City of Indio

CLIMATE ACTION PLAN

ADOPTED SEPTEMBER 18, 2019

INDIO

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1. Introduction

In the next century, climate change will not only impact our natural environment, but also threaten the health and economic vitality of communities across California and the country. The extent to which society is impacted by climate change is dependent on our actions today. By curbing greenhouse gas (GHG) emissions and adapting our communities to the already changing environment, we can significantly reduce the damages incurred from climate change. Local governments are in a unique position to become climate leaders by initiating city-wide policies, incentives, and education programs to deploy new technologies, pilot regulatory mechanisms, and spark behavioral change to meet the deep greenhouse gas reduction targets established by the State of California.

Recognizing the important role that cities will play in the transition to a low-carbon economy, Indio has prepared this Climate Action Plan (CAP) as a roadmap for achieving community-wide GHG emissions reductions. Indio's CAP is a proactive step toward addressing the climate challenge to protect our children and grandchildren before climate change becomes irreversible. The CAP includes a quantitative inventory and analysis of emissions, starting with 2010 as the baseline year through to a projection of emissions for 2020, 2030, and 2040, the time horizon of the General Plan.

Indio's CAP is designed to provide clear policy guidance to City staff and decision-makers on how to reduce greenhouse gas emissions. It identifies a pathway to reduce emissions within consistent with State-level emissions reduction targets for 2020 and 2030. This path includes strategies for improving connectivity and land use patterns, improving transportation modes and systems, incorporating energy efficiency standards, increasing the City's renewable energy supply, and reducing solid waste.

Purpose of This Document

The Climate Action Plan serves as Indio's GHG reduction strategy. The CAP is a tool to identify the sources of emissions in the community and the steps necessary to reduce emissions. The CAP describes the community and municipal GHG emissions for baseline year 2010 and creates a path to decrease communitywide emissions through strategies and implementation actions outlined in Chapter 4. The City of Indio will use these strategies to minimize emissions across households, businesses, and government operations and facilities. This Plan also establishes citywide GHG reduction targets for 2020, 2030, and 2040, which represent the City's contribution to the State's effort to reduce GHG emissions. This CAP is intended to be a living plan, integrating new actions and strategies overtime.

In particular, this CAP:

- Establishes the City's goals for addressing the issue of climate change with consideration to the statewide reduction goal outlined in Assembly Bill 32 and Senate Bill 32;
- Demonstrates how the City can assist the region and the Southern California Association of Governments (SCAG) in reducing GHG emissions from cars and light trucks, consistent with California Air Resources Board (CARB) targets for the SCAG region: 8 percent per capita reduction from 2005 levels by 2020 and a 13 percent per capita reduction from 2005 levels by 2035;
- Quantifies both community and municipal GHG emissions in 2010 through an updated emissions inventory, using new modeling methodology adopted by the International Council for Local Environmental Initiatives (ICLEI)/Statewide Energy Efficiency Collaborative (SEEC) and recommended by the Governor's Office of Planning and Research (OPR);
- Forecasts future emissions that would occur through 2020, 2030, and 2040 (time horizon of the General Plan);
- Assesses forecasted local emissions against the per capita equivalent of statewide emissions targets;
- Develops and selects locally based implementation measures consisting of policies, programs, and/or plans to achieve emissions reductions that would meet or exceed the established GHG reduction targets; and
- Provides the framework for future projects to tier from the CAP analysis, consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5(b).

Relationship to the General Plan

The Indio General Plan describes the City's vision and establishes guiding principles, goals, policies, and implementation actions to realize the vision. This CAP evaluates the forecasted growth from the City's General Plan and the effects of the GHG reduction measures included in the General Plan. These reduction measures are included in Chapter 4 and the chapter provides a reference to the related action in the General Plan.

Context

The City of Indio is an active member of the Desert Cities Energy Partnership (DCEP) (managed by Coachella Valley Association of Governments (CVAG)), which pledges to collaborate on a regional greenhouse gas emissions inventory and promote energy efficiency and clean alternative energy. Through the DCEP, Indio has received assistance in identifying opportunities to improve energy efficiency both in municipal facilities and communitywide. Some recent GHG reductions programs are listed below.

- Solar installation at the City of Indio Water Authority at Plant 1 and City Hall;
- Energy efficiency upgrades to municipal facilities including high-efficiency light fixtures, heating ventilation and cooling (HVAC) upgrades, and occupancy sensors that automatically turn off lights;
- Upgrading select traffic signals to LED light fixtures;
- Water efficiency measures including turf reductions and installation of smart irrigation control systems;
- PACE financing programs for energy efficiency upgrades including Indio's Ygrene and HERO programs1;
- Solid waste recycling and diversion programs;
- Water-saving initiatives;
- Rebate and incentive programs offered by Imperial Irrigation District and Southern California Gas Company.
- Use of alternative-fuel vehicles in the municipal fleet service; and
- Adoption of a plastic bag ban, effective January 1, 2015.

[1] Ygrene and HERO are Property Assessed Clean Energy (PACE) programs that provide alternative financing for energy efficiency upgrades. For more information see https://ygreneworks.com/services-areas/cv-upgrade/ or https://www.heroprogram.com/ca/indio/.

2. Scientific + Regulatory Context

California, the Coachella Valley, and Indio are already experiencing climate change as the increased likelihood of droughts, worsening air quality, increased flooding, and heatwaves.[2] These changes to climate have been observed, and these trends are expected to continue into the future. Climate change impacts pose an immediate and growing threat to the economy, environment, and public health of cities, including:

- **Public health impacts**: Indio will experience longer, more frequent, and more severe heat waves, increasing the risk of heat-related morbidity in vulnerable populations. An increase in regional wildfires will further worsen air quality.
- **Flood impacts**: Stormwater infrastructure may require costly upgrades and increased maintenance costs in order to accommodate more intense rain events.
- **Drought**: Changes to the amount and timing of rainfall and regional groundwater levels may threaten an already limited regional water supply. Changes in precipitation can impact the production of staple crops, impacting the quantity and quality that is available, potentially increasing price.

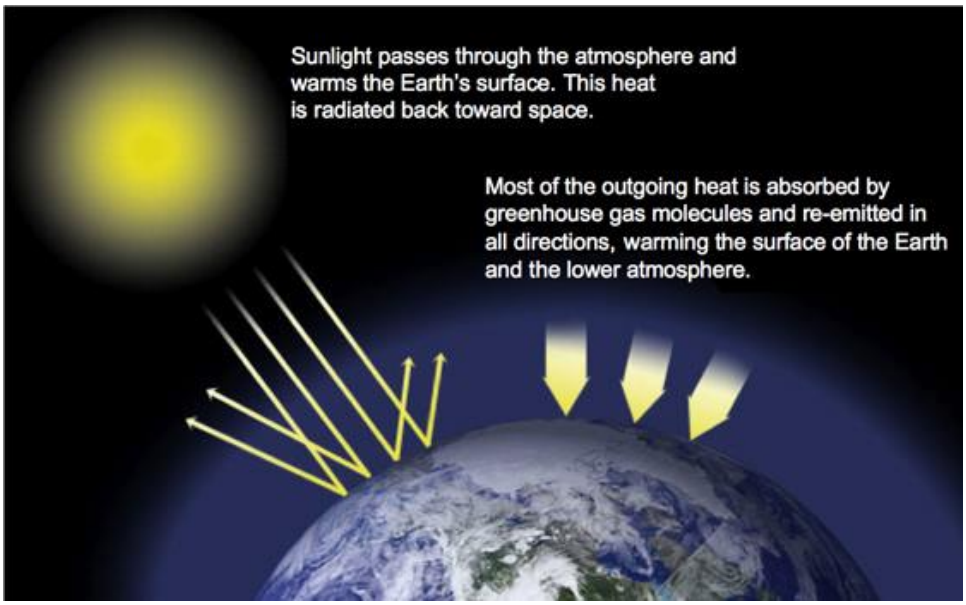
The following chapter summarizes key information about climate changes in the City as well as the regulatory context for emissions reductions.

[2] California Natural Resources Agency (2017). Safeguarding California. http://resources.ca.gov/wp-content/uploads/2017/05/DRAFT-Safeguarding-California-Plan-2017-Update.pdf

Greenhouse Gas Emissions + Climate Change

Human emissions of carbon dioxide and other greenhouse gases are important drivers of global climate change. Greenhouse gases trap heat in the atmosphere, resulting in warming over time, as shown in Figure 1.

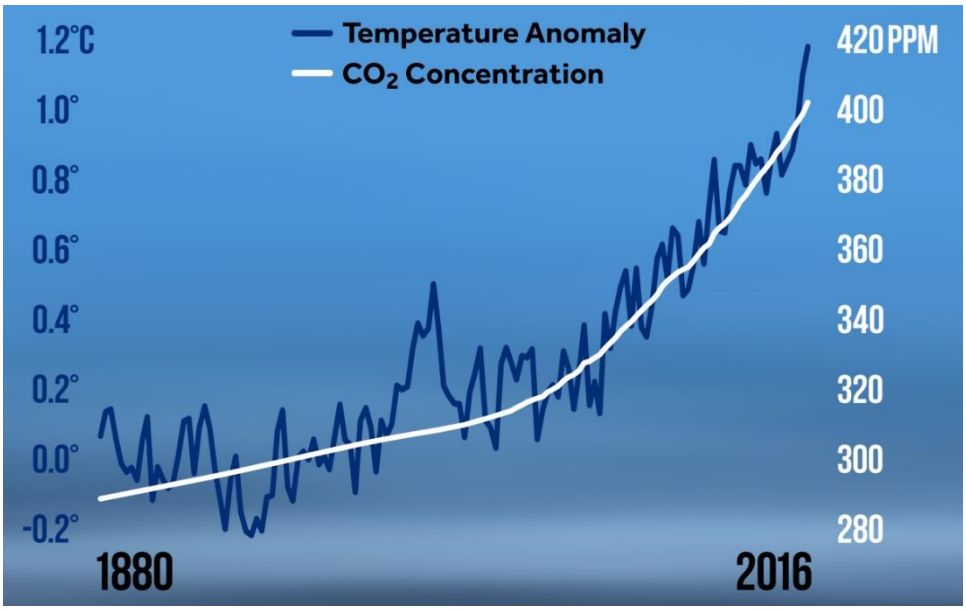
Figure 1. Greenhouse Gas Effect



Source: NASA (2018).

This atmospheric warming leads to other changes in the earth systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans. Figure 2 shows the closely related historic trends in carbon dioxide (CO_2) and global temperatures since 1880.

Figure 2. Global Temperatures and Greenhouse Gas Emissions



Source: Climate Central (2018).

The extent of climate change in the future depends in part on the amount of GHG emissions now and in the future. GHG emissions are driven by economic systems, land use patterns, transportation and energy systems, and other social and political factors. As such, climate scientists cannot be certain how emissions and the climate will change in the future.

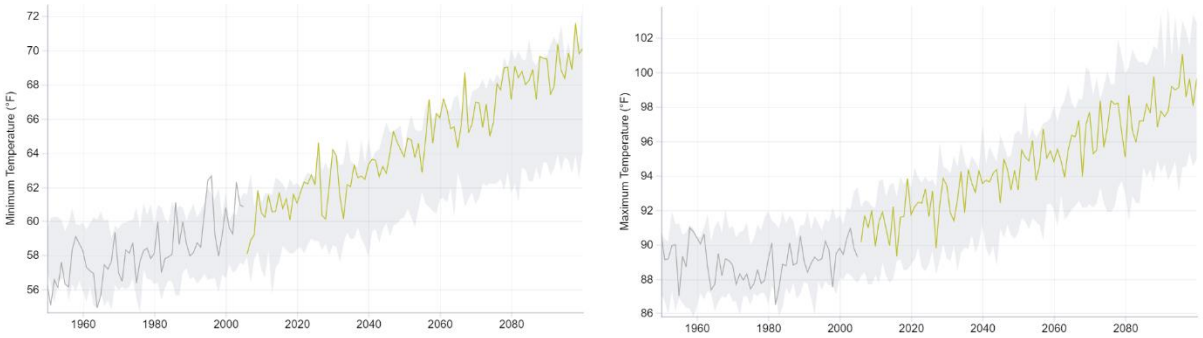
Scientists use GHG emission scenarios to understand a range of potential climate projections. These include: a higher emission (or business as usual) scenario where emissions continue to rise, along with population growth through 2050 and plateau around 2100, and a lower-emissions scenario where emissions peak around mid-century then decline, due to worldwide efforts to reduce them. This document includes data and forecasts representing an average climate model for the higher-emissions scenario (business as usual scenario) compared to potential reductions generated by the implementation of CAP strategies.

Temperature and Extreme Heat

During the last century, temperatures in California rose steadily. Between 1918 and 2006, the average minimum temperature increased by 0.3°F per decade, and the average maximum temperature increased by 0.13°F per decade. The rate of warming intensified from 1970 to 2006, with average minimum temperatures increasing 0.56°F per decade and average maximum temperatures rising 0.49°F per decade. Average minimum and maximum temperatures in Southern California rose faster than the State as a whole. Between 1970 and 2006, the average minimum temperature rose by 0.67°F per decade and the average maximum temperature increased by 0.74°F per decade across the region.[3]

Models indicate that temperatures will continue to rise in Indio. Annual maximum temperatures are projected to increase between 4.7°F and 5.8°F by mid-century (2040-2060) and 5.6°F and 9.1°F by end of century (2080-2100).[4] By the end of the century, average temperatures are anticipated to fall outside of the annual variability range seen in the historic record, particularly in the summer and fall. More simply, the average future temperature in the climate scenario with the least warming is greater than the very warmest year of the historic record.[5] Figure 3 shows the projected change in average annual minimum and maximum temperatures.

Figure 3. Projected Change in Average Annual Minimum and Maximum Temperatures in Indio



Note: Business as Usual Scenario (High Emissions), CanESM2 Model (Average)
Source: CalAdapt

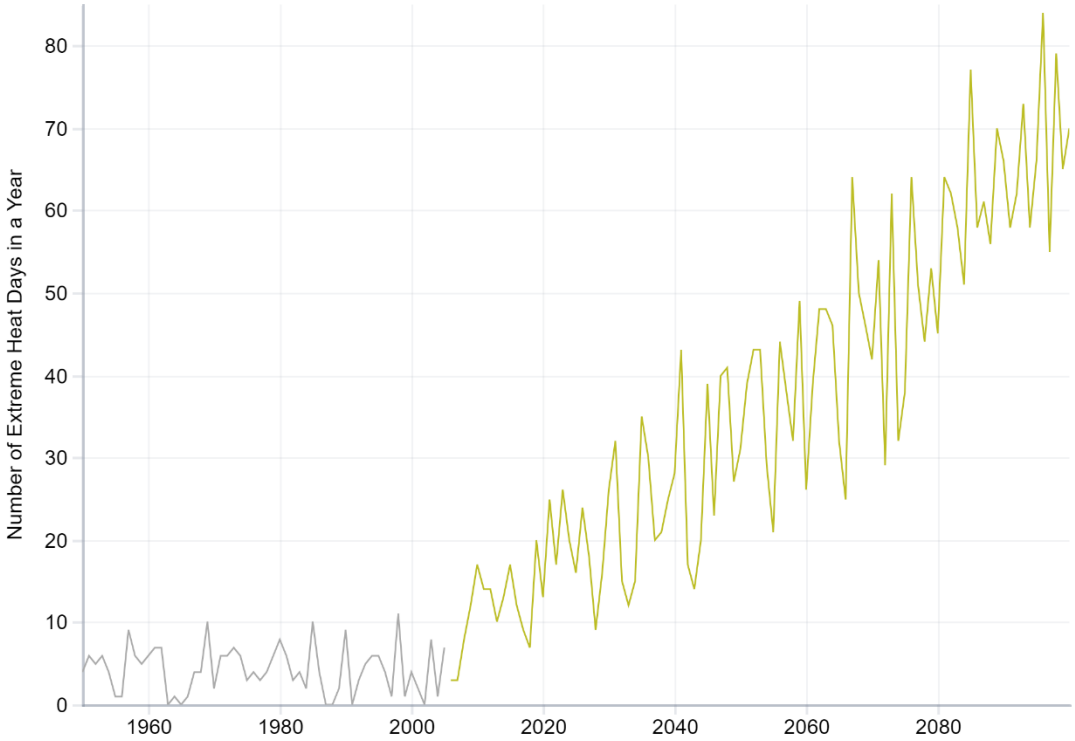
With climate change, extreme heat events in California and Indio are becoming more frequent, more intense, and longer lasting. An extreme heat day is defined by Cal-Adapt as a day between April and October when the maximum temperature exceeds a heat threshold. This threshold is often calculated as the 98th percentile of historical maximum temperatures between April 1 and October 31 based on observed daily temperature data. For Indio, this threshold is 104°F.

Between 1950 and 2005, Indio experienced, on average, about four extreme heat days per year. The number of extreme heat days is anticipated to increase significantly across the Coachella Valley region

[3] Cordero, E. C., W. Kessomkiat, J. Abatzoglou, and S. A. Mauget. (2011). the identification of distinct patterns in California temperature trends. Climatic change 108:357– 382.
[4] California Energy Commission. (2017). Cal-Adapt. Available at http://cal-adapt.org/.
[5] Fengpeng S, et al. (2015). A Hybrid Dynamical–Statistical Downscaling Technique. Part II: End-of-Century Warming Projections Predict a New Climate State in the Los Angeles Region. Journal of Climate. 28:4618-4636.

during the next century. Under a business-as-usual scenario, by mid-century Indio is expected to have 25 extreme heat days. By end of century, Indio is projected to experience 51 extreme heat days per year. Figure 4 shows the projected number of extreme heat days in Indio. More extreme heat days can pose a serious threat to human health, resulting in an increase in emergency room visits, hospitalizations,[6] and deaths.[7]

Figure 4. Projected Number of Extreme Heat Days



Note: Business as Usual Scenario (High Emissions), CanESM2 Model (Average)
Source: CalAdapt

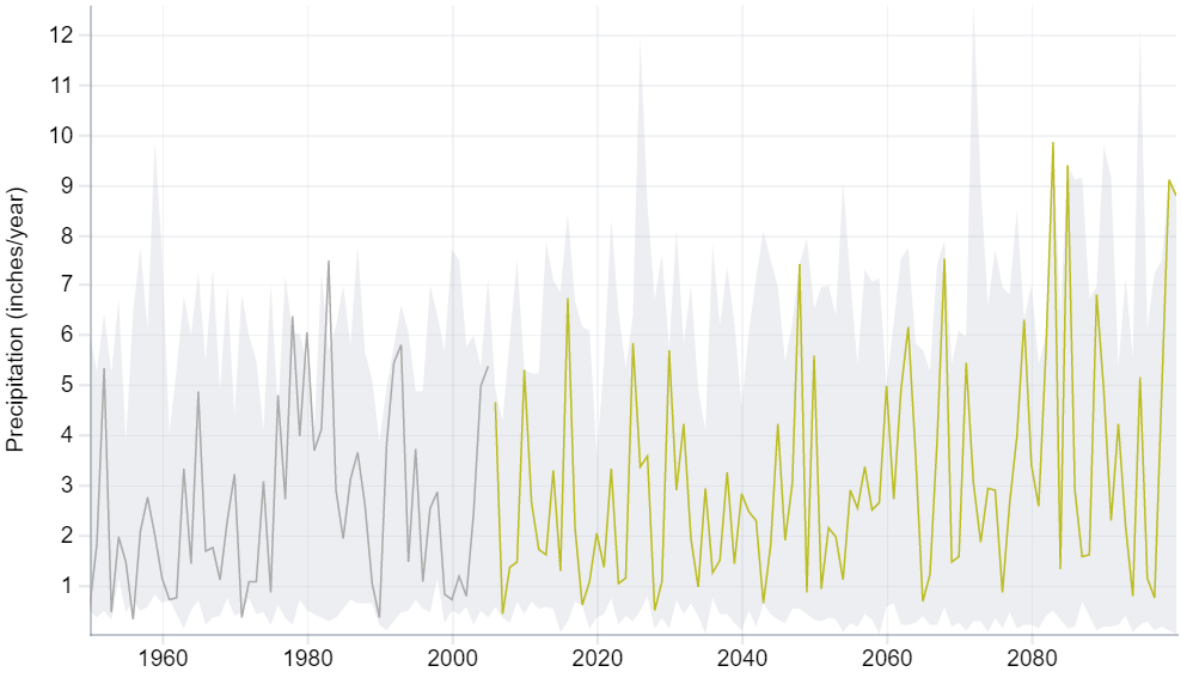
Heat waves, defined by Cal-Adapt as five or more extreme heat days, are also projected to occur more frequently by the end of the century. These events are predicated to impact larger areas, last longer, and have higher temperatures.[8]

[6] Knowlton, K., et. al. 2009. The 2006 California Heat Wave: Impacts on Hospitalizations and Emergency Department Visits. Environmental Health Perspectives, 117(1): pp. 61-67.
[7] Basu, R., Feng, W., and Ostro B. 2008. Characterizing temperature and mortality in nine California counties. Epidemiology, 19(1): pp. 138-45.
[8] Gershunov, A., and Guirguis, K. (2012). California heat waves in the present and future. Geophysical Research Letters, 39(18), 7.

Precipitation

Between 1961 and 2005, the historic annual precipitation mean in the Indio region was approximately 2.8 inches.[9] Annual precipitation, however, varies significantly between years. Overall changes in future precipitation and runoff are highly variable among climate models and relatively uncertain. Some precipitation projections for the region show a slight increase in annual rainfall, others show a slight decrease, and others show no change at all.[10] During the next century, Indio can expect approximately the same amount of total annual precipitation as it received in the last few decades of the 20th century. Figure 5 shows historic and future precipitation levels in Indio, which has fluctuated over time.

Figure 5. Average Annual Precipitation



Note: Business as Usual Scenario (High Emissions), CanESM2 Model (Average)
Source: CalAdapt

In the present-day climate, the region experiences wide swings in precipitation from year-to-year, and this variability is expected to continue under climate change with fluctuations between wet years and dry years.[11] Southern California's annual variability originates primarily from fluctuations in the number of large storms (Atmospheric river events), with approximately 90 percent of variability coming from the wettest days.[12] Therefore, drought occurs during years with fewer large storms and wet years occur when

[9] California Energy Commission. 2017. Cal-Adapt. Available at http://beta.cal-adapt.org/.
[10] Berg, N, et al. 2015. Twenty-Frist Century Precipitation Changes over the Los Angeles Region. Journal of Climate. 28: 401 – 421.
[11] Berg, N, et al. (2015). Twenty-Frist Century Precipitation Changes over the Los Angeles Region. Journal of Climate. 28: 401 – 421.
[12] Dettinger, M.D., and Cayan, D.R. (2014) Drought and the California Delta—A matter of extremes: San Francisco Estuary and Watershed Science, 12(2).

there are large storms. Figure 5 (above) shows the projected annual variability in precipitation, which is relatively consistent with historic observations.[13]

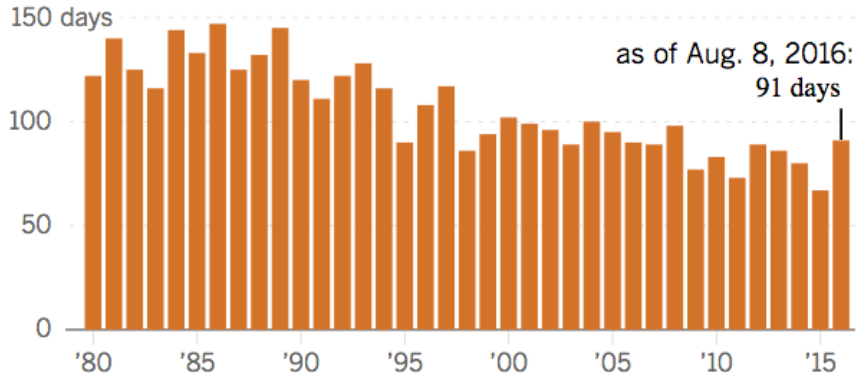
Due to anticipated warmer temperatures, more intense periods of rain may lead to an increase in winter runoff, which may impact flood risk. Annual stormwater runoff and peak runoff volumes may increase, which are anticipated to increase flood risk.

Air Quality and Wildfires

Air quality is expected to worsen with increasing climate change. Air quality is strongly dependent on weather, and climate change is expected to impact air quality through warming temperatures and more frequent episodes of stagnant air. Many strategies that are used to reduce greenhouse gases will also reduce emissions of air pollutants, such as ozone and particulate matter.

Overall, Southern California has the nation's worst smog and has consistently failed to meet federal ozone standards since 1979.[14] The number of days above the ozone standard, however, has been steadily declining since the 1980's in the South Coast Air Basin, as shown in Figure 6. However, in the summer of 2016, Southern California experienced its worst smog since 2008. By August 2016, ozone had exceeded federal standards on 91 days since the beginning of the year, compared to 67 days over the same period the previous year.[15]

Figure 6. Days above Ozone Standard – South Coast Air Basin



Source: Los Angeles Times

Figure 7 shows the number of days exceeding the federal ozone standard in the Los Angeles region and Coachella Valley. It illustrates the significant differences among non-attainment days across the entire region, including more days in Riverside County and the Coachella Valley.[16]

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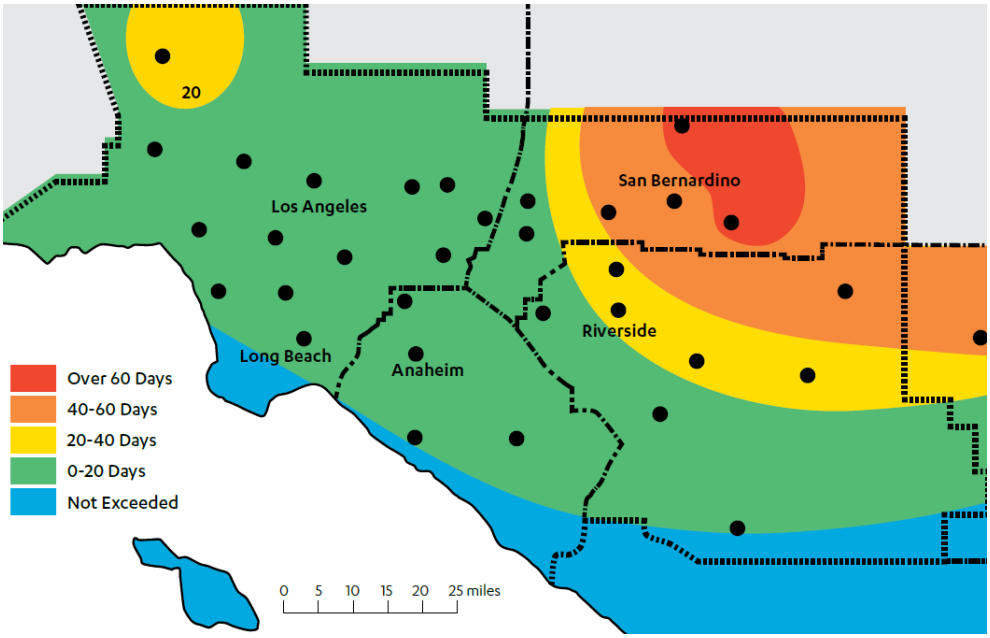
[13] California Energy Commission. (2017). Cal-Adapt. Available at http://beta.cal-adapt.org/.
[14] CalEPA. 2017. Air Quality and Meteorological Information (AQMIS2). Available at https://www.arb.ca.gov/aqmis2/display.php?year=2017&report=AREAMYR&o3pa8=SC&param=OZONE&ptype=aqd.
[15] Barboza, T. Aug. 11, 2016. SoCal Hit with Worst Smog in Years as Hot, Stagnant Weather Brings Surge in Hospital Visits. Los Angeles Times. Available at http://www.latimes.com/local/lanow/la-me-ln-summer-smog-20160805-snap-story.html.
[16] UCLA Institute of the Environment and Sustainability. 2016. 2015 Environmental Report Card for Los Angeles County.

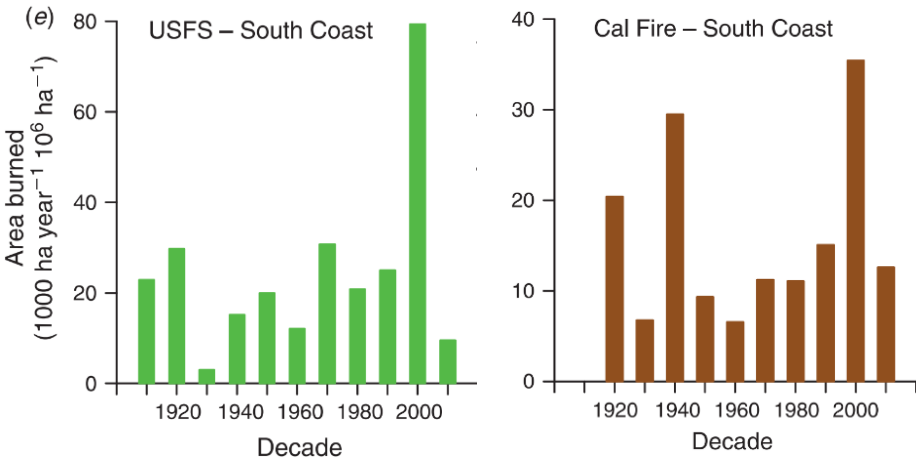
Figure 7. Number of Days Exceeding Federal Ozone Standard in 2013



Source: UCLA Institute of the Environment and Sustainability

Wildfires have increased in number and intensity across the Western US and Southern California in recent decades. These changes in wildfire patterns are often attributed to climate change and fire suppression techniques. As shown in Figure 8 the South Coast region, which includes Indio, had significant peaks in total area burned in the 1920s, 1940s, 1970s, and 2000s. The South Coast region is among the few areas within the State where burned area has increased in recent decades.[17]

Figure 8. Decadal Burning on US Forest Service and Cal Fire Managed Lands in California Climate Divisions



[17] Keeley, JE, AD Syphard. (2017). Different historical fire–climate patterns in California. International Journal of Wildland Fire 26(4): 253-268.

While the direct impacts of wildfire may be less of a concern for Indio, wildfires can be a significant source of air quality pollution. Wildfires burning within 50 to 100 miles of a city routinely cause air quality to be 5 to 15 times worse than normal, and often two to three times worse than the worst non-fire day of the year.[18] Emissions from wildfires can lead to excessive levels of particulate matter, ozone, and volatile organic compounds.[19]

Public Health

Climate change, together with other health stressors, is expected to impact many facets of public health in Indio. More extreme weather events, worsened air quality, and increased transmission of infectious disease may negatively affect human health, health behaviors, and the socio-economic factors that influence health outcomes. Some existing health threats may intensify, while new health threats may emerge. The impacts of climate change will not affect everyone equally. It is expected that already burdened and vulnerable populations, such as the elderly, infants and children, minority communities, and people living in poverty, will be disproportionally impacted by climate change. Important drivers of vulnerability include the attributes of certain groups such as: age, socioeconomic status, race, current level of health, and location. Fortunately, many of the actions that address climate change also improve the health and wellbeing of vulnerable communities.[20]

Health Impacts

Public health impacts of climate change in Indio include: extreme heat, poor air quality, and drought. For example, extreme heat may cause premature death, cardiovascular stress and failure, heat-related illness such as heat stroke, heat exhaustion, and kidney stones. Air pollution can worsen asthma, allergies, chronic obstructive pulmonary disease, and other cardiovascular and respiratory diseases. Droughts can cause hunger and malnutrition caused by disruption in food and water supply, increased cost and conflict over food and water, and food and water-borne disease. Furthermore, these impacts can also lead to mental and health disorders such as depression, anxiety, Post-traumatic Stress Disorder, substance abuse, and other conditions, cause by disruption, displacement, and migration, loss of home, lives and livelihood. Preventive and adaptive actions can reduce the severity of these impacts.

While climate change affects everyone in a community, not all people are impacted equally. People of color, immigrants, and lower-income populations experience increased exposure and sensitivity to climate hazards and a reduced capacity to adapt. Figure 9 shows the distribution of disadvantaged populations in Indio.

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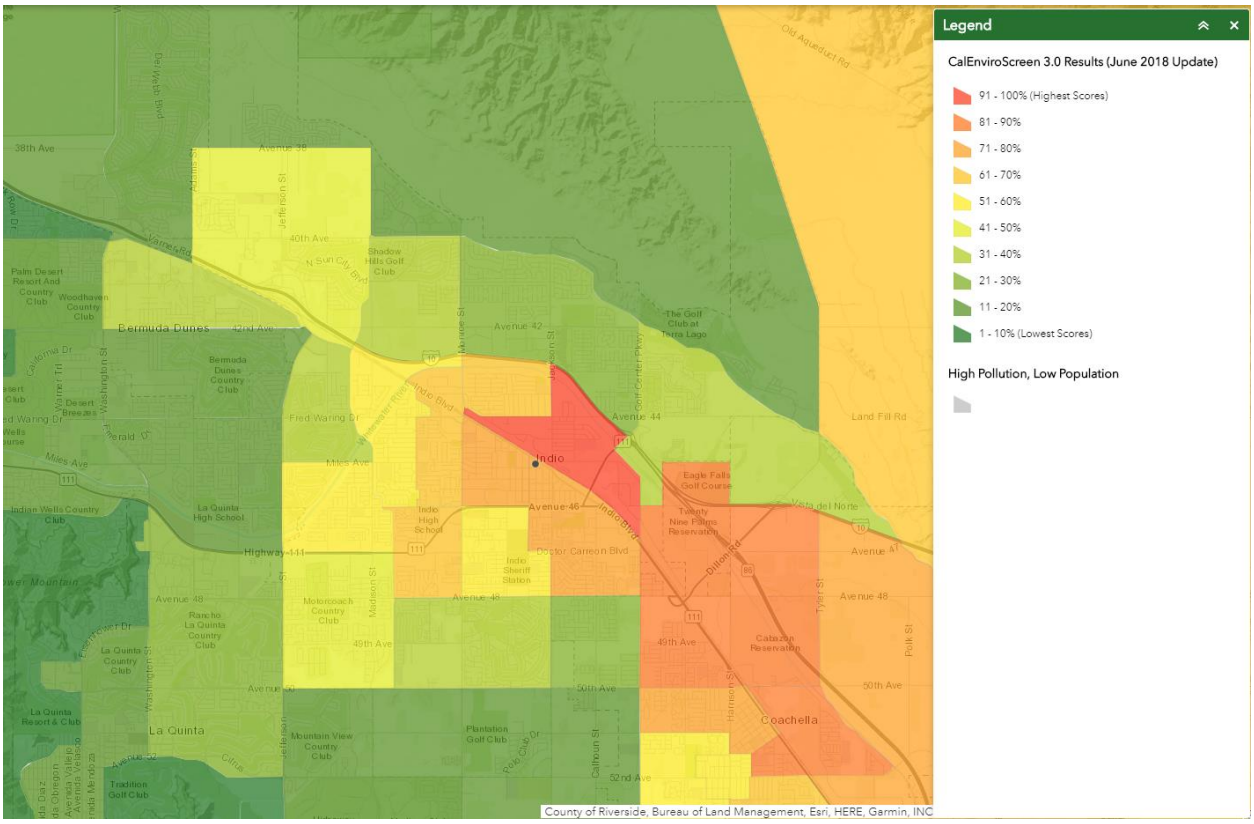
[18] Kenward, A, et al. 2013. Wildfires and Air Pollution: The Hidden Health Hazards of Climate Change. Climate Central. Available at http://assets.climatecentral.org/pdfs/WildfiresAndAirPollution.pdf.

[19] Phuleria, HC, et al. 2005. Air Quality Impacts of the October 2003 Southern California Wildfires. Journal of Geophysical Research. 110(D7).

[20] California Emergency Management Agency and Natural Resource Agency (2012). California Adaptation Planning Guide. http://resources.ca.gov/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf

Figure 9. Disadvantaged Populations



Source: OEHHA CalEnviroScreen 3.0

Health Co-benefits

Climate change will have significant health impacts and it is important that people are prepared to mitigate and adapt to the changing climate. Many climate change mitigation and adaptation efforts can bring multiple health co-benefits to Indio residents. For example, reducing vehicle miles traveled can increase physical activity, reduce chronic disease, improve mental health, and reduce air pollution. Similarly, reducing energy intensity in local food systems by promoting local agriculture can reduce air pollution and cardiovascular disease due to saturated fats, increase access to healthy, fresh foods, and local social cohesion. Urban greening is another strategy that helps reduce temperature and urban heat island health effect, air pollution, noise, and enhance safety. Additionally, reducing residential building energy use can reduce household energy costs and promote healthy homes while at the same time creating local green jobs.

Legislative + Regulatory Context

California has established itself as a national leader on climate change. The following section describes key elements of the legislative and regulatory context in California. This legislative framework guided development of the Climate Action Plan and greenhouse gas forecasting.

Table 1. Summary of State Climate Change Regulation

Regulation	Summary
Assembly Bill 398 (Eduardo Garcia, Chapter 135, Statutes of 2017)	**Cap-and-Trade Extension** Extends and improves the Cap and Trade Program, which will enable the state to meet its 2030 emission reduction goals in the most cost-effective manner.
Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016)	**Short-lived Climate Pollutants** Establishes statewide reduction targets for short-lived climate pollutants.
Assembly Bill 197 (Eduardo Garcia, Chapter 250, Statutes of 2016)	**Greenhouse gas regulations** Prioritizes direct emission reductions from large stationary sources and mobile sources.
Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)	**Greenhouse Gas emission reduction target for 2030** Establishes a statewide greenhouse gas (GHG) emission reduction target of 40 percent below 1990 levels by 2030.
Senate Bill 350 (De León, Chapter 547, Statutes of 2015	**Clean Energy and Pollution Reduction Act of 2015** Establishes targets to increase retail sales of renewable electricity to 50 percent by 2030 and double the energy efficiency savings in electricity and natural gas end uses by 2030.
Senate Bill 1275, (De León, Chapter 530, Statutes of 2014)	**Charge Ahead California Initiative** Establishes state goal of 1 million zero-emission and near-zero-emission vehicles in service by 2020. Amends the enhanced fleet modernization program to provide a mobility option. Establishes the Charge Ahead California Initiative requiring planning and reporting on vehicle incentive programs, and increasing access to and benefits from zero-emission vehicles for disadvantaged, low-income, and moderate-income communities and consumers.
Senate Bill 535 (De León, Chapter 830, Statutes of 2012)	**Greenhouse Gas Reduction Fund and Disadvantaged Communities** Requires the California Environmental Protection Agency to identify disadvantaged communities; requires that 25% of all funds allocated pursuant to an investment plan for the use of moneys collected through a cap-and-trade program be allocated to projects that benefit disadvantaged communities and 10 those 25% be use within disadvantaged communities; and requires the Department of Finance to include a description of how these requirements are fulfilled in an annual report.
Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008)	Sustainable Communities & Climate Protection Act of 2008 requires Air Resources Board to develop regional greenhouse gas emission reduction targets for passenger vehicles. ARB is to establish targets for 2020 and 2035 for each region covered by one of the State's 18 metropolitan planning organizations.
Greenhouse gas inventory transferred to Air Resources Board from the Energy Commission.	Greenhouse gas inventory transferred to Air Resources Board from the Energy Commission.
Senate Bill 1 (Murray, Chapter 132, Statutes of 2006)	California's Million Solar Roofs plan is enhanced by PUC and CEC's adoption of the California Solar Initiative. SB1 directs PUC and CEC to expand this program to more customers and requires the state's municipal utilities to create their own solar

	rebate programs. Beginning January 1, 2011, this bill requires a seller of new homes to offer the option of a solar energy system to all customers negotiating to purchase a new home constructed on land meeting certain criteria and to disclose certain information.
Senate Bill 107 (Simitian, Chapter 464, Statutes of 2006)	SB 107 directs California Public Utilities Commission's Renewable Energy Resources Program to increase the amount of renewable electricity (Renewable Portfolio Standard) generated per year, from 17% to an amount that equals at least 20% of the total electricity sold to retail customers in California per year by December 31, 2010.
Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006)	California Global Warming Solutions Act of 2006. This bill requires Air Resources Board (ARB) to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. ARB shall adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program.

California Climate Change Legislation, http://www.climatechange.ca.gov/state/legislation.html

3. Greenhouse Gas Inventory, Emissions Forecast + Targets

The City of Indio greenhouse gas emissions inventory captures both communitywide and municipal operations emissions generated from energy consumption in homes and buildings, fossil fuels in transportation, and methane emissions from waste disposal, and informs development of effective strategies and actions to reduce emissions. This chapter summarizes both communitywide and municipal emissions.

The City's baseline communitywide GHG inventory for 2010 forms the basis for setting emissions reduction targets and measuring future progress. Detailed information about the inventories is provided in Appendix A, including the methods of quantification and data sources.

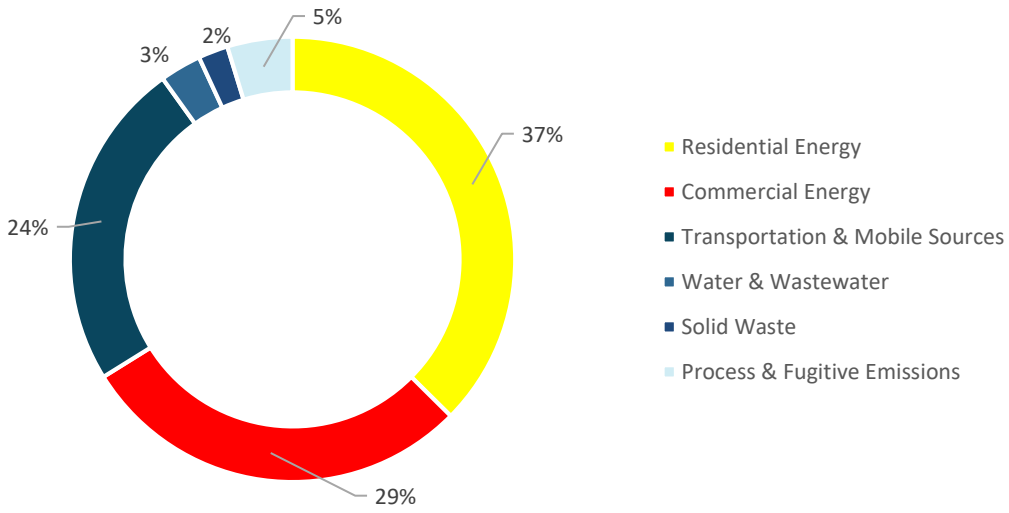
Communitywide Emissions Inventory

Table 2 and Figure 11 below illustrate Indio's 2010 communitywide emissions baseline of 607,946 metric tons of carbon dioxide equivalent ($MTCO_2E$). This aggregate number accounts for direct emissions from the combustion of fuel in vehicles, indirect emissions associated with community electricity consumption, and emissions from solid waste generated and water consumed in Indio.

Table 2. 2010 Communitywide Emissions

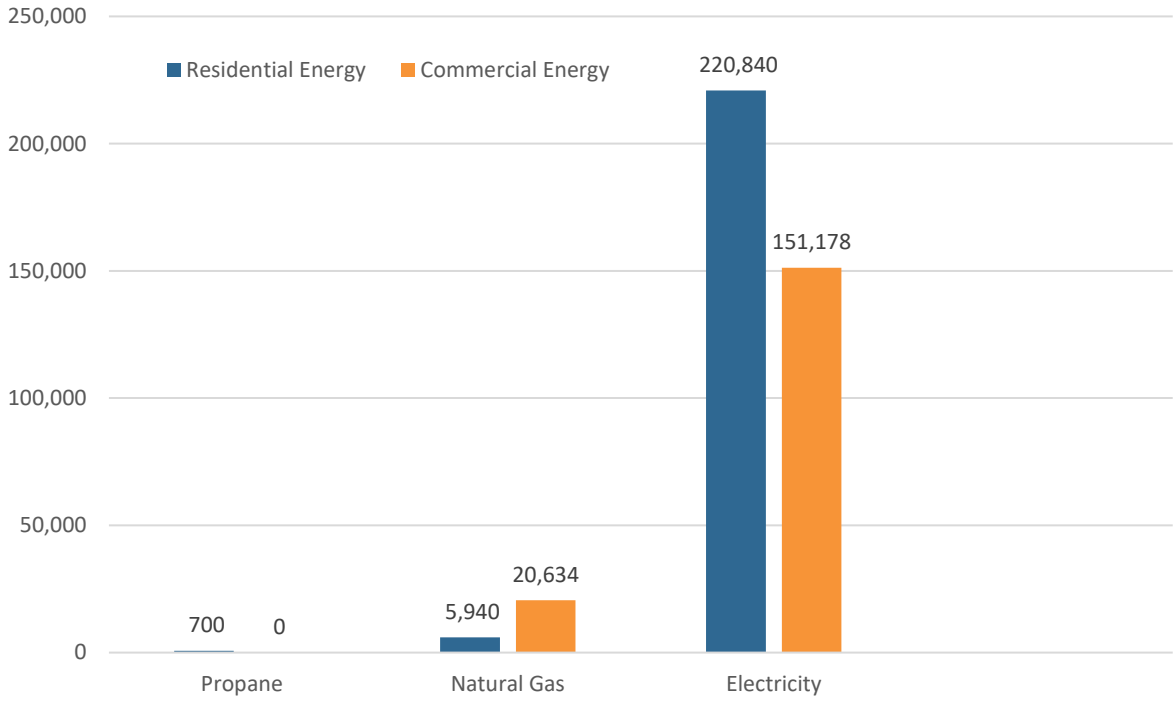
Source	2010 Inventory	
	$MTCO_2E$	Percent
Residential Energy	227,480	37%
Commercial Energy	174,693	29%
Mobile Sources	145,518	24%
Water and Wastewater	18,325	3%
Solid Waste	13,154	2%
Fugitive Emissions	28,776	5%
TOTAL	**607,946**	

Figure 11. Communitywide Emissions by Sector



GHG emission from energy use represent the largest proportion of emissions in Indio. Energy use emissions are generated directly by the combustion of fossil fuels, such as natural gas used in space and water heaters, and indirectly by the generation of electricity from fossil fuels at off-site power plants. Residential and commercial energy use generated a total of 402,173 $MTCO2_E$ in 2010, which accounts for 66 percent of total communitywide emissions. Figure 12 shows the breakdown of GHG emissions by sector (residential or commercial) and by source (electricity, natural gas propane). The residential sector represents a little over half of the emissions from energy use (56 percent). The majority of these emissions are from electricity use.

Figure 12. 2010 Greenhouse Gas Emissions (in $MTCO_2E$) from Residential and Commercial Energy Emissions



Emissions from transportation are the second largest source of emissions in the City. These emissions from vehicles come from the combustion of fossil fuels in vehicle engines for on-road vehicles and off-road equipment, such as construction and mining equipment. In 2010, the transportation sector generated a total of 145,518 $MTCO_2E$ annually, which accounts for 24 percent of total communitywide emissions.

Water use and wastewater generation indirectly generate GHG emissions. These emissions include the energy used to supply, distribute, and treat water and wastewater and the process emissions (primarily nitrous oxide [N_2O]) from wastewater treatment. In 2010, the water and wastewater sector generated a total of 18,325 $MTCO_2E$ annually, which accounts for 3 percent of total communitywide emissions.

Solid waste emissions include vehicle emissions from the collection of waste and disposal of solid waste in landfills. Disposal of waste in landfills produces GHG emissions, primarily methane from anaerobic

decomposition. The solid waste sector generated a total of 13,154 $MTCO_2E$ in 2010, which accounts for 2 percent of emissions.

Finally, the inventory includes fugitive emissions sources such as ozone-depleting substances (ODS), i.e. aerosols used by the public and N_2O emissions from fertilizer used in agriculture and landscaping maintenance. ODS include many man-made substances that are primarily used in refrigeration, air conditioning, insulating foams, solvents, and aerosol products. In 2010, the fugitive emissions sector generated a total of 28,776 $MTCO_2E$ annually, which accounts for 5 percent of total communitywide emissions.

Municipal Emissions Inventory

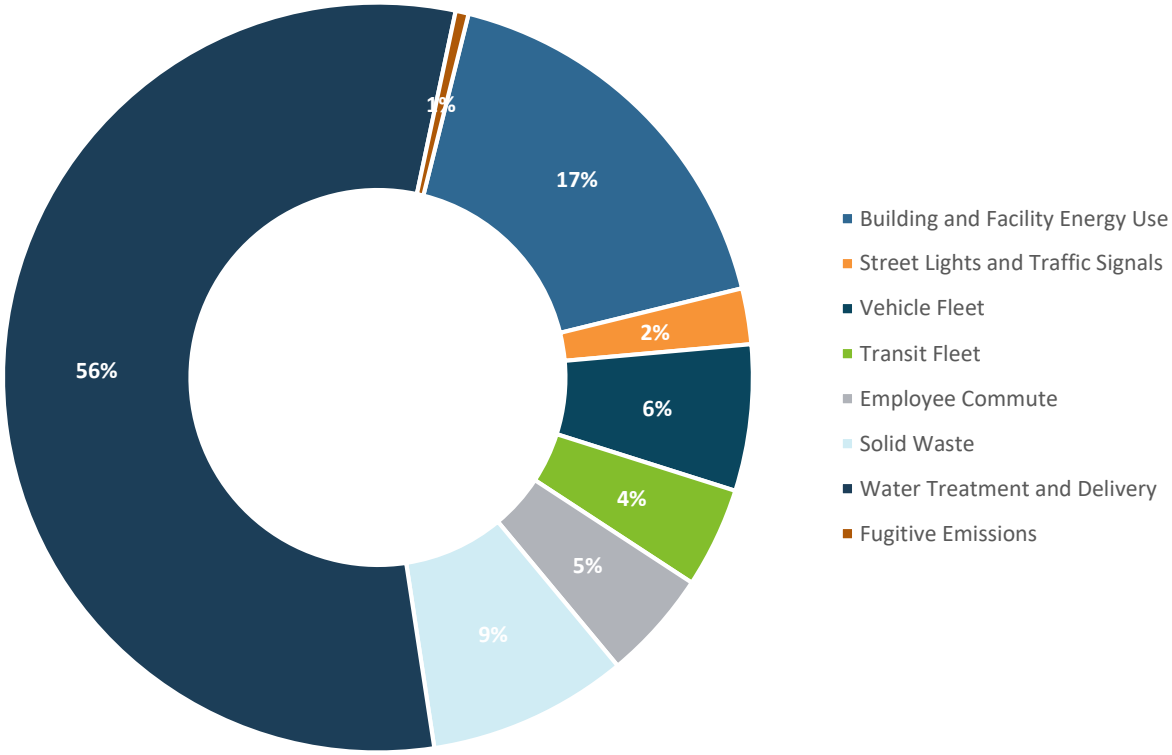
While municipal emissions are included in the communitywide inventory, the municipal inventory is intended to provide details about emissions sources the City has direct influence over. The municipal inventory provides a baseline from which the City can measure emissions reductions that result from the adoption and implementation of emission-reducing technologies and practices.

Municipal emissions are emissions due to the daily operation and activities of the City. Table 3 summarizes the City's 2010 inventory of greenhouse gas emissions by sector and Figure 13 provides a visual representation of the contribution of each sector to total municipal emissions. Total municipal emissions were 14,599 $MTCO_2E$ in 2010, with water treatment and delivery accounting for over half the emissions.

Table 3. Municipal Emissions by Sector

Sector / Sources	$MTCO_2E$	Percent
Building and Facility Energy Use	2,524	17%
Streetlights and Traffic Signals	351	2%
City Vehicle Fleet	921	6%
Transit Fleet	632	4%
Employee Commute	692	5%
Solid Waste	1,261	9%
Water Treatment and Delivery	8,136	56%
Fugitive Emissions	82	1%
TOTAL	**14,599**	

Figure 13. Municipal Emissions by Sector



Communitywide Emissions Forecast

Forecasting future emissions in the City starts with emissions from a baseline year or update year, and projects forward. Two emissions forecasts were developed: a business-as-usual (BAU) forecast and an adjusted business-as-usual forecast. The BAU emissions forecasts were derived based on demographic growth projections from the City of Indio General Plan 2040 for future population, jobs, and households. The BAU forecast assumes that the City and State will take no further regulatory actions to reduce emissions, including adopting stricter building codes or vehicle efficiency regulations. The adjusted BAU forecast accounts for the local impact of State measures designed to reduce GHG emissions, such as Title 24 updates, the Renewables Portfolio Standards (RPS), and the Pavley Clean Car Standards.[21] Table 4 shows the growth projections.

Table 4. Indio Growth Projections

	Existing			Indio 2040 Growth Projections***		
	2010*	2018**	Incremental Growth (2018 - 2010)	2040	Incremental Growth (2040 - 2010)	Compound Annual Growth Rate
Population	76,036	87,883	11,847	119,857	43,821	1.6%
Households	23,378	26,234	2,856	38,203	14,825	1.7%
Household Size (Ave)	3.25	3.35	4.15	3.14	2.96	N/A
Employment	14,925	15,565	640	24,792	9,227	2.0%

*Existing 2010 data collected from the US Census (population, households, and household size) and Census LEHD for employment

**Existing 2018 data collected from the California Department of Finance (populations, households, household size) and Census LEHD for employment (2015)

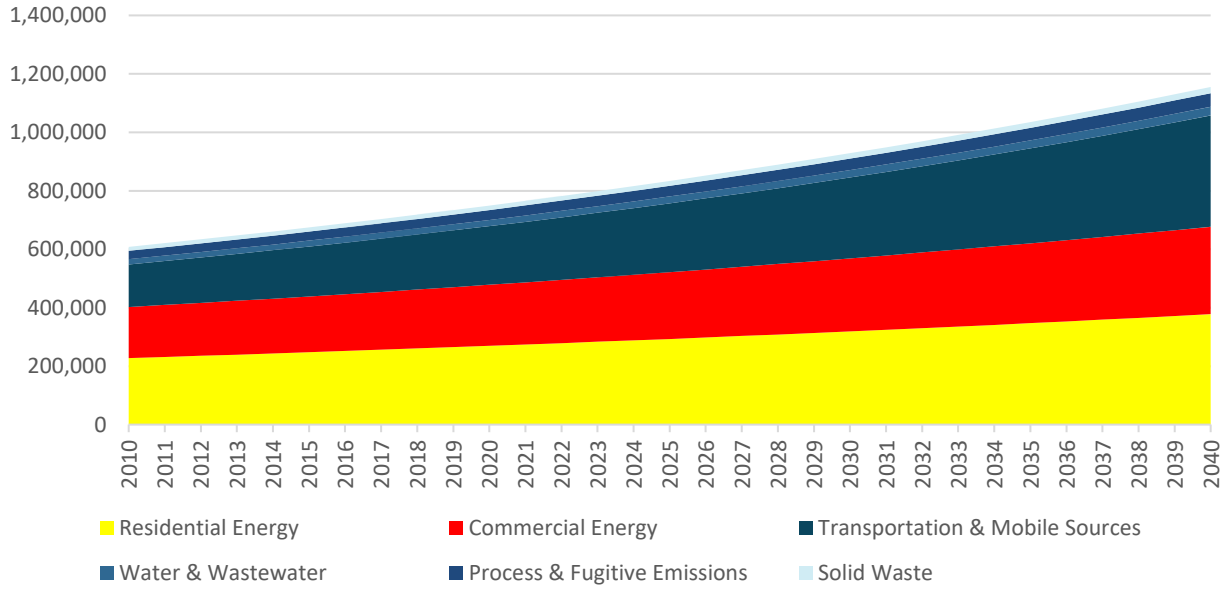
*** Indio 2040 Projections developed by Metropolitan Research + Economics (average projection value) employment growth from 2015

[21] For more information on California's climate change policies, programs, and regulations, see Chapter 2: Regulatory Setting.

Business-as-Usual Forecast

The BAU forecast estimates the emissions from the commercial and municipal; industrial; residential; transportation; solid waste; and water sectors, consistent with the 2010 greenhouse gas inventory. Figure 14 displays the forecasted emissions from 2010 to 2040 in terms of total emissions. Total emissions grew from a 2010 baseline of 607,946 $MTCO_2E$ to 1,154,996 $MTCO_2E$ in 2040. This represents a 90 percent increase in emissions.

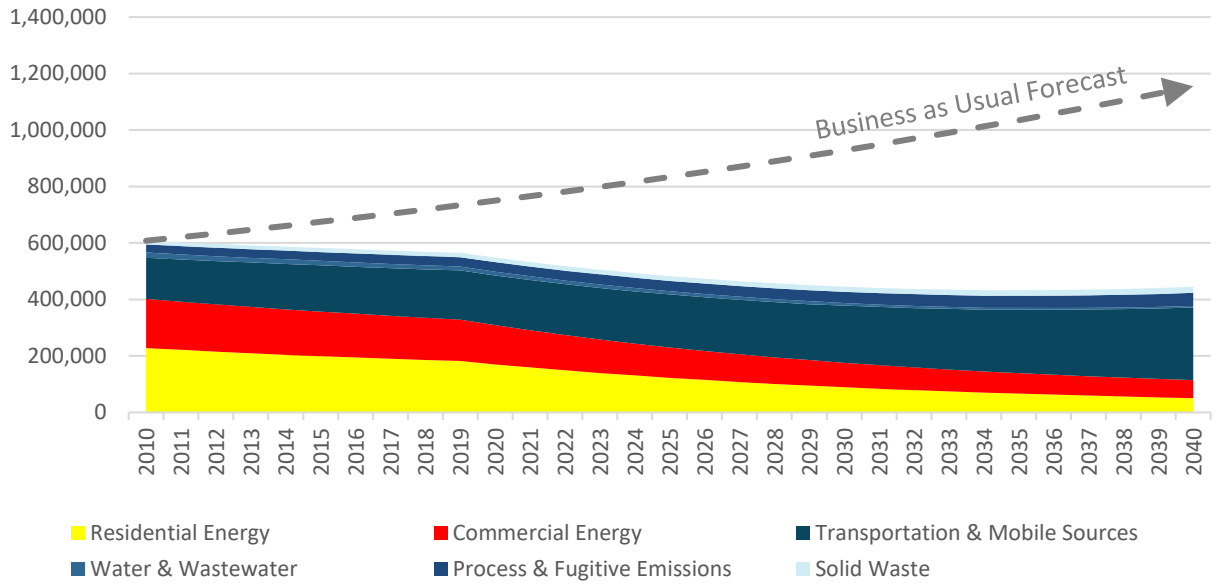
Figure 14. BAU Greenhouse Gas Emission Forecast



Adjusted Business-as-Usual Forecast

The adjusted BAU forecast accounts for the local impact of State measures designed to reduce greenhouse emissions. These measures include the Pavley vehicle standards and the RPS. Collectively, these measures are expected to reduce emissions by nearly 62 percent from the 2040 BAU forecast. Figure 15 shows how the BAU forecast compares to the Adjusted BAU forecast that accounts for state measures.

Figure 15. Adjusted BAU Greenhouse Gas Emission Forecast



Greenhouse Gas Reduction Target

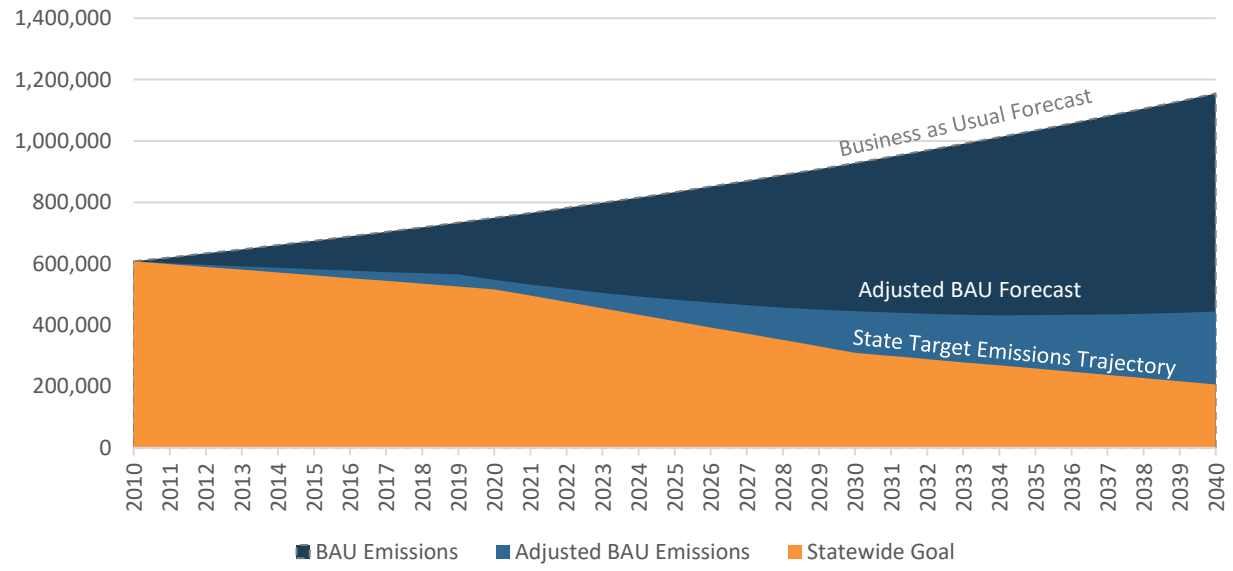
The City is committed to supporting State efforts to reduce GHG emissions and achieve statewide greenhouse gas reduction targets. EO S-3-05 established statewide greenhouse reduction targets in California for the years 2010, 2020, and 2050. EO B-30-15 added an interim GHG emissions reduction goal for the State of California to reduce GHG emissions to 40 percent below 1990 levels by 2030.

Figure 16 shows the greenhouse gas emissions forecasts for Indio (BAU and adjusted BAU) as compared to the State target emissions trajectory.

Reducing greenhouse gas emissions by 40 percent below 1990 levels in 2030 and by 80 percent below 1990 levels by 2050 aligns with scientifically established levels needed in the U.S. to limit global warming below 2°C.

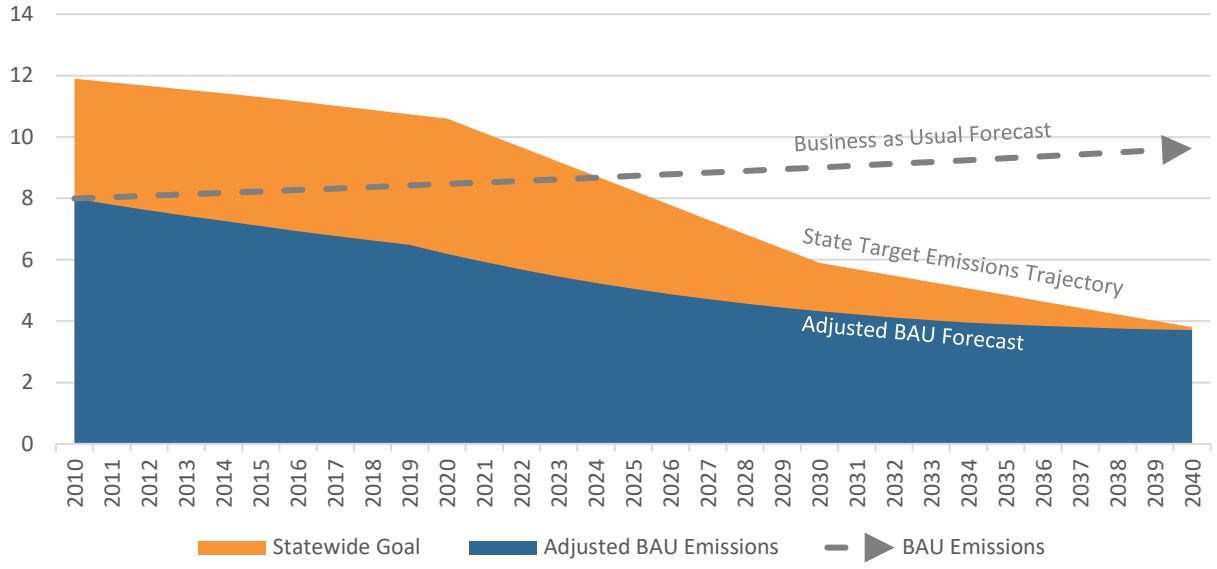
Source: California Air Resources Board

Figure 16. 2010 Total Baseline Emissions, BAU and Adjusted BAU Forecasts, and State Targets



California emissions reduction targets are communicated on a per-capita or per-service population basis. These “efficiency” targets represent the rate of emissions needed to meet the AB 32 and SB 32 targets. The CARB’s Proposed Scoping Plan recommends an efficiency target approach for local governments for 2030 and 2050 target years. Figure 17 shows the per capita greenhouse gas reduction target for Indio, as compared to the BAU and Adjusted BAU forecasts.

Figure 17. 2010 Per Capita Baseline Emissions, BAU and Adjusted BAU Forecasts, and State Targets



As outlined in the Strategies and Actions chapter, the Climate Action Plan provides a roadmap to meeting these deep greenhouse gas reductions by 2030 and 2040, consistent with the State's emission reduction targets.

4. Strategies + Actions

The Climate Action Plan details strategies and actions in five sectors to achieve the greenhouse gas emissions reduction goal. These strategies and actions were co-developed by the City and members of the community through the General Plan update process. The strategies and actions directly reflect the policy direction outlined in Indio 2040.

The strategies and actions described in the Climate Action Plan are implemented through State-level programs to implementation cleaner energy and decarbonized buildings, related plans and implementation programs across City departments, and new development proposals. To meet these greenhouse gas emissions reduction targets, the City must fund and implement those related plans and programs.

The Climate Action Plan measures are organized in five different areas:

- **Clean Energy**
- **Low-Carbon Buildings**
- **Zero Waste**
- **Water Conservation**
- **Sustainable Land Use and Transportation**

Additional climate adaptation policies and implementation actions are included in the Indio 2040 General Plan.

Table 5. Summary of Greenhouse Gas Reduction Measures

Key Strategies	GHGs Reduced - 2040	Example Tracking Metrics
Clean Energy		
Increase Local Renewable Energy Generation	7,655 $MTCO_2e$	Homes and businesses with solar Local solar generation IID % of renewable energy
Low-Carbon Buildings		
Improve Efficiency of Existing Buildings	18,506 $MTCO_2e$	Electricity and natural gas use (total and per capita) Building retrofits Natural gas systems electrified
Promote Green Building	45,882 $MTCO_2e$	Net zero buildings
Improve Efficiency of Municipal Operations and Public Infrastructure	Supportive strategy	Electricity and natural gas use (total and per capita) Building retrofits Solar energy generation
Zero Waste		
Solid Waste Diversion	13,452 $MTCO_2e$	Solid waste generation Waste diversion rates Tonnage of recycling and organics diverted from the landfill
Green Purchasing	Supportive strategy	Post-consumer content paper products Green Seal certified cleaning products
Water Conservation and Efficiency		
Promote Water Conservation	1,955 $MTCO_2e$	Water use (total and per capita)
Promote Water Recycling and Greywater Use	339 $MTCO_2e$	Recycled water use (total)
Sustainable Land Use and Transportation		
Support Fuel Efficient and Alternative Fuel Vehicles	13,228 $MTCO_2e$	Electric vehicle and zero-emission vehicles (% of fleet) Charging stations installed
Improve Pedestrian and Bicycle Infrastructure	1,837 $MTCO_2e$	Miles of bike lanes Complete Street retrofits completed
Expand Public Transit Options and "Last Mile" Connectivity	Supportive strategy	Transit ridership rates
Support Transportation Demand Management	Supportive strategy	TDM program participations
Promote Smart Growth, TOD, and Complete Neighborhoods	Supportive strategy	Residential and employment density Intersection density

Clean Energy

Greenhouse gas emissions associated with the use of electricity and natural gas account for 66 percent of the City's 2010 emissions. The City and the Imperial Irrigation District (IID) are committed to promoting renewable energy generation for its own operations and throughout the community. Renewable energy sources include wind, solar, biogas, and other energy sources that substitute for more conventional fossil fuels. Renewable energy should be combined with energy conservation and efficiency measures to reduce costs and maximize community benefits.

Photo: Jay Calderon/The Desert Sun

California placed requirements on electric utilities to provide a portion of their energy from renewable sources. Known as the Renewable Portfolio Standard (RPS), the RPS requires that utilities must purchase a minimum of 33 percent of its retail electricity from renewable sources by 2020 (SB 2 1X), 50 percent by 2030 (SB 350), and 100 percent by 2045 (SB 100). As of 2017, IID sourced 29 percent of its retail electricity from renewable sources.

In addition to the purchase of electricity from IID, electricity needs may be meet through the local generation of renewable energy. For example, the City installed solar panels on City Hall, meeting approximately 80 percent of the facility's energy needs. Likewise, the City is processing a significant number of permits annually for rooftop solar on existing residential and commercial buildings. Moving forward, California's 2019 Building Energy Efficiency Standards (effective January 1, 2020) require installing solar photovoltaic systems in newly constructed low-rise residential buildings.

The production and use of Renewable Natural Gas (RNG) can eliminate emissions from fossil natural gas and is carbon negative as it is produced from emission from organic waste. RNG can be produced from existing waste streams within the City including organic waste, green waste, and wastewater. These waste streams naturally emit methane into the atmosphere when the organic matter they contain decomposes, which contributes to City greenhouse gas emissions. The production process for RNG captures these emissions, refines them, and can inject them directly into the existing natural gas system for storage and later use. When combusted, the end product is CO_2, a considerably less potent emission than methane. Therefore, from a lifecycle perspective, RNG production is a carbon negative process because it pulls a greater amount of a more potent greenhouse gas out of the atmosphere than what it produces at end uses. The use of RNG aligns with the energy polices that support net zero buildings, as well as waste policies that advocate for increased landfill diversion and waste recycling.

Table 6. Clean Energy Implementation Actions

Action	GHG Reduction Potential	Responsible Parties	Timeframe	General Plan Reference
Residential Solar Program. Promote the installation of residential solar systems on existing buildings.	High	Sustainability, Planning	Short	Conservation Action 1, 4
Commercial Solar Program. Promote the installation of commercial solar systems on existing buildings.	Medium	Sustainability, Planning	Short	Conservation Action 1, 4
Solar Education Program. Encourage installation of solar panels by continuing to aggressively promote Indio's Ygrene and HERO Programs. Additionally, consider partnering with the IID to gather and distribute information on actual energy and cost savings achieved by residential PV systems.	Supportive measure	Sustainability	Medium	Conservation Action 1

Low-Carbon Buildings

Buildings account for the majority of GHG emissions in the City. There are significant opportunities to use existing programs to maximize energy efficiency, reduce energy demand, and establish new programs to reduce energy consumption. City programs are supported by an array of technical assistance, funding, and incentive programs around the region.

Single-family homes account for the majority of buildings in the City. Approximately 25 percent of these single-family homes were constructed before 1980. Older homes constructed before the State's energy efficiency standards were implemented, are often less energy efficient than newer construction. Building weatherization, heating ventilation, air conditioning maintenance and upgrades, and switching to LED light bulbs are cost-effective measures that save energy. These measures also improve indoor air quality and increase home values.

Commercial buildings (retail, office, industrial, and municipal buildings) contribute 29 percent of City emissions. Commercial buildings over 50,000 sf. are required to benchmark their energy use (AB 802). Understanding how much energy commercial building use is an important initial step in reducing energy use and gas associated GHG emissions. Moreover, the City has direct control over municipal buildings and will continue to be a leader in benchmarking municipal facilities, upgrading lighting fixtures, and improving HVAC systems.

Table 7. Low-Carbon Building Implementation Actions

Action	GHG Reduction Potential	Responsible Parties	Timeframe	General Plan Reference
Improve Efficiency of Existing Buildings				
Low Income Weatherization Assistance Program. Partner with IID and SoCal Gas to aggressively promote existing programs that provide financial assistance to low-income households for weatherization improvements and heating, ventilation, and air conditioning (HVAC) tune-ups. Establish program goals to provide assistance to 100 households per year.	Low	Sustainability	Short	Conservation Action 3
Energy Efficiency Education. Designate a City staff member responsible for overseeing an Energy Awareness Program to increase energy program participation rates and promote the utilization of energy efficient systems and appliances.	Low	Sustainability	Short	Conservation Action 1
Commercial Benchmarking. Incorporate commercial outreach in the Energy Awareness Program (see Residential Energy Efficiency Education). Aggressively promote commercial benchmarking using the Environmental Protection Agency's ENERGY STAR Portfolio Manager or equivalent benchmarking tool.	Medium	Sustainability	Ongoing	Conservation Action 1
Residential Transfer of Title Energy Disclosure. Establish an energy disclosure program to be performed prior to sale or other transfer of title.	Medium	Sustainability, Planning	Short	Conservation Action 2

Disclosures should provide prospective owners with recommendations for retrofit measures.				
Promote Green Building				
Net Zero Buildings. Adopt regular updates to the City's building code. Require all new buildings to meet or exceed Title 24 standards for net zero building (low-rise residential buildings by 2020 and commercial buildings by 2030).	High	Development Services	Ongoing	Conservation Action 7
Improve Efficiency of Municipal Operations and Public Infrastructure				
Municipal Benchmarking. By 2020, benchmark municipal facilities using the Environmental Protection Agency's ENERGY STAR Portfolio Manager. Implement building upgrades.	Low	City Manager, Public Works	Short	Conservation Action 1
Municipal Facility Upgrades. Continue lighting, HVAC, and light sensor upgrades to various municipal facilities.	Low	City Manager, Public Works	Ongoing	Conservation Action 1
Traffic Signal LED Fixture Upgrades. Continue upgrading traffic signals with light-emitting diodes (LED) fixtures. This measure includes developing and implementing a plan to replace City streetlights and traffic signals with LED fixtures by 2040.	Low	Public Works	Ongoing	Existing
Promote the Use of Resilient Energy Technologies				
Support Deployment of New Technologies. Explore with other agencies regulatory and non-regulatory options for the utilization of new and emerging technologies to increase local resiliency to climate change impacts especially to disadvantaged and vulnerable communities	Medium	Community Development	On-going	Conservation Action 7

Zero Waste

Achieving a zero-waste goal requires rethinking how we consume goods and services and how we manage their disposal. Indio strives to eliminate waste generated through waste prevention and increasing the amount of composting and recycling available to the community.

Solid waste emissions come from two sources: 1) landfill waste generates methane, a potent GHG and 2) the transportation and processing of waste. Solid waste accounts for only 2 percent of the community greenhouse gas emissions.

The City will continue to encourage waste diversion from landfills by promoting recycling, composting, and the appropriate disposal of hazardous materials. Education and awareness programs are crucial to help support residents and businesses. Increasing commercial and multi-family education and waste diversion programs and implementing and enforcing the construction and demolition waste 50 percent diversion targets are key actions to meet a zero-waste goal. Schools are now required by State law to contract for recycling and composting services.

Table 8. Zero Waste Implementation Actions

Action	GHG Reduction Potential	Responsible Parties	Timeframe	General Plan Reference
Solid Waste Diversion				
Zero Waste. Implement a zero waste plan to divert waste from landfills. Actions include working with waste haulers, businesses, and residents to increase recycling and composting, adjusting rate schedules to promote recycling and diversion, and ensuring schools have three-bin programs.	Low	Public Works, Sustainability	Ongoing	Infrastructure Action 4
Multifamily Recycling and Composting. Establish a protocol to expand outreach and technical assistance to multifamily buildings.	Supportive measure	Public Works	Short	Infrastructure Action 5
Construction and Demolition Waste. Monitor and promote the diversion of construction and demolition waste from landfills.	Low	Public Works, Sustainability	Ongoing	Infrastructure Action 4
Event Waste Diversion. Require recycling and food waste diversion at special events, including City-hosted events.	Supportive measure	Public Works, Sustainability	Short	Infrastructure Action 8
Green Purchasing				
Green Purchasing. Establish and implement an environmentally preferable purchasing policy for City goods and services.	Supportive measure	Sustainability, City Manager	Short	Infrastructure Action 6
Food Share Programs. Explore and pilot a food share [and recovery?] program.	Supportive measure	Sustainability	Medium	Infrastructure Action 7

Water Conservation and Efficiency

Unlike other cities in Southern California, much of the Indio's water comes from the Coachella Valley Groundwater Basin. Using local water requires less energy (and associated GHG emissions) to pump and convey water to the City. However, the historic pumping of groundwater has caused water levels in the Coachella Valley Basin to decline. Ongoing groundwater management efforts are working to reverse this trend. The Coachella Valley Water Management Plan calls for the elimination of groundwater overdraft by 2030. Water use accounts for 3 percent of the Community's greenhouse gas emissions.

Lower GHG emissions from water use are the result of implementing water conservation and efficiency measures. The City has many on-ongoing efforts to reduce potable water use. The Indio Water Authority provides residents and businesses with incentives to replace grass with drought-tolerant desert landscaping and replace inefficient irrigation systems, toilets, and washing machines. The City also adopted a Model Water Efficient Landscape Ordinance to reduce outdoor water use, and recycled water is used at golf courses and parks in the City. The City has also enacted water restrictions and surcharges as during the recent drought of 2012-2017. The City will continue these efforts to reduce water use in City facilities and parks, while encouraging water use reduction from homes and businesses.

Table 9. Water Conservation and Efficiency Implementation Actions

Action	GHG Reduction Potential	Responsible Parties	Timeframe	General Plan Reference
Promote Water Conservation				
Landscape and Water Conservation Ordinance. Continue to implement the Coachella Valley Model Water Efficient Landscape Ordinance.	Low	Planning	Ongoing	Conservation Action 5
Rebate Programs. Continue to promote Indio Water Authority rebate programs to reduce water use and improve efficiency.	Low	Sustainability, Indio Water Authority	Ongoing	Existing
Water Conservation Rate Schedule. Continue to implement the "20 x 2020" water conservation rate schedule, exploring the continued implementation of a tiered rate schedule, seasonal rates, and/or excess-use surcharges to reduce peak demands during summer months.	Low	Indio Water Authority	Ongoing	Existing
Turf Reduction and Smart Irrigation Control Systems. Continue to install low-water landscaping and smart irrigation control systems on City-owned parks, properties, and facilities.	Low	Sustainability, Public Works, Parks and Rec	Ongoing	Existing
Promote Water Recycling and Greywater Use				
Recycled Water Use. Expand recycled water use to service additional customers in Indio.	Medium	Public Works, Planning	Medium	Existing
Greywater Ordinance. Explore requirements for new commercial and residential developments to be constructed for easy implementation of greywater systems that redirect water from sinks, showers, and bath tubs.	Supportive measure	Sustainability, Planning, Public Works	Medium	Conservation Action 6

Sustainable Land Use and Transportation

Vehicle use accounts for a significant proportion of Indio's GHG emissions. 24 percent of the City's emissions resulted from auto, truck, and transit vehicle travel on the regional and local roadways.

These travel patterns are fundamentally linked to the City and region's land use pattern. Focusing growth and investment in the Downtown, Midtown, and Highway 111 corridor are a key opportunity to reduce vehicle trips, encourage active transportation, and reduce GHG emissions. Mixing office, retail, and services with residential uses, creating open and connected neighborhoods, and increasing density near transit investments are proven and effective measures to reduce vehicle travel and emissions. These land use policies coupled with requirements for transportation demand management (TDM) and parking management strategies can significantly reduce the City's transportation-related emissions.

. The City is working to implement a "Complete Streets" policy that shifts the focus of roadway design from auto- centric to a more balanced approach for all users, including pedestrians, cyclists, transit-riders, and drivers. This approach includes the addition of new on and off-street bike lanes and more integrated and complete sidewalks to improve the accessibility and safety of the City's streets.

In addition to shifting people out of vehicles, the vehicles that are on the road must transition to electric and zero-emission technologies. A critical barrier to electric vehicle adoption is the lack of available charging infrastructure, particularly in existing multifamily residential buildings.

Table 10. Sustainable Land Use and Transportation Implementation Actions

Action	GHG Reduction Potential	Responsible Parties	Timeframe	General Plan Reference
Support Fuel Efficient and Alternative Fuel Vehicles				
Low-Carbon Vehicles. Increase the deployment of electric and zero-emission vehicles in Indio. Support expansion of charging station infrastructure and develop an educational campaign.	High	Planning, Public Works, Sustainability	Short	Mobility Goal 8
Golf Cart Routes and Neighborhood Electric Vehicles. Develop infrastructure that promotes the use of golf carts and neighborhood electric vehicles. This includes installation of paths in new developments that connect to a larger transportation network of charging stations at non-residential uses.	Low	Planning, Public Works	Short	Mobility Element
Vehicle Idling. Establish a local ordinance that exceeds the State idling restrictions.	Supportive measure	Planning	Short	Mobility Action 8

Improve Pedestrian and Bicycle Infrastructure				
Complete Street and Bicycle Network. Implement a citywide Complete Street and bicycle network consisting of Class I multi-use paths, Class II bike lanes, and Class III and Class IV bicycle routes.	Medium	Public Works, Planning	Medium	Mobility Action 1,2, 7
Safe Routes to School. Expand the Safe Routes to School program to reach more schools.	Low	Public Works, Planning	Short	Mobility Action 7
Subdivision Ordinance. Update the City's site plan review process and subdivision ordinance to require the provision of adequate bicycle and pedestrian access for new development.	Supportive measure	Planning, Public Works	Short	Mobility Action 3
Bicycle Parking. Require all new develop to provide safe and secure parking for bicycles.	Supportive measure	Planning	Short	Mobility Goal 8
Expand Public Transit Options and "Last Mile" Connectivity				
Service Network. Expand transit services (frequency and network) in Indio.	Low	Planning, SunLine Transit	Short	Mobility Goal 3
Riverside Commuter Transit. Support expansion of the MetroLink commuter rail from Riverside.	Low	Planning, City Manager, Public Work	Long	Mobility Goal 3
Support Transportation Demand Management				
Employee Carpooling Program. Develop a City employee carpooling program. Designate a City staff member to oversee the program. Consider measures such as surveys to identify potential carpooling opportunities or incentives to promote carpooling.	Low	Public Works, Planning	Short	Mobility Goal 7
Managed Parking. Implement parking standards and management practices through the Zoning Code update that provide sufficient parking, limit impervious surface, and reduce congestion.	Medium	Planning	Short	Mobility Goal 8, Action 6
Promote Smart Growth, TOD, and Complete Neighborhoods				
Prioritize Mixed-Use, Connected Development. Implement the Land Use and Urban Design Element's focused growth strategy. Update the City's Zoning Code. Implement the Downtown Specific Plan. Seek a master developer for the Midtown area.	Supportive measure	Public Works, Planning	Short	Land Use Action 2,4, 6, and 9
Create Infill Housing. Establish an infill housing incentive program. Promote the construction of housing affordable to all income levels.	Supportive measure	Planning	Short	Land Use Action 11
Placemaking Program. Implement a placemaking program focused on cost-effective and flexible activities.	Supportive measure	Planning, Public Works	Medium	Land Use Action 7

Emission Reduction Summary

Table 11 shows the 2010 baseline greenhouse gas emissions for Indio and the forecast for the Climate Action Plan through 2040. Forecasts were based on anticipated future development consistent with the General Plan, the effects of existing City and State regulations, and the effects of reduction measures proposed in the General Plan. Additional proposed GHG reduction policies and measures are summarized earlier in this chapter.

Table 11. 2010 2010 Baseline Emissions and Indio CAP (Adjusted BAU with Local Measures) Forecast

Sector/Source	2010 Inventory		2020 Forecast		2030 Forecast		2040 Forecast	
	$MTCO_2E$	Percent	$MTCO_2E$	Percent	$MTCO_2E$	Percent	$MTCO_2E$	Percent
Residential Energy	227,480	37%	162,654	31%	60,309	16%	23,482	6%
Commercial Energy	174,693	29%	134,845	26%	77,625	20%	53,751	14%
Transportation and Mobile Sources	145,518	24%	174,363	33%	194,547	50%	242,405	64%
Water and Wastewater	18,325	3%	11,311	2%	5,610	1%	2,832	1%
Solid Waste	13,154	2%	11,080	2%	9,333	2%	7,862	2%
Fugitive Emissions	28,776	5%	33,798	6%	39,698	10%	46,627	12%
TOTAL	**607,946**		**528,051**		**387,122**		**376,959**	
$MTCO_2e$ Per Capita	8.0		6.5		3.9		3.2	
$MTCO_2e$ Per Service Population	6.7		5.0		3.3		2.6	

Future development consistent with the General Plan would result in communitywide emissions of 528,051 $MTCO_2E$ in 2020, which represents an emission level of approximately 5.0 $MTCO_2E$ per service population and an approximate 6.5 $MTCO_2E$ per capita. As this is less than the significance threshold of 7.4 $MTCO_2E$ per service population, and less than the 10.6 $MTCO_2E$ reduction goal per capita established in SB 32, the General Plan would be consistent with the City's and State's GHG reduction goals as shown in Figures 19 and 20.

Additionally, future development consistent with the General Plan would result in communitywide emissions of 387,122$MTCO_2E$ in 2030, which represents an emission level of approximately 3.3 $MTCO_2E$ per service population in 2030 and an approximate 3.9 $MTCO_2E$ per capita in 2030. This is less than the

threshold of 4.2 $MTCO_2E$ per service population and the 5.9 $MTCO_2E$ per capita reduction goal established in SB 32 and the 2017 Scoping Plan.

Therefore, the General Plan would achieve per capita and per service population thresholds for the years 2020 and 2030, as established by SB 32, and the State's 2017 Scoping Plan.

Figure 19. 2010 Per Capita Baseline Emissions, BAU and Indio CAP (Adjusted BAU with Local Measures) Forecasts, and State Targets

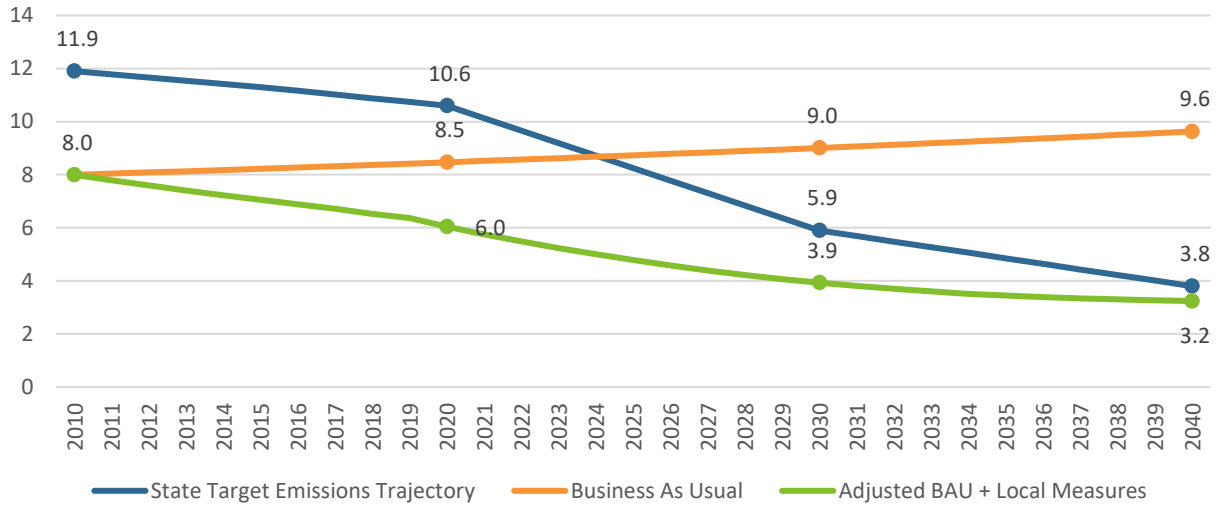
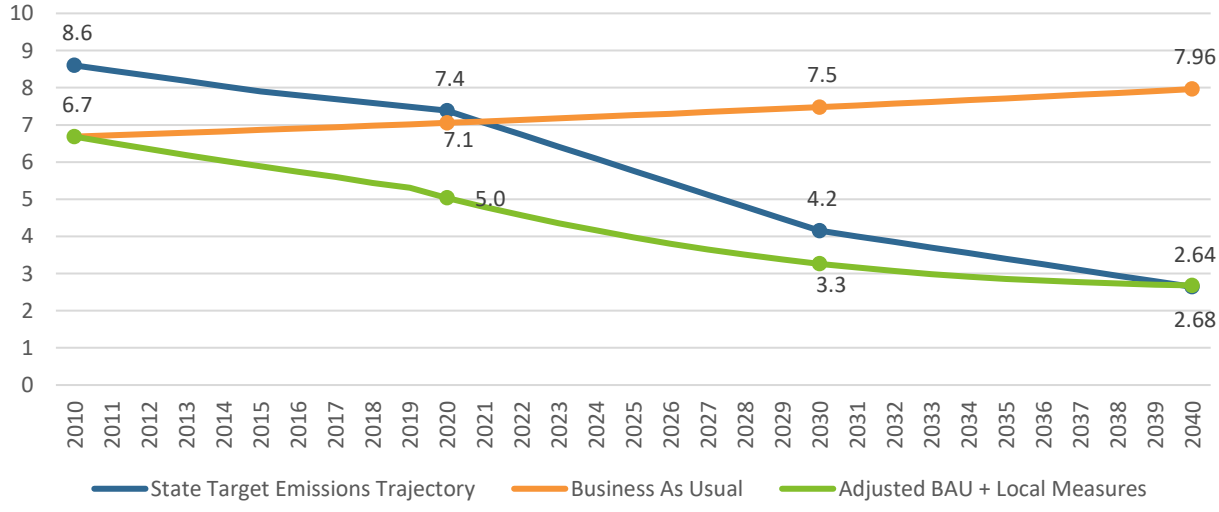


Figure 20. 2010 Per Service Population Baseline Emissions, BAU and Indio CAP (Adjusted BAU with Local Measures) Forecasts, and State Targets



CEQA Considerations and Tiering

This Climate Action Plan will serve as a qualified CAP for the City of Indio which identifies and mitigates significant greenhouse emissions at a programmatic level, allowing future projects (that meet certain requirements) to refer to this CAP for general environmental analysis. This process aims to prevent repetitive discussions of the same issues and focus on specific issues at each level of review. The CEQA guidelines (Section 15152) refer to this process as tiering.[22] Tiering should be limited to situations where the project is consistent with the General Plan and Zoning, scope is lesser, site-specific or a negative declaration, except when a project requires rezoning to maintain conformity with the general plan.

Screening Levels

The California Air Pollution Control Officers Association (CAPCOA) Guidance has provided guidance documents for quantifying greenhouse gas emissions and reduction measures. The report provides guidance for lead agencies in California determining the significance thresholds for GHG emissions. The report references 900 $MTCO_2E$ as a conservative threshold for determining when further analysis is required. This threshold is intended as a bright-line test that would exempt projects that are too small to have significant impacts from further analysis. The CAPCOA Guidance identifies project sizes likely to be exempt under the 900 $MTCO_2E$ annual emissions threshold as shown below in Table 12.

Table 12. Project Review Thresholds

Project Type	Approximate Project Size that Generates 900 MT CO_2E
Single-family Residential	50 units
Apartments/Condominiums	70 units
General Commercial Office Space	35,000 square feet
Retail Space	11,000 square feet
Supermarket/Grocery Space	6,300 square feet

For proposed projects above the screening thresholds, project applicants shall complete the Climate-Ready Development Review Checklist (Appendix A). For each item on the checklist, the applicant should indicate whether the measure is included as part of the project, or if it is not applicable. The checklist is designed to reflect the targets set for the measures presented in this chapter.

[22] California Code of Regulations. Chapter 3: Guidelines for Implementation of the California Environmental Quality Act. 14 CCR § 15152. Tiering.

Monitoring

The practice of quantifying, forecasting, and actively reducing greenhouse gas emissions is important. Although many policies that address energy and water conservation, transit efficiency, etc., have been implemented – the focused implementation of a Climate Action Plan is a relatively new practice. Creating an inventory and forecast of GHG emissions and identifying implementation measures to achieve reduction targets is only the first step towards implementing the Climate Action Plan.

The lasting GHG reductions identified by this Climate Action Plan will be achieved through continued implementation of reduction measures. Concurrent with implementation of identified measures, measurement and monitoring of reduction measures is essential to maintaining efficiency and identifying any programmatic changes that may become necessary. Towards that end, the City will track and verify reductions on a three to five-year cycle. Each year, the Sustainability Coordinator, with the support of staff, consultants, and interns, will report progress to the City Council.

Appendix A – Development Review Checklist

Appendix A: Development Review Checklist

This Climate-Ready Development Review Checklist was created to assist developers, community members, and City officials evaluate new projects for their effectiveness at reducing GHG emissions and for how well the projects comply with the City's GHG emissions reduction targets.

On a project-by-project basis, staff will monitor these criteria to track project-level contributions to the Climate Action Plan target. As a standalone appendix to the Climate Action Plan, City staff will have flexibility to modify the checklist over time.

Project Design Feature	Yes/No	Explanation
Will the project include bicycle facilities (e.g. bike lanes, parking)?		
Will the project include sidewalks along all roadways?		
Will the project support bike sharing or rental programs?		
Will there be transit stop within ¼ mile of the project?		
Will the install provide traffic calming elements?		
Will the project's pedestrian and/or bicycle infrastructure connect to the external network?		
If the project provides streets, will the streets meet the City's Complete Streets standards?		
Will the project include high-density housing? A range of housing types? Affordable housing? Be mixed-use?		
Will the project provide shared or reduced parking?		
Will the project be designed to maximize solar orientation?		
Will the buildings be designed to incorporate passive solar design?		
Will the project include transportation demand management measures?		
Will the project provide electric vehicle charging stations?		

Will the project pre-wire for electric vehicle charging stations to be added at a later date?	
Will the project use all electric appliances and HVAC systems?	
Will the project seek LEED or similar green building certification?	
Will the project increase the number of trees on site?	
Will renewable energy systems be installed as part of the project?	
Will construction waste and debris be diverted from the landfill consistent with City requirements?	
Will the project collect recycling? Compost?	
Will the project use low-water or drought-tolerant species for landscaping?	
Will the project use smart irrigation?	
Will rainwater be captured on site?	
Will all units have separate water and energy meters? Or be sub-metered?	
Will the project be connected to the recycled water system? Does the project use recycled water?	
Will the project use low-impact development practices?	

Appendix B – Greenhouse Gas Inventory

RECON

City of Indio
Detailed Climate Action Plan Methodology

Prepared for
City of Indio
Development Services Department
100 Civic Center Mall
Indio, CA 92201

Prepared by
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RECON Number 7497
February 17, 2016

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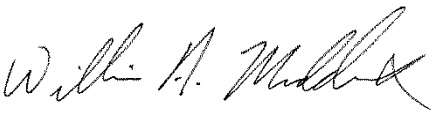


Reviewed and Approved by
William Maddux

Executive Summary

This Climate Action Plan (CAP) assesses the existing greenhouse gas (GHG) emissions in the City of Indio (City), forecasted future emissions, and identifies a list of measures to reduce future GHG emissions. As part of the development of the CAP, the RECON updated the City's existing 2010 GHG Inventory. Revisions included application of more refined emission factors and minor corrections to previous methodology to ensure consistency with the *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories Version 1.1* (LGOP). The LGOP is a standardized set of guidelines to assist local governments in developing GHG inventories and was developed in partnership by the California Air Resources Board (CARB), California Climate Action Registry (CCAR), ICLEI – Local Governments for Sustainability, and The Climate Registry. Following the revised LGOP methodology, communitywide emissions for 2010 are estimated to be 610,327 metric tons of carbon dioxide equivalent (MT CO_2E). Municipal emissions, emissions directly controlled by the City, account for 14,599 MT CO_2E or roughly 2.4 percent of the total communitywide emissions.

Based on the revised 2010 GHG inventory, 1990 emission levels were backcasted and future "business-as-usual" emissions were forecast. While Assembly Bill (AB) 32, executive order (EO) S-3-05, and EO B-30-15 established statewide GHG reduction targets, there are no state-mandated GHG reduction targets for an individual city or county. However, as the City is committed to supporting state efforts to reduce GHG emissions, forecasts were assessed against statewide GHG reduction targets. Assessing local GHG emissions against statewide reduction targets is subject to varying interpretations. RECON considered various approaches for assessing consistency with statewide reduction targets and recommended that the City assess per capita emissions levels against statewide targets to be appropriate as the per capita approach affords appropriate consideration to local conditions such as population growth. Following this approach, to achieve emission levels consistent with statewide reduction targets identified in AB 32 and EO B-30-15 the City must achieve a per capita emission rate of 10.6 MT CO_2E in 2020 and 5.9 MT CO_2E in 2030. Due to existing sustainability measures, the City already on course to achieve emission levels consistent with statewide reduction targets. Although the City already achieves per capita emission levels consistent with statewide target emissions levels, the City is committed to further reduce local emissions.

With input from City staff, RECON assembled a list of reduction measures that would further reduce emissions from both municipal and communitywide sources. Measures to reduce municipal emissions include: benchmarking municipal facilities, promoting employee carpooling, increasing rooftop solar photovoltaic panels on municipal facilities, increased installation of light-emitting diodes (LED) streetlights, turf reduction and smart irrigation, and energy efficiency upgrades for municipal facilities such as light fixture upgrades, motion sensors, and high-efficiency heating, ventilation and cooling (HVAC) units. Measures to reduce communitywide emissions primarily focus on the major emissions sectors including residential, commercial, and industrial energy use and mobile sources. Measures include: implementing education, outreach, and finance programs; adopting stricter building codes; requiring energy efficiency disclosures during real estate transactions; encouraging compact growth, and improvements to bicycle infrastructure.

With incorporation of these measures it can be demonstrated that the City will achieve emissions reductions above and beyond what is necessary to support statewide emissions targets. Therefore, it can be demonstrated that the recommended measures would support state efforts to reduce GHG emission levels.

1.0 Existing Inventories

The City of Indio has already taken several steps to reduce local GHG emissions and to demonstrate leadership on issues related to environmental sustainability. In 2012, following the Local Governments for Sustainability (formerly the International Council for Local Environmental Initiatives) (ICLEI)/Statewide Energy Efficiency Collaborative (SEEC) protocol, the City prepared the 2010 GHG Inventory. The inventory identifies both the municipal and communitywide emissions in 2010. Additionally, the inventory also backcasted communitywide emission levels to 1990 and forecasted 2020 emission levels to determine the GHG reductions necessary to remain consistent with statewide GHG reduction targets. The intent of the inventory was to take stock of emission sources and sectors in order to make informed decisions regarding policies that would further reduce GHG emissions in the City. The inventory provides a window of information from which opportunities for energy savings, compliance, and economic development can be identified. It consists of both the community inventory and the municipal inventory. The 2010 Inventory made the following findings:

1. Communitywide emissions in 2010, using guidelines approved by the California Air Resources Board (CARB), totaled 451,919 MT CO_2E (5.9 MT CO_2E per capita).
2. The above level was 23.6% above 1990 target levels recommended in AB 32—365,714 MT CO_2E; this was due to significant population growth tempered by efficiency gains.
3. The municipal contribution to the community's 2010 emissions footprint was 1.3%, or 5,899 MT CO_2E.
4. At 5.9 MT CO_2E per capita, Indio had similar emissions levels relative to neighboring cities.
5. The per capita regional transportation emissions value was 2.8 MT CO_2E, putting Indio's total combined emissions per capita at 8.7 MT CO_2E.

2.0 Revisions to the Existing Inventory

Prior to development of CAP measures, RECON reviewed the Indio GHG inventory for 2010 and found several areas where refined information and methodologies were available to provide a more accurate baseline. Additionally, to create a database for future tracking of GHG emissions by the City, it was necessary to update the inventory to be consistent with the data requirements of SEEC's inventory and emission estimating protocols. Therefore, RECON has revised the City's 2010 GHG Inventory with refined emissions factors and buildout projections associated with the City's General Plan Update (GPU). Emission levels for 1990 and 2010 were remodeled to determine the GHG reductions necessary to remain consistent with statewide GHG reduction targets. The modeled emission levels of the revised inventory are substantially greater than those in the original inventory. Revisions to the major emissions sectors of the communitywide and municipal inventories are discussed below and summarized in Table 1.

2.1 2010 Communitywide Inventory

Major emissions sectors of the communitywide inventory include residential energy, commercial/ industrial energy, mobile sources, water and wastewater, solid waste, and fugitive emissions.

a. Residential, Commercial, and Industrial Energy Use Sectors

Reported fuel use, 111,704 million British Thermal Units (MMBtu) and 123,930 gallons of propane was modeled in SEEC ClearPath using standard emission factors. Revised emission estimates are similar to the original inventory.

Reported residential electricity use, 382,317 gigawatt-hours (GWh), and commercial energy use, 261,718 GWh was modeled in SEEC ClearPath. For residential electricity use, this approach is similar to the original inventory. Commercial electricity use in the original inventory was revised. The original inventory categorized electricity used for water and wastewater treatment and

distribution as a commercial energy use. Energy use for water and wastewater treatment and distribution was re-categorized under the water and wastewater emissions sector per the ICLEI protocols. Accounting for this energy use in the water and wastewater emissions sector is necessary as the associated GHG emissions can be reduced through measures that achieve water use reductions. As a result, estimated commercial sector energy use was reduced by 31,568 GWh, or 10.8 percent as compared to the original inventory.

GHG emissions associated with electricity use are modeled using electricity intensity factors specific to the electricity provider, in this case, the Imperial Irrigation District (IID). The electricity intensity factor for a utility provider is the ratio of total electricity delivered versus the total GHG emissions associated with generation of that electricity. The energy intensity factor includes both the direct GHG emissions of plants owned by the electricity provider and GHG emissions associated with any power purchased from another electricity provider. Electricity intensity factors are reported to and published by organizations such as the United States Environmental Protection Agency (EPA) and the California Climate Action Registry (CCAR).

The stated source of 2010 electricity intensity factors in the original inventory is the IID; however, the cited reference is no longer available. Therefore, the electricity intensity factors were refined based on the most recent published data (2008) from the CCAR (CCAR 2012). The refined 2010 electricity intensity factors are 48.8 percent greater than those used in the original inventory. Accounting for refined electricity intensity factors, GHG emissions associated with energy use increased by 113,519 MT CO_2E, or 39.7 percent. This increased the overall communitywide emissions in 2010 by approximately 25.1 percent as compared to the original 2010 inventory.

b. Mobile Source Sector

GHG emissions from vehicles come from the combustion of fossil fuels in vehicle engines. These emissions consist mainly of emissions from on-road transportation; however, they also include off-road equipment such as construction and mining equipment (approximately 2.1 percent). On-road emissions are calculated by multiplying the estimated vehicle miles traveled (VMT) of each vehicle class by the emission factor for that vehicle class. For purposes of the CAP and GHG emission reduction strategies, the quantification of the mobile source sector emissions excludes regional traffic on freeways (Interstate 10 and State Route 86) as these sources are beyond of the jurisdiction of the City.

VMT was modeled based on roadway lengths from the Coachella Valley Association of Governments (CVAG) and traffic volumes from the California Department of Transportation (Caltrans; Caltrans 2010). The resulting VMT, approximately 262 million miles, was apportioned to vehicle classes based on City-conducted surveys of local roadways.

The original inventory used vehicle emission factors for on-road vehicle models between 2006 and 2010 using Clean Air and Climate Protection (CACP) software. These emission factors were based on CARB's 2007 Emission Factors Model (EMFAC2007). These emissions factors were updated with the more recent data from CARB's EMFAC2014 based on the ICLEI protocols. Revised emission factors from EMFAC2014 were taken for the aggregated mix of all in-use vehicles in the Salton Sea sub-area of Riverside County. This method accounts for all model years including those prior to 2006. Accounting for revised vehicle emission factors mobile source GHG emissions increased by 17.3 percent relative to the original inventory.

c. Water and Wastewater Sector

Water use and wastewater generation has indirect GHG emissions associated with it. These emissions include the energy used to supply, distribute, and treat water and wastewater and the process emissions (primarily nitrous oxide [N_2O]) from wastewater treatment.

Process emissions from wastewater treatment were modeled based on water use and LGOP formulas. Reported energy use for water treatment and distribution, 31,568 GWh, was accounted for in the water and wastewater emissions sector. As discussed above under the Energy Use Section, the original inventory had miscategorized electricity used for water and wastewater supply, delivery, and treatment as a commercial energy use. Additionally, GHG emissions associated with this energy use were modeled with the refined energy intensity factors from CCAR. As a result of the re-categorization of energy use and refined energy intensity factors, water and wastewater emissions increased from 1,880 MT CO_2E to 18,325 MT CO_2E.

d. Solid Waste Sector

The disposal of solid waste in a landfill produces GHG emissions (primarily methane [CH_4]) from anaerobic decomposition. Solid waste emissions are calculated based on the total quantity of waste disposed of, 63872 tons, and the estimated biodegradable content. The original inventory estimated total quantity of solid waste and biodegradable content based on data retrieved from CalRecycle's Jurisdiction Profile. Projected solid waste disposal and biodegradable content from the original inventory were replicated in the revised inventory. Accounting for refined emission factors from the SEEC protocol, solid waste emissions increased marginally.

Additionally, solid waste collection vehicles emit GHGs from the combustion of fossil fuels in vehicle engines. As discussed later in the Municipal Solid Waste Disposal Section, on-road emissions from the Burrtec solid waste collection fleet were re-categorized as solid waste emissions.

e. Fugitive Emissions Sector

Fugitive emission sources include ozone-depleting substances (ODS) such as aerosols used by the general public and N_2O emissions from fertilizer used for agriculture or golf courses.

ODS include many man-made substances that are primarily used in refrigeration, air conditioning, insulating foams, solvents, and aerosol products. ODS are potent GHGs; the emission of several pounds of ODS may have the equivalent effect on global climate as the emission of several tons of carbon dioxide (CO_2). Use of ODS emissions may be associated with certain industrial uses; however, to a larger extent it is associated with consumer products used by the general public. There is no accurate method of estimating ODS emissions specific to a jurisdiction. The communitywide ODS emissions were apportioned based on the City population relative to total statewide emissions.

N_2O emissions from fertilizer used for agriculture, 243 kilograms (kg) of N_2O, were modeled based on the specific crop types grown in the City using emission equations from the EPA. Additionally, emissions associated with fertilizer use on golf courses, 4 kg of N_2O, were based on typical fertilizer application rates and the total estimate acreage of grass on golf courses (29 acres). Projected N_2O emissions from the original inventory were replicated in the revised inventory.

f. Revised Communitywide Inventory

Table 1 summarizes the revised inventory by sector and Figure 1 provides a visual representation. Based on the revised inventory communitywide emissions were 610,327 MT CO_2E in 2010. Figure 2 provides a breakdown of emissions by sector and source.

Table 1 2010 Communitywide Emissions				
Sector/Source	Original Inventory		Revised Inventory	
	MT CO_2E	Percent	MT CO_2E	Percent
Residential Energy	155,022	34.3%	227,480	37.3%
Commercial Energy	124,166	27.5%	171,813	28.2%
Mobile Sources	124,004	27.4%	149,902	24.6%
Water and Wastewater	8,461	1.9%	18,325	3.0%
Solid Waste	11,049	2.4%	13,621	2.2%
Fugitive Emissions	29,216	6.5%	29,199	4.8%
TOTAL[1]	**451,919**		**610,340**	
[1]Totals and percentages may not sum properly due to rounding.				

Figure 1
Communitywide Emissions by Sector

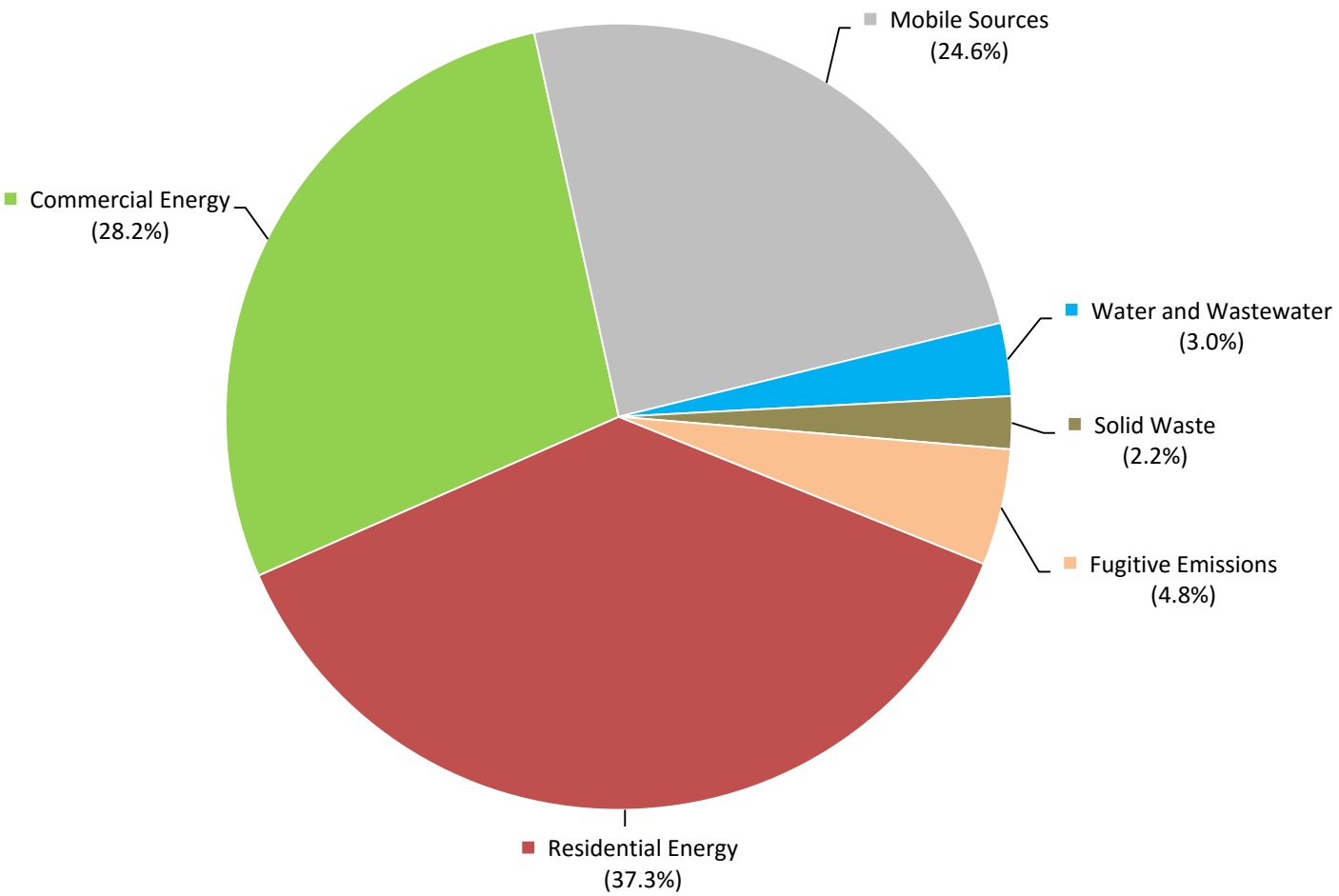
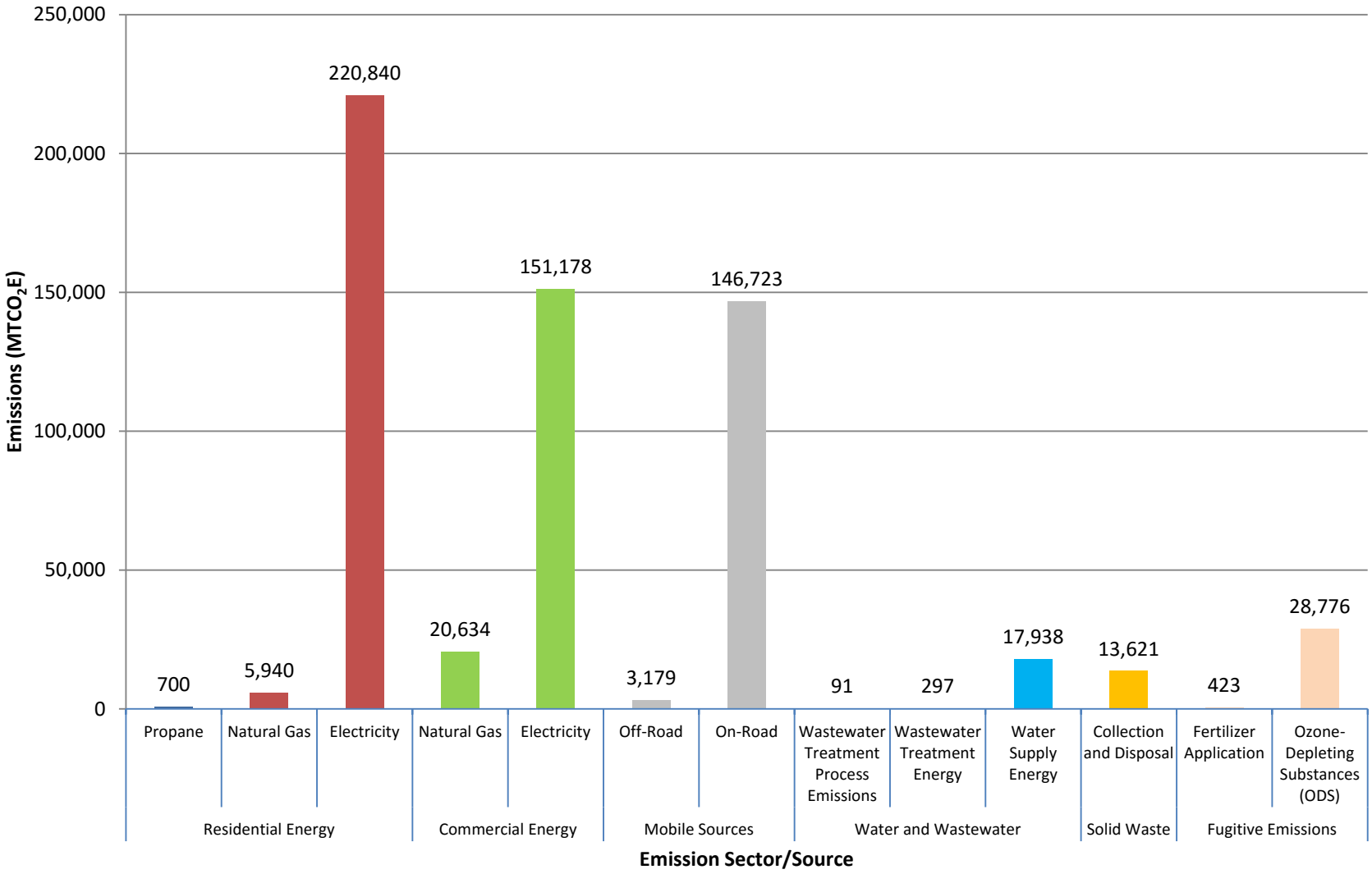


Figure 2
2010 Communitywide Emissions



2.2 2010 Municipal Inventory

Major GHG emission sectors of the municipal inventory include building and facility energy use, street lights and traffic signals, vehicle fleet, transit fleet, employee commute, solid waste disposal, water treatment and delivery, and fugitive emissions. Municipal GHG emissions are accounted for in the communitywide inventory, and the separate municipal inventory is intended to provide detail on emission sources directly controlled by the City.

a. Building and Facility Energy Use

This sector includes GHG emissions associated with energy use from all City-owned and -operated buildings with the exception of IWA buildings and facilities, which are accounted for under the water treatment and delivery sector. Energy use from City-owned and -operated buildings and facilities were modeled using billed quantities reported by utility providers, 4,244 GWh and 1,361 MMBtu. The electricity intensity factors were refined as described in the Residential, Commercial, and Industrial Energy Use Sector discussion. Due to the refined electricity intensity factors, estimated GHG emissions associated with building and facility energy use increased by 799 MT CO_2E, or 46.3 percent.

b. Streetlights and Traffic Signals

Similar to buildings and facilities, streetlights and traffic signals generate GHG emissions indirectly through electricity use. Reported electricity use, 608 GWh, was modeled using the refined electricity emission factors. Due to refined emission factors estimated GHG emissions associated with streetlight and traffic signal energy use increased by 115 MT CO_2E, or 48.7 percent.

c. City Vehicle Fleet

The City's vehicle fleet includes all vehicles owned and operated by the City. Total reported fuel use of the City's vehicle fleet, 86,923 gallons of gasoline and 15,412 gallons of diesel, was used to model emissions. Vehicle emission factors were updated with more recent data from CARB's EMFAC2014. Accounting for revised vehicle emission factors decreased GHG emissions by 6 MT CO2E, or 0.7 percent relative to the original inventory.

d. Transit Fleet

The transit fleet in the inventory includes all public transit vehicles over which the City maintains some degree of influence, including the SunLine bus fleet. The City maintains a representative on the Board of Directors of the SunLine Transit Agency. The original inventory also included the vehicle fleets of Burrtec, Desert Sands Unified School District, and the Coachella Valley Unified School Districts. Emissions from Burrtec's waste collection fleet were re-categorized to the solid waste disposal sector. School district fleets were not included in the municipal inventory, as the City does not have control over these fleets. While the school district fleets were removed from the municipal inventory, they remain in the communitywide inventory. Reported fuel use from SunLine Transit, 11,706 thousand cubic feet (kcf) of compressed natural gas (CNG), was modeled. Accounting for revised vehicle emission factors and transit fleet changes, GHG emissions associated with transit fleets decreased by 703 MT CO_2E, or 52.6 percent relative to the original inventory.

e. Employee Commute

Employee commute includes all City employees and was quantified based on employee surveys of City staff commute distances and vehicle types. Surveys did not include employees of the IWA; therefore, the number of employee commuting was increased based on the ratio of IWA employees to overall City staff. Overall, commute by City and IWA employees was estimated at 1,511,229 VMT annually. Based on revised vehicle emission factors and the increased number of employees included in the inventory, GHG emissions associated with employee commute increased by 24 MT CO_2E, or 3.5 percent relative to the original inventory.

f. Solid Waste Disposal

No landfills are operated within the City. The City contracts with Burrtec for solid waste collections and disposal services. Mobile emissions from solid waste collection were modeled based on reported fuel use from Burrtec, 7,200 gallons of diesel and 7,294 thousand cubic feet (kcf) of compressed natural gas (CNG). Additionally, projected solid waste collected from municipal facilities was estimated based by Burrtec. As discussed above under the Transit Fleet Section, the original inventory miscategorized Burrtec's waste collection fleet as a transit fleet. Revised emissions from solid waste disposal increased in the revised inventory because emissions from Burrtec's waste collection fleet were re-categorized to the solid waste sector.

g. Water Treatment and Delivery

As the IWA is owned by the City, the City has authority over associated GHG emission sources. Emissions associated with IWA electricity use, 14,086 GWh, were incorporated into the revised municipal inventory. The original inventory included GHG emissions resulting from water delivery by the IWA to municipal accounts. Including IWA energy use and accounting for refined electricity intensity factors, GHG emissions associated with the water treatment and delivery increased from 230 MT CO_2E to 8,136 MT CO_2E. This raised the overall projected municipal emissions by 134.0 percent over the original inventory.

h. Fugitive Emissions

Municipal sources of fugitive emissions include fertilizers applied to City-owned parks and golf courses and ODS such as refrigerants used in the City's vehicle fleet and fire department vehicles (Riverside County or Cal Fire) operating within the City. The N_2O emissions from fertilizer were modeled use based on the acreage of City-owned parks and golf courses (29 acres of parks and 46 acres of golf courses). Additionally, the original inventory documented ODS use in the City fleet (90 pounds of tetrafluoroethane, aka HCF-134a) and fire department vehicles (16 pounds of tetrafluoroethane). Revised emission estimates are similar to the original inventory.

i. Revised Municipal Inventory

Table 2 summarizes the revised inventory by sector and Figure 3 provides a visual representation. Based on the revised inventory, communitywide emissions were 14,599 MT CO_2E in 2010. Figure 4 provides a breakdown of emissions by sector and source. The majority of the increase is associated with revised emission factors associated with energy use.

Table 2 2010 Communitywide Emissions				
Sector/Source	Original Inventory		Revised Inventory	
	MT CO_2E	Percent	MT CO_2E	Percent
Building and Facility Energy Use	1,725	29.2%	2,524	17.3%
Street Lights and Traffic Signals	236	4.0%	351	2.4%
City Vehicle Fleet	927	15.7%	921	6.3%
Transit Fleet	1,335	22.6%	632	4.3%
Employee Commute	668	11.3%	692	4.7%
Solid Waste	705	11.9%	1,261	8.6%
Water Treatment and Delivery	230	3.9%	8,136	55.7%
Fugitive Emissions	74	1.3%	82	0.6%
TOTAL[1]	**5,899**		**14,599**	
[1]Totals and percentages may not sum properly due to rounding.				

Figure 3
Municipal Emissions by Sector

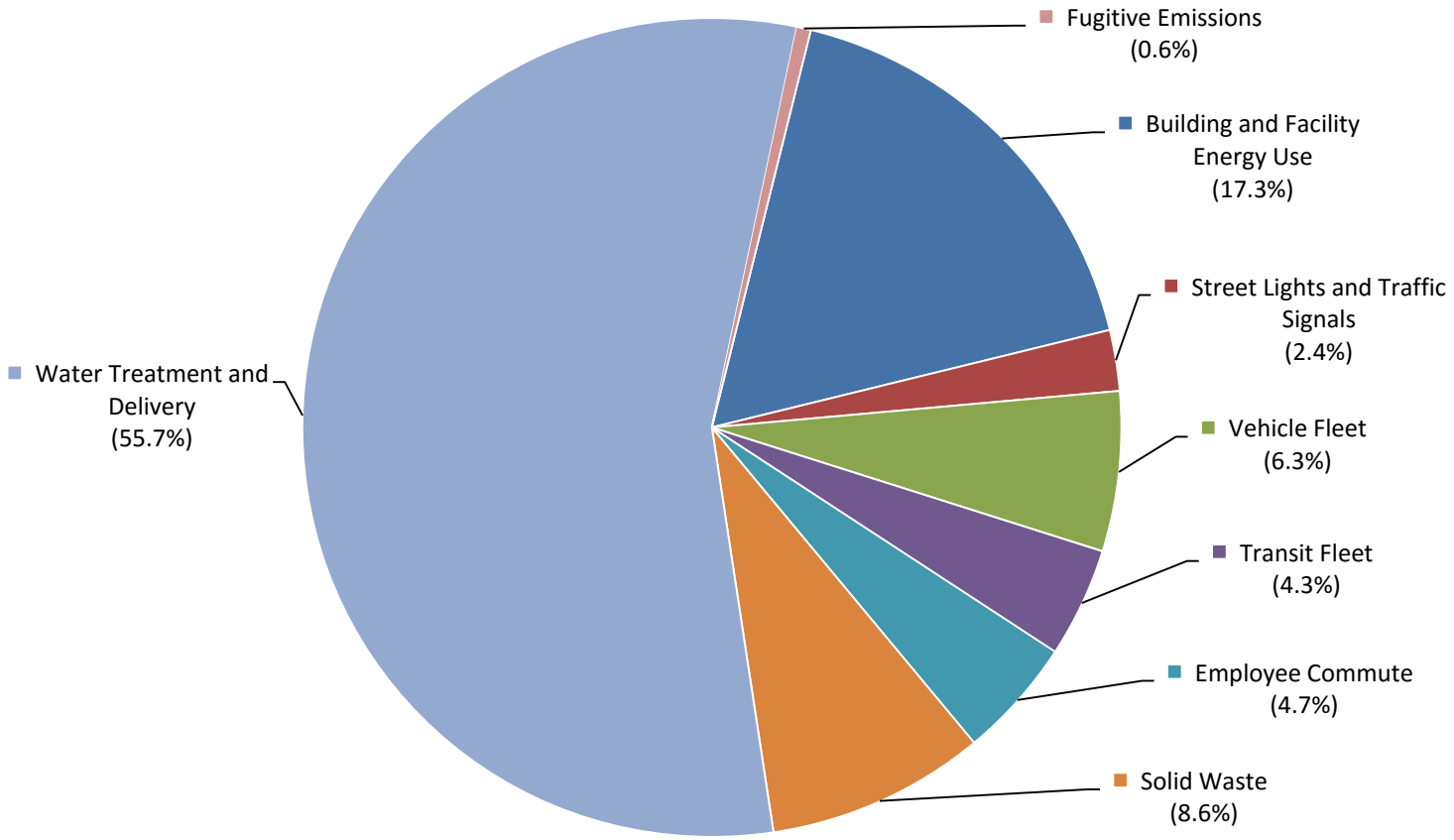
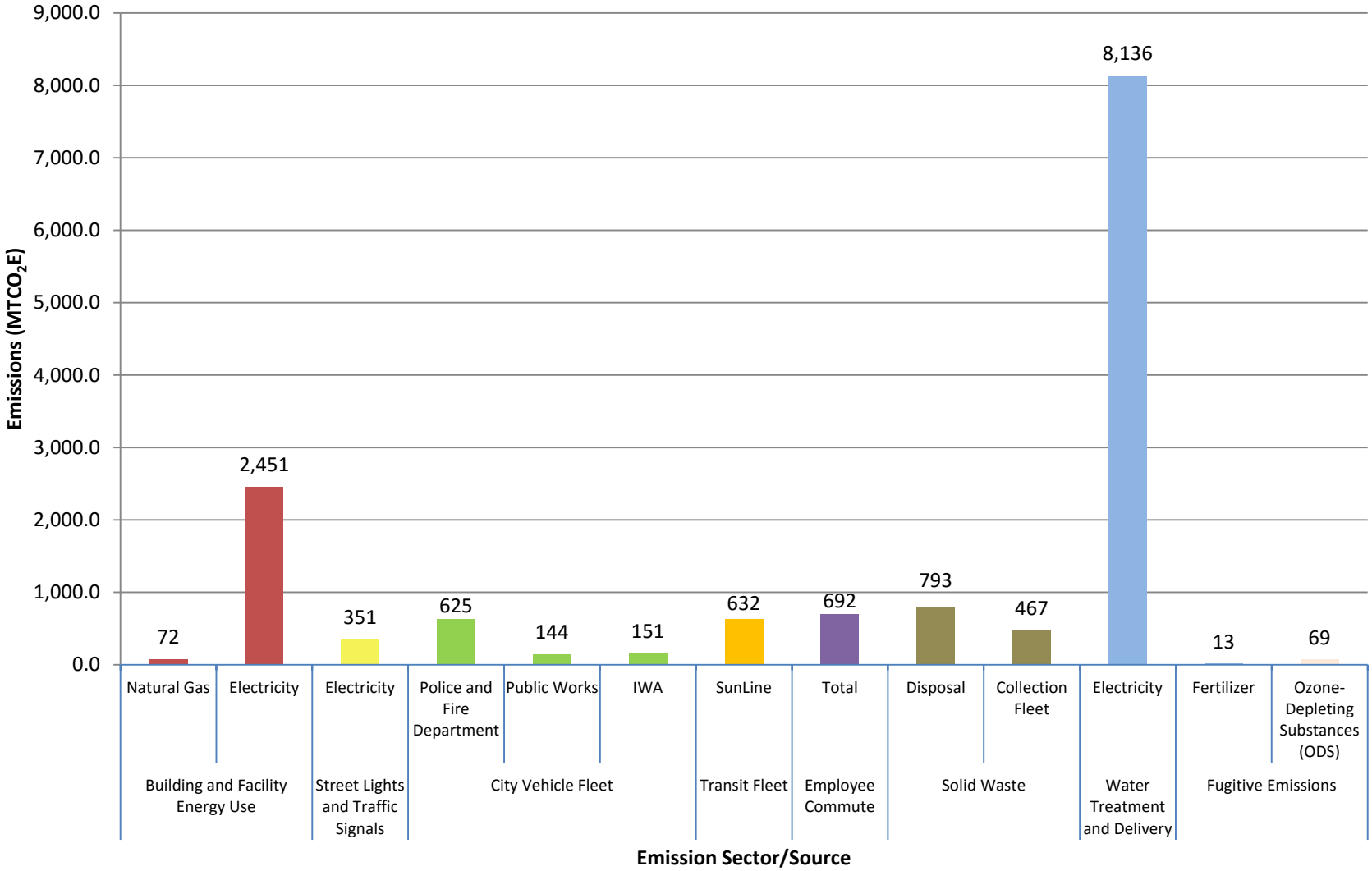


Figure 4
2010 Municipal Emissions



3.0 1990 Emissions Estimate

Statewide reduction targets and goals are based on 1990 emission levels. Thus, to provide a baseline for setting City GHG emission targets, the original inventory included a backcast, of 1990 emission levels.

Backcasting baseline emission levels is performed by taking 2010 activity levels and scaling them based on applicable growth factors, namely population growth. The guiding principle behind backcasting is that activities such as electricity use, water use, and VMT scale proportionally with the population. Population growth was estimated based data obtained from the *City of Indio General Plan Update Economic and Demographic Trends and Conditions* (Stanley R Hoffman Dec 2014). Although backcasting is less preferable than an inventory, it can be used when data from the target year is unavailable.

3.1 Communitywide

The original inventory estimated baseline communitywide emission levels to be 365,714 MT CO_2E. However, a review of the methodology and data sets used to develop this baseline required similar revisions to the electricity use and mobile sources as the original 2010 inventory.

Baseline emission levels for community electricity use were established based on electricity intensity factors from the EPA's eGrid tool. The original inventory used the 1990 carbon dioxide (CO_2) emission factors for the "power control area" (PCA) instead of the "utility provider", which is owner-based; this approach does not account for the effects of power purchases to and from the power control area. Additionally, as stated in the eGrid Technical Support Document, eGrid emissions and emission rates are calculated at the sources of generation and do not account for transmission and distribution losses; when modeling end use consumption, it is necessary apply regional grid loss factors to account for these losses (EPA 2012a). The original inventory used 1990 electricity intensity factors for electricity generation without correcting for grid transmission loss. Accounting for revised intensity factors, modeled GHG emissions associated with electricity use increased by 28.7 percent, or 81,113 MT CO_2E.

Baseline emission levels for on-road mobile emissions were backcasted linearly based on population in the original inventory. This approach does not account for the difference between vehicle emission factors in 1990 and 2010. Baseline emission levels were revised by backcasting the VMT and applying the appropriate vehicle emission factors to each year. Accounting for revised vehicle emission factors increased modeled GHG emissions from mobile sources by 9,849 MT CO_2E, or 16.8 percent.

3.2 Municipal

Backcasted municipal emission levels were not included in the original inventory. Therefore, 1990 municipal GHG emissions were backcasted based on population growth, changes in IID electricity emissions factors, and changes in vehicle emission factors. Additionally, energy use of IWA and fuel use of the Burrtec collection fleet have been modified to account for GHG reduction measures that have been implemented between 1990 and 2010. These measures include the installation of solar panels on IWA Plant 1 at 93101 Avenue 45 in 2010 (estimated to generate 14,086 GWh annually) and decarbonization of the SunLine and Burrtec vehicle fleets (approximately 95 percent of vehicles have been converted to CNG, which was estimated to generate 22 percent fewer GHGs per VMT). Based on these factors, 1990 municipal emissions are estimated to have been 8,886 MT CO_2E.

4.0 Forecasted Emission Levels – Business-as-Usual

Forecasting is performed by taking 2010 activity levels and scaling them based on applicable growth factors. Forecasting "business-as-usual" emissions refers to the projected emissions that will occur if the City and state take no further actions. As such, forecasting must account for increases in activity levels as well as the effects of adopted regulations. Forecasting for each of the major emissions sectors, residential energy, commercial/industrial energy, mobile sources, water and wastewater, solid waste, fugitive emissions, and municipal emissions, is discussed below. Forecasts related to population growth were estimated based data obtained from the *City of Indio General Plan Update Economic and Demographic Trends and Conditions* (Stanley R Hoffman Dec 2014).

4.1 Communitywide

a. Residential, Commercial, and Industrial Energy Use Sectors

Future energy use was forecasted based on population growth. The primary regulation that reduces energy use in the built environment is the California Energy Code, which is Part 6 of Title 24, the California Building Code (CBC). In addition, California has adopted the Renewable Portfolio Standard (RPS), which reduces the carbon intensity of the electricity that is delivered to customers.

California RPS requires all utility providers to achieve 33 percent renewable energy by 2020 and 50 percent renewable energy by 2030. The IID's electricity CO_2E intensity factors were revised to apply the projected reduction in CO_2. As of 2010, the IID had achieved a renewable mix of 8.3 percent of total electrical sales. Thus, the IID's electricity intensity factor is anticipated to be reduced by 26.9 percent by 2020 and 45.5 percent by 2030. No further reductions are accounted for after the 2030 RPS requirements.

The 2013 Energy Code requires energy measures to be incorporated into new construction. Based on the net change between existing development and the anticipated buildout of the GPU, it was estimated that the Energy Code would be applied to approximately 395 single-family residences, 649 multi-family units, and 1.1 million square feet of commercial space each year over the next 20 years. It should be noted that although the Energy Code is updated triennially, only the effects of the adopted CBC are included in the business-as-usual forecast. Therefore, business-as-usual emissions do not accurately reflect the effects to the Energy Code.

b. Mobile Source Sector

Vehicle use was forecasted based on the anticipated growth in local VMT identified by the project traffic consultant, Chen Ryan (Chen Ryan 2015). Vehicle emission factors applied were based on data from CARB's EMFAC2014.

c. Water and Wastewater Sector

The primary regulation that reduces energy use in the built environment is the California Green Building Code, referred to as CalGreen, which is Part 6 of Title 24, the CBC. The 2013 CalGreen Code requires indoor water-efficiency measures to be incorporated into new construction. As stated in CalGreen, new development is required to achieve a 20 percent reduction in indoor water use relative to specified levels. As the water use of new development relative to these baseline levels has not been established, this analysis conservatively does not account for a reduction in water use. Water use was forecasted based on population growth rates. Water and wastewater emissions were indirectly effected by California RPS as discussed above. In addition, California has adopted the RPS, which reduces the carbon intensity of the electricity that is delivered to customers.

d. Solid Waste Sector

Emissions associated with solid waste collection and disposal were forecasted based on population growth rates.

e. Fugitive Emissions Sector

Activities that generate fugitive emissions consist of application of fertilizer (1.4 percent) and the use of ODS (98.6 percent). Aas it is closely related to the agriculture industry, application of fertilizer was modeled based on employment growth rates; employment growth rates were based data obtained from the *City of Indio General Plan Update Economic and Demographic Trends and Conditions* (Stanley R Hoffman Dec 2014).

ODS are being phased out in favor of less environmentally adverse substitutes. CARB is overseeing the reduction of ODS as part of a cap-and-trade program, the ODS Offset Protocol. Growth rates, or more accurately decay rates for ODS were modeled based on data from a recent CARB report estimating future ODS emissions (CARB 2015a).

f. Business-as-Usual Communitywide Forecast

Based on growth rates discussed, a business-as-usual forecast was generated. Figures 5 and 6 display emission forecasts from 2010 to 2050 in terms of total emissions and per capita emissions, respectively.

Figure 5
Business-as-Usual Communitywide Forecast (Total Emissions)

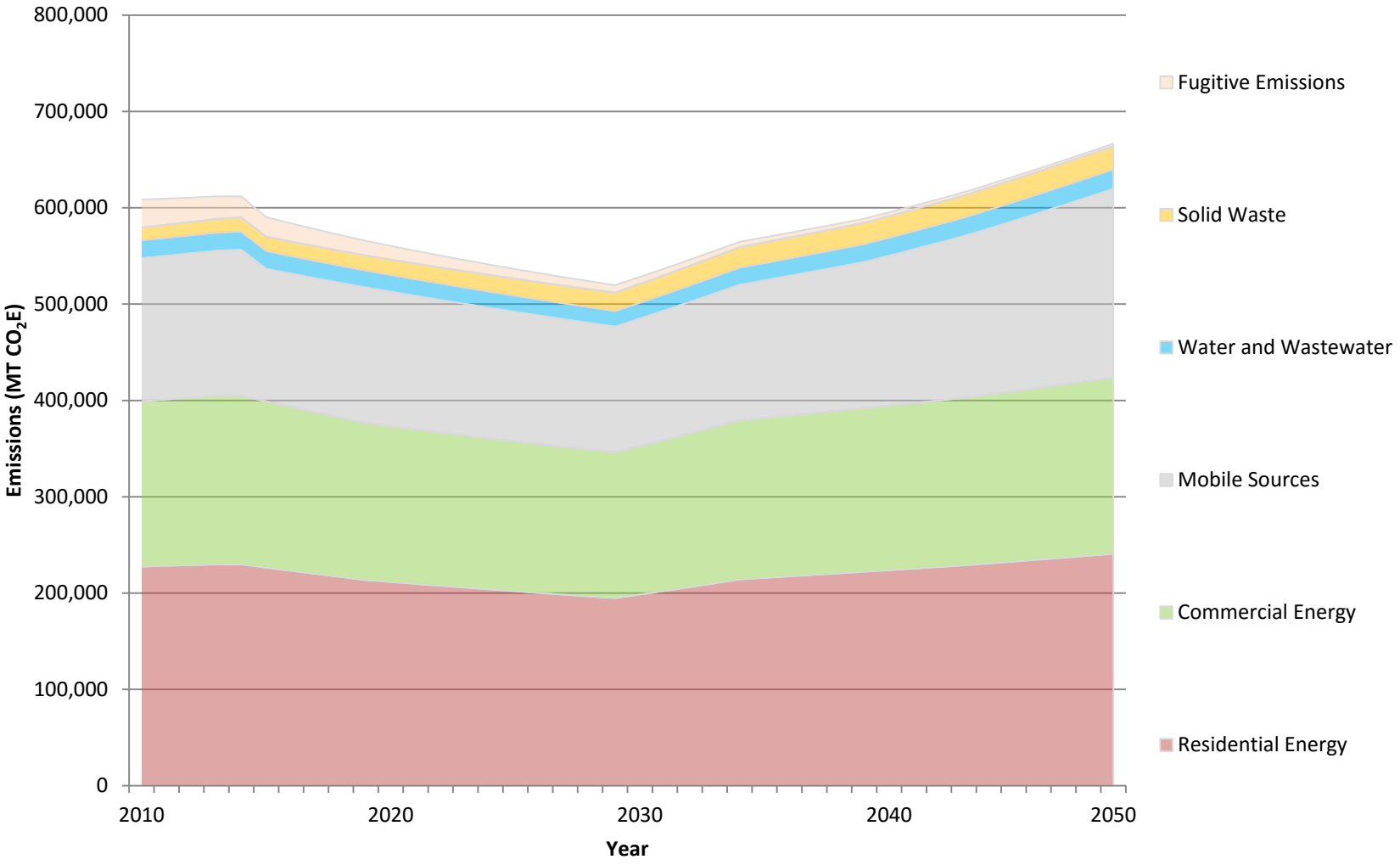
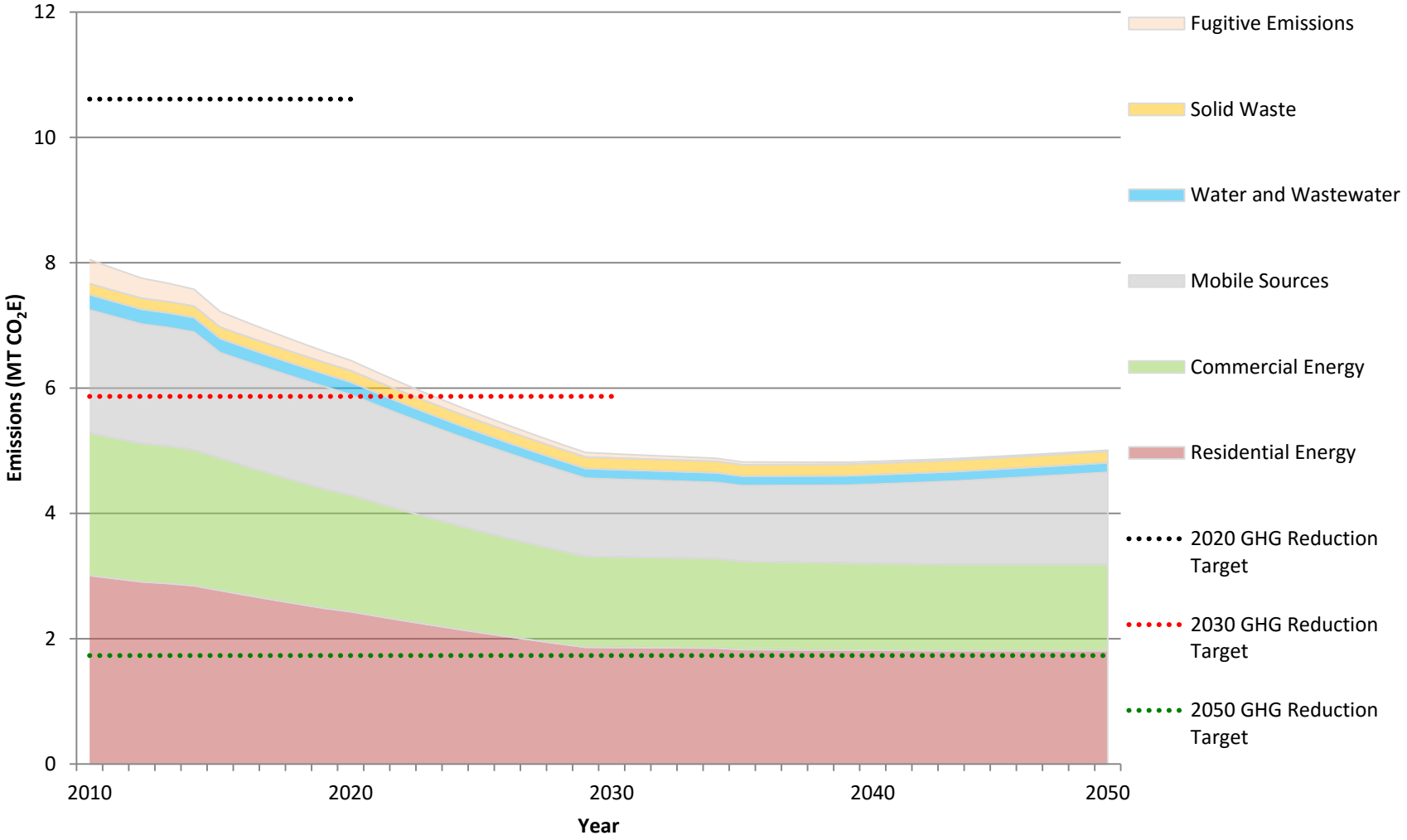


Figure 6
Business-as-Usual Communitywide Forecast (Per Capita Emissions)



4.2 Municipal Business-as-Usual Forecast

a. Building, Facility, Street Light, and Traffic Signal Energy Use

Electricity and natural gas use associated with municipal buildings, facilities, streetlights, and traffic signals was forecasted based on population growth rates. Electricity intensity factors are also forecasted to change over time due to the effects of California RPS. As the GPU does not include any substantial increase in municipal facilities, the effects of the 2013 CBC are anticipated to be minimal and were excluded from the forecast. Energy use emissions are forecasted to decrease gradually until the 50 percent RPS target is achieved in 2030; after the current RPS requirements are fully implemented, energy use emissions would gradually increase with population increases.

b. City Vehicle Fleet, Transit Fleet, Employee Commute

Vehicle use associated with the City's vehicle fleet, local transit fleets, and City employee commute was forecasted based on population growth. Vehicle emission estimates are based on 2020, 2030, and 2050 vehicle emission factors from CARB's EMFAC2014.

c. Solid Waste Disposal

Emissions associated with collection and disposal of solid waste were forecasted based on population growth rates.

d. Water Treatment and Delivery

Water use was forecasted based on population growth rates. Water and wastewater emissions were indirectly effected by California RPS as discussed above. As discussed under communitywide water use, the primary regulation that reduces energy use in the built environment is CalGreen. The 2013 CalGreen Code requires indoor water-efficiency measures to be incorporated into new construction. As stated in CalGreen, new development is required to achieve a 20 percent reduction in indoor water use relative to specified levels. As the water use of new development relative to these baseline levels has not been established, this analysis conservatively does not account for a reduction in water use.

e. Fugitive Emissions

Activities that generate fugitive emissions consist of application of fertilizer (16.2 percent) and the use of ODS for vehicle refrigerants (68.8 percent). Application of fertilizer is related to the number of municipal parks and golf courses. As the number of parks and golf courses would likely increase with population, application of fertilizer was forecasted based on population growth rates. Similar to communitywide ODS emissions, municipal ODS emissions were forecasted using decay rates from a recent CARB report estimating future ODS emissions (CARB 2015a).

f. Business-as-Usual Municipal Forecast

A business-as-usual forecast for the municipal sector was generated and is shown in Figures 7 and 8. The emission forecasts from 2010 to 2050 are presented in terms of total emissions and per population service base, respectively.

Figure 7
Municipal Business-as-Usual Forecast (Total Emissions)

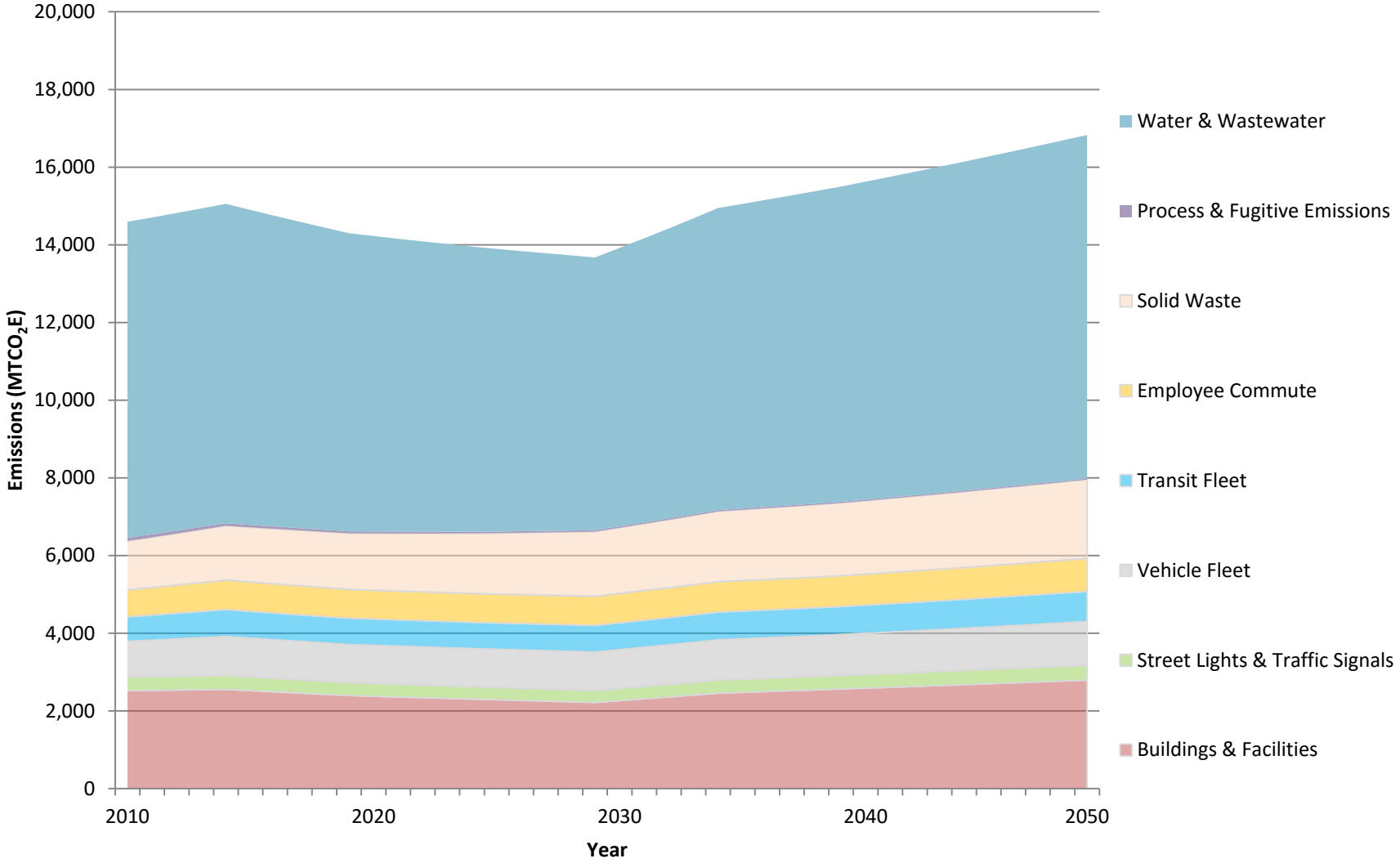
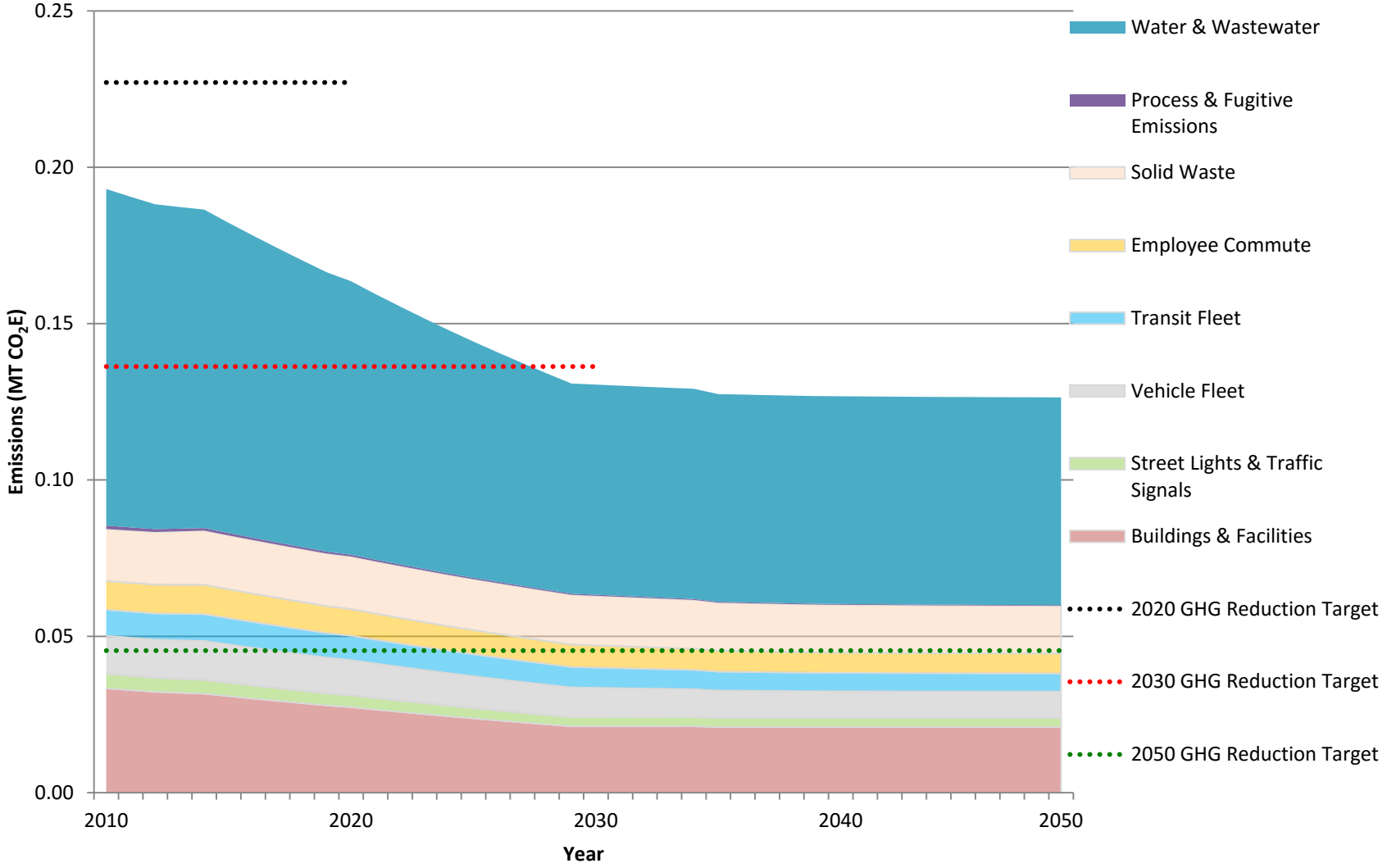


Figure 8
Municipal Business-as-Usual Forecast (Per Capita Served Emissions)



5.0 Greenhouse Gas Reduction Targets

5.1 Statewide Reduction Goals

Executive Order (EO) S-3-05 established the first statewide GHG reduction targets in California:

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

In response to EO S-3-05, the California Legislature passed AB 32, the California Global Warming Solutions Act of 2006, and thereby enacted Sections 38500–38599 of the California Health and Safety Code. AB 32 directed the CARB to establish an emissions cap and adopt rules and regulations that would reduce GHG emissions to 1990 levels by 2020. As directed by the AB 32, CARB adopted *the Climate Change Scoping Plan: A Framework for Change* (initial Scoping Plan) in 2008. CARB has periodically revised GHG emissions forecasts and prepared supplemental revisions to the initial Scoping Plan. Most recently, in 2014, CARB adopted the comprehensive *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update).

EO B-30-15 added an interim GHG emission reduction goal for the State of California to reduce GHG emissions 40 percent below 1990 levels by 2030. This EO also directed all state agencies with jurisdiction over GHG emitting sources to implement measures designed to achieve the new interim 2030 goal as well as the pre-existing, long-term 2050 goal identified in EO S-3-05. Additionally, this EO directed CARB to update its Climate Change Scoping Plan to address the 2030 goal. CARB is expected to develop statewide inventory projection data for 2030 as well as to commence its efforts to identify reduction strategies capable of securing emission reductions that allow for achievement of the EO's new interim goal.

Statewide GHG reduction targets in terms of millions of MT CO_2E (MMT CO_2E) are summarized in Table 3 along with the corresponding per capita emission levels in terms of MT CO_2E. The per capita emissions levels are calculated from CARB's statewide GHG emission projections for 2020, 2030, and 2050 and the California Department of Finance (DOF) statewide population projections for 2020, 2030, and 2050.

Table 3
Statewide Emission Targets

Year	Projected Population[1] (in millions)	Emissions Level	
		Total[2] (MMT CO_2E)	Per Capita[3] (MT CO_2E)
2020	29.96	431	10.6
2030	44.09	259	5.9
2050	49.78	86	1.7

[1] Projected population is based on recent California DOF figures published in December 2014 (California DOF 2014).
[2] Current 2020 GHG emissions limit (1990 emission levels) reported on the CARB website (CARB 2015b). Targets for 2030 and 2050 were calculated as 40 percent and 80 percent below this level.
[3] Per capita emissions were calculated by dividing emissions by population.

5.2 Local Reduction Goals

While AB 32 requires the State to reduce GHG emissions to 1990 level by 2020, and executive orders S-3-05, and B-30-15 set statewide goals for 2030 and 2050, there are no state-mandated GHG reduction targets for an individual city or county. The initial Scoping Plan recognized the critical role local governments play in the successful implementation of AB 32. Local governments have broad influence and exclusive authority over some activities that contribute directly and indirectly to GHG emissions. Local measures may be implemented as part of the land use planning, development permitting process, local ordinances, outreach and educational efforts, and municipal operations. In the initial Scoping Plan CARB encouraged local governments to adopt reduction goals that support the state goals.

While there is no definitive method of assessing local GHG emissions relative to statewide reduction targets, the City is committed to supporting state efforts to achieve the reduction targets identified in AB 32 as well as EOs S-3-05 and B-30-15. Achieving state goals will require a cumulative effort from jurisdictions across the state to reduce emissions to sustainable levels. Commonly accepted approaches to bridge the gap between statewide targets and local emissions include (1) applying statewide reduction targets to the local emissions, i.e. reducing total local GHG emissions to 1990 levels by 2020 and beyond, or (2) assessing per capita emission levels against statewide reduction targets, i.e., reducing per capita emission levels to statewide targets.

RECON considered various approaches for assessing consistency with statewide reduction targets and has recommended that the City assess per capita emissions levels against statewide targets to be appropriate. Although various approaches assess consistency with statewide reduction targets, only the per capita approach affords appropriate consideration to local conditions such as population growth.

Table 4 summarizes the communitywide and municipal emission level targets equivalent to 2020 and 2030 statewide GHG reduction targets. Although statewide reduction targets have been proposed for 2050, 2050 emission levels are only qualitatively assessed, as emission factors and reduction strategies for 2050 are subject to a high degree of speculation.

Table 4
Target Emission Levels (MT CO_2E)

Scope	Year	Target Emission Level		Forecasted Emission Level	
		Per Capita	Total	Per Capita	Total
Communitywide	2020	10.6	923,089	6.4	560,446
	2030	5.9	625,696	5.0	528,262
Municipal[1]	2020	0.23	19,758	0.09	14,228
	2030	0.14	14,536	0.07	13,920

[1] There is no statewide per capita of service base emission levels. Fairshare municipal reduction targets for 2020 and 2030 are 40 and 80 percent below 1990 per capita per capita of service base emission levels.

As shown in Table 4, the City's local emission levels already support efforts to achieve statewide reduction targets. Although the City already achieves per capita emission levels consistent with statewide target emissions levels, recommended reduction measures proposed in the following section would further reduce local emissions.

6.0 Recommended GHG Reduction Measures

RECON recommends the following GHG reduction measures for inclusion in the CAP. These measures are appropriate and relevant for the community and would allow the City to meet its GHG reduction targets.

6.1 Communitywide Measures

a. Measures that Reduce Residential Energy Use

Residential Energy Efficiency Education – Designate a City staff member responsible for overseeing an Energy Awareness Program. The purpose of the program would be to provide lectures, seminars, and training on green building based on a guide and training material emphasizing desert conditions and opportunities. For recommendations on implementation of the Energy Awareness Program see the CEC's *Energy Aware Planning Guide* (CEC 2011).

Reductions associated with this measure were estimated based on the amount of household reached by the Energy Awareness Program and the anticipated annual electricity savings per household. The electricity savings per household were estimated based on data from the California Energy Commission (CEC) commission report *Options for Energy Efficiency in Existing Buildings* and account for corrections to relate state averages to actual energy use in Indio (CEC 2005). This analysis assumes the outreach would reach approximately 1,000 households per year.

The CEC commission report included a case study energy awareness programs (referred to in the report as "Information Gateway") and found that the annual electricity savings of each participating household was 619 kilowatt hours (kWh). As stated in the CEC commissions report, the average annual electricity use of single-family unit in California is 7,000 kilowatt hours (kWh) and the average annual electricity use of a multi-family unit is about 4,000 kWh per year. Based on Census data, in 2010 there were 18,026 single-family homes and 9,770 multi-family units in Indio (U.S. Census Bureau 2010). Thus, based on statewide averages residences in Indio would be expected to use 165,262 GWh in 2010. As discussed above, reported residential energy use in 2010 was 382,317 GWh, therefore, residences in Indio consumed approximately 2.3 times the average electricity of residences studied by the CEC commissions report. Accounting for the relative electricity use of residences in Indio as compared to residences studied by the CEC commissions report, the anticipated annual electricity savings of the energy awareness programs were anticipated to be 1,432 kWh.

Estimated annual savings would be 5,811 MT CO_2E in 2020, 13,841 MT CO_2E in 2030, and 17,070 MT CO_2E in 2050.

Residential Transfer of Title Energy Disclosures – Implement General Plan Policy CE-5.4. Consistent with CE-5.4, encourage energy audits to be performed on residences prior to sale or other transfer of title. Provide prospective owners with recommendations for retrofit measures to be given to the buyer prior to transfer of title.

Reductions associated with this measure were estimated based on the rate at which households are expected to transfer title and the CEC forecast zone, and the anticipated percent energy savings. As stated in the CEC commission report *Options for Energy Efficiency in Existing Buildings*, single-family units and condominiums should be expected to sell at a rate of 5.5 and 6.3 percent per year, respectively (CEC 2005). This analysis conservatively assumed the lower rate of 5.5 percent per year sales. Based on the anticipated buildout of residences in Indio (53,890 units), this measures was estimated to apply to 2,964 residences per year. Indio is in CEC forecast zone 13. Energy use per residence was based on the number of residences in Indio in 2010 (27,796 units) and the residential energy use in 2010 (382,317 GWh). As indicated in the CEC commissions report, case studies for transfer-of-title disclosures indicated an average annual electricity savings of 550 kWh per

residence. The same method discussed under the Residential Energy Efficiency Education measure was used to account for the relative electricity use of residences in Indio as compared to residences studied by the CEC commissions report. The anticipated annual electricity savings of the energy awareness programs were anticipated to be 1,272 kWh, or 9.25 percent of energy use.

Estimated annual savings would be 14,286 MT CO_2E in 2020, 24,642 MT CO_2E in 2030, and 30,301 MT CO_2E in 2050.[1]

Low Income Weatherization Assistance Program – Partner with Imperial Irrigation District and SoCal Gas to aggressively promote existing programs that provide financial assistance to low-income households for weatherization improvements and heating, ventilation, and air conditioning (HVAC) tune-ups. Establish program goals including providing assistance to 100 households per year.

Although low-income households typically have fewer appliances, low-income households are often poorly insulated.

Reductions associated with this measure were estimated based on the amount of low-income households that are weatherized each year and the forecasted average electricity and natural gas savings of each residences. As stated in the measure, a target of 100 households per year would be established. As stated in the CEC commission report *Options for Energy Efficiency in Existing Buildings*, average electricity and natural gas savings associated with efficiency upgrades to affordable housing is 271 kWh and 72 therms. The same method discussed under the Residential Energy Efficiency Education measure was used to account for the relative energy use of residences in Indio as compared to residences studied by the CEC commissions report. Therefore, annual average savings per household were anticipated to by 627 kWh and 72 therms.

Estimated annual savings would be 412 MT CO_2E in 2020, 1,051 MT CO_2E in 2030, and 1,297 MT CO_2E in 2050 (CEC 2005).

Residential Solar Photovoltaic Financing – Set a communitywide goal of installing 1,000 kilowatts (kW) of solar capacity on existing residential rooftops annually. This goal translates to approximately 200 residential PV systems.

Encourage installation of solar panels by continuing to aggressively promote Indio's Ygrene and HERO Program to reach additional homes. Additionally, consider partnering with the Imperial Irrigation district to gather and distribute information on actual savings achieved by residential PV systems.

The average size of residential rooftop solar installations is 5 kW. Thus, the communitywide goal could be achieved through financing approximately 200 installations per year.

Reductions associated with this measure were estimated based on the amount of solar capacity installed each year and the regional solar generation potential. As stated in the measure, 1,000 kW of solar capacity would be installed each year. Based on the SEEC reference tables for solar generation potential, the regional solar generation potential for areas within the South Coast Air Quality Management District is 1,678 kWh per year per kW installed (SEEC 2016a). Estimated annual savings would be 182,642 MT CO_2E in 2020, 76,799 MT CO_2E in 2030, and 96,395 MT CO_2E in 2050. Note that solar installations on new developments that are required by the following measure should be excluded in assessing this goal.

1All projections that incorporate zero net energy have been adjusted to exclude overlapping effects from the 2013 CBC.

Residential Zero Net Energy Use Developments by 2020 – Implement General Plan Policy CE-5.2. Consistent with CE-5.2, encourage all new residential buildings to have zero net energy by 2020 consistent with the California Public Utilities Commission's (CPUC) *California Long Term Energy Efficiency Strategic Plan* (CPUC 2011).

Reductions associated with this measure were estimated based on the rate at which households are expected to be built, the ratio of single-family to multi-family units built, the CEC forecast zone, and the anticipated percent energy savings. Based on Census data, in 2010 there were 18,026 single-family homes and 9,770 multi-family units in Indio (U.S. Census Bureau 2010). Anticipated buildout of the General Plan would include 27,902 single-family units and 25,988 multi-family units. Therefore, residences would be built at a rate of 1,044 residences per year. Indio is in CEC forecast zone 13. Defining "zero net energy" as resulting in a negligible net electricity demand, anticipated electricity savings would be 100 percent.

Estimated annual savings would be 8,729 MT CO_2E in 2020, 85,463 MT CO_2E in 2030, and 105,400 MT CO_2E in 2050.

b. Measures that Reduce Commercial and Industrial Energy Use

Commercial Benchmarking – Incorporate commercial outreach in the Energy Awareness Program (see Residential Energy Education). Aggressively promote commercial benchmarking using the EPA's ENERGY STAR Portfolio Manager or equivalent benchmarking tool.

Reductions associated with this measure were estimated based on the amount of participated building space (square feet per year) and the anticipated annual savings per square foot. This measure was quantified assuming that outreach results in 1,000,000 square feet of benchmarking per year (this equates to roughly 21 percent by 2020, 43 percent by 2030, and 46 percent by 2050). Specific data indicating the existing area of commercial buildings in Indio is unavailable. The anticipated commercial building area at buildout of the General Plan (42,453,721 square feet) was backcasted based on employment data from the employment rates identified in the *City of Indio General Plan Update Economic and Demographic Trends and Conditions* (Stanley R Hoffman Dec 2014). Backasted estimates of existing commercial building area are 18,060,622 square feet. As discussed above, reported commercial energy use in 2010 was 253,952 GWh, therefore, on average commercial buildings in Indio consumed approximately 14.06 kWh. Based on recent data from the U.S. EPA EnergyStar Portfolio Manager, the electricity use of benchmarked buildings falls by approximately 7.1 percent within the first three years (U.S. EPA 2012). Extrapolating from the U.S. EPA data and assuming exponentially diminishing reductions, benchmarked buildings would only achieve a total reduction of approximately 10.1 percent. Thus, benchmarking commercial buildings is anticipated to result in a total reduction of 1.42 kWh per square foot.

Estimated annual savings would be 3,980 MT CO_2E in 2020, 8,691 MT CO_2E in 2030, and 10,719 MT CO_2E in 2050.

Non-Residential Solar Photovoltaic Financing – Set a communitywide goal of installing 2,500 kW of solar capacity on existing non-residential properties annually. Encourage installation of solar panels by expanding Indio's Ygrene and HERO Program to include financing options non-residential properties. Additionally, consider partnering with Imperial Irrigation District to gather and distribute information on actual savings achieved by commercial PV systems.

The average size of solar installations on non-residential buildings varies dramatically. Installation of 2,500 kW equates to less than 2 percent of existing non-residential building energy demand.

Reductions associated with this measure were estimated based on the amount of solar capacity installed each year and the regional solar generation potential. As stated in the measure, 2,500 kW

of solar capacity would be installed each year. Based on the SEEC reference tables for solar generation potential, the regional solar generation potential for areas within the South Coast Air Quality Management District is 1,678 kWh per year per kW installed (SEEC 2016a).

Estimated annual savings would be 11,587 MT CO_2E in 2020, 26,604 MT CO_2E in 2030, and 39,511 MT CO_2E in 2050.

Non-Residential Zero Net Energy Use Developments by 2030 – Implement General Plan Policy CE-5.2. Consistent with CE-5.2, encourage all new commercial buildings to have zero net energy by 2030 consistent with the CPUC's *California Long Term Energy Efficiency Strategic Plan* (CPUC 2011).

Reductions associated with this measure were estimated based on the rate at which commercial buildings are expected to be built, the CEC forecast zone, and the anticipated percent energy savings. The same method discussed under the Commercial Benchmarking measure was used to determine the electricity use of commercial buildings. Defining "zero net energy" as resulting in a negligible net electricity demand, anticipated electricity savings would be 100 percent.

Estimated annual GHG reductions would be 6,501 MT CO_2E in 2030 and 74,515 MT CO_2E in 2050.[2]

c. Measures that Reduce Mobile Sources

Adoption of General Plan Land Use Designations – Adopt land use designations proposed in the GPU.

Land uses proposed in the GPU include higher density land uses. Compact growth reduces average trip lengths, reducing VMT. Additionally, compact growth is an essential for other reduction measures, such as an increase in mass transit or alternative modes of transportation.

Reductions associated with this measure were estimated based on the projected population, the business-as-usual population density profile, and the population density profile of the GPU's revised land use designations. Population was estimated based on Indio's 2035 population, 118,113 residents. The business-as-usual population density profile was based on the existing land use designations throughout the city. Following SEEC protocol existing residential designations were categorized as rural, low-density suburban, medium-density, urban, or high density based on the allowable dwelling units per acre for each designation. The population density profile of the GPU's revised land use designations was also categorized. Reductions in VMT and associated GHG reductions were estimated using standard factors from the SEEC reference tables for Smart Growth (SEEC 2016b).

Estimated annual savings would be 6,564 MT CO_2E in 2020, 56,523 MT CO_2E in 2030, and 69,709 MT CO_2E in 2050.

Improved Bicycle Infrastructure – Adopt policies included in the GPU Mobility Element, which include improving the City's bicycle network.

Improving bicycle infrastructure promotes its use by increasing safety, aesthetics, and effectiveness. Increased ridership reduces vehicle trips. Basic bicycle infrastructure improvements include installing bicycle stations near business districts and maintaining a continuous network of on-street bicycle lanes.

[2]Ibid.

Reductions associated with this measure were estimated based on the population, the population density profile, the bicycle quality of the bicycle network, and the bicycle mode share. Population was estimated based on Indio's 2035 population, 118,113 residents. The population density profile of the GPU's revised land use designations was also categorized as rural, low-density suburban, medium-density, urban, or high density following same method discussed under the Adoption of General Plan Land Use Designations measure. Although policies included in the GPU Mobility Element are intended to encourage bicycle amenities, this analysis conservatively assumes a bare minimum bicycle network. Bicycle mode share was estimated based on SEEC reference tables for improved bike infrastructure (SEEC 2016c).

Based on Indio's population density and distribution, and assuming that improvements occur gradually over the next 20 years, estimated annual savings would be 603 MT CO_2E in 2020, 1337 MT CO_2E in 2030, and 3,420 MT CO_2E in 2050.

Golf Cart Infrastructure Improvements – Implement General Plan Policies ME-12.1 and 12.2. Consistent with ME-12.1 and 12.2, encourage infrastructure that promotes the use of golf carts. This may include encouraging installation of golf cart paths with new developments that connect to a larger transportation network or encouraging installation of charging stations at non-residential uses.

It is not possible to reasonably forecast GHG reductions achieved by golf cart infrastructure improvements at this time. Prior to forecasting GHG reductions, known parameters would need to include the number of golf carts owned per residence, the fuel mix of golf carts, vehicle emission factors for non-electric golf carts, and the location, orientation, and interconnectivity of proposed golf cart paths.

d. Measures that Reduce Water Use

Water Conservation Rate Schedule – (*Continuing measure*) In January 2014, the Indio Water Authority approved a "20 x 2020" water conservation rate schedule intended to reduce water use by 20 percent by the year 2020. This measure would include increasing the water use reduction target from 20 to 32 percent and would include continued implementation of a tiered rate schedule, seasonal rates, and/or excess-use surcharges to reduce peak demands during summer months. Supplemental water conservation measures may include turf reduction rebates, water-efficient appliance rebates, and distribution of indoor water conservation kits.[3]

Reductions associated with this measure were estimated based on the total electricity use of water delivery and wastewater treatment and the percent reduction. As discussed above, reported water-related electricity use in 2010 was 31,568 GWh. As stated in the measure, the Water Rate Conservation Schedule would achieve a 32 percent reduction in water use; thereby, the measure would reduce electricity use by 32 percent.

Based on the required reduction in water use, estimated annual savings would be 4,798 MT CO_2E in 2020, 4,558 MT CO_2E in 2030, and MT CO_2E in 2050.

[3]Water use reduction targets include reductions achieved through municipal measures. See accompanying municipal measures, which reduce water use through turf reduction and installation of "smart" irrigation systems.

Landscape and Water Conservation Ordinance – Consider for adoption the *Coachella Valley Model Water Efficient Landscape Ordinance*. The ordinance establishes a structure for planning, designing, installing, and maintaining water efficient landscapes for new and rehabilitated projects. Included in the ordinance is a structure for review and approval of landscape projects by both the Coachella Valley Water District and the City of Indio. A primary component of the ordinance is establishment of Maximum Applied Water Allowances (MAWA) that reduces water use to the lowest practical amount. Specific water reduction measures required of each project include separate requiring separate landscaping water meters, high flow sensors (leak detection), smart controllers, and landscape appropriate irrigation such as drip systems.

Reductions associated with this measure were estimated based on the total electricity use of water delivery and wastewater treatment, the scope to which the measure would apply, and the percent reduction of water use for landscapes compliant with the ordinance. As discussed above, reported water-related electricity use in 2010 was 31,568 GWh. The measure was assumed to achieve 75 percent compliance by 2035. Based on data from the U.S. EPA's paper *A Water-Smart Solution for Larger Landscapes*, annual average water savings associated with smart irrigation control are approximately 15 percent (U.S. EPA 2014).

Estimated annual savings of this continued measure would be 1,686 MT CO_2E in 2020, 1,628 MT CO_2E in 2030, and 1,960 MT CO_2E in 2050.

Graywater Ordinance – Implement General Plan Policy CE-3.5. Consistent with CE-3.5, encourage new residential developments to be constructed for easy implementation of gray water systems that redirect water from washbasins, showers, and tubs.

On average 70 percent of water is used indoors. Major uses include toilets (27 percent), clothes washers (22 percent), showers and tubs (17 percent), faucets (16 percent), leaks (14 percent), and other uses (U.S. EPA 2016). Graywater from showers, tubs, and faucets can replace potable water for outdoor use. Reductions associated with this measure were estimated based on the total electricity use of water delivery and wastewater treatment, the percent reduction in water use, and the amount of development to which the ordinance would apply. As discussed above, reported water-related electricity use in 2010 was 31,568 GWh. Assuming the graywater ordinance allowed for showers and faucets, the ordinance would reduce indoor water use of residences by 33 percent, and total water use by 23 percent. The population of Indio and the associated water use are anticipated to increase by approximately 61 percent by 2035. Thus, 61 percent of development would be subject to this ordinance by 2035. Overall, the ordinance is anticipated to reduce water use by approximately 14 percent.

Accounting only for new development that would be subject to the ordinance, estimated annual savings would be 2,079 MT CO_2E in 2020, 1,997 MT CO_2E in 2030, and 2,415 MT CO_2E in 2050.

e. Solid Waste and Fugitive Emissions Sectors

The City has elected to exclude GHG reduction measures to reduce communitywide GHG emissions associated with the solid waste or fugitive emissions sectors.

Common measures taken to reduce solid waste emissions include adoption of ordinances that require increased waste diversion rates, City-implemented recycling programs, improving waste diversion through improved landfill waste separation, or improved efforts to control fugitive methane emissions from landfills. The original inventory estimated that Indio achieved a waste diversion rate of 73.6 percent in 2010. As waste diversion efforts in the City already result in substantial reductions, further efforts to reduce solid waste disposal may be difficult to achieve. Additionally, as the City's solid waste is disposed of in landfills outside the City's jurisdiction, efforts to control fugitive methane emissions at these landfills are infeasible.

There are no common local measures to reduce emissions associated with the use ODS or the application of fertilizers. Regulation of ODS is under the jurisdiction of the CARB.

f. Mitigated Communitywide Forecast

Incorporating all measures listed above, a mitigated communitywide forecast was generated. Figures 9 and 10 display mitigated emission forecasts from 2010 to 2050 in terms of total emissions and per capita emissions, respectively.

Figure 9
Mitigated Communitywide Forecast (Total Emissions)

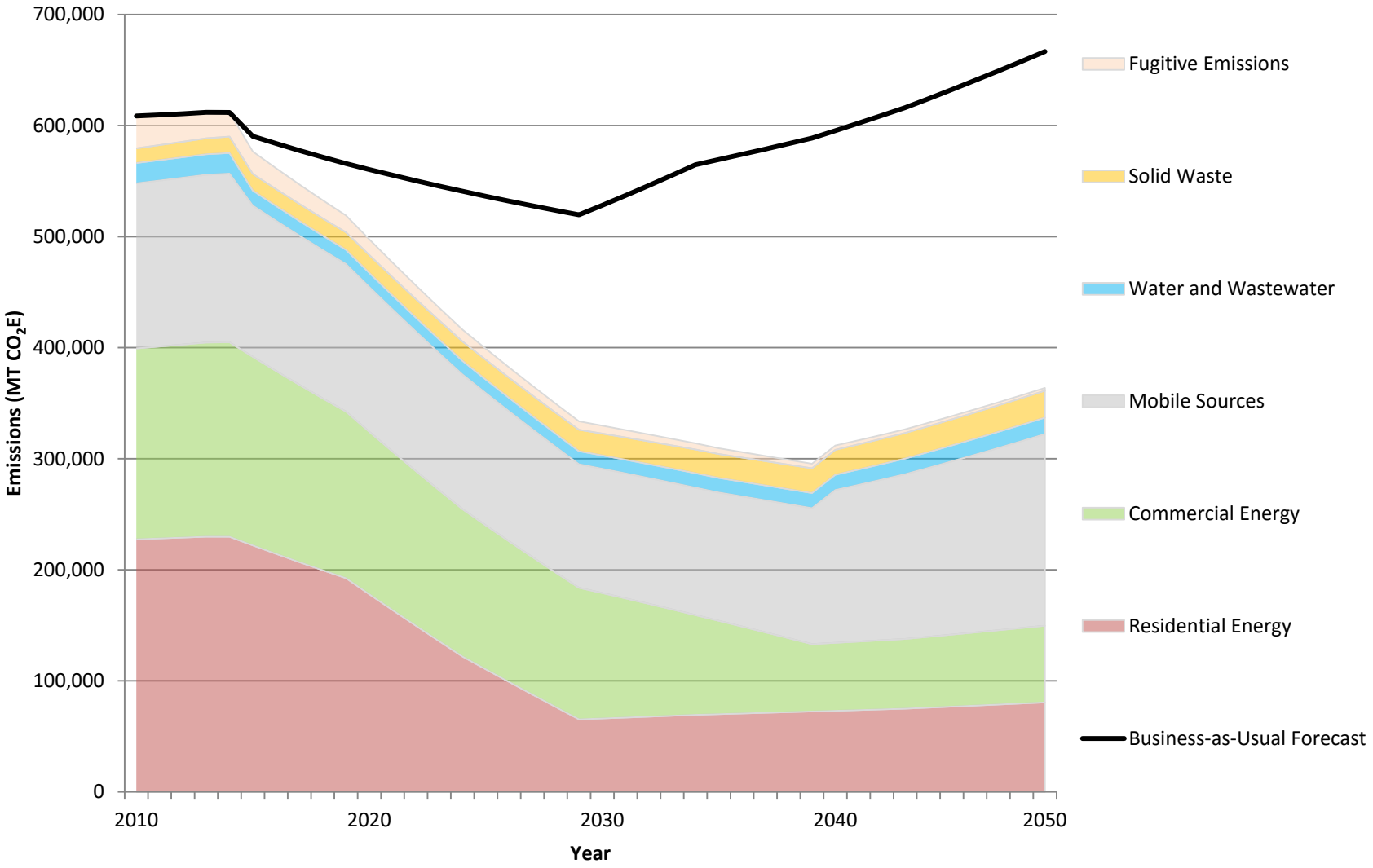
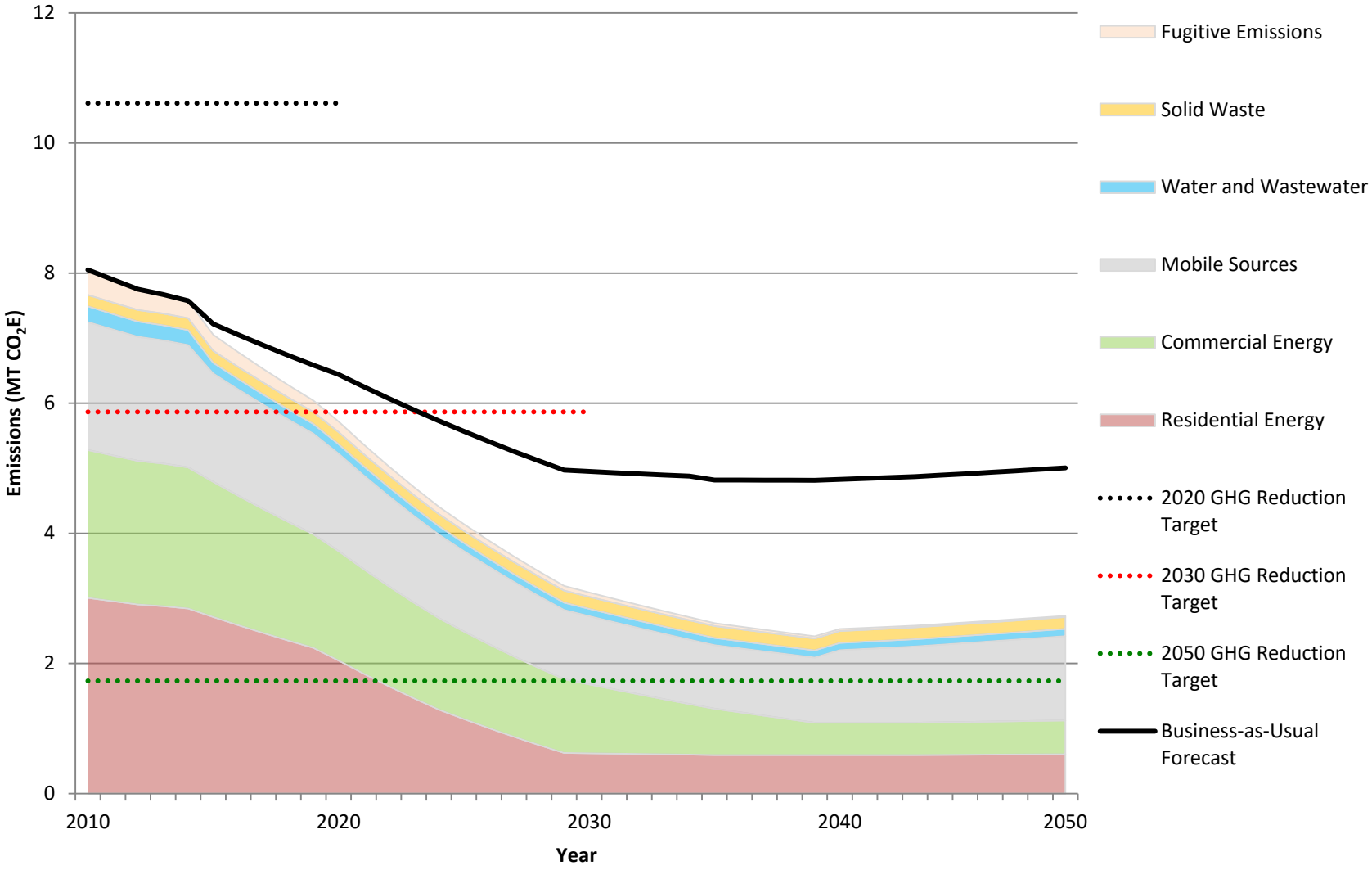


Figure 10
Mitigated Communitywide Forecast (Per Capita Emissions)



6.2 Municipal Measures

Based on the projected emissions, RECON recommends the following measures to be included in the City's CAP.

a. Measures that Reduce Building and Facility Energy Use

Municipal Benchmarking – Designate a City Staff member responsible for benchmarking municipal facilities using the EPA's ENERGY STAR Portfolio Manager or equivalent benchmarking tool. By 2020 benchmark the Coachella Valley History Museum, the Indio Corporate Yard, the Indio Police Department, Indio City Hall, the Indio Boys and Girls Club, and the Fire Department buildings. Consider energy efficiency upgrades if buildings achieve low ENERGY STAR scores.

Reductions associated with this measure were estimated based on the municipal building and facility energy use, the percent of use to which the measure would apply, and the anticipated savings for benchmarked buildings and facilities. As discussed previously, municipal buildings and facilities use 4,244 GWh and 1,361 MMBtu. The buildings and facilities listed account for approximately 90 percent of the City's building and facility energy use emissions. Following the same method discussed under the Commercial Benchmarking measure, benchmarked buildings would achieve a total reduction of approximately 10.1 percent (U.S. EPA 2012).

Estimated annual savings would be 244 MT CO_2E, or 9.6 percent of all municipal building and facility energy use emissions.

Increased Solar Photovoltaic – (*Continuing measure*) In 2010, the Indio Water Authority installed rooftop solar panels that are estimated to generate 50,000 kilowatt hours (kWh) annually. The City has also budgeted a rooftop solar project to provide 82 percent of the electrical demand from City Hall. Continuation of this measure would include increasing the amount of solar panels installed on all municipal facilities, as deemed feasible. This may include increasing solar panels installed on Indio Water Authority Plant 1 from 162 to 340 by 2020; this increase in would achieve a grid electricity use reduction of approximately 290,000 kWh.

Reductions associated with this measure were estimated based on the amount of solar capacity installed. As stated in the measure, increase solar capacity would include existing capacity to generate 50,000 kWh on IWA Plant 1, capacity to generate another 290,000 kWh at IWA Plant 1. Additionally enough capacity to generate 82 percent of City Hall's electrical use (338,758 kWh of 413,120 kWh) would also be installed.

Based on the reduction in electricity use, estimated annual savings would be 253 MT CO_2E, or 10.0 percent of all municipal building and facility energy use emissions.

Municipal Facility Light Fixture Upgrades – (*Continuing measure*) Between 2011 and 2013 the City contracted for lighting upgrades to various municipal facilities including Civic Center buildings, the Indio Performing Arts Center, the Indio Senior Center, the Coachella Valley History Museum, the Boy Scouts of America building, police and fire stations, and municipal golf courses.

Reductions associated with this measure were estimated based on the amount of energy savings associated with light fixture upgrades and the IID energy intensity factor. As indicated by City's 2011 contract with Gamma Builders, Inc. fixture upgrades in 2011 were estimated to result in annual electricity use savings of 112,477 kWh. As indicated by the City'snd the City's 2013 agreement with Climatec BTG, fixture upgrades in 2013 were estimated to result in annual electricity savings of 310,681 kWh. Electricity savings were equated to GHG reductions through the IID energy intensity factor.

Based on the reduction in electricity use, estimated annual savings would be 244 MT CO_2E, or 9.7 percent of all municipal building and facility energy use emissions.

Municipal Facility Light Sensors – (*Continuing measure*) Between 2011 and 2013 the City contracted for lighting upgrades to various municipal facilities including City Hall, the Indio Senior Center, and police and fire stations.

Reductions associated with this measure were estimated based on the amount of energy savings associated with light sensors and the IID energy intensity factor. As indicated by City's 2011 contract with Gamma Builders, Inc. installation of light sensors in 2011 were estimated to result in annual electricity use savings of 10,523 kWh. As indicated by the City'snd the City's 2013 agreement with Climatec BTG, fixture upgrades in 2013 were estimated to result in annual electricity savings of 128,098 kWh. Electricity savings were equated to GHG reductions through the IID energy intensity factor.

Based on the reduction in electricity use, estimated annual savings would be 80 MT CO_2E, or 3.2 percent of all municipal building and facility energy use emissions.

Municipal Facility HVAC Upgrades – (*Continuing measure*) Between 2011 and 2013 the City contracted for HVAC upgrades to various municipal facilities including City Hall, the Indio Senior Center, and the Indio Police station.

Reductions associated with this measure were estimated based on the amount of energy savings associated with HVAC upgrades and the IID energy intensity factor. As indicated by City's 2011 contract with Gamma Builders, Inc. HVAC upgrades in 2011 were estimated to result in annual electricity use savings of 69,559 kWh. Electricity savings were equated to GHG reductions through the IID energy intensity factor. Thus, the measure would result in a total annual electricity savings of 678,758 kWh. Electricity savings were equated to GHG reductions through the IID energy intensity factor.

Based on the reduction in electricity use, estimated annual savings would be 40 MT CO_2E, or 1.6 percent of all municipal building and facility energy use emissions.

b. Measures that Reduce Street Light and Traffic Signal Energy Use

Traffic Signal LED Fixture Upgrades – (Continuing measure) Between 2008 and 2012 the City upgraded approximately 96 traffic signals with light-emitting diodes (LED) fixtures. This measure would include developing and implementing a plan to replace City streetlights and traffic signals with LED fixtures by 2035.

Reductions associated with this measure were estimated based on the number of traffic signal fixtures that are upgraded. The exact number of traffic signal fixtures and the type of existing lamps in the City was not available. The total number of fixtures was assumed to be 800 based on the reported electricity use of traffic signals (608 GWh). Electricity savings were estimated assuming an average distribution of existing lamps types.

Based on the reduction in electricity use, estimated annual savings would be 244 MT CO_2E, or 69.5 percent of street light and traffic signal energy use.

c. Measures that Reduce Employee Commute Emissions

Employee Carpooling Program – Develop an employee carpooling program. Designate a City staff member to oversee the program. Consider measures such as surveys to identify potential carpooling opportunities or incentives to promote carpooling.

Reductions associated with this measure were estimated based on the number of employees, the participation rate, and the average trip distance. The number of employees was based on the total employees of the City and the IWA, 306 employees. A participation rate of 20 percent was assumed. Based on 2010 employee commute surveys an average trip distance of 10.3 miles was used (Indio 2012). Based on the reduction in VMT, estimated annual savings would be 64 MT CO_2E, or 9.2 percent of employee commute emissions.

d. Measures that Reduce Water Treatment and Delivery Emissions

Turf Reduction and Smart Irrigation Control Systems – (*Continuing measure*) Since 2010, the City has removed approximately 9,000 square feet of water-intensive landscaping and began installing smart irrigation control systems.

As water demand associated with landscaping varies substantially due to factors such as vegetation type, solar exposure, watering patterns, etc., it is not possible to reasonably forecast GHG reductions achieved by these water reduction measures.

Additionally, municipal emissions associated with water treatment and delivery would be reduced by measures that reduce communitywide water use. As discussed previously, these include adopting a water conservation rate schedule, increasing enforcement of the landscape and water conservation ordinance, and adopting a requirement for new development to be compatible with graywater systems.

The municipal reductions of the water conservation rate schedule, landscape and water conservation ordinance, and graywater ordinance were quantified using the same methods discussed in Section 6.1(d); however, rather than using the total water-related electricity use in 2010 (31,568 GWh) the water-related electricity use of IWA was used (14,086 GWh).

Based on the reduction in water use, estimated municipal savings would be 3,821 MT CO_2E in 2020, 3,651 MT CO_2E in 2030, and 4,440 MT CO_2E in 2050.

e. Vehicle Fleet, Transit Fleet, Solid Waste, and Fugitive Emissions

The City has elected to exclude GHG reduction measures to reduce municipal GHG emissions associated with transit fleet, solid waste disposal, or fugitive emissions.

Potential measures to reduce vehicle fleet emissions include transitioning the fleet to alternative fuel vehicles. Over half of the VMT of the City's vehicle fleet is attributable to emergency response vehicles. Costs associated with transitioning to an alternative fuel fleet include both direct costs associated with purchasing new vehicles and indirect costs associated with fuel infrastructure and vehicle maintenance. Due to fiscal and safety concerns the City has determined that there is too much uncertainty to proceed with the measure at this time. Consideration of alternative fuel vehicles may be revisited as technology and financing progresses.

Common measures taken to reduce transit fleet emissions would include switching to alternative fuels. The existing transit fleet has already shifted to primarily CNG fueled vehicles. In 2010, SunLine vehicles ran entirely on CNG, and 89 percent of all Burrtec fuel use was CNG. Achieving further reductions would have diminished returns and is likely to occur without any change in City policy.

As discussed under communitywide solid waste, common measures taken to reduce solid waste emissions include adoption of ordinances that require increased waste diversion rates, City-implemented recycling programs, improving waste diversion through improved landfill waste separation, or improved efforts to control fugitive methane emissions from landfills. As the City already achieve high diversion rates and the City's solid waste is disposed of in landfills outside the City's jurisdiction, further reductions would result in limited GHG reductions.

Municipal operations that result in fugitive emissions include application of fertilizer and use of ODS as vehicle refrigerants. Feasible reduction measures would include reducing fertilizer application rates and replacing vehicle refrigeration units with units that use more climate-friendly refrigerants. Application of fertilizer to municipal golf courses and parks is necessary for proper maintenance, and thus may not be reduced without adverse impacts. Replacing existing vehicle refrigeration units that use climate-friendly refrigerants would be cost prohibitive relative to the GHG reduction. As reductions are likely to occur gradually as City vehicles are replaced, no change in City policy is recommended.

f. Mitigated Municipal Forecast

Incorporating all measures listed above, a mitigated municipal forecast was generated. Figures 11 and 12 display mitigated emission forecasts from 2010 to 2050 in terms of total emissions and per capita emissions, respectively.

Figure 11
Mitigated Municipal Forecast (Total Emissions)

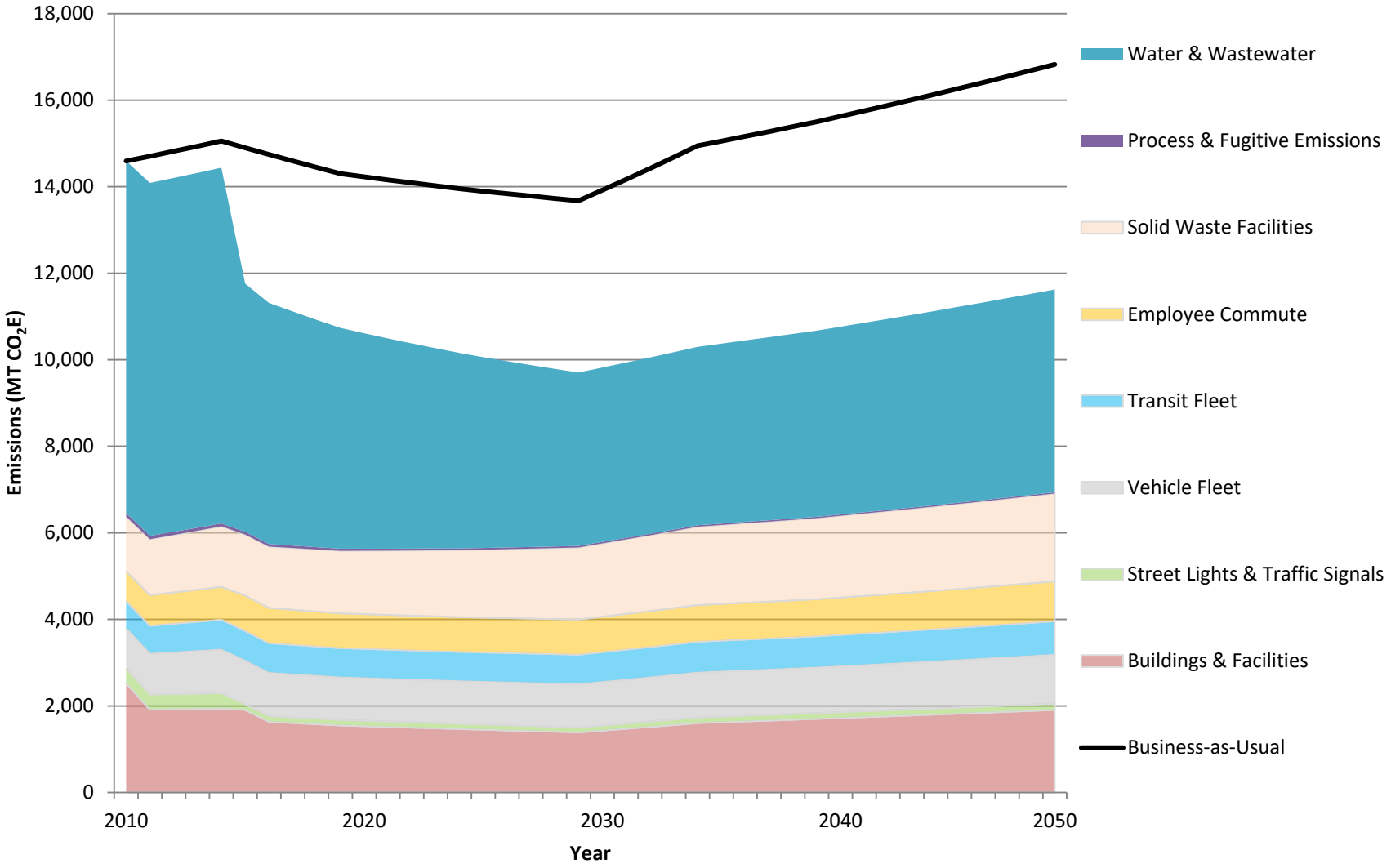
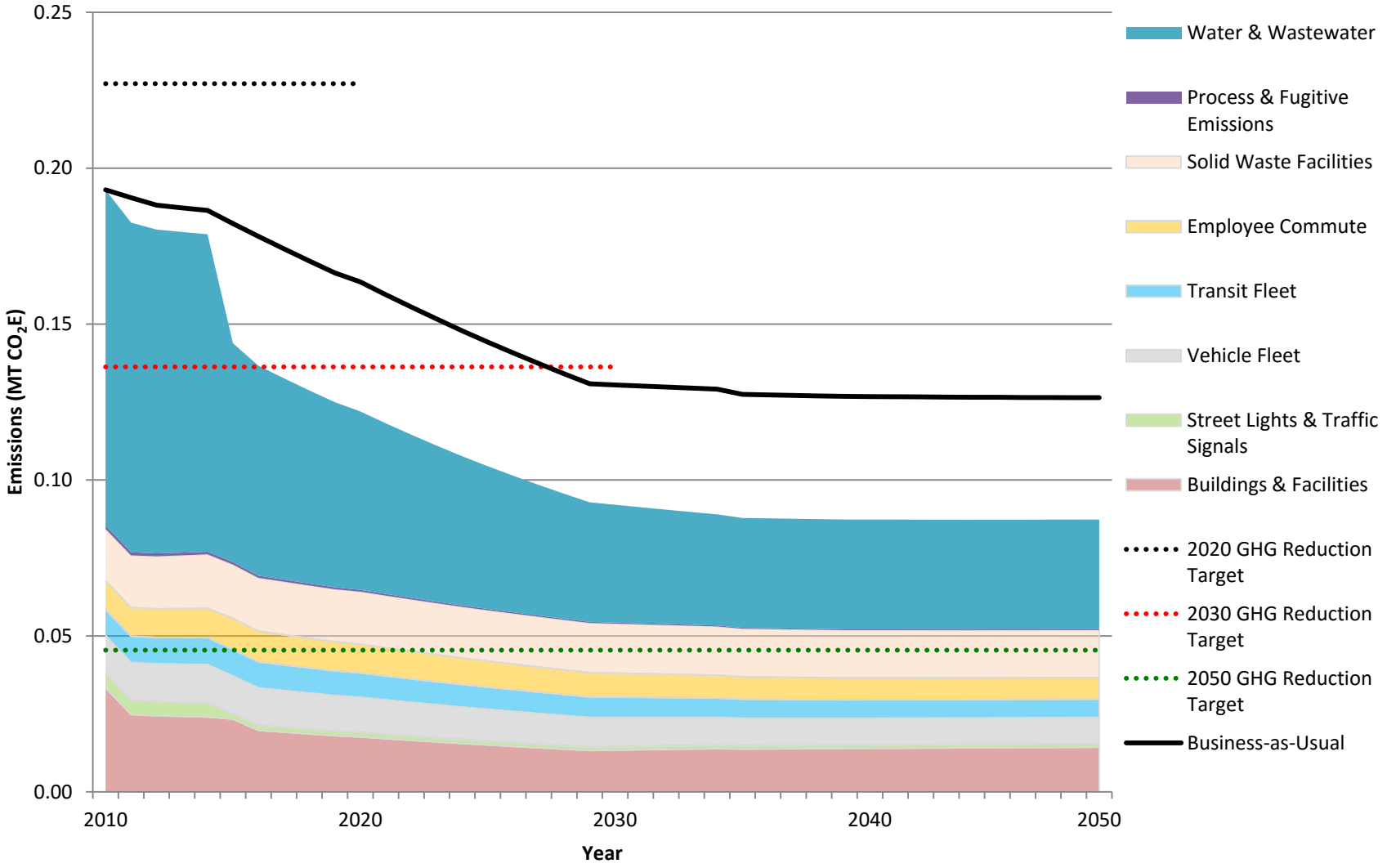


Figure 12
Mitigated Municipal Forecast (Per Capita Served Emissions)



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Appendix C – Greenhouse Gas Reduction Analysis Assumptions

Greenhouse Gas Reduction Analysis Assumptions

The following section describes the key assumptions used to calculate greenhouse gas reductions. When feasible, the potential reduction value of each measure has been quantified using industry standard methods. The SEEC ClearPath tool was used. The report describes approaches for quantifying greenhouse gas reductions from a specified list of mitigation measures. This list does not include measures that were not quantified.

Clean Energy

Commercial Solar Program			
Description	Promote the installation of commercial solar systems on existing buildings.		
Assumptions			
Start Year	2020		
Increased Solar Capacity	1,000	kW Installed Capacity Year	Based on CSI average California Solar Initiative program data
Generation Potential	1,678	kWh / kW Installed Capacity	Solar Photovoltaic Calculator in CAPA
Greenhouse Gas Reductions			
Annual Electricity Production	1,678,000	kWh / Year	
Total Emission Reductions 2040	5,917	$MTCO_2e$	

Residential Solar Program			
Description	Promote the installation of residential solar systems on existing buildings.		
Assumptions			
Start Year	2020		
Increased Solar Capacity	295	kW Installed Capacity Year	Based on CSI average California Solar Initiative program data. Assumes 25 DU per year with an array size of 11.8 kW (average in the Imperial Irrigation District)
Generation Potential	1,678	kWh / kW Installed Capacity	Solar Photovoltaic Calculator in CAPA
Greenhouse Gas Reductions			
Annual Electricity Production	495,010	kWh / Year	
Total Emission Reductions 2040	1,738	$MTCO_2e$	

Low Carbon Buildings

Low Income Weatherization			
Description	Partner with Imperial Irrigation District (IID) and SoCal Gas to aggressively promote existing programs that provide financial assistance to low-income households for weatherization improvements and heating, ventilation, and air conditioning (HVAC) tune-ups. Establish program goals including providing assistance to 100 households per year.		
Assumptions			
Start Year	2011		
Number of Homes Weatherized Each Year	100	Homes	
Electricity Savings per Home per Year	627	kWh / Home / Year	Options for Energy Efficiency in Existing Buildings - CEC
Gas Savings per Home per Year	72	Therms / Home	Options for Energy Efficiency in Existing Buildings - CEC
Greenhouse Gas Reductions			
Energy Savings	62,700	kWh / Year	
Natural Gas Savings	7,200	Therms / Year	
Total Emission Reductions 2040	934	$MTCO_2e$	

Energy Efficiency Education			
Description	Designate a City staff member responsible for overseeing an Energy Awareness Program to increase energy program participation rates and promote the conversion of natural gas systems and appliances to electric systems and appliances.		
Assumptions			
Start Year	2020		
Number of Participating Households	600	Homes	
Electricity Savings per Home per Year	619	kWh / Home / Year	Options for Energy Efficiency in Existing Buildings - CEC
Gas Savings per Home per Year	56	Therms / Home	Options for Energy Efficiency in Existing Buildings - CEC
Greenhouse Gas Reductions			
Energy Savings	371,400	kWh / Year	
Natural Gas Savings	33,600	Therms / Year	
Total Emission Reductions 2040	3,823	$MTCO_2e$	

Commercial Benchmarking			
Description	Incorporate commercial outreach in the Energy Awareness Program (see Residential Energy Efficiency Education). Aggressively promote commercial benchmarking using the Environmental Protection Agency's ENERGY STAR Portfolio Manager or equivalent benchmarking tool.		
Assumptions			
Start Year	2016		
Area of Participating Building Space	1,000,000	Square Feet Benchmarked Per Year	
Electricity Savings per Square Foot per Year	1.417	kWh / Home / Year	Options for Energy Efficiency in Existing Buildings - CEC
Gas Savings per Home per Year	0.002	Therms / Home	Options for Energy Efficiency in Existing Buildings - CEC
Greenhouse Gas Reductions			
Energy Savings	1,417,000	kWh / Year	
Natural Gas Savings	2,000	Therms / Year	
Total Emission Reductions 2040	6,250	$MTCO_2e$	

Residential Transfer of Title Energy Disclosure			
Description	Establish an energy disclosure program to be performed prior to sale or other transfer of title. Disclosures should provide prospective owners with recommendations for retrofit measures.		
Assumptions			
Start Year	2020		
Annual Household Sales	1,500	Residences Sold / Year	Zillow – 3 Year Average
Percent Single Family	89	Percent Residences Sold / Year	Zillow – 3 Year Average
Percent Multifamily	11	Percent Residences Sold / Year	Zillow – 3 Year Average
Target Reduction	9.25	Percent	Target
Greenhouse Gas Reductions			
Energy Savings	1,441,200	kWh / Year	
Natural Gas Savings	73,629	Therms / Year	
Total Emission Reductions 2040	7,499	$MTCO_2e$	

Title 24 Residential - 2013 Standard			
Description	Adopt regular updates to the City's building code. Require all new buildings to meet or exceed Title 24 standards.		
Assumptions			
Start Year	2013		
Single Family Construction	785,229	Square Feet / Year	Indio 2040 Growth Forecast
Multifamily Construction	253,689	Square Feet / Year	Indio 2040 Growth Forecast
Greenhouse Gas Reductions			
Energy Savings	602,391	kWh / Year	
Natural Gas Savings	7,321	Therms / Year	
Total Emission Reductions 2040	5,621	$MTCO_2e$	

Title 24 Commercial - 2013 Standard			
Description	Adopt regular updates to the City's building code. Require all new buildings to meet or exceed Title 24 standards.		
Assumptions			
Start Year	2013		
Medium Office Construction	36,601	Square Feet / Year	Indio 2040 Growth Forecast
Hotel Construction	10,795	Square Feet / Year	Indio 2040 Growth Forecast
Non-Mall Retail Construction	62,111	Square Feet / Year	Indio 2040 Growth Forecast
Warehouse Construction	6,468	Square Feet / Year	Indio 2040 Growth Forecast
Greenhouse Gas Reductions			
Energy Savings	179,030	kWh / Year	
Natural Gas Savings	398	Therms / Year	
Total Emission Reductions 2040	1,268	$MTCO_2e$	

Net Zero Residential Buildings			
Description	Adopt regular updates to the City's building code. Require all new buildings to meet or exceed Title 24 standards for net zero building (residential buildings by 2020 and commercial buildings by 2030).		
Assumptions			
Start Year	2020		
Single Family Construction	652	Homes	Indio 2040 Growth Forecast
Unit Energy Savings	13,197	kWh / Year	Average electricity use per home per year (2010)
Greenhouse Gas Reductions			
Energy Savings	29,366	MMBtu / Year	
Total Emission Reductions 2040	32,655	$MTCO_2e$	

Net Zero Commercial Buildings			
Description	Adopt regular updates to the City's building code. Require all new buildings to meet or exceed Title 24 standards for net zero building (residential buildings by 2020 and commercial buildings by 2030).		
Assumptions			
Start Year	2030		
Commercial Construction	115,975	Square Feet / Year	Indio 2040 Growth Forecast
Unit Energy Savings	42	kWh / Year	Average electricity use per business per year (2010)
Greenhouse Gas Reductions			
Energy Savings	16,624	MMBtu / Year	
Total Emission Reductions 2040	6,338	$MTCO_2e$	

Water Conservation and Use

Coachella Valley Model Water Efficient Landscape Ordinance			
Description	Continue to implement the Coachella Valley Model Water Efficient Landscape Ordinance.		
Assumptions			
Start Year	2018		
Type of Water Use Conserved	Outdoor		
Amount of Water Conserved	1,195,119,685	Gallons	
Water Supply Energy Intensity Factor	4,014	kWh / million gallons	
Greenhouse Gas Reductions			
Energy Savings	4,797,200	kWh / Year	
Total Emission Reductions 2040	1,955	$MTCO_2e$	

Recycled Water			
Description	Expand recycled water use to service additional customers in Indio.		
Assumptions			
Start Year	2018		
Type of Water Use Conserved	Outdoor		
Amount of Water Conserved	207,359,799	Gallons	
Water Supply Energy Intensity Factor	4,014	kWh / million gallons	
Greenhouse Gas Reductions			
Energy Savings	832,342	kWh / Year	
Total Emission Reductions 2040	339	$MTCO_2e$	

Sustainability Land Use and Transportation

Electric Vehicle Promotion			
Description	Increase the deployment of electric and zero-emission vehicles in Indio. Support expansion of charging station infrastructure and develop an educational campaign.		
Assumptions			
Start Year	2018		
Percent of Gasoline Vehicles Displaced by Electric at End of Program	10	Percent	
Percent of Electric Vehicles that are Plug-in Hybrid Electric Vehicles	7.5	Percent	
Percent of Plug-in Hybrid miles that are on Electricity	55	Percent	US DOE Alternative Fuels Data Center
Greenhouse Gas Reductions			
Total Emission Reductions 2040	13,228	$MTCO_2e$	

Complete Street and Bicycle Network			
Description	Implement a citywide Complete Street and bicycle network consisting of Class I multi-use paths, Class II bike lanes, and Class III and Class IV bicycle routes.		
Assumptions			
Start Year	2018		
Trip Frequency	3	Trips / Person / Day	
Average Bike Trip Length	1.8	Miles	
Greenhouse Gas Reductions			
Total Emission Reductions 2040	1,837	$MTCO_2e$	