff.	Calculations
Assumptions	This tab includes reference material used for GHG calculations, including conversion factors, global warming potential (GWP) factors, electricity emission factors, natural gas emission factors, and emission factors for other sectors.	Background Data
EMFAC	This tab includes background data used to calculate emission factors for on-road transportation. Emission factors for the sub-area of San Bernardino County in which the city and SOI are located are provided in the California Air Resources Board's (CARB's) Emission Factors 2017 (EMFAC2017) tool.	Background Data
SolidWasteEF	The Solid Waste Emissions Factors tab (or SolidWasteEF) includes background data used to calculate emission factors for solid waste. Emission factors for solid waste are determined by the characterization of solid waste generated in the city. Data was obtained from CalRecycle.	Background Data

Greenhouse Gas Emissions Summary

Emissions Sector	2018 GHG Emissions		2018	$MTCO_2e$ % of Annual
	Activity	Units	$MTCO_2e$	
Building Energy			**634,699**	**44.5%**
Non-Residential (Electricity)	431,409,974	MWh	257,911	18.1%
Non-Residential (Natural Gas)	30,020,066	Therms	159,752	11.2%
Non-Residential Total			417,663	29.3%
Residential (Electricity)	442,847,100	MWh	111,715	7.8%
Residential (Natural Gas)	19,775,182	Therms	105,321	7.4%
Residential Total			217,036	15.2%
On-Road Transportation			**729,617**	**51.1%**
Passenger Vehicles	4,945,221	VMT	560,531	39.3%
Light Duty Vehicles	61,130	VMT	15,174	1.1%
Medium-Duty Trucks	53,926	VMT	21,054	1.5%
Heavy-Duty Trucks	213,154	VMT	132,858	9.3%
Solid Waste			**28,632**	**2.0%**
Waste Generation	164,716	tons	28,632	2.0%
Water			**18,650**	**1.3%**
Groundwater	5,176	MG	3,175	0.2%
Local Canyon Water	633	MG	218	0.0%
State Water Project	8,213	MG	15,132	1.1%
Recycled	365	MG	125	0.0%
Off-Road Transportation			**12,405**	**0.9%**
Construction Equipment	*Reflects various types of fuel consumption. See tab for details.*		665	0.0%
Industrial and Light Commercial			3,262	0.2%
Portable Equipment			8,470	0.6%
Transportation Refrigeration Units			7	0.0%
Wastewater			**2,454**	**0.2%**
Wastewater Treatment	*Wastewater treatment and transport generates emissions from a varietiy of activities. See tab for details*		1,738	0.1%
Wastewater Transport			716	
Agriculture			**300**	**0.0%**
Agricultural Operations	*Emissions in the agriculture sector are associated with a variety of activites. See tab for details*		4	0.0%
Off-Road Equipment			296	0.0%
TOTAL EMISSIONS			**1,426,757**	

Greenhouse Gas Emissions Summary

Emissions Sector	2030	2040	2050	Percent Change from 2018 to 2040
Building Energy	**533,691**	**449,855**	**414,243**	**-29.1%**
Non-Residential (Electricity)	182,473	103,072	0	-60.0%
Non-Residential (Natural Gas)	144,471	160,124	248,284	0.2%
Non-Residential Total	326,944	263,196	248,284	-37.0%
Residential (Electricity)	82,405	46,465	0	-58.4%
Residential (Natural Gas)	124,342	140,194	165,959	33.1%
Residential Total	206,747	186,659	165,959	-14.0%
On-Road Transportation	**562,416**	**559,169**	**0**	**-23.4%**
Passenger Vehicles	409,498	388,741	373,908	-30.6%
Light Duty Vehicles	14,578	15,065	7,677	-0.7%
Medium-Duty Trucks	21,593	20,292	22,376	-3.6%
Heavy-Duty Trucks	116,746	135,071	146,555	1.7%
Solid Waste	**33,806**	**38,118**	**550,516**	**33.1%**
Waste Generation	33,806	38,118	42,430	33.1%
Water	**12,916**	**7,948**	**0**	**-57.4%**
Groundwater	2,336	1,315	0	-58.6%
Local Canyon Water	160	90	0	-58.6%
State Water Project	10,327	6,491	0	-57.1%
Recycled	93	52	0	-58.4%
Off-Road Transportation	**14,647**	**16,515**	**18,383**	**33.1%**
Construction Equipment	785	885	985	33.1%
Industrial and Light Commercial	3,852	4,343	4,834	33.1%
Portable Equipment	10,001	11,277	12,553	33.1%
Transportation Refrigeration Units	9	10	11	33.1%
Wastewater	**2,581**	**2,612**	**2,575**	**6.4%**
Wastewater Treatment	2,052	2,314	2,575	33.1%
Wastewater Transport	528	298	0	-58.4%
Agriculture	**300**	**300**	**300**	**0.0%**
Agricultural Operations	4	4	4	0.0%
Off-Road Equipment	296	296	296	0.0%
TOTAL EMISSIONS	**1,160,357**	**1,074,517**	**986,017**	**-24.7%**
State Reduction Targets from 2018	-31%	-47%	-62%	
Legislative Reductions	455,878	691,615	1,022,437	
Total Measure Reductions Achieved	#REF!	#REF!	#REF!	
Percent of Target achieved by Measures	#REF!	#REF!		
Target Reductions Needed	179,423	351,532	520,982	
City Annual Emissions Targets	980,934	722,985	465,035	
1,616,235	**1,766,132**	**2,008,454**	**23.8%**	

Business as Usual - Greenhouse Gas Emissions Summary

Emissions Sector	2018 GHG Emissions		2018	2020
	Activity	Units	$MTCO_2e$	
Building Energy			**634,699**	**641,667**
Non-Residential (Electricity)	431,409,974	MWh	257,911	264,861
Non-Residential (Natural Gas)	30,020,066	Therms	159,752	159,753
Non-Residential Total			417,663	424,614
Residential (Electricity)	442,847,100	MWh	111,715	111,729
Residential (Natural Gas)	19,775,182	Therms	105,321	105,324
Residential Total			217,036	217,053
On-Road Transportation			**729,617**	**753,562**
Passenger Vehicles	4,945,221	VMT	560,531	570,323
Light Duty Vehicles	61,130	VMT	15,174	15,927
Medium-Duty Trucks	53,926	VMT	21,054	22,183
Heavy-Duty Trucks	213,154	VMT	132,858	145,128
Solid Waste			**28,632**	**29,494**
Waste Generation	164,716	tons	28,632	29,494
Water			**18,650**	**19,199**
Groundwater	5,176	MG	3,175	3,268
Local Canyon Water	633	MG	218	224
State Water Project	8,213	MG	15,132	15,577
Recycled	365	MG	125	129
Off-Road Transportation			**12,405**	**12,405**
Construction Equipment	*Off-Road activity reflects various types of fuel consumption. See tab for details.*		665	665
Industrial and Light Commercial			3,262	3,262
Portable Equipment			8,470	8,470
Transportation Refrigeration Units			7	7
Wastewater			**2,454**	**2,528**
Wastewater Treatment	*Wastewater treatment and transport generates emissions from a varietiy of activities. See tab for details*		1,738	1,791
Wastewater Transport			716	737
Agriculture			**300**	**300**
Agricultural Operations	*Emissions in the agriculture sector are associated with a variety of activites. See tab for details*		4	4
Off-Road Equipment			296	296
TOTAL EMISSIONS			**1,426,757**	**1,459,155**

Business as Usual - Greenhouse Gas Emissions Summary

2030	2040	2050	
			$MTCO_2e$ % of Annual Total
729,203	**809,928**	**983,977**	**44.5%**
295,009	332,511	363,393	18.1%
177,949	188,534	289,074	11.2%
472,958	521,045	652,466	29.3%
131,903	148,689	165,552	7.8%
124,342	140,194	165,959	7.4%
256,245	288,883	331,511	15.2%
813,424	**873,287**	**933,150**	**51.1%**
594,804	619,285	643,766	39.3%
17,811	19,695	21,578	1.1%
25,006	27,829	30,651	1.5%
175,804	206,479	237,154	9.3%
33,806	**38,118**	**42,430**	**2.0%**
33,806	38,118	42,430	2.0%
21,956	**24,716**	**27,638**	**1.3%**
3,738	4,208	4,705	0.2%
256	289	323	0.0%
17,814	20,053	22,424	1.1%
148	167	186	0.0%
14,647	**16,515**	**18,383**	**0.9%**
785	885	985	0.0%
3,852	4,343	4,834	0.2%
10,001	11,277	12,553	0.6%
9	10	11	0.0%
2,898	**3,267**	**2,575**	**0.2%**
2,052	2,314	2,575	0.1%
845	953	0	0.1%
300	**300**	**300**	**0.0%**
4	4	4	0.0%
296	296	296	0.0%
1,616,235	**1,766,132**	**2,008,454**	

Demographics

City of Rancho Cucamonga Greenhouse Gas Inventory - 2018								
Forecast Assumptions								
	2018		**2030**		**2040**		**2050**	
	Total	**Percent**	**Total**	**%Change**	**Total**	**% Change**	**Total**	**% Change**
Population								
San Bernardino County								
Total Population (persons)	2,171,603		**2,491,923**	15%	2,758,856	27%	**3,025,789**	39%
Source: U.S. Census, ACS 5-Yr Estimate for 2018								
https://data.census.gov/cedsci/table?q=United%20States&g=01								
City of Rancho Cucamonga								
Total Population (persons)	175,679		**207,429**	18%	**233,887**	33%	**260,345**	48%
Jobs								
Total Jobs	85,379	100%	**99,326**	16%	**110,948**	30%	**122,570**	44%
Jobs by Sector								
Housing								
Total Households	60,795	100%	73,638	21%	86,480	42%		
Average Household Size	3.09		3.09		3.09			
Housing Units								
Single-Family Home	37,921	62.4%	39,893		41,865	10%		
Multi-Family Home	22,874	37.6%	33,745		44,615	95%		

Source: General Plan builout data provided by City staff and consultant team

General Plan Land Use Buildout

		2018	2030	2040	2040		2050
Item	Unit	Existing	New Buildout	New Buildout	Total Buildout	Net New Growth	
Housing:							
Single-Family	dwelling units	37,921	1,972	1,972	41,865	3,944	43,658
Percent Change in SFUs			5%	5%	10%	9%	15%
MF Low-Rise (3-4 stories)	dwelling units	22,874	10,871	10,871	44,615	21,741	54,497
Percent Change in MFUs			48%	48%	95%		138%
Total Units		60,795	12,843	12,843	86,480	25,685	98,155
Percent Change in Total Units			21%		42%		43%
Non-Residential							
Total Nonresidential SQ		43,579,983	5,533,536	5,533,536	54,647,055	11,067,073	59,677,543
			11%	11%	25%	20%	37%
Total Comm SQ		27,642,383	3,469,936	3,469,936	34,582,255	6,939,873	37,736,743
			11%	11%	25%	20%	37%
Retail	square feet	14,317,200	2,073,600	2,073,600	18,464,400	4,147,200	20,349,491
Percent Change			13%	13%	29%	22%	42%
Hotel	rooms	1,161	590	590	2,340	1,179	2,876
Percent Change			34%	34%	102%	50%	148%
Office	square feet	7,868,383	1,318,336	1,318,336	10,505,055	2,636,673	11,703,543
Percent Change			14%	14%	34%	25%	49%
Industrial/Flex: (Total)		15,937,600	2,063,600	2,063,600	20,064,800	4,127,200	21,940,800
Percent Change			11%	11%	26%	21%	38%
R&D/Flex	square feet						
Warehouse and Distribution	square feet	8,336,000	1,204,000	1,204,000	10,744,000	2,408,000	11,838,545
Percent Change			13%	13%	29%	22%	42%
Manufacturing	square feet	7,601,600	859,600	859,600	9,320,800	1,719,200	10,102,255
Construction	jobs	3,830			3,755	(75)	33%
Art, Entertainment, Recreation	square feet	5,456,800	78,000	78,000	5,612,800	156,000	5,683,709
Publicly maintained parks	acres				-2%	(0)	4%
Publicly-maintained roads	linear feet				3%		

Assumptions

Calendar Assumptions	
Annual Weekdays (Days)	261
Annual Weekends (Days)	104
Conversions	
g/MT	1000000
g/lb	453.592
lb/MT	2204.622622
kg/MT	1000
MT/ton	1.10231
g/ton	907185
lb/kg	2.20462
kWh/MWh	1000
MWh/GWh	1000
Btu/therm	100000
MMBtu/therm	0.1
MMBtu/MWh	3.41214148
LPG Gallons/GGE	1.344086022
LNG Gallons/GGE	1.572327044
gal/cubic foot	7.480519481
gal/Liter	3.785411784
therms/gallon propane	0.91333
gallon/acre-foot	325851.429
million gal/acre-feet	0.325851429
gal/MG	1000000
square meter/square feet	10.7639
Global Warming Potential (GWP)	
CO_2	1
CH_4	25
N_2O	298

Fuels (gallons)	Carbon Content (kg C/MMBtu)	CO_2 Emission Factor (kg CO_2/gallon)
Gasoline	19.2	8.78
Diesel	20.2	10.21
Aviation Gasoline	18.9	8.31
Jet Fuel (Jet A or A-1)	19.7	9.75
Kerosene	20.5	10.15
Residual Fuel Oil No. 5	19.9	10.21
Residual Fuel Oil No. 6	20.5	11.27
Crude Oil	20.3	10.29
Biodiesel (B100)	20.1	9.45
Ethanol (E100)	18.7	5.75
Methanol	n/a	4.1
Liquefied Natural Gas (LNG)*	n/a	4.46
Liquefied Petroleum Gas (LPG)	17.2	5.68
Propane (Liquid)	16.8	5.72
Ethane	17.1	4.11
Isobutane	17.7	6.3
Butane	17.8	6.54

Fuels (cubic ft)	Carbon Content (kg C/MMBtu)	CO_2 Emission Factor (kg CO_2/cubic ft)
CNG	14.5	0.05444
Propane (Gas)	16.8	0.15463
Renewable NG	14.5	0.05444

Source: 2019 Climate Registry Emission Factors, Table 2.1

Electricity Emission Factors

Legislative-Adjusted

SoCal Edison	2018	2020	2030	2040	2050
RPS Status	36%	40%	60%	80%	100%
CCA - RPS Status	36%	40%	60%	80%	100%
SCE Power Mix 2018					
Natural Gas	17%				
Unspecified Sources	37%				
Coal	0%				
GHG Free Sources	46%				
SCE Calculated Emission Factors					
lb CO_2/MWh	N/A				
lb CH_4/GWh	N/A				
lb N_2O/GWh	N/A				
MT CO_2e/MWh	0.242218326	*0.22707968*	*0.151386453*	*0.0757*	*0*

Source: SCE 2019 Sustainability Report Scorecard (https://

Rancho Cucamonga Municipal U	2018	2020	2030	2040	2050
RPS Status	25%	30%	60%	77%	100%
RCMU Power Mix 2018					
Natural Gas	0%				
Unspecified Sources	70%				
Coal	0%				
GHG Free Sources	30%				
Emission Factors for Unspecified Sources (assumed to equal average Emission Factors for Unspecified Sources in CA)					
lb CO_2/MWh	452.5				
Source: SCE 2019 Sustainability Report Scorecard					
lb CH_4/GWh	26				
lb N_2O/GWh	3				
MT CO_2e/MWh	0.205950894	*0.193078963*	*0.109840477*	*0.0644*	*0*
Adjusted RCMU Emissions Factors					
lb CO2/MWh	316.75				
lb CH4/GWh	18.2				
lb N2O/GWh	2.1				
MT CO2e/MWh	0.144165626	*0.135155274*	*0.076888334*	*0.0451*	*0*

Business As Usual

SoCal Edison	2018	2020	2030	2040	2045	2050
RPS Status	36%	36%	36%	36%	36%	36%
SCE Power Mix 2018						
Natural Gas	17%					
Unspecified Sources	37%					
Coal	0%					
GHG Free Sources	46%					
SCE Calculated Emission Factors						
lb CO_2/MWh	N/A					
lb CH_4/GWh	N/A					
lb N_2O/GWh	N/A					
MT CO_2e/MWh	0.242218326	0.24	0.24	0.24	0.25	0.25

Source: SCE 2019 Sustainability Report Scorecard (https://

Rancho Cucamonga Municipal Utility		2020	2030	2040	2045	2050
RPS Status	25%	25%	25%	25%	25%	25%
RCMU Power Mix 2018						
Natural Gas	0%					
Unspecified Sources	70%					
Coal	0%					
GHG Free Sources	30%					
Emission Factors for Unspecified Sources (assumed to equal average Emission Factors for Unspecified Sources in CA)						
lb CO_2/MWh	452.5					
Source: SCE 2019 Sustainability Report Scorecard						
lb CH_4/GWh	0.4446					
lb N_2O/GWh	0.0513					
MT CO_2e/MWh	0.034896957	0.03	0.03	0.03	0.03	0.03
Adjusted RCMU Emissions Factors						
lb CO2/MWh	316.75					
lb CH4/GWh	0.31122					
lb N2O/GWh	0.03591					
MT CO2e/MWh	0.02442787	0.02	0.02	0.02	0.02	0.02
California Average (2018)	**2018**	**2020**	**2030**	**2040**	**2045**	**2050**
RPS Status	31%	33%	60%	78%	100%	100%
CA Average Power Mix						
Natural Gas	35%					
Unspecified Sources	11%					
Coal	3%					
GHG Free Sources	51%					
CA Average 2018 Emissions Factors						
lb CO_2/MWh	420.4					
lb CH_4/GWh	0.027					
lb N_2O/GWh	0.003					
MT CO_2e/MWh	0.19141598	0.19	0.11	0.06	0.00	0.00
Natural Gas Emission Factors						
kg CO2/MMBtu	53.06					
Source: U.S. Weighted Average; The Climate Registry						
g CH4/MMBtu	4.7					
Source: Residential/Commercial Factor; The Climate Registry						
g N2O/MMBtu	0.1					
Source: Residential/Commercial Factor; The Climate Registry						
lb CO_2/Therm	0.005306					
lb CH_4/Therm	0.00000047					
lb N_2O/Therm	0.00000001					
MT CO_2e/Therm	0.00532073					
Agricultural Conversion Assumptions						
Nitrogen Volatization (g N_2O/g N)	0.0125					

Target Setting for Ag-Heavy Jurisdictions (without a 1990 baseline inventory)

Table 3: Estimated Change in ghg emissions by sector (mmtCo2e)		2030 Scoping Plan Ranges		
	1990	Low Scenario	High Scenario	% change from 1990
Agriculture	26	24	25	*-8 to -4*
Residential and Commercial	44	38	40	*-14 to -9*
Electric Power	108	30	53	*-72 to -51*
High GWP	3	8	11	167 to 267
Industrial	98	83	90	*-15 to -8*
Recycling and Waste	7	8	9	14 to 29**
Transportation (Including TCU)	152	103	111	*-32 to -27*
Natural Working Lands Net Sink*	*-7****	TBD		TBD
Sub Total	431	294	339	*-32 to -21*
Cap-and-Trade Program	n/a	34	79	n/a
Total	431	260	260	*-40*

Notes from CARB Scoping Plan:
* Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.
** The SLCP will reduce emissions in this sector by 40 percent from 2013 levels. However, the 2030 levels are still higher than the 1990 levels as emissions in this sector have grown between 1990 and 2013.
*** This number reflects net results and is different than the intervention targets discussed in Chapter 4.

Scoping Plan Scenario	Low

Sector Reduction Targets Relative to 1990

	1990	**2030 Low Scenario**	**2030 High Scenario**	**% Change from 1990 (low)**	**% Change from 1990 (high)**	**2030 Target**	**2040 Target**	**2050 Target**
Non-Ag Target (excluding cap and trade)	412	270	314	*-34%*	*-24%*	*-34%*	*-52%*	*-69%*
Ag Target	26	24	25	*-8%*	*-4%*	*-8%*	*-12%*	*-15%*
Weighted target						*-34%*	*-52%*	*-69%*
Ratio of Statewide targets (2050:2030)						2		

Baseline Comparison Year (if different from 1990)	2018

Sector Reduction Targets Relative to Baseline Comparison Year

	2018	2030 Low Scenario	2030 High Scenario	% Change from 2018 (low)	% Change from 2018 (high)	2030 Target	2040 Target	2050 Target
Non-Ag Target (excluding cap and trade)	393	270	314	-31%	-20%	-31%	-47%	-62%
Ag Target	33	24	25	-26%	-23%	-26%	-39%	-53%
Weighted target						-31%	-47%	-62%

Inventory-Specific Emissions Reduction Targets

		Baseline	MASS TARGETS		
Non-Ag Emissions Targets	**1990**	**2018**	**2030**	**2040**	**2050**
Rancho Cucamonga	1,496,833	1,426,757	980,934	722,985	465,035

		Baseline	MASS TARGETS		
Ag Emissions Targets	**1990**	**2018**	**2030**	**2040**	**2050**
Rancho Cucamonga	-	-	-	-	-

Weighted Targets if 1990 backcasted from Baseline Inventory Year

TOTAL Emissions Targets		Baseline	MASS TARGETS			Percent Target Reductions from 1990		
	1990	**2018**	**2030**	**2040**	**2050**	**2030**	**2040**	**2050**
Rancho Cucamonga	1,496,833	1,426,757	980,934	722,985	465,035	-34%	-52%	-69%

Percent Target Reductions from 2018		
2030	**2040**	**2050**
-31%	-49%	-67%

Building Energy

City of Rancho Cucamonga Greenhouse Gas Inventory - 2018 and Forecast	2018	2030	2040	2050
Natural Gas				
Southern California Gas Company (SoCalGas)				
Commercial				
Customers	1,581	1,838	2,054	2,270
Existing Therms	7,035,616	7,035,616	7,035,616	10,100,345
New Development Therms (No T24)		784,678	1,766,356	2,569,245
New Development Therms		777,000	1,749,072	2,544,105
Industrial				
Customers	216	251	281	310
Therms	22,984,450	22,984,450	22,984,450	32,996,525
New Development Therms (No T24)		2,634,864	3,641,916	8,657,531
New Development Therms		2,609,082	3,606,281	8,572,818
Single Family Residential				
Customers	44,976	53,104	59,878	66,652
Therms	15,497,854	15,497,854	15,497,854	15,497,854
New Development Therms (No T24)		2,800,870	5,134,928	7,468,987
New Development Therms		2,800,870	5,134,928	7,468,987
Multi-Family Residential				
Customers	16,407	19,372	21,843	24,314
Therms	4,277,328	4,277,328	4,277,328	6,140,541
New Development Therms (No T24)		773,026	1,417,214	2,061,402
New Development Therms		773,026	1,417,214	2,061,402
Natural Gas Consumption Total				
Customers	63,180	74,566	84,056	93,546
Therms	49,795,248	49,795,248	49,795,248	64,735,265
New Development Therms (No T24)		6,993,437	11,960,414	20,757,164
New Development Therms		6,959,978	11,907,495	20,647,311
Source: Data provided by SoCalGas Staff on 6/1/2020 in correspondence with Deborah Allen				
Natural Gas Emissions in the Sphere of Influence (SOI)				
Single Family Residential Units in SOI (units)	56	59	62	66
Commercial Customers in SOI	1	1	1	1
Source: Data provided by City of Rancho Cucamonga GIS Department				
Residential Natural Gas Consumption in SOI				
Natural Gas Consumption per Customer (therms/customer)	345			
Single Family Natural Gas Consumption in SOI (therms)	19,297	19,297	19,297	19,297
New (No T24) Single Family Natural Gas Consumption in SOI (therms)		1,003	2,007	2,919
New Single Family Natural Gas Consumption in SOI (therms)		1,003	2,007	2,919
Commercial Natural Gas Consumption in SOI				
Natural Gas Consumption per Commercial Customer	4,450			
Commercial Natural Gas Consumption in SOI	4,450	4,450	4,450	4,450
New (No T24) Commercial Natural Gas Consumption in SOI		496	1,117	1,625
New Commercial Natural Gas Consumption in SOI		443	997	1,451
GHG Emissions from Natural Gas Consumption ($MTCO_2e$)				
Commercial	37,458	4,158	9,330	13,560
New Commercial		4,137	9,312	13,544
Industrial	122,294	122,294	122,294	175,566
New Industrial		13,882	19,188	45,614
Non-Residential Total	159,752	144,471	160,124	248,284
Single-Family Residential	82,563	82,563	82,563	82,563
New Single-Family Residential		14,908	27,332	39,756
Multi-Family Residential	22,759	22,759	22,759	32,672
New Multi-Family Residential		4,113	7,541	10,968
Residential Total	105,321	124,342	140,194	165,959
Natural Gas Total	**265,073**	**268,813**	**300,318**	**414,243**
BAU				
Commercial	37,458	37,458	37,458	53,765
New Commercial		4,178	9,404	13,679
Industrial	122,294	122,294	122,294	175,566
New Industrial		14,019	19,378	46,064
Non-Residential Total	159,752	177,949	188,534	289,074
Single-Family Residential	82,563	82,563	82,563	82,563
New Single-Family Residential		14,908	27,332	39,756
Multi-Family Residential	22,759	22,759	22,759	32,672
New Multi-Family Residential		4,113	7,541	10,968
Residential Total	105,321	124,342	140,194	165,959
Natural Gas Total	**265,073**	**302,292**	**328,728**	**455,033**

Electricity				
Southern California Edison (SCE)				
Electricity Consumption (kWh)				
Commercial	358,980,746	358,980,746	358,980,746	358,980,746
New Commercial (No T24)		40,036,884	90,125,394	131,091,482
New Commercial		35,738,300	80,449,027	117,016,767
Industrial	645,563,610	645,563,610	645,563,610	645,563,610
New Industrial (No T24)		74,005,352	167,175,128	243,163,822
New Industrial		66,059,723	149,226,271	217,056,394
Total Nonresidential Electricity Use	1,004,544,356	1,106,342,380	1,234,219,655	1,338,617,518
Residential	441,104,860	441,104,860	441,104,860	441,104,860
Residential (No T24)		79,719,256	146,151,969	212,584,682
New Residential		79,719,256	146,151,969	212,584,682
Total Residential Electricity Use	441,104,860	520,824,116	587,256,829	653,689,542
		520,824,116		
Source: Data provided by SCE Staff on 5/26/2020 in correspondence with Deborah Allen		0.18		
GHG Emissions from Electricity Consumption ($MTCO_2e$)				
Commercial	86,952	54,345	27,172	0
New Commercial		5,410	6,089	0
Industrial	156,367	97,730	48,865	0
New Industrial		11,203	12,654	0
Residential	106,844	66,777	33,389	0
New Residential		12,068	11,063	0
SCE GHG Emissions Total	**350,163**	**247,534**	**139,232**	**0**
BAU				
Commercial	86,952	86,952	86,952	86,952
New Commercial		9,698	21,830	31,753
Industrial	156,367	156,367	156,367	156,367
New Industrial		17,925	40,493	58,899
Residential	106,844	106,844	106,844	106,844
New Residential		19,309	35,401	51,492
SCE GHG Emissions Total	**350,163**	**397,095**	**447,886**	**492,306**
Rancho Cucamonga Municipal Utility (RCMU)				
Electricity Consumption (kWh)				
Residential	1,734,956	1,734,956	1,734,956	1,734,956
SFU (Existing)	1,313,826	1,313,826	1,313,826	1,313,826
MFU (Existing)	421,130	421,130	421,130	421,130
SFU New Residential (No T24)		68,323	68,323	198,757
SFU New Residential		68,323	68,323	198,757
MFU New Residential (No T24)		200,135	200,135	582,212
MFU New Residential		200,135	200,135	582,212
New Residential (No T24)		268,458	268,458	780,969
New Residential		268,458	268,458	780,969
Commercial	69,187,292	69,187,292	69,187,292	69,187,292
New Commercial (No T24)		11,254,690	20,719,965	30,138,131
New Commercial		10,046,324	18,495,353	26,902,332
Industrial	2,989,440	2,989,440	2,989,440	2,989,440
New Industrial (No T24)		486,292	895,267	1,302,206
New Industrial		434,081	799,146	1,162,394
Total Electricity Use	73,911,688	84,660,551	93,474,645	102,757,383
Source: Data provided by City of Rancho Cucamonga staff on 6/1/2020 in correspondence with Ricky Williams				
GHG Emissions from Electricity Consumption ($MTCO_2e$)				
Residential	250	133	78	0
New Residential		21	12	0
Commercial	9,974	5,320	3,117	0
New Commercial		772	833	0
Industrial	431	230	135	0
New Industrial		33	36	0
RCMU GHG Emissions Total	**10,656**	**6,509**	**4,211**	**0**
BAU				
Residential	250	250	250	250
New Residential		39	39	113
Commercial	9,974	9,974	9,974	9,974
New Commercial		1,623	2,987	4,345
Industrial	431	431	431	431
New Industrial		70	129	188
RCMU GHG Emissions Total	**10,656**	**12,387**	**13,810**	**15,301**

Electricity Consumption in the SOI				
Single Family Residential Units in SOI (units)	56			
Commercial Customers in SOI	1			
Jobs in SOI (all jobs associated with Ling Yen Mountain Temple)	50			
Source: Data provided by City of Rancho Cucamonga GIS Department; Ling Yen Mountain Temple jobs provided in project expansion EIR (https://ceqanet.opr.ca.gov/1998051050).				
Residential Energy Consumption in SOI				
Electricity Consumption per Household (kWh/household)	7,284	8,601	9,698	11,120
Residential Electricity Consumption in SOI (kWh)	407,912	407,912	407,912	407,912
New (No T24) Residential Electricity Consumption in SOI (kWh)		73,720	135,154	196,588
New Residential Electricity Consumption in SOI (kWh)		73,720	135,154	196,588
Commercial Energy Consumption in SOI				
Electricity Consumption per Jobs (kWh/job)	5,050	5,871	6,562	7,443
Commercial Energy Consumption in SOI	252,496	252,496	252,496	252,496
New (No T24) Commercial Energy Consumption in SOI		41,074	75,617	109,988
New Commercial Energy Consumption in SOI		36,664	67,498	98,179
GHG Emissions from Electricity Consumption in SOI ($MTCO_2e$)				
Residential	59	31	18	0
New Residential		6	6	0
Commercial	36	19	11	0
New Commercial		3	3	0
Total GHG Emissions from Electricity Consumption in SOI	**95**	**59**	**39**	**0**
BAU				
Residential	59	59	59	59
New Residential		11	19	28
Commercial	36	36	36	36
New Commercial		6	11	16
Total GHG Emissions from Electricity Consumption in SOI	**95**	**112**	**126**	**139**
Electricity Losses from Distribution				
Electricity Distribution Loss Factor				
SCE Loss Factor	0.0426	0.0426	0.0426	
Source:				
Total Electricity Consumption by Utility (kWh)				
Total SCE Residential Electricity Consumption (includes SOI)	441,112,144	521,305,748	587,799,895	654,294,042
Total SCE Non-Residential Electricity Consumption (includes SOI)	359,233,242	1,106,631,540	1,234,539,649	1,338,968,193
Total RCMU Residential Electricity Consumption	1,734,956	2,003,414	2,003,414	2,515,925
Total RCMU Non-Residential Electricity Consumption	72,176,732	82,657,137	91,471,231	100,241,458
Estimated Electricity Loss (kWh)				
SCE Electricity Loss from Residential Consumption	18,791,377	22,207,625	25,040,276	27,872,926
SCE Electricity Loss from Non-Residential Consumption	15,303,336	47,142,504	52,591,389	57,040,045
RCMU Electricity Loss from Residential Consumption	73,909	85,345	85,345	107,178
RCMU Electricity Loss from Non-Residential Consumption	3,074,729	3,521,194	3,896,674	4,270,286
GHG Emissions From Electricity Losses				
SCE GHG Emissions from Residential Electricity Loss	4,552	3,362	1,895	0
SCE GHG Emissions from Non-Residential Electricity Loss	3,707	7,137	3,981	0
RCMU GHG Emissions from Residential Electricity Loss	11	7	4	0
RCMU GHG Emissions from Non-Residential Electricity Loss	443	271	176	0
BAU				
SCE GHG Emissions from Residential Electricity Loss	4,552	5,379	6,065	6,751
SCE GHG Emissions from Non-Residential Electricity Loss	3,707	11,419	12,739	13,816
RCMU GHG Emissions from Residential Electricity Loss	11	12	12	15
RCMU GHG Emissions from Non-Residential Electricity Loss	443	508	562	616
Total GHG Emissions from Electricity Consumption ($MTCO_2e$)				
Non-Residential	257,911	182,473	103,072	0
Residential	111,715	82,405	46,465	0
Total GHG Emissions from Electricity	**369,626**	**264,878**	**149,538**	**0**
BAU				
Non-Residential	257,911	295,009	332,511	363,393
Residential	111,715	131,903	148,689	165,552
Total GHG Emissions from Electricity	**369,626**	**426,912**	**481,200**	**528,945**

Building Energy Assumptions and Background Calculations			
Title 24 Standards	2040	2050	**Source**
RES_Percent reduction from 2016 levels due to new building energy efficiency standards in new construction (Residential).	0%	0%	Building Efficiency Assumptions Below
COMM_ Percent reduction from 2016 levels due to new building energy efficiency standards in new construction (Commercial).	11%	11%	Building Efficiency Assumptions Below
SB 100	2045		
Percent reduction in energy use in existing buildings as of 2016	100%		

Building Energy Assumptions
Residential
Single-Family Residential energy efficiency improvement of 2019 code above 2016 code
Multi-Family Residential energy efficiency improvement of 2019 code above 2016 code
Commercial
Energy efficiency improvement of 2019 code above 2016 code
CalEEMod Energy Use Assumptions by Building Type - Appendix D

Land Use Sub Type	**T24 Electricity (KWhr per DU)**	**Lighting Electricity**	**T24 Natural Gas (kBtu per DU)**	**NT24 Natural Gas**
Apartments Low Rise	186.83	810.36	9095.91	6030.00
Single Family Housing	199.8512545	1608.84	22256.93612	6030

	Total Electricity (kWh) per DU	**Total Natural Gas (Therms) per DU**	
Apartments Low Rise	3359.59	Apartments Low Rise	151.26
Single Family Housing	6355.82	Single Family Housing	282.87

CalEEMod Energy Use Assumptions by Building Type - Appendix D				
Land Use Sub Type	T24 Electricity (KWhr per DU)	Lighting Electricity	T24 Natural Gas (kBtu per DU)	NT24 Natural Gas
Apartments Low Rise	792.75311	810.36	12,069.03	2,498
Single Family Housing	1,269.07	1,608.84	30,907.53	5,950.14

	Total Electricity (kWh) per DU	Total Natural Gas (Therms) per DU	
Apartments Low Rise	4233.99	Apartments Low Rise	145.67
Single Family Housing	7967.72	Single Family Housing	368.58

Building Energy Ratio	For New Homes
Single Family Homes	12,533,687
Low Rise Apartments	36,520,475
	Percent
	26%
	74%

On-Road Transportation

City of Rancho Cucamonga Greenhouse Gas Inventory - 2018			
	2018	**2030**	**2040**
Daily Vehicle Miles Traveled (VMT)			
Passenger Vehicles (Pax)	4,945,221	5,227,959	5,463,575
Light Duty Vehicles (LHDT)	61,130	71,065	79,344
Medium-Duty Trucks (MHDT)	53,926	63,390	71,277
Heavy-Duty Trucks (HHDT)	213,154	277,580	331,268
Daily VMT Total	5,273,430	5,639,994	5,945,464
Source: Daily VMT data provided by Fehr & Peers, 2021			
Annual VMT			
Daily to Annual VMT Conversion			

Vehicle miles traveled for the plan area (City and SOI) were available in the form of "daily VMT," (provided by Fehr & Peers) which represents miles of vehicle travel on an average weekday. However, the GHG inventory estimates emissions for a single calendar year. Therefore, consistent with CARB's 2017 Scoping Plan, daily VMT was converted to annual VMT using a factor of 347 days (347 days is used instead of 365 days to account for reduced daily VMT that occurs on weekends and holidays).

Daily to Annual VMT Conversion	347	
Source: 2017 CARB Scoping Plan <https://www.arb.ca.gov/cc/scopingplan/document/measure_documentation.pdf>		
Calculated Annual VMT		
Passenger Vehicles (Pax)	1,715,991,535	1,814,101,917	1,895,860,568
Light Duty Vehicles (LHDT)	21,212,096	24,659,543	27,532,416
Medium-Duty Trucks (MHDT)	18,712,180	21,996,336	24,733,133
Heavy-Duty Trucks (HHDT)	73,964,388	96,320,169	114,949,986
Adjusted Annual VMT Total	1,829,880,199	1,957,077,965	2,063,076,104
Pollutant Emissions Factors by Vehicle Type (tons/mile)		**7%**	**13%**
Passenger Vehicles (Pax)		-0.306781294	
CO_2	322.77	223.75	203.32
CH_4	0.01	0.005	0.00
N_2O	0.01	0.006	0.01
CO2e	327	226	205
Light Duty Trucks (LHDT)		-0.173667234	
CO_2	697.18	576.10	534.29
CH_4	0.02	0.01	0.01
N_2O	0.06	0.05	0.04
CO2e	715	591	547
Medium Heavy Duty Trucks (MHDT)			
CO_2	1079.66	951.72	787.69
CH_4	0.01	0.00	0.00
N_2O	0.15	0.10	0.11
CO2e	1125	982	820
Heavy Duty Trucks (HHDT)			
CO_2	1710.88	1157.74	1119.72
CH_4	0.16	0.00	0.08
N_2O	0.27	0.18	0.18
CO2e	1796	1212	1175

Estimated GHG Emissions by Pollutant (tons/mile)			
Passenger Vehicles (Pax)			
CO_2	553,869.65	405,904.99	385,474.13
CH_4	621.40	246.33	163.21
N_2O	6,039.69	3,347.10	3,103.30
CO2e			
Light Duty Trucks (LHDT)			
CO_2	14,788.67	14,206.45	14,710.17
CH_4	9.40	4.68	3.62
N_2O	375.46	367.11	351.13
CO2e			
Medium Heavy Duty Trucks (MHDT)			
CO_2	20,202.77	20,934.35	19,482.02
CH_4	6.11	2.23	1.14
N_2O	845.19	656.70	808.95
CO2e			
Heavy Duty Trucks (HHDT)			
CO_2	126,544.40	111,513.36	128,711.90
CH_4	289.25	9.81	243.17
N_2O	6,024.77	5,222.95	6,116.15
CO2e			
Estimated GHG Emissions by Vehicle Type ($MTCO_2e$)			
Passenger Vehicles	560,531	409,498	388,741
Light Duty Vehicles	15,174	14,578	15,065
Medium Heavy Duty Trucks	21,054	21,593	20,292
Heavy Duty Trucks	132,858	116,746	135,071
Total GHG Emissions for all Vehicles	729,617	562,416	559,169
Total, On-Road Transportation	**729,617**	**562,416**	**559,169**

Business as Usual On-Road Transportation

Business as Usual Greenhouse Gas Forecast			
	2018	**2030**	**2040**
Daily Vehicle Miles Traveled (VMT)			
Passenger Vehicles (Pax)	4,988,417	5,247,594	5,463,575
Light Duty Vehicles (LHDT)	62,648	71,755	79,344
Medium-Duty Trucks (MHDT)	55,372	64,047	71,277
Heavy-Duty Trucks (HHDT)	222,997	282,054	331,268
Daily VMT Total	5,329,433	5,665,450	5,945,464
Source: Daily VMT data provided by Fehr & Peers, 2021			
Annual VMT			
Daily to Annual VMT Conversion			
Vehicle miles traveled for the plan area (City and SOI) were available in the form of "daily VMT," (provided by Fehr & Peers) which represents miles of vehicle travel on an average weekday. However, the GHG inventory estimates emissions for a single calendar year. Therefore, consistent with CARB's 2017 Scoping Plan, daily VMT was converted to annual VMT using a factor of 347 days (347 days is used instead of 365 days to account for reduced daily VMT that occurs on weekends and holidays).			
Daily to Annual VMT Conversion		347	
Source: 2017 CARB Scoping Plan			
Calculated Annual VMT			
Passenger Vehicles (Pax)	1,730,980,621	1,820,915,138	1,895,860,568
Light Duty Vehicles (LHDT)	21,738,789	24,898,949	27,532,416
Medium-Duty Trucks (MHDT)	19,213,926	22,224,403	24,733,133
Heavy-Duty Trucks (HHDT)	77,379,855	97,872,654	114,949,986
Adjusted Annual VMT Total	1,849,313,191	1,965,911,143	2,063,076,104
Pollutant Emissions Factors by Vehicle Type (tons/mile)			
Passenger Vehicles (Pax)			
CO_2	322.77	322.77	322.77
CH_4	0.01	0.01	0.01
N_2O	0.01	0.01	0.01
Light Duty Trucks (LHDT)			
CO_2	697.18	697.18	697.18
CH_4	0.02	0.02	0.02
N_2O	0.06	0.06	0.06
Medium Heavy Duty Trucks (MHDT)			
CO_2	1079.66	1079.66	1079.66
CH_4	0.01	0.01	0.01
N_2O	0.15	0.15	0.15
Heavy Duty Trucks (HHDT)			
CO_2	1710.88	1710.88	1710.88
CH_4	0.16	0.16	0.16
N_2O	0.27	0.27	0.27

Estimated GHG Emissions by Pollutant (tons/mile)			
Passenger Vehicles (Pax)			
CO_2	558,707.67	587,735.79	611,925.88
CH_4	626.83	659.39	686.53
N_2O	6,092.45	6,408.99	6,672.77
Light Duty Trucks (LHDT)			
CO_2	15,155.87	17,359.08	19,195.08
CH_4	9.63	11.03	12.20
N_2O	384.78	440.72	487.33
Medium Heavy Duty Trucks (MHDT)			
CO_2	20,744.49	23,994.78	26,703.35
CH_4	6.27	7.26	8.08
N_2O	867.85	1,003.83	1,117.14
Heavy Duty Trucks (HHDT)			
CO_2	132,387.87	167,448.64	196,665.96
CH_4	302.61	382.75	449.53
N_2O	6,302.98	7,972.22	9,363.25
Estimated GHG Emissions by Vehicle Type ($MTCO_2e$)			
Passenger Vehicles	565,427	594,804	619,285
Light Duty Vehicles	15,550	17,811	19,695
Medium Heavy Duty Trucks	21,619	25,006	27,829
Heavy Duty Trucks	138,993	175,804	206,479
Total GHG Emissions for all Vehicles	741,589	813,424	873,287
Total $MTCO_2e$ for On-Road Transportation	**741,589**	**813,424**	**873,287**

Off-Road Transportation

City of Rancho Cucamonga Greenhouse Gas Inventory

		2018				2030				2040			
County and City Population													
County Population		2,171,603				2,491,923				2,758,856			
City Population		175,679				207,429				233,887			
OFFROAD Emissions Estimates													
BAU Emissions													
OFFROAD2017 Equipment Sector	**Fuel Type**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**
OFFROAD - Agricultural	Gasoline	183,905	14,878	8.78	130.63	183,905	15,308	8.78	134.41	183,905	15,591	8.78	136.89
OFFROAD - Agricultural	Diesel	200,330	16,206	10.21	165.47	200,330	16,676	10.21	170.26	200,330	16,983	10.21	173.40
OFFROAD - Construction and Mining	Gasoline	729,204	58,991	8.78	517.94	729,204	69,653	8.78	611.55	729,204	78,537	8.78	689.56
OFFROAD - Construction and Mining	Diesel	177,627	14,370	10.21	146.72	177,627	16,967	10.21	173.23	177,627	19,131	10.21	195.33
OFFROAD - Industrial	Gasoline	1,932,401	156,328	8.78	1,372.56	1,932,401	184,581	8.78	1,620.62	1,932,401	208,124	8.78	1,827.33
OFFROAD - Industrial	Diesel	17,706	1,432	10.21	14.62	17,706	1,691	10.21	17.27	17,706	1,907	10.21	19.47
OFFROAD - Industrial	CNG	3,784,554	306,164	0.01	2.23	3,784,554	361,496	0.01	2.63	3,784,554	407,606	0.01	2.97
OFFROAD - Light Commercial	Gasoline	2,060,586	166,698	8.78	1,463.61	2,060,586	196,825	8.78	1,728.12	2,060,586	221,930	8.78	1,948.55
OFFROAD - Light Commercial	Diesel	495,075	40,051	10.21	408.92	495,075	47,289	10.21	482.82	495,075	53,321	10.21	544.41
OFFROAD - Light Commercial	CNG	473,033	38,268	0.01	0.28	473,033	45,183	0.01	0.33	473,033	50,947	0.01	0.37
Portable Equipment	Diesel	10,255,087	829,619	10.21	8,470.41	10,255,087	979,553	10.21	10,001.24	10,255,087	1,104,498	10.21	11,276.93
Transportation Refrigeration Unit	Diesel	8,979	726	10.21	7.42	8,979	858	10.21	8.76	8,979	967	10.21	9.87
Total Off-road GHG Emissions in city and SOI (Excluding Agricultural)					**12,413**				**14,647**				**16,515**
Total Off-road GHG Emissions (Agricultural) [2]					**296.09**				**304.67**				**310.29**
ABAU Emissions													
OFFROAD Emissions Estimates													
OFFROAD2017 Equipment Sector	**Fuel Type**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**
OFFROAD - Agricultural	Gasoline	183,905	14,878	8.78	130.63	183,905	15,308	8.78	134.41	183,905	15,591	8.78	136.89
OFFROAD - Agricultural	Diesel	200,330	16,206	10.21	165.47	200,330	16,676	10.21	170.26	200,330	16,983	10.21	173.40
OFFROAD - Construction and Mining	Gasoline	729,204	58,991	8.78	517.94	729,204	67,538	8.78	592.99	729,204	77,519	8.78	680.61
OFFROAD - Construction and Mining	Diesel	177,627	14,370	10.21	146.72	177,627	16,452	10.21	167.97	177,627	18,883	10.21	192.79
OFFROAD - Industrial	Gasoline	1,932,401	156,328	8.78	1,372.56	1,932,401	179,294	8.78	1,574.20	1,932,401	206,246	8.78	1,810.84
OFFROAD - Industrial	Diesel	17,706	1,432	10.21	14.62	17,706	1,640	10.21	16.74	17,706	1,890	10.21	19.29
OFFROAD - Industrial	CNG	3,784,554	306,164	0.01	2.23	3,784,554	350,522	0.01	2.55	3,784,554	403,928	0.01	2.94
OFFROAD - Light Commercial	Gasoline	2,060,586	166,698	8.78	1,463.61	2,060,586	190,654	8.78	1,673.94	2,060,586	218,547	8.78	1,918.85
OFFROAD - Light Commercial	Diesel	495,075	40,051	10.21	408.92	495,075	45,806	10.21	467.68	495,075	52,508	10.21	536.11
OFFROAD - Light Commercial	CNG	473,033	38,268	0.01	0.28	473,033	43,767	0.01	0.32	473,033	50,170	0.01	0.37
Portable Equipment	Diesel	10,255,087	829,619	10.21	8,470.41	10,255,087	949,816	10.21	9,697.62	10,255,087	1,090,175	10.21	11,130.68
Transportation Refrigeration Unit	Diesel	8,979	726	10.21	7.42	8,979	832	10.21	8.49	8,979	955	10.21	9.75
Total Off-road GHG Emissions in city and SOI (Excluding Agricultural)					**12,413**				**14,203**				**16,302**
Total Off-road GHG Emissions (Agricultural) [2]					**296.09**				**304.67**				**310.29**

Notes:

[1] CARB OFFROAD ORION v1.0.1 (https://arb.ca.gov/emfac/emissions-inventory)

[2] GHG Emissions associated with Off-road Agricultural Activities are included in the "Agriculture" Emissions Sector

Emissions from Off-Road Equipment Use in SOI (for 2018 only)	
Single-Family Residential Uses in SOI	56
Off-Road Emissions Per Household ($MTCO_2e$) [2]	0.139
Total GHG Emissions from Off-Road Equipment in SOI	8

Notes: Off-Road emissions in the SOI were only estimated for the single-family home uses. The only other use in the SOI accounted for in this inventory is a Church, for which no off-road emissions would be associated.

Solid Waste

City of Rancho Cucamonga Greenhouse Gas Inventory

Baseline 2018 GHG Emissions Estimates

Waste Generation Emissions

Solid Waste Generated in City (CalRecycle)

Receiving Landfill	Tonnage Generated by City	Total ADC	Percent of Total Tonnage	Generated Methane Emissions with LFG Capture (MT CH_4)	GHG Emissions ($MTCO_2e$)
Antelope Valley Public Landfill	69	0	0.04%	0.48	12
Azusa Land Reclamation Co. Landfill	601	0	0.38%	4.17	104
Badlands Sanitary Landfill	99,048	0	61.83%	688.05	17,201
Barstow Sanitary Landfill	3	0	0.00%	0.02	1
Chiquita Canyon Sanitary Landfill	71	0	0.04%	0.49	12
Commerce Refuse-to-Energy Facility	24	0	0.01%	0.17	4
El Sobrante Landfill	56,709	0	35.40%	393.93	9,848
Frank R. Bowerman Sanitary LE	120	0	0.07%	0.83	21
Kettleman Hills - B18 Nonhaz Codisposal	1	0	0.00%	0.01	0
Lamb Canyon Sanitary Landfill	673	0	0.42%	4.68	117
McKittrick Waste Treatment Site	3	0	0.00%	0.02	1
Mid-Valley Sanitary Landfill	2,042	4,503	1.27%	45.47	1,137
Olinda Alpha Landfill	466	0	0.29%	3.24	81
Prima Deshecha	26	0	0.02%	0.18	5
San Timoteo Sanitary Landfill	9	15	0.01%	0.17	4
Simi Valley Landfill & Recycling Center	61	0	0.04%	0.42	11
Southeast Resource Recovery Facility	255	0	0.16%	1.77	44
Victorville Sanitary Landfill	15	2	0.01%	0.12	3
Total Solid Waste from CalRecycle Data	160,196	4,520		1,144	28,605

Source: CalRecycle; U.S. Community Protocol Equation SW.4.1

Solid Waste Generated in Sphere of Influce

GHG Emissions Generated from Solid Waste ($MTCO_2e$)	28,605
Households in City	60,795
GHG Emissions per household ($MTCO_2e$/household)	0.471
Total households in SOI	56
Estimated GHG Emissions from SW in SOI ($MTCO_2e$)	26
Total	**28,632**

Methodology Assumptions

SW.4.1 Methane Emissions	
Emission factor for material "i"	
Default LFG Collection Efficiency	0.75
Oxidation Rate	0.1
Mixed Solid Waste Emission Factor (CH_4/wet short ton)	0.031

GHG Emissions Forecasts (Scaled by Population)					
	2018	**2020**	**2030**	**2040**	**2050**
City Tonnage Generated	160,196	165,021	189,148	213,274	237,400
Population		180,971	207,429	233,887	260,345
Population Change from 2018 (%)		3%	18%	33%	48%
% increase in jobs			16%	30%	44%
GHG Emissions		29,494	33,806	38,118	42,430

Solid Waste Emission Factors

Waste Characterization Data Provided by CalRecycle, Available at <https://www2.calrecycle.ca.gov/WasteCharacterization/>

Waste Type	Total Tons	% of Total Waste	WARM Waste Type	Emission Factor (MT CH_4/wet short ton)
Electronics	1,730	1%	N/A	0.000
Glass	3,339	2%	N/A	0.000
Household Hazardous Waste (HHW)	403	0%	N/A	0.000
Inerts and Other	16,633	10%	N/A	0.000
Metal	16,908	10%	N/A	0.000
Mixed Residue				
Mixed Residue	2,418	1%	N/A	0.000
Other Organic				
Branches and Stumps	1,232	1%	Branches	0.062
Carpet	1,294	1%	N/A	0.000
Food	31,971	19%	Food Scraps	0.078
Leaves and Grass	12,034	7%	Grass	0.038
Manures	36	0%	Food Scraps	0.078
Prunings and Trimmings	4,999	3%	Leaves	0.013
Remainder / Composite Organic	6,790	4%	Avg. Organics	0.069
Textiles	4,438	3%	N/A	0.000
Paper				
Magazines and Catalogs	1,143	1%	Magazines	0.049
Newspaper	3,154	2%	Newspaper	0.043
Other Miscellaneous Paper - Compostable	704	0%	Newspaper	0.043
Other Miscellaneous Paper - Other	5,968	4%	Newspaper	0.043
Other Office Paper	1,963	1%	Office Paper	0.203
Paper Bags	482	0%	Office Paper	0.203
Phone Books and Directories	56	0%	Office Paper	0.203
Remainder / Composite Paper - Compostable	10,414	6%	Office Paper	0.203
Remainder / Composite Paper - Other	2,902	2%	Office Paper	0.203
Uncoated Corrugated Cardboard	15,305	9%	Corrugated Containers	0.120
White Ledger Paper	1,945	1%	Office Paper	0.203
Plastic	14,712	9%	N/A	0.000
Special Waste	2,736	2%	N/A	0.000
Grand Total	**165,709**	**100%**		**0.031**

Table SW.5 CH4 Yield for Solid Waste Components

Waste Component	Emissions Factor (MT CH_4/wet short ton waste)	Source
Mixed MSW*	0.060	U.S. EPA AP-42
Newspaper	0.043	WARM
Office Paper	0.203	WARM
Corrugated Containers	0.120	WARM
Magazines	0.049	WARM
Food Scraps	0.078	WARM
Grass	0.038	WARM
Leaves	0.013	WARM
Branches	0.062	WARM
Dimensional Lumber	0.062	WARM

MSW = municipal solid waste

*Mixed MSW factor may be used for entire MSW waste stream if waste composition data are unavailable
U.S. EPA AP-42 – U.S. EPA Emission Factor Database, Chapter 2.4 Municipal Solid Waste Landfills (1998)
WARM—Documentation for Greenhouse Gas Emissions and Energy Factors Used in the Waste Reduction Model (WARM) 2006

Solid Waste Emission Factors - 2030

Waste Characterization Data Provided by CalRecycle, Available at <https://www2.calrecycle.ca.gov/WasteCharacterization/>

Waste Type	Total Tons		% of Total Waste	WARM Waste Type	Emission Factor (MT CH_4/wet short ton)
Electronics	1,730		1%	N/A	0.000
Glass	3,339		2%	N/A	0.000
Household Hazardous Waste (HHW)	403		0%	N/A	0.000
Inerts and Other	16,633		10%	N/A	0.000
Metal	16,908		10%	N/A	0.000
Mixed Residue					
Mixed Residue	2,418		1%	N/A	0.000
Other Organic					
Branches and Stumps	1,232	493	0%	Branches	0.062
Carpet	1,294	517	0%	N/A	0.000
Food	31,971	12,789	8%	Food Scraps	0.078
Leaves and Grass	12,034	4,813	3%	Grass	0.038
Manures	36	14	0%	Food Scraps	0.078
Prunings and Trimmings	4,999	1,999	1%	Leaves	0.013
Remainder / Composite Organic	6,790	2,716	2%	Avg. Organics	0.028
Textiles	4,438	1,775	1%	N/A	0.000
Paper					
Magazines and Catalogs	1,143	457	1%	Magazines	0.049
Newspaper	3,154	1,261	2%	Newspaper	0.043
Other Miscellaneous Paper - Compostable	704	282	0%	Newspaper	0.043
Other Miscellaneous Paper - Other	5,968	2,387	4%	Newspaper	0.043
Other Office Paper	1,963	785	1%	Office Paper	0.203
Paper Bags	482	193	0%	Office Paper	0.203
Phone Books and Directories	56	22	0%	Office Paper	0.203
Remainder / Composite Paper - Compostable	10,414	4,165	6%	Office Paper	0.203
Remainder / Composite Paper - Other	2,902	1,161	2%	Office Paper	0.203
Uncoated Corrugated Cardboard	15,305	6,122	9%	Corrugated Containers	0.120
White Ledger Paper	1,945	778	1%	Office Paper	0.203
Plastic	14,712		9%	N/A	0.000
Special Waste	2,736		2%	N/A	0.000
Grand Total	**165,709**		**100%**		**0.024**

Table SW.5 CH_4 Yield for Solid Waste Components

Waste Component	Emissions Factor (MT CH_4/wet short ton	Source
Mixed MSW*	0.060	U.S. EPA AP-42
Newspaper	0.043	WARM
Office Paper	0.203	WARM
Corrugated Containers	0.120	WARM
Magazines	0.049	WARM
Food Scraps	0.078	WARM
Grass	0.038	WARM
Leaves	0.013	WARM
Branches	0.062	WARM
Dimensional Lumber	0.062	WARM

MSW = municipal solid waste

*Mixed MSW factor may be used for entire MSW waste stream if waste composition data are unavailable

Target Reduction in Organic Waste			
Year	**2018**	**2030**	**2040**
% reduction in Organic Waste	0%	60%	75%

Solid Waste Emission Factors -2040

Waste Characterization Data Provided by CalRecycle, Available at <https://www2.calrecycle.ca.gov/WasteCharacterization/>

Waste Type	Total Tons		% of Total Waste	WARM Waste Type	Emission Factor (MT CH_4/wet short ton)
Electronics	1,730		1%	N/A	0.000
Glass	3,339		2%	N/A	0.000
Household Hazardous Waste (HHW)	403		0%	N/A	0.000
Inerts and Other	16,633		10%	N/A	0.000
Metal	16,908		10%	N/A	0.000
Mixed Residue					
Mixed Residue	2,418		1%	N/A	0.000
Other Organic					
Branches and Stumps	1,232	308	0%	Branches	0.062
Carpet	1,294	323	0%	N/A	0.000
Food	31,971	7,993	5%	Food Scraps	0.078
Leaves and Grass	12,034	3,008	2%	Grass	0.038
Manures	36	9	0%	Food Scraps	0.078
Prunings and Trimmings	4,999	1,250	1%	Leaves	0.013
Remainder / Composite Organic	6,790	1,698	1%	Avg. Organics	0.017
Textiles	4,438	1,110	1%	N/A	0.000
Paper					
Magazines and Catalogs	1,143	286	0%	Magazines	0.049
Newspaper	3,154	788	0%	Newspaper	0.043
Other Miscellaneous Paper - Compostable	704	176	0%	Newspaper	0.043
Other Miscellaneous Paper - Other	5,968	1,492	1%	Newspaper	0.043
Other Office Paper	1,963	491	0%	Office Paper	0.203
Paper Bags	482	120	0%	Office Paper	0.203
Phone Books and Directories	56	14	0%	Office Paper	0.203
Remainder / Composite Paper - Compostable	10,414	2,603	2%	Office Paper	0.203
Remainder / Composite Paper - Other	2,902	725	0%	Office Paper	0.203
Uncoated Corrugated Cardboard	15,305	3,826	2%	Corrugated Containers	0.120
White Ledger Paper	1,945	486	0%	Office Paper	0.203
Plastic	14,712		9%	N/A	0.000
Special Waste	2,736		2%	N/A	0.000
Grand Total	**165,709**		**100%**		**0.008**

Table SW.5 CH_4 Yield for Solid Waste Components

Waste Component	Emissions Factor (MT CH_4/wet short ton waste)	Source
Mixed MSW*	0.060	U.S. EPA AP-42
Newspaper	0.043	WARM
Office Paper	0.203	WARM
Corrugated Containers	0.120	WARM
Magazines	0.049	WARM
Food Scraps	0.078	WARM
Grass	0.038	WARM
Leaves	0.013	WARM
Branches	0.062	WARM
Dimensional Lumber	0.062	WARM

MSW = municipal solid waste

*Mixed MSW factor may be used for entire MSW waste stream if waste composition data are unavailable

Target Reduction in Organic Waste			
Year	**2018**	**2030**	**2040**
% reduction in Organic Waste	0%	60%	75%

Water

City of Rancho Cucamonga Greenhouse Gas Inventory-Forecast			
	2018	**2030**	**2040**
Water Consumption by End Use and Source (gallons)			
Single-Family Residential			
Groundwater	2,867,417,551	3,385,635,356	3,817,483,528
Local Canyon Water	350,680,391	414,057,566	466,871,878
State Water Project	4,550,209,308	5,372,551,866	6,057,837,331
Recycled	-		
Multi-Family Residential			
Groundwater	474,183,308	559,880,710	631,295,211
Local Canyon Water	57,991,829	68,472,478	77,206,353
State Water Project	752,465,682	888,456,032	1,001,781,323
Recycled	-		
Commercial			
Groundwater	678,608,892	788,998,136	881,836,275
Local Canyon Water	82,992,737	96,493,158	107,847,108
State Water Project	1,076,861,825	1,252,034,835	1,399,356,584
Recycled	-		
Landscape/Irrigation			
Groundwater	843,697,657	996,176,025	1,123,241,331
Local Canyon Water	103,182,818	121,830,669	137,370,544
State Water Project	1,338,835,681	1,580,798,520	1,782,434,218
Recycled	364,846,145	430,783,445	485,731,194
Industrial			
Groundwater	306,951,958	356,883,804	398,876,842
Local Canyon Water	37,539,713	43,646,295	48,781,973
State Water Project	487,091,828	566,327,010	632,964,361
Recycled	-		
Water Consumption in Sphere of Influences (SOI)			
Single-Family Residential Uses in SOI	56	66	75
Total Water Consumption per Single-Family Home	204,855		
Estimated Single Family Water Consumption in SOI	11,471,881	13,545,152	15,272,878
Estimated Water Consumption by Source in SOI			
Groundwater	4,234,471	4,999,752	5,637,485
Local Canyon Water	517,869	611,461	689,455
State Water Project	6,719,541	7,933,939	8,945,937
Recycled	-		
Commercial Jobs in SOI	50	58	65
Total Water Consumption Per Jobs	31,273		
Estimated Commercial Water Consumption in SOI	1,563,644	1818002	2031918
Estimated Water Consumption by Source in SOI			
Groundwater	577,168	671056	750016
Local Canyon Water	70,587	82069	91726
State Water Project	915,889	1064877	1190176
Recycled	-		

Total Water Consumption	**14,387**		
Groundwater	5,175,671,005		
Local Canyon Water	632,975,945		
State Water Project	8,213,099,755		
Recycled	364,846,145		
Electricity Associated with Water Consumption (kWh)			
Single-Family Residential			
Groundwater	7,272,459	8,586,783	9,682,054
Local Canyon Water	498,702	588,830	663,937
State Water Project	43,860,440	51,787,176	58,392,789
Recycled	-		
Multi-Family Residential			
Groundwater	1,200,869	1,417,898	1,598,755
Local Canyon Water	82,348	97,231	109,633
State Water Project	7,242,482	8,551,389	9,642,145
Recycled	-		
Commercial			
Groundwater	1,720,039	1,999,837	2,235,150
Local Canyon Water	117,950	137,137	153,273
State Water Project	10,373,610	12,061,085	13,480,263
Recycled	-		
Landscape/Irrigation			
Groundwater	2,136,664	2,522,816	2,844,609
Local Canyon Water	146,520	173,000	195,066
State Water Project	12,886,293	15,215,186	17,155,929
Recycled	518,082	611,712	689,738
Industrial			
Groundwater	777,356	903,808	1,010,156
Local Canyon Water	53,306	61,978	69,270
State Water Project	4,688,259	5,450,897	6,092,282
Recycled	-	-	-
Total Electricity Associated with Water Consumption	**93,575,379**		
Groundwater	13,107,387	15,431,143	17,370,723
Local Canyon Water	898,826	1,058,175	1,191,180
State Water Project	79,051,085	93,065,733	104,763,408
Recycled	518,082	611,712	689,738

GHG Emissions from Water Transport, Distribution, and Treatment ($MTCO_2e$)			
Single-Family Residential			
Groundwater	1,762	1,300	733
Local Canyon Water	121	89	50
State Water Project	8,396	5,747	3,618
Recycled	-		
Multi-Family Residential			
Groundwater	291	215	121
Local Canyon Water	20	15	8
State Water Project	1,386	949	597
Recycled	-		
Commercial			
Groundwater	417	303	169
Local Canyon Water	29	21	12
State Water Project	1,986	1,338	835
Recycled	-		
Landscape/Irrigation			
Groundwater	518	382	215
Local Canyon Water	35	26	15
State Water Project	2,467	1,688	1,063
Recycled	125	93	52
Industrial			
Groundwater	188	137	76
Local Canyon Water	13	9	5
State Water Project	897	605	377
Recycled	-		
Total GHG Emissions Associated with Water Transport, Distribution, and Treatment			
Groundwater	3,175	2,336	1,315
Local Canyon Water	218	160	90
State Water Project	15,132	10,327	6,491
Recycled	125	93	52
Total GHG Emissions for Water	**18,650**	**12,916**	**7,948**

BAU

GHG Emissions from Water Transport, Distribution, and Treatment ($MTCO_2e$)			
Single-Family Residential			
Groundwater	1,762	2,080	2,345
Local Canyon Water	121	143	161
State Water Project	8,396	9,913	11,177
Recycled	-	-	-
Multi-Family Residential			
Groundwater	291	343	387
Local Canyon Water	20	24	27
State Water Project	1,386	1,637	1,846
Recycled	-	-	-
Commercial			
Groundwater	417	484	541
Local Canyon Water	29	33	37
State Water Project	1,986	2,309	2,580
Recycled	-	-	-
Landscape/Irrigation			
Groundwater	518	611	689
Local Canyon Water	35	42	47
State Water Project	2,467	2,912	3,284
Recycled	125	148	167
Industrial			
Groundwater	188	219	245
Local Canyon Water	13	15	17
State Water Project	897	1,043	1,166
Recycled	-	-	-
Total GHG Emissions Associated with Water Transport, Distribution, and Treatment			
Groundwater	3,175	3,738	4,208
Local Canyon Water	218	256	289
State Water Project	15,132	17,814	20,053
Recycled	125	148	167
Total GHG Emissions for Water	**18,650**	**21,956**	**24,716**

Water Energy Intensity Factors Calculations			
	Supply Energy Intensity (kWh/MG)	Treatment Intensity (kWh/MG)	Distribution Intensity (kWh/MG)
Groundwater	1112.5	100	1200
Local Canyon Water	0	100	1200
State Water Project	0	100	1200
Recycled	0	100	1200

Source: CEC-500-2006-118, Table 9; Groundwater depth assumed to be 250' based on Mojave Water District information (Figure 3.7-5 http://www.sbcounty.gov/uploads/lus/Mine/14HydrologyWaterQuality.pdf); State Water Project Energy Intensity from Energy Nexus (https://dwr.maps.arcgis.com/apps/Styler/index.html?appid=c112a21431884158b58fc5564e66c439)

Wastewater

City of Rancho Cucamonga Greenhouse Gas Inventory - 2018

Wastewater Emissions Calculations

Wastewater Treatment

Facility	Influent Wastewater Flow (MG/day)	Population Served by Facility [1]	Treatment Method	Stationary Source Methods	Process/Fugitive Method	Stationary Emissions MT CH_4	Stationary Emissions MT N_2O	Process Emissions MT N_2O	Fugitive Emissions MT N_2O	$MTCO_2e$
IEUA RF-1	28	129,575	Anaerobic	WW.1.a and WW.2.a	WW.7 and WW.12.a	0.101	0.020	1.134	2.995	1,239
IEUA RF-4	10	46,277	Aerobic	None	WW.7 and WW.12.a	0.000	0.000	0.405	1.271	500
Total										**1,738**

Note:[1] Population served by facility values were calculated and weighted based on the influent flow of each facility serving the city.

Method Assumptions

WW.1.a: CH_4 Emissions from Devices Designed to Combust Anaerobic Digestor Gas	
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day)	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
CH_4 emission factor (kg CH_4/MMBTU)	0.0032
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.2.a N_2O Emissions from Combustion when only Population Served by System is Known	
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
N_2O emission factor (kg N_2O/MMBTU)	0.00063
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.7 N_2O Process Emission from Wastewater Treatment Plants that Uses Nitrification or Dentification	
Factor for high nitrogen loading of industrial or commercial discharge	1.25
Factor for insignificant industrial or commercial discharge	1
Emission factor for a WWTP with nitrification or denitrification (g N_2O/person/year)	7
Conversion from g to MT	0.000001
WW.12 N_2O Emission from Effluent Conversion	
Average total nitrogen per day (kg N/person/day)	0.026
Factor for industrial or commercial discharge	1.25
Nitrogen update for cell growth in anaerobic systems (kg N/kg BOD5)	0.05
Nitrogen update for cell growth in aerobic systems (kg N/kg BOD5)	0.005
Amount of BOD5 produced per person per day (kg BOD5/person/day)	0.09
Emission factor (kg N_2O-N/kg sewage-N discharged)	0.005
Molecular weight ratio of N_2O to N_2	1.57
Fraction of nitrogen removed form the WWTP with nitrification/denitrification	0.7
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001

Wastewater Transport

Estimated emissions associated with electricity consumed to transport water to IEUA RF-1	
Share of Regional Flow in 2018	24.1%
Source: Data provided by IEUA staff on 6/25 via email to Ricky Williams	
IEUA RF-1 Influent Water Flow (MG/day)	28
Distribution Intensity (kWh/MG)	1,200
Annual Electricity Consumed (kWh/year)	2,955,624
GHG Emissions from Wastewater Transport	**716**

Total GHG Emissions from Wastewater Treatment and Transport

GHG Emissions from Wastewater Treatment	1,738
GHG Emissions from Wastewater Transport	716
Total GHG Emissions from Wastewater Treatment and Transport	**2,454**

Wastewater

City of Rancho Cucamonga Greenhouse Gas Inventory - 2020

Wastewater Emissions Calculations

Wastewater Treatment

Facility	Influent Wastewater Flow (MG/day)	Population Served by Facility [1]	Treatment Method	Stationary Source Methods	Process/Fugitive Method	Stationary Emissions MT CH_4	Stationary Emissions MT N_2O	Process Emissions MT N_2O	Fugitive Emissions MT N_2O	$MTCO_2e$
IEUA RF-1	28.8	133,474	Anaerobic	WW.1.a and WW.2.a	WW.7 and WW.12.a	0.104	0.021	1.168	3.086	1,276
IEUA RF-4	10.3	47,669	Aerobic	None	WW.7 and WW.12.a	0.000	0.000	0.417	1.310	515
Total										**1,791**

Note:[1] Population served by facility values were calculated and weighted based on the influent flow of each facility serving the city.

Method Assumptions

WW.1.a: CH_4 Emissions from Devices Designed to Combust Anaerobic Digestor Gas	
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day)	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
CH_4 emission factor (kg CH_4/MMBTU)	0.0032
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.2.a N_2O Emissions from Combustion when only Population Served by System is Known	
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
N_2O emission factor (kg N_2O/MMBTU)	0.00063
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.7 N_2O Process Emission from Wastewater Treatment Plants that Uses Nitrification or Dentification	
Factor for high nitrogen loading of industrial or commercial discharge	1.25
Factor for insignificant industrial or commercial discharge	1
Emission factor for a WWTP with nitrification or denitrification (g N_2O/person/year)	7
Conversion from g to MT	0.000001
WW.12 N_2O Emission from Effluent Conversion	
Average total nitrogen per day (kg N/person/day)	0.026
Factor for industrial or commercial discharge	1.25
Nitrogen update for cell growth in anaerobic systems (kg N/kg BOD5)	0.05
Nitrogen update for cell growth in aerobic systems (kg N/kg BOD5)	0.005
Amount of BOD5 produced per person per day (kg BOD5/person/day)	0.09
Emission factor (kg N_2O-N/kg sewage-N discharged)	0.005
Molecular weight ratio of N_2O to N_2	1.57
Fraction of nitrogen removed form the WWTP with nitrification/denitrification	0.7
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001

Wastewater Transport

Estimated emissions associated with electricity consumed to transport water to IEUA RF-1		
Share of Regional Flow in 2018	24.1%	
Source: Data provided by IEUA staff on 6/25 via email to Ricky Williams		
IEUA RF-1 Influent Water Flow (MG/day)	29	
Distribution Intensity (kWh/MG)	1,200	
Annual Electricity Consumed (kWh/year)	3,044,651	BAU
GHG Emissions from Wastewater Transport	**691**	**737**

Total GHG Emissions from Wastewater Treatment and Transport

GHG Emissions from Wastewater Treatment	1,791	1,791
GHG Emissions from Wastewater Transport	691	737
Total GHG Emissions from Wastewater Treatment and Transport	**2,482**	**2,528**

Wastewater

City of Rancho Cucamonga Greenhouse Gas Inventory - 2030

Wastewater Emissions Calculations -2030

Wastewater Emissions Calculations

Facility	Influent Wastewater Flow (MG/day)	Population Served by Facility [1]	Treatment Method	Stationary Source Methods	Process/Fugitive Method	Stationary MT CH_4	Stationary MT N_2O	Process MT N_2O	Fugitive MT N_2O	$MTCO_2e$
IEUA RF-1	33.06	152,970	Anaerobic	WW.1.a, 2.a	WW.7, 12.a	0.119	0.024	1.338	3.536	1,463
IEUA RF-4	11.81	54,632	Aerobic	None	WW.7, 12.a	0.000	0.000	0.478	1.501	590
									Total	**2,052**

Note:[1] Population served by facility values were calculated and weighted based on the influent flow of each facility serving the city.

Method Assumptions

WW.1.a: CH_4 Emissions from Devices Designed to Combust Anaerobic Digestor Gas	
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day)	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
CH_4 emission factor (kg CH_4/MMBTU)	0.0032
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.2.a N_2O Emissions from Combustion when only Population Served by System is Known	
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
N_2O emission factor (kg N_2O/MMBTU)	0.00063
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.7 N_2O Process Emission from Wastewater Treatment Plants that Uses Nitrification or Dentification	
Factor for high nitrogen loading of industrial or commercial discharge	1.25
Factor for insignificant industrial or commercial discharge	1
Emission factor for a WWTP with nitrification or denitrification (g N_2O/person/year)	7
Conversion from g to MT	0.000001
WW.12 N_2O Emission from Effluent Conversion	
Average total nitrogen per day (kg N/person/day)	0.026
Factor for industrial or commercial discharge	1.25
Nitrogen update for cell growth in anaerobic systems (kg N/kg BOD5)	0.05
Nitrogen update for cell growth in aerobic systems (kg N/kg BOD5)	0.005
Amount of BOD5 produced per person per day (kg BOD5/person/day)	0.09
Emission factor (kg N_2O-N/kg sewage-N discharged)	0.005
Molecular weight ratio of N_2O to N_2	1.57
Fraction of nitrogen removed form the WWTP with nitrification/denitrification	0.7
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001

Wastewater Transport

Estimated emissions associated with electricity consumed to transport water to IEUA RF-1		
Share of Regional Flow in 2018	24.1%	
Source: Data provided by IEUA staff on 6/25 via email to Ricky Williams		
IEUA RF-1 Influent Water Flow (MG/day)	33	
Distribution Intensity (kWh/MG)	1,200	
Annual Electricity Consumed (kWh/year)	3,489,783	BAU
GHG Emissions from Wastewater Transport	**528**	**845**
Total GHG Emissions from Wastewater Treatment and Transport		BAU
GHG Emissions from Wastewater Treatment	2,052	2,052
GHG Emissions from Wastewater Transport	528	845
Total GHG Emissions from Wastewater Treatment and Transport	**2,581**	**2,898**

Wastewater

City of Rancho Cucamonga Greenhouse Gas Inventory - 2040

Wastewater Emissions Calculations

Wastewater Treatment

Facility	Influent Wastewater Flow (MG/day)	Population Served by Facility [1]	Treatment Method	Stationary Source Methods	Process/ Fugitive Method	Stationary Emissions		Process Emissions	Fugitive Emissions	
						MT CH_4	MT N_2O	MT N_2O	MT N_2O	$MTCO_2e$
IEUA RF-1	37.3	172,465	Anaerobic	WW.1.a, 2.a	WW.7, 12.a	0.135	0.027	1.509	3.987	1,649
IEUA RF-4	13.3	61,595	Aerobic	None	WW.7, 12.a	0.000	0.000	0.539	1.692	665
Total										**2,314**

Note:[1] Population served by facility values were calculated and weighted based on the influent flow of each facility serving the city.

Method Assumptions

WW.1.a: CH_4 Emissions from Devices Designed to Combust Anaerobic Digestor Gas	
Standard cubic feet of digester gas produced per person per day (std	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
CH_4 emission factor (kg CH_4/MMBTU)	0.0032
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.2.a N_2O Emissions from Combustion when only Population Served by System is Known	
Standard cubic feet of digester gas produced per person per day (std	1
Fraction of CH_4 in gas	0.65
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028
Conversion from BTU to 1 MMBTU	0.000001
N_2O emission factor (kg N_2O/MMBTU)	0.00063
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001
WW.7 N_2O Process Emission from Wastewater Treatment Plants that Uses Nitrification or Dentification	
Factor for high nitrogen loading of industrial or commercial discharge	1.25
Factor for insignificant industrial or commercial discharge	1
Emission factor for a WWTP with nitrification or denitrification (g	7
Conversion from g to MT	0.000001
WW.12 N_2O Emission from Effluent Conversion	
Average total nitrogen per day (kg N/person/day)	0.026
Factor for industrial or commercial discharge	1.25
Nitrogen update for cell growth in anaerobic systems (kg N/kg BOD5)	0.05
Nitrogen update for cell growth in aerobic systems (kg N/kg BOD5)	0.005
Amount of BOD5 produced per person per day (kg BOD5/person/day)	0.09
Emission factor (kg N_2O-N/kg sewage-N discharged)	0.005
Molecular weight ratio of N_2O to N_2	1.57
Fraction of nitrogen removed form the WWTP with	0.7
Conversion factor (day/year)	365.25
Conversion from kg to MT (MT/kg)	0.001

Wastewater Transport

Estimated emissions associated with electricity consumed to transport water to IEUA RF-1

Share of Regional Flow in 2018	24.1%	
Source: Data provided by IEUA staff on 6/25 via email to Ricky Williams		
IEUA RF-1 Influent Water Flow (MG/day)	37	
Distribution Intensity (kWh/MG)	1,200	
Annual Electricity Consumed (kWh/year)	3,934,916	BAU
GHG Emissions from Wastewater Transport	**298**	**953**

Total GHG Emissions from Wastewater Treatment and Transport

		BAU
GHG Emissions from Wastewater Treatment	2,314	2,314
GHG Emissions from Wastewater Transport	298	953
Total GHG Emissions from Wastewater Treatment and Transport	**2,612**	**3,267**

Wastewater

City of Rancho Cucamonga Greenhouse Gas Inventory - 2050

Wastewater Emissions Calculations

Wastewater Treatment

Facility	Influent Wastewater Flow (MG/day)	Population Served by Facility [1]	Treatment Method	Stationary Source Methods	Process/Fugitive Method	Stationary Emissions MT CH_4	Stationary Emissions MT N_2O	Process Emissions MT N_2O	Fugitive Emissions MT N_2O	$MTCO_2e$
IEUA RF-1	37.3	191,961	Anaerobic	WW.1.a, 2.a	WW.7, 12.a	0.150	0.030	1.680	4.438	1,835
IEUA RF-4	13.3	68,557	Aerobic	None	WW.7, 12.a	0.000	0.000	0.600	1.883	740
Total										**2,575**

Note:[1] Population served by facility values were calculated and weighted based on the influent flow of each facility serving the city.

Method Assumptions

WW.1.a: CH_4 Emissions from Devices Designed to Combust Anaerobic Digestor Gas		
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day)	1	
Fraction of CH_4 in gas	0.65	
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028	
Conversion from BTU to 1 MMBTU	0.000001	
CH_4 emission factor (kg CH_4/MMBTU)	0.0032	
Conversion factor (day/year)	365.25	
Conversion from kg to MT (MT/kg)	0.001	
WW.2.a N_2O Emissions from Combustion when only Population Served by System is Known		
Standard cubic feet of digester gas produced per person per day (std ft^3/person/day	1	
Fraction of CH_4 in gas	0.65	
Default BTU content of CH_4, higher heating value (BTU/ft^3)	1028	
Conversion from BTU to 1 MMBTU	0.000001	
N_2O emission factor (kg N_2O/MMBTU)	0.00063	
Conversion factor (day/year)	365.25	
Conversion from kg to MT (MT/kg)	0.001	
WW.7 N_2O Process Emission from Wastewater Treatment Plants that Uses Nitrification or Dentification		
Factor for high nitrogen loading of industrial or commercial discharge	1.25	
Factor for insignificant industrial or commercial discharge	1	
Emission factor for a WWTP with nitrification or denitrification (g N_2O/person/year)	7	
Conversion from g to MT	0.000001	
WW.12 N_2O Emission from Effluent Conversion		
Average total nitrogen per day (kg N/person/day)	0.026	
Factor for industrial or commercial discharge	1.25	
Nitrogen update for cell growth in anaerobic systems (kg N/kg BOD5)	0.05	
Nitrogen update for cell growth in aerobic systems (kg N/kg BOD5)	0.005	
Amount of BOD5 produced per person per day (kg BOD5/person/day)	0.09	
Emission factor (kg N_2O-N/kg sewage-N discharged)	0.005	
Molecular weight ratio of N_2O to N_2	1.57	
Fraction of nitrogen removed form the WWTP with nitrification/denitrification	0.7	
Conversion factor (day/year)	365.25	
Conversion from kg to MT (MT/kg)	0.001	

Wastewater Transport

Estimated emissions associated with electricity consumed to transport water to IEUA RF-1		
Share of Regional Flow in 2018	24.1%	
Source: Data provided by IEUA staff on 6/25 via email to Ricky Williams		
IEUA RF-1 Influent Water Flow (MG/day)	37	
Distribution Intensity (kWh/MG)	1,200	
Annual Electricity Consumed (kWh/year)	3,934,916	BAU
GHG Emissions from Wastewater Transport	**0**	**953**

Total GHG Emissions from Wastewater Treatment and Transport		BAU
GHG Emissions from Wastewater Treatment	2,575	2,575
GHG Emissions from Wastewater Transport	0	953
Total GHG Emissions from Wastewater Treatment and Transport	**2,575**	**3,529**

Agriculture

City of Rancho Cucamonga Greenhouse Gas Inventory - 2018

GHG Emission from Crop Cultivation

Location	Acres	Sq. Ft.	Crop	Crops Grown in 2018?	Fertilizer Application Assumptions		Nitrogen Emitted as N_2O	GHG Emissions
					lb N/ac/yr [1]	lb N/year	(MT N_2O/yr)	$MTCO_2e$
Cherry Ave	17.11	745,312	Grape	Yes	34	0.00	0.00000	0.00
Foothill Blvd/Grove Ave	8.74	380,714	Strawberry	No	85	742.90	0.00421	1.26
Victoria Street	4.45	193,842	Grape	No	34	151.30	0.00086	0.26
Victoria Street	4.45	193,842	Grape	No	34	151.30	0.00086	0.26
Wilson Ave/Hermosa Ave	2.00	87,120	Citrus	Yes	63	0.00	0.00000	0.00
Red Hill Country Club Drive	0.25	10,890	Strawberry	No	85	21.25	0.00012	0.04
Total for Crop Cultivations						**1066.75**	**0.00605**	**1.80**

Notes:

[1] Emission factors for fertilizer application provided for each crop type by University of California, Davis crop cost summaries. Where available, San Bernardino County specific information is used; otherwise, values used in this calculation reflect emissions factors for activities in county's with similar climates. Available at <https://coststudies.ucdavis.edu/en/archived/>

GHG Emissions from Equestrian Uses

Location	Acres	Sq. Ft.	Assumed Horses per Acre [2]	kg/CH_4/head/year	MT CH_4	GHG Emissions ($MTCO_2e$)
Hidden Farm Rd/Carnelian St	2.02	87,991.20	2	18	0.072	1.8
Hidden Farm Rd/Carnelian St	0.32	13,939.20	2	18	0.018	0.45
Total for Equestrian Uses					0.09	2.25

Notes:

[2] Assumed horses per acre based on review of standard horse boarding amounts allowed within City of Rancho Cucamonga Municipal Code (http://qcode.us/codes/ranchocucamonga/?view=desktop&topic=17-vi-17_114-17_114_050)

Summary of GHG Emissions Generated by Agricultural Activities ($MTCO_2e$)

Fertilizer Application	1.802
Equestrian Uses	2.250
Off-road Agric. Vehicles	296.093
Total, Agriculture	**300.145**

Appendix B

City of Rancho Cucamonga Greenhouse Gas Emissions Reduction Targets and Measures

Measure Reduction Summary		MTCO2e	
		2030	2040
S-1.1	Public EV Chargers at Public Facilities and Non-Residential Uses	3,928	7,778
S-1.2	EV Charging - New Development	4,040	7,419
S-1.3	Zero Emission and Clean Equipment	590	1,081
S-1.4	New Off-Road Equipment	205	406
S-1.5	Municipal Vehicle Fleet	234	793
S-1.6	Construction Vehicle Fleets	342	522
S-2.1	Energy Efficiency Retrofit Program	36,078	80,642
S-2.2	Solar at Existing Warehouses and Commercial Land Uses	569	669
S-2.3	Renewable Energy Retrofits	5,469	6,854
S-3.1	Zero Net Electricity Homes	4,646	3,380
S-3.2	Commercial Zero Net Electricity	8,591	19,043
S-3.3	Solar at New Warehouses	3,084	3,096
S-4.1	Energy Conservation	718	650
S-4.2	Renewable Energy at Municipal Facilities	722	546
S-5.1	Clean Local Power Supply	2,693	0
S-5.2	Electricity Supply Choice	99,499	29,343
S-6.1	Tree Planting at Existing Development	14	44
S-8.1	Water Efficient Landscaping Retrofits	57	32
S-10.1	Organics Recycling	6,298	21,541
S-11.1	Local Mobility Hub	6,880	10,885
S-11.2	Pedestrian and Bicycle Networks	670	1614
S-12.1	Transportation Demand Management	258	939
S-13.1	Emerging Technologies	1,254	2,430
	Total Reductions	**186,840**	**199,709**

S-1.1	EV Charging at Existing Developments

2030 Reductions (MTCO2e):	3,928
2040 Reductions (MTCO2e):	7,778

2030

EV Charger Emission Reduction Calculation

Number of Level II Charging Plugs			380	
Number of DC Fast Charging Plugs			25	
Total Number of Charging Plugs			405	
Number of Connections per Charge			2	
Average Charging hours per Connection per day			4	
Charging days per year			260	
Number of hours of charge per year for all chargers (h/year)			842,400	
Average Efficiency of EV LDV (kWh/100-mi) (1)			34	<-MY15-18
GHG Emissions/kWh in San Bernardino County in 2030 (MTCO2e/kWh)			0.00015	
GHG Emissions per mi for average gasoline LDV (gCO2/mi)			226	
Emissions reductions per EV mi (kg CO2/mi)			0.17	

% Charger Types	Type of EV Charger	Charger Power (kW or kWh/h) (2)	Charged amount (kWh)	Equivalent VMT (mi)	EV emissions (MT CO2e)	Equivalent Gasoline emissions (MT CO2e)	Emissions reductions (MT CO2e)	Emissions reductions per hour of charge (kg CO2e/h)
94%	Level 2 (high)	6.6	5,216,640	15,512,785	790	3,502	2,712	3
6%	DC Fast Charging	45	2,340,000	6,958,486	354	1,571	1,216	1
			Total VMT	22,471,271	Total Reductions		3,928	

S-1.1	EV Charging at Existing Developments

2040

EV Charger Emission Reduction Calculation

Number of Level II Charging Plugs			720	
Number of DC Fast Charging Plugs			50	
Total Number of Charging Plugs			770	
Number of Connections per Charge			2	
Average Charging hours per Connection per day			4	
Charging days per year			260	
Number of hours of charge per year for all chargers (h/year)			1,601,600	
Average Efficiency of EV LDV (kWh/100-mi) (1)			34	<-for MY2015-2018
GHG Emissions per kWh in San Bernardino County in 2040 (MTCO2e/kWh			0.00008	
GHG Emissions per mi for average gasoline LDV (gCO2/mi)			205	
Emissions reductions per EV mi (kg CO2/mi)			0.18	

% Charger Types	Type of EV Charger	Charger Power (kW or kWh/h) (2)	Charged amount (kWh)	Equivalent VMT (mi)	kWh from replace-ment	Equivalent Gasoline emissions (MT CO2e)	Emissions reductions (MT CO2e)	Emissions reductions per hour of charge (kg CO2e/h)
94%	Level 2 (high)	6.6	9,884,160	29,392,645	748	6,027	5,279	3
6%	DC Fast Charging	45	4,680,000	13,916,972	354	2,854	2,499	2
			Total VMT	43,309,617	Total Reductions		7,778	

Strategy 1.2: EV Charging at New Development	
2030 Reductions (MTCO2e):	4,040
2040 Reductions (MTCO2e):	7,419

2030								
	Number of new units	Number of Parking Spaces	Percent New Parking with EVs	Number of EV Parking Spaces	Number of EV Chargers (2 per station)	Hours of charging per Station per Day	% of homeowners who switch to EV	% of homeowners who switch to EV
SF Residential	1,972	1	100%	1,972	493	5	53%	25%
Multi-Family Residential	10,871	1.5	10%	1,631	408	5	44%	25%
Non-Residential	1318336	4	5%	264	264	4	28%	
Industrial Land Uses	2063600	2	5%	206	206	4	22%	

Number of Chargers			932	
Average Charging hours total per day			6,383	
Work days per Year			260	
#of hours of charge/year for all chargers (h/year)			1,659,665	
Average Efficiency of EV LDV (kWh/100-mi) (1)			34	
GHGs/kWh San Bernardino County in 2030 (MTCO2e/kWh)			0.00015	<-for MY2015-2018
GHGs per mi for average gasoline LDV (gCO2/mi)			226	
Emissions reductions per EV mi (kg CO2/mi)			0.174822409	

Percent Breakdown of Charger Types	Type of EV Charger	Charger Power (kW or kWh/h) (2)	Charged amount (kWh)	Equivalent VMT (mi)	EV emissions (MT CO2e)	Equivalent Gasoline emissions (MT CO2e)	Emissions reductions (MT CO2e)	Emissions reductions per hour of charge (kg CO2e/h)
97%	Level 1	1.4	2,245,755	6,678,228	340	1,507	1,168	
50%	Level 2 (high)	6.6	5,525,203	16,430,361	836	3,708.84	2,872	2
			Total VMT	23,108,589		Total Reductions	4,040	

Strategy 1.2: EV Charging at New Development								
2040								
	Number of new units (See LU buildout tab)	Number of Parking Spaces	Percent New Parking with EVs	Number of EV Parking Spaces	Number of EV Charger connections/spaces	Hours of charging per Station per Day		Perecntage of homeowners who switch to EV
SF Residential	3944	1	100%	3,944	1,972	5	54%	50%
Multi-Family Residential	21,741	1.5	15%	4,892	2,446	5	33%	50%
Non-Residential	2,636,673	4	5%	527	527	4	7%	
Industrial Land Uses	4,127,200	2	5%	413	413	4	6%	

Number of Chargers	3,665	
Average Charging hours total per day	25850	
Work days per Year	260	
#of hours of charge/year for all chargers (h/year)	6,720,878	
Average Efficiency of EV LDV (kWh/100-mi) (1)	34	
GHGs/kWh San Bernardino County in 2030 (MTCO2e/kWh)	0.000076	<-for MY2015-2018
GHGs per mi for average gasoline LDV (gCO2/mi)	205	
Emissions reductions per EV mi (kg CO2/mi)	0.18	

Percent Breakdown of Charger Types	Type of EV Charger	Charger Power (kW or kWh/h) (2)	Charged amount (kWh)	Equivalent VMT (mi)	EV emissions (MT CO2e)	Equivalent Gasoline emissions (MT CO2e)	Emissions reductions (MT CO2e)	Emissions reductions per hour of charge (kg CO2e/h)
87%	Level 1	1.4	8,202,505	24,391,887	621	5,001	4,381	
13%	Level 2 (high)	6.6	5,688,843	16,916,980	431	3,468.78	3,038	0
			Total VMT	41,308,867		Total Reductions	7,419	

Source:

http://www.fueleconomy.gov/feg/download.shtml (Without EV efficiency forecasts, EV efficiency assumed to be the same for all future years)

https://www.driveclean.ca.gov/pev/Charging.php

S-1.3

Off-Road Transportation

		2018				2020			
County and City Population									
County Population		2,171,603				2,171,603			
City Population		175,679				180,971			
OFFROAD Emissions Estimates									
OFFROAD2017 Equipment Sector	**Fuel Type**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 Emissions (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 Emissions (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**
OFFROAD - Agricultural	Gasoline	183,905	14,878	8.78	130.63	183,905	14,878	8.78	130.63
OFFROAD - Agricultural	Diesel	200,330	16,206	10.21	165.47	200,330	16,206	10.21	165.47
OFFROAD - Construction and Mining	Gasoline	729,204	58,991	8.78	517.94	729,204	58,991	8.78	517.94
OFFROAD - Construction and Mining	Diesel	177,627	14,370	10.21	146.72	177,627	14,370	10.21	146.72
OFFROAD - Industrial	Gasoline	1,932,401	156,328	8.78	1,372.56	1,932,401	156,328	8.78	1,372.56
OFFROAD - Industrial	Diesel	17,706	1,432	10.21	14.62	17,706	1,432	10.21	14.62
OFFROAD - Industrial	CNG	3,784,554	306,164	0.01	2.23	3,784,554	306,164	0.01	2.23
OFFROAD - Light Commercial	Gasoline	2,060,586	166,698	8.78	1,463.61	2,060,586	166,698	8.78	1,463.61
OFFROAD - Light Commercial	Diesel	495,075	40,051	10.21	408.92	495,075	40,051	10.21	408.92
OFFROAD - Light Commercial	CNG	473,033	38,268	0.01	0.28	473,033	38,268	0.01	0.28
Portable Equipment	Diesel	10,255,087	829,619	10.21	8,470.41	10,255,087	829,619	10.21	8,470.41
Transportation Refrigeration Unit	Diesel	8,979	726	10.21	7.42	8,979	726	10.21	7.42
Total Off-road GHG Emissions in city and SOI (Excluding Agricultural)					**12,413**				**12,405**
Total Off-road GHG Emissions (Agricultural) [2]					**296.09**				**296.09**

OFFROAD Emissions Estimates									
OFFROAD2017 Equipment Sector	Fuel Type	Countywide Fuel Consumption [1]	Citywide Fuel Consumption	CO_2 Emissions (kg CO_2/gal)	GHG Emissions ($MTCO_2e$)	Countywide Fuel Consumption [1]	Citywide Fuel Consumption	CO_2 Emissions (kg CO_2/gal)	GHG Emissions ($MTCO_2e$)
OFFROAD - Agricultural	Gasoline	183,905	14,878	8.78	130.63	183,905	14,878	8.78	130.63
OFFROAD - Agricultural	Diesel	200,330	16,206	10.21	165.47	200,330	16,206	10.21	165.47
OFFROAD - Construction and Mining	Gasoline	729,204	58,991	8.78	517.94	729,204	58,991	8.78	517.94
OFFROAD - Construction and Mining	Diesel	177,627	14,370	10.21	146.72	177,627	14,370	10.21	146.72
OFFROAD - Industrial	Gasoline	1,932,401	156,328	8.78	1,372.56	1,932,401	156,328	8.78	1,372.56
OFFROAD - Industrial	Diesel	17,706	1,432	10.21	14.62	17,706	1,432	10.21	14.62
OFFROAD - Industrial	CNG	3,784,554	306,164	0.01	2.23	3,784,554	306,164	0.01	2.23
OFFROAD - Light Commercial	Gasoline	2,060,586	166,698	8.78	1,463.61	2,060,586	166,698	8.78	1,463.61
OFFROAD - Light Commercial	Diesel	495,075	40,051	10.21	408.92	495,075	40,051	10.21	408.92
OFFROAD - Light Commercial	CNG	473,033	38,268	0.01	0.28	473,033	38,268	0.01	0.28
Portable Equipment	Diesel	10,255,087	829,619	10.21	8,470.41	10,255,087	829,619	10.21	8,470.41
Transportation Refrigeration Unit	Diesel	8,979	726	10.21	7.42	8,979	726	10.21	7.42
Total Off-road GHG Emissions in city and SOI (Excluding Agricultural)					**12,413**				**12,405**
Total Off-road GHG Emissions (Agricultural) [2]					**296.09**				**296.09**

Notes:

[1] CARB OFFROAD ORION v1.0.1 (https://arb.ca.gov/emfac/emissions-inventory)

[2] GHG Emissions associated with Off-road Agricultural Activities are included in the "Agriculture" Emissions Sector

Emissions from Off-Road Equipment Use in SOI (for 2018 only)	
Single-Family Residential Uses in SOI	56
Off-Road Emissions Per Household ($MTCO_2e$)	0.139
Total GHG Emissions from Off-Road	8

Notes: Off-Road emissions in the SOI were only estimated for the single-family home uses. The only other use in the SOI accounted for in this inventory is a Church, for which no off-road emissions would be associated.

S-1.3

Off-Road Transportation

		2030				2040			
County and City Population									
County Population		2,491,923				2,758,856			
City Population		207,429				233,887			
OFFROAD Emissions Estimates									
OFFROAD2017 Equipment Sector	**Fuel Type**	**Countywide Fuel Consumption**	**Citywide Fuel Consumption**	**CO_2 Emissions (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**	**Countywide Fuel Consumption [1]**	**Citywide Fuel Consumption**	**CO_2 Emissions (kg CO_2/gal)**	**GHG Emissions ($MTCO_2e$)**
OFFROAD - Agricultural	Gasoline	183,905	15,308	8.78	134.41	183,905	15,591	8.78	136.89
OFFROAD - Agricultural	Diesel	200,330	16,676	10.21	170.26	200,330	16,983	10.21	173.40
OFFROAD - Construction and Mining	Gasoline	729,204	71,669	8.78	629.26	729,204	82,302	8.78	722.62
OFFROAD - Construction and Mining	Diesel	177,627	17,458	10.21	178.25	177,627	20,048	10.21	204.69
OFFROAD - Industrial	Gasoline	1,932,401	189,925	8.78	1,667.54	1,932,401	218,102	8.78	1,914.94
OFFROAD - Industrial	Diesel	17,706	1,740	10.21	17.77	17,706	1,998	10.21	20.40
OFFROAD - Industrial	CNG	3,784,554	371,962	0.01	2.71	3,784,554	427,148	0.01	3.11
OFFROAD - Light Commercial	Gasoline	2,060,586	202,523	8.78	1,778.15	2,060,586	232,570	8.78	2,041.97
OFFROAD - Light Commercial	Diesel	495,075	48,658	10.21	496.80	495,075	55,877	10.21	570.51
OFFROAD - Light Commercial	CNG	473,033	46,492	0.01	0.34	473,033	53,389	0.01	0.39
Portable Equipment	Diesel	10,255,087	1,007,913	10.21	10,290.79	10,255,087	1,157,451	10.21	11,817.57
Transportation Refrigeration Unit	Diesel	8,979	883	10.21	9.01	8,979	1,013	10.21	10.35
Total Off-road GHG Emissions in city and SOI (Excluding Agricultural)					**15,071**				**17,307**
Total Off-road GHG Emissions (Agricultural) [2]					**304.67**				**310.29**

OFFROAD Emissions Estimates									
OFFROAD2017 Equipment Sector	Fuel Type	Countywide Fuel Consumption	Citywide Fuel Consumption	CO_2 Emissions (kg CO_2/gal)	GHG Emissions ($MTCO_2e$)	Countywide Fuel Consumption [1]	Citywide Fuel Consumption	CO_2 Emissions (kg CO_2/gal)	GHG Emissions ($MTCO_2e$)
OFFROAD - Agricultural	Gasoline	183,905	15,308	8.78	134.41	183,905	15,591	8.78	136.89
OFFROAD - Agricultural	Diesel	200,330	16,676	10.21	170.26	200,330	16,983	10.21	173.40
OFFROAD - Construction and Mining	Gasoline	729,204	3,548	8.78	31.15	729,204	82,302	8.78	722.62
OFFROAD - Construction and Mining	Diesel	177,627	17,458	10.21	178.25	177,627	20,048	10.21	204.69
OFFROAD - Industrial	Gasoline	1,932,401	184,581	8.78	1,620.62	1,932,401	208,124	8.78	1,827.33
OFFROAD - Industrial	Diesel	17,706	1,691	10.21	17.27	17,706	1,907	10.21	19.47
OFFROAD - Industrial	CNG	3,784,554	361,496	0.01	2.63	3,784,554	407,606	0.01	2.97
OFFROAD - Light Commercial	Gasoline	2,060,586	196,825	8.78	1,728.12	2,060,586	221,930	8.78	1,948.55
OFFROAD - Light Commercial	Diesel	495,075	47,289	10.21	482.82	495,075	53,321	10.21	544.41
OFFROAD - Light Commercial	CNG	473,033	45,183	0.01	0.33	473,033	50,947	0.01	0.37
Portable Equipment	Diesel	10,255,087	1,007,913	10.21	10,290.79	10,255,087	1,157,451	10.21	11,817.57
Transportation Refrigeration Unit	Diesel	8,979	883	10.21	9.01	8,979	1,013	10.21	10.35
Total Off-road GHG Emissions in city and SOI (Excluding Agricultural)					**14,361**				**17,098**
Total Off-road GHG Emissions (Agricultural) [2]					**304.67**				**310.29**

Strategy 1.4: New Off-Road Equipment

Off-Road Transportation

City of Rancho Cucamonga Greenhouse Gas Inventory

Target Replacement of Off-Road Equipment	Equipment
2030	100
2040	200

Calendar Year: 2030			Percent of vehicles in Replaced Equipment Fleet	# of Units of Equipment Replaced by Category	Fuel Use Reduced	MTCO2e Reduction
Scenario: All Adopted Rules - Exhaust						
Vehicle Classification: OFFROAD2017 Equipment Sectors						
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-						
Region	CalYr					
San Bernardino	2030					
San Bernardino	2030	OFFROAD - Industrial	4%	4	9,804	86.08
San Bernardino	2030	OFFROAD - Industrial	0%	1	328	3.35
San Bernardino	2030	OFFROAD - Industrial				
San Bernardino	2030	OFFROAD - Light Commercial	90%	90	10,258	90.07
San Bernardino	2030	OFFROAD - Light Commercial	6%	6	2,466	25.18
San Bernardino	2030	OFFROAD - Light Commercial				
San Bernardino	2030	Transportation Refridgeration Unit			Total Reductions	205

Calendar Year: 2040			Percent of vehicles in Replaced Equipment Fleet	# of Units of Equipment Replaced by Category	Fuel Use Reduced	MTCO2e Reduction
Scenario: All Adopted Rules - Exhaust						
Vehicle Classification: OFFROAD2017 Equipment Sectors						
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-						
Region	CalYr	VehClass				
San Bernardino	2040	OFFROAD - Construction and Mining				
San Bernardino	2040	OFFROAD - Industrial	4%	7	19,781	173.68
San Bernardino	2040	OFFROAD - Industrial	0%	1	181	1.85
San Bernardino	2040	OFFROAD - Industrial				
San Bernardino	2040	OFFROAD - Light Commercial	90%	179	20,506	180.04
San Bernardino	2040	OFFROAD - Light Commercial	6%	13	4,926	50.30
San Bernardino	2040	OFFROAD - Light Commercial		192	4,452,091	
San Bernardino	2040	Transportation Refridgeration Unit			Total Reductions	406

Strategy 1.5: Municipal Vehicle Fleet			
	2018	**2030**	**2040**
Municipal Fleet Fuel Use			
Unleaded Fuel (Gallons)	76,402	90,210	101,716
Diesel Fuel (Gallons)	8,320	9,824	11,077
CNG (Gallons)	4,543	5,364	6,048
Municipal Fleet Emissions (MTCO2e)			
Unleaded Fuel	671	792.0	893.1
Diesel Fuel	85	100.3	113.1
CNG	2	2.2	2.5
Total Emissions from Fleet Operations (MTCO2e)	758	894.5	1008.6
Forecasted Approximate BAU Emissions from Fleet Operations (MTCO2e)	758	895	1,009
below future forecasts years		50%	100%
GHG Reductions from Strategy 1.5: Municipal Vehicle Fleet (MTCO2e)		234	793

2018			
Vehicle Type	**Vehicle Count**	**Estimated Fuel Use - 2018**	**MTCO2e**
CNG - Heavy Duty vehicles	9	1,704	1
CNG - Medium Duty vehicles	4	757	0
CNG - Light Duty vehicles	11	2,082	1
EV - Light Duty vehicles	5		
Diesel - Medium Duty vehicle	1	2,080	21
Diesel - Heavy Duty vehicle	3	6,240	64
Gas - Medium Duty vehicles	41	20,883	183
Gas - Light Duty vehicles	83	42,276	371
Hybrid/Gas - Medium Duty Vehicle	1	509	4
Hybrid/Gas - Light Duty vehicles	25	12,734	112
Total	**183**	**89,265**	**758**

Source: City fleet fuel use for 2018 provided by City staff 5.13.21

2030

Vehicle Type	Vehicle Count	Estimated Fuel Use	MTCO2e	Replace-ments	MPG	Estimated Miles	kWh	MTCO2e Electricity	Total MTCO2e	Total MTCO2e Reduction
CNG - Heavy Duty vehicles	11	2,012	1						1	
CNG - Medium Duty vehicles	5	894	0						0	
CNG - Light Duty vehicles	13	2,459	1						1	
EV - Light Duty vehicles	6								-	
Diesel - Medium Duty vehicle	1	2,456	25		34.2	83,953			25	
Diesel - Heavy Duty vehicle	4	7,368	75		12.8	94,351			75	
Gas - Medium Duty vehicles	48	24,657	216	24	25.8	636,737	214,122	32.4	108	
Gas - Light Duty vehicles	98	49,916	438	49	38.9	1,940,219	652,457	98.8	219	
Hybrid/Gas - Medium Duty Vehicle	1	601	5	1	25.8	15,530	5,222	0.8	3	
Hybrid/Gas - Light Duty vehicles	30	15,035	132	15	38.9	584,403	196,523	29.8	66	
Total	216	105,398	895					161.7	660.23	234.29

2040

Vehicle Type	Vehicle Count	Estimated Fuel Use	MTCO2e	Replace-ments	MPG	Estimated Miles	kWh	MTCO2e Electricity	Total MTCO2e	Total MTCO2e Reduction
CNG - Heavy Duty vehicles	12	2,268	1						1	
CNG - Medium Duty vehicles	5	1,008	0						0	
CNG - Light Duty vehicles	15	2,772	1						1	
EV - Light Duty vehicles	7								-	
Diesel - Medium Duty vehicle	1	2,769	28		37.64841	104,254.83			28	
Diesel - Heavy Duty vehicle	4	8,308	85		13.70568	113,860.06			85	
Gas - Medium Duty vehicles	55	27,802	244	55	29.73756	826,778.09	278,029	21.04491	-	
Gas - Light Duty vehicles	111	56,283	494	111	41.97033	2,362,219.06	794,367	60.12821	-	
Hybrid/Gas - Medium Duty Vehicle	1	678	6	1	29.73756	20,165.32	6,781	0.51329	-	
Hybrid/Gas - Light Duty vehicles	33	16,953	149	33	41.97033	711,511.77	239,267	18.11091	-	
Total	244	118,841	1,009					99.8	215.35	793.27

2030

Average Efficiency of EV LDV (kWh/100-mi) (1)	34	<-for MY2015-2018
Average Efficiency of Gasoline LDV in 2030 (mpg)	29	<-informational purposes only
GHG/kWh in San Bernardino County in 2030	0.00015	
GHG Emissions per mi for average gasoline LDV	226	

2040

Average Efficiency of EV LDV (kWh/100-mi) (1)	34	<-for MY2015-2018
Average Efficiency of Gasoline LDV in 2020 (mpg)	42	<-informational purposes only
GHG/kWh in San Bernardino County in 2040	0.00008	
GHG Emissions per mi for average gasoline LDV	205	

S-1.6

Off-Road Transportation

City of Rancho Cucamonga Greenhouse Gas Inventory - 2018

		2018				2020			2030			2040		
OFFROAD2017 Equipment Sector	Fuel Type	County Fuel [1]	City Fuel	CO_2 (kg CO_2/gal)	GHG (MTCO2e)	City Fuel	CO_2 (kg CO_2/gal)	GHG (MTCO2e)	City Fuel	CO_2 (kg CO_2/gal)	GHG (MTCO2e)	City Fuel	CO_2 (kg CO_2/gal)	GHG (MTCO2e)
OFFROAD - Agricultural	Gasoline	183,905	14,878	8.78	131	15,326	8.78	135	15,308	8.78	134	15,591	8.78	137
OFFROAD - Agricultural	Diesel	200,330	16,206	10.21	165	16,695	10.21	170	16,676	10.21	170	16,983	10.21	173
OFFROAD - Industrial	Gasoline	1,932,401	156,328	8.78	1,373	161,037	8.78	1,414	160,854	8.78	1,412	163,823	8.78	1,438
OFFROAD - Industrial	Diesel	17,706	1,432	10.21	15	1,476	10.21	15	1,474	10.21	15	1,501	10.21	15
OFFROAD - Industrial	CNG	3,784,554	306,164	0.01	2	315,386	0.01	2	315,028	0.01	2	320,842	0.01	2
OFFROAD - Light Commercial	Gasoline	2,060,586	166,698	8.78	1,464	171,719	8.78	1,508	171,524	8.78	1,506	174,690	8.78	1,534
OFFROAD - Light Commercial	Diesel	495,075	40,051	10.21	409	41,257	10.21	421	41,210	10.21	421	41,971	10.21	429
OFFROAD - Light Commercial	CNG	473,033	38,268	0.01	0	39,420	0.01	0	39,375	0.01	0	40,102	0.01	0
Portable Equipment	Diesel	10,255,087	829,619	10.21	8,470	854,608	10.21	8,726	853,638	10.21	8,716	869,394	10.21	8,877
Transport. Refrigeration Unit	Diesel	8,979	726	10.21	7	748	10.21	8	747	10.21	8	761	10.21	8
Total Off-road GHG Emissions in city and SOI (Excluding Agricultural)					**12,413**			**12,778**			**12,422**			**12,477**
Total Off-road GHG Emissions (Agricultural) [2]					**296.09**			**305**			**305**			**310**
Total Measure Emissions Reduced											**342**			**522**

Notes:

[1] CARB OFFROAD ORION v1.0.1 (https://arb.ca.gov/emfac/emissions-inventory)

[2] GHG Emissions associated with Off-road Agricultural Activities are included in the "Agriculture" Emissions Sector

Off-Road Equipment Use in SOI (for 2018 only)		Measure Targets
Single-Family Residential Uses in SOI	56	Percent Construction Fleet ZEV by
Off-Road Emissions Per Household ($MTCO_2e$) [2]	0.139	Percent Construction Fleet ZEV by 2040
Total GHG Emissions from Off-Road Equipment in SOI	8	

Notes: Off-Road emissions in the SOI were only estimated for the single-family home uses. The only other use in the SOI accounted for in this inventory is a Church, for which no off-road emissions would be associated.

Strategy 2.1: Energy Efficiency Retrofit Program

	2016	2017	2018	2020	2030	2040
Natural Gas						
Southern California Gas Company (SoCalGas)						
Commercial						
Customers	1,535	1,549	1,581	1,623	1,838	2,054
Existing Therms	6,778,055	6,765,376	7,035,616	7,035,616	703,562	1,407,123
Industrial						
Customers	218	222	216	222	251	281
Therms	30,146,668	32,933,813	22,984,450	22,984,450	2,298,445	4,596,890
Single Family Residential						
Customers	44,772	45,065	44,976	46,331	53,104	59,878
Therms	15,965,600	16,046,810	15,497,854	15,497,854	1,549,785	3,099,571
Multi-Family Residential						
Customers	16,754	16,643	16,407	16,901	19,372	21,843
Therms	4,296,237	4,305,192	4,277,328	4,277,328	427,733	855,466
Natural Gas Consumption Total						
Customers	63,279	63,479	63,180	65,077	74,566	84,056
Therms	57,186,560	60,051,191	49,795,248	49,795,248	4,979,525	9,959,050
Source: Data provided by SoCalGas Staff on 6/1/2020 in correspondence with Deborah Allen						
Natural Gas Emissions in the Sphere of Influence (SOI)						
Single Family Residential Units in SOI (units)			56	58	66	75
Commercial Customers in SOI			1	1	1	1
Source: Data provided by City of Rancho Cucamonga GIS Department						
Residential Natural Gas Consumption in SOI						
Natural Gas Consumption per Customer (therms/customer)			345			
Single Family Natural Gas Consumption in SOI (therms)			19,297	19,297	1,930	3,859
Commercial Natural Gas Consumption in SOI						
Natural Gas Consumption per Commercial Customer			4,450	4,569	5,174	5,783
Commercial Natural Gas Consumption in SOI			4,450	4,450	445	890
GHG Emissions from Natural Gas Consumption ($MTCO_2e$)						
Commercial			37,458	37,458	3,746	7,492
Industrial			122,294	122,294	12,229	24,459
Non-Residential Total			159,752	159,752	15,975	31,950
Single-Family Residential			82,563	82,563	8,256	16,513
Multi-Family Residential			22,759	22,759	2,276	4,552
Residential Total			105,321	105,321	10,532	21,064
Total GHG Emissions reductions from natural gas			**265,073**	**265,073**	**26,507**	**53,015**
Electricity						
Southern California Edison (SCE)	**2016**	**2017**	**2018**	**2020**	**2030**	**2040**
Electricity Consumption (kWh)						
Residential	444,615,884	457,793,829	441,104,860	441,104,860	457,842,732	471,790,958
Non-Residential	987,388,105	999,155,516	1,004,544,356	1,004,544,356	110,634,238	1,234,219,655
Commercial	371,193,478	369,420,383	358,980,746	358,980,746	358,980,746	358,980,746
Industrial	616,194,627	629,735,133	645,563,610	645,563,610	645,563,610	645,563,610
Residential Retrofits kWh Reduction					45,784,273	94,358,192
Non-Residential Retrofits kWh Reduction					11,063,424	246,843,931
Commercial					35,898,075	71,796,149
Industrial					64,556,361	129,112,722
Source: Data provided by SCE Staff on 5/26/2020 in correspondence with Deborah Allen						
GHG Emissions from Reduced Electricity Consumption ($MTCO_2e$)						
Non-Residential					1,675	18,684
Residential					6,931	7,142
SCE GHG Emissions Total					**1,675**	**18,684**

Strategy 2.1: Energy Efficiency Retrofit Program

Rancho Cucamonga Municipal Utility (RCMU)						
Electricity Consumption (kWh)						
Residential	1,746,821	1,764,949	1,734,956	1,734,956	1,734,956	1,734,956
Commercial	67,066,372	67,465,439	69,187,292	69,187,292	69,187,292	69,187,292
Industrial	4,421,287	3,596,941	2,989,440	2,989,440	2,989,440	2,989,440
Residential Retrofits kWh Reduction					173,496	346,991
Commercial Retrofits kWh Reduction					6,918,729	13,837,458
Industrial Retrofits Energy Reduction					298,944	597,888
Source: Data provided by City of Rancho Cucamonga staff on 6/1/2020 in correspondence with Ricky Williams						
GHG Emissions from Electricity Consumption ($MTCO_2e$)						
Residential					13	16
Commercial					532	623
Industrial					23	27
RCMU GHG Emissions Total					**568**	**666**
Electricity Consumption in the SOI						
Residential Energy Consumption in SOI						
Residential Electricity Consumption in SOI (kWh)			407,912	407,912	407,912	407,912
Reduced Residential Electricity Consumption in SOI (kWh)					40,791	81,582
Commercial Energy Consumption in SOI						
Commercial Energy Consumption in SOI (kWh)			252,496	252,496	252,496	252,496
Reduced Commercial Energy Consumption in SOI (kWh)					25,250	50,499
GHG Emissions from Reduced Electricity Consumption in SOI ($MTCO_2e$)						
Residential			0	0	3	4
Commercial			0	0	2	2
Total GHG Emissions from Electricity Consumption in SOI			**0**	**0**	**5**	**6**
Avoided Electricity Losses from Distribution						
Electricity Distribution Loss Factor						
SCE Loss Factor			0.0426	0.0426	0.0426	0.0426
Source:https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/Policy_and_Planning/DataDash Board/17/System_Efficiency_Report.pdf						
Total Electricity Consumption by Utility (kWh)						
Total SCE Residential Electricity Consumption (includes SOI)					45,825,064	94,439,774
Total SCE Non-Residential Electricity Consumption (includes SOI)					11,088,673	246,894,430
Total RCMU Residential Electricity Consumption					173,496	346,991
Total RCMU Non-Residential Electricity Consumption					7,217,673	14,435,346
Estimated Avoided Electricity Loss (kWh)						
SCE Electricity Loss from Residential Consumption					1,952,148	4,023,134
SCE Electricity Loss from Non-Residential Consumption					472,377	10,517,703
RCMU Electricity Loss from Residential Consumption					7,391	14,782
RCMU Electricity Loss from Non-Residential Consumption					307,473	614,946
GHG Emissions From Electricity Losses						
SCE GHG Emissions from Residential Electricity Loss					296	305
SCE GHG Emissions from Non-Residential Electricity Loss					72	796
RCMU GHG Emissions from Residential Electricity Loss					1	1
RCMU GHG Emissions from Non-Residential Electricity Loss					24	28
BAU						
SCE GHG Emissions from Residential Electricity Loss					473	974
SCE GHG Emissions from Non-Residential Electricity Loss					114	2,548
RCMU GHG Emissions from Residential Electricity Loss					1	2
RCMU GHG Emissions from Non-Residential Electricity Loss					44	89
Total GHG Emissions from Electricity Consumption ($MTCO_2e$)						
Non-Residential					2,327	20,161
Residential					7,244	7,467
Total GHG Emissions reductions from electricity					**9,571**	**27,628**
Total Measure Reductions					**36,078**	**80,642**

Measure Targets	2030	2040
Percent Residential Energy Reduction	10%	20%
Percent Non-Res Energy Reduction	10%	20%

Strategy 2.2: Solar at Existing Warehouses and Commercial Land Uses

Solar at Existing Warehouses and Commercial Land Uses	2030	2040
Existing RCMU Industrial Electricity Use after Retrofits under S-2.1 (kWh)	2,690,496	2,989,440
Existing SCE Nonresidential Electricity Use under S-2.1 (kWh)	581,007,249	516,450,888
Total	583,697,745	519,440,328
Percentage of Electricity Use by Territory	RCMU	0.5%
	SCE	99.5%
Target of Industrial SQ in RCMU territory with Solar	15%	30%
Target of Nonresidential SQ in SCE territory with Solar	15%	30%
Target RCMU Industrial Square Meters	1,024	2,047
Target SCE Nonresidential Square Meters	221,074	442,148
Target RCMU Industrial PV System Generation (kWh)	23,932	47,864
Target SCE Nonresidential SQ PV System Generation (kWh)	5,168,099	10,336,198
Total PV System Generation (kWh)	5,192,031	10,384,062
RCMU Electricity Emissions factor (MTCO2e/kWh)	4.81E-02	7.57E-02
RCMU Electricity Emissions factor (MTCO2e/kWh)	1.10E-01	6.44E-02
GHGs avoided from measure in RCMU territory	1	4
GHG avoided from measure in SCE territory	568	665
Warehouses and Commercial Land Uses (MTCO2e)	569	669
Annual production of 100 square meter PV system in Rancho Cucamonga (kWH)	25,163	23.38
Source: https://pvwatts.nrel.gov/pvwatts.php		
Watts per square foot		

Source: https://www.solarreviews.com/blog/how-much-electricity-does-a-solar-panel-produce

Strategy 2.3: Renewable Energy Retrofits

	2018	2030	2040	
				% Electricity Use by Territory
Existing RCMU Residential Electricity Use after Retrofits under S-2.1 (kWh)(kWh)	1,734,956	1,561,460	1,387,965	0.4%
Existing SCE Residential Electricity Use after Retrofits under S-2.1 (kWh)(kWh)	441,104,860	412,058,459	377,432,767	99.6%
Total	442,839,816	413,619,919	378,820,731	

Target of percentage single family homes in RCMU territory with solar installations		10%	25%
Target of percentage single family homes in SCE territory with solar installations		10%	25%

Target of percentage multi family homes in RCMU territory with solar installations		15%	25%
Target of percentage multi family homes in SCE territory with solar installations		15%	25%

Single Family Homes

Target Residential Units in RCMU Territory	14	36
Target Residential Units in SCE Territory	3,778	9,444
Target RCMU Residential PV System Generation (kWh)	136,743	341,856
Target SCE Residential PV System Generation (kWh)	36,085,397	90,213,492
Total PV System Generation (kWh)	36,222,139	90,555,348
RCMU Electricity Emissions factor (MTCO2e/kWh)	4.81E-02	7.57E-02
SCU Electricity Emissions factor (MTCO2e/kWh)	1.51E-01	7.57E-02
Total GHG emissions avoided from measure in RCMU territory	7	26
Total GHG emissions avoided from measure in SCE territory	5,463	6,829
GHG Reductions from Strategy 2.3: Renewable Energy Retrofits (MTCO2e)	5,469	6,854

Annual kWh

Average Residential Solar System Size SCE Territory 9,552

5.694 kW

Source: https://www.solarconsumeradvisor.com/5kw-solar-system-size-panels-ca.html#:~:text=Sizing%20Tool%20to%20Decide%20How%20Many%20Solar%20Panels%20You%20Need%20in%20CA&text=The%20average%20system%20size%20for,example%20homeowners%20(%24200%2Fmo.

Watts per square foot 14.58

Source: https://www.solarreviews.com/blog/how-much-electricity-does-a-solar-panel-produce

Strategy 3.1: Zero Net Electricity for New Residential Buildings

			2017		
Electricity					
Southern California Edison (SCE)					
Electricity Consumption (kWh)					
Residential		457,793,829	441,104,860	441,104,860	441,104,860
Residential (No T24)				146,151,969	212,584,682
New Residential				30,686,098	44,634,325
Total Electrcity Use					
Source: Data provided by SCE Staff on 5/26/2020 in correspondence with Deborah Allen					
GHG Emissions from Electricity Consumption ($MTCO_2e$)					
Residential			106,844	66,777	33,389
New Residential				4,645	3,379
SCE GHG Emissions Total			**106,844**	**71,423**	**36,767**
BAU					
Residential			106,844	106,844	106,844
New Residential				35,401	51,492
SCE GHG Emissions Total			**106,844**	**142,244**	**158,336**
Rancho Cucamonga Municipal Utility (RCMU)					
Electricity Consumption (kWh)					
Residential	1,746,821	1,764,949	1,734,956	1,734,956	1,734,956
New Residential (No T24)				313,552	574,846
New Residential				32,917	120,695
Total Electrcity Use			1,734,956	1,767,873	1,855,651
Jobs in SOI (all jobs associated with Ling Yen Mountain Temple)			50		
Source: Data provided by City of Rancho Cucamonga GIS Department; Ling Yen Mountain Temple jobs provided in project expansion EIR (https://ceqanet.opr.ca.gov/1998051050).					
Residential Energy Consumption in SOI					
Electricity Consumption per Household (kWh/household)			7,284	8,601	9,698
RCMU GHG Emissions from Residential Electricity Loss			11	0.11	0
BAU					
SCE GHG Emissions from Residential Electricity Loss			4,552	317	461
RCMU GHG Emissions from Residential Electricity Loss			11	0	1
Total GHG Emissions from Electricity Consumption ($MTCO_2e$)					
Residential			111,715	71,789	37,015
Total GHG Emissions from Electricity			**111,715**	**71,789**	**37,015**

Energy efficiency improvement of 2019 code above 2016 code	11%	1%	

Strategy 3.2: Zero Net Electricity for New Nonresidential Buildings

	2016	2017	2018	2020	2030	2040
Electricity						
Southern California Edison (SCE)						
Electricity Consumption (kWh)						
Non-Residential	987,388,105	999,155,516	1,004,544,356	1,004,544,356	1,106,342,380	1,234,219,655
New Non-Residential Reductions				0	50,899,012	229,675,299
Source: Data provided by SCE Staff on 5/26/2020 in correspondence with Deborah Allen						
GHG Emissions from Electricity Consumption ($MTCO_2e$)						
New Non-Residential Reductions					7,705	17,385
Rancho Cucamonga Municipal Utility (RCMU)						
Electricity Consumption (kWh)						
Commercial	67,066,372	67,465,439	69,187,292	69,187,292	69,187,292	69,187,292
New Commercial					10,046,324	18,495,353
Industrial	4,421,287	3,596,941	2,989,440	2,989,440	2,989,440	2,989,440
New Industrial					434,081	799,146
Source: Data provided by City of Rancho Cucamonga staff on 6/1/2020 in correspondence with Ricky Williams						
GHG Emissions from Electricity Consumption ($MTCO_2e$)						
Commercial			9,974	9,351	5,320	3,117
New Commercial Reductions				0	483	833
Industrial			431	404	230	135
New Industrial Reductions				0	21	36
RCMU GHG Emissions Total			**10,405**	**9,755**	**6,053**	**4,121**
Electricity Consumption in the SOI						
Commercial Energy Consumption in SOI (kWh)						
Commercial Energy Consumption in SOI			252,496	252,496	252,496	252,496
New (No T24) Commercial Energy Consumption in SOI				6,722	41,074	75,617
New Commercial Energy Consumption in SOI Reductions				6,001	36,664	67,498
GHG Emissions from Electricity Consumption in SOI ($MTCO_2e$)						
Commercial			36	34	19	11
New Commercial Reductions				1	2	3
Total GHG Emissions from Electricity Consumption in SOI				**35**	**21**	**14**
Total GHG Emissions from Electricity Consumption ($MTCO_2e$)						
Non-Residential Reductions					**8,591**	**19,043**
Total Electricity Measure Reductions					**8,591**	**19,043**

Strategy 3.3: On-Site Renewable Energy Systems for New Industrial Buildings

	2018	2030	2040
New RCMU Industrial Electricity Use (kWh)		434,081	799,146
New SCE Nonresidential Electricity Use (kWh)		66,059,723	358,980,746
Total		66,493,804	359,779,892
Target RCMU Inudstrial SQ		310,494	620,987
Target SCE Nonresidential SQ		1,753,107	3,506,213
Total		2,063,600	4,127,200
		2030	**2040**
CalEEMod Modeled Energy Use for new industrial (kWh)		20,465,000	40,941,800
Target RCMU Inudstrial PV System Generation (kWh)		133,598	267,274
Target SCE Nonresidential SQ PV System Generation (kWh)		20,331,402	40,674,526
RCMU Electricity Emissions factor (MTCO2e/MWh)		0.05	0.06
SCE Electricity Emissions factor (MTCO2e/MWh)		0.15	0.08
Total GHG emissions reduced from measure in RCMU territory		6	17
Total GHG emissions reduced from measure in SCE territory		3,078	3,079
Systems for New Industrial Buildings (MTCO2e)		**3,084**	**3,096**

Strategy 4.1: Municipal Energy Conservation			
Municipal Energy Conservation	**2018**	**2030**	**2040**
Non-Residential Electricity Use (kWh)	358,980,746	358,980,746	358,980,746
Non-Residential Natural Gas Use (Therms)	7,035,616	7,035,616	7,035,616
Target Municipal Energy Reduction through Conservation		15%	20%
Total Municipal Electricity Use (kWh)		18,711,227	18,049,654
Total Municipal Natural Gas Use (Therms)		366,719	353,753
Total Municipal Electricity Use (kWh) Reduction		2,806,684	3,609,931
Total Municipal Natural Gas Use (Therms) Reduction		55,008	70,751
Electricity Emissions factor (MTCO2e/MWh)		0.15139	0.07569
Natural Gas Emissions factor (MTCO2e/therm)		0.00532	0.00532
Total GHG reductions from Electricity		424.89	273.25
Total GHG reductions from Natural Gas		292.68	376.44
GHG Reductions from Strategy 4.1: Municipal Energy Conservation (MTCO2e)		**718**	**650**

Strategy 4.2: Renewable Energy at Municipal Facilities	2030	2040
Reductions from PS-4.1	2,806,684	3,609,931
Total Municipal Electricity Use (kWh) (Estimated)	18,711,227	18,049,654
Total New Municipal Electricity Use (kWh) (Estimated)	15,904,543	14,439,724
Percent of forecasted municipal energy use offset by solar	30%	50%
Total kWh generated annually from solar	4,771,363	7,219,862
Electricity Emissions factor (MTCO2e/kWh)	1.51E-04	7.57E-05
GHG Reductions from Strategy 4.2: Renewable Energy at Municipal Facilities (MTCO2e)	**722**	**546**

Strategy 5.1: RCMU Renewable Electricity Supply Building Energy					
	2016	2017	2018	2030	2040
Rancho Cucamonga Municipal Utility (RCMU)					
Electricity Consumption (kWh)					
Residential	1,746,821	1,764,949	1,734,956	1,734,956	1,734,956
New Residential				147,370	270,177
Commercial	67,066,372	67,465,439	69,187,292	69,187,292	69,187,292
New Commercial				5,401,489	12,159,071
Industrial	4,421,287	3,596,941	2,989,440	2,989,440	2,989,440
New Industrial				239,890	541,902
Total Electrcity Use			73,911,688	79,700,436	86,882,838
GHG Emissions from Electricity Consumption ($MTCO_2e$)					
Residential			250	83	1,735
New Residential				7	270
Commercial			9,974	3,325	69,187
New Commercial				260	12,159
Industrial			431	144	2,989
New Industrial				12	542
RCMU GHG Emissions Total			**10,656**	**3,830**	**86,883**
2030 Measure GHG Reductions				**2,663**	
Rancho Cucamonga Municipal Utility					
RPS Status				75%	
MT CO2e/MWh				0.0481	
Electricity Consumption in the SOI					
Residential Energy Consumption in SOI					
Electricity Consumption per Household (kWh/household)			7,284	8,601	9,698
Residential Electricity Consumption in SOI (kWh)			407,912	407,912	407,912
New (No T24) Residential Electricity Consumption in SOI (kWh)				73,720	135,154
New Residential Electricity Consumption in SOI (kWh)				34,649	63,522
Commercial Energy Consumption in SOI					
Electricity Consumption per Jobs (kWh/job)			5,050	5,871	6,562
Commercial Energy Consumption in SOI			252,496	252,496	252,496
New (No T24) Commercial Energy Consumption in SOI				28,161	75,617
New Commercial Energy Consumption in SOI				19,713	52,932
GHG Emissions from Electricity Consumption in SOI ($MTCO_2e$)					
Residential			59	20	20
New Residential				4	6
Commercial			36	2	3
New Commercial				0	0
Total GHG Emissions from Electricity Consumption in SOI			**95**	**25**	**29**
SOI Measure Reductions				**30**	
Total Measure Reductions				**2,693**	

Strategy 5.2: Electricity Supply Choice	2018	2030	2040
Electricity			
Southern California Edison (SCE)			
Electricity Consumption (kWh)			
Non-Residential - ABAU (SCE)		1,106,342,380	1,234,219,655
Residential - ABAU - (SCE)		457,842,732	471,790,958
Reductions from Other Measures			
S-2.1 (Existing Res)		45,825,064	94,439,774
S-2.1 (Existing Non-Res)		11,088,673	246,894,430
S-2.3 (Existing Non-Res)		36,085,397	90,213,492
S-3.1 (New Res)		30,686,098	44,634,325
S-3.2 (New Non-Res)		50,899,012	229,675,299
S-3.3 (New Non-Res)		20,331,402	40,674,526
Total		194,915,646	746,531,846
Total from Res		76,511,163	139,074,099
Total from Non-Res		118,404,484	607,457,747
Energy Use after reductions from other measures (kwh)			
Total Non-Residential with Reductions		987,937,896	626,761,908
Total Residential with Reductions		381,331,569	332,716,859
Energy Use Under CCA (kWh)			
Non-Residential (Choice Plus)		74,095,342	47,007,143
Residential (Choice Plus)		28,599,868	124,768,822
Non-Residential (Choice)		666,858,080	235,035,716
Residential (Choice)		257,398,809	124,768,822
Source: Data provided by SCE Staff on 5/26/2020 in correspondence with Deborah Allen			
GHG Emission Reductions from Electricity Consumption under CCAs ($MTCO_2e$)			
Non-Residential (Choice Plus)		11,217	3,558
Residential (Choice Plus)		4,330	9,444
Non-Residential (Choice)		60,572	10,674
Residential (Choice)		23,380	5,666
GHG Emissions from Electricity Consumption ($MTCO_2e$)			
Total Non-Residential		71,789	14,232
Total Residential		27,710	15,111
SCE GHG Emissions Total		**99,499**	**29,343**

Strategy 5.2: Electricity Supply Choice

CCA Participation Rate Assumptions					
	2030		2035		Notes
Assumptions	Opt-In Rate	Opt-Out Rate	Opt-In Rate	Opt-Out Rate	
Residential	0.75	0.25	0.95	0.05	n/a
Nonresidential	0.75	0.25	0.95	0.05	n/a

Source: SDCP Implementation Plan
https://www.sandiego.gov/sites/default/files/sdcp_implementation_plan.withattachments.12.11.19.pdf

RPS By Energy Plan Option		
Choice Plan		Choice Plus Plan
2020	37%	100%
2030	60%	100%
Customer Participation		
Choice Plan		Choice Plus Plan
2030	90%	10%
2040	50%	50%

Strategy 6.1: Tree Planting at Existing Development and Municipal Facilities

Action Items:	
2030 Reductions (MTCO2e):	14
2040 Reductions (MTCO2e):	44

Increase City Tree Planting	**2023**	**2030**	**2040**
Annual Tree Planting Targets starting in 2025	50	400	1,250
Annual Sequestration from Planted Trees (MTCO2e/year)	2	14	44

Default Annual CO2 accumulation per tree for Miscellaneous Trees (MT CO2e/tree/year) (From Appendix A of CalEEMod v2020)	0.0354

Strategy 8.1: Water Efficient Landscaping Retrofits				
	2018	2020	2030	2040
Water Consumption by End Use and Source (gallons)				
Landscape/Irrigation				
Groundwater	843,697,657	869,110,718	818,386,727	818,386,727
New Groundwater		25,413,061	152,478,368	279,543,675
Local Canyon Water	103,182,818	106,290,793	100,087,334	100,087,334
New Local Canyon Water		3,107,975	18,647,850	34,187,726
State Water Project	1,338,835,681	1,379,162,821	1,298,670,611	1,298,670,611
New State Water Project		40,327,140	241,962,838	443,598,537
Recycled	364,846,145	375,835,695	353,900,761	353,900,761
New Recycled		10,989,550	65,937,299	120,885,048
Industrial				
Groundwater	306,951,958	315,124,222	356,883,804	398,876,842
Local Canyon Water	37,539,713	38,539,168	43,646,295	48,781,973
State Water Project	487,091,828	500,060,120	566,327,010	632,964,361
Recycled	-			
Water Consumption in Sphere of Influences (SOI)				
Single-Family Residential Uses in SOI	56	58	66	75
Total Water Consumption per SFR	204,855			
Estimated SF Water Consumption	11,471,881	11,817,426	11,127,725	11,127,725
New Single Family Water Consumption		345,545	2,073,271	3,800,996
Estimated Water Consumption by Source in SOI				
Groundwater	4,234,471	4,362,018	4,107,437	4,107,437
		127,547	765,280	1,403,014
Local Canyon Water	517,869	533,468	502,333	502,333
		15,599	93,593	171,586
State Water Project	6,719,541	6,921,941	6,517,955	6,517,955
		202,400	1,214,398	2,226,396
Landscape/Irrigation				
Groundwater	2,136,664	2,265,381	2,458,716	2,780,509
Local Canyon Water	146,520	155,346	168,604	190,671
State Water Project	12,886,293	13,662,591	14,828,597	16,769,341
Recycled	518,082	549,292	596,170	674,196
Industrial				
Groundwater	777,356	798,052	903,808	1,010,156
Local Canyon Water	53,306	54,726	61,978	69,270
State Water Project	4,688,259	4,813,079	5,450,897	6,092,282
Recycled	-	-	-	-
Total Electricity Associated with Water	**93,575,379**	**96,804,488**	**109,680,093**	**123,516,913**
Groundwater	13,107,387	13,557,820	15,364,783	17,302,748
Local Canyon Water	898,826	929,714	1,053,624	1,186,519
State Water Project	79,051,085	81,767,662	92,665,515	104,353,450
Recycled	518,082	549,292	596,170	674,196

GHG Emissions from Water Transport, Distribution, and Treatment ($MTCO_2e$)				
Landscape/Irrigation				
Groundwater	518	514	372	210
Local Canyon Water	35	35	26	14
State Water Project	2,467	2,539	1,645	1,039
Recycled	125	125	90	51
Industrial				
Groundwater	188	181	137	76
Local Canyon Water	13	12	9	5
State Water Project	897	895	605	377
Recycled	-			
Total GHG Emissions Associated with Water Transport, Distribution, and Treatment				
Groundwater	3,175	3,079	2,326	1,310
Local Canyon Water	218	211	160	90
State Water Project	15,132	15,198	10,283	6,465
Recycled	125	125	90	51
Total GHG Emissions for Water	**18,650**	**18,613**	**12,858**	**7,916**
Total Measure GHG Reductions			**57**	**32**

Water Energy Intensity Factors Calculations				
	Supply Energy Intensity (kWh/MG)	Conveyance Energy Intensity (kWh/MG)	Treatment Intensity (kWh/MG)	Distribution Intensity (kWh/MG)
Groundwater	1112.5	120	100	1200
Local Canyon Water	0	120	100	1200
State Water Project	0	8,325	100	1200
Recycled	0	120	100	1200

Source: CEC-500-2006-118, Table 9; Groundwater depth assumed to be 250' based on Mojave Water District information (Figure 3.7-5 http://www.sbcounty.gov/uploads/lus/Mine/14HydrologyWaterQuality.pdf); State Water Project Energy Intensity from Energy Nexus (https://dwr.maps.arcgis.com/apps/Styler/index.html?appid=c112a21431884158b58fc5564e66c439)

CA Urban Water Use Statistics

Res Indoor	2,900	32%
Res Outdoor	2,900	32%
Comm Outdoor	1,300	14%
Comm Indoor	780	9%
Indus	530	6%
Conveyance Loss	690	8%
Total	9,100	

Water use reduction	
water use for Irrigation	32%
efficient irrigation system	20%
2030 - Assumed Participation Rate for Measure	15%
Rate for Measure	30%

Sources: Pacific Institute - Urban Water Conservation and Efficiency Potential in CA (https://pacinst.org/wp-content/uploads/2014/06/ca-water-urban.pdf)

EPA WaterSense Program : https://19january2017snapshot.epa.gov/www3/watersense/docs/factsheet_outdoor_water_use_508.pdf

Pacific Institute - Grey Water : https://pacinst.org/wp-content/uploads/sites/21/2013/02/greywater_overview3.pdf

Strategy 10.1: Organics Recycling (2030)

Waste Generation Emissions						
Solid Waste Generated in City (CalRecycle)						
Receiving Landfill	Tonnage Generated by City	Total ADC	Percent of Total Tonnage	Percent of year under LFG collection control in 2018 (%)	Generated Methane Emissions with LFG Capture (MT CH_4)	GHG Emissions ($MTCO_2e$)
Antelope Valley Public Landfill	69	0	0.04%	100%	0.37	9
Azusa Land Reclamation Co. Landfill	601	0	0.38%	100%	3.26	81
Badlands Sanitary Landfill	99,048	0	61.83%	100%	536.70	13,418
Barstow Sanitary Landfill	3	0	0.00%	100%	0.02	0
Chiquita Canyon Sanitary Landfill	71	0	0.04%	100%	0.38	10
Commerce Refuse-to-Energy Facility	24	0	0.01%	100%	0.13	3
El Sobrante Landfill	56,709	0	35.40%	100%	307.28	7,682
Frank R. Bowerman Sanitary LE	120	0	0.07%	100%	0.65	16
Kettleman Hills - B18 Nonhaz Codisposal	1	0	0.00%	100%	0.01	0
Lamb Canyon Sanitary Landfill	673	0	0.42%	100%	3.65	91
McKittrick Waste Treatment Site	3	0	0.00%	100%	0.02	0
Mid-Valley Sanitary Landfill	2,042	4,503	1.27%	100%	35.46	887
Olinda Alpha Landfill	466	0	0.29%	100%	2.53	63
Prima Deshecha	26	0	0.02%	100%	0.14	4
San Timoteo Sanitary Landfill	9	15	0.01%	100%	0.13	3
Simi Valley Landfill & Recycling Center	61	0	0.04%	100%	0.33	8
Southeast Resource Recovery Facility	255	0	0.16%	100%	1.38	35
Victorville Sanitary Landfill	15	2	0.01%	100%	0.09	2
Total Solid Waste from CalRecycle Data	160,196	4,520			893	22,313
Source: CalRecycle; U.S. Community Protocol Equation SW.4.1						
Solid Waste Generated in Sphere of Influce						
GHG Emissions Generated from Solid Waste ($MTCO_2e$)						22,313
Households in City						60,795
GHG Emissions per household ($MTCO_2e$/household)						0.367
Total households in SOI						56
Estimated GHG Emissions from SW in SOI ($MTCO_2e$)						21
Total						**22,334**
Total Measure Reductions						**6,298**
Methodology Assumptions						
SW.4.1 Methane Emissions						
Emission factor for material "i"						
Default LFG Collection Efficiency		0.75				
Oxidation Rate		0.1				
Mixed Solid Waste Emission Factor (CH_4/wet short ton)		0.024				

Strategy 10.1: Organics Recycling (2030)

GHG Emissions Forecasts (Scaled by Population)

	2020	2030
City Tonnage Generated	165,021	189,148
Population	180,971	207,429
Population Change from 2018 (%)	3%	18%
GHG Emissions	23,006	26,370

	2020	2030
2018 Reported Diversion Rate for the City of Rancho Cucamonga	50.00%	50.00%
Diversion Target Assumed Under Measure Implementation	50.00%	80.00%
City Target Tonnage Reduction		56,744
City Target Annual		132,403
Target GHG Emissions Reduction		**7,687**
New Total Annual Emissions		**17,936**

Strategy 10.1: Organics Recycling (2040)

Solid Waste

Waste Generation Emissions						
Solid Waste Generated in City (CalRecycle)						
Receiving Landfill	Tonnage Generated by City	Total ADC	Percent of Total Tonnage	Percent of year under LFG collection control in 2018 (%)	Generated Methane Emissions with LFG Capture (MT CH_4)	GHG Emissions ($MTCO_2e$)
Antelope Valley Public Landfill	69	0	0.04%	100%	0.12	3
Azusa Land Reclamation Co. Landfill	601	0	0.38%	100%	1.03	26
Badlands Sanitary Landfill	99,048	0	61.83%	100%	170.39	4,260
Barstow Sanitary Landfill	3	0	0.00%	100%	0.01	0
Chiquita Canyon Sanitary Landfill	71	0	0.04%	100%	0.12	3
Commerce Refuse-to-Energy Facility	24	0	0.01%	100%	0.04	1
El Sobrante Landfill	56,709	0	35.40%	100%	97.55	2,439
Frank R. Bowerman Sanitary LE	120	0	0.07%	100%	0.21	5
Kettleman Hills - B18 Nonhaz Codisposal	1	0	0.00%	100%	0.00	0
Lamb Canyon Sanitary Landfill	673	0	0.42%	100%	1.16	29
McKittrick Waste Treatment Site	3	0	0.00%	100%	0.01	0
Mid-Valley Sanitary Landfill	2,042	4,503	1.27%	100%	11.26	281
Olinda Alpha Landfill	466	0	0.29%	100%	0.80	20
Prima Deshecha	26	0	0.02%	100%	0.04	1
San Timoteo Sanitary Landfill	9	15	0.01%	100%	0.04	1
Simi Valley Landfill & Recycling Center	61	0	0.04%	100%	0.10	3
Southeast Resource Recovery Facility	255	0	0.16%	100%	0.44	11
Victorville Sanitary Landfill	15	2	0.01%	100%	0.03	1
Total Solid Waste from CalRecycle Data	160,196	4,520			283	7,084
Source: CalRecycle; U.S. Community Protocol Equation SW.4.1						
Solid Waste Generated in Sphere of Influce						
GHG Emissions Generated from Solid Waste ($MTCO_2e$)						7,084
Households in City						60,795
GHG Emissions per household ($MTCO_2e$/household)						0.117
Total households in SOI						56
Estimated GHG Emissions from SW in SOI ($MTCO_2e$)						7
Total						**7,090**
Total Measure Reductions						**21,541**
Methodology Assumptions						
SW.4.1 Methane Emissions						
Emission factor for material "i"						
Default LFG Collection Efficiency		0.75				
Oxidation Rate		0.1				
Mixed Solid Waste Emission Factor (CH_4/wet short ton)		0.008				

Strategy 10.1: Organics Recycling (2040)

City SW Tonnage and Demogrphics	**2040**
City Tonnage Generated	213,274
Population	233,887
Population Change from 2018 (%)	33%
GHG Emissions	9,439

Measure Reduction Calculations	**2040**
2018 Reported Diversion Rate for the City of Rancho Cucamonga	50.00%
Diversion Target Assumed Under Measure Implementation	90.00%
City Target Tonnage Reduction	85,310
City Target Annual	127,964
Target GHG Emissions Reduction	3,669
New Total Annual Emissions	5,503

Strategy 11.1: Local Mobility Hubs	
GHG Reductions (MTCO2e):	
2030 Reductions	6,880
2040 Reductions	10,885

Assumptions	2030	2040
Percent Reduction in Citywide VMT from	6.0%	10.0%
Performance Targets	**2030**	**2035**
Passenger Car VMT reduction from measures	30,476,912	53,084,096

Quantification

	Unit		2030	2040
Passenger Car - Gasoline	VMT		1,814,101,917	1,895,860,568
Percent of Household VMT for commuting			28%	28%
Percent Reduction in Citywide VMT from comprehensive expansion of transit network (Estimated	Percent		6.0%	10.0%
Passenger Car VMT reduction from measures	VMT		30,476,912	53,084,096

Passenger Vehicles - CO2e/Mi	MPG		226	205
Passenger Vehicle GHG Reduction			6,880	10,885
Total GHG Reduction			6,880	10,885

Source:

Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm

Commuting in America 2013 (AASHTO 2013)

Strategy 11.2: Pedestrian and Bicycle Network		
	2030	2040
Measure Reductions (MTCO2e)	670	1614

Assumptions	2030	2040
New Bicycle Commuters	479	1371
% citywide street length with bike lanes	30%	40%

Quantification

Bicycle Infrastructure Reductions					Source
	2018	2020	2030	2040	
% citywide street length with bike lanes		27%	30%	40%	
Total lane miles	474	474	474	474	Caltrans HPMS 2018
Total lane miles w/ Class II lane or better		128	144	188	
Additional proposed bike lanes in Mbility element			15.60	60.00	
% increase of citywide street length with bike lanes			12%	31%	
Passenger Car - Gasoline VMT			1,814,101,917	1,895,860,568	
City Population	175,679	180,971	207,429	233,887	
Percent of Household VMT for commuting	28%	28%	28%	28%	Commuting in America 2013
Passenger Commute Related VMT	-	-	507,948,537	530,840,959	(AASHTO 2013)
Commuter Population	8,754	71,545	82,005	92,465	
Commuter Pop. living and working in City		9,802	11,235	12,668	
% City workforce living and working in City		14%	14%	14%	ACS 2016
Population 16 Over	66%	66%	66%	66%	ACS 2016
16 Over in Labor Force	60%	60%	60%	60%	ACS 2016
Commute Related VMT per Labor Force worker	-	-	6,194	5,741	
Commute Related VMT per Labor Force worker					
Percent New Bike Commuters			4.3%	10.8%	
% increase in bike trips from 1% increase of citywide street length with bike lanes[1]		0.35%	0.35%	0.35%	
New Bicycle Commuters			479.23	1,370.86	
Reduction in VMT from new bicycle commuters			2,968,404	7,870,124	
Rancho Cucamonga County (gCO2e/mi) - Passenger Car			226	205	
Annual GHG Reductions			670	1614	
Total GHG Reduction					

1. Marshall, & Garrick. 2010. Effect of street network design on walking and biking. Transportation Research Record, 2198(1), 103-115.

Strategy 12.1: Transportation Demand Management		
	2030	2040
Measure Reductions (MTCO2e)	258	939

Quantification

TDM Reductions					Source
	2018	**2020**	**2030**	**2040**	
Existing Passenger Car VMT		1,732,343,265	1,814,101,917	1,895,860,568	
New Passenger Car VMT			81,758,651	163,517,303	
City Population	175679	180970.6364	207,429	233887	
Percent of Household VMT for commuting	0.28	0.28	0.28	0.28	Commuting in America 2013 (AASHTO 2013)
New Passenger Commute Related VMT	0	0	22,892,422	45,784,845	
Commuter Population	8754	71544.93138	82004.90898	92464.88658	
New Commuter Population			10,460	20,920	
Population 16 Over	0.66	0.66	0.66	0.66	Rancho Cucamonga ACS 2016
16 Over in Labor Force	0.599	0.599	0.599	0.599	Rancho Cucamonga ACS 2016
Percent reduction in VMT from Suite of TDM Measures			5%	10%	
Passenger Car VMT reduction from measures			1,144,621	4,578,484	
Commute Related VMT per New Labor Force worker			2188.572794	2188.572794	
Rancho Cucamonga County (gCO2e/mi) - Passenger Car			226	205.0470659	
Total GHG Reduction			258	939	

Strategy 13.1: Emerging Technologies
Improve traffic flow and reduce traffic congestion by implementing a comprehensive traffic signalization synchronization and update.

GHG Reductions (MTCO2e):	
1,254	2030
2,430	2040

Quantification

	Unit	2030	2040	Source
Citywide VMT	VMT	1,957,077,965	2,063,076,104	F&P GP VMT Modeling
Percent of Household VMT for commuting	Percent	28%	28%	Commuting in America 2013 (AASHTO 2013)
Citywide Commute VMT	VMT	547,981,830	577,661,309	General Plan EIR
Passenger Car - Miles Per Gallon (MPG)	MPG	41	44	EMFAC 2017 - Rancho Cucamonga County
Fuel Consumption for Commute VMT	Gallons Gasoline	13,377,036	13,224,641	
Average Commute Trip Length	Miles	14.7	15.0	CalEEMod Appendix D - San Bernadino County
Estimated longest portion of commute trip in the City limits	Miles	3	3	Estimated using Google Earth
Portion of Commute VMT effected by measure		20%	20%	
Estimated Fuel Reduction from Measure	Gallons Gasoline	122,850	238,044	
Fuel Reduction from improved traffic flow		5%	9%	Source: FHWA, Strategies to Reduce Greenhouse Gas Emissions from
MTCO2e/Gallon of Gasoline		0.010	0.010	
GHG Reduction		1,254	2,430	

Assumptions	2030	2040
Fuel Reduction from improved traffic flow	5%	9%

Performance Targets	2030	2035
Estimated Fuel Reduction from Measure	122,850	238,044

Appendix C

City of Rancho Cucamonga Climate Action Plan
Consistency Review Checklist

Climate Action Plan
Consistency Review Checklist

The City of Rancho Cucamonga (City) adopted a Climate Action Plan (CAP) on December 15, 2021. The CAP outlines strategies and measures that the City will undertake to achieve its proportional share of State greenhouse gas (GHG) emissions reduction targets. The purpose of the CAP Consistency Checklist (Checklist), in conjunction with the CAP, is to provide a streamlined review process for new development projects that meet the definition of a "project" under the California Environmental Quality Act (CEQA).

Analysis of GHG emissions and potential climate change impacts from new development is required under CEQA. The City's CAP is a qualified GHG emissions reduction plan in accordance with State CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulatively considerable if it complies with the requirements of a "qualified" CAP.

The City's CAP includes strategies and measures targeting new development, the existing built environment, and City government operations. Collectively, the set of measures would achieve the City's GHG reduction target for 2030 and make substantial progress toward the City's 2040 target. The City has prepared this Checklist to facilitate the implementation of GHG reduction strategies and measures from the CAP that apply to new development projects (the following section, "Applicability and Procedures," defines the projects that are required to complete this Checklist). In addition, projects that are consistent with the CAP's growth projections (which are based on the General Plan) and implement the applicable strategies and measures of this Checklist will demonstrate compliance with the CAP and its achievement of the City's 2030 reduction target.

Projects that comply with the CAP, as determined through completion of this Checklist, may rely on the CAP for the analysis of cumulative GHG emissions impacts as part of the CEQA process. Projects that do not comply with the CAP must prepare a comprehensive project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the strategies and measures in this Checklist to the extent feasible. Cumulative GHG impacts would be significant for any project that does not comply with the CAP.

This Checklist may be updated periodically to incorporate new GHG reduction techniques or to comply with later amendments to the CAP, or changes in local, State, or federal law or regulation. Comprehensive updates to this Checklist will be coordinated with each CAP update. Administrative updates to the Checklist may occur regularly, as necessary for the purposes of keeping the Checklist up-to-date and clarifying its requirements. Periodic updates to the CAP approved by the City Council will also include updates to this Checklist to ensure consistent application of the included policies.

APPLICABILITY AND PROCEDURES

This Checklist is required for projects that are subject to CEQA.[1] General procedures for completing the Checklist are described below. Additional guidance is also provided under each of the questions in Steps 1 and 2 of the Checklist.

- The City's Planning Department reviews development applications and makes determinations regarding environmental review requirements under CEQA.
- The applicant must provide written documentation and supporting evidence that demonstrates how the project would implement each applicable Checklist requirement described herein to the satisfaction of the Planning Department.
- The "Project Information" section should include sufficient detail about the project to support the responses to the Checklist questions.
- Measures identified as applicable to the project in the Checklist shall be required as conditions of project approval.
- Each Checklist question describes the circumstances in which a response of not applicable (N/A) is appropriate.
- For each N/A response, written documentation and evidence supporting that response shall be provided to the satisfaction of the Planning Department.
- If an N/A response is provided for reasons other than those specifically provided in the Checklist, supporting documentation and/or evidence justifying the response shall be provided, subject to Planning Department approval. The Planning Department may conclude that a project is inconsistent with the CAP if it determines that one or more N/A responses is not supported by adequate documentation and/or evidence.
- A No response to a question in Step 2: CAP Measures Consistency would render a project inconsistent with the CAP.
- Projects required to complete this Checklist but that cannot demonstrate compliance with the CAP using this Checklist shall prepare a separate, project-level GHG analysis as part of the project's CEQA compliance.

[1] In this context, a project is any action that meets the definition of a "Project" in Section 15378 of the State CEQA Guidelines.

Project #_____

Application Information

Contact Information

Project No. and Name: _____

Property Address and APN: _____

Applicant Name and Co.: _____

Contact Phone: _____ Contact Email: _____

Was a consultant retained to complete this checklist? ☐ Yes ☐ No

If Yes, complete the following:

Consultant Name: _____ Contact Phone: _____

Company Name: _____ Contact Email: _____

Project Information

1. What is the size of the project site (acres)? _____

2. Identify all applicable proposed land uses:
   - ☐ Residential (provide # of single-family dwelling units): _____
   - ☐ Residential (provide # of multi-family dwelling units): _____
   - ☐ Commercial (provide total square footage): _____
   - ☐ Industrial (provide total square footage): _____
   - ☐ Other (describe): _____

3. Provide a description of the project. This description shall be consistent with the basic project description used for the CEQA document. The description may be attached to the Checklist if there are space constraints.

Step 1: Land Use Consistency

Step 1 determines a project's consistency with the growth assumptions of the CAP (which are based on the General Plan) by evaluating its consistency with the adopted land use designation of the City's General Plan.

Step 1: Land Use Consistency		
Checklist Item (Check the appropriate box, explain your answer, and attach supporting documentation and/or evidence as needed)	**Yes**	**No**
1. Is the proposed project consistent with the City's adopted General Plan land use designation(s)? If **"Yes"**, proceed to Step 2. If **"No"**, proceed to Question 2 of Step 1	☐	☐
2. For projects not consistent with the adopted General Plan land use designation(s), does the project include a General Plan Amendment that would generate GHG emissions equal to or less than estimated emissions generated under the existing designation? If **"Yes"**, proceed to Step 2 and provide a comparison of estimated GHG emissions under both the adopted and the proposed designations. If **"No"**, the project's GHG impact is potentially significant, and the project's GHG emissions impacts must be analyzed in accordance with CEQA and the State CEQA Guidelines. The project is also required to complete Step 2 of the Checklist and implement the applicable measures. Other measures to reduce the project's GHG emissions may also be required as part of the project's CEQA compliance.	☐	☐

STEP 2: CAP MEASURES CONSISTENCY

The second step of CAP consistency review is to evaluate a project's consistency with the applicable strategies and measures of the CAP. Each Checklist item is associated with specific GHG reduction strategies and measures in the City's CAP.

Step 2: CAP Measures Consistency			
Checklist Item (Check the appropriate box, explain your answer, and attach supporting documentation and/or evidence as-needed)	**Yes**	**No**	**N/A**
1. Electric Vehicle Charging (Strategy 1.2) Will the project provide the following amount of "EV Ready"[1] and "EV Installed"[2] parking spaces? <u>Residential</u> ☐ *One- and two-family dwelling units and townhouses*: All off-street parking spaces would be "EV Installed". ☐ *Multifamily dwelling units*: ▪ 15% of parking spaces would be "EV Ready" or a minimum of 1 "EV Ready" space for 0-6 parking spaces, and ▪ 5% of spaces would be "EV Installed" or a minimum of 1 "EV Installed" space for 0-20 parking spaces. <u>Non-Residential</u> ☐ *Office and Industrial*: ▪ 10% of parking spaces would be "EV Ready" or a minimum of 1 "EV Ready" space for 0-9 parking spaces, and ▪ 5% of parking spaces would be "EV Installed" or a minimum of 1 "EV Installed" space for 0-20 parking spaces. Note: Calculations for required number of EV spaces shall be rounded up to nearest whole number. Check "N/A" if the project does not include the land uses listed above or would not provide any on- or off-street parking spaces. <u>Definitions</u> [1] "EV Ready" = pre-wired with dedicated 208/240 branch circuit installed in wall that originates at electrical service panel or sub-panel with a 40-ampere minimum overcurrent protection device and terminates into a cabinet, box, or enclosure, in a manner approved by the building official. [2] "EV Installed" = EV Ready plus installation of Level 2 electric vehicle supply equipment (EV charger).	☐	☐	☐

Please substantiate how the project satisfies question 1:

_____

_____

_____

_____

Step 2: CAP Measures Consistency			
Checklist Item (Check the appropriate box, explain your answer, and attach supporting documentation and/or evidence as-needed)	**Yes**	**No**	**N/A**
2. Off-Road Equipment (Strategy 1.4) Commercial and Industrial: For heavy-duty off-road vehicles and equipment (defined as equal to or greater than 50 horsepower) use associated with project operations, will the project use zero emissions technology (e.g., electricity) or zero emissions fuels (e.g., renewable diesel, hydrogen, biomethane)? Check "N/A" if zero emission equipment and/or fuel options are not commercially available for the project's heavy-duty off-road equipment needs. To support a "N/A" response, the applicant shall demonstrate that a minimum of three off-road equipment fleet owners/operators/fuel providers in San Bernardino County or adjacent counties were contacted and responded that zero emission equipment and/or fuel options are not commercially available for the project's heavy-duty off-road equipment needs. Check "N/A" if the project does not include a commercial or industrial use.	☐	☐	☐
Please substantiate how the project satisfies question 2: _____ _____ _____ _____ _____			
3. Construction Vehicles and Equipment (Strategy 1.6) For heavy-duty vehicles and equipment (defined as equal to or greater than 50 horsepower) used in construction of the project, will a minimum of 50% of vehicles and pieces of equipment be powered by electricity or other zero emissions technology or fuels? Check "N/A" if zero emission equipment and/or fuel options are not commercially available for the project's heavy-duty off-road equipment needs. To support a "N/A" response, the applicant shall demonstrate that a minimum of three off-road equipment fleet owners/operators/fuel providers in the San Bernardino County or adjacent counties were contacted and responded that zero emission equipment and/or fuel options are not commercially available for the project's heavy-duty off-road equipment needs. Check "N/A" if the project does not require the use of heavy-duty construction equipment.	☐	☐	☐
Please substantiate how the project satisfies question 3: _____ _____ _____ _____			

Step 2: CAP Measures Consistency			
Checklist Item (Check the appropriate box, explain your answer, and attach supporting documentation and/or evidence as-needed)	**Yes**	**No**	**N/A**
4. Zero Net Electricity (Strategy 3.1 and 3.2) Residential and Non-Residential (except for projects located in the Neo-Industrial (NI) and Industrial Employment (IE) zoning districts): Will the project include an on-site renewable energy generation system that generates an amount of electricity equal to annualized building demand? Check "N/A" if the project is located in the Neo-Industrial (NI) and Industrial Employment (IE) zoning districts and refer to question 5.	☐	☐	☐

Please substantiate how the project satisfies question 4:

_____

_____

_____

_____

_____

5. On-Site Renewable Energy Systems for Projects in the Neo-Industrial and Industrial Employment Districts (Strategy 3.3) Neo-Industrial (NI) and Industrial Employment (IE) zoning districts: Will the project comply with Development Code Section 17.76.020, Development Criteria for Solar Systems, Subsection B., regarding on-site renewable energy systems? Check "N/A" if the project is not within the NI or IE zoning districts, or if located in an NI or IE zoning district, the project would not include construction of a new building.	☐	☐	☐

Please substantiate how the project satisfies question 5:

_____

_____

_____

_____

_____

Step 2: CAP Measures Consistency			
Checklist Item (Check the appropriate box, explain your answer, and attach supporting documentation and/or evidence as-needed)	**Yes**	**No**	**N/A**
6. Transportation Demand Management (Strategy 12.1) Multi-Family Residential and Non-Residential: will the project include all of the following strategies? ☐ Provide pedestrian connections between all internal uses and to all existing or planned external streets that abut the project site; close any gaps in existing pedestrian network along internal streets or external streets that abut the site. ☐ Provide end-of-trip bicycle facilities including secure, weather-protected storage; bike parking; shower facilities; changing rooms; personal lockers. ☐ Provide traffic calming measures, such as: designated areas where vehicles are prohibited; marked pedestrian crossings; curb extensions, speed tables, raised crosswalks/intersections, median islands, tight corner radii, roundabouts or mini traffic circles, planter strips with shade trees, chicanes. ☐ Provide designated car-share, carpool, vanpool, and/or park-and-ride parking spaces.[2] ☐ Do not exceed the minimum code requirement for parking capacity. And include at least one of the following strategies? ☐ For Non-Residential projects, provide employees with financial incentives for commuting to work by modes other than driving alone, such as public transit, carpool/vanpool, walk/bike, or teleworking. ☐ For Multi-Family Residential projects, provide financial subsidies for using travel modes other than driving alone, such as free or discounted transit passes or other shared mobility services (e.g., bike- or scooter share; car-sharing programs) ☐ For Multi-Family Residential projects, require tenants/owners to purchase/rent vehicle parking separate from the cost to purchase/rent a residential unit ☐ Implement a car-sharing program (for residents and/or employees) Check "N/A" if the project is a single-family residential project.	☐	☐	☐

Please substantiate how the project satisfies question 6:

_____

_____

_____

_____

[2] The designated number of car-share, carpool, vanpool, and/or park-and-ride parking spaces shall be provided at a rate equal to or greater than CALGreen minimum requirements.

Step 2: CAP Measures Consistency			
Checklist Item (Check the appropriate box, explain your answer, and attach supporting documentation and/or evidence as-needed)	**Yes**	**No**	**N/A**
7. Bike Lanes (Strategy 11.2) Will the project implement bike lane improvements on the City's roadway network consistent with the General Plan or other City plans or requirements? Check "N/A" if the project is not required to implement any bike lane improvements or if required improvements are already in place.	☐	☐	☐
Please substantiate how the project satisfies question 7: _____ _____ _____ _____ _____			
8. Traffic Signal Timing (Strategy 13.1) Will the project implement traffic signal timing improvements on key commute corridor on the City's roadway network consistent with the General Plan or other City plans or requirements? Check "N/A" if the project is not required to implement any traffic signal timing improvements or if required improvements are already in place.	☐	☐	☐
Please substantiate how the project satisfies question 8: _____ _____ _____ _____ _____			

Appendix D

Potential Funding Sources for
Climate Action Plan Implementation

Potential Funding Sources

Implementation of GHG reduction measures to increase energy efficiency and reduce the use of non-renewable resources will result in substantial cost-savings for the City and its residences in the long-term. The City will undergo initial start-up, ongoing administration, staffing, and enforcement costs with implementation which will require seeking cost-effective implementation and strategic funding opportunities and developing partnerships to share costs. All measures with potential for significant costs will be brought to City Council for consideration and approval.

To reduce the cost burden of implementation, a variety of funding sources are available to the City. A preliminary summary of funding and financing options are summarized in **Table 4-1**; however, these funding sources and programs are subject to change over time. As the CAP is updated and monitored, the City will need to reevaluate its overall costs and funding sources available.

Table D-1 Potential Funding Sources to Support Greenhouse Gas Reduction Measures

Funding Source	Description
For City Operations	
California Department of Resources Recycling and Recovery (CalRecycle)	▪ CalRecycle grant programs allow jurisdictions to assist public and private entities in management of waste streams. ▪ Incorporated cities and counties in California are eligible for funds. ▪ Program funds are intended to: • Reduce, reuse, and recycle all waste. • Encourage development of recycled-content products and markets. • Protect public health and safety and foster environmental sustainability.
California Air Resources Board (CARB)	▪ CARB offers several grants, incentives, and credit programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program. ▪ The following programs can be utilized to fund local measures: • Air Quality Improvement Program (Assembly Bill (AB) 118) • Loan Incentives Program • California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project
Transportation-Related Federal and State Funding	▪ For funding measures related to transit, bicycle, or pedestrian improvements, the following funding sources from the Southern California Association of Governments (SCAG) and San Bernardino Transportation Authority (SBCTA) may be utilized: • Sustainability Planning Grant Program • Fixed Guideway Capital Investment Grants • Job Access and Reverse Commute and New Freedom Programs • Enhanced Mobility of Seniors & Individuals with Disabilities • Transportation Development Act
New Development Impact Fees	▪ These types of fees may have some potential to provide funding for proposed programs and projects.
General Obligation Bond	▪ A general obligation bond is a form of long-term borrowing and could be utilized to fund municipal improvements.

Table D-1 Potential Funding Sources to Support Greenhouse Gas Reduction Measures

Funding Source	Description
Other Funding Mechanisms for Implementation	■ Grants may be available from the Strategic Growth Council (SGC) or the State Department of Conservation (DOC) to fund sustainable community planning, natural resource conservation, and development, and adoption.
For Community Operations	
Southern California Edison (SCE)	■ SCE is one of the utilities participating in the Go Solar initiative. ■ A variety of rebates are available for existing and new homes. ■ Photovoltaics, thermal technologies, and solar hot water projects are eligible. ■ Single-family homes, commercial development, and affordable housing are eligible.
Property-Assessed Clean Energy (PACE)	■ The PACE finance program is intended to finance energy and water improvements within a home or business through a land-secured loan, and funds are repaid through property assessments. ■ Municipalities are authorized to designate areas where property owners can enter into contractual assessments to receive long-term, low-interest loans for energy and water efficiency improvements, and renewable energy installation on their property. ■ Financing is repaid through property tax bills. ■ San Bernardino Association of Governments (SANBAG) has implemented the Home Energy Renovation Opportunity (HERO; a PACE program) in the County to assist residents in financing residential energy efficiency and solar retrofits.
Clean Vehicle Rebate Program	■ Individual, fleet operators, local government entities, and businesses can apply for rebates for purchases of plug-in electric hybrids (PHEVs), battery electric vehicles (BEVs), fuel-cell electric vehicles (FCEVs), and other non-highway, motorcycle and commercial BEVs.
Low Carbon Fuel Standard – Zero Emission Vehicle (ZEV) Infrastructure Crediting	■ The 2018 Low Carbon Fuel Standard (LCFS) amendments added a ZEV infrastructure crediting provision to the LCFS (section 95486.2) designed to support the deployment of ZEV infrastructure. The ZEV infrastructure provision covers Hydrogen Refueling Infrastructure (HRI) and Direct Current (DC) Fast Charging Infrastructure (FCI). In addition to generating LCFS credit for dispensed fuel, the eligible hydrogen station, or DC fast charger can generate infrastructure credits based on the capacity of the station or charger minus the quantity of dispensed fuel. Credits can be monetized by selling them to companies that need credits or by selling them in the annual state-run auction.
Energy Upgrade California	■ Program is intended for home energy upgrades. ■ Funded by the American Recovery and Reinvestment Act, California utility ratepayers, and private contributions. ■ Utilities administer the program, offering homeowners the choice of one of two upgrade packages—basic or advanced. ■ Homeowners are connected to home energy professionals. ■ Rebates, incentives, and financing are available. ■ Homeowners can receive up to $4,000 back on an upgrade through the local utility.
Federal Tax Credits for Energy Efficiency	■ Tax credits for energy efficiency can be promoted to residents.
Energy Efficient Mortgages (EEM)	■ An EEM is a mortgage that credits a home's energy efficiency in the mortgage itself. ■ Residents can finance energy saving measures as part of a single mortgage. ■ To verify a home's energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved. ■ EEMs typically are used to purchase a new home that is already energy efficient, such as an ENERGY STAR® qualified home.
Private Funding	■ Private equity can be used to finance energy improvements, with returns realized as future cost savings.

Table D-1 Potential Funding Sources to Support Greenhouse Gas Reduction Measures

Funding Source	Description
	■ Rent increases can fund retrofits in commercial buildings. ■ Net energy cost savings can fund retrofits in households. ■ Power Purchase Agreements (PPA) involve a private company that purchases, installs, and maintains a renewable energy technology through a contract that typically lasts 15 years. After 15 years, the company would uninstall the technology or sign a new contract. ■ On-Bill Financing (OBF) can be promoted to businesses for energy-efficiency retrofits. Funding from OBF is a no-interest loan that is paid back through the monthly utility bill. Lighting, refrigeration, heating, ventilation, and air conditioning, and light-emitting diode streetlights are all eligible projects.
Community Choice Aggregation (CCA) Revenue	■ Community Choice Aggregation (CCA) programs are governmental entities formed by cities and counties to procure electricity for their residents, businesses, and municipal facilities. ■ Revenue generated by a CCA program may be used to fund or incentivize GHG reduction measures.
Housing Rehabilitation Loan Programs	■ Critical Home Repair Program through Habitat for Humanity provides home improvements for low-income homeowners to improve home efficiency, safety, and accessibility. ■ The U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG) program provides communities with resources to address redevelopment needs, specifically for home rehabilitation. ■ HUD also administers the HOME program, providing grants to improve affordable housing opportunities and conditions.
General Funding and Staff Capacity	
CivicSpark Program	■ Supports sustainability-focused research, planning, and implementation projects throughout California by providing public agencies and other organizations with capacity building support and community engagement ■ Provides volunteer engagement through AmeriCorps fellows to provide added staff capacity for eleven months
California Climate Investments (CCI)	■ CCI is the statewide initiative that provides funds from the Cap-and-Trade program for GHG reducing projects and programs. ■ Funds can support a variety of projects including affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, sustainable agriculture, recycling, and more. ■ Numerous State programs listed above are funded by CCI; however, the program continues to evolve and is updated by the State periodically to include new or modified programs.

Source: Ascent Environmental, Inc. 2021