CITY OF CORONA

CLIMATE ACTION PLAN UPDATE

March 2019

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CLIMATE ACTION PLAN UPDATE

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LSA Project No. CCR1701

Funded by:

March 2019

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Executive Summary

The City of Corona (City) is committed to providing a more livable, equitable, and economically vibrant community through the reduction of greenhouse gas (GHG) emissions. By using energy more efficiently, harnessing renewable energy to power buildings, recycling waste, and enhancing access to sustainable transportation modes, the City will keep dollars in the local economy, create jobs, and improve the community's quality of life. The efforts towards increasing the reduction of City-wide greenhouse gas emissions described in this report would be done in coordination with the City's other planning and land use decisions. Through the Climate Action Plan Update (CAP Update), the City has established goals and policies that incorporate environmental responsibility into the everyday management of its community operations. The following presents a brief summary of the steps taken to prepare this CAP Update.

S.1 Inventory

The first step in completing the CAP Update was to update the City's GHG emissions inventory. The City completed a baseline year 2008 GHG inventory as part of the Corona Climate Action Plan (CAP) that was adopted in 2012. The City emitted approximately 1.7 million metric tons carbon dioxide equivalent (MMT CO_2e) in 2008. The largest portion of the City's 2008 emissions were from transportation (48 percent), followed by emissions from electricity and natural gas use in buildings (44 percent). For the purposes of CAP Update the City completed a 2016 emissions inventory for community-wide sectors. Figure ES-1 shows a sector level comparison of results for the 2008 and 2016 inventories.

The 2016 inventory indicated that the City emitted approximately 1.1 MMT CO_2e, which is approximately 35 percent lower than 2008 levels of emissions. The largest portion of emissions in the 2016 inventory came from the transportation sector which was 46 percent of the City's total GHG emissions. This is approximately a 1 percent reduction compared to the 2008 emissions inventory. Commercial and residential energy (both electricity and natural gas) uses were the second and third largest contributor of GHG emissions with 31 percent and 16 percent of total emissions, respectively which is also approximately 1 percent reduction of emissions when compared with 2008.

Solid waste accounted for 5 percent of total GHG emissions in 2016 (Solid waste was 2 percent in 2008). This was an increase in emissions of approximately 20,000 MT CO_2e.

Water-related GHG emissions accounted for 2 percent of total GHG emissions, and wastewater and off-road sectors emitted less than 1 percent. These levels of emissions are approximately the same when compared with the 2008 emissions inventory.

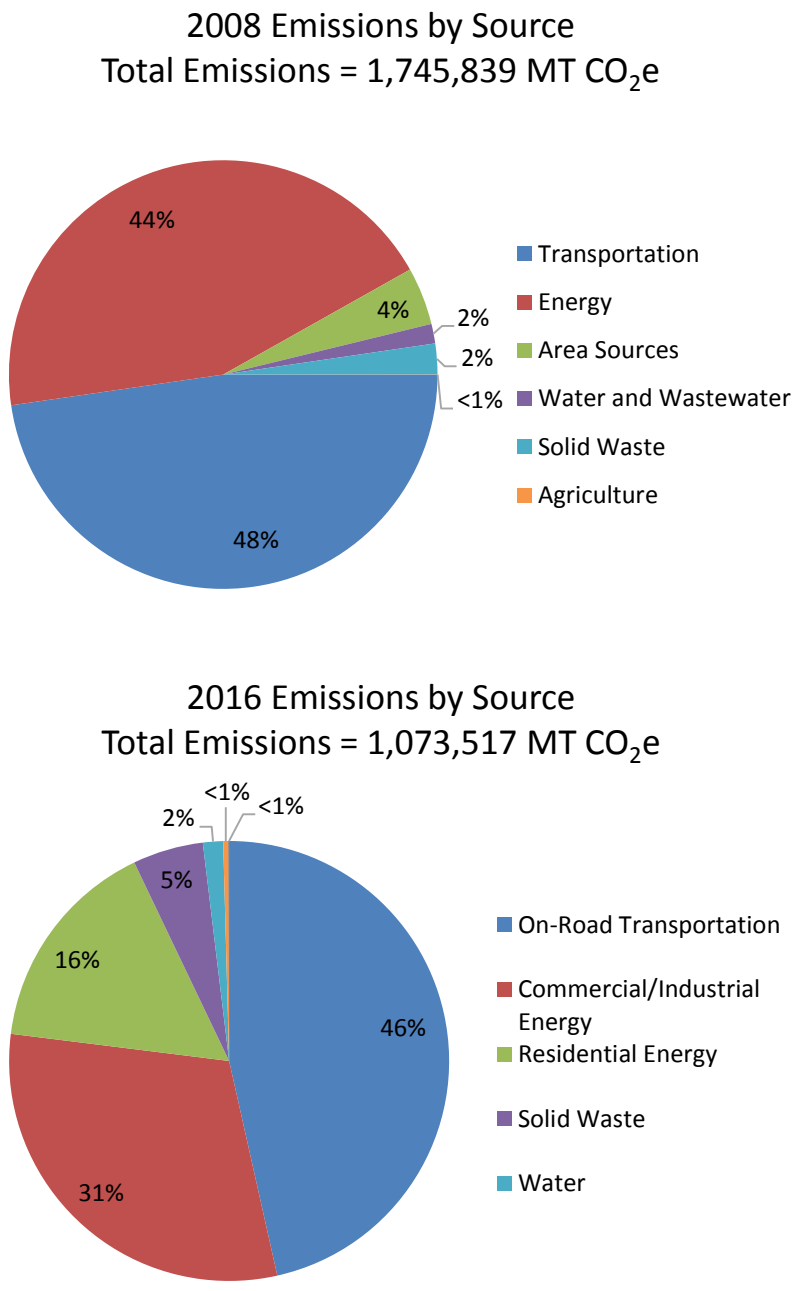

Figure ES-1: Community GHG Emissions by Sector for Years 2008 and 2016

S.2 Forecast and Target Setting

The next step after conducting the 2016 GHG inventory update was to estimate future emissions from different sectors in the city and to establish GHG reduction targets.

The City's future emissions were estimated using demographic indicators such as households and jobs growth. Growth indicators used are shown by sector in Table ES-1.

Table ES-1: Growth Indicators for 2016 and 2040

Sector	Demographic Indicator	2016	2040	2016–2040 CAGR[1] (percentage)
Residential Energy	Households	46,979	52,297	0.45
Commercial/ Industrial Energy	Jobs	70,972	84,395	0.72
N/A[2]	Population	165,366	184,086	0.45
Solid Waste, Water, Wastewater, and Off-road Sources	Service Population (Population + Jobs)	236,338	268,481	0.53
Transportation (Gasoline)	Vehicle Miles Traveled	1,169,706,600	1,336,928,145	0.56
Transportation (Diesel)	Vehicle Miles Traveled	150,934,699	177,578,872	0.68

Source: City of Corona General Plan Update, 2018

[1] Compound annual growth rate.

[2] Not Applicable. Population data are shown for informational purposes but are not used for forecasting any sector.

Future emissions estimates also included reductions that would happen with implementation of legislation adopted at the State level. That is, some level of emission reduction is anticipated within Corona as a result of policies implemented at the State level, including:

- Low Carbon Fuel Standards
- Assembly Bill (AB) 1493 and Advanced Clean Cars
- California Building Code Title 24
- Renewable Portfolio Standard

The resulting projected emissions are considered an "adjusted" business-as-usual (Adjusted BAU) forecast. Figure ES-2 shows historic emissions and Adjusted BAU forecasts.

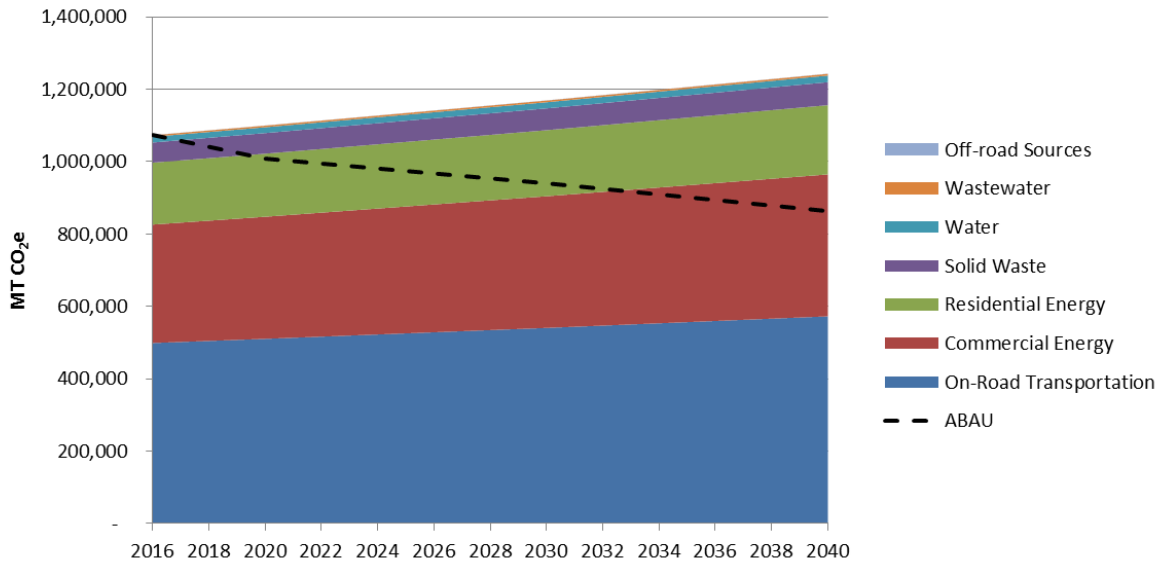

Figure ES-2: BAU and ABAU Emissions Forecast

ABAU: adjusted business as usual
BAU: business as usual
MT CO_2e = metric tons of carbon dioxide equivalent

GHG reductions targets were identified for 2020, 2030, and 2040. The City has established the following reduction targets that are consistent with current regulation.

Consistent with the State's adopted AB 32 GHG reduction target, the City has set a goal to reduce emissions to 1990 levels by the year 2020. This target was calculated as a 15-percent decrease from 2008 levels, as recommended in the AB 32 Scoping Plan. An interim goal for the City was created for 2030, which was to reduce emissions to 49 percent below 2008 levels. A longer-term goal was established for 2040, which was to reduce emissions to 66 percent below 2008 levels. The interim and longer-term goals would put the Corona on a path toward the State's long-term goal to reduce emissions 80 percent below 1990 levels by 2050 (Table ES-2).

Table ES-2: Mass GHG Reduction Targets for Community Emissions

Strategy	Target
2020 Target	15% below 2008 levels
2020 Emissions Goal (MT CO_2e)	1,483,963
2030 Target	49% below 2008 levels
2030 Emissions Goal (MT CO_2e)	890,378
2040 Target	66% below 2008 levels
2040 Emissions Goal (MT CO_2e)	593,585

Source: SEEC ClearPath Tool for the City of Corona, 2018.
MT CO_2e = metric tons of carbon dioxide equivalent

S.3 Reduction Measures

The City has already demonstrated its commitment to conserve energy and reduce emissions through a variety of programs and policies. In order to reach the reduction target, the City would also implement the additional local reduction measures described in this report. These measures encourage energy efficiency, water conservation, alternative transportation, solid waste reduction, and clean energy. Table ES-3 summarizes the reductions from measures that would be implemented to meet the Community GHG reduction goals for 2030 and 2040.

Table ES-3: Summary of Community GHG Reduction Strategies and Emission Reductions

Goals and Measures	2030 Emission Reductions (MT CO_2e)	2040 Emission Reductions (MT CO_2e)
Goal 1: Increase Energy Efficiency in Existing Residential Units		
1.1: Energy Efficiency Training, Education, and Recognition in the Residential Sector	Supporting Measure[1]	
1.2: Increase Community Participation in Existing Energy Efficiency Programs	3,715	3,885
1.3: Home Energy Evaluations	Supporting Measure[1]	
1.4: Residential Home Energy Renovations	2,276	2,380
Goal 2: Increase Energy Efficiency in New Residential Units		
2.1: Exceed Energy Efficiency Standards	3,918	4,097
Goal 3: Increase Energy Efficiency in Existing Commercial Units		
3.1: Energy Efficiency Training, Education, and Recognition in Commercial Sector	Supporting Measure[1]	
3.2: Increase Business Participation in Existing Energy Efficiency Programs	7,031	7,557
3.3: Nonresidential Building Energy Audits	Supporting Measure[1]	
3.4: Nonresidential Building Retrofits	37,592	40,406
Goal 4: Increase Energy Efficiency in New Commercial Units		
4.1: Exceed Energy Efficiency Standards	5,742	6,172
Goal 5: Increase Energy Efficiency through Water Efficiency		
5.1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7	1,524	1,607
5.2: Exceed Water Efficiency Standards	Supporting Measure[1]	
Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect per Title 24 Requirements		
6.1: Tree Planting for Shading and Energy Saving	Supporting Measure[1]	
6.2: Light-Reflecting Surfaces for Energy Saving	601	633
Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled		
7.1: Alternative Transportation Options	53,944	57,849
7.2: Implement Bicycle Master Plan to Expand Bike Routes around the City	482	517
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation		
8.1: Reduce Waste to Landfills	20,271	21,378

Table ES-3: Summary of Community GHG Reduction Strategies and Emission Reductions

Goals and Measures	2030 Emission Reductions (MT CO_2e)	2040 Emission Reductions (MT CO_2e)
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use		
9.1: Clean Energy	21,999	21,999
Total Community Measures without CCA	**159,096**	**168,481**
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use		
9.2: Join CCA Program	214,052	230,348
Total Community Measures with CCA	**373,148**	**398,829**

Note: [1] Supporting Measures are the measures that will reduce emissions but cannot be quantified. These measures enhance the quantifiable measures through education and outreach programs.
CCA = Community Choice Aggregation (See pages 13 and 40 for explanation of CCA)
MT CO_2e = metric tons of carbon dioxide equivalent

S.4 Adaptation

The City recognizes that planning sustainably is more than reducing GHG emissions; it also requires being prepared for changes that would impact the community's quality of life, its use of resources, and its economy. Preparedness, or adaptation, efforts seek to reduce vulnerability and increase the local capacity to adapt to changes. Corona may expect increased temperatures, variable precipitation, and increased extreme weather events. The City has developed adaptation strategies to reduce potential impacts and build resiliency among the communities. The adaptation strategies focus on public health and safety, electricity demand, water availability, infrastructure damage, wildfire, and social equity.

S.5 Implementation

Finally, the CAP in itself is not enough to meet the reduction goals without a commitment to implementation. The Implementation Chapter of the CAP Update identifies the process for implementing and monitoring the strategies described. Figure ES-3 summarizes the six-step process.

Figure ES-3: Process of Implementing the Climate Action Plan

Through successful implementation of this CAP Update, the City will demonstrate the potential economic, social, and environmental benefits of reducing GHG emissions and providing environmental stewardship within the community.

1.0 Introduction

The City of Corona (City) is committed to planning sustainably for the future while ensuring a livable, equitable, and economically vibrant community. Planning sustainably includes acknowledging the local role in climate change and how the City can mitigate their emissions and prepare for (i.e., adapt to) anticipated climate-related changes. By using energy more efficiently, harnessing renewable energy to power buildings, recycling waste, and enhancing access to sustainable transportation modes, Corona can keep dollars in its local economy, create new green jobs, and improve the community's health, safety, and welfare in addition to addressing climate change. To that end, the City has implemented a number of sustainability and conservation efforts and seeks to continue those efforts through local planning and partnerships. This Climate Action Plan Update (CAP Update) integrates the City's past and current efforts with future efforts to grow and thrive sustainably.

1.1 Climate Change Science

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

Gases that trap heat in the atmosphere are called GHGs because they transform the light of the sun into heat, similar to the glass walls of a greenhouse. Human-generated GHG emissions significantly contribute to the changes in the global climate, which have a number of physical and environmental effects. Effects associated with global climate change include sea level rise, an increase in the frequency and intensity of droughts, and increased temperature. Increased GHG emissions are largely the result of the increase in the combustion of fossil fuels.

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

Carbon Dioxide is the most important anthropogenic GHG and accounts for more than 75 percent of all GHG emissions caused by humans. Its atmospheric lifetime of 50–200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades, even after mitigation efforts to

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

reduce GHG concentrations are implemented. The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). Transportation is the single largest source of CO_2 in California; which is primarily comprised of on-road travel. Electricity production, industrial, and residential sources also contribute to CO_2 emissions in California.[2] CO_2 can be removed from the atmosphere by photosynthetic organisms (e.g., plants and certain bacteria). Atmospheric CO_2 has increased from a preindustrial concentration of 280 parts per million (ppm) to 408 ppm in 2018.[3]

Methane (CH_4), the main component of natural gas, is the second most abundant GHG and has a GWP of 25. Agriculture accounts for the majority of methane emissions in California, resulting primarily from livestock enteric fermentation and manure management. Industrial sources and landfills are also sources of CH_4. Other sources contribute only a small fraction to CH_4 emissions including residential, transportation, electricity generation, and commercial sources.[4]Certain land uses also function as a both a source and sink for CH_4. For example, the primary terrestrial source of CH_4 are wetlands, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere). Atmospheric CH_4 has increased from a pre-industrial concentration of 715 parts per billion (ppb) to 1,860 ppb in 2018.[5]

Nitrous Oxide (N_2O) is a powerful GHG, with a GWP of 298. In the United States, more than 70 percent of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application. Agriculture accounts for the majority of N_2O emissions, primarily from fertilizer and manure added to soil. Commercial and residential use of nitrogen fertilizer on turf and transportation (through the combustion of fossil fuels) are also major sources of N_2O. Industrial sources of N_2O include solid waste and wastewater treatment, manufacturing, refining and other sources.[6] N_2O concentrations in the atmosphere have increased nearly 21 percent, from pre-industrial levels of 270 ppb to 330 ppb in 2018.[7]

1.2 Benefits of the CAP

This CAP Update, while addressing climate change, also benefits Corona in many direct and indirect ways.

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2 California Air Resources Board, 2016 Carbon Dioxide (CO_2) https://www.arb.ca.gov/cc/inventory/background/co2.htm (accessed February 13, 2019)

3 National Oceanic and Atmospheric Administration (NOAA). Annual Greenhouse Gas Index, Recent Monthly Average CO2. Website: https://www.esrl.noaa.gov/gmd/ccgg/trends/ (accessed December 26, 2018).

4 California Air Resources Board, 2016 Methane (CH_4) https://www.arb.ca.gov/cc/inventory/background/ch4.htm (accessed February 13, 2019)

5 NOAA, Annual Greenhouse Gas Index, Recent Monthly Mean CH_4. Website: https://www.esrl.noaa.gov/gmd/ccgg/trends_ch4/ (accessed December 26, 2018).

6 California Air Resources Board, 2016 Nitrous Oxide (N_2O) https://www.arb.ca.gov/cc/inventory/background/n2o.htm (accessed February 13, 2019)

7 NOAA, Annual Greenhouse Gas Index, Graph of N_2O Concentration. Website: https://www.esrl.noaa.gov/gmd/aggi/aggi.fig2.png (accessed December 26, 2018).

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

1.3 Regulatory Setting

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

1.3.1 Federal

1.3.1.1 Clean Air Act

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

1.3.2 State

1.3.2.1 California Air Resources Board Standards and Programs

The California Air Resources Board (CARB), a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and State air pollution control and climate change programs within California. In this capacity, CARB conducts research, sets State ambient air quality standards (California Ambient Air Quality Standards), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products, and various types of commercial equipment.

1.3.2.2 Executive Order S-3-05

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

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

Executive Order S-3-05 also laid out responsibilities among State agencies for implementation and for reporting on progress toward the targets.

1.3.2.3 Executive Order B-30-15

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

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

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

1.3.2.4 Assembly Bill 1493, Clean Car Standards

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

1.3.2.5 Assembly Bill 32, the California Global Warming Solutions Act of 2006

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

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

1.3.2.6 Assembly Bill 341 (Commercial Recycling)

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

1.3.2.7 Senate Bill 97

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

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

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

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

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

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

1.3.2.10 California Code of Regulations Title 24, Part 6

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

The California Energy Commission adopted 2008 Standards on April 23, 2008, in response to AB 32. The Standards were adopted to provide California with an adequate, reasonably priced, and environmentally sound supply of energy; to pursue California energy policy, which states that energy efficiency is the resource of first choice for meeting California's energy needs; to meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes every 3 years; and to meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards. The latest update of CCR Title 24, Part 6 went into effect July 1, 2014, which significantly increases the energy efficiency of new residential buildings.

1.3.2.11 Senate Bill 375, Sustainable Communities Strategy

SB 375 provides for a new planning process that coordinates land use planning, regional transportation plans, and funding priorities to help California meet the GHG reduction goals established in AB 32. SB 375 requires regional transportation plans, developed by metropolitan planning organizations to incorporate a sustainable communities strategy in their regional transportation plans. The goal of the sustainable communities strategy is to reduce regional vehicle miles traveled (VMT) through land use planning and consequent transportation patterns. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development.

1.3.2.12 CALGreen Building Code

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

1.3.2.13 SB X7-7

SB X7-7 requires water suppliers to reduce urban per capita water consumption 20 percent from a baseline level by 2020.

1.3.2.14 Renewable Portfolio Standard

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

1.3.2.15 Assembly Bill 117 Community Choice Aggregation Law

Passed in 2002, the Community Choice Aggregation (CCA) law (AB 117) allows cities and counties, or collections of cities and counties, to combine the electricity demand of customers in their jurisdictions and procure electricity through their own generation or through the market.[8] CCA allows communities to set rates for their customers and choose the form of energy generation, enabling communities to choose renewable energy sources rather than the local utility's mix of energy sources. Although a community choice aggregator (CCA, also used to denote community choice aggregation) purchases the electricity commodity, the local investor-owned utility still owns and maintains the transmission and delivery systems. When a CCA is formed, customers can opt out of the CCA if they wish to stay with their current provider.

1.4 City Setting

Corona is in northwestern Riverside County near the convergence of Los Angeles, Orange, and Riverside Counties. Corona covers a 39-square-mile area and is bounded by Riverside County and the Santa Ana Mountains to the west and the south, Norco to the north, and the city of Riverside to the east. Approximately 25 percent of Corona's land is undeveloped, with opportunity for growth. The City has an extensive park system with more than 394 acres of parks, with sports fields, basketball courts, playgrounds, tennis courts, two skate parks and an outdoor pool.

[8] Faulkner Katherine, 2010 Community Choice Aggregation in California https://nature.berkeley.edu/classes/es196/projects/2010final/FaulknerK_2010.pdf (accessed on February 12, 2019).

Corona is a community of more than 160,000 residents. Corona's age profile is 30 percent under age 18 and 7.3 percent over age 65, leaving 62.7 percent of the population between the ages of 18 and 65. Corona's ethnicity is approximately 38 percent white, 42 percent Latino, 11 percent Asian, 5 percent African-American, and 4 percent other. Corona has approximately 48,000 housing units, with more than 70 percent being single-family, nearly 25 percent as multifamily units, and the remaining as mobile home and other units.

1.5 Organization of the CAP

The remainder of this CAP Update includes four additional chapters:

- **Chapter 2** summarizes Corona's historic and future GHG emissions and the reduction targets the City has established.
- **Chapter 3** details the reduction strategies that will be implemented to meet the reduction targets identified in Chapter 2. Measures also include the potential energy savings and local cobenefits of the measures.
- **Chapter 4** discusses how Corona may be impacted by climate change and how it can adapt and become more resilient to climate change effects.
- **Chapter 5** includes the implementation of the measures, potential funding sources, and how the CAP Update will be monitored and updated over time. It also summarizes the outreach and CEQA review process conducted as part of this CAP Update.

2.0 GHG Emissions Inventory, Forecast, and Targets

2.1 GHG Emissions Inventory

GHG emissions inventories are the foundation of planning for future reductions. Establishing an inventory of emissions helps to identify and categorize the major sources of emissions produced over a single calendar year. A community inventory includes GHG emissions that result from the activities of Corona's residents and businesses. The inventories identify the major sources of GHGs emissions caused by activities in sectors that are specific to community activities.

The City prepared community inventories for the years 2008 and 2016. The 2008 inventory is considered the baseline year. A baseline year is established as a starting point against which other inventories may be compared and targets may be set and is generally the earliest year with a full emissions inventory. The most recent inventory has the most relevant data for planning purposes, whereas multiple inventory years provide context and may help identify trends or anomalies in the community emissions. The sectors evaluated in each inventory are provided in Table 1.

Table 1: Community Sectors Evaluated in the Inventory

Community Sectors
Residential Energy
Commercial/Industrial Energy
On-Road Transportation
Solid Waste
Water
Wastewater
Off-Road Sources

The City prepared a detailed GHG Inventory, Forecasting, and Target-Setting (IFT) Report, included as Appendix A, which contains detailed methodology of the information summarized in this chapter. Data were calculated and managed to best fit the GHG inventory and planning software tool used for this project, called ClearPath. ClearPath was developed by the Statewide Energy Efficiency Collaborative (SEEC), which is a partnership between several statewide agencies, utilities, and non-profits to assist cities and counties in climate mitigation planning. The ClearPath Tool is an all-in-one suite of online tool to help local agencies complete government operations and community-wide greenhouse gas inventories, forecasts and climate action plans. Appendix B contains input and output data from the ClearPath Tool for the City's GHG emissions inventory and forecasts.

2.1.1 2016 Greenhouse Gas Emissions Summary

Corona's total emissions in 2016 were 1,073,517 MT CO_2e. As shown in Figure 1 and Table 2, the On-road Transportation sector was the largest contributor to emissions in the 2016 inventor, with 46 percent of the City's total GHG emissions. Commercial and residential energy use were the second and third largest contributor of GHG emissions with 31 percent and 16 percent of total emissions, respectively. Solid waste accounted for 5 percent of total GHG emissions, water-related GHG emissions accounted for 2 percent of total GHG emissions, and wastewater and off-road sectors emitted less than 1 percent.

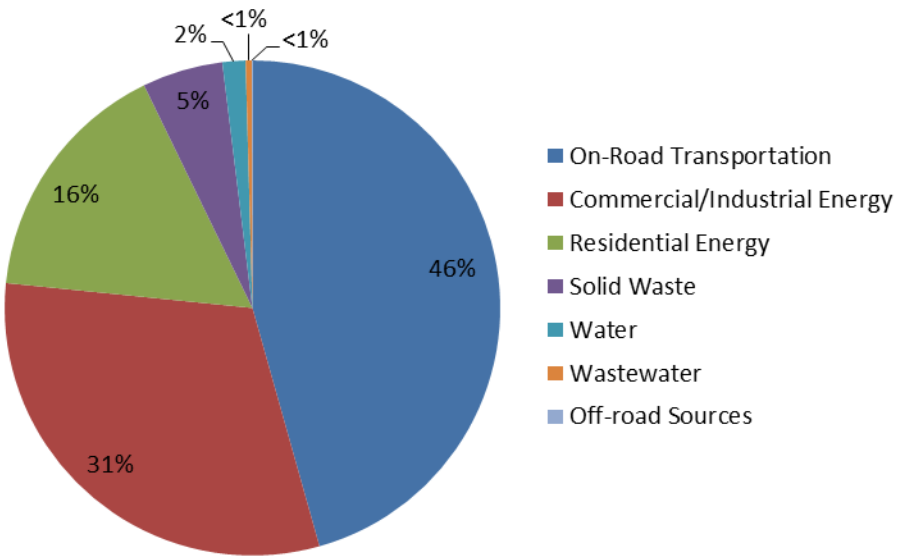


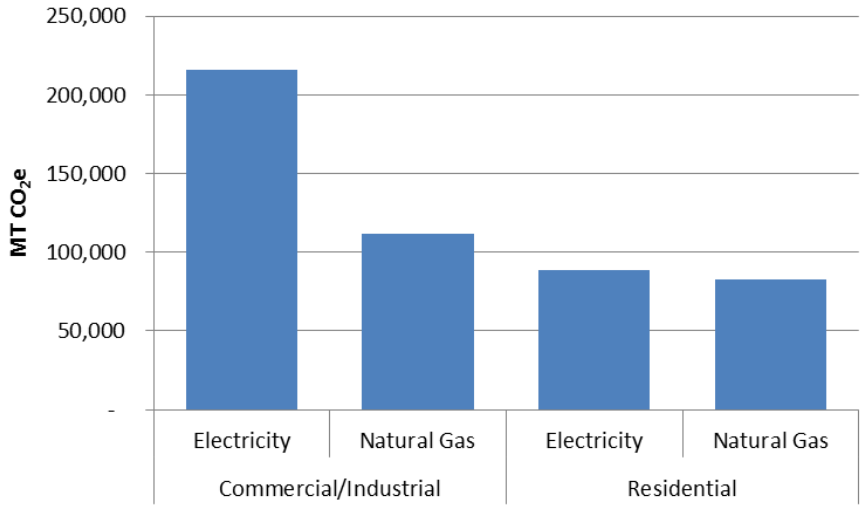
Figure 1: Community-Wide GHG Emissions by Sector For 2016

Table 2: Community-Wide GHG Emissions by Sector for 2016

Sector	2016 (MT CO_2e)	Percent of Total
On-road Transportation	498,985	46
Commercial Energy	327,311	31
Residential Energy	171,047	16
Solid Waste	55,642	5
Water	15,909	2
Wastewater	4,198	<1
Off-road Sources	426	<1
Total	**1,073,517**	100

Source: SEEC ClearPath Tool for the City of Corona, 2018.
MT CO_2e = metric tons of carbon dioxide equivalent

Energy is an area over which local agencies often have the greatest opportunities for effecting change. Therefore, electricity and natural gas use remains a key area for reduction opportunities. Emissions from commercial and residential sectors energy use account for 47 percent of total community emissions in 2016. Figure 2 shows the electricity and natural gas emissions from 2016 for the Commercial/Industrial and Residential sectors. Table 3 includes the activity data and GHG emissions for 2016.



Source: SEEC ClearPath Tool for the City of Corona, 2018.
MT CO_2e = metric tons of carbon dioxide equivalent

Figure 2: GHG Emissions for Community Electricity and Natural Gas, By Sector

Table 3: Activity Data and GHG Emissions for Energy in 2016

Sector	2016	
	Activity (kWh or therms)	Emissions (MT CO_2e)
Commercial/Industrial		
Electricity	898,057,448	215,534
Natural Gas	21,015,979	111,777
Residential		
Electricity	367,883,307	88,293
Natural Gas	15,559,287	82,754
Total	1,302,516,021	498,358

Source: SEEC ClearPath Tool for the City of Corona, 2018.
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

2.1.2 Inventory Forecast

Forecasting future GHG emissions allows the City to understand how emissions are expected to increase or decrease in the future. Major changes in growth or land uses may affect how to best plan to reduce emissions in the future. GHG emissions are forecasted using two scenarios: a Business-as-Usual (BAU) and an Adjusted BAU (ABAU) scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that would reduce emissions in the future (that is, the policies and related efficiency levels in place in 2016 are assumed to remain constant through 2040). Projected growth is estimated using data from the City's 2018 General Plan Update. Growth calculation and methods are detailed in the IFT Report in Appendix A. In general, the City is expecting modest growth to 2040 as population, housing, and jobs are all expected to increase. Table 4 shows the growth projections used to develop the emissions forecasts.

Table 4: Growth Indicators for 2016 and 2040

Sector	Demographic Indicator	2016	2040	2016-2040 CAGR[1] (percent)
Residential Energy	Households	46,979	52,297	0.45
Commercial/Industrial Energy	Jobs	70,972	84,395	0.72
N/A[2]	Population	165,366	184,086	0.45
Solid Waste, Water, Wastewater, and Off-road Sources	Service Population (Population + Jobs)	236,338	268,481	0.53
Transportation[2]	VMT – Gas	1,169,706,600	1,336,928,145	0.56
	VMT – Diesel	150,934,699	177,578,872	0.68

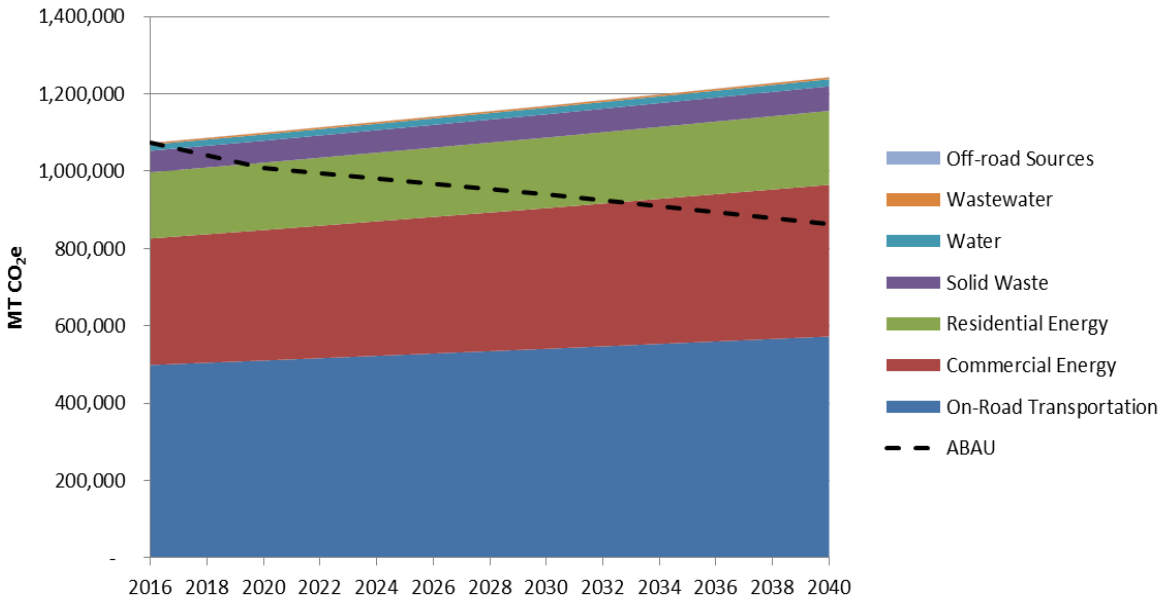
Source: City of Corona General Plan Update, 2018.
[1] CAGR = Compound annual growth rate.
[2] Not applicable. Population data are shown for informational purposes but are not used for forecasting any sector.
VMT = vehicle miles traveled

The Adjusted BAU scenario describes emissions based on projected growth *and* considers policies that will achieve GHG reductions in the future. Policies, described in the Regulatory Setting section of Chapter 1, include State-adopted or approved legislation that will affect future emissions. By evaluating the two scenarios, the City can evaluate the effect that existing policies may have on future emissions and determine which local measures would provide additional reductions.

Three future years are forecasted for each scenario: 2020, 2030 and 2040. The 2020 and 2030 forecast years are consistent with the goals identified in AB 32 and the corresponding Scoping Plan, which identifies statewide GHG reduction targets by 2020 and 2030. The 2040 forecast year is consistent with the City's 2018 General Plan Update buildout year and will allow the City to develop long-term strategies to continue GHG reductions.

2.1.2.1 Business-as-Usual Forecasts

The City's BAU emissions in 2020 are estimated to be 1,100,068 MT CO_2e, or a 2.5 percent increase from 2016 emissions. The 2030 BAU emissions are estimated to be 1,169,446 MT CO_2e, or an 8.9 percent increase from 2016 level. By 2040, emissions are estimated to increase 15.8 percent from the 2016 level to 1,243,348 MT CO_2e (Figure 3). Table 5 shows the BAU emissions for different sectors. For the BAU scenario, the energy sector emissions are going to rise substantially by up to 11 percent by 2030 and 20 percent by 2040 from 2016 baseline. The transportation sector will have a 7 percent increase in emissions by 2030 and 12 percent by 2040 compared to 2016 baseline.



Source: SEEC ClearPath Tool for the City of Corona, 2018.
ABAU: adjusted business as usual
BAU: business as usual
MT CO_2e = metric tons of carbon dioxide equivalent

Figure 3: Community BAU and ABAU Forecasts

Table 5: Community Business As Usual (BAU) Forecast Emissions

Sector	2016 (MT CO_2e)	2020 (MT CO_2e)	Percent Change 2016–2020	2030 (MT CO_2e)	Percent Change 2016–2030	2040 (MT CO_2e)	Percent Change 2016–2040
On-Road Transportation	482,354	491,602	1.9	515,513	6.9	540,596	12.1
Commercial/ Industrial Energy	327,311	337,321	3.1	363,708	11.1	392,158	19.8
Residential Energy	171,046	174,266	1.9	182,584	6.7	191,299	11.8
Solid Waste	55,642	56,889	2.2	60,132	8.1	63,560	14.2
Water	15,909	16,266	2.2	17,193	8.1	18,173	14.2
Wastewater	4,198	4,293	2.3	4,537	8.1	4,796	14.2
Off-road Sources	426	453	6.3	527	23.7	616	44.6
Total	**1,056,886**	**1,081,090**	**2.3**	**1,144,194**	**8.3**	**1,211,198**	**14.6**

Source: SEEC ClearPath Tool for the City of Corona, 2018.
BAU = Business-as-Usual
MT CO_2e = metric tons carbon dioxide equivalent

2.1.2.2 Adjusted Business-as-Usual Forecasts

The City's ABAU emissions are estimated to be 1,009,458 MT CO_2e in 2020, 939,423 MT CO_2e in 2030, and 862,279 MT CO_2e in 2040 (Figure 3). This change represents a 6.0 percent reduction from 2016 by 2020, 12.5 percent reduction by 2030, and 19.7 percent reduction by 2040. Table 6 shows the change in emissions from 2016 to 2040 under the ABAU scenario. Due to the stringent State vehicle standards, the emissions from the Transportation sector are expected to decrease significantly over time, while the proportion of emissions from Residential and Commercial/ Industrial Energy will increase. Emissions from Solid Waste are expected to increase over time but account for less than 10 percent of total emissions.

Table 6: Community Adjusted BAU (ABAU) Forecast Emissions

Sector	2016 (MT CO_2e)	2020 (MT CO_2e)	2020 Percent of Total	2030 (MT CO_2e)	2030 Percent of Total	2040 (MT CO_2e)	2040 Percent of Total
Transportation & Mobile Sources	482,779	446,052	45	387,245	42	336,282	40
Commercial/Industrial Energy	327,311	308,566	31	299,731	33	280,738	33
Residential Energy	171,047	162,292	16	156,221	17	146,591	17
Solid Waste	55,642	56,889	6	60,132	7	63,560	8
Water & Wastewater	20,108	18,457	2	17,150	2	15,146	2
Total	**1,056,887**	**992,256**	**-6.1**	**920,479**	**-12.9**	**842,317**	**-20.3**

Source: SEEC ClearPath Tool for the City of Corona, 2018.
ABAU = Adjusted Business-as-Usual
MT CO_2e = metric tons carbon dioxide equivalent

2.1.3 Reduction Targets

The State has set goals for reducing GHG emissions by 2020, 2030, and 2050 through AB 32, Executive Order S-3-05, and Executive Order B-30-15, respectively. The State has also provided guidance to local jurisdictions as "essential partners" in achieving the State's goals by identifying a 2020 recommended reduction goal. That goal, stated in the AB 32 Scoping Plan, was for local governments to achieve a 15-percent reduction below 2005 to 2008 levels by 2020, which aligns with the State's goal of not exceeding 1990 emissions levels by 2020. The State's long-term target is to emit no more than 20 percent of 1990 levels by 2050 (or, a reduction of 80 percent below 1990 levels by 2050).

The State has also provided an interim target, which is 40 percent below 1990 levels by 2030. It is clear that the issue of climate change will not end in 2030, and continued reduction goals should be implemented to keep the State on a path toward the 2050 goal. A straight-line projection from the 2030 to 2050 goals would result in a reduction goal of 66 percent below 2008 levels by 2040 midpoint.

2.1.4 Community Targets

Consistent with the State's adopted AB 32 GHG reduction target, the City has set a goal to reduce emissions to 1990 levels by 2020. This target was calculated as a 15-percent decrease from 2008

levels, as recommended in the AB 32 Scoping Plan. An interim goal for Corona was created for 2030, which was to reduce emissions to 49 percent below 2008 levels. A longer-term goal was established for 2040, which was to reduce emissions to 66 percent below 2008 levels. The 2030 interim and 2040 longer-term goals would put Corona on a path toward the State's long-term goal to reduce emissions 80 percent below 1990 levels by 2050 (Table 7).

Table 7: GHG Reduction Targets for Community Emissions

Strategy	Target
2020 Target	15 percent below 2008 levels
2020 Emissions Goal (MT CO_2e)	1,483,963
2030 Target	49 percent below 2008 levels
2030 Emissions Goal (MT CO_2e)	890,378
2040 Target	66 percent below 2008 levels
2040 Emissions Goal (MT CO_2e)	593,585

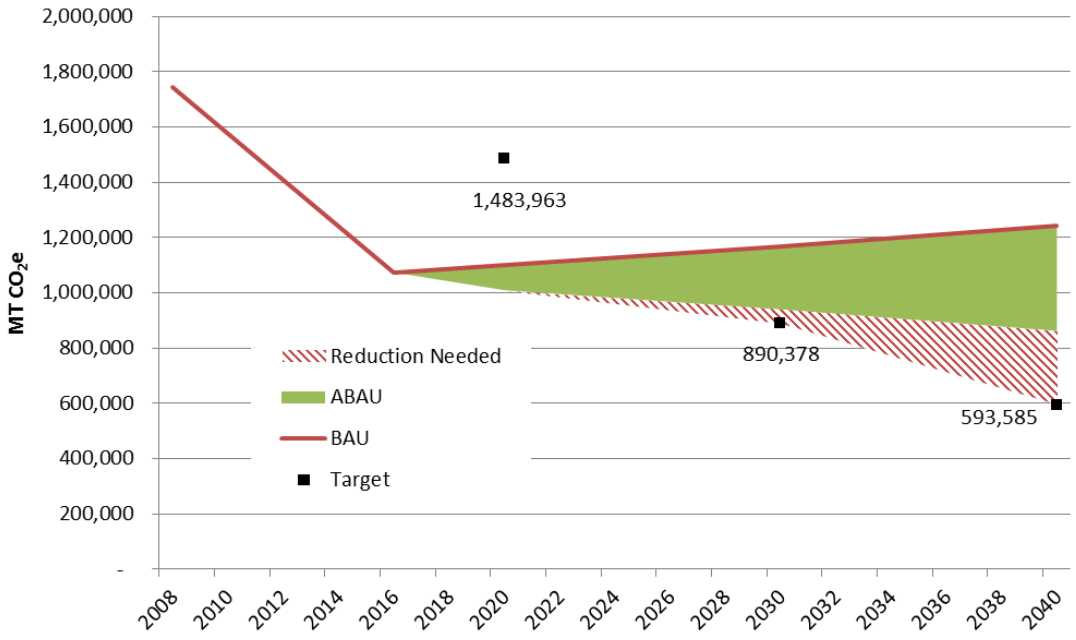
Notes and Acronyms
MT CO_2e = Metric tons of carbon dioxide equivalent

As shown in Table 8 and Figure 4, in 2020, Corona would meet the State Aligned performance GHG reduction targets under the ABAU scenario. In 2030, under the ABAU scenario, Corona would need to reduce 49,045 MT CO_2e to meet the target. In 2040, under the ABAU scenario, the City would need to reduce 268,694 MT CO_2e to meet the target.

Table 8: State-Aligned GHG Reduction Targets for Community Emissions by Year

Sector	2008[1]	2016	2020	2030	2040
BAU Emissions (MT CO_2e)	1,745,839	1,073,517	1,100,068	1,169,446	1,243,348
ABAU Emissions (MT CO_2e)	1,745,839	1,073,517	1,009,458	939,423	862,279
State-Aligned Target (Percentage change from 1990)	-	-	0	-40	-60
State-Aligned Target (Percentage change from 2008)[2]	-	-	-15	-49	-66
State-Aligned Emissions Goal (MT CO_2e)	-	-	1,483,963	890,378	593,585
Reductions from ABAU needed to meet the State-Aligned Target (MT CO_2e)	-	-	Target Met	49,045	268,694

Source: SEEC ClearPath Tool for the City of Corona, 2018.
[1] Baseline (2008) emissions are from the City's 2012 Climate Action Plan GHG inventory.
[2] Reduction targets calculation details are provided in Appendix A.
BAU = Business-as-Usual
ABAU= Adjusted BAU
GHG = greenhouse gas
MT CO_2e = metric tons of carbon dioxide equivalent



Source: SEEC ClearPath Tool for the City of Corona, 2018.
ABAU: adjusted business as usual
BAU: business as usual
MT CO2e = metric tons of carbon dioxide equivalent

Figure 4: Community Emissions Inventory, Forecasts, and Targets

3.0 GHG Reduction Measures

This chapter details how the City would meet its GHG reduction targets by implementing goals, measures, and actions at the community level. The goal describes the overarching objective related to increasing energy efficiency or decreasing energy consumption, such as increasing energy efficiency in residential units, as well as reducing vehicle miles traveled and solid waste generation.

Within each goal, one or more measures are presented indicating the City's commitment toward meeting the goal. The measures are either new measures or an enhancement and continuation of reduction measures proposed in the 2012 City of Corona Climate Action Plan (2012 CAP) as identified under the description of each reduction measure below. Within each measure, one or more actions are presented that indicate the steps the City may take in achieving the measure.

Each measure includes the GHG reduction potential in 2030 and 2040. Actions are designed to include the steps needed to implement the measure. Actions may be added or removed over time, depending on their relevancy, funding availability, and whether the actions are successful in supporting measures as they are monitored over time but are considered essential to guiding staff in implementation. Actions include a performance indicator, an implementation timeframe, department or agency responsible for implementation, and cost information, where applicable. In addition, the implementation of the measures presented below would result in local benefits while reducing GHG emissions, called cobenefits. The cobenefits associated with implementing the GHG reduction measures can range from providing improved air quality and mobility to increased awareness about sustainability. The cobenefits are identified for each measure and represented by an icon.

Local Cobenefits		
Increased energy efficiency/reduced demand	Water conservation	Improved public health
Improved air quality	Increased renewable energy	Increased non-motorized transportation
Sustainability education and awareness	Enhanced land use/ community design	Increased resiliency

3.1 Energy Efficiency

As discussed in Chapter 2, GHG emissions from Corona's commercial/industrial and residential energy sectors accounted for 47 percent of the total community emissions in 2016. Energy use includes electricity and natural gas consumption within Corona. There are many opportunities to conserve energy from existing and future development.

Goal 1: Increase Energy Efficiency in Existing Residential Units

The following measures are focused on increasing energy efficiency in existing residential buildings through behavior modification of residents and encouraging and incentivizing home energy retrofits. As discussed in Chapter 2, in 2016, residential consumers used 367,883,307 kilowatt hours (kWh) of electricity and 15,559,287 therms of natural gas.

- **Measure 1.1:** Energy Efficiency Training, Education, and Recognition in the Residential Sector

Opportunities for residents to improve energy efficiency in their homes include changes to their behaviors and physical modifications or improvements to their homes. Education of the public is at the core of attaining energy efficiency goals. While most of the measures include an outreach component, creating a specific education measure would emphasize the critical role of education in achieving energy efficiency. An education measure would also provide City staff with a framework to educate community members about behavioral and technological changes that can increase energy efficiency. This is an enhancement of Measure R3-E2 proposed in the 2012 CAP. Potential actions for this measure include:

- ☐ Post energy efficiency information or links on websites and/or social media and provide materials at public events
- ☐ Promote an annual energy efficiency fair
- ☐ Promote a home energy efficiency resource center
- ☐ Invite building inspectors to hold trainings semi-annually on energy efficiency and Title 24 requirements

GHG Reduction Potential	*Supporting Measure*
Co-Benefits	

➢ **Measure 1.2:** Increase Community Participation in Existing Energy Efficiency Programs

There are many energy efficiency opportunities that are low cost for residents to initiate and would result in cost savings over time. These opportunities are generally from existing programs, such as Southern California Edison (SCE) and Southern California Gas Company (SoCalGas), which offer rebates and incentives to purchase energy-efficient appliances and lights. Through this measure, the City would work to increase residents' participation in existing energy efficiency programs that are low-cost and would provide a financial benefit to the residents. As programs change over time, continued and up-to-date outreach would be necessary. This is an enhancement of the City's existing Community Energy Partnership program and Measure R3-E4 proposed in the 2012 CAP. Potential action for this measure includes:

☐ Partner with the Southern California Association of Governments (SCAG), SCE, and SoCalGas for outreach events

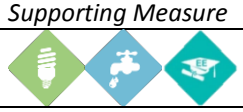
GHG Reduction Potential (2030)	*3,715 MT CO_2e*
GHG Reduction Potential (2040)	*3,885 MT CO_2e*
kWh Savings (2030)	*11,797,498 kWh*
Therms Savings (2030)	*166,205 therms*
Co-Benefits	

GHG = greenhouse gas
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

➢ **Measure 1.3:** Promote Home Energy Evaluations

Home energy evaluations are necessary to identify cost-effective opportunities for energy savings and for residents to take practical actions to achieve energy efficiency. Home energy evaluations can be established or promoted by a variety of existing programs. This is a new measure and was not proposed in the 2012 CAP. A potential action for this measure is:

☐ Promote energy audits through programs such as Energy Upgrade California

GHG Reduction Potential	*Supporting Measure*
Co-Benefits	

➢ **Measure 1.4:** Promote Residential Home Energy Renovations

Approximately 27 percent of Corona's residential buildings were constructed before the adoption of Title 24 (SCAG 2017). Renovations to buildings constructed before the adoption of Title 24 would evidently improve energy efficiency. Many federal and State programs and incentives support home energy renovations, including city-supervised funding, permit process improvements, and city ordinances. This is an enhancement of Measures R1-E4, R1-E5, R2-E3, and R2-E4 proposed in the 2012 CAP. Potential actions for this measure include:

☐ Enhance enforcement of Title 24 compliance for existing residential buildings

☐ Promote existing home energy renovation programs

☐ Promote participation in green building programs, such as Leadership in Energy and Environmental Design (LEED) and Energy Upgrade California

☐ Promote financing programs for home upgrades, such as Home Energy Renovation Opportunity (HERO) and Property Assessed Clean Energy (PACE)

☐ Establish online permitting to facilitate upgrades

GHG Reduction Potential (2030)	*2,276 MT CO_2e*
GHG Reduction Potential (2040)	*2,380 MT CO_2e*
kWh Savings (2030)	*8,646,290 kWh*
Therms Savings (2030)	*37,727 therms*
Co-Benefits	

Goal 2: Increase Energy Efficiency in New Residential Units

The following measures focus on increasing energy efficiency in new residential buildings through encouraging and incentivizing green buildings. As discussed in Chapter 2, energy use for the residential sector in Corona is anticipated to increase by 12 percent by 2040 compared to 2016, which is attributable to new residential units.

- **Measure 2.1:** Exceed Energy Efficiency Standards

City staff has a unique opportunity to encourage or inform developers of new energy efficiency opportunities for new development. This measure would educate City staff to encourage and implement energy efficiency measures beyond those required in current Title 24 standards. This measure would also ensure that as Title 24 standards are updated, City staff are well informed and can implement updates quickly and effectively. This is an enhancement of Measures R2-E1 and R2-E2 proposed in the 2012 CAP. Potential actions for this measure include:

☐ Educate City staff and developers on future Title 24 updates and new energy efficiency opportunities for new residential development

☐ Promote Tier 1 and Tier 2 green building ratings such as LEED, Build It Green, or Energy Star®- certified buildings

☐ Establish online permitting to facilitate new residential building energy efficiency opportunities

GHG Reduction Potential (2030)	*3,918 MT CO_2e*
GHG Reduction Potential (2040)	*4,097 MT CO_2e*
kWh Savings (2030)	*3,918,684 kWh*
Therms Savings (2030)	*559,809 therms*
Co-Benefits	

GHG = greenhouse gas
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

Goal 3: Increase Energy Efficiency in Existing Commercial Units

The following measures focus on increasing energy efficiency in existing commercial buildings through behavior modification and encouraging and incentivizing commercial building retrofits. As discussed in Chapter 2, in 2016, Corona's commercial/industrial consumers used 898,057,448 kWh of electricity and 21,015,979 therms of natural gas.

- **Measure 3.1:** Energy Efficiency Training, Education, and Recognition in Commercial Sector

Education is at the core of attaining energy efficiency goals. A specific education measure would emphasize the critical role of education in achieving energy efficiency. This measure would provide City staff with a framework to interact with and educate the commercial property owners and operators about behavioral and technological changes that can increase energy efficiency in commercial buildings. This is an enhancement of Measure R3-E2 proposed in the 2012 CAP. Potential actions for this measure include:

- ☐ Post energy efficiency information or links on websites and/or social media and provide materials at public events
- ☐ Promote an annual energy efficiency fair
- ☐ Promote commercial energy efficiency resource center
- ☐ Invite building inspectors to hold trainings semi-annually on energy efficiency and Title 24

GHG Reduction Potential	*Supporting Measure*
Cobenefits	

➢ **Measure 3.2:** Increase Business Participation in Existing Energy Efficiency Programs

There are many energy efficiency opportunities that are low-cost for businesses to initiate that would result in cost-savings over time. SCE and the SoCalGas offer many rebates and incentives to purchasing energy-efficient appliances and lights. As many business owners may be unaware that the opportunities exist, this measure would allow for the City to increase the participation of businesses in existing energy-efficiency programs that are low-cost and would provide financial benefits. This is an enhancement of the City's existing Community Energy Partnership program and Measure R3-E4 proposed in the 2012 CAP. Potential action for this measure includes:

☐ Partner with the Southern California Association of Governments (SCAG), SCE, and SoCalGas for outreach events

GHG Reduction Potential (2030)	*7,031 MT CO_2e*
GHG Reduction Potential (2040)	*7,557 MT CO_2e*
kWh Savings (2030)	*24,108,652 kWh*
Therms Savings (2030)	*234,074 therms*
Cobenefits	

GHG = greenhouse gases
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

➢ **Measure 3.3:** Nonresidential Building Energy Audits

Commercial energy audits are necessary to identify cost-effective opportunities for energy savings and for business owners to take practical actions to increase energy efficiency. The audits can be established or promoted by various existing programs. This is a new measure and was not proposed in the 2012 CAP. Potential action for this measure includes:

☐ Promote energy audits through programs such as Energy Upgrade California

GHG Reduction Potential	*Supporting Measure*
Cobenefits	

➢ **Measure 3.4:** Nonresidential Building Retrofits

As many of Corona's commercial buildings were constructed before the adoption of Title 24, their facilities and equipment are not considered energy efficient. Therefore, retrofits are necessary to achieve higher energy efficiency. Many federal and State programs and incentives support nonresidential building energy retrofits, including City-supervised funding, permit process improvements, and City ordinances. This is an enhancement of Measures R1-E4, R1-E5, and R2-E7 proposed in the 2012 CAP. Potential actions for this measure include:

☐ Enhance enforcement of Title 24 compliance for existing nonresidential buildings
☐ Promote existing nonresidential building retrofit programs
☐ Promote participation in green building programs, such as California Solar Initiative
☐ Promote financing programs such as Property Assessed Clean Energy Program (PACE)
☐ Establish online permitting to facilitate retrofits

GHG Reduction Potential (2030)	*37,592 MT CO_2e*
GHG Reduction Potential (2040)	*40,406 MT CO_2e*
kWh Savings (2030)	*36,917,528 kWh*
Therms Savings (2030)	*5,402,144 therms*
Co-Benefits	

GHG = greenhouse gas
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

Goal 4: Increase Energy Efficiency in New Commercial Units

The following measures focus on increasing energy efficiency in new commercial buildings through encouraging and incentivizing green buildings. As discussed in Chapter 2, energy use for the commercial building sector in Corona is anticipated to increase by 20 percent by 2040 compared to 2016, which would be attributable to new commercial buildings.

- **Measure 4.1:** Exceed Energy Efficiency Standards

City staff has a unique opportunity to inform and encourage developers to apply new energy efficiency opportunities in new development. This measure would educate City staff to encourage and implement energy efficiency beyond that required by current Title 24 standards. This measure would also ensure that as Title 24 standards are updated, City staff would be well informed and could implement updates quickly and effectively. This is an enhancement of Measures R2-E5 and R2-E6 proposed in the 2012 CAP. Potential actions for this measure include:

- ☐ Educate City staff and developers on future Title 24 updates and additional energy efficiency opportunities for new nonresidential development
- ☐ Promote Tier 1 and Tier 2 Green Building Ratings, such as LEED, Build It Green, or Energy Star®- certified buildings
- ☐ Establish online permitting to facilitate new nonresidential building energy efficiency programs

GHG Reduction Potential (2030)	*5,742 MT CO_2e*
GHG Reduction Potential (2040)	*6,172 MT CO_2e*
kWh Savings (2030)	*15,755,654 kWh*
Therms Savings (2030)	*368,707 therms*
Co-Benefits	

3.2 Water Efficiency

As discussed in Chapter 2, GHG emissions from Corona consumers' water use and wastewater treatment accounted for 3 percent of the total community emissions in 2016. GHG emissions are generated by the transport and consumption of water due to the energy needed to supply water to the end users. There are many opportunities to reduce water consumption throughout Corona.

Goal 5: Increase Energy Efficiency through Water Efficiency

The following measures focus on increasing water efficiency through community behavior modification.

- **Measure 5.1:** Water Efficiency through Enhanced Implementation of Senate Bill X7-7

SB X7-7, or The Water Conservation Act of 2009, requires all water suppliers to increase water-use efficiency. The legislation set an overall goal of reducing per capita urban water consumption by 20 percent from a baseline level by 2020. This goal can be met by taking a variety of actions, including targeted public outreach and promoting water efficiency measures such as low-irrigation landscaping. This is an enhancement of Measure R3-W1 proposed in the 2012 CAP. Potential actions for this measure include:

- ☐ Post water efficiency information or links on the City's website and/or social media and provide materials at public events
- ☐ Require low-irrigation landscaping

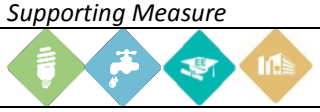
GHG Reduction Potential (2030)	*1,524 MT CO_2e*
GHG Reduction Potential (2040)	*1,607 MT CO_2e*
kWh Savings (2030)	*6,351,024 kWh*
Co-Benefits	

GHG = greenhouse gas
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

➢ **Measure 5.2:** Exceed Water Efficiency Standards

In addition to SB X7-7, more actions are being studied or have been taken to exceed water efficiency standards. These efforts include education and outreach practices that could be combined with residential and commercial actions that promote reuse or recycled water, use of gray water and the collection and use of harvested rainwater. This is an enhancement of Measure R2-W1 proposed in the 2012 CAP. Potential action for this measure includes:

☐ Conduct direct outreach to homeowner associations, businesses, and other community groups to inform them about water efficiency standards. The City would implement this in conjunction with the existing water conservation outreach efforts by the City's Department of Water and Power so that any necessary efforts are not duplicated.

GHG Reduction Potential	*Supporting Measure*
Cobenefits	

3.3 Advanced Goals and Measures

Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect

The following measures focus on reducing urban heat island effect and therefore indirectly reducing energy use throughout Corona.

➢ **Measure 6.1:** Tree Planting for Shading and Energy Efficiency

Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration, making vegetation a simple and effective way to reduce urban heat islands. Shaded surfaces may be 20 to 45 degrees Fahrenheit ([°F], equal to 11 to 25 degrees Celsius [°C]) cooler than the peak temperatures of unshaded materials. In addition, evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures by 2 to 9 °F (or 1 to 5 °C). Trees and vegetation that directly shade buildings can reduce energy use by

decreasing demand for air conditioning. This is a new measure and was not proposed in the 2012 CAP. Potential action for this measure includes:

☐ Promote tree planting at plan check for private properties

GHG Reduction Potential	*Supporting Measure*
Cobenefits	

➢ **Measure 6.2:** Light-Reflecting Surfaces for Energy Saving

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

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

Cool pavement is built from materials that reflect more solar energy, enhance water evaporation, or have been otherwise modified to remain cooler than conventional pavements. Cool pavement can be created with existing paving technologies as well as newer approaches such as the use of coatings, permeable paving, or grass paving. Cool pavements save energy by lowering the outside air temperature. This allows air conditioners to cool buildings with less energy, and the reflective qualities of cool pavements reduce the need for electric street lighting at night.

This is a new measure and was not proposed in the 2012 CAP. Potential actions for this measure include:

- ☐ Promote cool roofs on the residential, commercial, industrial or office buildings where feasible
- ☐ Promote cool pavements in Corona where feasible

GHG Reduction Potential (2030)	*601 MT CO_2e*
GHG Reduction Potential (2040)	*633 MT CO_2e*
kWh Savings (2030)	*2,502,246 kWh*
Cobenefits	

GHG = greenhouse gas
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

3.4 Transportation

As discussed in Chapter 2, GHG emissions from Corona's on-road transportation accounted for 46 percent of the total community emissions in 2016. There are many opportunities to reduce VMT and improve mobility within Corona to achieve the 2030 and 2040 targets as described below.

Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled

- **Measure 7.1:** Alternative Transportation Options

Alternative transportation includes taking transit and non-motorized transportation options, among them walking and bicycling, and variants such as small-wheeled transport like skates, skateboards, push scooters and handcarts, and wheelchair travel. These modes provide both recreation and transportation, and can reduce VMT by removing automobiles from the road.

This is an enhancement of Measures R2-T1 and R3-T1 proposed in the 2012 CAP. Potential actions for this measure include:

- ☐ Work with SCAG and the community to remove barriers to alternative transportation
- ☐ Create additional active transportation routes from Corona Transit Center to surrounding residential areas
- ☐ Evaluate parking requirements to identify areas such as transit districts and mixed use developments for shared or reduced parking requirement opportunities

GHG Reduction Potential (2030)	*53,944 MT CO_2e*
GHG Reduction Potential (2040)	*57,849 MT CO_2e*
VMT Reduction (2030)	*169,761,409 miles*
Cobenefits	

GHG = greenhouse gas
MT CO_2e = metric tons of carbon dioxide equivalent
VMT = vehicle miles traveled

➢ **Measure 7.2:** Implement Bicycle Master Plan to Expand Bicycle Routes Around the City

Bicycle-friendly roads are crucial to promoting bicycle use as a transportation method. People tend to bicycle if routes are available to separate them from motor vehicles and bicyclists' safety can be ensured. The City's existing bicycle master plan was adopted in 2001 and has not been updated since then. Thus, updating and implementing the bicycle master plan and constructing more bicycle routes would encourage more bicycle rides and would help to reduce VMT. This is an enhancement of Measure R2-T3 proposed in the 2012 CAP. Potential action for this measure includes:

- ☐ Expand bicycle routes and prioritize funding for Class I bicycle lanes to improve bicycle transit

GHG Reduction Potential (2030)	*482 MT CO_2e*
GHG Reduction Potential (2040)	*517 MT CO_2e*
VMT Reduction (2030)	*1,518,191 miles*
Cobenefits	

GHG = greenhouse gas
MT CO_2e = metric tons of carbon dioxide equivalent
VMT = vehicle miles traveled

3.5 Solid Waste

As discussed in Chapter 2, GHG emissions from Corona's solid waste generation accounted for 5 percent of the total community emissions in 2016. There are many opportunities to reduce waste disposal and increase waste recycling and composting.

Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation

- **Measure 8.1:** Reduce Waste to Landfills

According to 2014 Statewide Waste Characterization data,[9] much of the waste disposed in landfills is readily recyclable. Increasing the recovery of recyclable materials will directly reduce GHG emissions. In particular, recycled materials can reduce the GHG emissions from multiple phases of product production, including extraction of raw materials, preprocessing, and manufacturing. This is an enhancement of Measures R1-S1, R2-S1, and R3-S2 proposed in the 2012 CAP. Potential actions for this measure include:

- ☐ Promote waste recycling and diversion in the community
- ☐ Add additional recycling containers in public places where possible and needed

[9] CalRecycle, 2014 Statewide Waste Characterization data https://www2.calrecycle.ca.gov/WasteCharacterization/

☐ Promote a waste reduction, recycling, and composting program

GHG Reduction Potential (2030)	*20,271 MT CO_2e*
GHG Reduction Potential (2040)	*21,378 MT CO_2e*
Cobenefits	

3.6 Clean Energy

Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use

➢ **Measure 9.1:** Clean Energy

Clean energy includes energy efficiency and clean energy supply options such as highly efficient combined heat and power as well as renewable energy sources. Installing solar photovoltaic panels on residential and commercial building rooftops is an effective way to save energy use. Moreover, when combined with energy storage systems, solar panels could continuously meet residential and commercial energy demand. By identifying, designing, and implementing clean energy measures and technology solutions, Corona would receive environmental and economic benefits, including reductions in GHG emissions. This is an enhancement of Measures R1-E6 and R3-E3 proposed in the 2012 CAP. Potential actions for this measure include:

☐ Promote clean energy incentives to the community

☐ Encourage solar panel installation on existing residential buildings

☐ Encourage solar panel installation on existing commercial buildings and commercial parking lots

☐ Encourage energy storage system installation with solar panels

GHG Reduction Potential (2030)	*21,999 MT CO_2e*
GHG Reduction Potential (2040)	*21,999 MT CO_2e*
kWh Savings (2030)	*91,660,465 kWh*
Cobenefits	

GHG = greenhouse gas
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

➢ Measure 9.2 Community Choice Aggregation

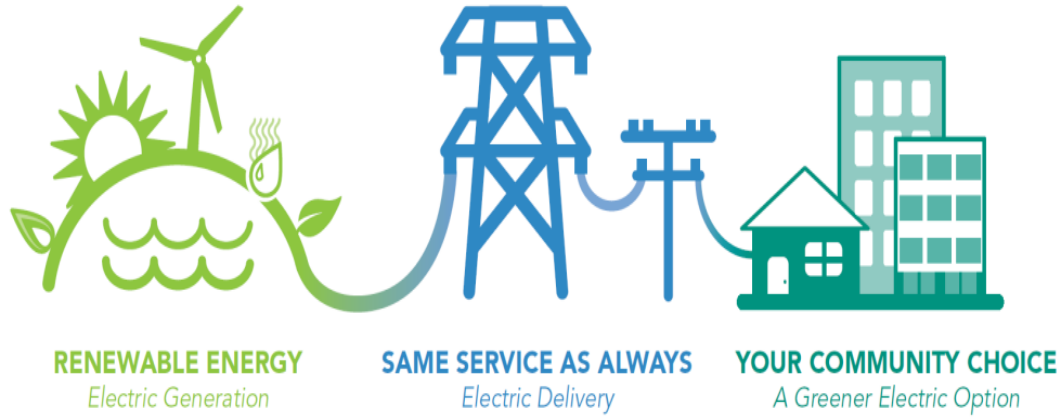
AB 117, which was signed into law in 2002, allows California cities and counties to either individually or collectively supply electricity to customers within their borders through the establishment of a Community Choice Aggregation (CCA) program. The City could also seek opportunities to join the regional CCA program, which would allow Corona's energy users to choose an alternative option to SCE and to use more renewable energy. The ongoing CCA programs have renewable energy percentages between 33 and 100, and the national opt-out rates for the program range from 3 to 8 percent, with most programs at or below 5 percent.[10] Participation in a regional CCA district could provide a significant source of future emission reductions.

The advantages of regional CCAs that include participation from multiple local jurisdictions would be the creation of efficiencies. The City could seek opportunities for collaboration with other local jurisdictions to develop and implement a CCA that would produce mutually beneficial results. Developing a CCA would require a detailed analysis of energy demand, efficiency opportunities, and available clean electricity sources for purchase.

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

This is a new measure and was not proposed in 2012 CAP. Potential action for this measure includes:

☐ Explore opportunities to join a CCA program

	
GHG Reduction Potential (2030)	*214,559 MT CO_2e*
GHG Reduction Potential (2040)	*230,348 MT CO_2e*
kWh Savings (2030)	*891,882,228 kWh*
Cobenefits	

GHG = greenhouse gas
kWh = kilowatt hours
MT CO_2e = metric tons of carbon dioxide equivalent

3.7 Summary of Reductions

By implementing the statewide and all of the local reduction measures described above, the City would reduce its community-wide GHG emissions by 14 percent compared to the 2030 BAU emissions and 14 percent compared to the 2040 BAU emissions. Table 9 summarizes the strategies and the potential GHG reductions for community operations.

Table 9: Summary of Community GHG Reduction Strategies and Emission Reductions

Goals and Measures	2030 Emission Reductions (MT CO_2e)	2040 Emission Reductions (MT CO_2e)
Goal 1: Increase Energy Efficiency in Existing Residential Units		
1.1: Energy Efficiency Training, Education, and Recognition in the Residential Sector	Supporting Measure[1]	
1.2: Increase Community Participation in Existing Energy Efficiency Programs	3,715	3,885
1.3: Home Energy Evaluations	Supporting Measure[1]	
1.4: Residential Home Energy Renovations	2,276	2,380
Goal 2: Increase Energy Efficiency in New Residential Units		
2.1: Exceed Energy Efficiency Standards	3,918	4,097
Goal 3: Increase Energy Efficiency in Existing Commercial Units		
3.1: Energy Efficiency Training, Education, and Recognition in Commercial Sector	Supporting Measure[1]	
3.2: Increase Business Participation in Existing Energy Efficiency Programs	7,031	7,557
3.3: Nonresidential Building Energy Audits	Supporting Measure[1]	
3.4: Nonresidential Building Retrofits	37,592	40,406
Goal 4: Increase Energy Efficiency in New Commercial Units		
4.1: Exceed Energy Efficiency Standards	5,742	6,172
Goal 5: Increase Energy Efficiency through Water Efficiency		
5.1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7	1,524	1,607
5.2: Exceed Water Efficiency Standards	Supporting Measure[1]	
Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect per Title 24 Requirements		
6.1: Tree Planting for Shading and Energy Saving	Supporting Measure[1]	
6.2: Light-Reflecting Surfaces for Energy Saving	601	633
Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled		
7.1: Alternative Transportation Options	53,944	57,849
7.2: Implement Bicycle Master Plan to Expand Bicycle Routes around Corona	482	517
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation		
8.1: Reduce Waste to Landfills	20,271	21,378
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use		
9.1: Clean Energy	21,999	21,999
Total Community Measures without CCA	**159,096**	**168,481**
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use		
9.2: Join CCA Program	214,052	230,348
Total Community Measures with CCA	**373,148**	**398,829**

[1] Supporting Measures are the measures that will reduce emissions but cannot be quantified. These measures enhance the quantifiable measures through education and outreach programs.

CCA = Community Choice Aggregation (see pages 13 and 40 for more explanation of CCA)

MT CO_2e = metric tons of carbon dioxide equivalent

3.8 Comparison of Reductions to Targets

Table 10 and Figure 5 summarize the baseline 2008 and updated 2016 community emissions, the projected 2020, 2030, and 2040 emission inventories, as well as the reduced 2030 and 2040 inventories after implementation of the reduction measures for community operations.

By 2030, without implementation of the CCA program, the statewide and local measures together would reduce Corona's community GHG emissions from the 2030 BAU level to 780,327 MT CO_2e, which would exceed the 49 percent below 2008 levels reduction target of 890,378 MT CO_2e for 2030. Implementation of CCA would provide an additional 214,052 in MT CO_2e reductions. In 2040, without the CCA, implementation of statewide and local measures together would reduce emissions from the 2040 BAU level to 693,798 MT CO_2e, which would not meet the 66 percent below 2008 levels reduction target of 593,585 MT CO_2e for 2040. Implementation of the CCA would provide an additional 230,348 in MT CO_2e reductions and would result in emission levels that would meet the target.

Table 10: Community Emissions and Targets Comparison

Sector	2008 MT CO_2e	2016 MT CO_2e	2020 MT CO_2e	2030 MT CO_2e	2040 MT CO_2e
BAU Emissions	1,745,839	1,073,517	1,100,068	1,169,446	1,243,348
State and Federal Reductions	-	-	*90,610*	*230,023*	*381,069*
ABAU Emissions			1,009,458	939,423	862,279
Local Measures Reductions without CCA	-	-	--[1]	*159,096*	*168,481*
Total Adjusted Emissions without CCA	-	-	1,009,458	780,327	693,798
Reduction Target	-	-	1,483,963	890,378	593,585
Additional Reductions Needed without CCA	-	-	Target Met	Target Met	100,213
Local Measures Reductions with CCA	-	-	--	*373,148*	*398,829*
Total Adjusted Emissions with CCA	-	-	1,009,458	566,275	463,450
Additional Reductions Needed with CCA	-	-	Target Met	Target Met	Target Met

[1] No local reduction measures are proposed for 2020 because the ABAU emissions are below the target level.
ABAU = Adjusted Business as Usual
BAU = Business as Usual
CCA = Community Choice Aggregation
MT CO_2e = metric tons of carbon dioxide equivalent

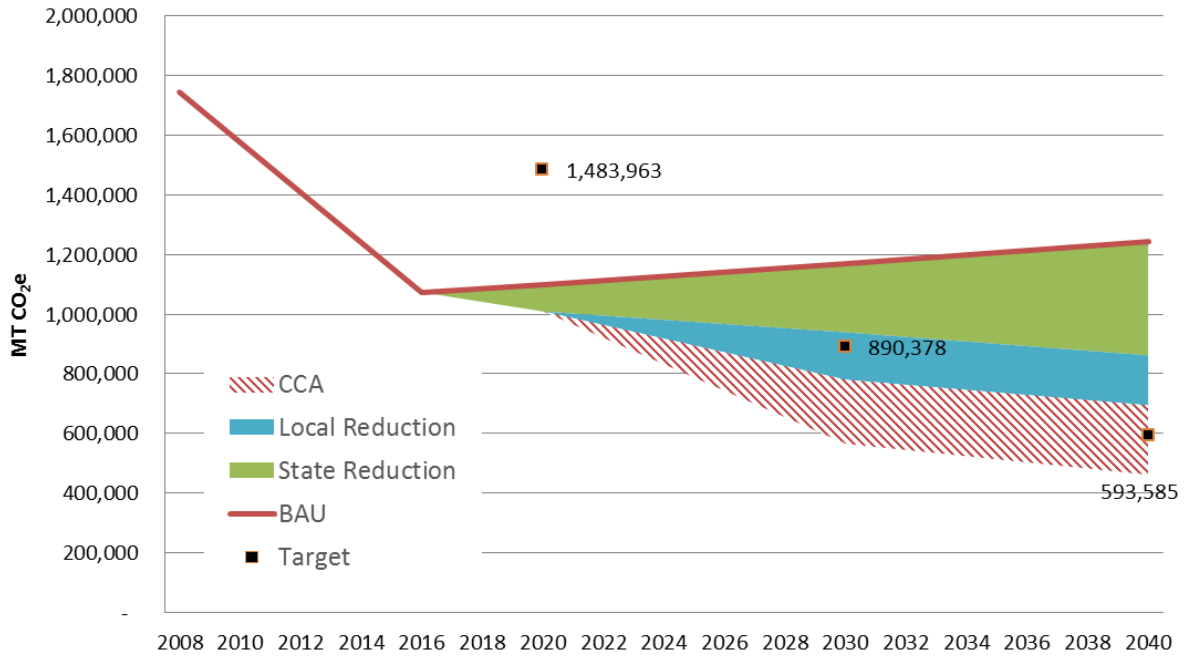


Figure 5: State and Local Reductions Comparison with Targets for Community

3.9 Beyond 2030 Target

The City's emission reduction targets for the years 2020 and 2030 discussed in this CAP are consistent with the goals identified in AB 32 and the corresponding Scoping Plan, which identifies statewide GHG reduction targets by 2020 and 2030. The 2040 forecast year is consistent with the City's 2018 General Plan Update buildout year. It is important to note that 2030 is only a milestone in GHG reduction planning. To be consistent with the State regulations, the City would need to look beyond 2030 and take into consideration Executive Order S-03-05, which calls for a reduction of GHG emissions to a level of 80 percent below 1990 levels by 2050. The City has already set a target for 2040 GHG reductions in this CAP Update at 66 percent below baseline 2008 levels by 2040, which would align the City on a right trajectory to meet the 2050 emissions reduction target.

As the City proceeds with implementing the measures identified above, the reduction targets may need adjustments to reflect updates in the inventory and resultant GHG emission reductions achieved through implementation of these measures from now until 2030. In future when the City would be close to meeting 2030 target per this CAP Update and would have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches, the current 2040 GHG reduction target and measures may need adjustments.

Furthermore, the federal, State, and local programs and policies for the GHG reductions for the near term (2020–2030) are likely to be well underway and continuing technological change in the fields of

energy efficiency, alternative energy generation, vehicles, fuels, methane capture and other areas will have taken place. The City will then be able to take the local, regional, State and federal context into account and may consider updating the GHG reduction targets post-2030. The potential new CAP update will include a specific target for GHG reductions for 2050. The targets will be consistent with broader State and federal reduction targets and will take into consideration the effectiveness and applicability of the reduction measures identified in this CAP Update.

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4.0 Adaptation

The City recognizes that planning sustainably is more than reducing GHG emissions; it also requires being prepared for changes that would impact the community's quality of life, use of resources, and economy. Preparedness, or adaptation, efforts seek to reduce vulnerability and increase the local capacity to adapt to changes. Therefore, this CAP Update summarizes changes in average and extreme weather that may occur in the next several decades and identifies actions to build resilience to and adapt to those changes.

4.1 Projections of Future Climate

There is a scientific consensus that California will experience warmer temperatures, increased drought, and more extreme weather events due to climate change.[11] The latest fourth Climate Change Assessment Report further underscores the vulnerability and impacts of climate change on California.[12] The Los Angeles Region[13] Report[14] of the California's Fourth Climate Change Assessment, summarizes the key impacts of climate change as continued future warming, rise in extreme temperatures and number of extreme hot days, variable precipitation with increase in dry and wet extremes and continued sea-level rise. The impacts of Climate Change to Corona are expected to be similar. As a result of Climate Change Corona may expect:

- **Increased temperatures**. By the end of this century, the average United States temperatures are predicted to increase by 3 °F to 12 °F, depending upon the amount of future emissions and how the earth responds to those emissions.[15] For California, the average annual temperature is expected to rise by 2.7 °F by 2050 and 4.1 to 8.6 °F by the end of the century.[16] For Corona, average temperatures are expected to increase between about 8 °F and 10 °F by the end of the century, depending on the emission scenario.[17]

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11 California Natural Resources Agency and California Energy Commission. 2012. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.* CEC-500-2012-007. July.

12 California's Fourth Climate Change Assessment Report, 2018 California's Changing Climate http://www.climateassessment.ca.gov/state/docs/20180827-SummaryBrochure.pdf (accessed on February 11, 2019)

13 The Los Angeles region contains all of Ventura, Los Angeles, and Orange Counties, along with adjacent urbanized portions of San Bernardino and Riverside Counties.

14 California's Fourth Climate Change Assessment, Los Angeles Region Report. 2018. Website: http://www.climateassessment.ca.gov/regions/docs/20180928-LosAngeles.pdf (accessed on February 11, 2019).

15 U.S. Global Change Research Program. 2014. *Climate Change Impacts in the United States: The Third National Climate Assessment*. Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds.

16 California Natural Resources Agency and California Energy Commission. 2012. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.* CEC-500-2012-007. July.

17 Cal-Adapt. 2018. https://cal-adapt.org/tools/annual-averages/.

- **Variable precipitation**. Globally, future precipitation is highly variable, and California is no exception. Annual precipitation in California is expected to increase by more than 12 percent through the end of the 21st century. Most of this increase is expected in Northern and Central California; precipitation in Southern California is expected to decrease by 3.3 percent. All regions of California are expected experience wetter winters, with Southern California rain increasing by 11 percent during the rainy months of December, January, and February.[18]
- **Increase in extreme weather events**. Corona currently experiences up to 20 extreme heat days (days warmer than 102 °F) per year. By 2050, the number of extreme heat days in the City could increase to more than 30 days per year, and by the end of the century, the number of extreme heat days could exceed 80 per year (Figure 6).[19]

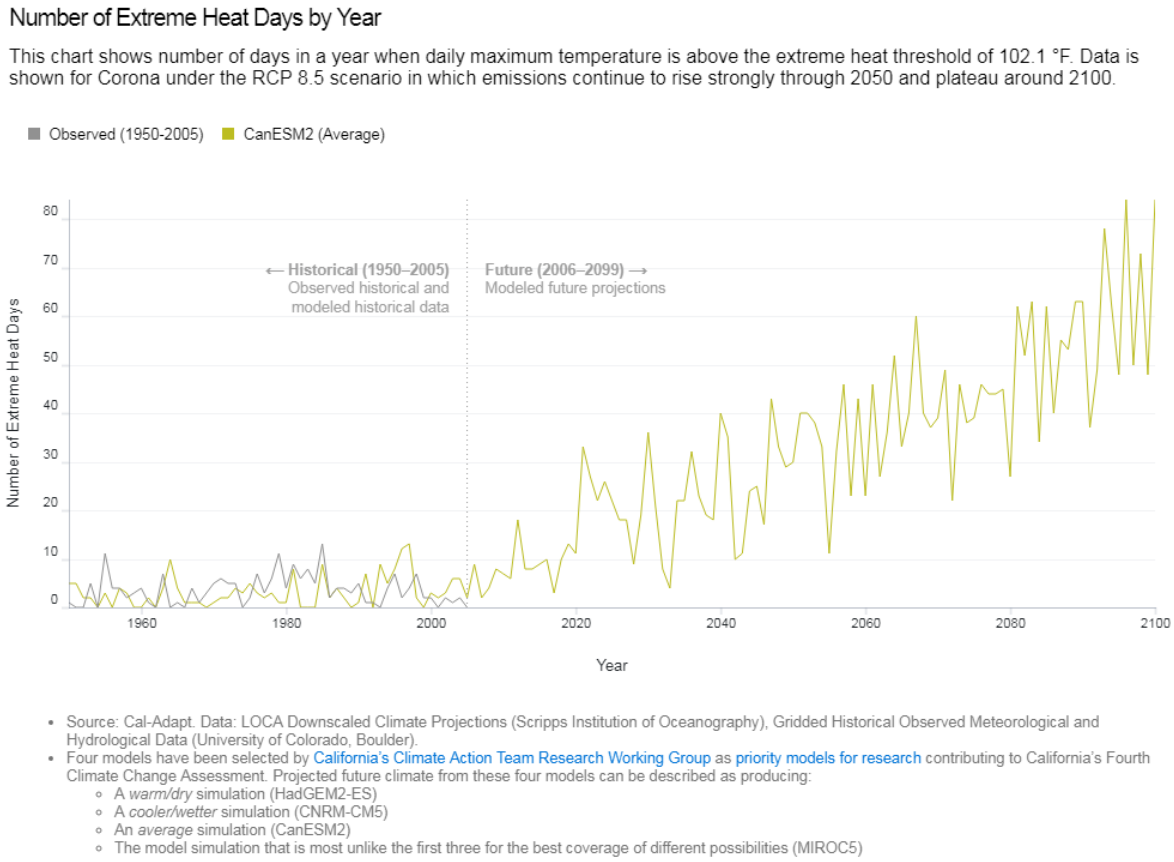

Figure 6: Number of Extreme Heat Days per Year for Corona (Observed and Modeled Historical data 1950-2005 and Modeled Future Projections 2006-2099)

[18] Allen, Robert J., and Rainer Luptowitz. 2017. El Niño-like Teleconnection Increases California Precipitation in Response to Warming. *Nature Communications* 8: 16055. doi:10.1038/ncomms16055.

[19] Cal-Adapt. 2018. Website: https://cal-adapt.org/tools/extreme-heat/.

4.2 Impacts of Climate Change and Adaptation Strategies

Increasing awareness and concern regarding potential climate change impacts has led to some policy responses and programs aimed at providing direction on how the State and Cities, such as Corona, can plan for and respond to the impacts of climate change, such as Executive Order S-13-08, discussed in Chapter 1. Impacts of climate change are already being seen and other more serious consequences are likely to occur in the future. The exact nature of the climate change impacts is unknown and also depends on near-term emissions, but the most likely climate change impacts to the State and to Corona over the next century are discussed below along with strategies to reduce these potential impacts or to build resiliency among communities.

4.2.1 Public Health & Safety

Periods of increased high temperatures or extended high temperatures can lead to increased heat-related, cardiovascular-related, and respiratory illnesses and diseases, and other health impacts. Emergency medical services and hospital visits also increase during heat waves. Changes in temperature are also expected to worsen air quality by increasing ozone and particulate matter concentrations, which can cause or exacerbate respiratory symptoms such as asthma attacks. The City recognizes that climate change will not impact all populations equally. Especially sensitive populations include the young (under 5 years of age) and the elderly (over 65). While Corona has a significantly smaller proportion of elderly residents (7.3 percent) when compared to Riverside County (11.8 percent), the percentage that falls within this age group is trending upwards. Other populations that could be affected by extreme temperatures include outdoor workers such as construction and maintenance employees. This places limits on work hours and may require additional training and understanding of heat-related illnesses that workers should be aware of.

4.2.1.1 Strategies

- Map neighborhoods that could be more vulnerable to the effects of climate change, such as flooding, fire, and the urban heat island effect is important in identifying high-risk areas of the city
- Create cooling centers at public spaces, such as libraries, for populations without air conditioning.
- Implement cooling technologies such as cool roofs and cool pavements
- Strategically place shade trees near buildings, in parking lots, and along bike and pedestrian pathways

4.2.2 Electricity Demand

In addition to the health and public safety risks, Corona may face challenges to its energy supply due to warmer temperatures. Peak demand for electricity may increase due to the increased use of air

conditioners in the city and other regions of the City's Department of Water and Power and SCE territory, which may cause brownouts or blackouts. Additionally, efficiencies of electricity generation and transmission decrease as air temperatures increase, which further inhibit the ability of electric providers to meet increased demand.

4.2.2.1 Strategies

- ☐ Educate the public to become more energy efficient and to reduce demand
- ☐ Encourage solar-based or other renewable energy sources to supplement the grid and to reduce peak demand on the grid
- ☐ Improve building envelopes by adding insulation and placing trees to provide shade
- ☐ Encourage cooling technologies
- ☐ Increase the use of smart meter devices to allow appliances to run during off-peak hours

4.2.3 Water Availability

Water availability is and has been a vital economic, natural resource, and public health issue in California. Governor Jerry Brown declared a drought State of Emergency in January 2015 and the State Water Resources Control Board (SWRCB) announced in March 2015 that water suppliers were encouraged to go beyond the minimum requirements to safeguard remaining water supplies. In April 2015, the Governor issued Executive Order B-29-15 that directs the SWRCB to implement mandatory water reductions to reduce water usage by 25 percent. Multiyear droughts decrease water supplies, while population growth exacerbates the problem by increasing demand. Supply limitations will only intensify as climate change causes reduced rainfall and increased temperatures. Water demand in California is already increasing because of population expansion. In addition, demand for water for irrigation rises with warmer temperatures. Summers with higher temperatures and even less rainfall and runoff than usual will exacerbate demands for water in California.

4.2.3.1 Strategies

- ☐ Educate the public about water conservation.
- ☐ Encourage low-impact development.
- ☐ Expand water recycling and graywater systems.
- ☐ Promote conversion of turf grass to xeriscaping.

4.2.4 Infrastructure Damage

Cities, including Corona, rely on infrastructure for commuting, working, and other basic services. Roadways and buildings are constructed for long-term use; however, infrastructure is also susceptible to the impacts of climate change as it is generally built to meet historic climate

conditions. Therefore, infrastructure is also vulnerable to climate change impacts. Many roadways and railways are dark or metal-based, conducting heat and raising temperatures well beyond the observed air temperature. Increased temperatures can cause pavement to soften and to expand, causing potholes. Railways can buckle under extreme heat, requiring trains to slow to navigate the buckle or stop service for repairs. Flooding can also shorten the life of roadway infrastructure, require more maintenance, and cause traffic delays. Building infrastructure likewise may have shortened lifetimes due to flooding.

4.2.4.1 Strategies

- ☐ Evaluate infrastructure vulnerability based on current degradation and expected climate-related impacts
- ☐ Prioritize and plan for infrastructure improvements
- ☐ Identify alternative routes where infrastructure damage may occur

4.2.5 Wildfire

Wildfire in Southern California is influenced by a multitude of factors, including a dry and warm Mediterranean climate with periodic episodes of Santa Ana winds and droughts, the type and spatial distribution of vegetation (along with dead/ dry vegetation caused by pests), varying topography, large urban-wildland interfaces, past fire suppression attempts, and human activities. Projections indicate that wildfire may increase over Southern California, but there remains uncertainty in quantifying future changes of burned area over the LA region[20]. This uncertainty applies to Corona too. However, it is important that the City is prepared to deal with any wildfire situation and take preventative steps to mitigate risks.

About 14 percent of Corona is covered by open space, which is the type of land most vulnerable to wildfire. Homes and buildings near open space areas could also be threatened by future wildfires. Effects from wildfire can include eye and respiratory illness, worsening asthma, allergies, chronic obstructive pulmonary disease, and other cardiovascular and respiratory diseases. All new buildings within a State Responsibility Area, Local Agency Very-High Fire Hazard Severity Zone, or Wildland-Urban Interface Fire Area designated by the enforcing agency must comply with all sections of the Wildland-Urban Interface Fire Area Building Standards. These standards provide a reasonable level of exterior wildfire exposure protection for buildings within these hazard areas and establish minimum standards for materials and material assemblies to lessen the vulnerability of a building to resist the intrusion of flames and burning embers projected during a conflagration or wildfire.[21] Additional resources may be needed to combat additional wildfires in the region, including water.

[20] California's Fourth Climate Change Assessment, Los Angeles Region Report, 2018 http://www.climateassessment.ca.gov/regions/docs/20180928-LosAngeles.pdf (accessed on February 11, 2019)

[21] Department of Forestry and Fire Protection, Office of the State Fire Marshal. 2007. *Wildland-Urban Interface Building Standards Information Bulletin*. Website: http://www.fire.ca.gov/fire_prevention/downloads/IB_LRA_Effective_Date.pdf (accessed December 5, 2017).

4.2.5.1 Strategies

- ☐ Educate the public on the importance of fire safety.
- ☐ Encourage buffer zones between vegetation and infrastructure.
- ☐ Identify fire-prone habitats, evaluate and plan for increased risk of larger and more frequent wildfires.

4.2.6 Social Equity

The City recognizes that some disadvantaged populations (e.g., youth, elderly, low-income) may need special assistance in adapting to future climate changes. Disadvantaged populations are more likely to be without air conditioning and may need assistance in accessing cooling locations, especially if they do not have cars or cannot drive. Disadvantaged populations may also face increased financial hardships with increased energy use. While the City may not be able to change the underlying factors of disadvantaged populations (e.g., age, health status, socio-economics) it can provide information and access to resources to help these populations adapt to future climate changes.

4.2.6.1 Strategies

- ☐ Increase public outreach and educational programs to inform the public of health and safety resources
- ☐ Assist in facilitating access to cooling centers for the public
- ☐ Provide information about available low-income weatherization programs and identify other outreach methods to increase visibility and familiarity with these programs
- ☐ Educate the public on the benefits of improved occupant comfort and reduced utility bills

5.0 Plan Implementation

This chapter describes implementation steps for the CAP Update to support achievement of the energy efficiency and GHG reduction goals for the community at large. Success in meeting the City's energy efficiency and GHG emission reduction goals will depend on cooperation, innovation, and participation by the City, residents, businesses, and local government entities. This section outlines key steps that the City would follow for the implementation of this CAP Update.

Successful implementation of the CAP will require the following components. These are described in more detail the sections below.

- Administration and staffing
- Financing and budgeting
- Timelines for measure implementation
- Community outreach and education
- Monitoring, reporting, and adaptive management

The steps above are basic steps that any city might take or that other California communities have taken to implement a GHG reduction plan. These are suggested—not required—and are intended to guide a city in its implementation planning.

5.1 Administration and Staffing

The CAP Update's success will require coordination with other regional agencies. The City will work with these agencies and will designate staff to oversee the successful implementation and the tracking of all selected GHG reduction strategies. The City will primarily be responsible for coordinating with contacts across departments to gather data, to report on progress, to track completed projects, and to ensure that scheduling and funding of upcoming projects is discussed at key City meetings. The City may identify one or more staff to act as the Plan Implementation Administrator(s) to guide monitoring, reporting, and dissemination of information to the public. Where possible, the City may use assistants from programs such as CivicSpark, an AmeriCorps program designed to build capacity for local governments to address climate change.

The Administrator could have the following responsibilities:

- Secure long-term financing for the energy efficiency and GHG reduction measures (i.e., grant applications)
- Coordinate CAP Update implementation-related meetings
- Serve as the external communication hub to local and regional climate action organizations, including SCAG
- Conduct public outreach to inform the community of the City's reduction planning efforts

- Investigate methods to use existing resources and harness community support to better streamline implementation of the Plan
- Monitor implementation of reduction measures and success of the CAP Update
- Develop a protocol for monitoring the effectiveness of emission-reduction programs
- Establish guidelines for reporting and documenting emission-reduction progress.
- Submit annual reports to the City Council
- Develop a protocol for using the real-time information collected through the verification process to modify and revise existing reduction programs
- Track State and federal legislation and its applicability to the City

In general, the goal in implementing the CAP is not to create new administrative tasks or new staff positions necessarily, but rather to leverage existing programs and staff to the maximum extent feasible. Cities should seek to fold GHG planning and long-term reduction into their existing procedures, institutional organization, reporting, and long-term planning.

5.2 Financing and Budgeting

Implementation of the local GHG reduction measures may require investment for the capital improvements and other investments, and increased operations and maintenance costs. However, in some cases operating costs are anticipated to decrease, resulting in offset savings. This section presents a summary of funding and financing options (Table 11) available at the time of writing this document. Some funding sources are not necessarily directed towards a city, but to a larger regional agency such as SCAG, or a waste services provider serving multiple jurisdictions. The City should monitor private and public funding sources for new grant and rebate opportunities and to better understand how larger agencies are accessing funds that can be used for GHG reductions in their areas. Leveraging financing sources is one of the most important roles a local government can play in helping the community to implement many of the GHG reduction measures.

Table 11: Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
State and Federal Funds	
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 are typically used to purchase a new home that is already energy efficient, such as an ENERGY STAR®-qualified home.

Table 11: Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
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 Energy Commission (CEC)	■ CEC has energy efficiency financing options for projects with proven energy savings. These options include 0% interest rate loans for K–12 school districts, county offices of education, State special schools, community colleges, and 1% interest rate loans for cities, counties, special districts, public colleges or universities, public care institutions/public hospitals, University of California campuses, and California State University campuses. ■ Projects eligible for the CEC energy efficiency financing low interest loans include: ○ Lighting system upgrades ○ Pumps and motors ○ Streetlights and light-emitting diode (LED) traffic signals ○ Building insulation ○ Heating, ventilation and air conditioning equipment ○ Water and waste water treatment equipment
California Air Resources Board (CARB)	■ CARB offers several grants, incentives, and credits 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 118) ○ Carl Moyer Program – Voucher Incentive Program ○ Goods Movement Emission Reduction Program (Proposition 1B Incentives) ○ Loan Incentives Program ○ Lower-Emission School Bus Program/School Bus Retrofit and Replacement Account (Proposition 1B and United States Environmental Protection Agency Incentives)
Existing Capital Improvement Program	■ State and federal funds would most likely continue to local governments, builders, and homeowners in the following forms: ○ Grants ○ Transportation and transit funding ○ Tax credit and rebate programs ○ The Capital Improvement Program can be used for measures relating to traffic or transit.
State Funding for Infrastructure	■ The State's Infill Infrastructure Grant Program may potentially be used to help fund measures that promote infill housing development. ■ Grants can be used for gap funding for infrastructure improvements necessary for specific residential or mixed-use infill development projects.

Table 11: Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
Transportation-Related Federal and State Funding	■ For funding measures related to transit, bicycle, or pedestrian improvements, the following funding sources from SCAG may be used. ○ Sustainability Planning Grant ○ California Active Transportation Program ■ Caltrans Transportation Planning Grant Program provides funding that would lead to programming and implementation of transportation improvement projects. ○ Sustainable Communities Grants ○ Strategic Partnerships Grants ○ Adaptation Planning Grants
Utility Rebates	■ Department of Water and Power offers a variety of residential and commercial rebate programs: ○ Residential and Commercial Turf Replacement Program ○ Pool/Spa Cover Rebates ○ Rebates for Water-Efficient Devices ○ Recirculating Pump Rebate ○ Free Urinal Flush Valve Upgrades and Installation ■ Southern California Edison is one of the utilities participating in the California 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.
Energy Upgrade California	■ The program is intended for home energy upgrades. ■ Funding comes from 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.
Private Funding	
Private Funding	■ Private equity can be used to finance energy improvements, with returns realized as future cost savings. ■ Rent increases can fund retrofits in commercial buildings. ■ Net energy cost savings can fund retrofits in households. ■ Power Purchase Agreements 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. OBF funding is a no-interest loan that is paid back through monthly utility bills. Lighting, refrigeration, HVAC, and LED streetlights are all eligible projects.

Table 11: Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
Other Funding Mechanisms for Implementation	
Other Funding	■ Increased operating costs can be supported by grants from the Strategic Growth Council or the State Department of Conservation to fund sustainable community planning, natural resource conservation and development, and adoption.
Future Funding Options: Funding Mechanisms for Capital and/or Implementation Costs	
New Development Impact Fees	■ These types of fees may have some potential to provide funding, but such fees are best implemented when the real estate market and overall regional economic conditions are strong.
General Obligation Bond	■ A general obligation bond is a form of long-term borrowing and could be used to fund municipal improvements.
AB 811 Districts Property-Assessed Clean Energy (PACE)	■ Assembly Bill (AB) 811 is intended to help municipalities accomplish the goals outlined in Assembly Bill 32. ■ 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. ■ AB 811 and the PACE program are currently on hold for residential properties due to potential violation of standard Federal Housing Finance Agency federally guaranteed (Fannie Mae/Freddie Mac) residential mortgage contracts. ■ The Western Riverside Council of Governments (WRCOG) has implemented the Home Energy Renovation Opportunity (HERO; a PACE program) in Riverside County to assist residents in financing residential energy efficiency and solar retrofits.

HVAC = heating, ventilation, and air conditioning
SCAG = Southern California Association of Governments
WRCOG = Western Riverside Council of Governments

In addition to pursuing the funding options above and monitoring the availability of others, the City should take the following steps to best inform decisions related to the cost of GHG reduction measures:

- **Perform and refine cost estimates.** Cost estimates for local reduction measures should be performed to identify the cost-effectiveness of each measure to inform and to guide the implementation process. This analysis will likely be based on a variety of participation, per-unit, and other assumptions. As programs are developed, cost estimates should be refined and updated over time with more precise implementation-level data.
- **Integrate GHG reduction into existing City budget and Capital Improvements Program.** Certain capital improvements may need to be added to the City's Capital Improvements Program (CIP) and facility master plan programs, as well as those of the City utility enterprises and other public agencies that have control for project implementation. For CIPs

completely under the City's control, new projects would need to be assessed for consistency with the CAP.

- **Adopt or update ordinances and/or codes:** Some local reduction measures may require new or revised ordinances. Staff would need to coordinate these efforts in conjunction with planning departments, planning commissions, and City councils.
- **Pursue outside funding sources:** A range of funding from State and federal agencies has been identified. The City would need to pursue these (and other emerging) funding sources as a part of implementation efforts.
- **Implement and direct preferred City funding sources:** While City funding sources are limited, the City, when financially able, as a part of its budget process, could appropriate funding from general sources or make changes in its fee schedules, utility rates, and other sources as needed to support funding the implementation of the GHG reduction measures.
- **Create monitoring/tracking processes:** Local reduction measures would require program development, tracking, and/or monitoring.
- **Identify economic indicators to consider future funding options:** Economic recovery may occur rapidly or slowly. Whatever the timeframe, the City would need to determine the point at which certain additional funding sources may become feasible and/or favorable. Identification and monitoring of economic indicators and trends, such as home prices, energy prices, cost per kWh on solar installations, unemployment rates, or real wage increases, can help the City decide when to further explore the potential for funding local reduction measures through different financing mechanisms.

5.3 Timelines for Measure Implementation

After taking into account the reductions in energy and water usage and the GHG emissions resulting from statewide measures, the City would need to implement the local reduction measures to reach its reduction targets.

The City has developed an implementation schedule for the local reduction measures. Prioritization was based on the following factors:

- Cost effectiveness
- GHG reduction efficiency
- Availability of funding
- Level of City Control
- Ease of implementation
- Time to implement

To encourage implementation of all reduction measures, City staff would develop a CAP Update Implementation Timeline. Measure prioritization could be based on the following factors.

- **Cost/Funding:** How much does the measure cost? Is funding already in place for the measure?

- **Greenhouse Gas Reductions:** How effective is the measure at reducing greenhouse gases?
- **Other Benefits:** For example, does the measure improve water quality or conserve resources? Would it create jobs or enhance community well-being?
- **Consistency with Existing Programs:** Does the measure complement or extend existing programs?
- **Impact on the Community:** What are the advantages and disadvantages of the measure to the community as a whole?
- **Speed of Implementation:** How quickly can the measure be implemented and when would the City begin to see benefits?
- **Implementation Effort:** How difficult will it be to develop and implement the program?

A qualitative appraisal of implementation effort for the City is also provided. Measures can be categorized based on the convention of low, medium, or high, with low-level measures requiring the least level of effort by the City and being the most likely to be pursued immediately (i.e., the low-hanging fruit). Sample criteria are shown in Table 12.

Table 12: Implementation Matrix

Implementation Effort Level	Sample Criteria
Low	■ Requires limited staff resources to develop. ■ Existing programs in place to support implementation. ■ Required internal and external coordination is limited. ■ Required revisions to policy or code are limited.
Medium	■ Requires staff resources beyond the typical daily level. ■ Policy or code revisions become necessary. ■ Internal and external coordination (e.g., with stakeholders, other cities or agencies, or general public) is necessary.
High	■ Requires extensive staff time and resources. ■ Requires the development of completely new policies or programs and potential changes to the general plan. ■ Requires a robust outreach program to alert residents and businesses of program requirements and eligibility. ■ Requires regional cooperation and securing long-term funding.

5.4 Community Outreach and Education

Corona's citizens and businesses are integral to the success of the CAP Update and to overall GHG reduction for the region. Their involvement is essential, considering that several measures depend on the voluntary commitment, creativity, and participation of the community.

The City would educate stakeholders, such as businesses, business groups, residents, developers, and property owners about the GHG reduction measures that require their participation, encourage participation in these programs, and alert them to program requirements, incentives and/or rebate availability, depending on the measure. City staff would schedule periodic meetings to facilitate formal community involvement in CAP Update implementation and adaptation over time. This could include focused meetings for a specific measure or program such as the PACE program and/or agenda items at City Council or other public meetings. These meetings would be targeted to particular stakeholder groups and provide information on CAP implementation progress as well as the implementation of a specific program or new policy. Alternatively, periodic written updates could be provided in City newsletters, SCAG's newsletter, on City websites, or through other media communications with the general public, such as press releases and public service announcements. Stakeholders would be provided an opportunity to comment on potential improvements or changes to the CAP Update. The City would also sponsor periodic outreach events to directly inform and solicit the input, suggestions, and participation of the community at large.

5.5 Monitoring, Reporting, and Adaptive Management

Regular monitoring is important to ensure programs function as they were originally intended. Early identification of effective strategies and potential issues would enable the City to make informed decisions on future priorities, funding, and scheduling. Moreover, monitoring provides concrete data to document the City's progress in reducing GHG emissions. The City would be responsible for developing a protocol for monitoring the effectiveness of emission reduction programs as well as for undertaking emission inventory updates:

- **Update GHG Inventory:** The City would update inventory emissions prior to 2030 to ensure they meet their GHG reduction goals. This includes regular data collection in each of the primary inventory sectors (utility, regional VMT, waste, wastewater, and water), and comparing the inventory to the City's baseline GHG emissions in 2008. The City would consolidate information in a database or spreadsheet that could be used to evaluate the effectiveness of individual reduction measures.
- **Track State Progress:** The CAP Update will rely heavily on State-level measures. The City would be responsible for tracking the State's progress on implementing State-level programs. Close monitoring of the real gains being achieved by State programs would allow the City to adjust its CAP, if needed.
- **Track Completion of GHG Reduction Measures:** The City would keep track of measures implemented as scheduled in the CAP Update, including progress reports on each measure, funding, and savings. This will allow at least a rough attribution of gains when combined with regular GHG inventory updates.
- **Regular Progress Reports:** The City may report annually (or semi-annually or at other assigned intervals) to the City Council on CAP Update implementation progress. If annual reports, periodic inventories, or other information indicates that the GHG reduction measures are not as effective as originally anticipated, the CAP may need to be adjusted, amended, or supplemented.

5.6 Tracking Tools

5.6.1 Screening Tables

The purpose of the screening tables is to provide a measurable way of determining if a development project is implementing the GHG Performance Standard and is able to quantify the reduction of emissions attributable to certain design and construction measures incorporated into development projects. The screening table assigns points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as "feature"). The point values correspond to the minimum emission reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG Performance Standard. Projects that earn enough points would be consistent with the reductions anticipated in the City's CAP Update.

The City would use a Screening Tables tracker tool, which is a Microsoft Excel-based spreadsheet program that can be used to track implementation of the various menu options within the screening tables. This spreadsheet would allow the City to track cumulative points garnered by projects and to predict emission reductions. These values of reductions can then be input into the GHG Performance Standard within the Plan Implementation Tracker Tool (PITT) described in more detail below.

5.6.2 Plan Implementation Tracker Tool (PITT)

The City's PITT is integrated into the City's Trak-it permit application tracking software that will help the City track GHG reductions achieved through implementation of the GHG reduction measures within the CAP Update, to monitor the plan's implementation progress, and to share findings with stakeholders, partners, and the community.

The PITT will help derive estimates for annual GHG reductions achieved by State, County, and local reduction measures to track progress toward meeting the City's GHG reduction targets. This is achieved by monitoring trends over time on a live feed from the PITT to a web-based dashboard incorporated into the City's website. The dashboard will focus on progress in local reductions and used as a reporting mechanism. City staff will review the monitoring dashboard and assess if the City needs to revise reduction measures based on results to achieve the reduction targets.

Once implemented the PITT will demonstrate climate action planning leadership and initiative, to assist the State and the region in meeting the reduction targets outlined under AB 32, to demonstrate CAP Update progress, to show and communicate results, and to adaptively manage the CAP's implementation to ensure achievement of the reduction target.

5.6.3 Progress Reports

The CAP Update will be tracked continuously through the City's Trak-it permitting software and reported continuously in a live feed to a CAP Reporting Dashboard on the City's website. This automated tracking system will be used by the City to report progress toward the CAP Goals. Metrics would be established for all measures to more specifically track implementation progress.

Sector summaries would be provided on the dashboard to identify each measure, the tracking metric, and emission reductions achieved to date.

The City will use the CAP Reporting Dashboard to assess progress toward the reduction targets and to highlight any adaptive management of the reduction strategies needed to achieve the targets.

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APPENDIX A

GHG INVENTORY, FORECASTING, AND TARGET-SETTING REPORT

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CITY OF CORONA
GHG INVENTORY, FORECASTING, AND TARGET-SETTING REPORT FOR A CLIMATE ACTION PLAN

CLIMATE ACTION PLAN UPDATE

CITY OF CORONA, CALIFORNIA

LSA

August 2018

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CITY OF CORONA
GHG INVENTORY, FORECASTING, AND TARGET-SETTING REPORT FOR A CLIMATE ACTION PLAN

CLIMATE ACTION PLAN UPDATE

CITY OF CORONA, CALIFORNIA

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Project No. COR1801

Funded by:

SCAG
INNOVATING FOR A BETTER TOMORROW

August 2018

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LIST OF ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
ADC	Alternative Daily Cover
BAU	Business-as-Usual
CAFE	Corporate Average Fuel Economy
CAP	Climate Action Plan
CARB	California Air Resources Board
CH_4	Methane
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
EO	Executive Order
GHG	Greenhouse Gas
GWP	Global Warming Potential
IFT	Inventory, Forecasting, and Target-Setting
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt-hour
LCFS	Low Carbon Fuel Standard
MT	Metric Tons
N/DN	Nitrification/denitrification
N_2O	Nitrous Oxide
RPS	Renewable Portfolio Standard
SCAG	Southern California Association of Governments
SCE	Southern California Edison
SEEC	Statewide Energy Efficiency Collaborative

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KEY FINDINGS

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

- The City of Corona 2016 greenhouse gas (GHG) emission was 1,073,517 metric tons carbon dioxide equivalent (MT CO_2e).
- On-road Transportation was the largest contributor of emissions, accounting for 46 percent (498,985 MT CO_2e) of total emissions.
- Energy-related emissions including thee Commercial/Industrial Energy sector and Residential Energy sector, which account for 31 percent and 16 percent of the total community emissions, respectively.
- Under the Business-as-Usual (BAU) forecast, emissions will be 1,100,068 MT CO_2e in 2020, 1,169,446 MT CO_2e in 2030, and 1,243,348 MT CO_2e in 2040. These emissions levels are 2.5 percent higher in 2020 than 2016, 8.9 percent higher in 2030 than 2016, and 15.8 percent higher than 2016 by 2040.
- Under the Adjusted BAU forecast, emissions will be 1,009,458 MT CO_2e in 2020, 939,423 MT CO_2e in 2030, and 862,279 MT CO_2e in 2040. These emissions levels are 6.0 percent lower in 2020 than 2016, 12.5 percent lower in 2030 than 2016, and 19.7 percent lower than 2016 by 2040.
- The City should choose a reduction target that is feasible and ambitious. The State recommends reducing GHG emissions to 1990 levels by 2020, which is equal to a 15 percent reduction below baseline (2008) levels. The City would achieve this target from an Adjusted BAU forecast by 2020 which includes statewide reductions in combination with continued implementation of the currently adopted Corona CAP.
- To continue reductions consistent with the State's interim emissions reduction goal of lowering emissions 40 percent below 1990 levels by 2030 and long-term goal of 80 percent below 1990 levels by 2050, the City would need to reduce emissions 49,045 MT CO_2e by 2030 and 268,694 MT CO_2e by 2040 from Adjusted BAU forecasts. These are equivalent to 49 percent and 66 percent reduction, respectively, from baseline (2008) levels.
- The CAP update will focus on developing reduction strategies toward achieving the 2030 and 2040 reduction goals.

INTRODUCTION

The Greenhouse Gas (GHG) Inventory, Forecasting, and Target-Setting (IFT) Report contains the first steps toward the City of Corona (City) identifying GHG reduction measures in a Climate Action Plan (CAP). The inventory describes historic energy use and GHG emissions and the forecasts describe projected future emissions in the City. The target-setting section describes GHG reduction recommendations that are consistent with State goals and may assist the City in establishing local GHG reduction targets. The inventory and recommended reduction targets will help the City in the next step of the CAP, which is to identify GHG reduction measures that are relevant, meaningful, and feasible.

Specifically, the IFT Report includes (key terms are described in Table 1):

- Historic GHG emissions in **community inventory** for 2016;
- Future GHG emissions for 2020, 2030 and 2040 under a **business-as-usual** forecast scenario and **adjusted business-as-usual** forecast scenario; and
- Recommended GHG **reduction targets** for 2020, 2030 and 2040.

Table 1. Key Terms in the Report[1]

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

Source: AEP White Paper: Forecasting Community-wide GHG Emissions and Setting Reduction Targets (AEP May 2012).

[1] A glossary of terms is also included as Appendix A.

GHG EMISSIONS INVENTORY

GHG emissions inventories are the foundation of planning for future reductions. Establishing an existing inventory of emissions helps to identify and categorize the major sources of emissions currently being produced. A **baseline year** was identified as the year of 2008 in the City's 2012 CAP. A baseline year is established as a starting point against which other inventories may be compared and targets may be set, and is generally the earliest year with a full emissions inventory. In this report, the year of 2016 is presented for the community inventory to show the major sources of emissions in the City and the City's progress towards reduction targets.

EMISSIONS REPORTING

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

Table 2. GHGs Analyzed in the Inventories

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

Source: IPCC Fifth Assessment Report, 2014.

Emissions Sectors

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

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

- **Energy** in the Community Inventory is further broken down into two sectors:
    - **Commercial/Industrial Energy** includes emissions from electricity and natural gas consumption in non-residential buildings and facilities (including outdoor lighting) in the City.
    - **Residential Energy** includes emissions from electricity and natural gas consumption in residential buildings in the City.
- **On-road Transportation** includes emissions from vehicle fuel use in trips wholly within the City (in-boundary) and trips that either originate or end in the City (cross-boundary). Emissions from in-boundary trips are fully accounted for in the inventory, whereas only half of the emissions from cross-boundary trips are accounted for. Trips that pass-through the City, such as on SR-91 or I-15, are not accounted for in the inventory because the City has little or no control of these emissions. As a result, this methodology reflects only trips or parts of trips within City borders that the City has the ability to affect.
- **Solid Waste** includes emissions from waste that is generated in the community and sent to landfills.
- **Water** includes emissions from the electricity used to source, treat, and deliver imported water in the community that is not accounted for in the community utility data.
- **Wastewater** includes emissions from treating wastewater generated in the community.
- **Off-road Sources** include emissions from operating equipment for construction, commercial, light industrial and agricultural activities; lawn and garden equipment; and recreational vehicles such as all-terrain vehicles.

Calculation Methodology

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

COMMUNITY EMISSIONS

The community inventory includes the GHG emissions that result from activities within City boundaries. This section presents the findings of the community inventory for the year of 2016, and more specific detail and findings on the energy sectors.

2016 Emissions Summary

As shown in Figure 1 and Table 3, the On-Road Transportation sector was the largest contributor to emissions in 2016 (46 percent) by producing 498,985 MT CO_2e. Commercial/Industrial energy is the second-largest contributor to emissions, adding 31 percent in 2016. The emissions from the Residential energy sector were 171,047 MT CO_2e in 2016, taking 16 percent of the total emissions. The Residential and Commercial/Industrial energy combined took 47 percent of the total emissions. Solid waste comprised 5 percent of the total (55,642 MT CO_2e). Water, Wastewater, and Off-road sources made up the remaining emissions. Water and Wastewater emissions comprised 2 percent of the total emissions, while Off-road sources comprise a very small percentage of overall emissions.

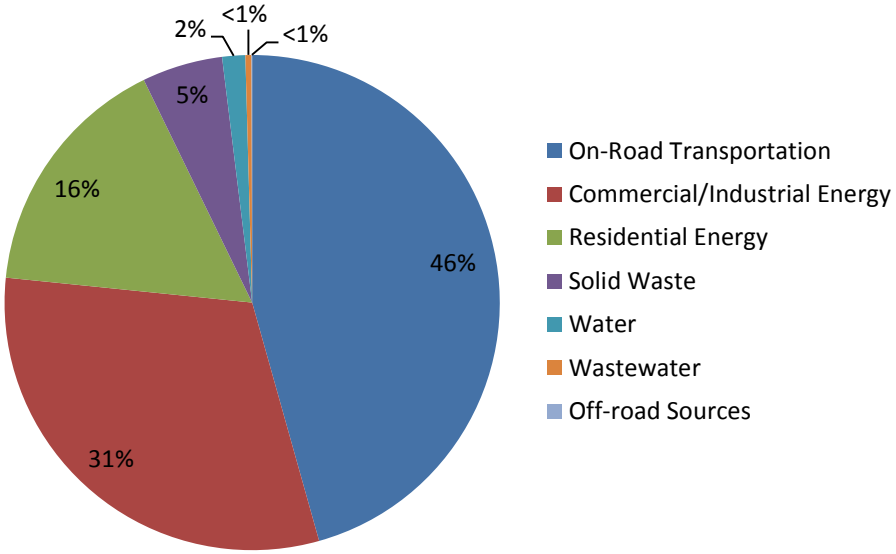


Figure 1. Community-Wide GHG Emissions by Sector for 2016

Table 3. Community-Wide GHG Emissions by Sector for 2016

Sector	2016 (MT CO_2e)	Percent of Total
On-Road Transportation	498,985	46
Commercial/Industrial Energy	327,311	31
Residential Energy	171,047	16
Solid Waste	55,642	5
Water	15,909	2
Wastewater	4,198	<1
Off-road Sources	426	<1
Total	**1,073,517**	**100**

Source: SEEC ClearPath Tool for the City of Corona, 2018.

Activity data can provide more insight into behavioral changes in the community, as these data are not affected by emission factors. Table 4 summarizes activity data for each sector and subsector. Wastewater and Off-road emissions use indicator data to attribute county-level emissions to the City and the indicator data are also shown in Table 4.

Table 4. Activity Data used in 2016 Community Inventory

Sector	Data
On-road Transportation	
Total Vehicle Miles Traveled	1,303,740,162
Commercial/Industrial Energy	
Electricity (kWh)	898,057,448
Natural Gas (therms)	21,015,979
Residential Energy	
Electricity (kWh)	367,883,307
Natural Gas (therms)	15,559,287
Solid Waste	
Landfilled (tons)	204,211
ADC (tons) [1]	147
Water and Wastewater	
Commercial/Industrial Water (million gallons)	3,501
Residential Water (million gallons)	6,515
Wastewater (City population)	165,366
Off-road sources[2] (Percent of Riverside County emissions attributed to the City)	
Lawn & Garden (Percent of Households)	6.6
Construction (Percent of Building permits)	1.3
Industrial (Percent of Manufacturing jobs)	11.5
Light Commercial (Percent of Other jobs)	9.9
Recreation (Population weighted by income)	9.3
Agriculture (Percent of Ag. Jobs)	4.7

Source: SEEC ClearPath Tool for the City of Corona, 2018.

[1] ADC is Alternative Daily Cover, which is green waste (grass, leaves, and branches) that is used to cover landfill emissions. They are reported separately by CalRecycle and therefore shown separately here.

[2] Off-road emissions are available at the county level through CARB's OFFROAD model. Emissions attributable to the City were derived using indicator data related to the Off-road source. For example, the percentage of households in the City compared to the county was used to attribute the same percentage of lawn & garden equipment emissions to the City. See Appendix B for more methodology details.

Demographic data also help provide perspective to changes in emissions over time. Table 5 shows the number of households, jobs, population, and service population (jobs + population) for 2016.

Table 5. Demographic Data for 2016

	2016
Households	46,979
Jobs	70,972
Population	165,366
Service Population (Population + Jobs)	236,338

Source: City of Corona General Plan Update, 2018.

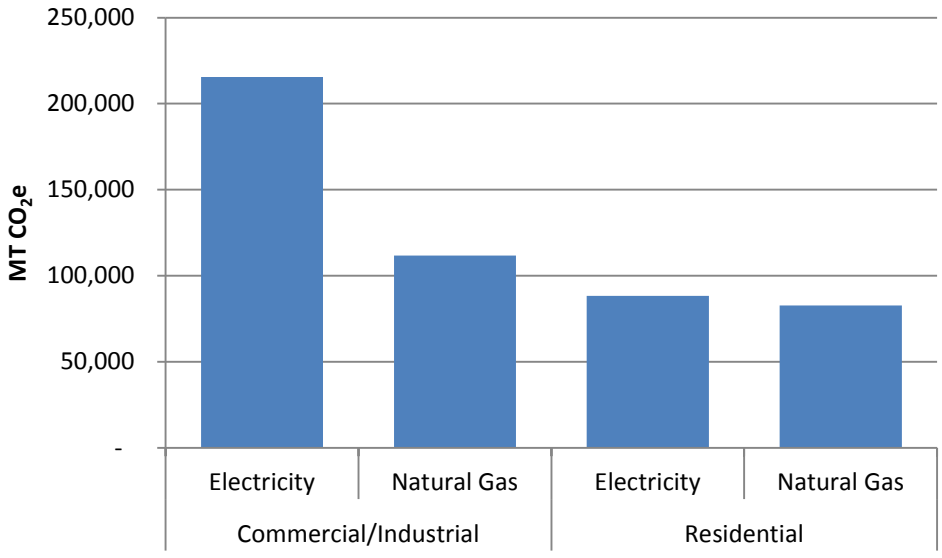
Energy

Energy is an area over which local agencies often have the greatest opportunities for affecting change. Energy use consists of electricity and natural gas. Emissions from Commercial/Industrial and Residential energy use account for 47 percent of the total community emissions in 2016. Table 6 shows the breakdown in activity (kWh or therms) and GHG emissions by sector and energy source. Figure 2 shows electricity and natural gas emissions for the Commercial/Industrial and Residential sectors.

Table 6. Activity Data and GHG Emissions of Energy in 2016

	2016	
Sector	**Activity (kWh or therms)**	**Emissions (MT CO_2e)**
Commercial/Industrial Energy		
Electricity	898,057,448	215,534
Natural Gas	21,015,979	111,777
Residential Energy		
Electricity	367,883,307	88,292
Natural Gas	15,559,287	82,754
Total (MT CO_2e)		**261,060**

Source: SEEC ClearPath Tool for the City of Corona, 2018.



Source: SEEC ClearPath Tool for the City of Corona, 2018

Figure 2. GHG Emissions for Community Electricity and Natural Gas, by Sector

INVENTORY FORECASTS

The City developed two forecasts for GHG emissions, a Business-as-Usual (BAU) and an Adjusted BAU scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that will reduce emissions in the future (that is, the policies in place in 2016 that would remain constant through 2040). The City developed GHG reduction measures in the 2012 CAP that constitute policies in place in 2016. These measures have been implemented and are reflected in the 2016 GHG emissions inventory, and will continue reducing emissions through 2020. Therefore, the BAU and ABAU forecasts included reductions from 2012 CAP GHG reduction measures. The Adjusted BAU scenario describes emissions based on projected growth *and* considers all policies that will achieve GHG reductions in the future. Policies, described in detail below, include State-adopted or approved legislation that will affect future emissions.

By evaluating the two scenarios, the City can determine the effect that existing policies may have on future emissions and assess what local measures can provide additional reductions. Three future years were forecasted for each scenario: 2020, 2030 and 2040. The 2020 and 2030 forecast years are consistent with the goals identified in Assembly Bill (AB) 32 and the corresponding Scoping Plan (CARB 2017), which identifies statewide GHG reduction targets by 2020 and 2030. The 2040 forecast year is consistent with the City's 2018 General Plan Update buildout year and will allow the City to develop long-term strategies to continue GHG reductions.

BUSINESS-AS-USUAL FORECAST

The BAU forecasts estimates future emissions using current (2016) consumption patterns and emission factors with the anticipated growth in the City. Anticipated growth is estimated using data from the City's 2018 General Plan Update (Table 7). The most relevant growth factors are used to project emissions by sector. For example, future Residential Energy emissions were developed using current energy use per household (from the 2016 inventory) and the anticipated number of households in 2040. Actual energy use is a function of several variables, not only the number of households; however, this approach is supported by current protocols and best practices within the State and provides a consistent approach to forecasting. Compound annual growth rates were developed using the growth projections from 2016 to 2040, as shown Table 7. In general, the City is expecting modest growth to 2040 as population, housing, jobs, and vehicle miles traveled are all expected to increase.

Community Business-as-Usual Forecast

The City's BAU emissions in 2020 are estimated to be 1,100,068 MT CO_2e, or a 2.5 percent increase from 2016 emissions. By 2030, emissions are estimated to increase 8.9 percent from the 2016 level to 1,169,446 MT CO_2e. By 2040, emissions are estimated to increase 15.8 percent from the 2016 level to 1,243,348 MT CO_2e (Table 8).

Table 7. Growth Factors for 2016 and 2040

Sector	Demographic Indicator	2016	2040	2016-2040 CAGR[1] (percent)
Residential Energy	Households	46,979	52,297	0.45
Commercial/ Industrial Energy	Jobs	70,972	84,395	0.72
N/A[2]	Population	165,366	184,086	0.45
Solid Waste, Water, Wastewater, and Off-road Sources	Service Population (Population + Jobs)	236,338	268,481	0.53
Transportation (Gasoline)	Vehicle Miles Traveled	1,169,706,600	1,336,928,145	0.56
Transportation (Diesel)	Vehicle Miles Traveled	150,934,699	177,578,872	0.68

Source: City of Corona General Plan Update, 2018
[1] Compound annual growth rate.
[2] Not Applicable. Population data are shown for informational purposes but are not used for forecasting any sector.

Table 8. Community BAU Forecast Emissions

Sector	2016 (MT CO_2e)	2020 (MT CO_2e)	Percent Change 2016-2020	2030 (MT CO_2e)	Percent Change 2016-2030	2040 (MT CO_2e)	Percent Change 2016-2040
On-Road Transportation	498,985	510,580	2.3	540,765	8.4	572,746	14.8
Commercial/ Industrial Energy	327,311	337,321	3.1	363,708	11.1	392,158	19.8
Residential Energy	171,046	174,266	1.9	182,584	6.7	191,299	11.8
Solid Waste	55,642	56,889	2.2	60,132	8.1	63,560	14.2
Water	15,909	16,266	2.2	17,193	8.1	18,173	14.2
Wastewater	4,198	4,293	2.3	4,537	8.1	4,796	14.2
Off-road Sources	426	453	6.3	527	23.7	616	44.6
Total	**1,073,519**	**1,100,068**	**2.5**	**1,169,446**	**8.9**	**1,243,348**	**15.8**

Source: SEEC ClearPath Tool for the City of Corona, 2018.
BAU = Business-as-Usual
MT CO_2e = metric tons carbon dioxide equivalent

Adjusted Business-as-Usual Forecast

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

Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS) was developed as a result of Executive Order S-1-07, which mandates that the carbon intensity of transportation fuels in California are lowered 10 percent by

2020. The State is currently implementing this standard, which is being phased in and will achieve full implementation in 2020. The LCFS target would be maintained beyond 2020.

Assembly Bill (AB) 1493 and Advanced Clean Cars

AB 1493 directed CARB to adopt GHG standards for motor vehicles through model year 2015 that would result in reductions in GHG emissions by up to 25 percent in 2030. In addition, the State's Advanced Clean Cars program includes additional components that will further reduce GHG emissions statewide, including more stringent fuel efficiency standards for model years 2017—2025 and support infrastructure for the commercialization of zero-emission vehicles. CARB anticipates additional GHG reductions of 3 percent by 2020, 27 percent by 2035, and 33 percent by 2050[1]. These are also known as "Pavley I" and "Pavley II" regulations.

California Building Code Title 24

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

Renewable Portfolio Standard

The Renewable Portfolio Standard (RPS) requires energy providers to derive 33 percent and 50 percent of their electricity from qualified renewable sources by 2020 and 2030, respectively. This is anticipated to lower emission factors (i.e., fewer GHG emissions per kilowatt-hour used) statewide. Therefore, reductions from RPS are taken for energy embedded in water, as well as commercial/industrial and residential electricity.

Community Adjusted Business-as-Usual Forecast

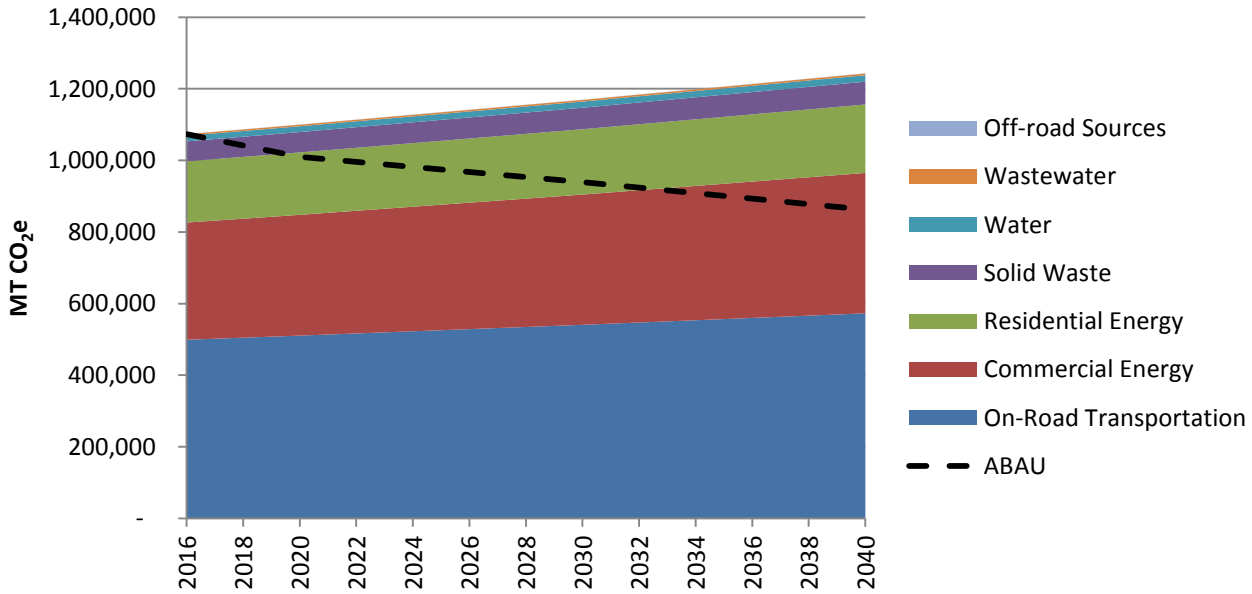
The City's Adjusted BAU emissions in 2020 are estimated to be 992,256 MT CO_2e in 2020, 920,479 MT CO_2e in 2030, and 842,317 MT CO_2e in 2040 (Table 9). This change represents a 6.1 percent reduction from 2016 by 2020, 12.9 percent reduction by 2030, and 20.3 percent reduction by 2040. Due to the stringent State vehicle standards, the emissions from the Transportation sector are expected to decrease significantly over time, while the proportion of emissions from Residential and Commercial/Industrial Energy will increase. Emissions from Solid Waste are expected to increase over time but account for less than 10 percent of total emissions. Figure 3 shows community BAU and Adjusted BAU forecasts.

[1] CARB Advanced Clean Cars Summary Sheet.

Table 9. Community Adjusted BAU Forecast Emissions

Sector	2016 (MT CO_2e)	2020 (MT CO_2e)	2020 Percent of Total	2030 (MT CO_2e)	2030 Percent of Total	2040 (MT CO_2e)	2040 Percent of Total
Transportation & Mobile Sources	499,411	463,254	46	406,189	43	356,244	41
Commercial/Industrial Energy	327,311	308,566	31	299,731	32	280,738	33
Residential Energy	171,047	162,292	16	156,221	17	146,591	17
Solid Waste	55,642	56,889	6	60,132	6	63,560	7
Water & Wastewater	20,108	18,457	2	17,150	2	15,146	2
Total	**1,073,519**	**1,009,458**	**-6.0**	**939,423**	**-12.5**	**842,317**	**-19.7**

Source: SEEC ClearPath Tool for the City of Corona, 2018.
BAU = Business-as-Usual
MT CO_2e = metric tons carbon dioxide equivalent



Source: SEEC ClearPath Tool for the City of Corona, 2018.

Figure 3. Community BAU and Adjusted BAU Forecasts

REDUCTION TARGETS

The State has set goals for reducing GHG emissions by 2020, 2030, and 2050 through AB 32, Executive Order (EO) S-3-05, and EO B-30-15, respectively. The State has also provided guidance to local jurisdictions as "essential partners" in achieving the State's goals by identifying a 2020 recommended reduction goal. That goal, stated in the AB 32 Scoping Plan, was for local governments to achieve a 15 percent reduction below 2005 to 2008 levels by 2020, which aligns with the State's goal of not exceeding 1990 emissions levels by 2020. The State's long-term target is to emit no more than 20 percent of 1990 levels by 2050 (or, a reduction of 80 percent below 1990 levels by 2050). The State has also provided an interim target, which is 40 percent below 1990 levels by 2030. It is clear that the issue of climate change will not end in 2030 and continued reduction goals should be implemented to keep the State on a path toward the 2050 goal. A straight-line projection from the 2030 to 2050 goals would result in a reduction goal of 66 percent below 2008 levels by 2040 midpoint.

Ultimately, the City will determine the level of reductions that it can and should achieve. The recommended targets provided below are guidance based on consistency with the State's goals.

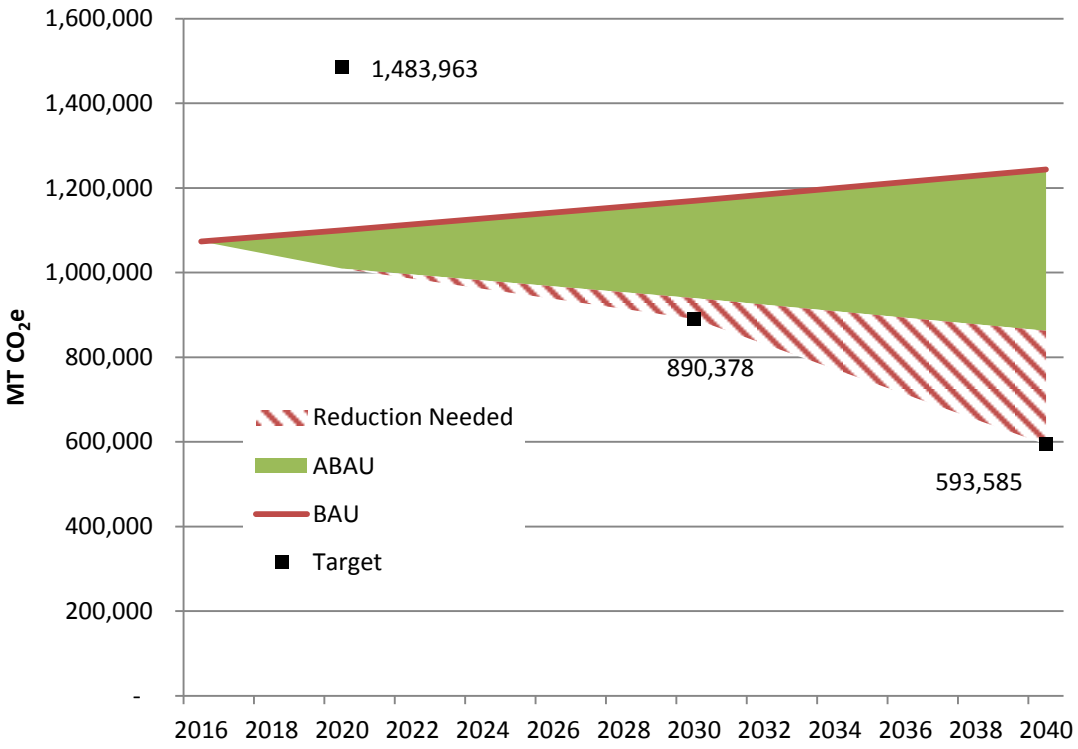
RECOMMENDED COMMUNITY TARGETS

In order to keep the City of Corona CAP in line with the State's reduction goals the following targets are recommended. In 2020, the City would meet the reduction target from an Adjusted BAU forecast. In 2030, the City would need to reduce 49,045 MT CO_2e emissions below the Adjusted BAU scenario to meet the reduction target. In 2040, the City would need to reduce 268,694 MT CO_2e emissions below the Adjusted BAU scenario to meet the State-Aligned target (Table 10 and Figure 4).

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

Sector	2008[1]	2016	2020	2030	2040
BAU Emissions (MT CO_2e)	1,745,839	1,073,517	1,100,068	1,169,446	1,243,348
Adjusted BAU Emissions (MT CO_2e)	1,745,839	1,073,517	1,009,458	939,423	862,279
State-Aligned Target (Percent change from 1990)			0	-40	-60
State-Aligned Target (Percent change from 2008)[2]			-15	-49	-66
State-Aligned Emissions Goal (MT CO_2e)			1,483,963	890,378	593,585
Reductions from Adjusted BAU needed to meet the State-Aligned Target (MT CO_2e)			-	49,045	268,694

Source: SEEC ClearPath Tool for the City of Corona, 2018.
Note: [1] Baseline (2008) emissions are from the City's 2012 Climate Action Plan GHG inventory.
[2] Reduction targets calculation details are provided in Appendix B.
BAU = Business-as-Usual
GHG = greenhouse gas
MT CO_2e = metric tons carbon dioxide equivalent



Source: SEEC ClearPath Tool for the City of Corona, 2018.

Figure 4. Community Emissions Inventory, Forecasts, and Targets

CONCLUSIONS AND NEXT STEPS

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

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

REFERENCES

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APPENDIX A

GLOSSARY OF TERMS

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

Baseline Year: The inventory year used for setting targets and comparing future inventories against.

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

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

Community Inventory: GHG emissions that result from the activities by residents and businesses in the city. An inventory reports emissions that occur over a single calendar year.

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

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

Metric Ton (MT): Common international measurement for the quantity of greenhouse gas emissions. A metric ton is equal to 2205 lbs. or 1.1 short tons.

Reduction targets: GHG emissions levels not to be exceeded by a specific date. Reduction targets are often informed by state recommendations and different targets may be established for different years.

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

State-Aligned targets: The State's goals for reducing GHG emissions by 2020, 2030, and 2050 through AB 32, Executive Order (EO) S-3-05, and EO B-30-15, respectively.

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APPENDIX B

METHODOLOGY

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

PROTOCOLS

The GHG inventory was developed using tools and guidance documents developed or supported by government agencies such as Environmental Protection Agency. Calculation protocols have been developed to ensure consistency among community inventories. Specifically, the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Community Protocol)[1] and the California Supplement[2] were used for the community inventory. These protocols often have multiple calculation methods for a single emission source depending on the data available. There are two broad approaches for calculating emissions: "bottom-up" and "top-down". A bottom-up approach relies on end-use data, such as the city-level electricity usage. A top-down approach relies on aggregated data that is allocated to the city based on population, employment, or other relevant indicator. Bottom-up calculations were performed whenever possible to provide the most detailed and likely accurate picture of emissions within a jurisdiction; however, when detailed data were not available, other appropriate methods were used and are described in this appendix. Data were also calculated and managed to best fit the GHG inventory and planning software tool used for this project, called ClearPath. ClearPath was developed by the Statewide Energy Efficiency Collaborative (SEEC) which is a partnership between several statewide agencies, utilities, and non-profits to assist cities and counties in climate mitigation planning. ClearPath is further described at californiaseec.org. In addition, a User's Guide has been developed as part of this project to help the City to maintain the data and provide for consistent reporting of emissions over time.

GLOBAL WARMING POTENTIAL FACTORS

The inventory includes the three GHGs most relevant to community emissions: CO_2, CH_4, and N_2O since they are most relevant to human activities[3]. Each GHG differs in its ability to absorb heat in the atmosphere based on their molecular properties and expected lifetime in the atmosphere, and it is useful to describe emissions in one unit of measurement. That unit of measurement is a CO_2-equivalent, or CO_2e, and Global Warming Potential (GWP) factors are used to standardize emissions from various GHGs. GWP factors, developed by the Intergovernmental Panel on Climate Change

1 ICLEI 2012. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions version 1.0.

2 Association of Environmental Professionals. 2013. The California Supplement to the United States Community-Wide Greenhouse Gas (GHG) Emissions Protocol.

3 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. 2014.

(IPCC), represent the heat-trapping ability of each GHG relative to that of CO_2. For example, the GWP factor of CH_4 is 28 because one metric ton (MT) of CH_4 has 28 times the heat-trapping capacity as one MT CO_2 (over a 100-year period). IPCC periodically updates the GWP factors of GHGs based on new science and updated background mixing ratios of CO_2. CO_2 always has a GWP factor of 1 and the other GHGs are calculated relative to CO_2. The GWP factors are shown in Table B-1. GWP factors are unitless. Emissions in the inventory are reported in units of CO_2e.

Table B-1. Global Warming Potentials

	CO_2	CH_4	N_2O
GWP	1	28	265

Source: IPCC Fifth Assessment Report, 2014.

ACTIVITY DATA

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

Table. B-2. Activity Data Sources

Data	Data Source	Notes
Community Electricity	Southern California Edison (SCE), City of Corona Department of Water and Energy	City-wide data
Community Natural Gas	Southern California Gas (SCG)	City-wide data
Community Water	City of Corona Department of Water and Energy	City-wide data
Vehicle Miles Traveled	City of Corona General Plan Update	Origin-destination approach, described below
Demographic Data	City of Corona General Plan Update	City-wide data
Off-road Emissions	OFFROAD Model	County-level data
Community Solid Waste	CalRecycle	City-wide data

Origin-Destination VMT

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

- All of the emissions where the trip begins and ends within the City.

- Half of the emissions where one endpoint is in the City, for example either the origin or destination of the trip.

- None of the emissions that are "pass-through"; that is, a trip passes through the City but does not begin or end within its boundary.

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

Community Activity Data

Community activity data are shown in Table B-3, except for Off-road emissions, which are shown as the City's proportion of countywide emissions. Total countywide Off-road emissions by GHG are shown in Table B-4.

Table B-3. Community Inventory Activity Data

Sector	2016
On-road Transportation	
Total Vehicle Miles Traveled	1,303,740,162
Commercial/Industrial Energy	
Electricity (kWh)	898,057,448
Natural Gas (therms)	21,015,979
Residential Energy	
Electricity (kWh)	367,883,307
Natural Gas (therms)	15,559,287
Solid Waste	
Landfilled (tons)	204,211
ADC (tons)[1]	147
Water and Wastewater	
Commercial/Industrial Water (million gallons)	3,501
Residential Water (million gallons)	6,515
Wastewater (City population)	165,366
Off-road sources[2] (Percent of Riverside County emissions attributed to the City)	
Lawn & Garden (Percent of Households)	6.6
Construction (Percent of Building permits)	1.3
Industrial (Percent of Manufacturing jobs)	11.5
Light Commercial (Percent of Other jobs)	9.9
Recreation (Population weighted by income)	9.3
Agriculture (Percent of Agriculture Jobs)	4.7

[1] ADC is Alternative Daily Cover, which is green waste (grass, leaves, and branches) that is used to cover landfill emissions. They are reported separately by CalRecycle and therefore shown separately here.

[2] Off-road emissions are available at the county level through CARB's OFFROAD model. Emissions attributable to the City were derived using indicator data related to the Off-road source. For example, the percentage of households in the City compared to the county was used to attribute the same percentage of lawn & garden equipment emissions to the City. See below for more methodology details.

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

Off-road Class	GHG Type	2016 (MT CO_2e /year)
Agricultural Equipment	CO_2	1,588
	CH_4	0.157
	N_2O	0.019
Construction and Mining Equipment	CO_2	7,336
	CH_4	0.669
	N_2O	0.040
Industrial Equipment	CO_2	719
	CH_4	0.245
	N_2O	0.037
Lawn and Garden Equipment	CO_2	755
	CH_4	1.107
	N_2O	0.486
Light Commercial Equipment	CO_2	500
	CH_4	0.137
	N_2O	0.081
Recreational Equipment	CO_2	425
	CH_4	1.804
	N_2O	0.640

Source: CARB 2007. *OFFROAD model*.
GHG = Greenhouse Gas
MT CO_2e = metric tons carbon dioxide equivalent

EMISSION FACTORS

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

Electricity

California utilities report the average CO_2 content per output of electricity on an intermittent basis. The CO_2-intensity of electricity varies by utility and year, due to changes in supply, renewable generation, and other factors. The community operations use electricity provided by Southern California Edison (SCE) except for embedded energy in water, which travels throughout the state and therefore utilizes electricity from multiple utilities (and are shown under the Water Sector).

Southern California Edison

SCE reported CO_2 factors for 2016 through the Corporate Responsibility and Sustainability Report[1], as shown in Table B-5.

[1] Southern California Edison. 2016 Corporate Responsibility and Sustainability Report. Website: https://www.edison.com/content/dam/eix/documents/investors/corporate_responsibility/2016-eix-corporate-responsibility-and-sustainability-report.pdf.

Table B-5. Southern California Edison Emission Factor

Year	CO_2e (lbs/MWh)
2016	529.11

Source: Southern California Edison 2016 Corporate Responsibility and Sustainability Report.

Natural Gas Combustion

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

Table B-6. Natural Gas Emission Factors

	CO_2	CH_4	N_2O
kg /MMBtu	53.02	0.005	0.0001

Source: ICLEI 2012. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions version 1.0.

Transportation and Mobile Sources

EMFAC Model

CO_2 emission factors for transportation and mobile sources are calculated using the State-developed Emissions Factor (EMFAC) model, version 2017, which can be accessed at http://www.arb.ca.gov/emfac/. Emissions are available at the county level and emission factors were developed and applied to VMT for 2016. Data are aggregated as annual emissions for all vehicle model years and speeds, but separated by vehicle category. Vehicle categories include passenger vehicles, light-duty trucks, and heavy-duty trucks. These categorizations are used to develop an emissions factor for gasoline and diesel vehicles. Emission factors were developed using total CO_2 exhaust, which includes emissions from vehicles in motion, idling, and ignition. While emissions from idling and ignitions are not directly related to mileage, they were included so that reductions from measures that may decrease idling could be accounted for in future inventories.

On-Road Transportation

Emissions were converted to emission factors as grams of CO_2 per mile for gasoline and diesel vehicle using EMFAC and a 3-step process:

1. Calculate the vehicle-class average fuel efficiency (miles/gallon) using EMFAC vehicle miles traveled and gallons of fuel consumed for Riverside County;

2. Calculate the vehicle-class average CO_2 emission factor using EMFAC CO_2 emissions[1] and gallons of fuel consumed for Riverside County;

[1] The emissions factors take in to account existing policies (Pavley and Low Carbon Fuel Standard).

3. Calculate the average grams CO_2/mile traveled factor weighted by vehicle class miles traveled for Riverside County.

CH_4 and N_2O emission factors for gasoline and diesel vehicle were derived from the Community Protocol (Table B-7).

Table B-7. Fleet-Average Emission Factors

Year	Vehicle Type	Gasoline On-Road Average Factor (grams/mile)			Diesel On-Road Average Factor (grams/mile)		
		CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
2016	Passenger Vehicle	342.194	0.028	0.029	248.633	0.001	0.001
	Light Truck	439.612	0.028	0.029	355.279	0.001	0.001
	Heavy Truck	936.062	0.028	0.029	579.563	0.001	0.001

Source: CARB 2017. EMFAC2017 Web Database.

Off-Road

Off-road emissions include emissions from agriculture, construction, industrial, lawn and garden, light commercial, and recreational equipment. Annual emissions of CO_2, CH_4, and N_2O are available at the county level from the State's OFFROAD model. To estimate values for the City, relevant indicator data are used to estimate the proportion of county level emissions attributable to the City[1]. Table B-8 lists the indicator data used to estimate the City's portion of emissions for each category and Table B-9 shows City-specific data. City and county level indicator data were obtained from City's General Plan Update and Southern California Association of Governments (SCAG) Local Profile for the City of Corona and the County of Riverside.

Table B-8. Off-road Emissions Indicators

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

Source: SCAG 2017. Profile of the City of Corona and Profile of Riverside County.

[1] For example, the indicator for Off-road emissions from construction equipment is building permits. The City issued 66 building permits in 2016, and 5,136 building permits were issued County-wide. As such, City building permits account for 1.3 percent of the County's total building permits. It is assumed that the City's proportion of building permits is equal to the City's proportion of the County's Off-road emissions. Based on this assumption, 1.3 of the County's 2016 Off-road CO_2 emissions are attributable to the City. Similar methodology applies to the remaining year and Off-road emissions sources.

Table B-9. Off-road Emissions Indicator Data

		Ag. Jobs	Building Permits	Mfg. Jobs	Households	Other Jobs[1]	Population	Income ($)
2016	City	500	66	11,862	46,979	59,005	165,366	76,065
	County	10,700	5,136	103,633	713,205	595,607	2,347828	57,367
	Percent of County	4.7	1.3	11.5	6.6	9.9	9.3	

Source: SCAG 2017. Profile of the City of Corona and Profile of Riverside County.
Note: Some percentages may appear off due to rounding. Ag. = Agriculture. Mfg. = Manufacturing.
[1] Other indicates non-manufacturing and non-agricultural.

Water

Emissions from water are indirect. Water requires energy to move from its source to final treatment and the energy for most of these processes is not captured in local utility data (i.e., the portion that is used in a home or business and therefore contained in the owner's utility bill). This portion is termed the "embedded energy" in water and particularly for Southern California, the energy embedded in water is high and should be accounted for in a community inventory. The California Energy Commission (CEC) developed a report that estimates the energy required to supply, convey, distribute, and treat water in northern and southern California.[1] Local groundwater is less energy-intensive because it does not require the supply and conveyance energy. Outdoor water infiltrates into the ground and therefore does not have the wastewater energy treatment component. Therefore, the emission factors are adjusted to account for the proportion of local groundwater and outdoor water. Approximately 56 percent of the water use in the City comes from local groundwater. The amount of water used for indoor or outdoor use was not available at the City level. It is assumed that 50 percent of water is for outdoor use. Therefore, the embedded energy in a million gallon (MG) of water in the City is estimated in Table B-10 using the CEC report and estimated local groundwater and indoor versus outdoor water usage assumption.

Table B-10. Energy Embedded in Water

	Indoor (kWh/MG)	Outdoor (kWh/MG)
Supply and Conveyance	9,727	9,727
Treatment	111	111
Distribution	1,272	1,272
Wastewater Treatment	1,911	--
Total	13,022	11,111
Indoor/Outdoor Percentage	50	50
Corona Factor	**6,618.38[1]**	

Source: California Energy Commission. 2006. *Refining Estimates for Water-Related Energy Use in California*. December.
[1] Corona factor for conventional water is weighed by local groundwater and indoor versus outdoor water usage breakdown.

[1] California Energy Commission. 2006. Refining Estimates for Water Related Energy Use in California.December.

Statewide Average Electricity

For energy embedded in water, a statewide average emission factor is applied because water in the City is supplied from various regions in the State. These emissions factors are listed in Table B-11.

Table B-11. California Statewide Electricity Emission Factors

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

Source: US Environmental Protection Agency. Emissions & Generation Resource Integrated Database (eGRID) 2016. Website: https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid.

Wastewater

The emissions for wastewater include the CH_4 and N_2O emissions from processing which consist of three sources: **stationary**, **process**, and **fugitive** emissions.

Stationary emissions are derived from combustion of digester gas at a centralized treatment facility. Detailed information regarding the amount of digester gas produces was not available, so an alternative method using City population information was used. Default factors from the Community Protocol were applied to estimate CH_4 and N_2O emissions for stationary emissions. Although CO_2 emissions are also produced, the fuel source is considered a biofuel, and the resulting CO_2 emissions are considered "biogenic" and are not reported[1].

Process emissions include N_2O emissions as a result of nitrification/denitrification (N/DN) processes at the treatment facility. All wastewater facilities have emissions from N/DN—some facilities have a formal N/DN process, which would result in greater N/DN emissions, but for the City, N/DN emissions are solely a result of natural processes. The recommended approach to estimating these emissions is through the population served and default factors listed in the Community Protocol. In an advanced, centralized treatment facility, stationary and process emissions are relatively small compared to fugitive emissions. The Community Protocol, and likewise ClearPath, recommends multiplying the population-derived emissions by 1.25 to account for commercial and industrial discharges to the system.

Fugitive emissions occur from inflow (septic systems) and effluent discharge. Daily nitrogen load was not available; therefore, service population was used to estimate process N_2O from effluent discharge to rivers and estuaries.

Solid Waste

Emissions from solid waste are primarily in the form of fugitive emissions of methane from decomposition, and only organic waste may decompose. Emission factors are derived from the Community Protocol, based on the type of waste disposed. The State conducts a Waste

[1] Emissions from digester gas combustion are automatically calculated in ClearPath when population is entered.

Characterization Study (Study) every 4 to 6 years to determine the amount of waste attributable to each waste type. The Study is conducted at the State level by economic sector; therefore, community-level characterizations are not available. For the community inventory, the overall composition of California's disposed waste stream was used to convert total tons into waste types. In addition to community-generated waste, some diverted green waste is used as landfill cover rather than importing landfill cover from other regions. This green waste is known as alternative daily cover (ADC) and is reported by CalRecycle for each community. The ADC characterization was determined through communication with the developers of ClearPath and does not vary by year or community. The emission factor to determine methane generation varies if the landfill operates a methane flare or generates electricity from methane capture. The Community Protocol recommends using an average factor of 75 percent recovery from landfill gas, although some landfills have much higher gas recovery systems, and other landfills do not have any. Carbon dioxide generated by decomposition of waste in landfills is not considered anthropogenic because it would be produced through the natural decomposition process regardless of its disposition in the landfill. Nitrous oxide is not a by-product of decomposition and therefore no fugitive emissions of N_2O are anticipated from this source. The waste characterizations and emission factors used to estimate emissions from solid waste are provided in Table B-12. The "Category in the 2014 Study" details which Study categories make up the ClearPath Category.

Table B-12. Waste Characterization and Emission Factors for Solid Waste

ClearPath Category	Category in 2014 Studies	Alternative Daily Cover[1] (percent)	2014 Study[2] (percent)	Emission Factor
Newspaper	Newspaper	0	1.2	0.043
Office Paper	White/Colored Ledger Paper + Other Office Paper + Other Miscellaneous Paper	0	4.6	0.203
Cardboard	Uncoated Corrugated Cardboard + Paper Bags	0	3.3	0.120
Magazine/Third Class Mail	Magazines and Catalogs + Remainder/ Composite Paper	0	8.1	0.049
Food Scraps	Food	0	18.1	0.078
Grass	Leaves and Grass	30	1.9	0.038
Leaves	Leaves and Grass	40	1.9	0.013
Lumber	Branches and Stumps + Prunings and Trimmings	0	11.9	0.062
Branches	Lumber	30	4.8	0.062

Source: CalRecycle 2015. 2014 Disposal-Facility-Based Characterization of Solid Waste in California.
[1] Breakdown from ClearPath Developers via e-mail dated June 19, 2014.
[2] 2016 Waste Characterization Study for California, Overall Waste Stream. Totals do not sum to 100 percent because not all waste is organic.

FORECASTS

The forecasts are an estimate of what emissions in the City may be in 2020, 2030 and 2040. The forecasts were developed using standard methodologies under two scenarios: Business-as-Usual (BAU) and Adjusted BAU.

Business-as-Usual Forecasts

The BAU scenario uses current (2016) consumption patterns and predicted growth in the City in the absence of state and federal legislation that would reduce future emissions. The growth assumptions are based on City of Corona General Plan Update estimates[1] and are applied to emissions sectors based on their relevance. For example, future Residential Energy emissions were developed using current energy use per household (from the 2016 inventory) and the anticipated number of households in the future. Table B-13 shows the growth factors used to project emissions in the City.

Table B-13. Emissions Sectors and Demographic Growth Indicators

Sector	Demographic Indicator
Residential Energy	Households
Commercial/ Industrial Energy	Jobs
Solid Waste, Water, Wastewater, Off-road Sources	Service Population (Population + Jobs)
Transportation	VMT

Source: AEP White Paper: California Community-Wide GHG Baseline Inventory Protocol (June 2011)

Adjusted Business-as-Usual Forecasts

The Adjusted BAU scenario also uses growth estimates for the City, but accounts for legislation that will reduce emissions in the future, regardless of City actions. The legislation is detailed in the IFT Report under Adjusted Business-as-Usual Forecasts section and summarized in Table B-14.

Low Carbon Fuel Standard, AB 1493, and Advanced Clean Cars

Changes in on-road emissions in Riverside County were modeled using EMFAC2017. Additional modeling was conducted to estimate the change in emissions due to the State's Advanced Clean Cars program, which includes additional components that will further reduce GHG emissions statewide, including more stringent fuel efficiency standards for model years 2017—2025 and support infrastructure for the commercialization of zero-emission vehicles. The rate of reductions from on-road transportation measures through 2020 was assumed to be 2.602 percent per year for gasoline and 1.908 percent per year for diesel. After 2020, the rate of reductions was assumed to be 1.412 percent per year for gasoline and 1.695 percent per year for diesel.

[1] City of Corona General Plan Update. 2018.

Table B-14. Legislation Applied to Adjusted BAU Forecasts

Legislation	Description	Emissions Sector Affected
Low Carbon Fuel Standard	Reduce carbon intensity of transportation fuels 10 percent by 2020 and maintain the target beyond 2020.	On-road Transportation
AB 1493 and Advanced Clean Cars	Implement GHG standards for passenger vehicles, implement zero-emission vehicle program, support clean fuels outlet regulation.	On-road Transportation
California Building Code Title 24	Improved energy efficiency standards for new residential and non-residential construction.	Residential Energy, Commercial/Industrial Energy
Renewable Portfolio Standard	Provide 33 percent and 50 percent of electricity from renewable sources by 2020 and 2030, respectively.	Water Energy, Residential Energy, Commercial/Industrial Energy

Source: California Air Resources Board Low Carbon Fuel Standard Webpage https://www.arb.ca.gov/fuels/lcfs/lcfs.htm
California Air Resources Board Clean Car Standards (AB 1493) Webpage: https://www.arb.ca.gov/cc/ccms/ccms.htm
California Air Resources Board California Green Building Standards Code (CALGreen) Webpage: https://www.arb.ca.gov/research/indoor/greenbuildings.htm
California Air Resources Board Renewable Portfolio Standard Webpage: https://www.arb.ca.gov/energy/rps/rps.htm
All webpages accessed on August 13, 2018

California Building Code Title 24

Title 24 updates will raise the minimum energy efficiency standards for new buildings, thereby decreasing the expected energy consumption of future development in the City. Under the adjusted BAU scenario, it was assumed that the 2016 Title 24 standards that went into effect in 2017 will make new residential and commercial/industrial buildings more efficient than they would be under the 2013 Title 24 standards for new residential and commercial/industrial buildings. The energy savings were estimated using analyses developed by the CEC and applied to the expected new development in the City from 2016 to 2040. The rate of reductions was applied to the City's 2016 energy use (kWh or therms) per household (for Residential energy) or per job (for Commercial/Industrial energy). Savings were applied to new development anticipated in the City. Detailed energy savings assumptions are below.

Residential

Residential electricity is estimated to be 13.3 percent lower under the new standards.[1] This percentage savings is relative to heating, cooling, lighting and water heating only and do not include other appliances, outdoor lighting that is not attached to buildings, plug loads, or other energy uses. Electricity consumption due to heating, cooling, lighting, and water heating accounts for 34 percent of total household electricity use.[2] Therefore, the percentage of total residential electricity that will be reduced as a result of the 2016 Title 24 standards is 4.5 percent.

Residential natural gas savings under the new standards are estimated to be 25.1 percent. Again, this percentage savings pertains only to the energy sources affected by Title 24 Standards. Natural gas consumption due to space and water heating accounts for 86 percent of total household natural

1 CEC Impact Analysis, California's 2016 Building Energy Efficiency Standards, June 2015.
2 CEC 2009 California Residential Appliance Saturation Appliance Study, October 2010. CEC-200-2010-004.

gas use.[1] Therefore, the percentage of total residential natural gas that will be reduced as a result of the 2016 Title 24 standards is 21.6 percent.

Commercial/Industrial

Commercial/Industrial Electricity savings were estimated to be 4.6 percent lower under the new standards. Title 24-related measures would impact 77.2 percent of total electricity use in commercial buildings[2]; therefore, 3.6 percent reduction in electricity consumption may be expected in new commercial/industrial development.

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

Renewable Portfolio Standard

The Renewable Portfolio Standard requires energy providers to derive 33 percent and 50 percent of their electricity from qualified renewable sources by 2020 and 2030, respectively. The level of implementation varies by utility; however, ICLEI estimates that SCE's level of implementation is 3.4 percent per year before 2020, compounded annually. It is assumed that between 2020 and 2030, the level of implementation is 1.7 percent. The reduction is taken for electricity within SCE's territory as well as the delivery and treatment of water[3].

TARGET SETTING

The State-Aligned targets are provided to assist the City in determining appropriate emission reduction goals. Recommended targets are based on existing California climate change legislation and State guidance relevant to establishing a GHG reduction target. While State goals are based on a 1990 baseline year, the City's baseline year is 2008. Therefore, the reduction targets are expressed as a percent reduction below 2008 levels. Targets are recommended for 2020 to align with AB 32, 2030 to align with EO B-30-15, and 2040 to align with the City's General Plan Update buildout year. Planning beyond 2040 is considered speculative, as legislation and technology may change significantly before 2050. While it is important for continued reductions well beyond 2040, no local 2050 targets are recommended at this time.

Table B-15 provides a summary of the State's goals and the State's guidance to local governments regarding GHG reduction targets. This guidance applies to community-wide emissions reductions efforts.

1 CEC 2009 California Residential Appliance Saturation Appliance Study, October 2010. CEC-200-2010-004.
2 CEC 2006. California Commercial End-Use Survey. March 2006. CEC-400-2006-005.
3 SEEC ClearPath California Reference Sheet – Default Carbon Intensity Factors

Table B-15. Summary of State Reduction Targets and Guidance on Local Government Targets Aligned with State Targets

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

Source: California Air Resources Board: AB 32 Scoping Plan Update (2013), and California's 2017 Climate Change Scoping Plan (2017)
Office of Governor Edmund G. Brown Jr., Executive Order B-30-15 (2015)

Table B-16 demonstrates how the recommendations for local targets that do not have a 1990 emissions inventory were derived and how they align with State targets.

Table B-16. Comparison of 1990 Baseline Targets vs. 2008 Baseline Targets

Target Year	Percent below 1990 Emission Levels	Percent below 2008 Emission Levels
2020	**0.0**	**15.0**
2021	4.0	18.4
2022	8.0	21.8
2023	12.0	25.2
2024	16.0	28.6
2025	20.0	32.0
2026	24.0	35.4
2027	28.0	38.8
2028	32.0	42.2
2029	36.0	45.6
2030	**40.0**	**49.0**
2031	42.0	50.7
2032	44.0	52.4
2033	46.0	54.1
2034	48.0	55.8
2035	50.0	57.5
2036	52.0	59.2
2037	54.0	60.9
2038	56.0	62.6
2039	58.0	64.3
2040	**60.0**	**66.0**

Source: LSA 2018

APPENDIX B

SUPPORTING DATA

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APPENDIX B SUPPORTING DATA

This appendix contains input and output data from the ClearPath Tool for the City of Corona's greenhouse gas (GHG) emissions inventory and forecasts. ClearPath Tool was developed by the Statewide Energy Efficiency Collaborative (SEEC) which is a partnership between several statewide agencies, utilities, and non-profits to assist cities and counties in climate mitigation planning. The ClearPath Tool is an all-in-one suite of online tool to help local agencies complete government operations and community-wide greenhouse gas inventories, forecasts and climate action plans. The tools are offered at no-cost to California local governments through the SEEC partnership.

The following tables are provided in this appendix:

- Factor Sets
- Community Inventory Input (Excluding Off-Road Sector)
- Community Business-As-Usual Forecast Input
- Community Adjusted Business-As-Usual Forecast Input
- Community Inventories, Business-As-Usual Forecast, and Adjusted Business-As-Usual Forecast Output

Grid Electricity Factor Sets Inputs

SCE Electricity

Year	GHG	SEEC Entry Name	Units	Factor	Source
2016	CO2e	SCE_2016	MT CO2e/MWh	0.24	SCE 2016 Corporate Responsibility & Sustainability Report
2016	CO2e	SCE_2016	lbs CO2e/MWh	529.11	SCE 2016 Corporate Responsibility & Sustainability Report

Statewide Electricity (For Water-related Energy)

Year	GHG	SEEC Entry Name	Units	Factor	Source	ClearPath FS Name	Notes
2016	CO2		lbs CO2/MWh	527.9	EPA eGRID 2016 data summary table	CA_2013_2009proxy	
2016	CH4	CA_2016	lbs CH4/MWh	0.033	WECC California total output emission rates	CA_2013_2009proxy	
2016	N2O		lbs N2O/MWh	0.004	https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid	CA_2013_2009proxy	

Waste Characterization Factor Sets Inputs

	Alternative Daily Cover (ADC)	Landfilled Solid Waste	
SEEC Entry Name	ADC_2016	CalRecycle_2016	Corresponding Name in California Integrated Waste Management Board Report
Year	2016	2016	
Unit	%	%	
Mixed MSW	0	0	All other paper
Newspaper	0	1.2	Newspaper
Office Paper	0	4.6	White/Colored Ledger Paper + Other Office Paper + Other Miscellaneous Paper
Cardboard	0	3.3	Uncoated Corrugated Cardboard + Paper Bags
Magazine/Third Class Mail	0	8.1	Magazines and Catalogs + Remainder/Composite Paper
Food Scraps	0	18.1	Food
Grass	30	1.9	Leaves and Grass (Half)
Leaves	40	1.9	Leaves and Grass (Half)
Branches	30	4.8	Branches and Stumps + Prunings and Trimmings
Lumber	0	11.9	Lumber

Transportation Factor Sets Inputs

SEEC Entry Name	FleetAverage_2016				
Year	2016				
	MPG	On Road Average Factor (g/mile)			Percentage
		CO2	CH4	N2O	
Gasonline Passenger Vehicle	27.68572889	342.1941835	0.028	0.029	68.27%
Gasonline Light Truck	21.55059521	439.6117741	0.028	0.029	29.43%
Gasoline Heavy Truck	10.12100817	936.0624197	0.028	0.029	2.30%
Diesel Passenger Vehicle	45.12851448	248.6331411	0.001	0.001	15.02%
Diesel Light Truck	31.5821063	355.2785305	0.001	0.001	1.86%
Diesel Heavy Truck	19.36018961	579.5627283	0.001	0.001	83.12%
Source	EMFAC2017	EMFAC2017	Community Protocol Appendix D Table TR.1.4		

Note: EMFAC Vehicle Categories: Passenger Vehicle = LDA, Light Truck = LDT1+LDT2, Heavy Truck = LHD1+LHD2

	2016	**2040**
Gasoline	0.89719304	0.846626545
Diesel	0.115770537	0.112454052

Note: Total percentage is less than 100% because of electrical vehicles.

Unit Conversions	
lb/MT	2204.623
therm/MMBTU	0.10000040
kg/MT	0.001

Conversions for Water to Energy (For Inventory Water Sector)

	Indoor	Outdoor	Units
Supply and Convey	9,727	9,727	kWh/MG
Treatment	111	111	kWh/MG
Distribution	1,272	1,272	kWh/MG
Wastewater Treatment	1,911	0	kWh/MG
Total (Adjusted by Water Source)	7,574	5,663	kWh/MG
Conversion factor for Corona	**6618.38**		kWh/MG

Notes:

Conversion from MG to kWh uses CEC 2006 Refining Estimates for Water-Related Energy Use in California for Southern California.
Approximately 44% of Corona's water was imported from Metropolitan Water District of Southern California (MWD) through Western Municipal Water District (WMWD) and 56% came from local groundwater sources.
Assume no Supply and Convey energy consumption for local groundwater sources.
Adjusted to account for indoor vs outdoor water use, assume 50% indoor and 50% outdoor.

Community Inventory Input

Year	Variable	SEEC Entry Name	Corona	Riverside County	Data Source
2016	Population	Multiple Entries	164,659	2,347,828	SCAG 2017 Local Profile
2017	Population		165,366		GP Update
2040	Population	NA (For Forecast Growth Rate Calculation Only)	184,086		
2016	Households	Multiple Entries	46,873	713,205	SCAG 2017 Local Profile
2017	Households		46,979		GP Update
2040	Households	NA (For Forecast Growth Rate Calculation Only)	52,297		
2016	Total Jobs	Multiple Entries	71,367	709,940	SCAG 2017 Local Profile (2015 Number of Jobs)
2017	Total Jobs		70,972		GP Update
2040	Total Jobs	NA (For Forecast Growth Rate Calculation Only)	84,395		
2016	Residential Electricity SCE (kWh)	Residential_Electricity_SCE_2016	350,354,664	NA	SCE
2016	Commercial Electricity SCE (kWh)	Commercial_Electricity_SCE_2016	638,381,587	NA	SCE
2016	Residential Electricity DWP (kWh)	Residential_Electricity_DWP_2016	17,528,643	NA	City Department of Water and Power
2016	Commercial Electricity DWP (kWh)	Commercial_Electricity_DWP_2016	259,675,861	NA	City Department of Water and Power
2016	Residential Natural Gas (therms)	Residential_NaturalGas_2016	15,559,287	NA	SCG
2016	Commercial Natural Gas (therms)	Commercial_NaturalGas_2016	21,015,979	NA	SCG
2017	Vehicle Miles Traveled_Gasoline (miles)	On-road_Gasoline_2016	1,169,706,600		Calculated from total and gas/diesel breakdown from EMFAC2017
2017	Vehicle Miles Traveled_Diesel (miles)	On-road_Diesel_2016	150,934,699		Calculated from total and gas/diesel breakdown from EMFAC2017
2017	Vehicle Miles Traveled_Total (miles)	NA (For Gas/Diesel VMT Calculation Only)	1,303,740,162		Fehr&Peers
2040	Vehicle Miles Traveled_Gasoline (miles)	NA (For Forecast Growth Rate Calculation Only)	1,336,928,145		Calculated from total and gas/diesel breakdown from EMFAC2017
2040	Vehicle Miles Traveled_Diesel (miles)	NA (For Forecast Growth Rate Calculation Only)	177,578,872		Calculated from total and gas/diesel breakdown from EMFAC2017
2040	Vehicle Miles Traveled_Total (miles)	NA (For Gas/Diesel VMT Calculation Only)	1,579,123,821		Fehr&Peers
2016	Landfilled Solid Waste (tons)	SolidWaste_Landfilled_2016	204,211	2,158,648	CalRecycle DRS Single-year Countywide Origin Detail
2016	ADC Solid Waste (tons)	SolidWaste_ADC_2016	147	23,709	CalRecycle DRS Single-year Countywide Origin Detail
2016	Residential Water Consumption (Million Gallons per year)	Residential_Water_2016	6,515	N/A	2018 General Plan Update
2016	Residential Water Energy Consumption (kWh)	Residential_Water_2016	43,119,577	N/A	Conversions using 2006 CEC Report
2016	Commercial Water Consumption (Million Gallons per year)	Commercial_Water_2016	3,501	N/A	2018 General Plan Update
2016	Commercial Water Energy Consumption (kWh)	Commercial_Water_2016	23,167,982	N/A	Conversions using 2006 CEC Report

Business-As-Usual Forecast Growth Rates Inputs

Variable	SEEC Entry Name	Corona	Notes
Annual Growth Rate_Jobs_2016-2040	CAGR_Jobs_2016-2040	0.007243723	CAGR calculation formula: (Future/Past)^(1/years)-1
Annual Growth Rate_Households_2016-2040	CAGR_Households_2016-2040	0.004478261	Growth rate is calculated from 2017 to buildout year, but is used for 2016 to 2030
Annual Growth Rate_Population_2016-2040	CAGR_Population_2016-2040	0.004478408	
Annual Growth Rate_ServPop_2016-2040	CAGR_ServPop_2016-2040	0.005327355	Service Population = Population + Jobs
Annual Growth Rate_VMT_Gas_2016-2040	CAGR_VMT_Gas_2016-2040	0.005583095	
Annual Growth Rate_VMT_Diesel_2016-2040	CAGR_VMT_Diesel_2016-2040	0.006796642	
Annual Growth Rate_VMT_2016-2040	CAGR_VMT_Total_2016-2040	0.00801667	

Adjusted Business-As-Usual Forecast Inputs

Variable	SEEC Entry Name	Corona	Notes
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Gasoline_2016-2020	-2.602%	Calculated from EMFAC2017 CO2 emission factors change between 2016, 2020, and 2040.
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Gasoline_2021-2040	-1.908%	Aggregated from all EMFAC vehicle categories.
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Diesel_2016-2020	-1.412%	
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Diesel_2021-2040	-1.695%	
kWh per household x 4.5% (residential savings from Title 24)	State_Title24_Res_Electricity_2016-2040	336.4	Impact Analysis, California Energy Commission
kWh per job x 3.6% (commercial savings from Title 24)	State_Title24_Comm_Electricity_2016-2040	322.0	2016 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings
therm per household x 21.6% (residential savings from Title 2	State_Title24_Res_NatGas_2016-2040	71.7	Table 2 for residential and commercial electricity savings
therm per job x 0.35% (commercial savings from Title 24)	State_Title24_Comm_NatGas_2016-2040	1.0	Table 4 for residenital and commercial natural gas savings
Primary Driver_Household_2016-2040 (units/yr)	State_Title24_Res_Electricity/NatGas_2016-2040	226	
Primary Driver_Total Jobs_2016-2040 (jobs/yr)	State_Title24_Comm_Electricity/NatGas_2016-2040	543	
Renewable Portfolio Standards (Change Carbon Intensity)	State_Water_RPS_2016-2020	-3.4%	ICLEI Reference Sheet https://s3.amazonaws.com/CEMS_Docs/SEEC+ClearPath+Carbon+Intensity+Reference+Sheet.pdf
Renewable Portfolio Standards (Change Carbon Intensity)	State_Water_RPS_2021-2030	-1.7%	Renewable energy 33% by 2020 and 50% by 2030, 1.7% reduction per year
Renewable Portfolio Standards (Change Carbon Intensity)	State_Water_RPS_2031-2050	-2.5%	Renewable energy 50% by 2030 and 100% by 2050, 2.5% reduction per year
Renewable Portfolio Standards (Change Carbon Intensity)	State_Res_Electricity_RPS_2016-2020	-3.4%	ICLEI Reference Sheet https://s3.amazonaws.com/CEMS_Docs/SEEC+ClearPath+Carbon+Intensity+Reference+Sheet.pdf
Renewable Portfolio Standards (Change Carbon Intensity)	State_Res_Electricity_RPS_2021-2030	-1.7%	Renewable energy 33% by 2020 and 50% by 2030, 1.7% reduction per year
Renewable Portfolio Standards (Change Carbon Intensity)	State_Res_Electricity_RPS_2031-2050	-2.5%	Renewable energy 50% by 2030 and 100% by 2050, 2.5% reduction per year
Renewable Portfolio Standards (Change Carbon Intensity)	State_Comm_Electricity_RPS_2016-2020	-3.4%	ICLEI Reference Sheet https://s3.amazonaws.com/CEMS_Docs/SEEC+ClearPath+Carbon+Intensity+Reference+Sheet.pdf
Renewable Portfolio Standards (Change Carbon Intensity)	State_Comm_Electricity_RPS_2021-2030	-1.7%	Renewable energy 33% by 2020 and 50% by 2030, 1.7% reduction per year
Renewable Portfolio Standards (Change Carbon Intensity)	State_Comm_Electricity_RPS_2031-2050	-2.5%	Renewable energy 50% by 2030 and 100% by 2050, 2.5% reduction per year
Water Conservation SBX7-7 (Reduce Energy Use)	State_Water_SBx7-7	0	Metropolitan Water District of Southern California 2015 Urban Water Management Plan, Section 3.7
			2020 reduction target is 145 GPCD, 2015 usage was 131 GPCD, therefore no more reduction.

Community Inventory Input (Off-Road Sector)

Class	Values	2016	2020	2030
Agricultural Equipment	Sum of Annual_MT_CO2 Exhaust	1,588	1555.507142	1480.952819
	Sum of Annual_MT_CH4 Exhaust	0.157	0.109236125	0.063077023
	Sum of Annual_MT_N2O Exhaust	0.019	0.018495839	0.019197948
Construction and Mining Equipment	Sum of Annual_MT_CO2 Exhaust	7,336	7750.019526	8799.428507
	Sum of Annual_MT_CH4 Exhaust	0.669	0.543639627	0.403223312
	Sum of Annual_MT_N2O Exhaust	0.040	0.03953828	0.041731386
Industrial Equipment	Sum of Annual_MT_CO2 Exhaust	719	755.1735718	862.2508771
	Sum of Annual_MT_CH4 Exhaust	0.245	0.253665736	0.306946916
	Sum of Annual_MT_N2O Exhaust	0.037	0.037184466	0.039770136
Lawn and Garden Equipment	Sum of Annual_MT_CO2 Exhaust	755	894.0844133	1485.748141
	Sum of Annual_MT_CH4 Exhaust	1.107	1.295721634	2.136058128
	Sum of Annual_MT_N2O Exhaust	0.486	0.569949576	0.941689256
Light Commercial Equipment	Sum of Annual_MT_CO2 Exhaust	500	508.7459046	544.9366109
	Sum of Annual_MT_CH4 Exhaust	0.137	0.119330142	0.111932274
	Sum of Annual_MT_N2O Exhaust	0.081	0.07910845	0.082541373
Recreational Equipment	Sum of Annual_MT_CO2 Exhaust	425	470.8609351	583.0182602
	Sum of Annual_MT_CH4 Exhaust	1.804	2.062785554	2.880822248
	Sum of Annual_MT_N2O Exhaust	0.640	0.718535945	0.942353847

For Projections

Indicator	2016 MT	2040 MT
% Ag jobs	1588.114498	1409.583073
	0.156688451	0.05558469
	0.019404633	0.020693111
% Building Permits	7335.683628	9840.499547
	0.668899819	0.39447395
	0.039568328	0.04412217
% Manufacturing Jobs	718.9539603	989.5865666
	0.244824174	0.38234071
	0.036870438	0.042318824
% Households	755.0643289	2417.844359
	1.107483422	3.476388727
	0.485837252	1.532590585
% Other Jobs	500.3438994	579.5979854
	0.136762261	0.117313195
	0.080745877	0.087628879
% Population weighted by Income	424.5671197	752.1139357
	1.803759137	4.112737071
	0.640037435	1.279972404
Total MT CO2e	11770.84082	16999.63781
CAGR_Offroad_2016-2040	0.015433158	

	Corona	County	Sources:
BuildingPermits	66	5,136	US Census Bureau https://www2.census.gov/econ/bps/
Population	165,366	2,347,828	SCAG 2017 Local Profile
Portion Population weighted by Income	9.34%		
Households	46,979	713,205	SCAG 2017 Local Profile
Portion Households	6.59%		
Jobs_Total	71,367	709,940	SCAG 2017 Local Profile (2015 Number of Jobs)
Portion Other Jobs	9.91%		
Jobs_Agriculture	500	10,700	SCAG 2017 Local Profile (2015 Jobs in Agriculture 0.7%)
Portion Ag jobs	4.67%		
Jobs_Manufacturing	11,862	103,633	SCAG 2017 Local Profile (2015 Jobs in Manufacturing)
Portion Manufacturing Jobs	11.45%		
Median_Income	76,065	57,367	SCAG 2017 Local Profile
Portion Building Permits	1.29%		
Other Jobs	59,005	595,607	

SEEC Entry Name		Corona
Offroad_Agriculture_2016	CO2	74.14698799
	CH4	0.00731558
	N2O	0.00090598
Offroad_Construction_2016	CO2	94.26696251
	CH4	0.00859568
	N2O	0.00050847
Offroad_Industrial_2016	CO2	82.29262761
	CH4	0.02802297
	N2O	0.00422025
Offroad_Lawn&Garden_2016	CO2	49.73628495
	CH4	0.07295022
	N2O	0.03200223
Offroad_Commercial_2016	CO2	49.56793226
	CH4	0.01354873
	N2O	0.00799931
Offroad_Recreation_2016	CO2	39.65053319
	CH4	0.16845396
	N2O	0.05977341

Output from SEEC - Community Inventory

	2016
Inventory Record	**MT CO2e**
Residential_Electricity_DWP_2016	4,207
Residential_Electricity_SCE_2016	84,085
Residential_NaturalGas_2016	82,754
Commercial_Electricity_DWP_2016	62,322
Commercial_Electricity_SCE_2016	153,212
Commercial_NaturalGas_2016	111,777
On-road_Gasoline_2016	426,742
On-road_Diesel_2016	72,243
Offroad_Agriculture_2016	75
Offroad_Construction_2016	95
Offroad_Industrial_2016	84
Offroad_Lawn&Garden_2016	60
Offroad_Recreation_2016	60
Offroad_Commercial_2016	52
SolidWaste_ADC_2016	33
SolidWaste_Landfilled_2016	55,609
Wastewater_Digester_2016	10
Residential_Water_2016	10,349
Commercial_Water_2016	5,560
Wastewater_Nitrification_2016	175
Wastewater_Effluent_2016	4,013
Total	**1,073,517**

Output from SEEC - Community Business-As-Usual Forecasts

Year	Usage	CO2e	Output Name
2016	204358	55642	Waste Generated (wet tons)
2020	208941	56889	Waste Generated (wet tons)
2030	220852	60132	Waste Generated (wet tons)
2040	233442	63560	Waste Generated (wet tons)
2016	59825	88292	Res Electricity Energy Equivalent (MMBtu)
2020	60951	89954	Res Electricity Energy Equivalent (MMBtu)
2030	63860	94248	Res Electricity Energy Equivalent (MMBtu)
2040	66908	98746	Res Electricity Energy Equivalent (MMBtu)
2016	1555929	82754	Res Natural Gas - Energy Equivalent (MMBtu)
2020	1585219	84312	Res Natural Gas - Energy Equivalent (MMBtu)
2030	1660881	88336	Res Natural Gas - Energy Equivalent (MMBtu)
2040	1740154	92553	Res Natural Gas - Energy Equivalent (MMBtu)
2016	599173	215534	Comm Electricity Energy Equivalent (MMBtu)
2020	617498	222126	Comm Electricity Energy Equivalent (MMBtu)
2030	665800	239502	Comm Electricity Energy Equivalent (MMBtu)
2040	717881	258236	Comm Electricity Energy Equivalent (MMBtu)
2016	2101598	111777	Comm Natural Gas - Energy Equivalent (MMBtu)
2020	2165873	115195	Comm Natural Gas - Energy Equivalent (MMBtu)
2030	2335294	124206	Comm Natural Gas - Energy Equivalent (MMBtu)
2040	2517968	133922	Comm Natural Gas - Energy Equivalent (MMBtu)
2016	1	84	Ships and Boats - Off Road Fuel Use
2020	1	90	Ships and Boats - Off Road Fuel Use
2030	1	104	Ships and Boats - Off Road Fuel Use
2040	1	122	Ships and Boats - Off Road Fuel Use
2016	1	60	Locomotives - Off Road Fuel Use
2020	1	64	Locomotives - Off Road Fuel Use
2030	1	75	Locomotives - Off Road Fuel Use
2040	1	87	Locomotives - Off Road Fuel Use
2016	1	75	Agricultural - Off Road Fuel Use
2020	1	79	Agricultural - Off Road Fuel Use
2030	1	92	Agricultural - Off Road Fuel Use
2040	1	108	Agricultural - Off Road Fuel Use
2016	1	95	Construction - Off Road Fuel Use
2020	1	101	Construction - Off Road Fuel Use
2030	1	117	Construction - Off Road Fuel Use
2040	1	137	Construction - Off Road Fuel Use
2016	1	60	Snowmobiles and Recreational - Off Road Fuel Use
2020	1	64	Snowmobiles and Recreational - Off Road Fuel Use
2030	1	74	Snowmobiles and Recreational - Off Road Fuel Use
2040	1	87	Snowmobiles and Recreational - Off Road Fuel Use
2016	1	52	Small Utility - Off Road Fuel Use
2020	1	55	Small Utility - Off Road Fuel Use
2030	1	65	Small Utility - Off Road Fuel Use
2040	1	75	Small Utility - Off Road Fuel Use
2016	1130718822	412519	Gasoline - On Road VMT
2020	1151592261	420134	Gasoline - On Road VMT
2030	1205477276	439793	Gasoline - On Road VMT
2040	1261883665	460371	Gasoline - On Road VMT
2016	145903858	69835	Diesel - On Road VMT
2020	149315905	71468	Diesel - On Road VMT
2030	158199209	75720	Diesel - On Road VMT
2040	167611012	80225	Diesel - On Road VMT
2016	60399932	10	Annual Gas Production (scf / Year)
2020	61754378	11	Annual Gas Production (scf / Year)
2030	65274869	11	Annual Gas Production (scf / Year)
2040	68996057	12	Annual Gas Production (scf / Year)
2016	165366	175	Process N2O Population Served
2020	169074	179	Process N2O Population Served
2030	178713	189	Process N2O Population Served
2040	188901	200	Process N2O Population Served
2016	198740	15909	Water Supply Energy Equivalent (MMBtu)
2020	203196	16266	Water Supply Energy Equivalent (MMBtu)
2030	214780	17193	Water Supply Energy Equivalent (MMBtu)
2040	227024	18173	Water Supply Energy Equivalent (MMBtu)
2016	5281	4013	Daily N Load at Facility with Release to Environment (kg N/day)
2020	5400	4103	Daily N Load at Facility with Release to Environment (kg N/day)
2030	5708	4337	Daily N Load at Facility with Release to Environment (kg N/day)
2040	6033	4584	Daily N Load at Facility with Release to Environment (kg N/day)

Output from SEEC - Community Adjusted Business-As-Usual Forecasts

Year	Category	CO2e
2016	Transportation & Mobile Sources	482779
2020	Transportation & Mobile Sources	446052
2030	Transportation & Mobile Sources	387245
2040	Transportation & Mobile Sources	336282
2016	Water & Wastewater	20108
2020	Water & Wastewater	18457
2030	Water & Wastewater	17150
2040	Water & Wastewater	15146
2016	Residential Energy	171047
2020	Residential Energy	162292
2030	Residential Energy	156221
2040	Residential Energy	146591
2016	Commercial Energy	327311
2020	Commercial Energy	308566
2030	Commercial Energy	299731
2040	Commercial Energy	280738
2016	Solid Waste	55642
2020	Solid Waste	56889
2030	Solid Waste	60132
2040	Solid Waste	63560

APPENDIX C

SCREENING TABLES

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City of Corona

GREENHOUSE GAS EMISSIONS

Screening Tables

March 2019

Prepared for:

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CONTENTS

TABLES

Introduction

The City of Corona Climate Action Plan Update (CAP Update) includes an interim goal of reducing greenhouse gas (GHG) emissions to 49 percent below 2008 levels by the year 2030, and a longer-term GHG reduction goal of 66 percent below 2008 levels by 2040. The interim and longer-term goals would put the City of Corona (City) on a path toward the State's long-term goal to reduce emissions 80 percent below 1990 levels by 2050. Reductions related to transportation, water, solid waste, energy, and renewable energy sources all play a crucial part in gaining the level of efficiency needed within the new development across the City.

Mitigation of GHG emissions impacts through the Development Review Process (DRP) provides one of the most substantial reduction strategies for reducing community-wide emissions associated with new development. The DRP procedures for evaluating GHG impacts and determining significance for CEQA purposes will be streamlined by utilizing Screening Tables to mitigate project GHG emissions and demonstrating compliance with the CAP Update. Projects will have the option of preparing a project-specific technical analysis to quantify and mitigate GHG emissions or completing the Screening Tables to demonstrate compliance.

The California Environmental Quality Act (CEQA) requires the assessment of environmental impacts for proposed projects including the impacts of GHG emissions. The purpose of this document is to provide guidance on how to analyze GHG emissions and determine the significance of those emissions during CEQA review of proposed development projects within the City. The analysis, methodology, and significance determination (thresholds) are based upon the CAP Update, the GHG emission inventories within the CAP Update, and the GHG reduction measures that reduce emissions to the State-aligned reduction target of the CAP Update. The Screening Tables can be used by the City for review of development projects in order to ensure that the specific reduction strategies in the CAP Update are implemented as part of the CEQA process for development projects. The Screening Tables provide a menu of options that ensures both implementation of the reduction strategies and flexibility on how development projects would implement the reduction strategies to achieve an overall reduction of emissions, consistent with the reduction targets of the CAP Update.

California Environmental Quality Act

CEQA Mandates for Analysis of Impacts

CEQA requires that Lead Agencies inform decision makers and the public regarding the following: potential significant environmental effects of proposed projects; feasible ways that environmental damage can be avoided or reduced through the use of feasible mitigation measures and/or project alternatives; and the reasons why the Lead Agency approved a project if significant environmental

effects are involved (CEQA Guidelines §15002). CEQA also requires Lead Agencies to evaluate potential environmental effects based to the fullest extent possible on scientific and factual data (CEQA Guidelines §15064[b]). A determination of whether or not a particular environmental impact would be significant shall be based on substantial evidence, which includes facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines §15064f[5]).

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

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

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

Greenhouse Gas Impact Determination

Statewide or Regional Thresholds of Significance

There are currently no published statewide thresholds of significance for measuring the impact of GHG emissions generated by a proposed project. CEQA Guidelines §15064.7 indicates only that, "each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects." South Coast Air Quality Management District (SCAQMD) has published draft thresholds that, when finalized, jurisdictions within the SCAQMD boundary can use if they do not have their own thresholds and GHG mitigation plans. However, the CAP Update for the City addresses cumulative GHG emissions, has reduction targets that reduces the cumulative GHG impacts to less than significant, has a set of reduction measures that achieves the reduction targets, and provides an implementation plan to implement the reduction measures. This document provides guidance in how to address GHG emissions in CEQA analysis and determine the significance of project generated GHG emissions.

Quantitative Analysis Relative to the Climate Action Plan

METHODOLOGY OVERVIEW

An individual project cannot generate enough GHG emissions to influence global climate change. The project participates in climate change by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together may have a significant impact on global climate change (AEP 2007). To address the State's requirement to reduce GHG emissions, the City prepared the CAP Update with targets of reducing GHG emissions within the City by 15 percent below 2008 baseline emission levels by year 2020, 49 percent below 2008 baseline by 2030, and 66 percent below the 2008 baseline by 2040. The City's targets are consistent with Assembly Bill (AB) 32 and Senate Bill (SB) 32, and ensure that the City is providing GHG reductions locally that will complement the State and international efforts of stabilizing climate change.

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

GHG emissions are only important in the context of cumulative emissions; therefore, the focus of the analysis is on answering the question of whether incremental contributions of GHGs are a cumulatively considerable contribution to climate change impacts. The CAP Update includes a set of reduction measures designed to substantially lessen cumulative impacts associated with GHG emissions as described in CEQA Guidelines §15130(a)(3), in determining if a project's effects would result in significant impacts. The CAP Update has the following components that fulfill cumulative mitigation for GHG emissions:

1. The CAP Update provides a community-wide GHG emissions reduction target that would substantially lessen the cumulative impact;
2. The CAP Update provides measures that new development projects shall follow to meet the City's reduction target and substantially lessen the cumulative impact;
3. The CAP Update provides a set of GHG emission inventories that provides quantitative facts and analysis for how the measures within the CAP Update meet the reduction targets that substantially lessen the cumulative impact; and
4. The CAP Update provides an implementation, monitoring, and update program to ensure that the reduction target is met.

The CAP Update satisfies the first condition by adopting targets of reducing GHG emissions within the City by 15 percent below 2008 levels by 2020, 49 percent by 2030, and 66 percent by 2040. The 2020 reduction target is compliant with AB 32. The AB 32 Climate Change Scoping Plan states: "In recognition

of the critical role local governments will play in the successful implementation of AB 32, ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below existing levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target" (Scoping Plan page ES-5, CARB, December 2008). In this way, the City is teaming with the State's efforts to reduce GHG emissions globally and substantially lessen cumulative emissions. The 2030 reduction target is compliant with SB 32, and the 2040 reduction target continues the GHG reduction trend (AEP 2012).

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

The CAP Update satisfies the third criteria by providing a set of community-wide GHG emissions inventories for existing conditions (2008 baseline); and future 2020, 2030, and 2040 GHG emissions that are anticipated without the reduction measures (Adjusted Business-As-Usual, or ABAU); and the CAP Update also demonstrates reduced levels of 2020, 2030, and 2040 GHG emissions that demonstrate how the implementation of reduction measures achieves the reduction targets. These community-wide GHG emission inventories are found in Appendix A of the CAP Update.

The Development Review Process

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

Question 1: Is the proposed activity a "Project" as defined by CEQA? If the activity is not a project under CEQA, no further action is required concerning GHG emissions in the development review process.

Question 2: Is the project exempt under CEQA? If so, then the California Air Resources Board has determined that GHG emissions are less than significant and no additional GHG reductions are needed. A list of CEQA Exemptions are found in CEQA Guidelines §15300 through §15332.

There are also exemption opportunities associated with transit-oriented development (TOD) associated with the Sustainable Communities Strategy (SCS) for the region developed by the Southern California Association of Governments (SCAG) and first introduced in the 2012 Regional Transportation Plan (RTP). Exemptions associated with TOD are divided into two categories: transit priority projects (TPP) and Sustainable Community Projects (SCP). A TPP and SCP Checklist is provided in Appendix B of this document to assist project applicants in determining if a project qualifies for these exemptions under

CEQA. If the project does not qualify for a CEQA exemption, then the applicant can move on to the Methods for the Calculation of GHG Emissions and Screening Tables.

METHODOLOGY FOR THE CALCULATION OF GHG EMISSIONS

Analysis of development projects can either be done through emissions calculations or by using the Screening Tables beginning on page 7.

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

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

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

Analysis of development projects not using the screening tables should use the emission factors found in the latest version of the California Climate Action Registry (CCAR) General Reporting Protocol (CCAR, January 2009), and guidance in the Association of Environmental Professionals' (AEP) *White Paper: Community-Wide Greenhouse Gas Emission Inventory Protocols* (AEP, June 2011). Quantification of emissions from electricity used for potable water treatment and transportation as well as wastewater transport and treatment can be found in the California Energy Commission (CEC) document titled *Refining Estimates of Water-Related Energy Use in California* (CEC 2006).

Screening Tables

The purpose of the Screening Tables is to provide guidance in measuring the reduction of GHG emissions attributable to certain design and construction measures incorporated into development projects. The analysis, methodology, and significance determination (thresholds) are based upon the CAP and CAP Update, which include GHG emission inventories (2008 and 2016); forecasts for years 2020, 2030, and 2040; 2020, 2030, and 2040 emission reduction targets; and the goals and policies to reach the targets. The methodology for the development and application of the Screening Tables is set forth in Appendix C

of this document and uses the California Air Pollution Control Officers Association (CAPCOA) guidance on quantifying project level GHG reductions (CAPCOA 2010).

INSTRUCTIONS FOR RESIDENTIAL, COMMERCIAL, OR INDUSTRIAL PROJECTS

The Screening Tables assign points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as "feature"). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. The point levels are based upon improvements compared to 2017 emission levels of efficiency. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the CAP Update. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Note that the Screening Tables use a base level of efficiency that corresponds to the California Building Energy Efficiency Standards for Residential and Non-residential Buildings (Title 24, Part 6) that became effective January 1, 2017. These are the statewide minimum requirements of efficiency that are currently in effect.

INSTRUCTIONS FOR MIXED-USE PROJECTS

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

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

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

Feature	Description	Assigned Point Values	Project Points
Reduction Measure 2.1: Exceed Energy Efficiency Standards in New Residential Units			
2.1.A Building Envelope			
2.1.A.1 Insulation	• 2016 Title 24 Requirements (walls R-13, roof/attic R-30) • Modestly Enhanced Insulation (walls R-15, roof/attic R-38) • Enhanced Insulation (rigid wall insulation R-13, roof/attic R-38) • Greatly Enhanced Insulation (spray foam wall insulated walls R-18 or higher, roof/attic R-38 or higher)	0 points 7 points 9 points 11 points	
2.1.A.2 Windows	• 2016 Title 24 Windows (0.57 U-factor, 0.4 solar heat gain coefficient [SHGC]) • Modestly Enhanced Window (0.4 U-Factor, 0.32 SHGC) • Enhanced Window (0.32 U-Factor, 0.25 SHGC) • Greatly Enhanced Window (0.28 or less U-Factor, 0.22 or less SHGC)	0 points 3 points 4 points 5 points	
2.1.A.3 Cool Roofs	• Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance) • Enhanced Cool Roof (CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance) • Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	6 points 7 points 8 points	
2.1.A.4 Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage. • Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent) • Blower Door HERS Verified Envelope Leakage or equivalent	6 points 5 points	
2.1.A.5 Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls. • Modest Thermal Mass (10% of floor or 10% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials) • Enhanced Thermal Mass (20% of floor or 20% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials)	1 point 2 points	
2.1.B Indoor Space Efficiencies			
2.1.B.1 Heating/ Cooling Distribution System	• Minimum Duct Insulation (R-4.2 required) • Modest Duct insulation (R-6) • Enhanced Duct Insulation (R-8) • Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	0 points 4 points 5 points 7 points	
2.1.B.2 Space Heating/ Cooling Equipment	• 2016 Title 24 Minimum HVAC Efficiency (SEER 13/75% AFUE or 7.7 HSPF) • Improved Efficiency HVAC (SEER 14/78% AFUE or 8 HSPF) • High Efficiency HVAC (SEER 15/80% AFUE or 8.5 HSPF) • Very High Efficiency HVAC (SEER 16/82% AFUE or 9 HSPF)	0 points 2 points 4 points 5 points	
2.1.B.3 Water Heaters	• 2016 Title 24 Minimum Efficiency (0.57 Energy Factor) • Improved Efficiency Water Heater (0.675 Energy Factor) • High Efficiency Water Heater (0.72 Energy Factor) • Very High Efficiency Water Heater (0.92 Energy Factor) • Solar Pre-heat System (0.2 Net Solar Fraction) • Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	0 points 7 points 9 points 11 points 2 points 5 points	

Feature	Description	Assigned Point Values	Project Points
2.1.B.4 Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours. • All peripheral rooms within the living space have at least one window (required) • All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.) • All rooms daylighted	 0 points 1 point 1 point	
2.1.B.5 Artificial Lighting	• Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficiency is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt) • High Efficiency Lights (50% of in-unit fixtures are high efficiency) • Very High Efficiency Lights (100% of in-unit fixtures are high efficiency)	5 points 6 points 7 points	
2.1.B.6 Appliances	• Energy Star Refrigerator (new) • Energy Star Dishwasher (new) • Energy Star Washing Machine (new)	1 point 1 point 1 point	
2.1.C Miscellaneous Residential Building Efficiencies			
2.1.C.1 Building Placement	North/south alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	3 points	
2.1.C.2 Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on June 21st.	2 points	
2.1.C.3 Energy Star Homes	EPA Energy Star for Homes (version 3 or above)	15 points	
2.1.C.4 Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
2.1.C.5 Other	This allows innovation by the applicant to provide design features that increase the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
2.1.C.6 Existing Residential Retrofits	Having residential developments within walking and biking distances of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT). The suburban project will have at least three of the following on site and/or off site within ¼-mile: Residential Development, Retail Development, Park, Open Space, or Office. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial locations (and vice versa). The project should minimize the need for external trips by including services/facilities for daycare, banking/ATM, restaurants, vehicle refueling, and shopping.	TBD	

Feature	Description	Assigned Point Values	Project Points
Reduction Measure 9.1: Clean Energy			
9.1.A Residential Renewable Energy Generation			
9.1.A.1 Photovoltaic	Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 9 points 12 points 17 points 20 points 23 points 25 points 28 points 31 points	
9.1.A.2 Wind Turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the areas' capability to support wind turbines should be evaluated prior to choosing this feature. Individual wind turbines at homes or collective neighborhood arrangements of wind turbines such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 9 points 12 points 17 points 21 points 23 points 25 points 28 points 31 points	
9.1.A.3 Off-site Renewable Energy Project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes. These off-site renewable energy retrofit project proposals will be determined on a case-by-case basis and shall be accompanied by a detailed plan that documents the quantity of renewable energy the proposal would generate. Point values will be determined based upon the energy generated by the proposal.	TBD	
9.1.A.4 Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure 5.2: Exceed Water Efficiency Standards			
5.2.A Residential Irrigation and Landscaping			
5.2.A.1 Water Efficient Landscaping	• Limit conventional turf to < 25% of required landscape area • Limit conventional turf to < 50% of required landscape area • No conventional turf (warm season turf to < 50% of required landscape area and/or low water using plants are allowed) • Only California Native Plants that requires no irrigation or some supplemental irrigation	0 points 2 points 4 points 5 points	
5.2.A.2 Water Efficient Irrigation Systems	• Low precipitation spray heads < .75"/hr or drip irrigation • Weather based irrigation control systems or moisture sensors (demonstrate 20% reduced water use)	1 point 2 points	

Feature	Description	Assigned Point Values	Project Points
5.2.A.3 Stormwater Reuse Systems	Innovative on-site stormwater collection, filtration, and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
5.2.B Residential Potable Water			
5.2.B.1 Showers	Water Efficient Showerheads (2.0 gpm)	2 points	
5.2.B.2 Toilets	Water Efficient Toilets (1.5 gpm)	2 points	
5.2.B.3 Faucets	Water Efficient faucets (1.28 gpm)	2 points	
5.2.B.4 Dishwasher	Water Efficient Dishwasher (6 gallons per cycle or less)	1 point	
5.2.B.5 Washing Machine	Water Efficient Washing Machine (Water factor <5.5)	1 point	
5.2.B.6 WaterSense	EPA WaterSense Certification	7 points	
5.2.C Increase Residential Reclaimed Water Use			
5.2.C.1 Recycled Water	5% of the total project's water use comes from recycled/reclaimed water	5 points	
Reduction Measure 7.1: Alternative Transportation Options			
7.1.A Increase Residential Density			
7.1.A.1 Residential Density	Designing the project with increased densities, where allowed by the General Plan and/or Zoning Ordinance, reduces GHG emissions associated with traffic in several ways. Increased densities affect the distance people travel and provide greater options for the modes of travel they choose. This strategy also provides a foundation for implementation of many other strategies, which would benefit from increased densities. 1 point is allowed for each 10% increase in density beyond 7 units/acre, up to 500% (50 points)	1–50 points	
7.1.B Mixed-Use Development			
7.1.B.1 Mixed-Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed-use projects will be determined based upon a Transportation Impact Analysis (TIA) demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges: • Diversity of land uses complementing each other (2–28 points) • Increased destination accessibility other than transit (1–18 points) • Increased Transit Accessibility (1–25 points) • Infill location that reduces vehicle trips or VMT beyond the measures described above (points TBD based on traffic data).	TBD	

Feature	Description	Assigned Point Values	Project Points
7.1.B.2 Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT). The suburban project will have at least three of the following on site and/or off site within ¼-mile: Residential Development, Retail Development, Park, Open Space, or Office. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial locations (and vice versa). The project should minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.	1–16 points	
7.1.C Traffic Flow Management Improvements			
7.1.C.1 Signal Synchronization	Techniques for improving traffic flow include: traffic signal coordination to reduce delay, incident management to increase response time to breakdowns and collisions, Intelligent Transportation Systems (ITS) to provide real-time information regarding road conditions and directions, and speed management to reduce high free-flow speeds. • Signal synchronization • Traffic signals connected to existing ITS	 1 point/signal 3 points/signal	
7.1.D Increase Public Transit			
7.1.D.1 Public Transit Access	The point value of a projects ability to increase public transit use will be determined based upon a Transportation Impact Analysis (TIA) demonstrating decreased use of private vehicles and increased use of public transportation. Increased transit accessibility (1–15 points)	TBD	
Reduction Measure 7.2: Adopt and Implement a Bicycle Master Plan to Expand Bike Routes around the City			
7.2.A.1 Sidewalks	• Provide sidewalks on one side of the street (required) • Provide sidewalks on both sides of the street • Provide pedestrian linkage between residential and commercial uses within 1 mile	0 points 1 point 3 points	
7.2.A.2 Bicycle Paths	• Provide bicycle paths within project boundaries • Provide bicycle path linkages between residential and other land uses • Provide bicycle path linkages between residential and transit	TBD 2 points 5 points	
Reduction Measure 8.1: Reduce Waste to Landfills			
8.1.A.1 Recycling	City-initiated recycling program diverting 100% of waste requires coordination in neighborhoods to realize this goal. The following recycling features will help the City fulfill this goal: • Provide green waste composting bins at each residential unit • Multi-family residential projects that provide dedicated recycling bins separated by types of recyclables combined with instructions/education program explaining how to use the bins and the importance or recycling	 4 points 3 points	
Other GHG Reduction Feature Implementation			
O.A.1 Other GHG Emissions Reduction Features	This allows innovation by the applicant to provide residential design features for the GHG emissions from construction and/or operation of the project not provided in the table. Note that engineering data will be required documenting the GHG reduction amount and point values given based upon emission reductions calculations using approved models, methods, and protocols.	TBD	
Total Points Earned by Residential Project:			

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

Feature	Description	Assigned Point Values	Project Points
Reduction Measure 4.1: Exceed Energy Efficiency Standards in New Commercial Units			
4.1.A Building Envelope			
4.1.A.1 Insulation	• 2017 Title 24 Requirements (walls R-13; roof/attic R-30) • Modestly Enhanced Insulation (walls R-13, roof/attic R-38) • Enhanced Insulation (rigid wall insulation R-13, roof/attic R-38) • Greatly Enhanced Insulation (spray foam insulated walls R-15 or higher, roof/attic R-38 or higher)	0 points 9 points 11 points 12 points	
4.1.A.2 Windows	• 2016 Title 24 Windows (0.57 U-factor, 0.4 SHGC) • Modestly Enhanced Window Insulation (0.4 U-factor, 0.32 SHGC) • Enhanced Window Insulation (0.32 U-factor, 0.25 SHGC) • Greatly Enhanced Window Insulation (0.28 or less U-factor, 0.22 or less SHGC)	0 points 4 points 5 points 7 points	
4.1.A.3 Cool Roofs	• Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance) • Enhanced Cool Roof (CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance) • Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	7 points 8 points 10 points	
4.1.A.4 Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage. • Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent) • Blower Door HERS Verified Envelope Leakage or equivalent	7 points 6 points	
4.1.A.5 Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls. • Modest Thermal Mass (10% of floor or 10% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials) • Enhanced Thermal Mass (20% of floor or 20% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials) • Enhanced Thermal Mass (80% of floor or 80% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood, or other insulating materials)	2 points 4 points 14 points	
4.1.B Indoor Space Efficiencies			
4.1.B.1 Heating/ Cooling Distribution System	• Minimum Duct Insulation (R-4.2 required) • Modest Duct insulation (R-6) • Enhanced Duct Insulation (R-8) • Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	0 points 5 points 6 points 8 points	

Feature	Description	Assigned Point Values	Project Points
4.1.B.2 Space Heating/ Cooling Equipment	• 2016 Title 24 Minimum HVAC Efficiency (EER 13/75% AFUE or 7.7 HSPF) • Improved Efficiency HVAC (EER 14/78% AFUE or 8 HSPF) • High Efficiency HVAC (EER 15/80% AFUE or 8.5 HSPF) • Very High Efficiency HVAC (EER 16/82% AFUE or 9 HSPF)	0 points 4 points 5 points 7 points	
4.1.B.3 Commercial Heat Recovery Systems	Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.	TBD	
4.1.B.4 Water Heaters	• 2016 Title 24 Minimum Efficiency (0.57 Energy Factor) • Improved Efficiency Water Heater (0.675 Energy Factor) • High Efficiency Water Heater (0.72 Energy Factor) • Very High Efficiency Water Heater (0.92 Energy Factor) • Solar Pre-heat System (0.2 Net Solar Fraction) • Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	0 points 8 points 10 points 11 points 2 points 5 points	
4.1.B.5 Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours. • All peripheral rooms within building have at least one window or skylight • All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.) • All rooms daylighted	 0 points 1 point 1 point	
4.1.B.6 Artificial Lighting	• Efficient Lights (25% of in-unit fixtures considered high efficiency. High efficiency is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt) • High Efficiency Lights (50% of in-unit fixtures are high efficiency) • Very High Efficiency Lights (100% of in-unit fixtures are high efficiency)	5 points 7 points 8 points	
4.1.B.7 Appliances	• Energy Star Commercial Refrigerator (new) • Energy Star Commercial Dishwasher (new) • Energy Star Commercial Clothes Washer	2 points 2 points 2 points	
4.1.C Miscellaneous Commercial Building Efficiencies			
4.1.C.1 Building Placement	North/south alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	4 points	
4.1.C.2 Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on Jun 21st.	6 points	
4.1.C.3 Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
4.1.C.4 Existing Commercial Buildings Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing commercial buildings to further the point value of their project. Retrofitting existing commercial buildings within the City is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case-by-case basis and shall have the approval from the City of Corona Planning Department. The decision to allow applicants to participate in this program will be evaluated based upon, but not limited to the following: Will the energy efficiency retrofit project benefit low income or disadvantaged communities?	TBD	

Feature	Description	Assigned Point Values	Project Points
	Does the energy efficiency retrofit project provide co-benefits important to the City? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.		
Reduction Measure 9.1: Clean Energy			
9.1.B Commercial/Industrial Renewable Energy Generation			
9.1.B.1 Photovoltaic	Solar Photovoltaic panels installed on commercial buildings or in collective arrangements within a commercial development such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 8 points 12 points 16 points 19 points 23 points 26 points 30 points 34 points	
9.1.B.2 Wind Turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Wind turbines as part of the commercial development such that the total power provided augments: • 30 percent of the power needs of the project • 40 percent of the power needs of the project • 50 percent of the power needs of the project • 60 percent of the power needs of the project • 70 percent of the power needs of the project • 80 percent of the power needs of the project • 90 percent of the power needs of the project • 100 percent of the power needs of the project	 8 points 12 points 16 points 19 points 23 points 26 points 30 points 34 points	
9.1.B.3 Off-site Renewable Energy Project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing residential or existing commercial/industrial. These off-site renewable energy retrofit project proposals will be determined on a case-by-case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.	TBD	
9.1.A.4 Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed would be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure 5.2: Exceed Water Efficiency Standards			
5.2.D Commercial Irrigation and Landscaping			
5.2.D.1 Water Efficient Landscaping	• Eliminate conventional turf from landscaping • Only moderate water using plants • Only low water using plants • Only California Native landscape that requires no or only supplemental irrigation	0 point 2 points 3 points 5 points	

Feature	Description	Assigned Point Values	Project Points
5.2.D.2 Water Efficient Irrigation Systems	• Low precipitation spray heads< .75"/hr or drip irrigation • Weather based irrigation control systems combined with drip irrigation (demonstrate 20% reduced water use)	1 point 3 points	
5.2.D.3 Stormwater Reuse Systems	Innovative on-site stormwater collection, filtration, and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
5.2.E Commercial Potable Water			
5.2.E.1 Showers	Water Efficient Showerheads (2.0 gpm)	2 points	
5.2.E.2 Toilets	• Water Efficient Toilets/Urinals (1.5 gpm) • Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	3 points 3 points	
5.2.E.3 Faucets	Water Efficient faucets (1.28 gpm)	2 points	
5.2.E.4 Commercial Dishwashers	Water Efficient dishwashers (20% water savings)	2 points	
5.2.E.5 Commercial Laundry Washers	• Water Efficient laundry (15% water savings) • High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	2 points 4 points	
5.2.E.6 Commercial Water Operations Program	Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.	TBD	
5.2.F Increase Commercial/Industrial Reclaimed Water Use			
5.2.F.1 Recycled Water	Graywater (purple pipe) irrigation system on site	5 points	
Reduction Measure 7.1: Alternative Transportation Options			
7.1.E Mixed-Use Development			
7.1.E.1 Mixed-Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed-use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled.	TBD	
7.1.E.2 Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled.	TBD	
7.1.F Preferential Parking			
7.1.F.1 Parking	• Provide reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles. • Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools and include adequate passenger waiting/loading areas.	1 point 1 point	

Feature	Description	Assigned Point Values	Project Points
7.1.G Signal Synchronization and Intelligent Traffic Systems			
7.1.G.1 Signal Improvements	Techniques for improving traffic flow include: traffic signal coordination to reduce delay, incident management to increase response time to breakdowns and collisions, Intelligent Transportation Systems (ITS) to provide real-time information regarding road conditions and directions, and speed management to reduce high free-flow speeds. • Synchronize signals along arterials used by project. • Connect signals along arterials to existing ITS.	 1 point/signal 3 points/signal	
7.1.H Increase Public Transit			
7.1.H.1 Public Transit	The point value of a projects ability to increase public transit use will be determined based upon a Transportation Impact Analysis (TIA) demonstrating decreased use of private vehicles and increased use of public transportation. Increased transit accessibility (1-15 points)	TBD	
Reduction Measure 7.2: Adopt and Implement a Bicycle Master Plan to Expand Bike Routes around the City			
7.2.B.1 Sidewalks	• Provide sidewalks on one side of the street (required) • Provide sidewalks on both sides of the street • Provide pedestrian linkage between commercial and residential land uses within 1 mile	0 point 1 point 3 points	
7.2.B.2 Bicycle Paths	• Provide bicycle paths within project boundaries • Provide bicycle path linkages between commercial and other land uses • Provide bicycle path linkages between commercial and transit	1 point 2 points 5 points	
Reduction Measure 8.1: Reduce Waste to Landfills			
8.1.B.1 Recycling	City initiated recycling program diverting 80% of waste requires coordination with commercial development to realize this goal. The following recycling features will help the City fulfill this goal: • Provide separated recycling bins within each commercial building/floor and provide large external recycling collection bins at central location for collection truck pick-up • Provide commercial/industrial recycling programs that fulfills an on-site goal of 80% diversion of solid waste	 2 points 5 points	
Other GHG Reduction Feature Implementation			
O.B.1 Other GHG Emissions Reduction Features	This allows innovation by the applicant to provide commercial design features that the GHG emissions from construction and/or operation of the project not provided in the table. Note that engineering data will be required documenting the GHG reduction amount and point values given based upon emission reductions calculations using approved models, methods, and protocols.	TBD	
Total Points Earned by Commercial/Industrial Project:			

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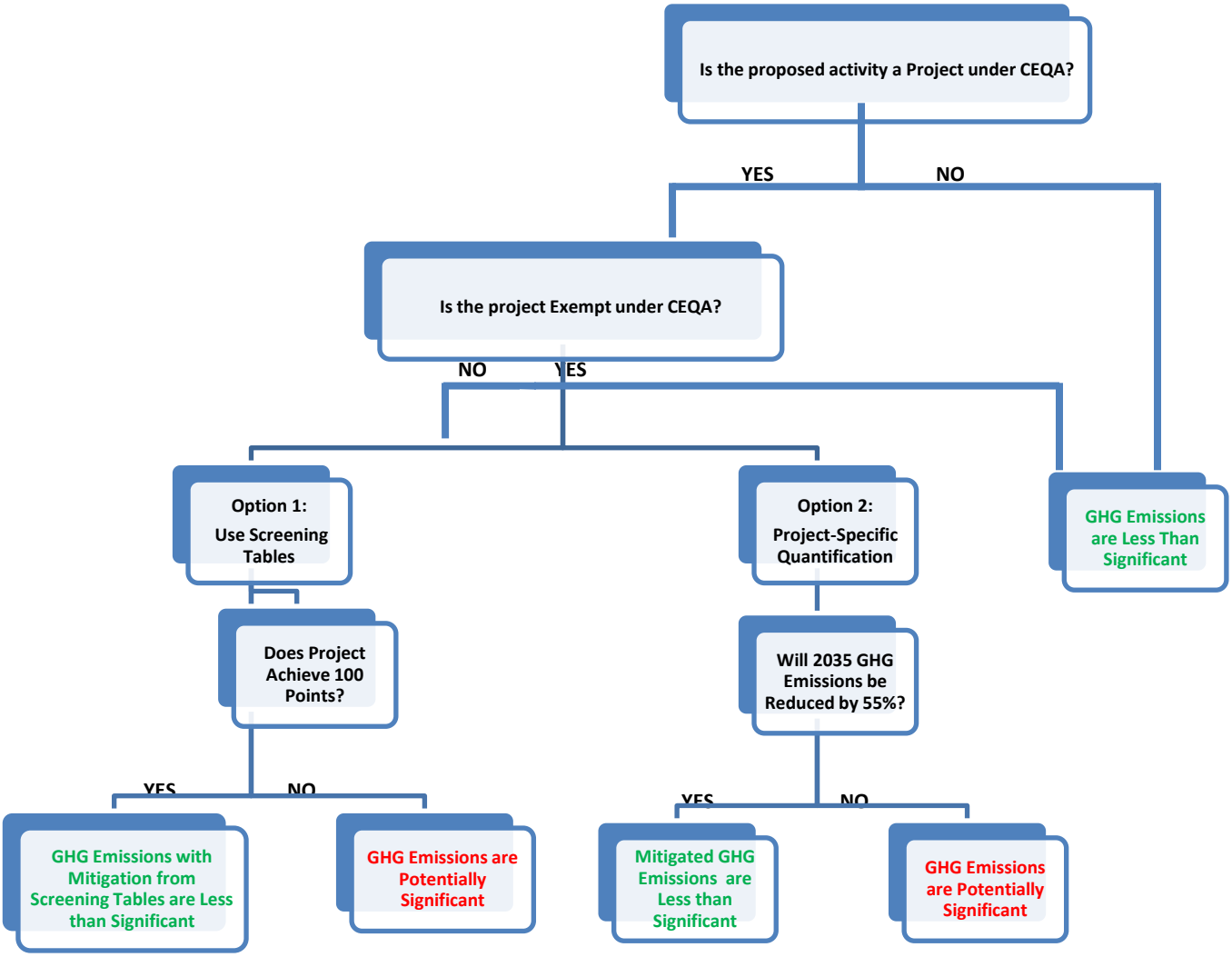
APPENDIX A: GHG DEVELOPMENT REVIEW PROCESS FLOW CHART DIAGRAM

Approach to Implementation of GHG Development Review



APPENDIX B: TRANSIT PRIORITY PROJECT AND SUSTAINABLE COMMUNITY PROJECT CHECKLIST

TRANSIT PRIORITY PROJECT CHECKLIST

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

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

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

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

Continue with the next list of land use questions below:

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

Determining Eligibility based upon the answers:

Full CEQA Exemption for Sustainable Community Projects (SCPs)

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

Transit Priority Projects (TPP)

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

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

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

Other Residential and Mixed-Use Projects

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

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

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

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

METHODS SUMMARY

The point values in the Screening Tables were derived from the projected emissions reductions that would be achieved by each of the reduction measures associated with new development within the City of Corona CAP Update. The points within the Screening Tables were proportioned by residential unit or square footage of commercial/industrial uses. This was accomplished by taking the predicted growth in households and commercial uses in 2030 and proportioning the appropriate reduction quantities for new development to the residential, commercial, and industrial land use sectors within the Screening Tables. This results in point values that are proportioned by residential unit or commercial/industrial square footage. Because of this outcome, the size of the project is not relevant to the Screening Tables. Regardless of size, each project needs to garner 100 points to demonstrate consistency with the CAP Update. Efficiency, not size of the project, is critical.

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

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

DEVELOPMENT OF THE POINT VALUES

Within the local reduction measures, 16,090 MT CO_2e would be reduced using the Screening Tables for new development. The Screening Tables and the point allocation within the Screening Tables are tied to 16,090 MT CO_2e of reductions.

The first step in allocating point values is to determine the number of new homes and commercial buildings that are anticipated by year 2030. The City predicts that a total of 3,026 new residential units will be needed by 2030 and a total of approximately 4,970,550 square feet of new commercial and industrial buildings within the City is needed to accommodate anticipated job growth.

Approximately 3,026 new residential units and 4,970,550 square feet of new commercial and industrial buildings within the City are anticipated to either use the Screening Tables or provide an independent analysis demonstrating reductions. Evaluating the growth in residential and commercial/industrial land uses, approximately 38 percent is attributable to residential and 62 percent is attributable to commercial/industrial land uses. Using those ratios, the Screening Tables would need to reduce 6,147 MT CO_2e from residential development and 9,943 MT CO_2e from commercial/industrial development by 2030.

Dividing the 6,147 MT CO_2e reductions of emissions afforded the Screening Table for new residential development by the anticipated 3,026 new residential units that will be built yields 2.03 MT CO_2e per residential unit that needs to be reduced to fulfill the anticipated reductions of the CAP Update. Using the same process, the Screening Tables for new commercial/industrial development would need to reduce 2.00 MT CO_2e per 1,000 gross square feet of commercial/industrial building area.

The levels of reduction efficiency for typical residential units in this climate zone yields:

0.0203 MT CO_2e per Point per Residential Unit

The levels of reduction efficiency for the mix of commercial/industrial uses in this climate zone yields:

0.0200 MT CO_2e per Point per 1,000 Square Feet of Gross Commercial/Industrial Building Area

Since each residential unit needs to reduce 2.03 MT CO_2e and each 1,000 square feet of commercial/ industrial building area needs to reduce 2.00 MT CO_2e, each project needs to gain 100 points to provide the expected reductions from the Screening Tables.