Sustainable Santee Plan

The City's Roadmap to Greenhouse Gas Reductions

~~Draft~~ Final – ~~February~~ August 2019

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Sustainable Santee Plan: The City's Roadmap to Greenhouse Gas Reductions

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Acronyms and Abbreviations

AB	Assembly Bill
ABAU	Adjusted Business-As-Usual
CARB	California Air Resources Board
BAU	Business-As-Usual
^{o} C	degrees Celsius
Cal/EPA	California Environmental Protection Agency
CALGreen	California's Green Building Standard Code
CalRecycle	California Department of Resources Recycling and Recovery
CCA/E	Community Choice Aggregation/Energy
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
CIP	Capital Improvement Program
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
EE	energy efficiency
EEM	Energy Efficient Mortgages
EIR	Environmental Impact Report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EV	Electric Vehicles
ºF	degrees Fahrenheit
GHG	greenhouse gas
GWP	global warming potential
HERO	Home Energy Renovation Opportunity
HEV	Hybrid Electric Vehicles
HFC	Hydrofluorocarbons
HOA	Home-Owner Association
HVAC	Heating, venting, and air conditioning
IFT	Emissions Inventory, Forecasting, and Targets
IPCC	Intergovernmental Panel on Climate Change

kWh	kilowatt-hours
lb(s)	pound(s)
LCFS	Low Carbon Fuel Standard
LED	light-emitting diode
LEED	Leadership in Energy and Environmental Design
MT	metric tons
MWh	megawatt-hours
N_2O	nitrous oxide
OBF	on-Bill Financing
PACE	Property Assessed Clean Energy
PFC	Perfluorocarbons
PITT	plan implementation tracker tool
Plan	Sustainable Santee Plan
ppb	parts per billion
ppm	parts per million
RTP	Regional Transportation Plan
SANDAG	San Diego Associated Governments
SB	Senate Bill
SDG&E	San Diego Gas & Electric
SF_6	sulfur hexafluoride
SCS	Sustainable Communities Strategy
SEEC	Statewide Energy Efficiency Collaborative
SP	service population
SWRCB	State Water Resources Control Board
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
VMT	vehicle miles traveled

Executive Summary

The City of Santee (City) is committed to providing a more livable, equitable, and economically vibrant community through the incorporation of energy efficiency features and reduction of greenhouse gas (GHG) emissions. By using energy more efficiently, the City will keep dollars in the local economy, create jobs, and improve the community's quality of life. The efforts toward reducing City-wide greenhouse gas emissions described in this report would be done in coordination with the City's other planning land use decisions. Through the *Sustainable Santee Plan: The City's Roadmap to Greenhouse Gas Reductions* ("Sustainable Santee Plan"), the City has established goals and policies that incorporate environmental responsibility into its daily management of its community and municipal operations.

INVENTORIES

The first step in completing the Sustainable Santee Plan was to update the City's GHG emissions inventory. In 2015, the City completed the 2005, 2008, 2012 and 2013 emissions inventories for community-wide sectors. The results of the 2005 and 2013 inventories are shown in FIGURE ES-1. Sector-level emissions for 2005 and 2013 are also shown in TABLE ES-1.

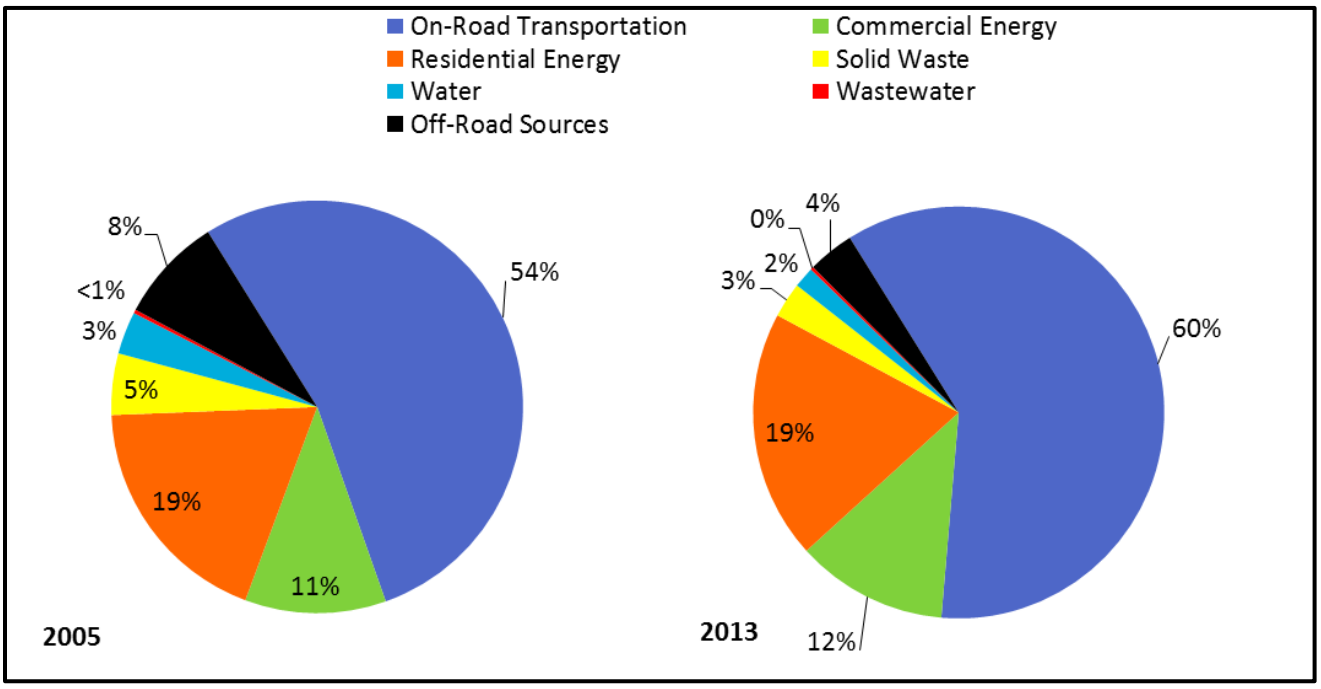


FIGURE ES-1 **Community GHG Emissions by Sector for 2005 and 2013**

TABLE ES-1 **Community-Wide GHG Emissions by Sector for 2005 and 2013**

Sector	2005 (MT CO_2e)	2013 (MT CO_2e)	% Change 2005–2013
On-Road Transportation	181,812	242,499	33.4%
Residential Energy	63,544	78,651	23.8%
Commercial Energy	37,697	48,025	27.4%
Solid Waste	16,376	11,151	-31.9%
Water	11,354	6,578	-42.1%
Off-Road Sources	28,230	14,699	-47.9%
Wastewater	959	971	1.3%
Total	**339,972**	**402,574**	**18.4%**

Similarly, the City's municipal operations were inventoried for 2005 and 2013. FIGURE ES-2 shows the municipal emissions. Municipal emissions are a subset of community emissions and account for less than 1 percent of community emissions. Sector-level details for 2005 and 2013 are shown in TABLE ES-2.

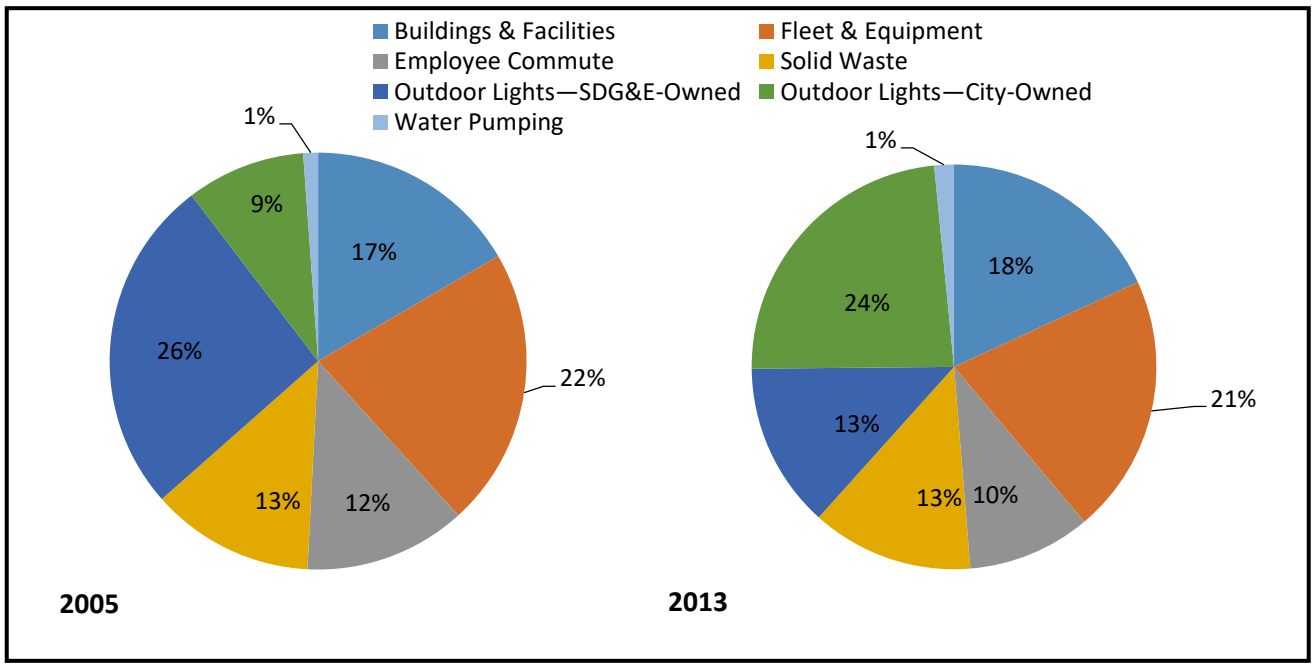


FIGURE ES-2 **Municipal GHG Emissions by Sector for 2005 and 2013**

TABLE ES-2 **Municipal GHG Emissions by Sector for 2005 and 2013**

Sector	2005 (MT CO_2e)	% of Total	2013 (MT CO_2e)	% of Total	% Change 2005–2013
Outdoor Lights–SDG&E-Owned	433	26%	252	13%	-42%
Fleet & Equipment	359	22%	396	21%	10%
Buildings & Facilities	275	17%	346	18%	10%
Solid Waste	210	13%	247	13%	18%
Employee Commute	208	13%	188	10%	-10%
Outdoor Lights–City-Owned	153	9%	450	24%	194%
Water Pumping	19.0	1%	30.0	2%	58%
Total	**1,657**		**1,909**		**15%**

FORECASTS AND TARGET SETTING

The next step in the process was to estimate future emissions in the City and establish GHG reduction targets.

The City's future emissions were estimated using demographic indicators such as population and jobs growth. Emissions for the City's municipal operations were estimated using the number of staff anticipated in future years. Growth indicators used are shown by sector in TABLE ES-3.

TABLE ES-3 **Growth Indicators for 2013, 2020, and 2035**

Sector	Demographic Indicator	2013	2020	2035
Solid Waste, Water, Wastewater, Off-Road Sources	Service Population (Population + Jobs)	71,663	76,437	84,200
Population[1]	Population	55,033	59,488	63,518
Residential Energy	Households	19,725	20,995	24,165
Commercial/Industrial Energy	Jobs	16,630	16,949	20,682
Transportation[2]	VMT – Gas	458,785,827	493,494,150	576,966,520
	VMT – Diesel	27,822,637	32,536,348	45,500,895
Municipal Jobs (FTE)	Municipal Emissions[3]	112.8	115	120

SOURCE: SANDAG

FTE = Full-time equivalent employees

1 Population data are shown for informational purposes but are not used for forecasting any sector.

2 2020 VMT is derived from the compound annual growth rate between 2013 and 2035.

3 The number of jobs in the City is used as an indicator for all municipal operation emissions.

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

- Low Carbon Fuel Standard
- Assembly Bill (AB) 1493 and Advanced Clean Cars
- California Building Code Title 24
- Renewable Portfolio Standard
- Senate Bill X7-7

The resulting projected emissions are considered an "adjusted" business-as-usual (Adjusted BAU) forecast. Historic emissions, and Adjusted BAU forecasts are shown in FIGURE ES-3 (community) and FIGURE ES-4 (municipal).

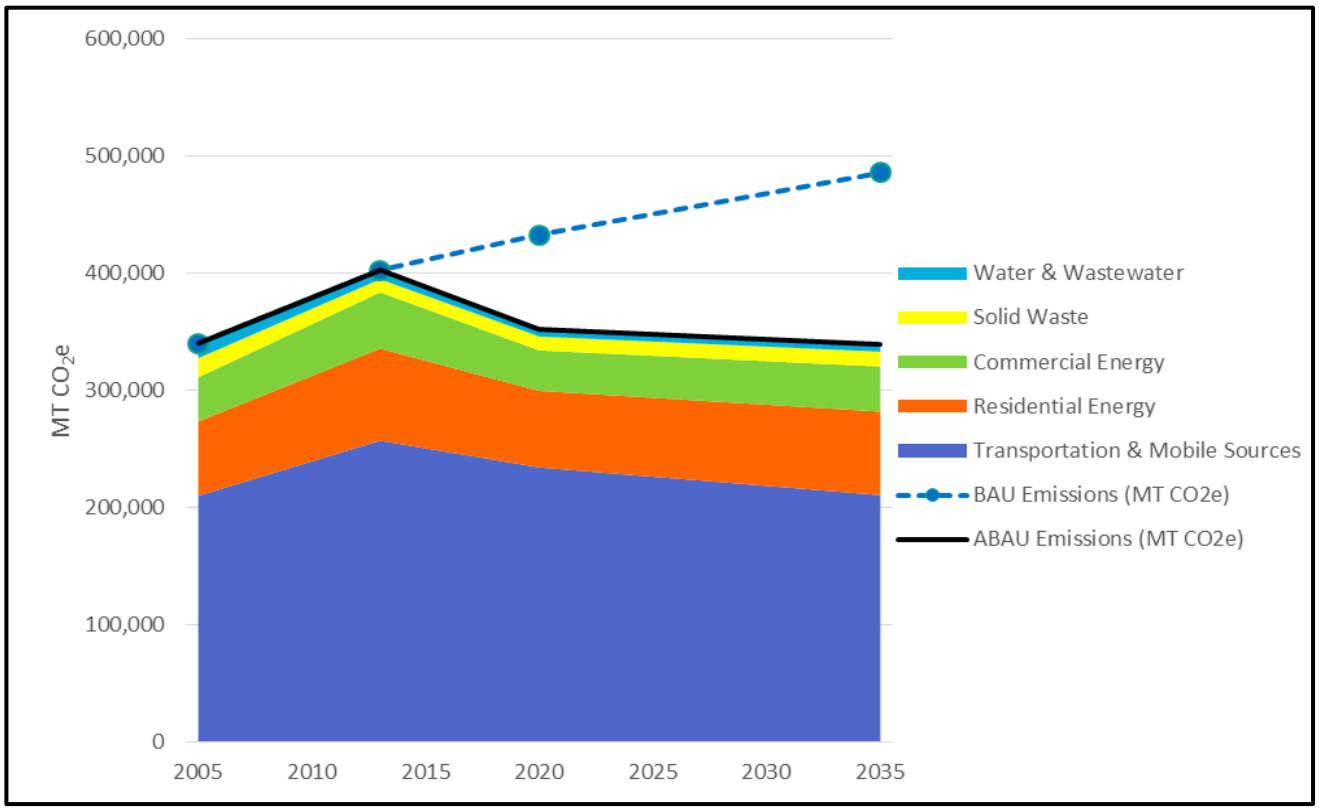


FIGURE ES-3 **Community BAU and ABAU Emissions Forecast**

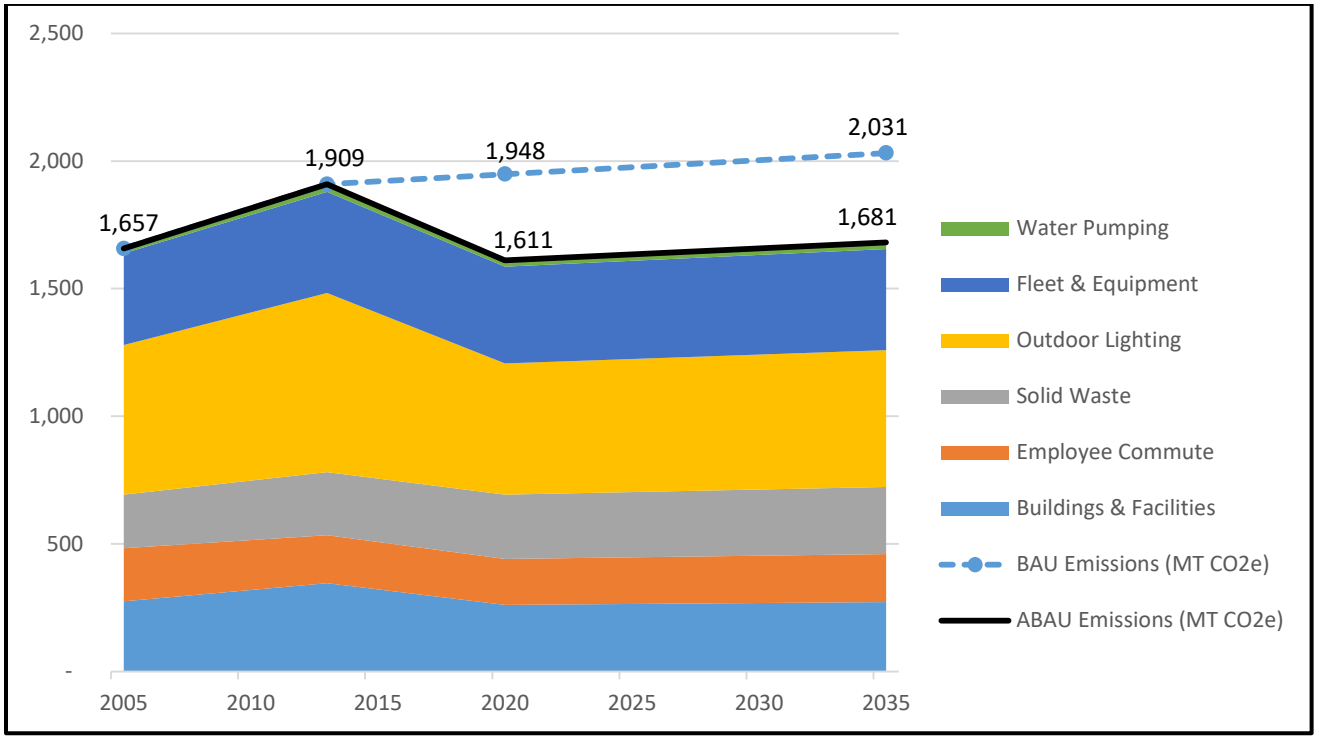


FIGURE ES-4 **Municipal BAU and ABAU Emissions Forecast**

Both mass emissions (performance target) and per capita emissions (efficiency target) GHG reductions targets were identified for 2020, 2030, and 2035. The City has established the following reduction targets that are consistent with current regulation.

Mass Emissions Targets

Consistent with the State's adopted AB 32 GHG reduction target, the City has set a goal to reduce emissions to 1990 levels by the year 2020. This target was calculated as a 15 percent decrease from 2005 levels, as recommended in the AB 32 Scoping Plan. An interim goal for the City was created for 2030, which was to reduce emissions to 40 percent below 2005 levels. A longer-term goal was established for 2035, which was to reduce emissions to 49 percent below 2005 levels. The interim and longer-term goal would put the City on a path toward the State's long-term goal to reduce emissions 80 percent below 1990 levels by 2050 (TABLE ES-4).

TABLE ES-4 **Mass GHG Reduction Targets for Community Emissions**

	Community Target
2020 Target	15% below 2005 levels
2020 Emissions Goal (MT CO_2e)	288,976
2030 Target	40% below 2005 levels
2030 Emissions Goal (MT CO_2e)	203,983
2035 Target	49% below 2005 levels
2035 Emissions Goal (MT CO_2e)	173,386

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

FIGURE ES-5 shows how the mass emissions reduction targets for community emissions aligns with the Statewide goals of reducing GHG emissions.

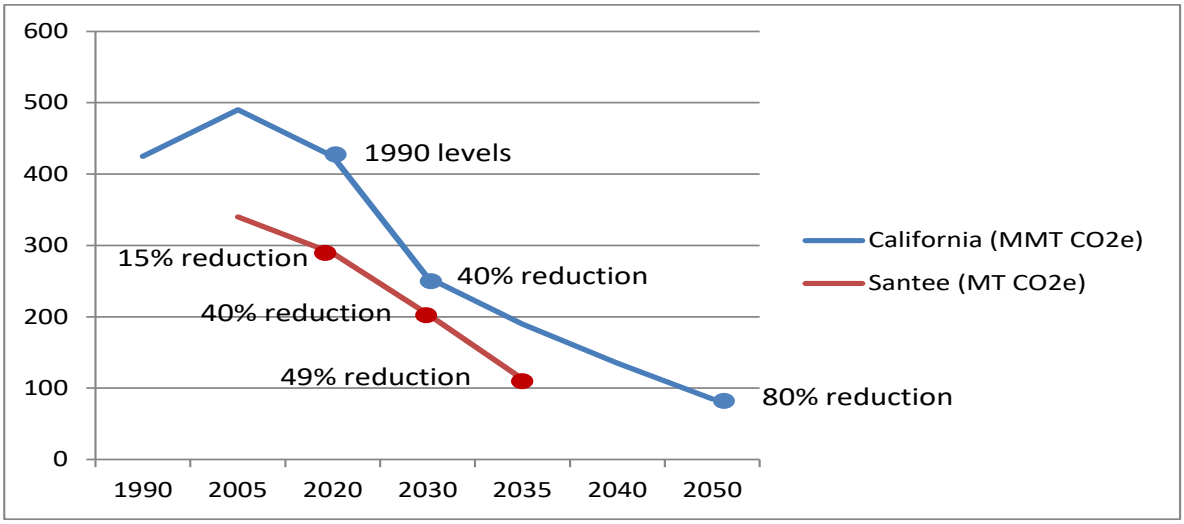


FIGURE ES-5 **Comparison of State Reduction Targets with Community Emission Reduction Targets**

Per Capita Emissions Targets

The 2017 Scoping Plan Update recommends local plan level GHG emissions reduction goals of no more than 6 metric tons CO_2e per capita by 2030 and no more than 2 metric tons carbon dioxide equivalent (CO_2e) per capita by 2050. These goals consider all Statewide emission sources; however, some of the emission sources are not included in the City's GHG inventories, such as industrial and aviation, and the City has no control over these emissions. By comparing the Statewide most recent year (2015) GHG inventory and the City's 2013 inventory, it was determined that the City had control over 63 percent of total Statewide emission sources. Therefore, the State-aligned emissions goals were proportioned to 3.8 MT CO_2e per capita by 2030, and 1.27 MT CO_2e per capita by 2050. The 2020 and 2035 goals were interpolated from the 2030 and 2050 goals, assuming same rate of reduction of the emission goals each year (TABLE ES-5).

TABLE ES-5 **Per Capita GHG Reduction Targets for Community Emissions**

	Community Target
2020 State Target (MT CO_2e/SP)	8
2020 Emissions Goal (MT CO_2e/SP)	5.06
2030 State Target (MT CO_2e/SP)	6
2030 Emissions Goal (MT CO_2e/SP)	3.80
2035 State Target (MT CO_2e/SP)	5
2035 Emissions Goal (MT CO_2e/SP)	3.16

Notes and Acronyms:
MT CO_2e = Metric tons of carbon dioxide equivalent ~~per capita~~
SP = Service Population (combined number of residents and people working in the City)

REDUCTION MEASURES

The City has already demonstrated its commitment to conserve energy and reduce emissions through a variety of programs and policies. The City has adopted programs to reduce emissions such as a water efficient landscape ordinance and participation in multiple home financing programs that will allow home and business owners to obtain low-interest loans for implementing energy efficiency in their buildings. In order to reach the reduction target, the City would also implement the additional local reduction measures described in this report. These measures encourage energy efficiency, water conservation and alternative transportation. TABLE ES-6 and TABLE ES-7 summarize the reductions from measures that would be implemented to meet the community and municipal GHG reduction goals, respectively, for 2020, 2030 and 2035.

TABLE ES-6 **Community GHG Reduction Strategies and Emission Reductions**

Goals and Measures	2020 Emission Reductions (MT CO_2e)	2030 Emission Reductions (MT CO_2e)	2035 Emission Reductions (MT CO_2e)
Goal 1: Increase Energy Efficiency in Existing Residential Units			
1.1: Energy Efficiency Education and Best Practices	Supporting Measure		
1.2: Increase Community Participation in Existing Energy Efficiency Opportunities	45	45	45
1.3: Home Energy Evaluations	Supporting Measure		
1.4: Residential Home Energy Renovations	7,811	7,811	7,811
Goal 2: Increase Energy Efficiency in New Residential Units			
2.1: Energy Efficient Homes	5,102	~~13,534~~8,423	17,750
Goal 3: Increase Energy Efficiency in Existing Commercial Units			
3.1: Energy Efficiency Training, Education, and Recognition in the Commercial Sector	Supporting Measure		
3.2: Increase Business Participation in Existing Energy Efficiency Programs	660	660	660
3.3: Non-Residential Energy Audits	Supporting Measure		
3.4: Non-Residential Retrofits	8,010	8,010	8,010
Goal 4: Increase Energy Efficiency in New Commercial Units			
4.1: Energy Efficient Businesses	1,442	8,705	12,337
Goal 5: Increase Energy Efficiency through Water Efficiency			
5.1: Water Efficiency through Enhanced Implementation of SB X7-7	1,279	1,366	1,409
5.2: Exceed Water Efficiency Standards	22	24	25
Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect			

TABLE ES-6 Community GHG Reduction Strategies and Emission Reductions

Goals and Measures	2020 Emission Reductions (MT CO_2e)	2030 Emission Reductions (MT CO_2e)	2035 Emission Reductions (MT CO_2e)
6.1: Tree Planting for Shading and Energy Efficiency	330	352	363
6.2: Light-reflecting Surfaces for Energy Efficiency	4	4	4
6.3: Carbon Sequestration through Preservation of Natural Lands	Supporting Measure		
Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled			
7.1: Non-Motorized Transportation Options	438	395	373
7.2: Implement Bicycle Master Plan to Expand Bike Routes around the City	~~14,788~~3,268	~~13,329~~2,962	~~12,600~~2,800
7.3: Ride Sharing Programs within Businesses	19,761	17,~~812~~282	16,838
7.4: Electrify the Fleet	3,341	21,723	47,414
7.5: Complete Streets and Safe Routes to Schools Programs	5,477	4,937	4,667
7.6: Reduce Vehicle Trips To/From School	16,431	14,811	14,000
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation			
8.1: Reduce Waste to Landfills	7,233	~~7,903~~8,974	8,238
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use			
9.1: Clean Energy	Supporting Measure		
9.2: Community Choice Aggregation Program[1]	38,701	46,322	50,132
Goal 10: Decrease GHG Emissions from New Development through Performance Standards			
10.1: Screening Tables	393	1,003	1,308
Total Community Measures			
Total of All Measures Excluding CCA	~~92,569~~81,047	~~133,135~~107,487	~~155,605~~131,462
Total of All Measures Including CCA	~~131,270~~119,748	~~179,456~~153,809	~~203,549~~181,594

Notes and Acronyms:

[1] Supporting measures have no direct GHG reduction, but are able to boost other measures by increasing the participation levels.

[2] CCA is separated from total of other reduction measures.

BAU = Business as Usual

CCA = Community Choice Aggregation (also known as Community Choice Energy)

MT CO_2e = metric tons of carbon dioxide equivalent

TABLE ES-7 Municipal GHG Reduction Strategies and Emission Reductions

Goal and Measure	2020 Emission Reductions (MT CO_2e)	2030 Emission Reductions (MT CO_2e)	2035 Emission Reductions (MT CO_2e)
Goal M-1: Participate in Education, Outreach, and Planning Efforts for Energy Efficiency			

M-1.1: Increase Energy Savings through the SDG&E Energy Efficiency Partnership	Supporting Measure		
Goal M-2: Increase Energy Efficiency in Municipal Buildings			
M-2.1: Conduct Municipal Energy Audit	Supporting Measure		
M-2.2: Procurement Policy for Energy Efficient Equipment	19	19	19
M-2.3: Install Cool Roofs	Tracking Data		
M-2.4: Retrofit HVAC and Water Pump Equipment	12	12	12
Goal M-3: Increase Energy Efficiency in Community Buildings and Infrastructure			
M-3.1: Traffic Signal and Outdoor Lighting Retrofits	212	351	421
M-3.2: Upgrade or Incorporate Water-Conserving Landscape	Supporting Measure		
M-3.3: Plant Trees for Shade and Carbon Sequestration	Supporting Measure		
Goal M-4: On-Road Energy Efficiency Enhancements; Employee Commute and Vehicle Fleet			
M-4.1: Encourage or Incentivize Employee Carpools	6	11	14
M-4.2: Encourage or Incentivize Purchase of Hybrid or Electric Vehicles	5	9	11
M-4.3: Replace or Supplement Vehicle Fleet with Hybrid/Electric Vehicles	7	13	16
M-4.4: Install E-Vehicle Chargers	Supporting Measure		
Goal M-5: Reduce Energy Consumption in the Long Term			
M-5.1: Ongoing Actions and Projected Reductions	-	372	558
Total Municipal Measures			
Total of all Measures listed above	260	787	1,050

BAU = Business as Usual
MT CO_2e = metric tons of carbon dioxide equivalent
SDG&E = San Diego Gas & Electric

~~TABLE ES-7 **Municipal GHG Reduction Strategies and Emission Reductions**~~

~~Goal and Measure~~	~~2020 Emission Reductions (MT CO_2e)~~	~~2035 Emission Reductions (MT CO_2e)~~
~~**Goal M-1: Education, Outreach, and Planning Efforts for Energy Efficiency**~~		
~~M-1.1: Increase Energy Savings through the SDG&E Energy Efficiency Partnership~~	~~Supporting Measure~~	
~~**Goal M-2: Increase Energy Efficiency in Municipal Buildings**~~		
~~M-2.1: Conduct Municipal Energy Audit~~	~~Supporting Measure~~	
~~M-2.2: Procurement Policy for Energy Efficient Equipment~~	~~19~~	~~19~~
~~M-2.3: Install Cool Roofs~~	~~Tracking Data~~	
~~M-2.4: Retrofit HVAC and Water Pump Equipment~~	~~12~~	~~12~~
~~**Goal M-3: Increase Energy Efficiency in Community Buildings and Infrastructure**~~		
~~M-3.1: Traffic Signal and Outdoor Lighting Retrofits~~	~~212~~	~~421~~
~~M-3.2: Upgrade or Incorporate Water-Conserving Landscape~~	~~Supporting Measure~~	

~~M-3.3: Plant Trees for Shade and Carbon Sequestration~~	~~Supporting Measure~~	
~~**Goal M-4: On-Road Energy Efficiency Enhancements; Employee Commute and Vehicle Fleet**~~		
~~M-4.1: Employee Carpools~~	~~6~~	~~14~~
~~M-4.2: Purchase of Hybrid or Electric Vehicles~~	~~5~~	~~11~~
~~M-4.3: Replace and/or Supplement Vehicle Fleet with Hybrid/Electric Vehicles~~	~~7~~	~~16~~
~~M-4.4: Install E-Vehicle Chargers~~	~~Supporting Measure~~	
~~**Goal M-5: Reduce Energy Consumption in the Long Term**~~		
~~M-5.1: Ongoing Actions and Projected Reductions~~	~~-~~	~~558~~
~~**Total Municipal Measures**~~		
~~Total of all Measures listed above~~	~~260~~	~~1,050~~
~~Notes and Acronyms:~~ ~~BAU = Business as Usual~~ ~~MT CO_2e = metric tons of carbon dioxide equivalent~~		

ADAPTATION

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

IMPLEMENTATION

Finally, the Sustainable Santee Plan in itself is not enough to meet the reduction goals without a commitment to implementation. The Implementation Chapter of the Sustainable Santee Plan identifies the process for implementing and monitoring the strategies described. The six step process is summarized in FIGURE ES-6.

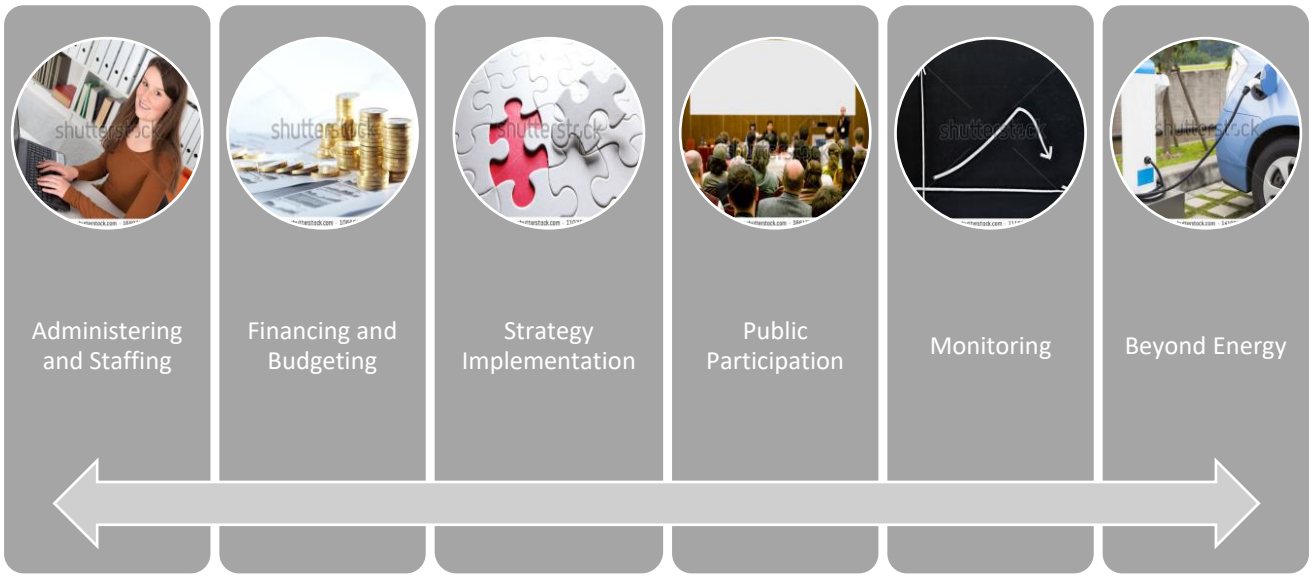


FIGURE ES-6 **Process of Implementing the Sustainable Santee Plan**

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

CHAPTER 1 Introduction

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

PURPOSE

The Sustainable Santee Plan has four primary purposes or goals:

1. Present the City's plan for achieving sustainability by utilizing resources efficiently, reducing greenhouse gas emissions, and preparing for potential climate-related impacts.
2. Identify how the City will effectively implement this Sustainable Santee Plan by obtaining funding for program implementation and tracking and monitoring the progress of Plan implementation over time.
3. Allow streamlined CEQA compliance for new development by preparing an Environmental Impact Report for the Plan and developing screening tools that provide clear guidance to developers and other project proponents.
4. Maintain economic competitiveness within the region.

CLIMATE CHANGE SCIENCE

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

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

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

Carbon Dioxide is the most important anthropogenic GHG and accounts for more than 75 percent of all GHG emissions caused by humans. Its atmospheric lifetime of 50–200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades, even after mitigation efforts to reduce GHG concentrations are implemented. The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO_2 can be removed from the atmosphere by photosynthetic organisms (e.g., plants and certain bacteria). Atmospheric CO_2 has increased from a preindustrial concentration of 280 parts per million (ppm) to ~~397~~ 408 ppm in ~~2014~~2018.[1]

Methane (CH_4), the main component of natural gas, is the second most abundant GHG and has a GWP of 25. Sources of anthropogenic emissions of CH_4 include using natural gas, burning fossil fuels, landfill outgassing, certain agricultural practices, and mining coal. Certain land uses also

[1] NOAA, Annual Greenhouse Gas Index (AGGI), https://www.esrl.noaa.gov/gmd/aggi/aggi.html~~http://www.esrl.noaa.gov/gmd/aggi/aggi.fig2.png~~ (accessed ~~March 19~~July 11, 2019~~, 2015~~).

function as a both a source and sink for CH_4. For example, the primary terrestrial source of CH_4 are wetlands, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere). Atmospheric CH_4 has increased from a pre-industrial concentration of 715 parts per billion (ppb) to 1,~~820~~ 860 ppb in ~~2014~~2018.[2]

Nitrous Oxide (N_2O) is a powerful GHG, with a GWP of 298. Anthropogenic sources of N_2O include combustion of fossil fuels, agricultural processes (e.g., fertilizer application), and nylon production. In the United States more than 70 percent of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application. N_2O concentrations in the atmosphere have increased ~~nearly 21~~over 22 percent, from pre-industrial levels of 270 ppb to ~~326~~ 330 ppb in ~~2014~~2018.[3]

In October 2018, IPCC published a report on the impacts of global warming of 1.5°C above pre-industrial levels The report states that global warming, at its current rate, will result in the a global temperature increase of 1.5°C , sometime between 2030 and 2052. The report also states that in order to keep global warming below 1.5°C, global net anthropogenic CO_2 emissions should decline by about 45 percent from 2010 levels by 2030, and reach net zero around 2050.

BENEFITS OF THE PLAN

This Plan, while addressing climate change, also benefits the City in many direct ways.

- **Local Control**—This Plan allows the City to identify strategies to reduce resource consumption, costs, and GHG emissions in all economic sectors in a way that maintains local control over the issues and fits the character of the community. It also may position the City for funding to implement programs tied to climate goals.
- **Energy and Resource Efficiency**—This Plan identifies opportunities for the City to increase energy efficiency and lower GHG emissions in a manner that is most feasible in the community. Reducing energy consumption through increasing the efficiency of energy technologies, reducing energy use, and using alternative sustainable sources of energy are effective ways to reduce GHG emissions. Energy efficiency also provides opportunities for cost-savings.
- **Increased Public Health**—Many of the GHG reduction strategies identified in this Plan also have local public health benefits. Benefits include local air quality improvements; creating a more active community through implementing sustainable living practices; and reducing health risks, such as heat stroke, elevated by climate change impacts such as increased extreme heat days.

[2] NOAA, Annual Greenhouse Gas Index (AGGI), http://www.esrl.noaa.gov/gmd/aggi/aggi.fig2.png (accessed March 19, 2015).
[3] Ibid.

- **Demonstrating Consistency with State GHG Reduction Goals**—A GHG reduction plan may be used as GHG mitigation in a General Plan to demonstrate that the City is aligned with state goals for reducing GHG emissions to a level considered less than cumulatively considerable.
- **Meeting California Environmental Quality Act Requirements**—California Environmental Quality Act (CEQA) requires impacts from GHG emissions to be reviewed. A qualified GHG reduction plan may be used in future development projects as the GHG analysis for their CEQA document, resulting in greater certainty for developers and cost-effectiveness for developers and City staff.

REGULATORY SETTING

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

Federal

Clean Air Act

In 2007, through Massachusetts v. Environmental Protection Agency, 549 U.S. 497 (2007), the United States Supreme Court held that the United States Environmental Protection Agency (USEPA) has authority to regulate GHGs from new motor vehicles as pollutants under Section 202(a)(1) of the federal Clean Air Act in the event that it forms a judgment that such emissions contribute to climate change. EPA can avoid taking regulatory action only if it determines that greenhouse gases do not contribute to climate change, or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do.

State

California Air Resources Board Standards and Programs

The California Air Resources Board (CARB), a part of the California EPA (Cal/EPA) is responsible for the coordination and administration of both federal and state air pollution control and climate change programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards (California Ambient Air Quality Standards), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products, and various types of commercial equipment. The California Health and Safety Code, Section 38561(h) requires CARB to update the State's scoping plan for achieving the maximum technologically feasible and cost effective reductions of GHG emission at least once every 5 years.

Executive Order S-3-05

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

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

The EO S-3-05 also laid out responsibilities among the state agencies for implementation and for reporting on progress toward the targets.

Executive Order B-30-15

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

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

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

Assembly Bill 1493, Clean Car Standards

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

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

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

CARB released the 2017 Scoping Plan Update on January 20, 2017. The 2017 Scoping Plan Update provides strategies for achieving the 2030 target established by Executive Order B-30-15 and codified in Senate Bill (SB) 32 (40 percent below 1990 levels by 2030). The 2017 Scoping Plan

Update recommends local plan level GHG emissions reduction goals. CARB recommends that local governments aim to achieve emissions of no more than 6 metric tons (MT) of CO_2e per capita by 2030 and no more than 2 $MTCO_2e$ per capita by 2050.

Assembly Bill 341 (Commercial Recycling)

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

Senate Bill 97

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

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

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

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

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

- Initiate California's first Statewide Climate Adaptation Strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable, and recommend climate adaptation policies.
- Request that the National Academy of Sciences establish an expert panel to report on sea level rise impacts in California in order to inform state planning and development efforts.

- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new and existing projects.
- Initiate studies on critical infrastructure and land-use policies vulnerable to sea level rise.

California Code of Regulations Title 24, Part 6

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

The California Energy Commission (CEC) adopted 2008 Standards on April 23, 2008, in response to AB 32. The Standards were adopted to provide California with an adequate, reasonably priced, and environmentally sound supply of energy; to pursue California energy policy, which states that energy efficiency is the resource of first choice for meeting California's energy needs; to meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes every three years; and to meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards. The latest update of CCR Title 24, Part 6 went into effect January 1, 2017, which significantly increases the energy efficiency of new residential buildings. ~~.~~ The 2019 Title 24 standards, which will become effective on January 1, 2020, are estimated to result in new buildings that use 7 percent less energy for lighting, heating, cooling, ventilation, and water heating than the previous 2016 Standards. The 2019 updates to Title 24 are focused on moving closer to zero net energy (ZNE) homes by increasing energy efficiency and requiring solar photovoltaic (PV) systems for new homes. The 2019 Title 24 standards also encourage demand responsive technologies including battery storage and heat pump water heaters and improve the building's thermal envelope through high performance attics, walls and windows to improve comfort and energy savings.

Senate Bill 375, Sustainable Communities Strategy

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

CALGreen Building Code

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

SB x7-7

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

Renewable Portfolio Standard

The Renewable Portfolio Standard requires energy providers to derive 33 percent of their electricity from qualified renewable sources by 2020, 60 percent by 2030, and 100 percent by 2045. This is anticipated to lower emission factors (i.e., fewer GHG emissions per kilowatt-hour used) from utilities across the state, including San Diego Gas & Electric (SDG&E).

Executive Order B-55-18 to Achieve Carbon Nuetrality

On September 12, 2018, California Governor Jerry Brown announced through Executive Order B 55 18, the following GHG emissions target:

- By 2045, California will be carbon neutral.

This executive order is more ambitious and replaces the 2050 goal found in Executive Order S-3-05. The order directs the California Air Resources Board to provide a plan with specific regulations to reduce statewide sources of GHG emissions. The Executive Order does not include a specific guideline for local governments.

CITY SETTING

The City is located in eastern San Diego County, at the eastern end of the San Clemente Canyon Freeway (State Route 52), bordering Mission Trails Regional Park and Marine Corps Air Station (MCAS) Miramar to the west, the unincorporated community of Lakeside to the north and east, and the unincorporated community of Bostonia and the City of El Cajon to the south. Approximately half of the City's land is undeveloped, with opportunity for growth. The City's extensive open space and proximity to nearby lakes offers a diverse environment of both urban and country qualities compared to many of San Diego County's larger, more developed cities.

The City of Santee is a community of approximately 58,000 residents. The City's population is diverse in age. The City's ethnicity is approximately 74 percent White, 16 percent Latino, 7 percent other ethnicities, and 7 percent two or more races. The City has nearly 20,000 households, with half

being single-family detached units, a quarter as multifamily units, and the remaining as single-family multiunit, mobile home, and other units.

PLAN STRUCTURE

The Sustainable Santee Plan is divided into the following chapters

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

Under Section 15183.5 of the CEQA Guidelines, a plan to reduce GHG emissions should:

(A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
(B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable; **(Chapter 2/3)**
(C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
(D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
(E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
(F) Be adopted in a public process following environmental review.

CHAPTER 2 Energy and GHG Emissions Inventory, Forecast, and Targets

GHG EMISSIONS INVENTORY

GHG emissions inventories are the foundation of planning for future reductions. Establishing an inventory of emissions helps to identify and categorize the major sources of emissions produced over a single calendar year. Jurisdictions often prepare emissions inventories for the community and municipal operations. A community inventory includes GHG emissions that result from the activities by residents and businesses in the City and a municipal inventory includes GHG emissions that result from the activities performed as part of the government operations in the City and are a subset of the community inventory. The inventories identify the major sources of GHGs emissions caused by activities in sectors that are specific to community or municipal activities.

The City prepared community inventories for the years 2005, 2008, 2012, and 2013, and municipal inventories for the years 2005 and 2013. The 2005 inventory (for both community and municipal operations) is considered the baseline year. A baseline year is established as a starting point against which other inventories may be compared and targets may be set, and is generally the earliest year with a full emissions inventory. The year of 2005 was considered the baseline year because it was the earliest year with a full emissions inventory for the City, and it met the need of setting emissions reduction targets based on 2005 to 2008 emission levels according to the Scoping Plan. The most

recent inventory has the most relevant data for planning purposes, while interim years provide context and may help identify trends or anomalies in the community emissions. The sectors evaluated in each inventory are provided in TABLE 1. The City prepared a detailed GHG Inventories, Long-Term Forecasts, and Target-Setting (IFT) Report, included as Appendix A, which contains detailed methodology of the information summarized in this chapter. Data were calculated and managed to best fit the GHG inventory and planning software tool used for this project, called ClearPath. ClearPath was developed by the Statewide Energy Efficiency Collaborative, which is a partnership among several Statewide agencies, utilities, and non-profits to assist cities and counties in climate mitigation planning. The ClearPath Tool is an all-in-one suite of online tools to help local agencies complete government operations and community-wide GHG inventories, forecasts, and climate action plans. Appendix B contains input and output data from the ClearPath Tool for the City's GHG emissions inventory and forecasts.

TABLE 1 **Community and Municipal Sectors Evaluated in the Inventories**

Community Sectors	Municipal Sectors
■ Residential Energy	■ Building and Facilities Energy
■ Commercial/Industrial Energy	■ Outdoor Lights and Streetlights
■ On-road Transportation	■ Water Pumping and Delivery
■ Solid Waste	■ Fleet and Equipment
■ Water	■ Employee Commute
■ Wastewater	■ Solid Waste
■ Off-road Sources	

2005–2013 Community Emissions Summary

Emissions increased 18 percent from 2005 to 2013, from 339,972 MT CO_2e to 402,574 MT CO_2e, with On-Road Transportation emissions showing the greatest overall increase. As shown in FIGURE 1 and TABLE 2, the Transportation sector, including on-road and off-road emissions, was the largest contributor to emissions in all four inventory years.

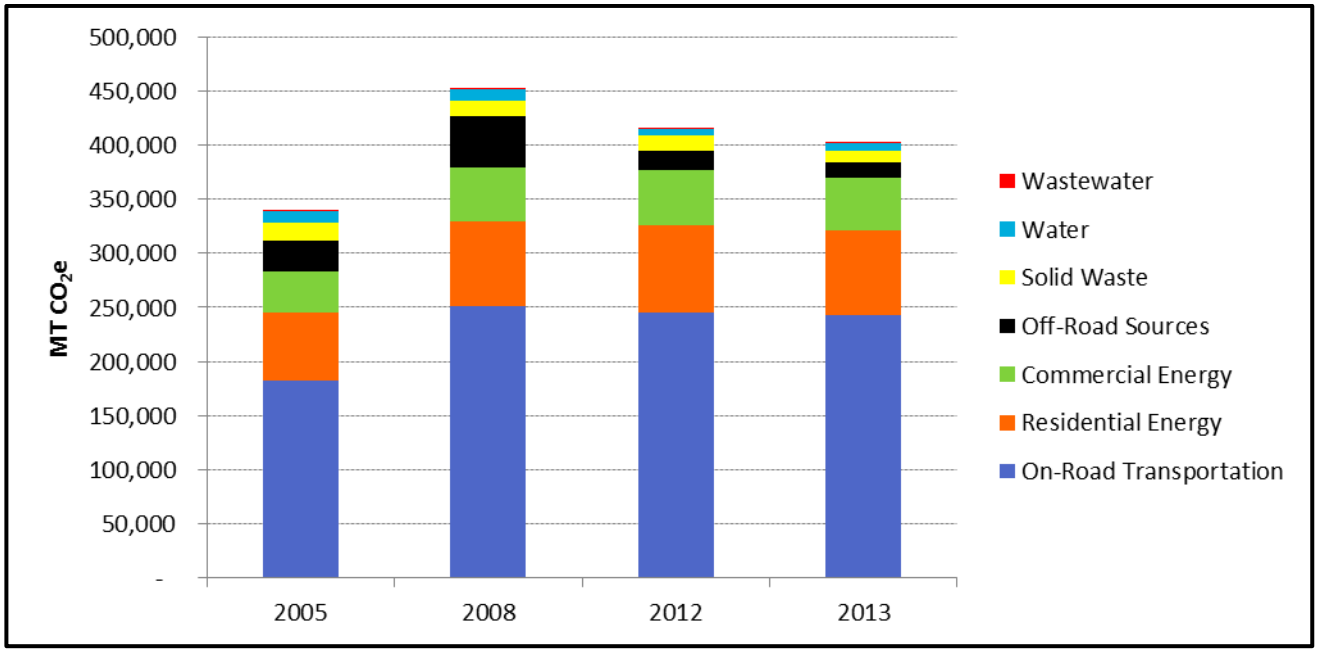


FIGURE 1 **Community GHG Emissions by Sector for 2005, 2008, 2012, and 2013**

TABLE 2 **Communitywide GHG Emissions by Sector for 2005 and 2013**

Sector	2005 (MT CO_2e)	2013 (MT CO_2e)	% Change 2005–2013
On-Road Transportation	181,812	242,499	33.4%
Residential Energy	63,544	78,651	23.8%
Commercial Energy	37,697	48,025	27.4%
Solid Waste	16,376	11,151	-31.9%
Water	11,354	6,578	-42.1%
Off-Road Sources	28,230	14,699	-47.9%
Wastewater	959	971	1.3%
Total	**339,972**	**402,574**	**18.4%**

Note: [1] Vehicle Miles Traveled was modeled with SANDAG Series 12 (2008 Baseline Year) model. On-Road Transportation Emission Factors were derived from EMFAC2014.

Community Emissions by Energy

Energy is an area over which local agencies often have the greatest opportunities for affecting change. In Santee, energy use has largely declined, although emissions have increased, reflecting the increase in emissions to produce a kilowatt-hour (kWh) of electricity in SDG&E territory.[4]

[4] As described in the IFT Report, emissions from electricity generation are variable, depending on the source of generation. SDG&E's energy portfolio for electricity increased from 550 pounds (lbs) CO_2e per megawatt hour (MWH) in 2005 to 781 lbs CO_2e per MWh in 2013. Therefore, a decrease in electricity use can still result in an increase in emissions, as occurred in the City.

Therefore, electricity and natural gas use remains a key area for reduction opportunities. Emissions from energy use accounts for ~~54~~ 31 percent of total community emissions in 2013. FIGURE 2shows the trend in electricity and natural gas emissions from 2005 to 2013 for the Commercial and Residential sectors. TABLE 3 includes the activity data and GHG emissions for 2005 and 2013.

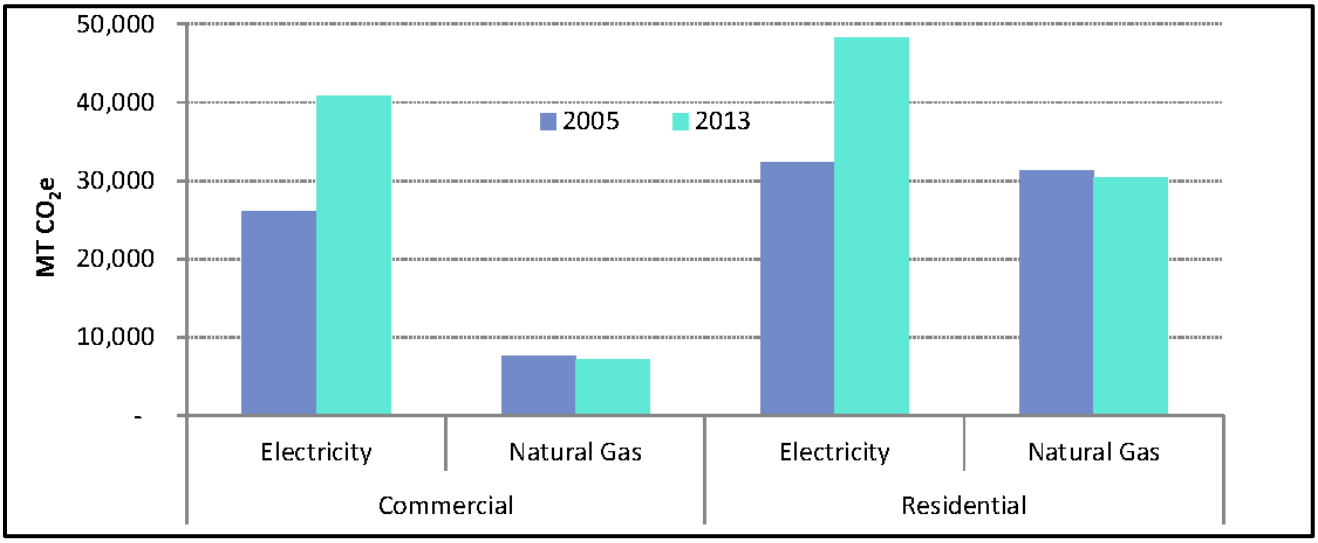


FIGURE 2 **GHG Emissions for Community Electricity and Natural Gas, by Sector**

TABLE 3 **Community Activity Data and GHG Emissions for Energy in 2005 and 2013**

Sector	2005		2013		Percent Change in Activity 2005–2013	Percent Change in Emissions 2005–2013
	Activity (kWh or therms)	Emissions (MT CO_2e)	Activity (kWh or therms)	Emissions (MT CO_2e)		
Commercial/Industrial						
Electricity	120,725,233	26,127	115,339,581	40,860	-4.5%	56.4%
Natural Gas	1,419,790	7,550	1,347,484	7,165	-5.1%	-5.1%
Residential						
Electricity	129,290,439	32,286	136,108,148	48,218	5.3%	49.3%
Natural Gas	5,878,287	31,258	5,723,205	30,433	-2.6%	-2.6%
Total (MT CO2e)		**97,221**		**126,676**		**30.3%**

2005–2013 Municipal Emissions Summary

Emissions from municipal activities increased 15 percent from 2005 to 2013, from 1,657 MT CO_2e to 1,909 MT CO_2e. Emissions from City-owned outdoor lights increased the most (297 MT CO_2e between 2005 and 2013), followed by Buildings and Facilities, which increased emissions by 71 MT CO_2e (FIGURE 3 and TABLE 4). Emissions decreased in two sectors, SDG&E-owned outdoor lights and

employee commute. The decrease in employee commute emissions could be due to a decrease in staff.

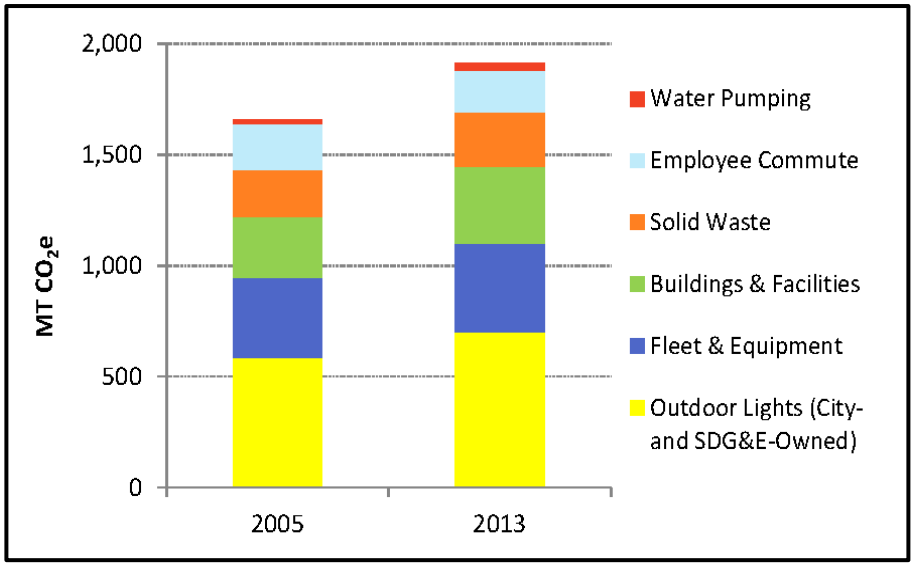


FIGURE 3 **Municipal GHG Emissions by Sector for 2005 and 2013**

Municipal Emissions

Municipal emissions account for 1% of total community emissions. However, municipal emissions are more directly controllable by the City and can be used to showcase sustainability efforts in the community.

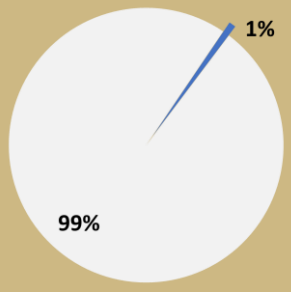
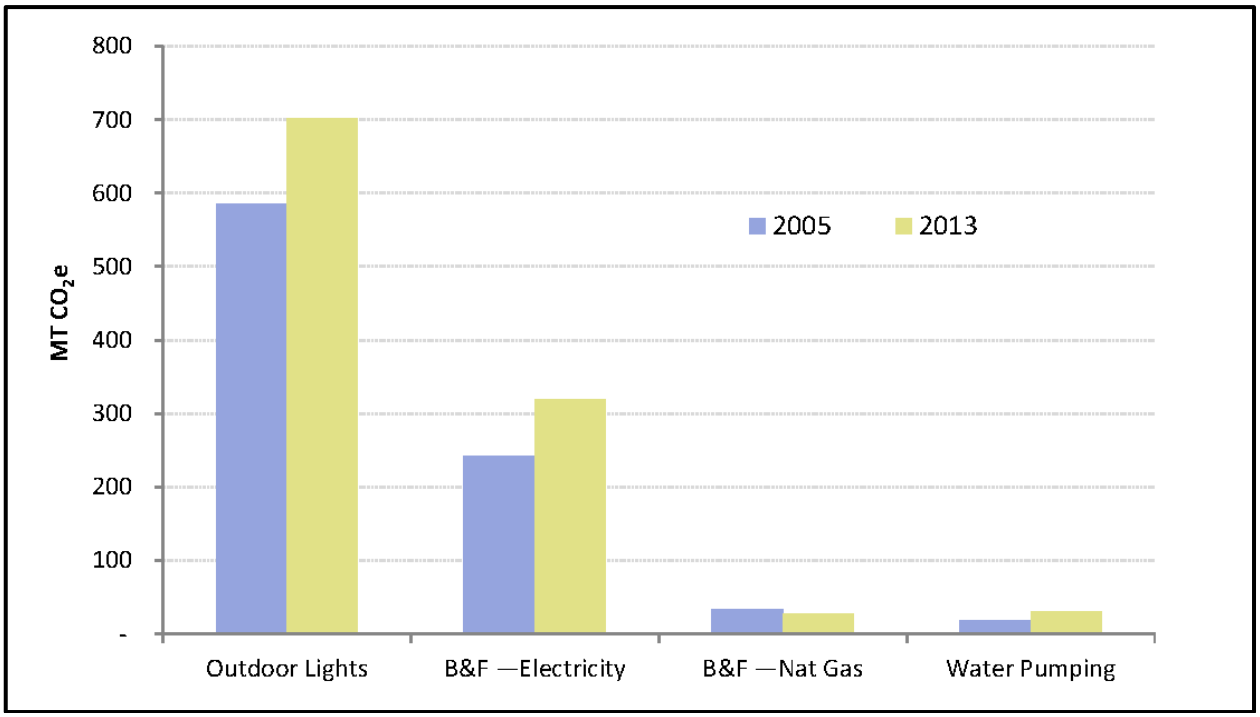


TABLE 4 **Municipal GHG Emissions by Sector for 2005 and 2013**

Sector	2005 (MT CO_2e)	2013 (MT CO_2e)	% Change 2005 – 2013
Outdoor Lights — SDG&E-Owned	433	252	-42%
Fleet and Equipment	359	396	10%
Buildings and Facilities	275	346	26%
Solid Waste	210	247	18%
Employee Commute	208	188	-10%
Outdoor Lights—City-Owned	153	450	194%
Water Pumping	19.0	30.0	58%
Total	**1,657**	**1,909**	**15%**

Municipal Emissions by Energy

As with the community energy, municipal energy use decreased, but due to the emission factors for electricity, the GHG emissions increased from 2005 to 2013. Municipal energy use includes buildings and facilities (electricity and natural gas), outdoor lights, and water pumping. FIGURE 4 shows the trend in electricity and natural gas emissions from 2005 to 2013 for the municipal energy sectors.



NOTE: B&F = Buildings and Facilities

FIGURE 4 **GHG Emissions for Municipal Electricity and Natural Gas by Sector**

INVENTORY FORECAST

Forecasting future GHG emissions allows the City to understand how emissions are expected to increase or decrease in the future. Major changes in growth or land uses may affect how to best plan to reduce emissions in the future. GHG emissions are forecast using two scenarios: a Business-as-Usual (BAU) and an Adjusted BAU scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that will reduce emissions in the future (that is, the policies and related efficiency levels in place in 2013 are assumed to remain constant through 2035). Projected growth is estimated using data from regional planning scenarios developed by the San Diego Association of Governments (SANDAG) and the City. To facilitate the Plan's long-term applicability, the forecast for households in 2035 includes a 2,000 household buffer above the build out accommodated by the City's currently adopted General Plan. Growth calculation and methods are detailed in the IFT Report located in Appendix A. In general, the City is expecting modest growth to 2020 and 2035 as population, housing, and jobs are all expected to increase. The City expects its municipal services to increase slightly over time. TABLE 5 shows the growth projections used to develop the emissions forecasts.

TABLE 5 **Growth Indicators for 2013, 2020, and 2035**

Sector	Demographic Indicator	2013	2020	2035
Solid Waste, Water, Wastewater, Off-Road Sources	Service Population (Population + Jobs)	71,663	76,437	84,200
Population [a]	Population	55,033	59,488	63,518
Residential Energy	Households	19,725	20,995	24,165
Commercial/Industrial Energy	Jobs	16,630	16,949	20,682
Transportation [b]	VMT – Gas	458,785,827	493,494,150	576,966,520
	VMT – Diesel	27,822,637	32,536,348	45,500,895
Municipal Jobs (FTE)	Municipal Emissions [c]	112.8	115	120

SOURCE: SANDAG

FTE = Full-time equivalent employees

a. Population data are shown for informational purposes but are not used for forecasting any sector.

b. 2020 VMT is derived from the compound annual growth rate between 2013 and 2035.

c. The number of jobs in the City is used as an indicator for all municipal operation emissions.

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

Three future years are forecasted for each scenario: 2020, 2030 and 2035. The 2020 forecast year is consistent with the goals identified in AB 32, which identifies a Statewide GHG reduction target by 2020. The 2030 forecast year is consistent with the goals identified in 2017 Scoping Plan Update, which recommends a per capita GHG reduction target by 2030. The 2035 forecast year was chosen to be consistent with the horizon year of the Santee General Plan Mobility Element and will allow the City to develop long-term strategies to continue GHG reductions beyond 2030 towards the 2050 State target.

Business-as-Usual Forecasts

Community Business-as-Usual Forecast

The City's BAU emissions in 2020 are estimated to be 432,982 MT CO_2e, or a 27 percent increase from baseline (2005) emissions. The 2030 BAU emissions are estimated to be 486,170 MT CO_2e, or a 43 percent increase from 2005 level. By 2035, emissions are estimated to increase 51.6 percent from the baseline level to 515,462 MT CO_2e (FIGURE 5).

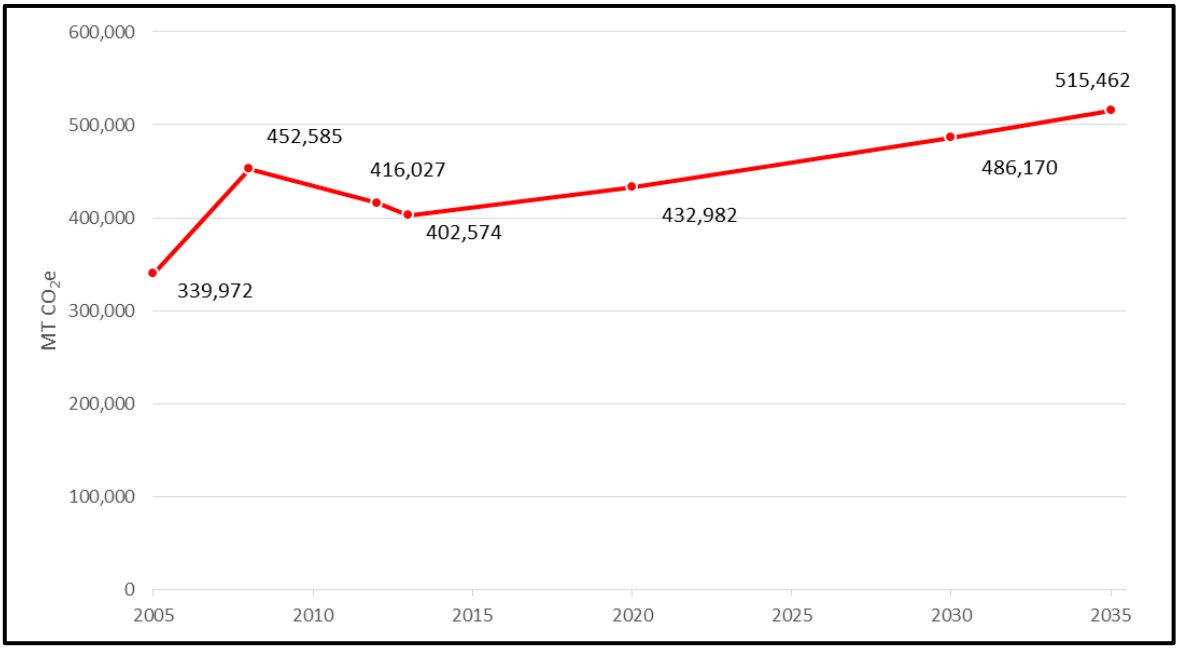


FIGURE 5 **Community BAU Forecast**

Municipal Business-as-Usual Forecast

The City anticipates approximately 2 percent growth in emissions from City services by 2020, 5 percent by 2030, and 6 percent by 2035, relative to 2013 levels. However, emission levels are expected to be 18 percent, 21 percent, and 23 percent higher, respectively, due to the higher electricity emission factor assumed under a BAU forecast compared to the 2005 factor as described in FIGURE 6.

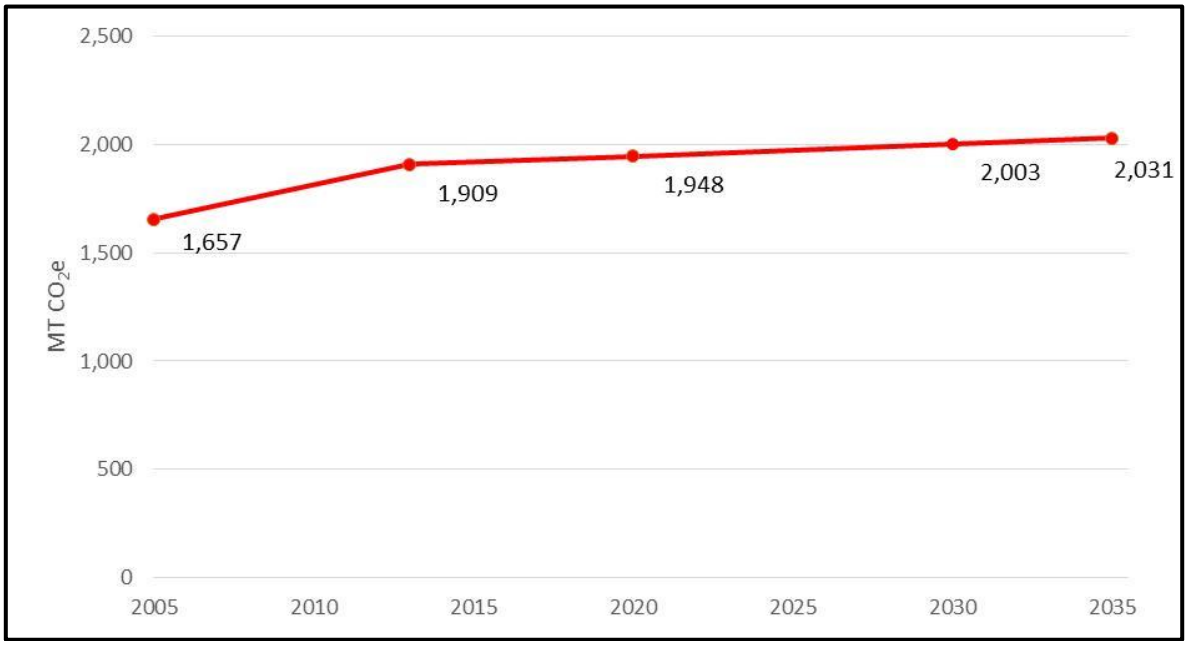


FIGURE 6 **Municipal BAU Forecast**

Adjusted Business-as-Usual Forecasts

Community Adjusted Business-as-Usual Forecast

The City's Adjusted BAU emissions are estimated to be 352,106 MT CO_2e in 2020, 339,514 MT CO_2e in 2030, and 336,543 MT CO_2e in 2035 (FIGURE 7). This change represents a 3.6 percent increase from 2005 by 2020, 0.1 percent reduction by 2030, and 1.0 percent reduction by 2035.

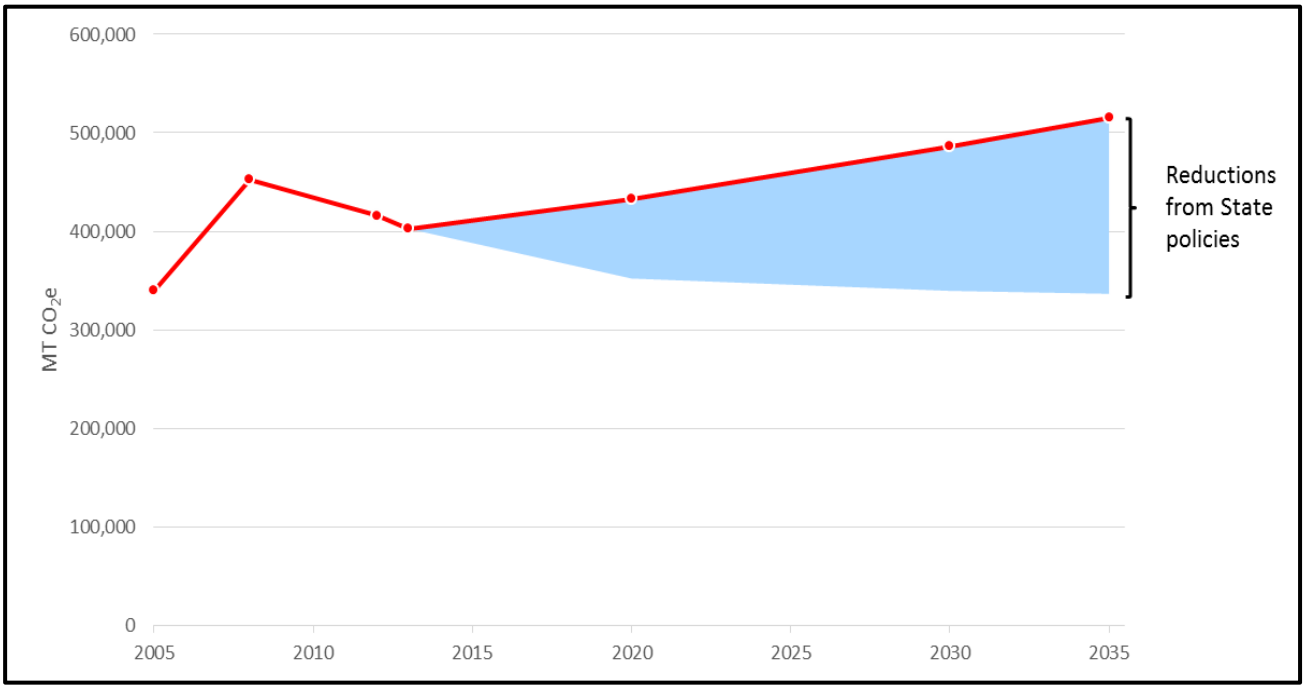


FIGURE 7 **Community Adjusted BAU Emissions**

Municipal Adjusted Business-as-Usual Forecast

The City's Municipal Adjusted BAU emissions in 2020 are estimated to be 1,611 MT CO_2e, which is 3 percent lower than the 2005 baseline level (FIGURE 8). In 2030, emissions are expected to be 1,657 MT CO_2e, which is equivalent to 2005 levels. In 2035, emissions are expected to be 1 percent higher than in 2005 (1,681 MT CO_2e).

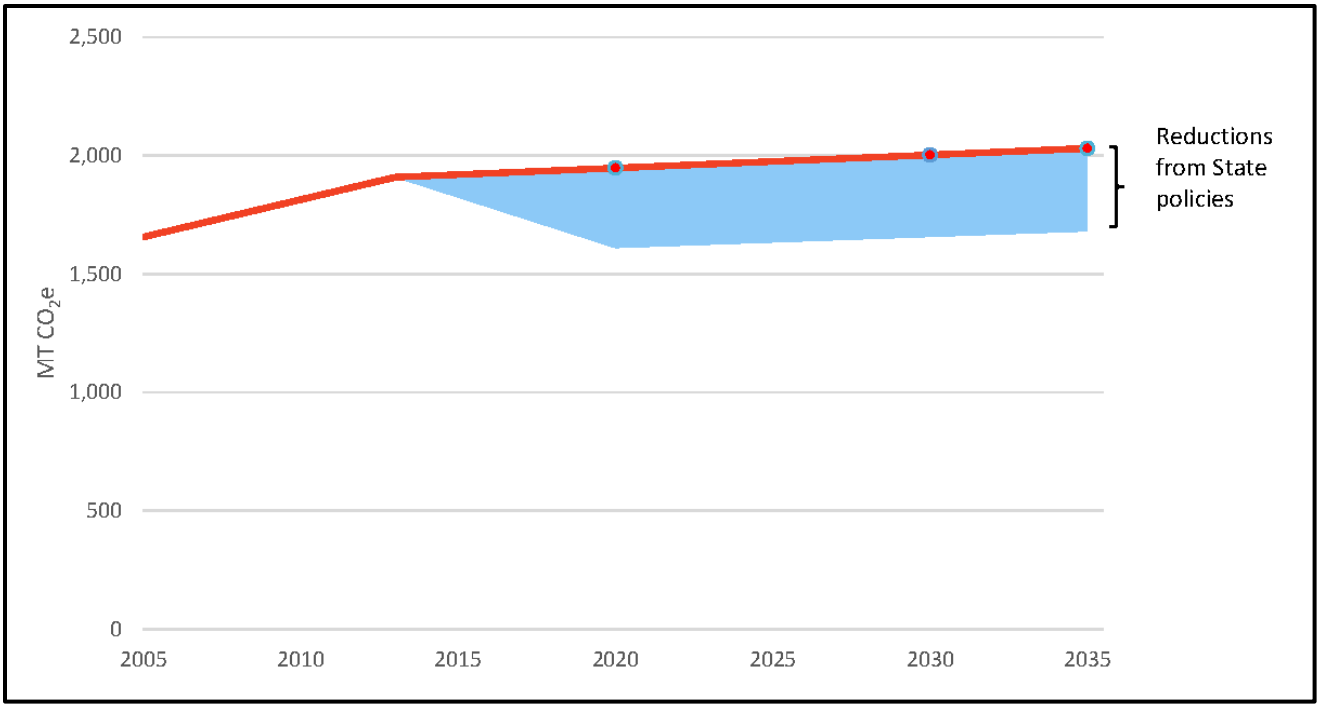


FIGURE 8 **Municipal Adjusted BAU Emissions**

REDUCTION TARGETS

The State has set goals for reducing GHG emissions by 2020 and 2050 through AB 32 and Executive Order (EO) S-3-05, respectively. The State has also provided guidance to local jurisdictions as "essential partners" in achieving the State's goals by identifying a 2020 recommended reduction goal. That goal, stated in the AB 32 Scoping Plan, was for local governments to achieve a 15 percent reduction below 2005 levels by 2020, which aligns with the State's goal of not exceeding 1990 emissions levels by 2020.[5] Beyond 2020, AB 32 states that the emissions level in 2020 should be maintained post-2020 and Executive Order S-03-05 states that emissions should decline to 80 percent below 1990 levels by 2050.

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

[5] The State concluded that a 15 percent reduction in emissions from 2005 levels by 2020 would be equivalent to achieving 1990 emissions levels.

Both mass emissions (performance target) and per capita emissions (efficiency target) GHG reductions targets were identified for 2020, 2030, and 2035. The City has established the following reduction targets that are consistent with current regulation.

Community Targets

Mass Emissions Targets

Consistent with the State's adopted AB 32 GHG reduction target, the City has set a goal to reduce emissions to 1990 levels by 2020. This target was calculated as a 15-percent decrease from 2005 levels, as recommended in the AB 32 Scoping Plan. An interim goal for the City was created for 2030, which was to reduce emissions to 40 percent below 2005 levels. A longer-term goal was established for 2035, which was to reduce emissions to 49 percent below 2005 levels. The 2030 interim and 2035 longer-term goals would put the City on a path toward the State's long-term goal to reduce emissions 80 percent below 1990 levels by 2050 (TABLE 6).

TABLE 6 **Mass GHG Reduction Targets for Community Emissions**

	Community Target
2020 Target	15% below 2005 levels
2020 Emissions Goal (MT CO_2e)	288,976
2030 Target	40% below 2005 levels
2030 Emissions Goal (MT CO_2e)	203,983
2035 Target	49% below 2005 levels
2035 Emissions Goal (MT CO_2e)	173,386

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

Per Capita Emission Targets

The 2017 Scoping Plan Update recommends local plan level GHG emissions reduction goals of no more than 6 MT CO_2e per capita by 2030 and no more than 2 MT CO_2e per capita by 2050. These goals consider all Statewide emission sources; however, some of the emission sources are not included in the City's GHG inventories, such as industrial and aviation, and the City has no control over these emissions. By comparing the Statewide most recent year (2015) GHG inventory (ARB 2017) and the City's 2013 inventory, it was determined that the City had control over 63 percent of Statewide GHG source types. Therefore, the state-aligned emissions goals were proportioned to 3.8 MT CO_2e per capita by 2030, and 1.27 MT CO_2e per capita by 2050. The 2020 and 2035 goals were interpolated from the 2030 and 2050 goals assuming same rate of reduction of the emission goals each year (TABLE 7).

TABLE 7 **Per Capita GHG Reduction Targets for Community Emissions**

	Community Target
2020 State Target (MT CO_2e/SP)	8.00
2020 Emissions Goal (MT CO_2e/SP)	5.06
2030 State Target (MT CO_2e/SP)	6.00
2030 Emissions Goal (MT CO_2e/SP)	3.8
2035 State Target (MT CO_2e/SP)	5.00
2035 Emissions Goal (MT CO_2e/SP)	3.16

Notes and Acronyms:
MT CO_2e = Metric tons of carbon dioxide equivalent
SP = service population (population + jobs)

As shown in FIGURE 9, FIGURE 10 and TABLE 8, in 2020 the City would meet the State Aligned efficiency GHG reduction targets under the ABAU scenario, but would need to reduce 63,130 MT CO_2e to meet the performance target. In 2030, under the ABAU scenario, the City would need to reduce 29,816 MT CO_2e to meet the State Aligned efficiency target, and would need to reduce 108,531 MT CO_2e to meet the performance target. In 2035, under the ABAU scenario, the City would need to reduce 70,471 MT CO_2e to meet the State Aligned efficiency target, and would need to reduce 163,157 MT CO_2e to meet the performance target.

TABLE 8 **State-Aligned GHG Reduction Targets for Community Emissions**

Sector	2005	2013	2020	2030	2035
BAU Emissions (MT CO_2e)	339,972	402,574	432,982	486,170	515,462
Adjusted BAU Mass Emissions (MT CO_2e)	339,972	402,574	352,106	339,514	336,543
Service Population (Population + Jobs)	70,152	71,663	76,437	81,499	84,200
Adjusted BAU Per Capita Emissions (MT CO_2e/SP)			4.61	4.17	4.00
State-Aligned Performance Target (% change from 2005)			-15%	-40%	-49%
State-Aligned Performance Target (MT CO_2e)			288,976	203,983	173,386
Reductions from Adjusted BAU needed to meet the Performance Target (MT CO_2e)			63,130	~~108,531~~ 135,531	163,157
State-Aligned Efficiency Target (MT CO_2e/SP)			5.06	3.80	3.16
Reductions from Adjusted BAU needed to meet the Efficiency Target (MT CO_2e/SP)			Target Met	29,816	70,471

Notes and Acronyms:
MT CO_2e = Metric tons of carbon dioxide equivalent
SP = service population = population + jobs

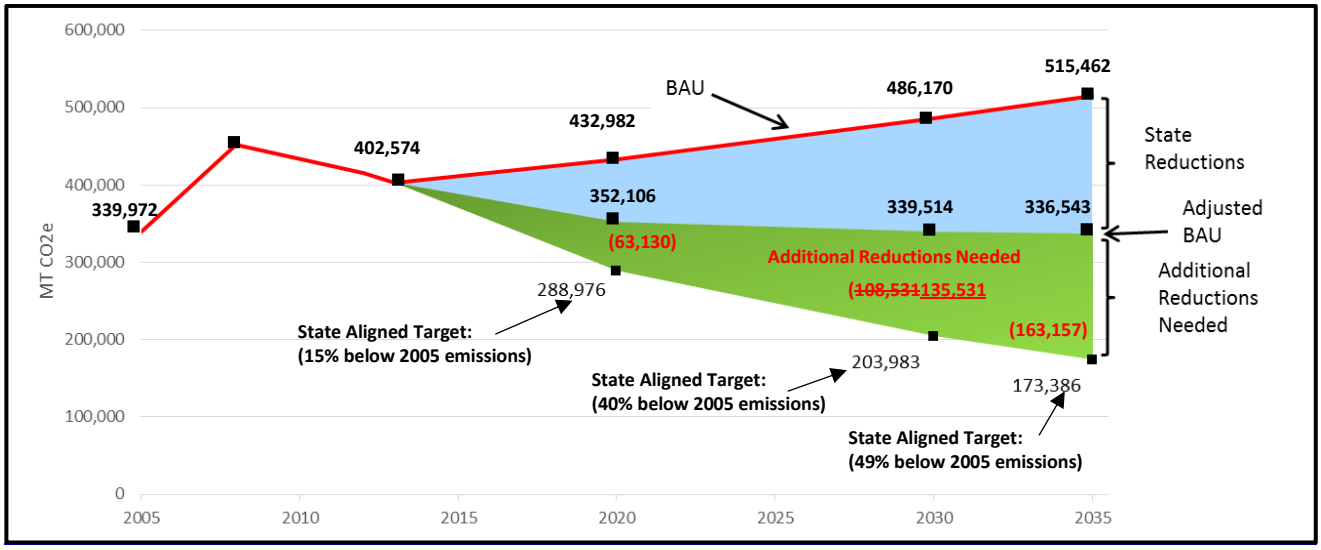


FIGURE 9 **Community Emissions Inventories, Projections, and Performance Targets**

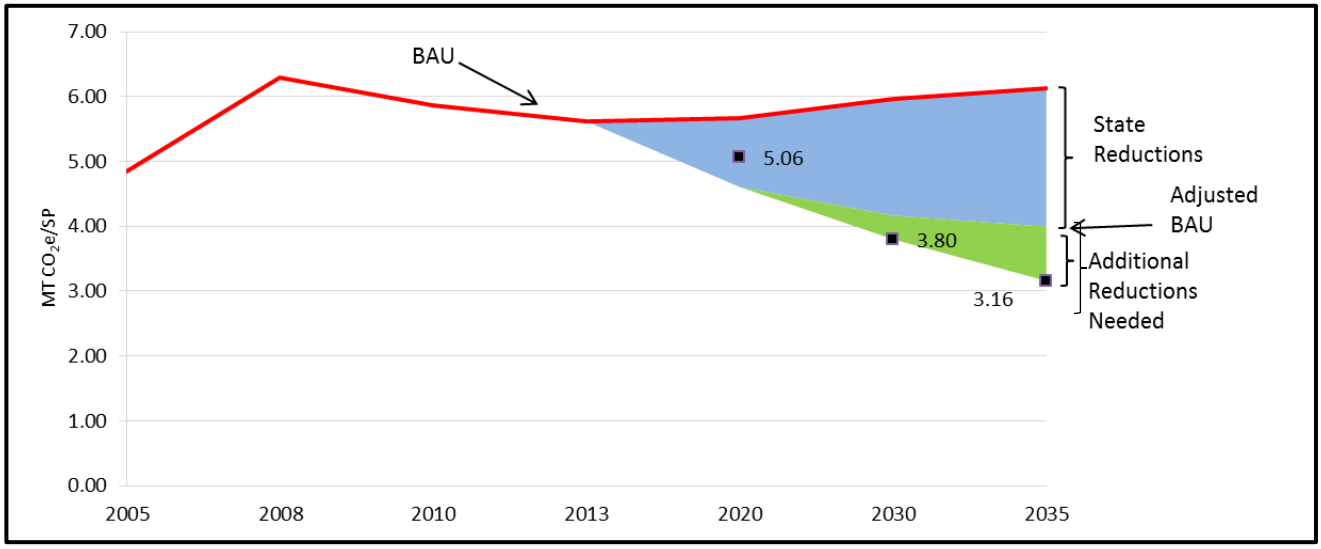


FIGURE 10 **Community Emissions Inventories, Projections, and Efficiency Targets**

Municipal Targets

To be aligned with the community goals, the City would need to reduce its emissions by 203 MT CO_2e from the 2020 Adjusted BAU forecast. The City will also need to implement measures to continue to achieve GHG reductions beyond 2020. By 2030, the City will need to reduce municipal operation emissions by 994 MT CO_2e from an Adjusted BAU forecast to meet a 40-percent reduction goal below 2005 levels. By 2035, the City will need to reduce municipal operation emissions by 836 MT CO_2e from an Adjusted BAU forecast to meet a 49-percent reduction goal below 2005 levels (TABLE 9 and FIGURE 11).

TABLE 9 State-Aligned GHG Reduction Targets for Municipal Emissions

Sector	2005	2013	2020	2030	2035
BAU Emissions (MT CO_2e)	1,657	1,909	1,948	2,003	2,031
Adjusted BAU Emissions (MT CO_2e)	1,657	1,909	1,611	1,657	1,681
State-Aligned Target (% change from 2005)			-15%	-40%	-49%
State-Aligned Target (% change from 2013)			-26%	-46%	-56%
State-Aligned Emissions Goal (MT CO_2e)			1,408	994	845
Reductions from Adjusted BAU needed to meet the Target (MT CO_2e)			203	663	836

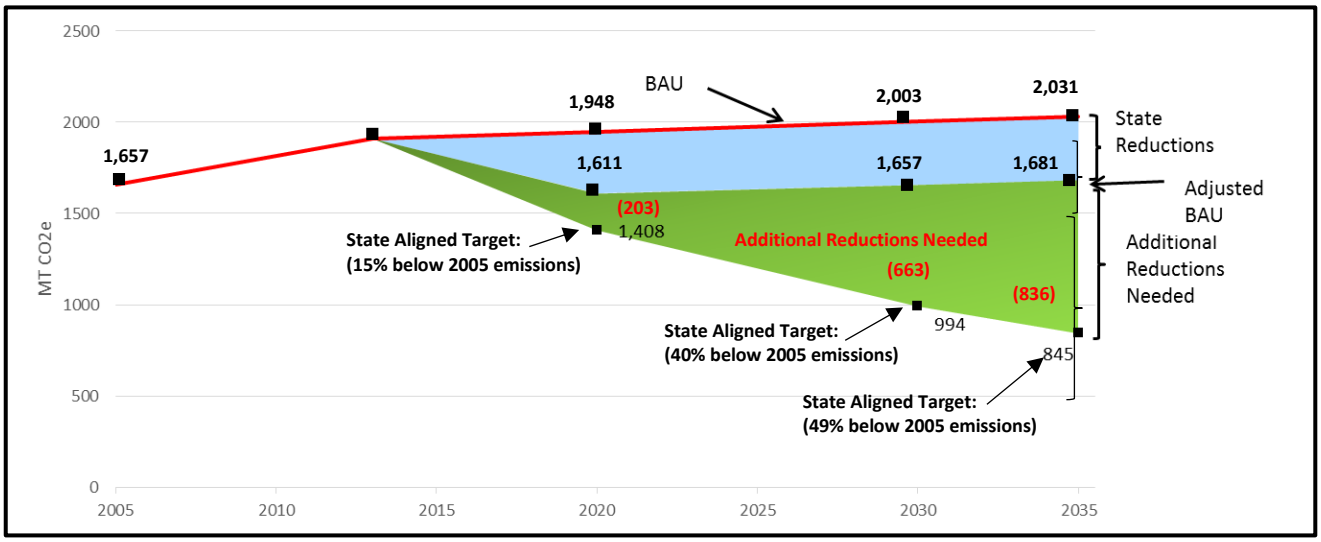


FIGURE 11 **Municipal Emissions Inventories, Projections, and Targets**

CHAPTER 3 GHG Reduction Measures

This chapter details how the City will meet its GHG reduction targets by using goals, measures, and actions at the community and municipal levels. The goal describes the overarching objective related to increasing energy efficiency or decreasing energy consumption, such as increasing energy efficiency in residential building units, as well as reducing VMT and solid waste generation. Within each goal, one or more measures are presented indicating the City's commitment toward meeting the goal. Within each measure, one or more actions are presented that indicate the steps the City ~~may~~ will take in achieving the measure. Each measure includes the GHG reduction potential in 2020, 2030 and 2035. Actions are designed to include the steps needed to implement the measure. Actions may be added, removed, or modified during a Sustainable Santee Plan Update that is approved with a public hearing and by presenting substantial evidence that the measures and actions are consistent with the State's GHG reduction targets. ~~Actions may be added or removed over time, depending on their relevancy, funding availability, and whether the actions are successful in supporting measures as they are monitored over time, but are considered essential to guiding staff in implementation.~~ Actions include a performance indicator, implementation timeframe, department or agency responsible for implementation, and cost information, where applicable. In addition, this Plan will result in local benefits while reducing GHG emissions, called co-benefits. Co-benefits range from providing improved air quality and mobility to increased awareness about sustainability. Co-benefits are identified with each measure by an icon.

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

EXISTING REGIONAL AND LOCAL GHG REDUCTION MEASURES

Existing regional and local GHG reductions include the San Diego Association of Governments (SANDAG) Sustainable Communities Strategy (SCS) found in the SANDAG Regional Transportation Plan and the City of Santee Mobility Element within the Santee General Plan. These documents qualitatively describe on-road transportation strategies that will reduce GHG emissions within the Santee community. However, SANDAG did not quantify GHG emission reductions within the City of Santee specific to the SCS. The City of Santee Mobility Element implements the SANDAG SCS within the City of Santee but did not quantify the reductions in GHG emissions. The following briefly summarizes the goals, objectives and policies within the City of Santee Mobility Element that implement the SANDAG SCS relate to GHG reductions.

Mobility Element Goal: A balanced, interconnected multimodal transportation network that allows for the efficient and safe movement of all people and goods, and that supports the current and future needs of Santee community members and travel generated by planned land uses. The following Mobility Element objectives and policies reduce GHG emissions.

Objective 1.0: Complete Streets.

Policy 1.1: The City shall provide integrated transportation and land use decisions that enhance smart growth development served by complete streets, which facilitate multimodal transportation opportunities.

Policy 1.2: The City should design streets in a manner that is sensitive to the local context and recognizes that needs vary between mixed use, urban, suburban, and rural settings.

Policy 1.3: The City shall ensure that the entire right-of-way is designed to accommodate appropriate modes of transportation.

Policy 1.4: The City should create a vibrant town center by developing a connected system of multi-modal corridors that encourage walking, biking, and riding transit. A mobility hub should be considered at the existing Santee Trolley Square providing features such as bike-share, bike parking, car-share, neighborhood electric vehicles, real time traveler information, demand-based shuttle

services, wayfinding signage, bicycle and pedestrian improvements, urban design enhancements, etc.

Objective 2.0 Multi-modal Transportation Network of local roads, collectors, arterials, freeways and transit services. This multi-modal transportation network will be developed in a manner that promotes the health and mobility of Santee residents and that meets future circulation needs, provides access to all sectors of the City, and supports established and planned land uses. The following policies reduce GHG emissions and will implement objective 2.0.

Policy 2.1: The City shall encourage an automobile Level of Service "D" on street segments and at intersections throughout the circulation network while also maintaining or improving the effectiveness of the non-automotive components of the circulation system (i.e. pedestrians, bicyclists, and public transit), especially in the Town Center area.

Policy 2.2: The City should ensure adequate accessibility for all modes to the northern undeveloped area of the City by designating a functional network of public streets for future dedication either prior to, or concurrent with anticipated need.

Policy 2.6: The City should encourage traffic circulation improvements such as, but not limited to, enhanced roadway markings, synchronized traffic signals, and Intelligent Transportation System (ITS) network management.

Policy 2.9: The City should work with the region to develop traffic and congestion management programs to improve commute times and improve air quality.

Objective 5.0: Allow parking reductions around transit and affordable housing.

Policy 5.1: The City should consider reducing parking requirements in the town center area and at transit stations as transit ridership increases over time due to increased development intensities and a broader mix of land uses.

Policy 5.2: The City should maximize shared parking opportunities for uses with varied peak parking periods.

Policy 5.3: The City should exercise flexibility in the application of parking standards to support transit-oriented development.

Objective 6.0: Increase the use of public transit systems.

Policy 6.1: The City should coordinate with SANDAG and MTS to maintain and enhance transit services in the City so that they are efficient, cost-effective, and responsive to growth and redevelopment.

Policy 6.2: The City should coordinate with SANDAG and MTS to improve bus stop and shelter facilities to increase the comfort of users.

Policy 6.3: The City should coordinate with SANDAG and MTS to provide multi-modal support facilities and adequate access near and to/from transit stops for bicyclists and pedestrians, including children and youth, seniors, and persons with disabilities.

Policy 6.4: The City should coordinate with SANDAG and MTS to post route maps and pick-up/drop-off times at each stop.

Policy 6.5: The City should coordinate with MTS to encourage establishing transit stops in areas of concentrated activity such as near senior housing projects, medical facilities, major employment centers, and mixed use areas.

Policy 6.6: The City should coordinate with MTS to accommodate transit centers and major stops with adequate bicycle and pedestrian access and secure bicycle storage where appropriate. Include facilities that are well designed, provide appropriate lighting and are safe, comfortable, and attractive.

Policy 6.7: The City should provide incentives for transit-oriented development, such as a parking reduction consistent with regional standards, for more intense development and higher density residential uses along major transportation corridors or in areas accessible to transit use.

Objective 7.0: Develop, maintain, and support a safe, comprehensive and integrated bikeway system that encourages bicycling, as documented in the City's Bicycle Master Plan (BMP).

Policy 7.1: The City shall continue to implement and maintain a comprehensive bicycle route system, and to designate appropriate bikeways through the regular update of the City's Bicycle Master Plan.

Policy 7.2: The City should strive to achieve objectives and policies identified in the Bicycle Master Plan including those related to bicycle safety awareness, bicycle promotion, maintenance and monitoring.

Policy 7.3: The City should promote the development of hiking and bicycle trails along the San Diego River in conjunction with the San Diego River Plan.

Policy 7.4: The City should require new development and redevelopment to provide connections to existing and proposed bicycle routes, where appropriate.

Policy 7.5: The City should keep abreast of bicycle facility innovations in other cities and regions, and seek to incorporate these into the bicycle network.

Objective 8.0: Develop and maintain an accessible, safe, complete and convenient pedestrian system that encourages walking.

Policy 8.1: The City should require the incorporation of pedestrian-friendly design concepts where feasible including separated sidewalks and bikeways, landscaped parkways, traffic calming measures, safe intersection designs and access to transit facilities and services into both public and private developments.

Policy 8.2: The City should provide for the connectivity of wide, well-lit sidewalks and environments with safety buffers between pedestrians and vehicular traffic, where feasible.

Policy 8.3: The City should pursue the elimination of physical barriers around public facilities and commercial centers to improve access and mobility of the elderly and disabled in a manner consistent with the Title 24 of the California Code of Regulations and the federal Americans with Disabilities Act (ADA).

Policy 8.4: The City shall require non-contiguous sidewalks on all streets with a residential collector classification or higher, as appropriate.

Policy 8.5: The City should identify and implement pedestrian improvements with special emphasis on providing safe access to schools, parks, community and recreation centers, and shopping districts.

Policy 8.6: The City should promote walking and improve the pedestrian experience by requiring pedestrian facilities along all classified streets designated on the Circulation Plan; by implementing streetscape improvements along pedestrian routes that incorporate such elements as shade trees, street furniture, and lighting; by orienting development toward the street; by employing traffic calming measures; and by enforcing vehicle speeds on both residential and arterial streets.

Policy 8.7: The City should promote walking as the primary travel mode for the school trip through implementing the citywide Safe Route to School Plan.

Policy 8.8: The City should improve pedestrian safety at intersections and mid-block crossings, where appropriate.

Policy 8.9: On all primary pedestrian corridors, the City shall ensure adequate green time, based on established standards, at all crosswalks that allow the elderly and disabled to cross City streets on a single green light.

Policy 8.10: The City should provide connected network of safe pedestrian crossings throughout the City.

Policy 8.11: The City should enhance pedestrian visibility by enforcing parking restrictions at intersection approaches, improving street lighting, and minimizing obstructions.

Objective 9.0: Increased use of alternative modes of travel to reduce peak hour vehicular trips, save energy, and improve air quality.

Policy 9.1: The City shall encourage and provide for Ride Sharing, Park ‘n Ride, and other similar commuter programs that eliminate vehicles from freeways and arterials.

Policy 9.2: The City should encourage businesses to provide flexible work schedules for employees.

Policy 9.3: The City should encourage employers to offer shared commute programs and/or incentives for employees to use transit.

Policy 9.4: The City should encourage the use of alternative transportation modes, such as walking, cycling and public transit. The City should maintain and implement the policies and recommendations of the Bicycle Master Plan and Safe Routes to School Plan to improve safe bicycle and pedestrian access to major destinations.

Policy 9.5: The City should improve safety of walking and biking environment around schools to reduce school-related vehicle trips.

Objective 10.0: The City shall remain actively involved in regional issues.

Policy 10.1: The City should promote and support the continued expansion of the San Diego Trolley system which benefits residents of Santee, especially in higher density areas.

The community measures related to on-road transportation implement these Mobility Element Policies.

COMMUNITY MEASURES

This section summarizes the proposed reduction measures to be implemented by the City to reduce its community GHG emissions. The reduction measures are organized by source category (electricity, natural gas, water, transportation, solid waste, and new developments).

Energy Efficiency

Residential Land Uses

Residential Energy includes electricity and natural gas consumption within households in the City. There are many opportunities to save energy from existing and future development, described in the goals and measures below.

Goal 1: Increase Energy Efficiency in Existing Residential Units

MEASURE 1.1: ENERGY EFFICIENCY EDUCATION AND BEST PRACTICES

Opportunities for residents to improve energy efficiency in their homes range from changes to behavior that they can start today to physical modifications or improvements they can make to their homes. Education of both the public and municipal employees is at the core of attaining energy efficiency goals. While most of the other measures include an outreach component, creating a specific education measure will emphasize the critical role of education in achieving energy efficiency. An education measure will also provide City staff with a framework to educate community members about behavioral and technological changes that can increase energy efficiency.

ACTIONS

- ☐ Post links on website/social media and provide materials at public events
- ☐ Email list for email blasts of new information or trainings

- ☐ Support SDG&E energy efficiency programs within Santee
- ☐ Support the use of the SDG&E energy efficiency resource center
- ☐ Designate an Energy Advocate to promote and manage energy efficiency programs
- ☐ Fund EsGil Corporation building inspector to hold a 1-hour training, semi-annually, on energy efficiency and Title 24 requirements

1.1: Energy Efficiency Training, Education, and Recognition	
GHG Reduction Potential	Supporting Measure
Co-Benefits	

MEASURE 1.2: INCREASE COMMUNITY PARTICIPATION IN EXISTING ENERGY EFFICIENCY OPPORTUNITIES

There are many energy efficiency opportunities that are low-cost for residents to initiate and result in cost savings over time. These opportunities are generally from existing programs, and SDG&E offers many rebates and other incentives to purchase energy efficient appliances, lighting and other low cost investments that facilitate energy efficiency. Through this measure, the City will work to increase residents' participation in existing energy efficiency programs such as Energy Savings Assistance Program that are low-cost or even provide a financial benefit to the resident. As programs change over time, continued and up-to-date outreach is necessary. The action below would provide a variety of channels for ongoing communication to the City's residents.

ACTION

☐ Partner with SDG&E for outreach events including SDG&E energy efficiency program events. If requested, SDG&E will also provide a booth at local events within Santee to educate residents and businesses on the various energy efficiency programs and incentives.

☐ Track SDG&E energy efficiency program participation of existing residential land uses within the City of Santee. Program participation includes weather stripping, light bulb and light fixture replacements. Expected GHG reductions associated with this measure are based on participation rates between 2013 and 2017 within Santee. The rate of GHG reductions per year remains constant at 45 $MTCO_2e$ in 2020, 2030, and 2035.

1.2: Increase Existing Energy Efficiency Program Participation

GHG Reduction Potential (2020)	45 MT CO_2e[6]
GHG Reduction Potential (2030)	45 MT CO_2e
GHG Reduction Potential (2035)	45 MT CO_2e
kWh Savings (2020)	66,890 kWh[7]
Therms Savings (2020)	3,943 therms[8]

[6] GHG emissions reductions based upon kWh and Therm savings and calculated using the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas (GHG) Mitigation Measures (CAPCOA 2010), Section 2.1, Building Energy Use.
[7] kWh savings based on historical participation rates in the SDG&E energy efficiency incentives programs.
[8] Therms savings based on historical participation rates in the SDG&E energy efficiency incentives programs.

Co-Benefits	

MEASURE 1.3: HOME ENERGY EVALUATIONS

Home energy evaluations are necessary to identify cost-effective opportunities for energy saving and for residents to take practical actions to achieve energy efficiency. Home energy evaluations can be established or promoted by a variety of existing programs. An Energy Conservation and Disclosure Ordinance is also a mechanism to disclose building energy performance and facilitate energy improvements in existing homes. If an Energy Conservation and Disclosure Ordinance is adopted, it would require properties to undergo energy audits before the sale of the property.

ACTIONS

- ☐ Promote or provide energy audits such as through Energy Upgrade California.
- ☐ Present a residential Energy Conservation and Disclosure Ordinance to the City Council for consideration.
- ☐ Present an ordinance requiring point of sale energy rating to City Council for consideration.

1.3: Promote Home Energy Evaluations	
GHG Reduction Potential	Supporting Measure
Co-Benefits	

MEASURE 1.4: RESIDENTIAL HOME ENERGY RENOVATIONS

Approximately 56 percent of residential buildings in the City were built before the adoption of Title 24. Buildings built before adoption of Title 24 are not energy efficient, and renovations would achieve higher energy efficiency. Many programs and incentives across the state or country help promote home energy renovations, including city-supervised funding, permit process improvements and city ordinances.

ACTIONS

- ☐ Promote existing incentivized programs.
- ☐ Promote participation in Green Building Program.
- ☐ Establish or promote financing programs for home upgrades such as HERO.
- ☐ Establish online permitting to facilitate upgrades.
- ☐ Track energy efficiency retrofits of existing residential land uses with the City of Santee through the permit application process. Expected GHG reductions associated with this measure are based on participation rates between 2013 and 2017 within Santee. Because the future participation rate uses the 2013 through 2017 average, the rate of GHG reductions per year remains constant at 7,811 MTCO2e in 2030, 2035, and 2035.

1.4: Promote Residential Home Energy Renovations	
GHG Reduction Potential (2020)	7,811 MT CO_2e[9]
GHG Reduction Potential (2030)	7,811 MT CO_2e
GHG Reduction Potential (2035)	7,811 MT CO_2e
kWh Savings (2020)	15,065,193 kWh[10]
Therms Savings (2020)	468,554 therms[11]
Co-Benefits	

[9] GHG Reductions based upon kWh and Therm savings and calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 2.1, Building Energy Use.
[10] kWH savings based upon historical participation rates in the HERO energy efficiency financing program.
[11] Therms savings based upon historical participation rates in the HERO energy efficiency financing program.

Goal 2: Energy Efficiency in New Residential Units

MEASURE 2.1: ENERGY EFFICIEN~~C~~T HOMES

City planners have a unique opportunity to encourage/inform developers of new energy efficiency opportunities in new development. This policy will develop City staff to become resources in encouraging and implementing energy efficiency building measures beyond those required in current Title 24 standards. This policy will also ensure that as Title 24 standards are updated, City staff are well informed and can implement updates quickly and effectively.

ACTIONS

- ☐ Educate City staff, developers, etc., on future Title 24 updates and additional energy efficiency opportunities for new residential development.
- ☐ Promote Tier 1 / 2 Green Building Ratings such as Leadership in Energy and Environmental Design (LEED), Build It Green/Green Point Rating System, or Energy Star® certified buildings.
- ☐ Establish online permitting to facilitate upgrades.
- ☐ Within one year of plan adoption, create an energy award program for net-zero energy homes.
- ☐ Track LEED participation of new construction within the City of Santee through the permitting process. Assumes 135 LEED or Energy Star homes between 2013 and 2020 (5,102MTCO_2e), 223 Homes in 2030 (8,423 MTCO_2e), and 470 homes in 2035 (17,750 MTCO_2e).

2.1: Energy Efficient Homes	
GHG Reduction Potential (2020)	5,102 MT CO_2e[12]
GHG Reduction Potential (2030)	~~13,534~~8,423 MT CO_2e

[12] GHG reductions based upon new residential developments being built as zero net energy homes and calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 2.1, Building Energy Use.

GHG Reduction Potential (2035)	17,750 MT CO_2e
Co-Benefits	

Commercial Land Uses

Commercial Energy includes electricity and natural gas consumption for businesses in the City. Opportunities to save energy from existing and future development are described in the goals and measures below.

Goal 3: Increase Energy Efficiency in Existing Commercial Units

MEASURE 3.1: ENERGY EFFICIENCY TRAINING, EDUCATION, AND RECOGNITION IN COMMERCIAL SECTOR

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

ACTIONS

- ☐ Post links on website/social media and provide materials at public events.
- ☐ Email list for email blasts of new information or trainings.
- ☐ Promote SDG&E energy efficiency events fair.
- ☐ Promote the SDG&E energy efficiency resource center.
- ☐ Designate an Energy Advocate to promote and manage energy efficiency programs.
- ☐ Fund EsGil Corporation building inspector to hold a one-hour training session, semi-annually on energy efficiency and Title 24 requirements.

3.1: EE Training, Education, and Recognition	
GHG Reduction Potential	Supporting Measure

Co-Benefits	

MEASURE 3.2: INCREASE BUSINESS PARTICIPATION IN EXISTING ENERGY EFFICIENCY PROGRAMS

There are many energy efficiency opportunities that are low-cost for businesses to initiate and result in cost-savings over time. SDG&E offers many rebates and other incentives to purchase energy efficient appliances, lighting and other low cost investments that facilitate energy efficiency. Through Measure 3.2, the City will work to increase businesses' participation in existing energy efficiency programs that are low-cost or even provide a financial benefit to the business. Many businesses owners may be unaware that the opportunities exist.

ACTION

- ☐ Partner with SDG&E for outreach events including SDG&E energy efficiency program events. If requested, SDG&E will also provide a booth at local events within Santee to educate residents and businesses on the various energy efficiency programs and incentives.
- ☐ Track SDG&E energy efficiency program participation of existing commercial land uses within the City of Santee. Program participation includes weather stripping, window glazing, and light fixture replacements. Expected GHG reductions associated with this measure are based on participation rates between 2013 and 2017 within Santee. The rate of GHG reductions per year remains constant at 660 $MTCO_2e$ in 2020, 2030, and 2035.

3.2: Increase Business Participation in Existing Energy Efficiency Opportunities	
GHG Reduction Potential (2020)	660 MT CO_2e[13]
GHG Reduction Potential (2030)	660 MT CO_2e
GHG Reduction Potential (2035)	660 MT CO_2e
kWh Savings (2020)	1,651,021 kWh[14]
Therms Savings (2020)	14,551 therms[15]
Co-Benefits	

[13] GHG emissions reductions based upon kWh and Therm savings calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 2.1, Building Energy Use.
[14] kWH savings based upon historical participation rates in SDG&E energy efficiency incentives programs.
[15] Therm savings based upon historical participation rates in SDG&E energy efficiency incentives program.

MEASURE 3.3: NON-RESIDENTIAL ENERGY AUDITS

Commercial energy audits are necessary to identify cost-effective opportunities for energy savings and for business owners to take practical actions to achieve energy efficiency. The audits can be established or promoted by various existing programs.

ACTION

☐ Promote energy audits such as through Energy Upgrade California.

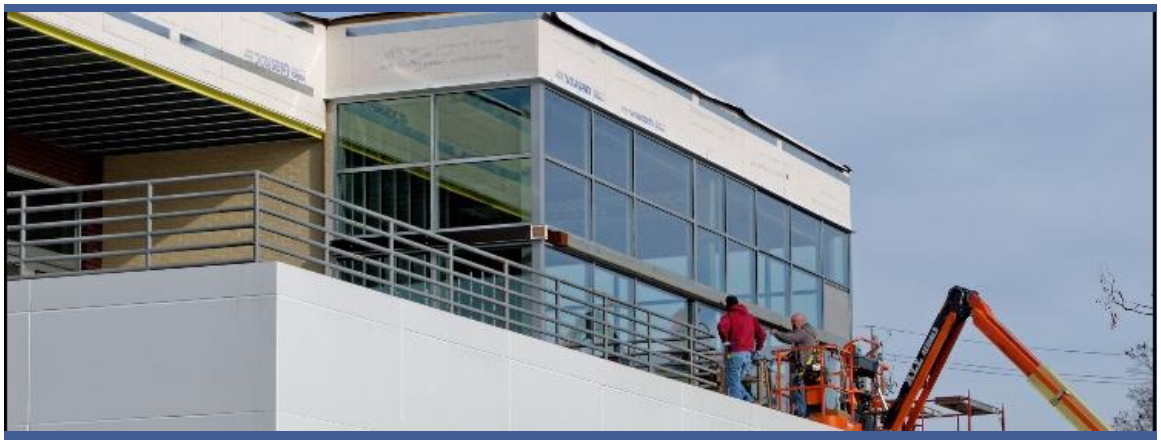
3.3: Incentivize or Require Nonresidential Energy Audits	
GHG Reduction Potential	Supporting Measure
Co-Benefits	

MEASURE 3.4: NON-RESIDENTIAL RETROFITS

As most commercial buildings in the City were built before the adoption of Title 24, most commercial facilities and equipment are not energy efficient. Therefore, retrofits are necessary to achieve higher energy efficiency. Many programs and incentives across the state or country help promote nonresidential energy retrofits, including City-supervised funding, permit process improvements and City ordinances.

ACTIONS

- ☐ Promote existing incentivized programs such as Energy Upgrade California.
- ☐ Establish or promote participation in California Solar Initiative.
- ☐ Establish or promote financing programs such as Property-Assessed Clean Energy (PACE).
- ☐ Track SDG&E energy efficiency retrofits of existing commercial buildings within the City of Santee through the permit application process. Expected GHG reductions associated with this measure are based on participation rates between 2013 and 2017 within Santee. The rate of GHG reductions per year remains constant at 8,010 $MTCO_2e$ in 2020, 2030, and 2035.



3.4: Promote Commercial Energy Retrofits	
GHG Reduction Potential (2020)	8,010 MT CO_2e[16]
GHG Reduction Potential (2030)	8,010 MT CO_2e
GHG Reduction Potential (2035)	8,010 MT CO_2e
kWh Savings (2020)	20,148,154 kWh[17]
Therms Savings (2020)	168,436 therms[18]
Co-Benefits	

[16] GHG reductions based upon kWh and Therms savings calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 2.1, Building Energy Use.
[17] Kwh savings based on historical participation rates in PACE energy efficiency financing programs.
[18] Therm savings based on historical participation rates in PACE energy efficiency financing programs.

Goal 4: Increase Energy Efficiency in New Commercial Units

Measure 4.1: ENERGY EFFICIENT BUSINESSES

City planners have a unique opportunity to inform developers of new energy efficiency opportunities and encourage them to adopt these technologies in new development. This policy will develop City staff to be resources in encouraging and implementing energy efficiency beyond that required by current Title 24 standards. This will also ensure that as Title 24 standards are updated, City staff are well informed and can implement updates quickly and effectively.

ACTIONS

- ☐ Educate City staff, developers, etc., on future Title 24 updates and the additional energy efficiency opportunities for new residential development.
- ☐ Promote Tier 1 and Tier 2 Green Building Ratings such as LEED, Build It Green/Green Point Rating System, or Energy Star® certified buildings.
- ☐ Within three years of plan adoption, provide for City Council consideration a plan to waive or reduce permit fees for zero energy businesses.
- ☐ Establish online permitting to facilitate upgrades.
- ☐ Create an energy award for net-zero energy businesses.
- ☐ Within two years of adotion of the plan, present to the City Council an ordinance that exceeds Title 24.
- ~~☐~~ Track LEED and Energy Star participation of new construction within the City of Santee through the permitting process. Assumes 114,000 square feet of LEED or Energy Star buildings between 2013 and 2020 (1,442 $MTCO_2e$), 570,000 square feet of buildings by 2030 (8,705 $MTCO_2e$), and 968,000 square feet of buildings by 2035 (12,337 $MTCO_2e$).

4.1: Energy Efficient Businesses

GHG Reduction Potential (2020)	1,442 MT CO_2e[19]
GHG Reduction Potential (2030)	8,705 MT CO_2e
GHG Reduction Potential (2035)	12,337 MT CO_2e[20]
Co-Benefits	

Water Efficiency

Goal 5: Increase Energy Efficiency through Water Efficiency

MEASURE 5.1: WATER EFFICIENCY THROUGH ENHANCED IMPLEMENTATION OF SB X7-7

SB X7-7, or The Water Conservation Act of 2009, requires all water suppliers to increase water use efficiency. The legislation set an overall goal of reducing per capita urban water consumption by 20 percent from a baseline level by 2020. This goal can be met by taking a variety of actions, including targeted public outreach and promoting water efficiency measures such as low-irrigation landscaping.

ACTIONS

- ☐ Post links on website/social media and provide materials at public events.
- ☐ Email list for email blasts of new information or trainings.
- ☐ Require low-irrigation landscaping which will reduce 1,279 $MTCO_2e$ by 2020, 1,366 $MTCO_2e$ by 2030, and 1,409 $MTCO_2e$ by 2035.
- ☐ Develop an Urban Forest Management Plan within two years of plan adoption.
- ☐ Within one year of plan adoption, update the City's official street tree list to include more water-efficient varieties.
- ☐ Within one year of plan adoption, provide an update to the Zoning Ordinance to add clarity on desired recreational amenities in multifamily complexes to replace the previously desired pool and water features.

[19] 2020 GHG reductions based upon new commercial development applications in 2019 providing energy efficiency at the 2020 Title 24 standard of efficiency.
[20] 2035 GHG reductions based upon new commercial development providing zero net energy buildings.

5.1: Support Enhanced Implementation of SB X7-7

GHG Reduction Potential (2020)	1,279 MT CO_2e[21]
GHG Reduction Potential (2030)	1,366 MT CO_2e
GHG Reduction Potential (2035)	1,409 MT CO_2e
kWh Savings (2020)	3,622,962 kWh[22]
Co-Benefits	

[21] GHG reductions based upon estimated kWh savings resulting from compliance with SB X7-7 calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 4.2, Water Use.

[22] kWh savings based upon compliance with SB X7-7

MEASURE 5.2: EXCEED WATER EFFICIENCY STANDARDS

In addition to SB X7-7, more actions are being studied or have been taken to exceed water efficiency standards. These efforts include education and outreach practices that could be combined with residential and commercial actions that emphasize the reuse of recycled/grey water and promote harvesting rainwater.

ACTIONS

- ☐ Staff time dedicated to work with Homeowner Associations (HOAs), businesses, and other groups for outreach.
- ☐ ~~Promote~~ Increase recycled or grey water uses for non-municipal uses per City Ordinance No 534 for non-municipal uses, which will reduce 22 $MTCO_2e$ by 2020, 24 $MTCO_2e$ by 2020, and 25 $MTCO_2e$ by 2035.
- ☐ Promote rainwater harvesting rebates and demonstrations.
- ☐ Promote and facilitate Padre Dam MWD's Advanced Water Purification (AWP) project.

5.2: Exceed SB X7-7	
GHG Reduction Potential (2020)	22 MT CO_2e[23]
GHG Reduction Potential (2030)	24 MT CO_2e
GHG Reduction Potential (2035)	25 MT CO_2e
kWh Savings (2020)	63,340 kWh[24]
Co-Benefits	

[23] GHG reductions based upon estimated kWh savings calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 4.1, Water Supply.

[24] kWh savings based upon ten percent of non-municipal new development including gray water systems and connecting to recycled water systems.

Advanced Goals and Measures

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

MEASURE 6.1: TREE PLANTING FOR SHADING AND ENERGY EFFICIENCY

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

ACTIONS

- ☐ Within one year of plan adoption, propose a change to landscaping ordinance to require more trees on site during project review and plan check.
- ☐ Work with community to develop a tree-planting group.
- ☐ Develop a City tree-planting program consistent with the urban forestry management plan (Measure 5.1) and partner with other agencies and groups to plant additional trees. Assumes tree planting in parking lots and along streets will shade 14 percent of pavement during the summer months resulting in a reduction of 330 $MTCO_2e$ by 2020, 20 percent shade resulting in 352 $MTCO_2e$ by 2030, and 23 percent shade resulting in 363 $MTCO_2e$ by 2035.

6.1: Tree Planting for Shading and Energy Efficiency	
GHG Reduction Potential (2020)	330 MT CO_2e[25]
GHG Reduction Potential (2030)	352 MT CO_2e
GHG Reduction Potential (2035)	363 MT CO_2e
kWh Savings (2020)	934,322 kWh[26]

[25] GHG reductions based upon kWh savings calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 7.1, Vegetation.

Co-Benefits

MEASURE 6.2: LIGHT-REFLECTING SURFACES FOR ENERGY EFFICIENCY

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

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

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

ACTIONS

- ☐ Present to City Council for consideration an ordinance requiring or incentivizing enhanced cool roofs on commercial, residential, and municipal buildings. Assumes new cool roof installation will result in 4 $MTCO_2e$ reductions in 2020, 2030, and 2035.
- ☐ Present to City Council for consideration an ordinance requiring or incentivizing cool pavements for commercial, residential, and municipal uses.

6.2: Promote, Incentivize, or Require Light-Reflecting Surfaces

[26] kWh savings based upon an assumed 2.5 percent reduction in cooling load for buildings resulting from reduced urban heat island effect. United States Environmental Protection Agency (EPA) Using Trees and Vegetation to Reduce Heat Islands. https://www.epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands. Accessed August 2018.

GHG Reduction Potential (2020)	4 MT CO_2e[27]
GHG Reduction Potential (2030)	4 MT CO_2e
GHG Reduction Potential (2035)	4 MT CO_2e
kWh Savings (2020)	11,343 kWh
Co-Benefits	

[27] GHG reductions and kWh savings calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 10.1, General Plans.

MEASURE 6.3: CARBON SEQUESTRATION THROUGH PRESERVATION OF NATURAL LANDS

The 2017 Scoping Plan Update provides that keeping natural and working lands intact and at high levels of ecological function (including resilient carbon sequestration) is necessary for the well-being and security of Californians in 2030 and beyond. Natural and working lands are identified as a key sector in the State's climate change strategy. Storing carbon in trees, other vegetation, soils, and aquatic sediment is an effective way to remove carbon dioxide from the atmosphere. The City recognizes that preserving natural lands and enhancing natural habits can help to minimize the net GHG emissions. Through Measure 6.3, the City will work to preserve and enhance existing natural and working lands within the City that already contribute to carbon sequestration.

ACTIONS

- ☐ Adopt policies that encourage management practices known to enhance carbon sequestration on Natural and Working Lands.
- ☐ Adopt plans to conserve lands, water, and other natural features and resources for habitat function, watershed protection, air and water quality protection, and other ecosystem services.

6.3: Carbon Sequestration through Preservation of Natural Lands	
GHG Reduction Potential (2020)	Supporting Measure
Co-Benefits	

Transportation

Goal 7: Decrease GHG Emissions through Reducing Vehicle Miles Traveled

MEASURE 7.1: NON-MOTORIZED TRANSPORTATION OPTIONS

Non-motorized transportation includes walking and bicycling, and variants such as small-wheeled transport such as skates, skateboards, push scooters and hand carts, and wheelchair travel. These modes provide both recreation and transportation, and can help reduce vehicle miles traveled (VMT) by changing people's everyday transportation habits.

The City of Santee Mobility Element was updated in October 2017, and includes a goal of "a balanced, interconnected multimodal transportation network that allows for the efficient and safe movement of all people and goods, and that supports the current and future needs of Santee community members and travel generated by planned land uses." The objectives included in the updated element will support the Sustainable Santee Plan's measure of encouraging mode shift in the City. Such objectives include implementation of AB 1358, the Complete Streets Act, which supports a balanced, multimodal transportation network. Additionally, the element includes objectives to increase the use of public transit, to develop and maintain accessible and safe pedestrian systems that encourage walking, and to remain active in regional transportation coordination, such as the expansion of the San Diego Trolley system.

ACTIONS

- ☐ Work with SANDAG and community to remove barriers to alternative transportation.
- ☐ Create a "Bike to work day" or "car free zone day" and other sponsored events to promote biking and other non-motorized transportation.
- ☐ Create additional active transportation routes from Santee Light Rail Transit station to surrounding residential areas as identified in Mobility Policies 1.1 through 10.1.
- ☐ Change Zoning Ordinances to re-evaluate parking requirement in areas served by transit which will implement Mobility Policy 5.3. This action and active transportation routes between the light rail station and surrounding residential areas shown in the action above results in a reduction of 438 MT CO_2e by 2020, another 395 MT CO_2e by 2030, and an additional 373 MT CO_2e by 2035.

7.1: Non-Motorized Transportation Options

GHG Reduction Potential (2020)	438 MT CO_2e[28]
GHG Reduction Potential (2030)	395 MT CO_2e
GHG Reduction Potential (2035)	373 MT CO_2e
VMT reduction (2020)	1,052,531 miles
Co-Benefits	

[28] GHG and VMT reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.3, Parking Policy/Pricing and Section 3.5 Transit System Improvements.

MEASURE 7.2: IMPLEMENT BICYCLE MASTER PLAN TO EXPAND BIKE ROUTES AROUND THE CITY

Bicycle-friendly roads are crucial to promote bicycle use as a transportation method. People tend to choose to bicycle if bike routes are available to separate them from motor vehicles and their safety can be ensured. Thus, implementing the existing City of Santee Bicycle Master Plan (2009) and constructing more bike routes would encourage more bicycle rides and help to reduce VMT. The updated City Mobility Element also includes an objective to develop, maintain, and support a safe, comprehensive and integrated bikeway system that encourages bicycling, as documented in the City's Bicycle Master Plan.

ACTION

☐ Expand bike routes to improve bike transit by increasing Class 1 Bike Paths from 2.0 miles to 15.5 miles; Class 2 Bike Lanes from 14.5 miles to 34.3 miles; and Class 3 Bike Routes from 9.3 miles to 21.7 miles, which would implement the City of Santee Bicycle Master Plan. This measure assumes that approximately two percent of local short distance vehicle trips would be reduced resulting in a reduction of 3,286 MT CO_2e by 2020, another 2,962 MT CO_2e by 2030, and an additional 2,800 MT CO_2e by 2035.

☐

7.2: Implement Bicycle Master Plan to Expand Bike Routes around City	
GHG Reduction Potential (2020)	~~14,788~~3,286 MT CO_2e[29]
GHG Reduction Potential (2030)	~~13,329~~2,962 MT CO_2e

[29] GHG and VMT reductions calculated using ~~CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.2, Neighborhood / Site Enhancements.~~Software User's Guide, URBEMIS2002 for Windows, Appendix D, URBEMIS2007 Mobile Source Mitigation Component, Jones & Stokes Associated, November 2007.

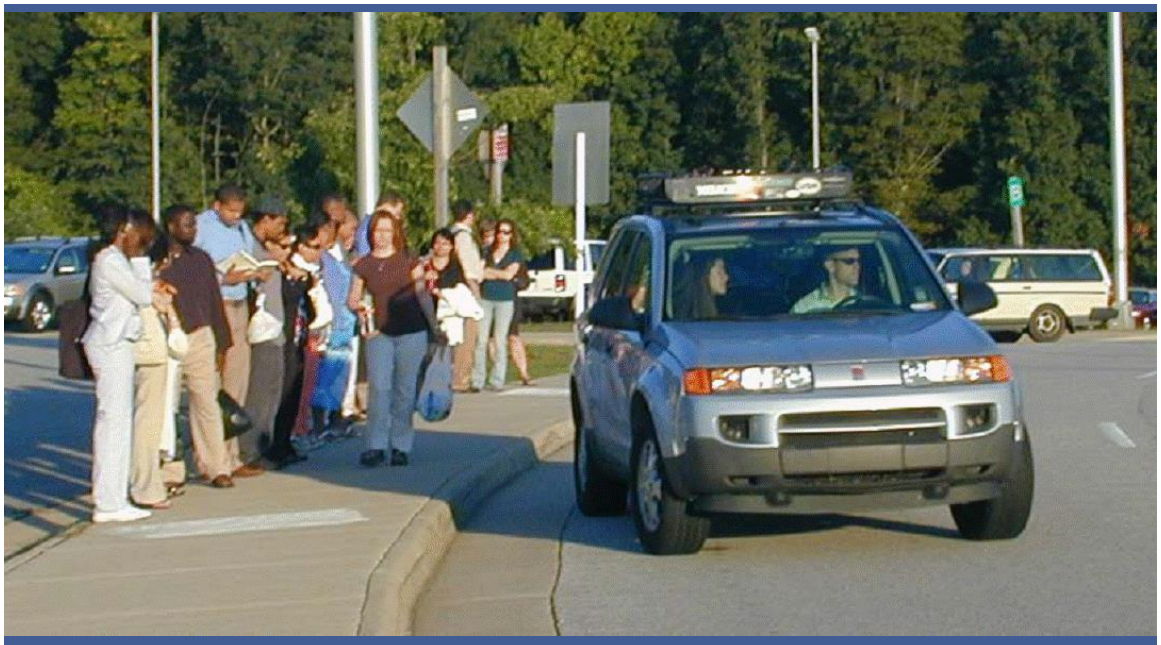
GHG Reduction Potential (2035)	~~12,600~~2,800 MT CO_2e
VMT reduction (2020)	~~35,522,934~~7,893,985 miles
Co-Benefits	

MEASURE 7.3: RIDE SHARING PROGRAMS WITHIN BUSINESSES

The local carpooling rate is as low as 3 percent for the City, and most people drive alone for work every day. A higher ridesharing rate means fewer VMT and GHG emissions, so encouraging carpool by providing incentive programs and necessary facilities can be helpful. The updated Mobility Element Objective 9.0, Transportation Demand Management aims to increase the use of alternative modes of travel to reduce peak-hour vehicular trips, to save energy, and to improve air quality. The policies include providing and encouraging Ride Sharing, Park 'n Ride, and other commuter programs.

ACTIONS

- ☐ Promote ridesharing and facilitate air district incentives for ride sharing through Mobility Element Objective 9.0.
- ☐ Require existing and new businesses of a certain size (200 employees or more) to provide a Transportation Management Plan that details rideshare and active transportation goals and provide active transportation facilities (e.g., bike racks near building entrance, showers in offices). This action will reduce approximately 47,469,165 VMT resulting in a reduction of 19,761 MT CO_2e by 2020, an additional 17,282 MT CO_2e by 2030, and another 16,838 MT CO_2e by 2035.



7.3: Ride Sharing Programs within Businesses	
GHG Reduction Potential (2020)	19,761 MT CO_2e[30]
GHG Reduction Potential (2030)	17,~~812~~ 282 MT CO_2e
GHG Reduction Potential (2035)	16,838 MT CO_2e

[30] GHG and VMT reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.3, Commute Trip Reduction Programs.

VMT reduction (2020)	47,469,165 miles
Co-Benefits	

MEASURE 7.4: ELECTRIFY THE FLEET

Hybrid electric vehicles, plug-in hybrid electric vehicles, and all-electric vehicles (EVs) typically produce lower emissions than conventional vehicles. Any type of electrified vehicle emits less GHG than conventional vehicles by least nearly 40 percent. However, more than 95 percent of people still drive conventional gasoline or diesel vehicles, so programs to encourage use of alternative fuel vehicles are highly needed. With the Statewide EV ownership goal and the implementation of this measure, it was calculated that EV ownership would reach 13 percent by 2035.

ACTIONS

- ☐ Promote incentive programs at outreach meetings.
- ☐ Promote neighborhood electric vehicles.
- ☐ Apply for grants to install e-chargers at public facilities.
- ☐ Work with community groups, other public agencies and business to identify priority areas and install ~~e-~~EV ~~chargers~~charging stations.
- ☐ ~~Require or incentive new residential and commercial development to install e-chargers.~~Within two years of plan adoption, staff will present an ordinance for City Council consideration that would require the installation of EV charging stations in new commercial, industrial and residential development. This action would provide a modest reduction of 3,341 MT CO_2e by 2020, an additional 21,723 MT CO_2e by 2035 as electric vehicles become more common, and 47,414 MT CO_2e by 2035.

7.4: Electrify the Fleet	
GHG Reduction Potential (2020)	3,341 MT CO_2e[31]
GHG Reduction Potential (2030)	21,723 MT CO_2e

[31] GHG and VMT reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.7 Vehicles, based upon historical trends of electric vehicle (EV) ownership (2010-2017) for 2020 EV ownership and California Air Resources Board (ARB) 2018 Zero Emissions Vehicle Action Plan Priorities Update to calculate 2035 electric vehicle ownership. Website: http://business.ca.gov/Portals/0/ZEV/2018-ZEV-Action-Plan-Priorities-Update.pdf. Accessed January 7, 2019.

GHG Reduction Potential (2035)	47,414 MT CO_2e
VMT reduction (2020)	8,025,552 miles
Co-Benefits	

MEASURE 7.5: COMPLETE STREETS AND SAFE ROUTES TO SCHOOLS PROGRAMS

Complete streets provide sidewalks and bicycle lanes on both sides of the street, and the roadway design at intersections and crossings ensures safety for people walking and bicycling. Safe routes to schools incentivize more children to walk or bike to school, instead of families driving private vehicles to take their children to school. Both programs would enhance walkability in the City and make the City more bicycle-friendly. By encouraging more people to walk and bike rather than drive, these programs could help reduce VMT.

ACTIONS

- ☐ Within two years of SSP adoption, the City shall i~~t~~mplement the complete streets program ~~through~~of Mobility Element Objective 1.0, ~~Complete Streets~~by adopting the Active Santee Plan .
- ☐ Establish a safe routes to schools program by providing routes along sidewalks within the City connecting surrounding residential uses with schools. This action in combination with the complete streets program listed above results in 5,477 MT CO_2e by 2020, 4,937 MT CO_2e by 2030 and 4,677 MT CO_2e by 2035.
- ☐ Create a vibrant town center by developing a connected system of multi-modal corridors that encourage people to drive less and walk and bicycle more through Mobility Element Policy 1.4.

7.5: Complete Streets and Safe Routes to Schools Programs

GHG Reduction Potential (2020)	5,477 MT CO_2e[32]
GHG Reduction Potential (2030)	4,937 MT CO_2e
GHG Reduction Potential (2035)	4,677 MT CO_2e
VMT reduction (2020)	13,156,642 miles
Co-Benefits	

[32] GHG and VMT reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.2 Neighborhood / Site Enhancements.

MEASURE 7.6: REDUCE VEHICLE TRIPS TO/FROM SCHOOL

School-based VMT comprises approximately 20 percent of the City's total VMT. The Santee School District offers school bus services free of charge. This effort could greatly reduce school-based trips using private vehicles. By expanding the school bus program and encouraging more families to use the services, the school bus program could not only contribute to VMT reduction, but also provide safe and convenient services to families with children.

ACTION

- ☐ Coordinate with the School District to expand the school bus program within new development in the City and encourage more families to use school bus services. Currently, the School District extends bus service to accommodate children living in excess of 2 miles from a school. It is assumed that this practice would continue through 2035 resulting in a reduction of 16,431 MT CO_2e by 2020, an additional 14,811 MT CO_2e, and 14,000 MT CO_2e by 2035.

- ☐ ~~Expand the school bus program and encourage more families to use school bus services~~.
- ☐ Promote the use of electronic applications to foster carpooling (supporting action) [33]

7.6: Reduce Vehicle Trips to School

GHG Reduction Potential (2020)	16,431 MT CO_2e[34]

[33] https://www.carpooltoschool.com or similar applications. This is a supporting action and no GHG or VMT reductions are taken as part of this plan.

[34] GHG and VMT reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.4, Commute Trip Reduction Programs.

GHG Reduction Potential (2030)	14,811 MT CO_2e
GHG Reduction Potential (2035)	14,000 MT CO_2e
VMT reduction (2020)	39,469,927 miles
Co-Benefits	

Solid Waste

Goal 8: Decrease GHG Emissions through Reducing Solid Waste Generation

MEASURE 8.1: REDUCE WASTE TO LANDFILLS

According to 2008 Statewide Waste Characterization data, the commercial sector generates nearly 75 percent of the solid waste in California. Furthermore, much of the commercial sector waste disposed in landfills is readily recyclable. Increasing the recovery of recyclable materials will directly reduce GHG emissions. In particular, recycled materials can reduce the GHG emissions from multiple phases of product production, including extraction of raw materials, preprocessing, and manufacturing. As described under the Regulatory Setting in Chapter 1, the Mandatory Commercial Recycling Measure was adopted in 2012 and is designed to achieve a reduction in GHG emissions of 5 million MT CO_2e. To achieve the measure's objective, an additional 11 percent of solid waste will need to be recycled from the commercial sector by 2020 and beyond. The City has also created a 90-percent diversion goal by 2035. The actions below are necessary to help the City achieve both its 2020 and 2035 goals. These goals will continue to progress the City towards zero waste. CalRecyle defines zero waste as "a process and a philosophy that involves a redesign of products and consumption, so that all material goods can be reused or recycled—or not needed at all."[35]

ACTIONS

- ☐ Outreach to community to promote waste recycling and diversion.
- ☐ ~~Add additional recycling containers in public places~~Within two years of adoption of the SSP, staff will present an ordinance for City Council consideration that contains specific measures to reduce, reuse, and recycle solid material to achieve a 90% diversion of commercial waste by 2035.
- ☐ Require the solid waste collector to provide recycling containers for all customers in compliance with State law and facilitate waste diversion requirements mandated on solid waste facilities. This action results in 6,250 $MTCO_2e$ reductions by 2020, 7,903 $MTCO_2e$ by 2030, and 7,071 $MTCO_2e$ by 2035.

[35] CalRecycle. 2017. "Zero Waste." December 11, 2017. Website: http://www.calrecycle.ca.gov/ZeroWaste/ (accessed December 18, 2017).

☐ Increase Construction and Demolition Debris Reduction Requirement by 10 percentage points over the current State requirement up to a maximum of 100%. This action results in 983 MT CO_2e by 2020, 1,071 MT CO_2e by 2030, and 1,167 MT CO_2e by 2035.

Note: Current State requirement is 65%. We would initially increase this to 75%.

☐ Encourage joint projects between the solid waste collector and Padre Dam Municipal Water District designed to reduce the stream of solid waste going to the landfill.

8.1: Reduce Waste to Landfills	
GHG Reduction Potential (2020)	7,233 MT CO_2e[36]
GHG Reduction Potential (2030)	8,974 MT CO_2e
GHG Reduction Potential (2035)	8,238 MT CO_2e
Co-Benefits	

[36] GHG reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 6.1, Solid Waste and City of San Diego Environmental Services Recycling Programs. Website: https://www.sandiego.gov/environmental-services/recycling/residential/consumer. Accessed January 14, 2019.

Clean Energy

Goal 9: Decrease GHG Emissions through Increasing Clean Energy Use

MEASURE 9.1: CLEAN ENERGY

Clean energy includes energy efficiency and clean energy supply options such as highly efficient combined heat and power as well as renewable energy sources. By identifying, designing, and implementing clean energy measures and technology solutions, the City is delivering important environmental and economic benefits, including a reduction in GHG emissions.

ACTION

☐ Outreach to the community to promote incentives such as the California Solar Initiative.

9.1: Promote Clean Energy	
GHG Reduction Potential (2020)	Supporting Measure
Co-Benefits	

MEASURE 9.2: COMMUNITY CHOICE AGGREGATION PROGRAM

Besides outreach, the City is also actively seeking opportunities to join the ~~regional~~ Community Choice Aggregation (CCA) program, which would allow the City's energy users to choose an alternative option to SDG&E and use more renewable energy. The ongoing CCA programs have renewable energy percentages between 20 and 100, and the national opt-out rates for the program range from 3 percent to 5 percent. Because electricity accounts for ~~54~~ 31 percent of the City's baseline emission inventory, participation in a regional CCA district could provide ~~a significant~~an important source of future emission reductions.

Assembly Bill 117 (2002) allows California cities and counties to either individually or collectively supply electricity to customers within their borders through the establishment of a CCA. The advantages of regional CCAs that include participation from multiple local jurisdictions would be the creation of efficiencies. The City will seek opportunities for collaboration with other local jurisdictions to develop and implement a CCA that would produce mutually beneficial results. Developing a CCA would require a detailed analysis of energy demand, efficiency opportunities, and available clean electricity sources for purchase.

If the City implements a CCA program, there would be an additional 38,701 MT CO_2e reduced by 2020, 46,322 MT CO_2e reduced by 2030, and 50,132 MT CO_2e reduced by 2035. However, due to the fact that implementation of a CCA program would require preparation time for carrying out studies, forming governing bodies, and carrying out other administrative tasks, to provide a conservative estimate, energy savings and GHG reductions from CCA are listed separately from the total quantification of other local reduction measures.

ACTION

Present to City Council for consideration a Community Choice Aggregation program that aims to provide 100 percent renewable energy by 2035.[37] [38]

9.2: Community Choice Aggregation Program	
GHG Reduction Potential (2020)	38,701 MT CO_2e[39]
GHG Reduction Potential (2030)	46,322 MT CO_2e
GHG Reduction Potential (2035)	50,132 MT CO_2e
Co-Benefits	

[37] Rather than assuming attainment of 100% clean energy, the City used the historical average of 70% clean energy for CCAs with similar goals. The actual percentage for the reduction measure could vary and may exceed this conservative assumption.
[38] The City used a conservative "opt out" rate of 5% which is at the upper range discussed above.
[39] GHG reductions calculated using historical data on CCAs in California accessed at LeanEnergy.org. Website: http://leanenergyus.org/cca-by-state/california/. Accessed on January 14, 2019.

CEQA Screening Tables

Goal 10: Decrease GHG Emissions from New Development through Performance Standards

MEASURE 10.1: SCREENING TABLES

City planners have a unique opportunity to provide developers a flexible way of demonstrating GHG reductions within new development by providing screening tables for developers to fill out during applications of new development projects. Screening tables are a menu of options of energy efficiency improvements, renewable energy options, water conservation measures, and other options that provide predictable GHG reductions. Each option within the Screening tables includes point values based upon the GHG reduction that option would provide to a development project. Developers that choose options from the screening tables totaling 100 points or more will be determined to have provided a fair-share contribution of GHG reductions, and therefore, are considered consistent with the Sustainable Santee Action Plan. This determination of consistency can be used in a CEQA climate change analysis of the development, which provides a legally defensible and streamlined CEQA process for the project. Appendix C details screening tables for the City and is the source for GHG reductions specified below.

ACTIONS

- ☐ Educate City staff, developers, etc., on how the screening tables work and advantages in using the screening tables.
- ☐ Include screening tables in submittal packages for development projects and have developers select their choices of reduction measures within the screening tables to include in as a project's conditions of approval. This action assumes developers would achieve 100 points for new development resulting in 393 MT CO_2e by 2020, 1,003 MT CO_2e by 2030, and 1,308 MT CO_2e by 2035.
- ☐ Establish online permitting to facilitate upgrades.

10.1: Screening Tables	
GHG Reduction Potential (2020)	393 MT CO_2e
GHG Reduction Potential (2030)	1,003 MT CO_2e
GHG Reduction Potential (2035)	1,308 MT CO_2e

Co-Benefits	

MUNICIPAL MEASURES

City operations make up a small percentage of the total communitywide GHG emissions, and therefore, the majority of the GHG reductions would result from the measures that are applied to the communitywide energy usage. Nevertheless, the City can set an example for its residents by improving the energy efficiency and reducing GHG emissions at its own facilities. This section summarizes the proposed reduction measures to be implemented by the City to further reduce its GHG emissions associated with energy consumption, water use, and transportation.

Goal M-1: Participate in Education, Outreach, and Planning Efforts for Energy Efficiency

MEASURE M-1.1 INCREASE ENERGY SAVINGS THROUGH THE SDG&E ENERGY EFFICIENCY PARTNERSHIP

The SDG&E Energy Efficiency Partnership Program is a framework that offers enhanced rebates and incentives to cities that achieve measurable energy savings, reduce peak-time electricity demand and plan for energy efficiency. The program has a tiered incentive structure with threshold criteria required to trigger advancement to the next level of participation.

M-1.1: Increase Energy Savings through the SDG&E Energy Efficiency Partnership	
GHG Reduction Potential	Supporting Measure
Co-Benefits	

Goal M-2: Increase Energy Efficiency in Municipal Buildings

MEASURE M-2.1: CONDUCT MUNICIPAL ENERGY AUDIT

Knowledge of building energy use is an effective way to determine energy inefficiencies and opportunities for retrofits and upgrades. Energy audits provide an improved understanding of energy use, reveal energy inefficiencies of the building or building energy appliances, and offer recommendations on how to improve or correct the energy inefficiencies through retrofits or upgrades. Therefore, energy audits should be conducted on a routine basis.

M-2.1: Conduct Municipal Energy Audits	
GHG Reduction Potential	Supporting Measure
Co-Benefits	

MEASURE M-2.2: PROCUREMENT POLICY FOR ENERGY-EFFICIENT EQUIPMENT

Energy efficient procurement policies can reduce government facility energy costs by about 5 to 10 percent.[40] As municipal appliances wear out, the City would replace them with Energy Star or energy efficient equipment. Energy Star offers an appliance calculator to estimate money and energy saved by purchasing its products.

M-2.2: Procurement Policy for Energy Efficient Equipment	
GHG Reduction Potential (2020)	19 MT CO_2e[41]
GHG Reduction Potential (2030)	19 MT CO_2e
GHG Reduction Potential (2035)	19 MT CO_2e
kWh Savings (2020)	48,450 kWh
Co-Benefits	

[40] Lawrence Berkeley National Laboratory, *Potential Energy, Cost, and CO_2 Saving from Energy-Efficient Government Purchasing*, 2002.

[41] GHG reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 2.1, Building Energy Use.

MEASURE M-2.3: INSTALL COOL ROOFS

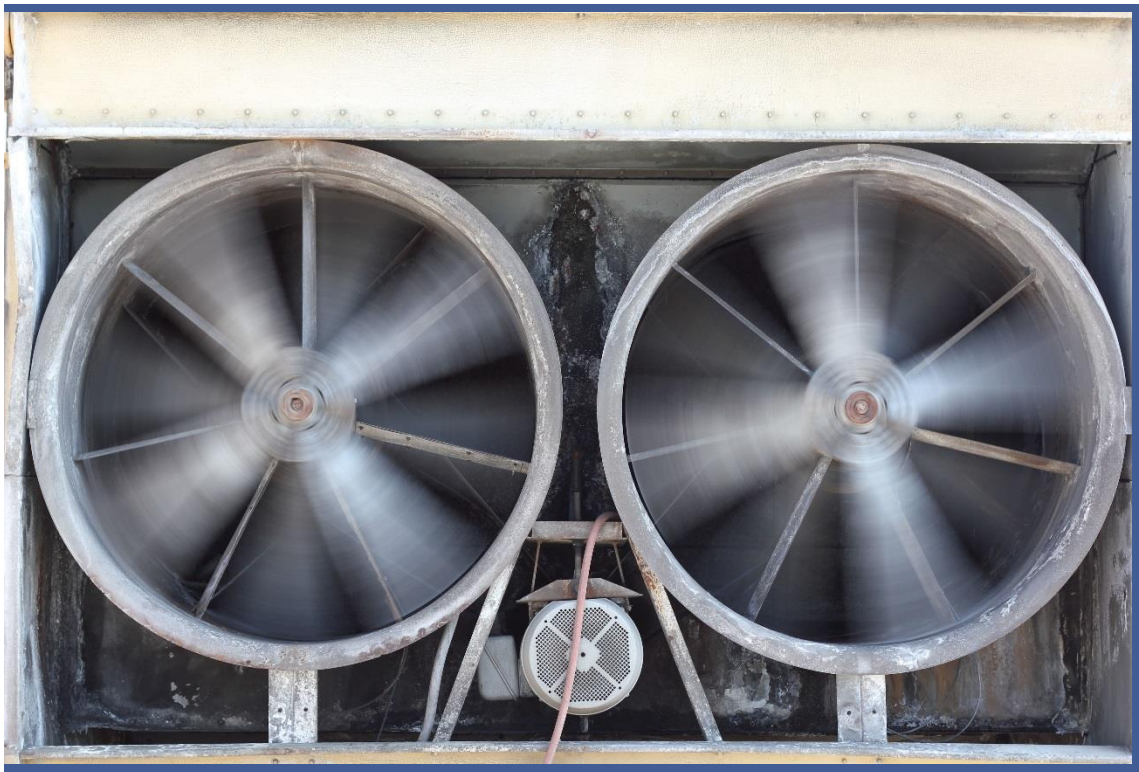
Surfaces with low albedo, or solar reflectance, amplify the urban heat island effect. Many surfaces in an urban environment consist of buildings' roofs. Roofs affect not only the temperature of the surrounding urban environment, but also the building's interior temperature. Upgrading roofs to materials with high albedo can reduce outdoor and indoor temperatures, thereby also reducing energy demand for air conditioning. Replacing a 1,000-square-foot dark roof with a white roof can offset approximately 10 MT CO_2e.

M-2.3: Install Cool Roofs	
Rate of GHG Reduction Potential	10 MT CO_2e per 1,000 sq. ft.[42]
Rate of Estimated Energy Savings in 2020	Tracking Data
Rate of Estimated Energy Savings in 2030	Tracking Data
Rate of Estimated Energy Savings in 2035	Tracking Data.
Co-Benefits	

[42] GHG reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 10.1, General Plans.

MEASURE M-2.4: RETROFIT HVAC AND WATER PUMPING EQUIPMENT

The City could upgrade its heating, ventilation, and air conditioning (HVAC) systems to save energy. HVAC units, especially air conditioners, are large energy consumers. Applicable retrofits include converting central forced air conditioners into smart multi-zone systems and replacing inefficient HVAC equipment. The City has upgraded its HVAC system at City Hall, and will extend upgrades to other government buildings.



M-2.4: Retrofit HVAC and Water Pumping Equipment	
GHG Reduction Potential (2020)	12 MT CO_2e[43]
GHG Reduction Potential (2030)	12 MT CO_2e
GHG Reduction Potential (2035)	12 MT CO_2e
kWh Savings (2020)	33,734 kWh
Co-Benefits	

[43] GHG reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 2.1 Building Energy Use.

Goal M-3: Increase Energy Efficiency in Community Buildings and Infrastructure

MEASURE M-3.1: TRAFFIC SIGNAL AND OUTDOOR LIGHTING RETROFITS

Up to 2011, the City has replaced almost 1,000 City-owned streetlights with more energy-efficient lighting. An upgrade of all 1,986 City-owned streetlights is ongoing. Other outdoor lights (e.g. traffic signals, park lighting, etc.) can or will also be retrofitted.

M-3.1: Traffic Signal and Outdoor Lighting Retrofits	
GHG Reduction Potential (2020)	212 MT CO_2e[44]
GHG reduction Potential (2030)	351 MT CO_2e
GHG Reduction Potential (2035)	421 MT CO_2e
kWh Savings (2020)	600,000 kWh
Co-Benefits	

[44] GHG reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 2.2, Lighting.

MEASURE M-3.2: UPGRADE OR INCORPORATE WATER-CONSERVING LANDSCAPE

The City can reduce water consumption and associated energy use by converting traditional landscaping to water-conserving landscaping. An average acre of lawn in the United States uses about 652,000 gallons of water per year.

M-3.2: Upgrade or Incorporate Water-Conserving Landscape	
GHG Reduction Potential	Supporting Measure
Co-Benefits	

MEASURE M-3.3: PLANT TREES FOR SHADE AND CARBON SEQUESTRATION

Trees and vegetation naturally help cool an environment by providing shade and evapotranspiration (the movement of water from the soil and plants to the air) and reduce GHG emissions by sequestering CO_2. Trees planted near pavement can reduce surface temperatures of streets and parking lots, and trees planted strategically near windows or roofs of buildings can effectively reduce interior temperatures. The City could plant trees in City-owned spaces to reduce urban heat island effect and building energy use and increase carbon sequestration.

M-3.3: Plant Trees for Shade and Carbon Sequestration	
GHG Reduction Potential (2020)	Supporting measure
Co-Benefits	

Goal M-4: On-Road Energy Efficiency Enhancements; Employee Commute and Vehicle Fleet

MEASURE M-4.1: ENCOURAGE OR INCENTIVIZE EMPLOYEE CARPOOLS

The carpooling rate is as low as 3 percent for government employees of the City, and most people drive alone for work every day. Higher carpooling rates mean fewer VMT and GHG emissions, so encouraging carpooling by providing incentive and informational programs and necessary facilities such as preferred parking can be helpful.

ACTION

☐ City will develop an informational campaign to facilitate the development of car or van pools among employees.

M-4.1: Encourage or Incentivize Employee Carpools	
GHG Reduction Potential (2020)	6 MT CO_2e[45]
GHG Reduction Potential (2030)	11 MT CO_2e
GHG Reduction Potential (2035)	14 MT CO_2e
VMT Savings (2020)	16,544 miles
Co-Benefits	

[45] GHG reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.4, Commute Trip Reduction Programs.

MEASURE M-4.2: ENCOURAGE OR INCENTIVIZE PURCHASE OF HYBRID OR ELECTRIC VEHICLES

According to the employee commute survey, over 95 percent of government employees drive conventional gasoline or diesel vehicles, and only 1.5 percent of them plan to purchase an alternative fuel vehicle in the next year. Encouraging those employees to switch to any type of electrified vehicle would help reduce GHG by at least nearly 40 percent compared to conventional vehicles. The City will encourage employees to participate in the SDG&E and California Electric Vehicle (EV) incentive programs that provide rebates for the purchase of EVs.

ACTION

☐ City to develop non-monetized incentives for the purchase or use Hybrid or Electric Vehicles by City employees.

M-4.2: Encourage or Incentivize Purchase of Hybrid or Electric Vehicles	
GHG Reduction Potential (2020)	5 MT CO_2e
GHG Reduction Potential (2030)	9 MT CO_2e
GHG Reduction Potential (2035)	11 MT CO_2e
VMT Equivalent[46] Savings (2020)	13,188 miles
Co-Benefits	

[46] Hybrid vehicles are expected to reduce fuel usage by 50 percent, which is equal to reducing VMT by 50 percent.

MEASURE M-4.3: REPLACE OR SUPPLEMENT VEHICLE FLEET WITH HYBRID/ELECTRIC VEHICLES

The City's vehicle fleet results in more than 20 percent of total municipal GHG emissions. As hybrid or electric vehicles emit far less GHG than conventional cars, encouraging the replacement of the conventional vehicle fleet can help reduce the City's municipal GHG emissions greatly.

ACTION

☐ Within one year of the plan's adoption, staff will present for City Council consideration a resolution committing to the phased replacement of all non-emergency, non-construction, and non-all-terrain vehicles with electric vehicles.

M-4.3: Replace or Supplement Vehicle Fleet with Hybrid/Electric Vehicles	
GHG Reduction Potential (2020)	7 MT CO_2e[47]
GHG Reduction Potential (2030)	13 MT CO_2e
GHG Reduction Potential (2035)	16 MT CO_2e
VMT Equivalent[48] Savings (2020)	19,268 miles
Co-Benefits	

[47] GHG reductions calculated using CAPCOA Quantifying GHG Mitigation Measures (CAPCOA 2010), Section 3.7, Vehicles.

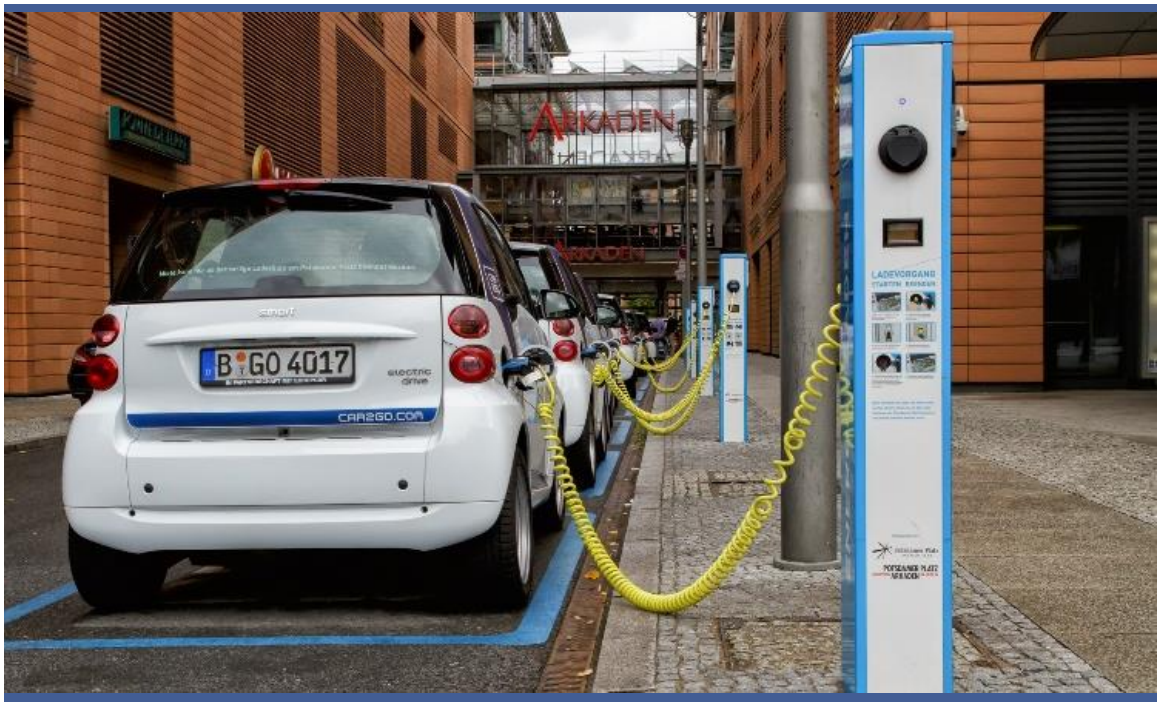
[48] Hybrid vehicles are expected to reduce fuel usage by 50 percent, which is equal to reducing VMT by 50 percent.

MEASURE M-4.4: INSTALL E-VEHICLE CHARGERS

More e-vehicle chargers become an incentive for employees to purchase an alternative fuel vehicle and to replace the conventional vehicle fleet with e-vehicles. The city can reduce GHG emissions indirectly through this measure.

ACTION

☐ Within two years of plan adoption the City will develop and implement a plan for the placement of EV charging stations on City property.



M-4.4: Install E-Vehicle Chargers	
GHG Reduction Potential (2020)	Supporting Measure
VMT Savings (2020)	
Co-Benefits	

Goal M-5: Reduce Energy Consumption in the Long Term

MEASURE M-5.1: ONGOING ACTIONS AND PROJECTED REDUCTIONS

Based on completed and planned GHG reduction projects between 2013 and 2020 that are listed and quantified above, the City expects to reduce GHG emissions by approximately 34 MT CO_2e annually. Assuming the City continues to achieve these annual reductions by continuing to implement committed measures and programs, it is projected that that the City could reduce energy related emissions by an additional 558 MT CO_2e below the baseline level by 2035.

M-5.1: Ongoing Actions and Projected Reductions	
GHG Reduction Potential (2020)	----
GHG Reduction Potential (2030)	372MT CO_2e
GHG Reduction Potential (2035)	558 MT CO_2e
Co-Benefits	

SUMMARY OF REDUCTIONS

By implementing the Statewide and local reduction measures described above, the City would reduce its community-wide GHG emissions by 40 percent compared to the 2020 BAU emissions. Statewide measures reduce the City's GHG emissions by 19 percent and the local measures reduce it an additional 21 percent. TABLE 10 and TABLE 11 summarize the strategies and the potential GHG reductions for community and municipal operations, respectively.

Field Co

TABLE 10 **Summary of Community GHG Reduction Strategies and Emission Reductions**

Goals and Measures	2020 Emission Reductions ($MT CO_2e$)	2030 Emission Reductions ($MT CO_2e$)	2035 Emission Reductions ($MT CO_2e$)
Goal 1: Increase Energy Efficiency in Existing Residential Units			
1.1: Energy Efficiency Education and Best Practices	Supporting Measure		
1.2: Increase Community Participation in Existing Energy Efficiency Opportunities	45	45	45
1.3: Home Energy Evaluations	Supporting Measure		
1.4: Residential Home Energy Renovations	7,811	7,811	7,811
Goal 2: Increase Energy Efficiency in New Residential Units			
2.1: Energy Efficient Homes	5,102	~~13,534~~8.423	17,750
Goal 3: Increase Energy Efficiency in Existing Commercial Units			
3.1: Energy Efficiency Training, Education, and Recognition in the Commercial Sector	Supporting Measure		
3.2: Increase Business Participation in Existing Energy Efficiency Programs	660	660	660
3.3: Non-Residential Energy Audits	Supporting Measure		
3.4: Non-Residential Retrofits	8,010	8,010	8,010
Goal 4: Increase Energy Efficiency in New Commercial Units			
4.1: Energy Efficient Businesses	1,442	8,705	12,337
Goal 5: Increase Energy Efficiency through Water Efficiency			
5.1: Water Efficiency through Enhanced Implementation of SB X7-7	1,279	1,366	1,409
5.2: Exceed Water Efficiency Standards	22	24	25
Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect			
6.1: Tree Planting for Shading and Energy Efficiency	330	352	363
6.2: Light-reflecting Surfaces for Energy Efficiency	4	4	4
6.3: Carbon Sequestration through Preservation of Natural Lands	Supporting Measure		

TABLE 10 (Continued) Summary of Community GHG Reduction Strategies and Emission Reductions

Goals and Measures	2020 Emission Reductions (MT CO_2e)	2030 Emission Reductions (MT CO_2e)	2035 Emission Reductions (MT CO_2e)
Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled			
7.1: Non-Motorized Transportation Options	438	395	373
7.2: Implement Bicycle Master Plan to Expand Bike Routes around the City	~~14,788~~3,286	~~13,329~~2,962	~~12,600~~2,800
7.3: Ride Sharing Programs within Businesses	19,761	17,~~812~~282	16,838
7.4: Electrify the Fleet	3,341	21,723	47,414
7.5: Complete Streets and Safe Routes to Schools Programs	5,477	4,937	4,667
7.6: Reduce Vehicle Trips To/From School	16,431	14,811	14,000
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation			
8.1: Reduce Waste to Landfills	7,233	~~7,903~~8,974	8,238
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use			
9.1: Clean Energy	Supporting Measure		
9.2: Community Choice Aggregation Program[1]	38,701	46,322	50,132
Goal 10: Decrease GHG Emissions from New Development through Performance Standards			
10.1: Screening Tables	393	1,003	1,308
Total Community Measures			
Total of All Measures Excluding CCA	~~92,569~~81,047	~~133,135~~107,487	~~155,605~~131,462
Total of All Measures Including CCA	~~131,270~~119,748	~~179,456~~153,809	~~203,549~~181,594

[1] CCA is separated from total of other reduction measures.

BAU = Business as Usual

CCA = Community Choice Aggregation

MT CO_2e = metric tons of carbon dioxide equivalent

SB = Senate Bill

TABLE 11 **Summary of Municipal GHG Reduction Strategies and Emission Reductions**

Goal and Measure	2020 Emission Reductions (MT CO_2e)	2030 Emission Reductions (MT CO_2e)	2035 Emission Reductions (MT CO_2e)
Goal M-1: Participate in Education, Outreach, and Planning Efforts for Energy Efficiency			
M-1.1: Increase Energy Savings through the SDG&E Energy Efficiency Partnership	Supporting Measure		
Goal M-2: Increase Energy Efficiency in Municipal Buildings			
M-2.1: Conduct Municipal Energy Audit	Supporting Measure		

M-2.2: Procurement Policy for Energy Efficient Equipment	19	19	19
M-2.3: Install Cool Roofs	Tracking Data		
M-2.4: Retrofit HVAC and Water Pump Equipment	12	12	12
Goal M-3: Increase Energy Efficiency in Community Buildings and Infrastructure			
M-3.1: Traffic Signal and Outdoor Lighting Retrofits	212	351	421
M-3.2: Upgrade or Incorporate Water-Conserving Landscape	Supporting Measure		
M-3.3: Plant Trees for Shade and Carbon Sequestration	Supporting Measure		
Goal M-4: On-Road Energy Efficiency Enhancements; Employee Commute and Vehicle Fleet			
M-4.1: Encourage or Incentivize Employee Carpools	6	11	14
M-4.2: Encourage or Incentivize Purchase of Hybrid or Electric Vehicles	5	9	11
M-4.3: Replace or Supplement Vehicle Fleet with Hybrid/Electric Vehicles	7	13	16
M-4.4: Install E-Vehicle Chargers	Supporting Measure		
Goal M-5: Reduce Energy Consumption in the Long Term			
M-5.1: Ongoing Actions and Projected Reductions	-	372	558
Total Municipal Measures			
Total of all Measures listed above	260	787	1,050

BAU = Business as Usual
MT CO_2e = metric tons of carbon dioxide equivalent
SDG&E = San Diego Gas & Electric

~~TABLE 11 **Summary of Municipal GHG Reduction Strategies and Emission Reductions**~~

~~Goal and Measure~~	~~2020 Emission Reductions (MT CO_2e)~~	~~2035 Emission Reductions (MT CO_2e)~~
~~**Goal M-1: Participate in Education, Outreach, and Planning Efforts for Energy Efficiency**~~		
~~M-1.1: Increase Energy Savings through the SDG&E Energy Efficiency Partnership~~	~~Supporting Measure~~	
~~**Goal M-2: Increase Energy Efficiency in Municipal Buildings**~~		
~~M-2.1: Conduct Municipal Energy Audit~~	~~Supporting Measure~~	
~~M-2.2: Procurement Policy for Energy Efficient Equipment~~	~~19~~	~~19~~
~~M-2.3: Install Cool Roofs~~	~~Tracking Data~~	
~~M-2.4: Retrofit HVAC and Water Pump Equipment~~	~~12~~	~~12~~
~~**Goal M-3: Increase Energy Efficiency in Community Buildings and Infrastructure**~~		
~~M-3.1: Traffic Signal and Outdoor Lighting Retrofits~~	~~212~~	~~421~~
~~M-3.2: Upgrade or Incorporate Water-Conserving Landscape~~	~~Supporting Measure~~	

M-3.3: Plant Trees for Shade and Carbon Sequestration	Supporting Measure	
Goal M-4: On-Road Energy Efficiency Enhancements; Employee Commute and Vehicle Fleet		
M-4.1: Encourage or Incentivize Employee Carpools	6	14
M-4.2: Encourage or Incentivize Purchase of Hybrid or Electric Vehicles	5	11
M-4.3: Replace or Supplement Vehicle Fleet with Hybrid/Electric Vehicles	7	16
M-4.4: Install E-Vehicle Chargers	Supporting Measure	
Goal M-5: Reduce Energy Consumption in the Long Term		
M-5.1: Ongoing Actions and Projected Reductions	-	558
Total Municipal Measures		
Total of all Measures listed above	260	1,050

BAU = Business as Usual
MT CO_2e = metric tons of carbon dioxide equivalent
SDG&E = San Diego Gas & Electric

COMPARISON OF REDUCTIONS TO TARGETS

TABLE 12, TABLE 13, FIGURE 12 AND FIGURE 13 summarize the baseline 2005 community and municipal emissions, the projected 2020, 30302030, and 2035 emission inventory, as well as the reduced 2020, 2030, and 2035 inventories after implementation of the reduction measures for community and municipal operations, respectively.

By 2020, without implementation of the CCA program, the Statewide and local measures together would reduce the City's community GHG emissions from the 2020 BAU level to 259,537271,041 MT CO_2e, which exceeds the 15 percent below 2005 levels reduction target of 288,976 MT CO_2e for 2020. Implementation of CCA would provide an additional 38,701 in MT CO_2e reductions. In 2030, without the CCA, implementation of Statewide and local measures together would reduce emissions from the 2030 BAU level to 206,379230,983 MT CO_2e, which exceeds the 40 percent below 2005 levels reduction target of 249,596203,983 MT CO_2e for 2030. Implementation of the CCA would provide an additional 46,322 MT CO_2e in reductions to help the City meet this target. In 2035, without the CCA, implementation of Statewide and local measures together would reduce emissions from the 2035 BAU level to 183,125205,081 MT CO_2e, which would not meet the 49 percent below 2005 levels reduction target of 173,386 MT CO_2e for 2035. Implementation of the CCA would provide an additional 50,132 in MT CO_2e reductions and help the City meet the target.

TABLE 12 **Community Emissions and Targets Comparison**

	2005 MT CO_2e	2020 MT CO_2e	2030 MT CO_2e	2035 MT CO_2e
BAU Emissions	~~402,574~~339,972	432,982	486,170	515,462
Reduction Target	--	288,976	~~249,596~~203,983	173,386
State and Federal Reductions	--	80,876	146,656	178,919
Local Measures Reductions Excluding CCA	--	~~92,569~~81,056	~~133,135~~107,487	~~155,605~~143,992
Total Adjusted Emissions Without CCA	--	~~259,537~~271,041	~~206,379~~232,027	~~183,125~~192,551
Additional Reductions Needed	--	Target Met	~~Target Met~~28,044	~~9,739~~31,695
CCA Reductions	--	38,701	46,322	50,132
Total Adjusted Emissions With CCA	--	~~220,836~~232,340	~~160,057~~181,195	~~132,993~~142,419
Additional Reductions Needed	--	Target Met	Target Met	Target Met

Notes and Acronyms:
BAU = Business as Usual
CCA = Community Choice Aggregation
MT CO_2e = metric tons of carbon dioxide equivalent

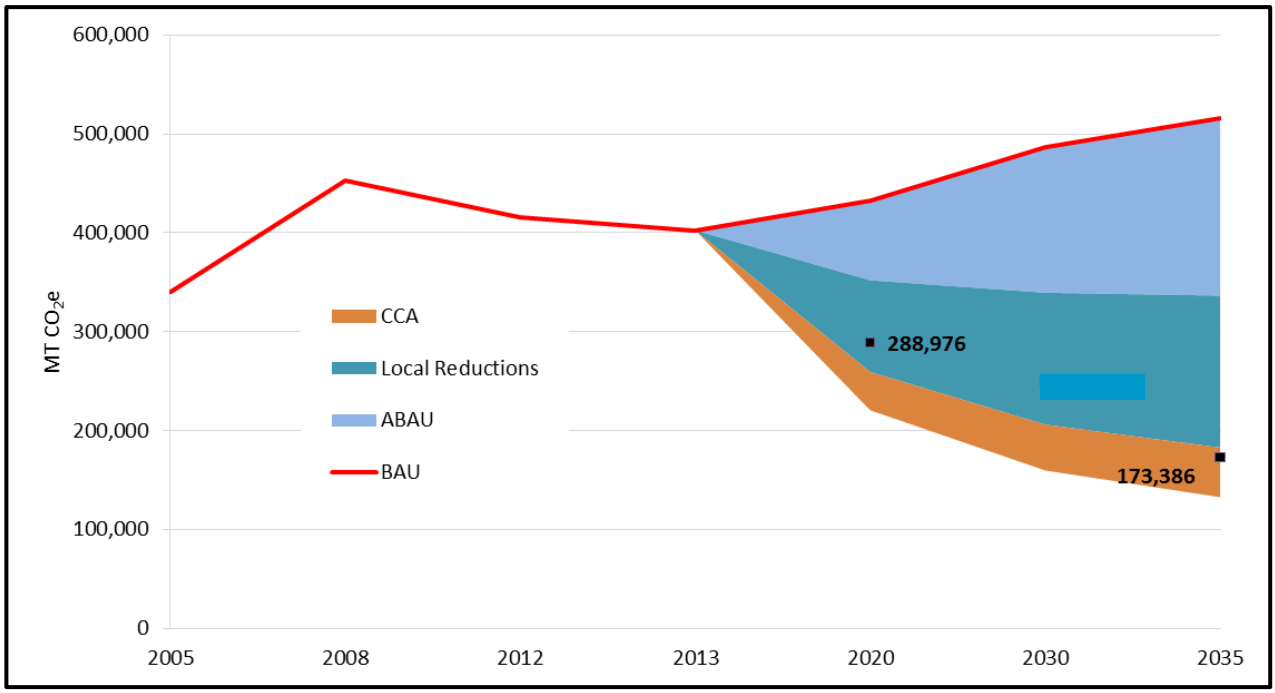


FIGURE 12 **State and Local Reductions Comparison with Targets for Community**

By 2020, the Statewide and local measures together would reduce the City's municipal GHG emissions from the 2020 BAU condition by 31 percent, or 597 MT CO_2e. The total adjusted emissions would be 1,351 MT CO_2e, which would exceed the 15 percent below 2005 levels

reduction target of 1,408 MT CO_2e for 2020. Implementation of additional measures beyond 2020 would result in a 69 percent or 1,400 MT CO_2e reduction below 2035 BAU. That would result in 631 MT CO_2e of emissions and would exceed its municipal operation 49 percent below 2005 levels target of 845 MT CO_2e by 2035.

TABLE 13 Municipal Emissions and Targets Comparison

	2005	2020	2030	2035
	MT CO_2e	MT CO_2e	MT CO_2e	MT CO_2e
BAU Emissions	1,657	1,948	2,003	2,031
Reduction Target	--	1,408	994	845
State and Federal Reductions	--	337	346	350
Local Energy Efficiency Reductions	--	260	787	1,050
Total Adjusted Emissions	--	1,351	870	631
Additional Reductions Needed	--	Target Met	Target Met	Target Met

Notes and Acronyms:
BAU = Business as Usual MT CO_2e = metric tons of carbon dioxide equivalent

~~**TABLE 13 Municipal Emissions and Targets Comparison**~~

	~~2005~~	~~2020~~	~~2035~~
	~~MT CO_2e~~	~~MT CO_2e~~	~~MT CO_2e~~
~~BAU Emissions~~	~~1,657~~	~~1,948~~	~~2,031~~
~~Reduction Target~~	~~--~~	~~1,408~~	~~845~~
~~State and Federal Reductions~~	~~--~~	~~337~~	~~350~~
~~Local Energy Efficiency Reductions~~	~~--~~	~~260~~	~~1,050~~
~~Total Adjusted Emissions~~	~~--~~	~~1,351~~	~~631~~
~~Additional Reductions Needed~~	~~--~~	~~Target Met~~	~~Target Met~~

~~Notes and Acronyms:~~
~~BAU = Business as Usual MT CO_2e = metric tons of carbon dioxide equivalent~~

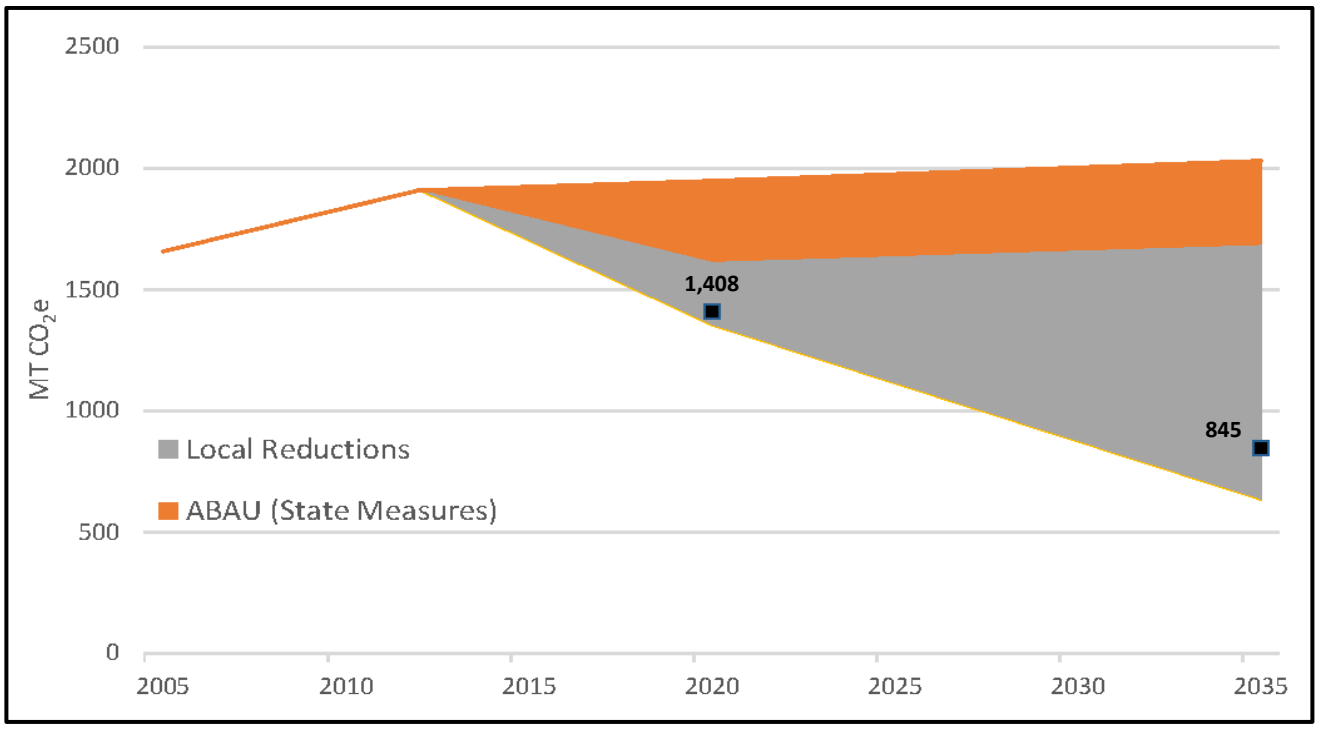


FIGURE 13 **State and Local Reductions Comparison with Targets for Municipal Emissions**

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CHAPTER 4 Adaptation

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

PROJECTIONS OF FUTURE CLIMATE

Studies show that California will experience warmer temperatures, increased drought, and more extreme weather events.[49] The impacts to the city will be similar.

The City may expect:

- **Increased temperatures**—By the end of this century, the average United States temperatures are predicted to increase by 3 °F to 12 °F, depending upon the amount of

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

future emissions and how the earth responds to those emissions.[50] For California, the average annual temperature is expected to rise by 2.7 °F by 2050 and 4.1 to 8.6 °F by the end of the century.[51] For the city, average temperatures are expected to increase between about 5 °F and 10 °F by the end of the century, depending on the emission scenario.[52]

- **Variable precipitation**— Globally, future precipitation is highly variable, and California is no exception. Annual precipitation in California is expected to increase by more than 12 percent through the end of the 21st century. Most of this increase is expected in Northern and Central California; precipitation in Southern California is expected to decrease by 3.3 percent. All regions of California are expected experience wetter winters, with Southern California rain increasing by 11 percent during the rainy months of December, January, and February.[53]
- **Increase in extreme weather events**—The historical number of extreme heat days (days over 99.9 °F) has been about four in Santee. By 2050, the number of extreme heat days in the city could increase to more than 12 per year, and by the end of the century, the number of extreme heat days could exceed 40 per year (FIGURE 14). [54] In addition the length of extremely hot days will increase. Historically, the maximum duration of heat waves in the city has been four, but may increase to 10 by mid-century and 20 to 45 by the end of the century.

[50] U.S. Global Change Research Program. 2014. Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment*.
[51] California Natural Resources Agency and California Energy Commission. 2012. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.* CEC-500-2012-007. July.
[52] Scripps Institution of Oceanography. 2017. Projected Temperatures Data Set (2017). Website: http://cal-adapt.org/tools/annual-averages/#climatevar=tasmax&scenario=rcp85&lat=32.84375&lng=-.
[53] Allen, Robert J., and Rainer Luptowitz. 2017. "El Niño-like Teleconnection Increases California Precipitation in Response to Warming." Nature Communications 8 (July): 16055. doi:10.1038/ncomms16055.
[54] Scripps Institution of Oceanography. 2017 Projected Daily Temperature Data Set (2017), Website: http://cal-adapt.org/tools/extreme-heat/#climatevar=tasmax&scenario=rcp85&lat=32.84375&lng=-116.96875&boundary=locagrid&units=fahrenheit.

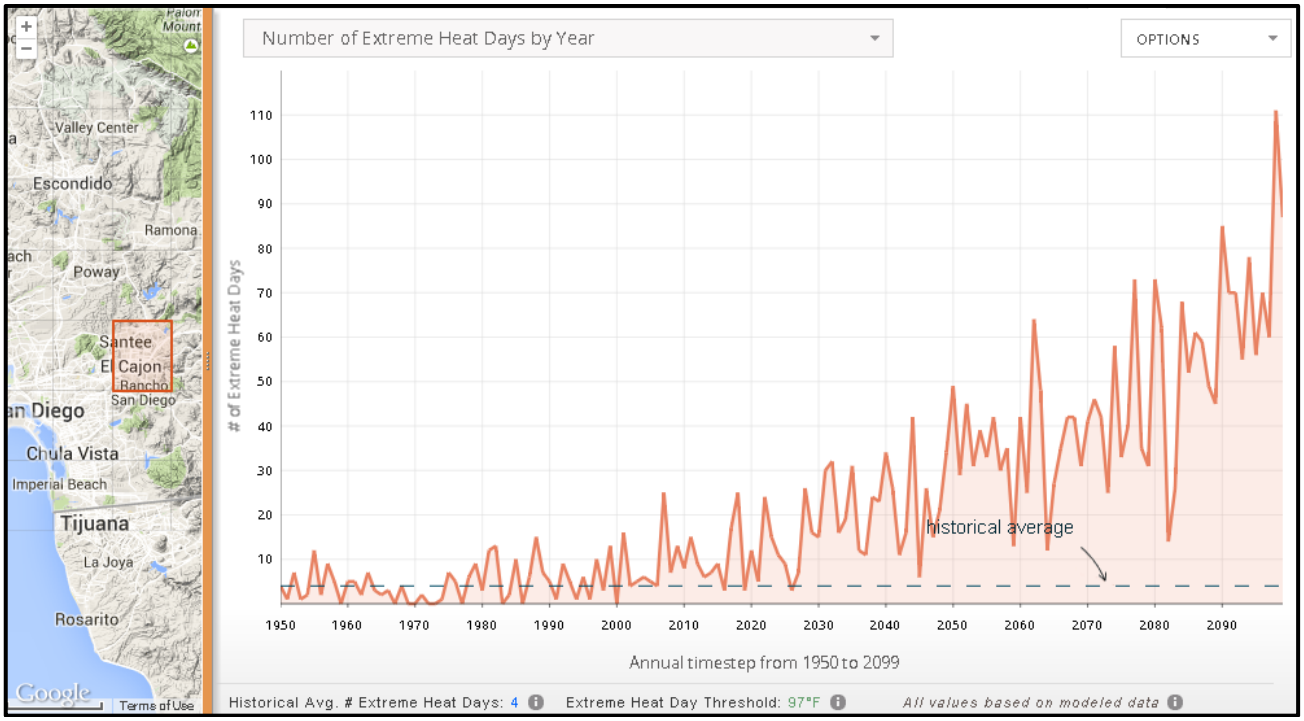


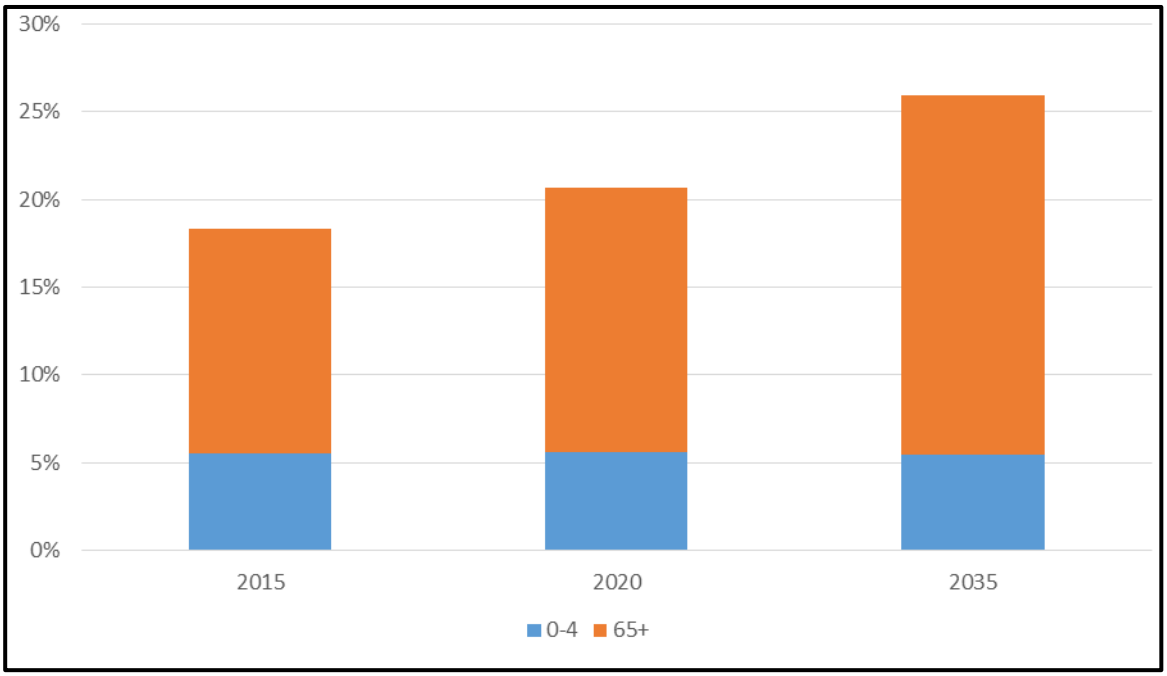
FIGURE 14 **Number of Extreme Heat Days per Year**

IMPACTS OF CLIMATE CHANGE AND ADAPTATION STRATEGIES

Increasing awareness and concern regarding potential climate change impacts has led to some policy responses and programs aimed at reducing GHG emissions at the City, including Executive Order S-13-08 discussed in Chapter 1. Impacts of climate change are already being seen and other more serious consequences are likely to occur in the future. The exact nature of the impacts is unknown and also depends on near-term emissions, but the most likely impacts to the State and to the City over the next century are discussed below along with strategies to reduce potential impacts or to build resiliency to impacts. To this end, the City of Santee is part of the regional *Multi-Jurisdictional, Multi-Hazard Mitigation Plan.*

Public Health & Safety

Periods of increased high temperatures or extended high temperatures can lead to increased heat-related, cardiovascular-related, and respiratory illnesses and diseases, and other health impacts. Emergency medical services and hospital visits also increase during heat waves. Changes in temperature are also expected to worsen air quality by increasing ozone and particulate matter concentrations, which can cause or exacerbate respiratory symptoms such as asthma attacks. The City recognizes that climate change will not impact all populations equally. Especially sensitive populations include the young (under 5 years of age) and the elderly (over 65), which constitute 19 percent of the 2015 population and will increase to more than 35 percent of the population by 2035 (FIGURE 15). Other populations that could be affected by extreme temperatures include outdoor workers such as construction and maintenance employees. This places limits on work hours and may require additional training for workers to expand their understanding of heat-related illnesses.



SOURCE: SANDAG Data Warehouse

FIGURE 15 **Percentage of Santee's Population Considered Sensitive**

Strategies

- Map neighborhoods that could be more vulnerable to the effects of climate change, such as flooding, fire, and the urban heat island effect is important in identifying high risk areas of the City.
- Create cooling centers at public spaces, such as libraries, for populations without air conditioning.
- Implement cooling technologies such as cool roofs and cool pavements.
- Strategically place shade trees near buildings, in parking lots, and along bike and pedestrian pathways.
- Use reverse 911 calls to notify residents of serious heat events or natural disasters, and encourage residents to register into the "AlertSanDiego" system

Electrical Demand

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

air conditioners in the City and other regions of SDG&E territory, which may cause brownouts or blackouts. Additionally, efficiencies of electricity generation and transmission decrease as air temperatures increase, which further inhibit the ability of electric providers to meet increased demand.

Strategies

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

Water Availability

Water availability is and has been a vital economic, natural resource, and public health issue in California. Governor Jerry Brown declared a drought State of Emergency in January 2015 and the State Water Resources Control Board (SWRCB) announced in March 2015 water suppliers were encouraged to go beyond the minimum requirements to safeguard remaining water supplies. In April 2015, the Governor issued Executive Order B-29-15 that directs the SWRCB to implement mandatory water reductions to reduce water usage by 25 percent. Multiyear droughts decrease water supplies, while population growth exacerbates the problem by increasing demand. Supply limitations will only intensify as climate change causes reduced rainfall and increased temperatures. The San Diego County Water Authority, the wholesale supplier to San Diego County, expects demand to increase 22 percent between 2009 and 2035.[55] The water agency serving the City, Padre Dam Municipal Water District, also sets water demands goals through 2035 consistent with SB X7-7 in the Urban Water Management Plan. SDCWA provided potential actions that may be taken in a drought situation in the Water Shortage and Drought Response Plan.

[55] San Diego County Water Authority. 2014. *San Diego County Water Authority Climate Action Plan*. p. 28. March.

Strategies

- ☐ Educate the public about water conservation.
- ☐ Encourage low-impact development.
- ☐ Expand water recycling and grey-water systems.
- ☐ Promote sub-metering in multifamily housing units.
- ☐ Promote conversion of turf grass to xeriscaping.

Infrastructure Damage

Cities, including Santee, rely on infrastructure for commuting, working, and other basic services. Roadways and buildings are built for long-term use; however, infrastructure is also susceptible to the impacts of climate change as it is generally built to meet historic climate conditions. Therefore, infrastructure is also vulnerable to climate change impacts. Much of the roadways and railways are dark or metal-based, conducting heat and raising temperatures well beyond the observed air temperature. Increased temperatures can cause pavement to soften and to expand, causing potholes. Railways can buckle under extreme heat, requiring trains to go slower to navigate the buckle or stop service for repairs. Flooding can also shorten the life of roadway infrastructure, require more maintenance, and cause traffic delays. Building infrastructure likewise may have shortened lifetimes due to flooding.

Strategies

- ☐ Evaluate infrastructure vulnerability based on current degradation and expected climate-related impacts.
- ☐ Prioritize and plan for infrastructure improvements that increase fire safety and reduce energy, especially in vulnerable neighborhoods.
- ☐ Identify alternative routes where infrastructure damage may occur.

Wildfire

Because California is expected to experience increased temperatures and reduced precipitation, there will likely be more frequent and intense wildfires and longer fire seasons. About one-third of the City of Santee is covered by open space, which is the type of land most vulnerable to wildfire. Effects from wildfire can include eye and respiratory illness, worsening asthma, allergies, chronic obstructive pulmonary disease, and other cardiovascular and respiratory diseases.

Homes and buildings near open space areas could also be threatened by future wildfires. All new buildings within a State Responsibility Area, Local Agency Very-High Fire Hazard Severity Zone, or Wildland-Urban Interface Fire Area designated by the enforcing agency must comply with all sections of the Wildland-Urban Interface Fire Area Building Standards. These standards provide a reasonable level of exterior wildfire exposure protection for buildings within these hazard areas and

establish minimum standards for materials and material assemblies to lessen the vulnerability of a building to resist the intrusion of flames and burning embers projected during a conflagration or wildfire.[56] Additional resources may be needed to combat additional wildfires in the region, including already-scarce water.

Strategies

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

Social Equity

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

Strategies

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

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

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CHAPTER 5 Plan Implementation

This chapter describes implementation steps for the Plan to support achievement of the energy efficiency and GHG reduction goals for the community at large. Success in meeting the City's energy efficiency and GHG emission reduction goals will depend on cooperation, innovation, and participation by the City and residents, businesses, and local government entities. It is the City's intention that both the mass emissions reductions and efficiency goals be achieved by implementation of the Sustainable Santee Plan. This section outlines key steps that the City would follow for the implementation of this Plan.

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

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

ADMINISTRATION AND STAFFING

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

The Administrator could have the following responsibilities:

- Secure long-term financing for the energy efficiency and GHG reduction measures (i.e., grant application primary contact).
- Coordinate Plan implementation-related meetings.
- Serve as the external communication hub to local and regional climate action organizations, including SANDAG.
- Conduct public outreach to inform the community of the City's reduction planning efforts.
- Investigate methods to use existing resources and harness community support to better streamline implementation of the Plan.
- Monitor implementation of reduction measures and success of the Plan.
- Develop a protocol for monitoring the effectiveness of emission-reduction programs.
- Establish guidelines for reporting and documenting emission-reduction progress.
- Submit annual reports to the City Council.
- Develop a protocol for using the real-time information collected through the verification process to modify and revise existing reduction programs.
- Track State and federal legislation and its applicability to the City.

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

FINANCING AND BUDGETING

Implementation of the local GHG reduction measures may require investment for the capital improvements and other investments, and increased operations and maintenance costs. However,

in some cases operating costs are anticipated to decrease, resulting in offset savings. This section presents a summary of funding and financing options (TABLE 14) available at the writing of this document. Some funding sources are not necessarily directed towards a City, but to a larger regional agency such as SANDAG, or a waste services provider serving multiple jurisdictions. The City would monitor private and public funding sources for new grant and rebate opportunities and to better understand how larger agencies are accessing funds that can be used for GHG reductions in their area. Leveraging financing sources is one of the most important roles the City can play in helping the community to implement many of the GHG reduction measures.

TABLE 14 **Potential Funding Sources to Support GHG Reduction Measures**

Funding Source	Description
State and Federal Funds	
Federal Tax Credits for Energy Efficiency	■ Tax credits for energy efficiency can be promoted to residents.
Energy Efficient Mortgages (EEM)	■ An EEM is a mortgage that credits a home's energy efficiency in the mortgage itself. ■ Residents can finance energy-saving measures as part of a single mortgage. ■ To verify a home's energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved. ■ EEMs are typically used to purchase a new home that is already energy efficient, such as an ENERGY STAR®-qualified home.
California Department of Resources Recycling and Recovery (CalRecycle)	■ CalRecycle grant programs allow jurisdictions to assist public and private entities in management of waste streams. ■ Incorporated cities and counties in California are eligible for funds. ■ Program funds are intended to: ○ Reduce, reuse, and recycle all waste ○ Encourage development of recycled-content products and markets ○ Protect public health and safety and foster environmental sustainability
California Energy Commission (CEC)	■ CEC has energy efficiency financing options for projects with proven energy savings. These options include 0% interest rate loans for K–12 school districts, county offices of education, State special schools, community colleges, and 1% interest rate loans for cities, counties, special districts, public colleges or universities, public care institutions/public hospitals, University of California campuses, and California State University campuses. ■ Projects eligible for the CEC energy efficiency financing low interest loans include: ○ Lighting system upgrades ○ Pumps and motors ○ Streetlights and light-emitting diode (LED) traffic signals ○ Building insulation ○ Heating, ventilation and air conditioning equipment ○ Water and waste water treatment equipment
California Air Resources Board (CARB)	■ CARB offers several grants, incentives, and credits programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program. ■ The following programs can be utilized to fund local measures: ○ Air Quality Improvement Program (Assembly Bill 118)

TABLE 14 Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
	○ Carl Moyer Program – Voucher Incentive Program ○ Goods Movement Emission Reduction Program (Proposition 1B Incentives) ○ Loan Incentives Program ○ Lower-Emission School Bus Program/School Bus Retrofit and Replacement Account (Proposition 1B and United States Environmental Protection Agency Incentives)
Existing Capital Improvement Program	■ State and federal funds would most likely continue to local governments, builders, and homeowners in the following forms: ○ Grants ○ Transportation and transit funding ○ Tax credit and rebate programs ○ The Capital Improvement Program can be utilized for measures relating to traffic or transit.
State Funding for Infrastructure	■ The state's Infill Infrastructure Grant Program may potentially be used to help fund measures that promote infill housing development. ■ Grants can be used for gap funding for infrastructure improvements necessary for specific residential or mixed-use infill development projects.
Transportation-Related Federal and State Funding	■ For funding measures related to transit, bicycle, or pedestrian improvements, the following funding sources from SANDAG may be used. ○ Smart Growth Incentive Program ○ Active Transportation Grant Program ○ Job Access and Reverse Commute and New Freedom Programs
Utility Rebates	■ SDG&E is one of the utilities participating in the Go Solar initiative. ■ A variety of rebates are available for existing and new homes. ■ Photovoltaics, thermal technologies, and solar hot water projects are eligible. ■ Single-family homes, commercial development, and affordable housing are eligible.
Energy Upgrade California	■ The program is intended for home energy upgrades. ■ Funding comes from the American Recovery and Reinvestment Act, California utility ratepayers, and private contributions. ■ Utilities administer the program, offering homeowners the choice of one of two upgrade packages—basic or advanced. ■ Homeowners are connected to home energy professionals. ■ Rebates, incentives, and financing are available. ■ Homeowners can receive up to $4,000 back on an upgrade through the local utility.
Private Funding	
Private Funding	■ Private equity can be used to finance energy improvements, with returns realized as future cost savings. ■ Rent increases can fund retrofits in commercial buildings. ■ Net energy cost savings can fund retrofits in households. ■ Power Purchase Agreements involve a private company that purchases, installs, and maintains a renewable energy technology through a contract that typically lasts 15 years. After 15 years, the company would uninstall the technology or sign a new contract.

TABLE 14 **Potential Funding Sources to Support GHG Reduction Measures**

Funding Source	Description
	■ On-Bill Financing (OBF) can be promoted to businesses for energy-efficiency retrofits. OBF funding is a no-interest loan that is paid back through monthly utility bills. Lighting, refrigeration, HVAC, and LED streetlights are all eligible projects.
Other Funding Mechanisms for Implementation	
Other Funding	■ Increased operating costs can be supported by grants from the Strategic Growth Council or the State Department of Conservation to fund sustainable community planning, natural resource conservation and development, and adoption.
Future Funding Options: Funding Mechanisms for Capital and/or Implementation Costs	
New Development Impact Fees	■ These types of fees may have some potential to provide funding, but such fees are best implemented when the real estate market and overall regional economic conditions are strong.
General Obligation Bond	■ A general obligation bond is a form of long-term borrowing and could be used to fund municipal improvements.
AB 811 Districts Property-Assessed Clean Energy (PACE)	■ Assembly Bill 811 is intended to help municipalities accomplish the goals outlined in Assembly Bill 32. ■ The PACE finance program is intended to finance energy and water improvements within a home or business through a land-secured loan, and funds are repaid through property assessments. ■ Municipalities are authorized to designate areas where property owners can enter into contractual assessments to receive long-term, low-interest loans for energy and water efficiency improvements, and renewable energy installation on their property. ■ Financing is repaid through property tax bills. ■ AB 811 and the PACE program are currently on hold for residential properties due to potential violation of standard Federal Housing Finance Agency (FHFA) federally guaranteed (Fannie Mae/Freddie Mac) residential mortgage contracts. ■ SANDAG has implemented the Home Energy Renovation Opportunity (HERO; a PACE program) in the County to assist residents in financing residential energy efficiency and solar retrofits.

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

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

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

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

TIMELINE FOR MEASURE IMPLEMENTATION

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

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

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

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

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

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

A qualitative appraisal of implementation effort for the City is also provided. Measures can be categorized based on the convention of low, medium, or high, with low-level measures requiring the least level of effort by the City and being the most likely to be pursued immediately (i.e., the low-hanging fruit). Sample criteria are shown in TABLE 15.

TABLE 15 **Implementation Matrix**

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

COMMUNITY OUTREACH AND EDUCATION

The citizens and businesses in the City are integral to the success of the Plan and to overall GHG reduction for the region. Their involvement is essential, considering that several measures depend on the voluntary commitment, creativity, and participation of the community.

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

MONITORING, REPORTING, AND ADAPTIVE MANAGEMENT

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

- **Update GHG Inventory**—The City would update inventory emissions using 2020 data to verify the achievement of GHG reduction goals. This includes regular data collection in each of the primary inventory sectors (utility, regional VMT, waste, wastewater, and water), and comparing the inventory to the City's baseline GHG emissions in 2005. The City would consolidate information in a database or spreadsheet that can be used to evaluate the effectiveness of individual reduction measures. Updated GHG inventories will be conducted every 3 to 5 years depending upon funding.
- **Track State Progress**—The Plan will rely heavily on State-level measures. The City would be responsible for tracking the state's progress on implementing state-level programs. Close monitoring of the real gains being achieved by state programs would allow the City to adjust its Plan, if needed.
- **Track Completion of GHG Reduction Measures**—The City would keep track of measures implemented as scheduled in the Plan, including progress reports on each measure, funding, and savings. This will allow at least a rough attribution of gains when combined with regular GHG inventory updates.
- **Regular Progress Reports**—The City shall report annually to the City Council on Plan implementation progress. If annual reports, periodic inventories, or other information indicates that the GHG reduction measures are not as effective as originally anticipated, the Plan may need to be adjusted, amended, or supplemented.

TRACKING TOOLS

Screening Tables

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

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

Staff will develop a Sustainable Santee Plan consistency check list within six months of plan adoption to coincide with the Screening Tables to ensure new development is consistent with this plan.

Plan Implementation Tracker Tool

The City's PITT is a Microsoft Excel-based tool that would help the City track GHG reductions achieved through implementation of the GHG reduction measures within the Plan, to monitor the plan's implementation progress, and to share findings with stakeholders, partners, and the community.

The PITT would help derive estimates for annual GHG reductions achieved by State, county, and local reduction measures to track progress toward meeting the City's GHG reduction targets. This is achieved by inventorying GHG emissions, estimating reductions, monitoring trends over time, and revising actions based on results to achieve the reduction targets.

Tracking reductions should be done annually in order to demonstrate climate action planning leadership and initiative, to assist the State and the Region in meeting the reduction targets outlined under AB 32, to demonstrate Plan progress, to show and communicate results, and to adaptively manage the Plan's implementation to ensure achievement of the reduction target.

Progress Reports

The Plan's effectiveness in reducing GHG emissions would be tracked with annual Progress Reports to the City Council which would be designed to outline the current status of each measure identified in the City's Plan. Progress Reports would be designed to be used in conjunction with the PITT;

(e.g., the PITT tables and graphs as outputs can easily be pasted into the Plan's Progress Report). The annual report will address:

- Summary of changes in the regulatory framework during the past year
- The status of each implementation measure including all supporting actions
- A list of actions to be taken in the upcoming year
- In years where a GHG inventory was taken, a complete analysis of current emissions versus expected emissions under the plan shall be completed. Each measure and supporting action shall be reviewed for effectiveness. If necessary, revisions to existing measures and actions along with new measures/action would be proposed to ensure continuing progress toward GHG reduction targets.

NEXT STEPS

The Sustainable Santee Action Plan is not a static document and will continue with monitoring, inventory updates, and continued refinement of target setting to complement State goals and actions. To that end, while this current document has a horizon date of 2035, the City also recognizes the long term State goal found in Executive Order B-55-18 of carbon neutrality by 2045 and is committed to updating the Sustainable Santee Plan at regular intervals to continue reducing emissions that will complement State actions and provide the City's contribution toward the State's long term goal.

Towards this end, the City commits to:

1. City staff will monitor CARB's development of a methodology and accounting procedure needed to progress towards the carbon neutrality goals on Executive Order B-55-18.

2. Within two (2) years of the final CARB rulemaking regarding carbon neutrality, staff will bring for City Council consideration an Amendment to the Sustainable Santee Plan that includes revised Measures/Actions designed to achieve this goal, including but not limited to further incentives for electrification of existing buildings within Santee thpugh San Diego Gas & Electric and/or any CCA program in which the City participates.

3.Within three years of approval of the Sustainable Santee Plan, City Staff will develop a plan to install solar PV systems to the maximum extent possible at all City facilities. This plan shall be incorporated into the City's Capital Improvement Program ("CIP").

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Appendix A

City of Santee
GHG Inventory, Forecasting, Target-Setting Report

Revised ~~February~~ August 2019

Prepared for:

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Contents

Figures

Tables

List of Acronyms and Abbreviations

AB	Assembly Bill
ADC	Alternative Daily Cover
ARB	California Air Resources Board
BAU	Business-as-Usual
CAFE	Corporate Average Fuel Economy
CAP	Climate Action Plan
CH_4	Methane
CARB	California Air Resources Board
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
EO	Executive Order
E-Grid	Emissions and Generation Resource Integrated Database
EMFAC2014	On-road emission factors model version 2014
EPA	Environmental Protection Agency
EPIC	Energy Policy Initiatives Center
GHG	Greenhouse Gas
GWP	Global Warming Potential
IFT	Inventories, Long-Term Forecasts, and Target-Setting
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt-hour
LCFS	Low Carbon Fuel Standard
LGOP	Local Government Operations Protocol
MT	Metric Tons
NDN	Nitrification/denitrification
N_2O	Nitrous Oxide
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SDG&E	San Diego Gas & Electric
SEEC	Statewide Energy Efficiency Collaborative
VMT	Vehicle Miles Traveled

Key Findings

Community

- The City of Santee increased total greenhouse gas (GHG) emissions 18.4% from 2005 to 2013, from 339,972 metric tons of carbon dioxide equivalent (MT CO_2e) to 402,574 MT CO_2e.
- Solid waste, water, and off-road sources sector emissions decreased while on-road transportation, commercial energy, residential energy, and wastewater sectors increased emissions from 2005 to 2013.
- On-road transportation emissions account for about 54% of the total community emissions in 2005 and 60% in 2013.
- Energy-related emissions account for about 30% of the total community emissions in 2005 and 31% in 2013.
- Under the Adjusted Business-as-Usual (BAU) forecast, emissions will be 352,106 MT CO_2e in 2020, 339,514 MT CO_2e in 2030 and 336,543 MT CO_2e in 2035. These emissions levels are 3.6%, increase from 2005 by 2020 and a 0.1% and 1.0% lower than 2005 by 2030 and 2035 respectively.
- The State recommends a 15% reduction below 2005 levels by 2020, which the City will have met the target under an Adjusted BAU forecast by 2020.

Municipal

- Emissions from City government services (municipal emissions) are a subset of communitywide emissions and represent less than 1% of community emissions.
- Municipal emissions have increased 15% from 2005 to 2013, from 1,657 MT CO_2e to 1,909 MT CO_2e.
- Emissions in the buildings and facilities, fleet and equipment, solid waste, city-owned outdoor lights, and water pumping sectors increased between 2005 and 2013, and the employee commute, and SDG&E-owned outdoor lights sectors decreased.
- Municipal energy use accounted for 53% of total municipal emissions in 2005 and 57% in 2013.
- Under the Adjusted BAU forecast, emissions will be 1,611 MT CO_2e in 2020, which is 3% lower than in 2005. In 2030, emissions will be equivalent to 2005. By 2035, emissions will grow to 1,681, which is 1% higher than in 2005. The changes reflect anticipated growth in the City's municipal operations and reductions from State-mandated policies.

Introduction

This Greenhouse Gas (GHG) Inventories, Long-Term Forecasts, and Target-Setting (IFT) Report contains the first steps toward the City of Santee (City) identifying energy-efficiency and GHG reduction measures in a Climate Action Plan or Sustainable Santee Plan. The inventories describe historic energy use and GHG emissions and the forecasts describe projected future emissions in the City. The target-setting section describes GHG reduction approaches that are consistent with State goals and may assist the City in establishing local GHG reduction targets. This IFT Report will help the City identify energy efficiency and GHG reduction measures to meet their local reduction targets.

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

- Historic GHG emissions in **community inventories** for 2005, 2008, 2012, and 2013 and **municipal inventories** for 2005 and 2013;
- Future GHG emissions for 2020, 2030 and 2035 under a **business-as-usual** forecast scenario and **adjusted business-as-usual** forecast scenario; and
- GHG **reduction targets** for 2020, 2030 and 2035 that are aligned with State goals.

Table 1. Key Terms in the Report[1]

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

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

GHG Emission Inventories

GHG emissions inventories are the foundation of planning for future reductions. Establishing an existing inventory of emissions helps to identify and categorize the major sources of emissions currently being produced. In this report, four years of historic inventories are presented to show not only the major sources of emissions in the city, but also how those sources vary over time. For the community, the years 2005, 2008, 2012, and 2013 are presented, and for the municipal inventories the years 2005 and 2013 are presented. The 2005 inventory (for both community and municipal operations) is considered the **baseline year**. A baseline year is established as a starting point against which other inventories may be compared and targets may be set, and is generally the earliest year with a full emissions inventory. The most recent inventory (2013) has the most relevant data for planning purposes, while the interim years (2008 and 2012) provide context and may help identify trends or anomalies in the community emissions. Appendix B of the Sustainable Santee Plan provides the general methodology used to calculate the inventories.

The following explains why 2013 was considered the most recent inventory, how the City's community inventories were calculated, and why this information is still considered valid for use within the Sustainable Santee Plan. The 2013 inventory of emissions was considered the most recent inventory because the inventory process began in September of 2014. At that time, the most current modeling was used to translate activity data into GHG emissions. Activity data for the 2013 inventory and forecasts associated with on-road transportation was provided using the San Diego Association of Governments (SANDAG) Series 12 Transportation Model which became available in October 2013. The on-road transportation activity data from the Series 12 transportation model is provided in Attachment C. GHG emissions associated with the on-road activity data was calculated using the California Air Resources Board (ARB) on-road emissions factor model 2014 (EMFAC2014) which became available in April 2014.

Emission factors (EFs) for natural gas and electricity use within the community were provide by the University of San Diego School of Law Energy Policy Initiatives Center (EPIC) and shown in Attachment D. Electricity consumption for the 2005 and 2008 inventories used the 2010 EF provided by EPIC which originated from the Environmental Protection Agency (EPA) Emissions and Generation Resource Integrated Database (E-Grid) for San Diego Gas and Electric (SDG&E). The EFs for electrify consumption for the 2012 and 2013 inventories as well as the forecast years 2020, 2030, and 2035 used the 2012 E-Grid for SDG&E provided by EPIC.

The latest versions of these models as of January 2019 include SANDAG Series 13 Transportation Model, EMFAC2017, and E-Grid 2018 values for SDG&E. In evaluating the difference between the SANDAG Series 12 and Series 13 Transportation Models, the primary difference is in forecasted growth rates. The SANDAG Series 12 Transportation Model included very aggressive growth rates for future years which resulted in higher levels of transportation related travel in 2020, 2030 and 2035 than what the SANDAG Series 13 Transportation Model would have provided. Additionally, the EMFAC2014 emission factors for on-road transportation emissions did not include the low carbon fuel standard in calculating emissions. Because of this on-road transportation emissions for future years 2020, 2030, and 2035 shown in this report are higher than what would have been calculated using the most recent models.

The 2012 EFs from E-Grid used to calculate emissions from the use of electricity in 2020, 2030, and 2035 are higher than the 2018 EFs from E-Grid. The primary reason that the 2012 EFs are higher is due to the fact that in 2012 SDG&E was compensating for the loss of zero emissions electricity generation provided by San Onofre Nuclear Generating Station by generating more electricity with natural gas fired generation stations, which resulted in higher emissions. In 2018, the increased use of renewable electric generation in compliance with the required Renewable Portfolio Standard (RPS) resulted in lower GHG emissions compared with 2012. Because of this, future years 2020, 2030 and 2035 forecasts show higher energy related GHG emissions in this report than what would have been calculated using the 2018 E-Grid values.

The higher forecasted emission levels for 2020, 2030, and 2035, required more local reduction measures to reduce emissions down to the reduction targets.

Updating the 2020, 2030, and 2035 forecasts is considered unnecessary because doing so would only result in the local reduction measures reducing emissions even further below the reduction targets. The following describes how the inventories and forecasts were calculated.

Emission Reporting

The primary GHGs from the community and municipal operations are from carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) since they are most relevant to human activities[1]. Because each of these gases has a different capacity for trapping heat in the atmosphere, known as its global warming potential (GWP), a method of reporting is needed to be able to compare gases in the same terms. As a result, emissions are reported in carbon dioxide equivalents, or CO_2e, with each GHG normalized and calculated relative to CO_2 using its GWP. Table 2 describes the GHGs analyzed in this report, their symbol, GWP, and primary community sources of emissions. While N_2O has the highest GWP and may be considered the most dangerous on a per-molecule basis, CO_2 is by far the most prevalent pollutant, accounting for 88% of total statewide GHG emissions in 2005 (CARB 2011).

Table 2. GHGs Analyzed in the Inventories

Greenhouse Gas	Symbol	Global Warming Potential	Primary Community Sources
Carbon Dioxide	CO_2	1	Fossil fuel combustion
Methane	CH_4	25	Fossil fuel combustion, landfills, wastewater treatment
Nitrous Oxide	N_2O	298	Fossil fuel combustion, wastewater treatment

Source: IPCC Fourth Assessment Report, 2007.

Emission Sectors

The inventories identify the major sources of GHGs emissions caused by activities in sectors that are specific to community or municipal activities. A **sector** is a subset of the economy, society, or municipal operations whose components share similar characteristics. An emissions sector can also contain

[1] Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report. 2007.

subsectors that provide more specificity about the source of emissions (e.g., natural gas and electricity are subsectors of the energy sector).

Inventories were completed for the community and municipal operations. Because the majority of municipal activities occur within the boundaries of the city and therefore contribute to the overall emissions of the community, both inventories are interconnected, with the municipal inventory considered a subset of the community inventory. As a result, municipal emissions are included in numbers reported for the community. The municipal inventory is separated to highlight areas of emissions that the city has more direct control over and to identify where they can begin to set examples for the community on how reduction strategies can be implemented.

The following subsections describe the sectors used in the community and municipal inventories. It is important to note that both inventories capture similar types of information but may be categorized differently. For example, energy is reported in both the community and municipal inventory, but community level energy emissions are reported as "Residential" and "Commercial/Industrial", whereas municipal energy emissions are more logically reported as "Buildings & Facilities" and "Streetlights".[2]

Community Sectors

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

- **Energy** in the Community Inventory is further broken down into two sectors:
    - **Commercial/Industrial Energy** includes emissions from electricity and natural gas consumption in non-residential buildings and facilities (including outdoor lighting) in the city.
    - **Residential Energy** includes emissions from electricity and natural gas consumption in residential buildings in the city.
- **On-Road Transportation** includes emissions from vehicle fuel use in trips wholly within the city (in-boundary) and trips that either originate or end in the city (cross-boundary). Emissions from in-boundary trips are fully accounted for in the inventory, whereas only half of the emissions from cross-boundary trips are accounted for. Trips that pass-through the city, (such as on SR-125 and SR-67) are not accounted for in the inventory because the City no control of these emissions. As a result, this methodology reflects only trips or parts of trips within city borders that the City has the ability to affect. To calculate emissions associated with in-boundary and cross-boundary vehicle trips for the City of Santee, vehicle miles traveled (VMT) must be used. The source of the VMT data used in this report was calculated by the San Diego Association of Governments (SANDAG) and provided as an Excel Spreadsheet. SANDAG calculated the VMT using their Series 12 Transportation Model. The SANDAG VMT calculations are provided as Attachment C to this Report.

[2] Streetlights are further categorized as SDG&E-owned or City-owned as described later.

As part of a public outreach / public workshop campaign conducted in 2018, the City reported GHG emissions from on-road transportation were lower than some of the public expected. The Climate Action Campaign questioned the source of these numbers. Staff and the consultant researched the issue. A review determined that the consultant used the SANDAG VMT data labeled "SANTEE TOTAL" which resulted in lower number for VMT and GHG. During conference calls and a meeting with SANDAG staff it was discovered that the SANDAG VMT data titled "REGIONAL TOTAL" should have been used. This has been corrected and the VMT and resulting GHG numbers have been adjusted. The revised levels in the Sustainable Santee Plan appear consistent with levels reported by other jurisdictions.

- **Solid Waste** includes emissions from waste that is generated in the community and sent to landfills.
- **Water** includes emissions from the electricity used to source, treat, and deliver imported water in the community that is not accounted for in the community utility data.
- **Wastewater** includes emissions from treating wastewater generated in the community.
- **Off-Road Sources** include emissions from operating equipment for construction, commercial, light industrial and agricultural activities; lawn and garden equipment; and recreational vehicles such as all-terrain vehicles.

Municipal Sectors

Sources of municipal emissions are divided into the following sectors:

- **Energy** in the municipal inventory is further broken down into four sectors:
  - **Buildings and Facilities** includes energy use by the government, including electricity and natural gas.
  - **SDG&E-owned Streetlights** includes energy for streetlights on fixtures owned by SDG&E.
  - **City-owned Outdoor Lighting** includes energy for streetlights on fixtures owned by the City, traffic control signals, and outdoor lighting.
  - **Water Pumping** includes energy for water pumping and irrigation.
- **Fleet & Equipment** includes emissions from vehicles owned or operated by the government or contracted by the City for services such as street cleaning. It also includes equipment, such as emergency generators.
- **Employee Commute** includes emissions from fuel use in vehicle trips by municipal employees commuting to and from work in the city.
- **Solid waste** includes emissions from waste generated by municipal employees or at municipally-owned facilities.

Calculation Methodology

GHG emissions were calculated using activity data available (e.g., kilowatt-hours of electricity, therms of natural gas, vehicle miles traveled) for each sector and protocols for converting activity data to emissions output using relevant **emission factors**. Emission factors relate the activity to GHG emissions and may vary by year (e.g., for electricity) and often are not affected by local actions or behavior, unlike activity data. The U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (ICLEI 2012), The California Supplement to the U.S. Community Protocol (AEP 2013), and the Local Government Operations Protocol for the Quantification and Reporting of GHG Emissions Inventories (LGOP) (CARB 2010) were the primary protocols used for developing the community and municipal inventories, respectively. Activity data are reported in the community and municipal emissions subsections below, and emission factors are detailed in Attachment B.

Community Emissions

The community inventory includes the GHG emissions that result from activities within city boundaries. This section presents the findings of the community inventory for four years: 2005 (baseline year), 2008, 2012, and 2013. It also provides more specific detail and findings on the energy sectors, which will form the basis of the reduction targets and reduction measures the City identifies in the CAP.

2005—2013 Emissions Summary

Overall, emissions increased 18 percent from 2005 to 2013, from 339,972 MT CO_2e to 402,574 MT CO_2e, with On-Road Transportation emissions showing the greatest overall increase. As shown in Figure 1 and Table 3, the Transportation sector was the largest contributor to emissions in 2005, contributing 54% of total emission. By 2013, Transportation emissions increased to 60% of total emissions.

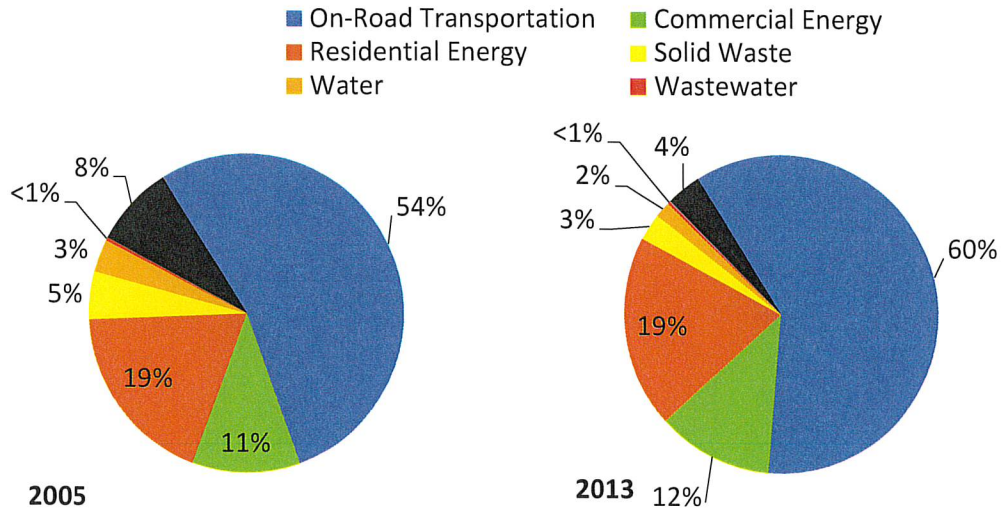
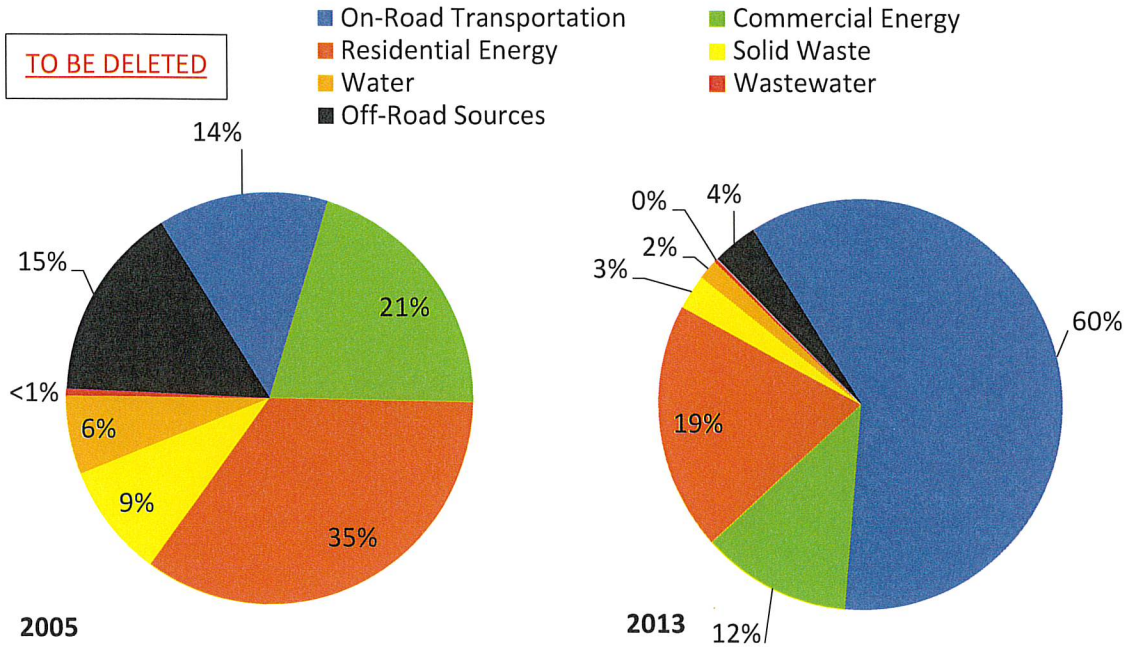


Figure 1. Community GHG Emissions by Sector for 2005 and 2013



~~**Figure 1. Community GHG Emissions by Sector for 2005 and 2013**~~

Table 3. Community-Wide GHG Emissions by Sector for 2005 and 2013

Sector	2005 (MT CO_2e)	2013 (MT CO_2e)	% Change 2005–2013
On-Road Transportation	181,812	242,499	33.4%
Residential Energy	63,544	78,651	23.8%
Commercial Energy	37,697	48,025	27.4%
Solid Waste	16,376	11,151	-31.9%
Water	11,354	6,578	-42.1%
Off-Road Sources	28,230	14,699	-47.9%
Wastewater	959	971	1.3%
Total	339,972	402,574	18.4%

2005, 2008, 2012, and 2013 Inventories

While the total emissions from 2005 to 2013 ~~decreased,~~increased there has been variation in the City's emissions by sector over time. Figure 1 and Table 4 show the GHG emissions by sector for four inventory years. Emissions are variable among the inventory years, and may reflect changes in the economy, weather, and programs implemented to reduce emissions. The table also lists the percentage of each sector relative to total emissions and shows how the proportion of each sector changed over the years. Of note are the relatively large variations in Commercial/Industrial Energy (varying from 15 to 21% of total emissions) and Off-Road Sources (which varied from 6 to 17% of total emissions), which were primarily due to changes in construction-related emissions.

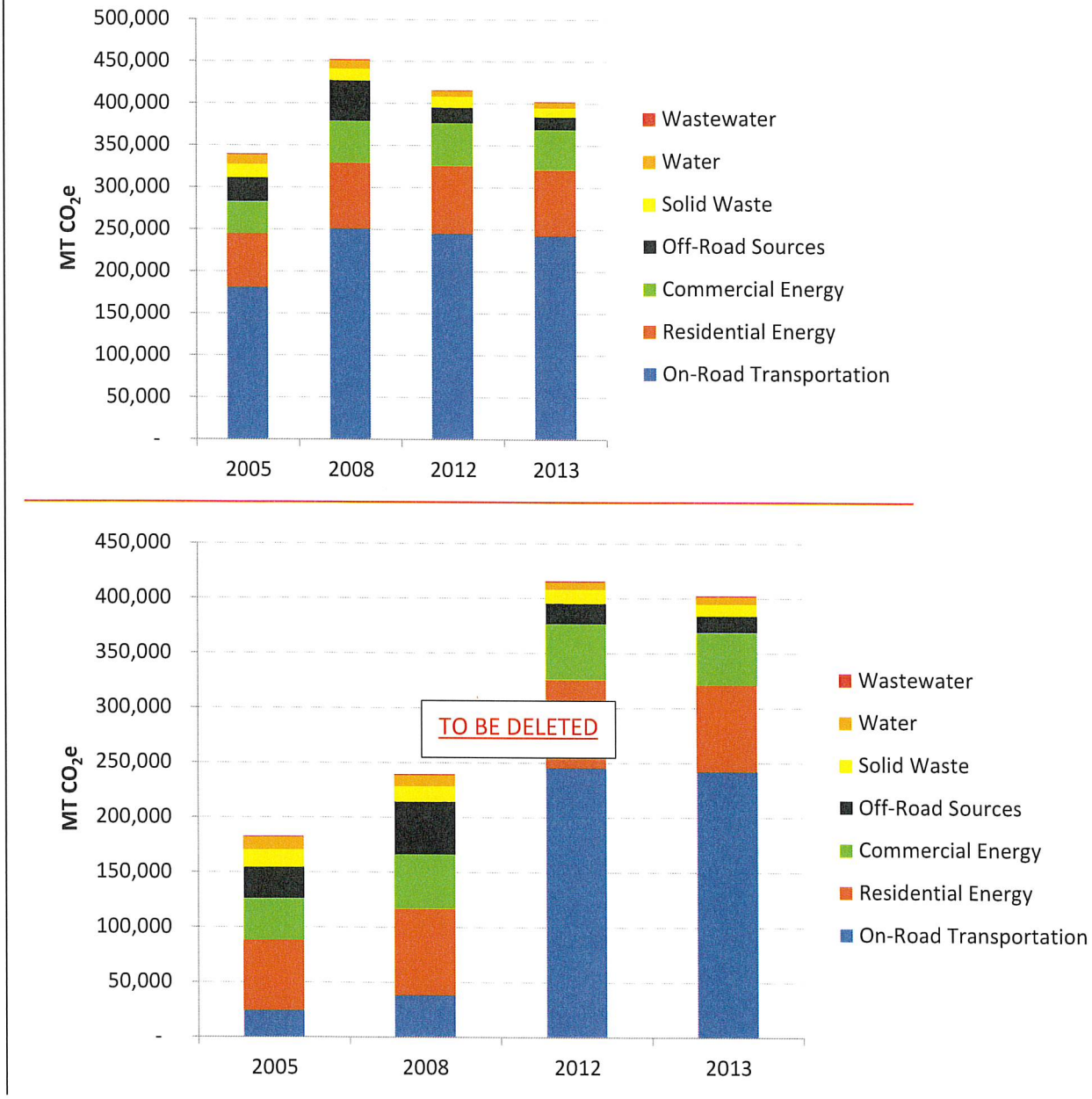


Figure 1. Community GHG Emissions for 2005, 2008, 2012, and 2013

Table 4. Community GHG Emissions for 2005, 2008, 2012, and 2013

Sector	2005 ($MT CO_2e$)	% of Total	2008 ($MT CO_2e$)	% of Total	2012 ($MT CO_2e$)	% of Total	2013 ($MT CO_2e$)	% of Total
On-Road Transportation	181,812	53%	251,184	55%	245,171	59%	242,499	60%
Residential Energy	63,544	19%	78,477	17%	80,673	19%	78,651	20%
Commercial/ Industrial Energy	37,697	11%	49,580	11%	51,148	12%	48,025	12%
Solid Waste	16,376	5%	14,295	3%	13,163	3%	11,151	3%
Water	11,354	3%	10,235	2%	6,722	2%	6,578	2%
Wastewater	959	<1%	985	<1%	964	<1%	971	<1%
Off-Road Sources	28,230	8%	47,829	11%	18,186	4%	14,699	4%
Total	**339,972**		**452,585**		**416,027**		**402,574**	
% Change from 2005	—		**33.1%**		**22.4%**		**18.4%**	

Activity data can provide more insight into behavioral changes in the community, as these data are not affected by emission factors. Table 5 summarizes activity data for each sector and subsector. The activity data show that while emissions from the Residential and Commercial/Industrial sectors increased, activity (kWh and therms) generally decreased (except for Residential electricity). The next section, Energy, discusses this apparent anomaly, which is related to the applicable emissions factors. Also notable, while On-road Transportation emissions increased 33.3% between 2005 and 2013, vehicle miles traveled increased by nearly 38%. The difference reflects that for each vehicle mile traveled, fewer emissions are generated due to improvements in the fuel efficiency of vehicles.

Table 5. Activity Data Used in 2005, 2008, 2012, and 2013 Community Inventories

Sector	2005	2008	2012	2013	% Change 2005–2013
On-Road Transportation					
Total Vehicle Miles Traveled	352,711,238	479,229,830	485,123,704	486,608,464	38.0%
Residential Energy					
Electricity (kWh)	129,290,439	149,427,819	141,649,936	136,108,148	5.3%
Natural Gas (therms)	5,878,287	5,797,758	5,734,216	5,723,205	-2.6%
Commercial/Industrial Energy					
Electricity (kWh)	120,725,233	108,987,978	102,850,529	115,339,581	-4.5%
Natural Gas (therms)	1,419,790	1,494,426	1,568,104	1,347,484	-5.1%
Solid Waste					
Landfilled (tons)	60,825	52,184	46,644	38,742	-36.3%
ADC (tons)[a]	8,136	7,362	8,531	8,185	0.6%
Water and Wastewater					
Water (MG)	2,197	2,044	1,863	1,822	-17.1%
Recycled Water (MG)	232.4	253.4	284.4	292.7	25.9%
Wastewater (City portion of countywide residents)	1.548%	1.547%	1.517%	1.523%	-1.57%
Off-Road Sources [b] (% of San Diego County emissions attributed to the City)					
Lawn & Garden (% Households)	1.75%	1.69%	1.78%	1.78%	1.8%
Construction (% Building permits)	3.46%	6.22%	1.65%	1.14%	-67.2%
Industrial (% Manufacturing jobs)	2.22%	2.22%	2.22%	2.22%	-0.1%
Light Commercial (% Other jobs)	0.97%	0.97%	0.97%	0.97%	-0.01%
Recreation (Population weighted by income)	2.42%	2.30%	1.95%	1.87%	-22.6%
Agriculture (% Ag. Jobs)	0.68%	0.68%	0.68%	0.68%	0.0%

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

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

Demographic data also help provide perspective to changes in emissions over time. Table 6 shows the number of households, jobs, population, and service population (jobs + population) for each inventory year.

Table 6. Demographic Data for 2005, 2008, 2012, and 2013

	2005	2008	2012	2013	% Change 2005–2013
Service Population (Population + Jobs)	70,152	71,859	70,959	71,663	1.0%
Population	54,370	55,850	54,643	55,033	1.2%
Households	18,563	19,080	19,725[1]	19,725	6.3%
Jobs	15,782	16,009	16,316	16,630	5.4%

[1] 2012 households data is the proxy from 2013 since 2012 data is not available through SANDAG.

Energy

Energy is an area over which local agencies often have the greatest opportunities for affecting change. In Santee, energy use has largely declined, although emissions have increased. Electricity and natural gas use remains a key area for reduction opportunities. Emissions from energy use account for 40% and 54% of total community emissions in 2005 and 2013, respectively. Commercial electricity use decreased 4.5% between 2005 and 2013; and emissions increased by 56%. Residential electricity use increased by about 5% but emissions increased by about 49%. The difference between the change in activity data and emissions data are due to the emission factor used for electricity for 2005 and 2013. Emission factors convert activity data into GHG emissions and electricity emission factors vary annually based on how electricity is generated by the electricity provider (i.e., the amount of renewables, natural gas, coal, etc.). In 2005, San Diego Gas & Electric (SDG&E) generated electricity that resulted in an emission factor of 550.488 pounds (lbs) CO_2e per megawatt hour (MWh). In 2013, SDG&E's electricity generation resulted in an emission factor of 781.062 lbs CO_2e per MWh. Therefore, a kilowatt-hour of electricity used in 2013 emitted more GHGs than a kilowatt-hour of electricity used in 2005. Future emissions could increase or decrease based on changes to SDG&E's emission factors, which the City cannot directly affect, or through changes in usage, which can be affected by changes in local policy, outreach, or incentive programs. Unlike electricity, the emission factor for natural gas is estimated on a national basis and remains fairly constant over time. Therefore, the natural gas GHG emissions follow the same trend as usage. In Santee, Commercial/ Industrial natural gas consumption (therms) decreased by 5% from 2005 to 2013; therefore the emissions also decreased 5%. Residential

natural gas therms used and GHG emissions declined nearly 3% from 2005 to 2013. Figure shows the trend in electricity and natural gas emissions from 2005 to 2013 for the Commercial/Industrial and Residential sectors. Figure 3 shows the GHG emissions from 2005 to 2013 and Table 7 includes the activity data and GHG emissions for 2005 and 2013.

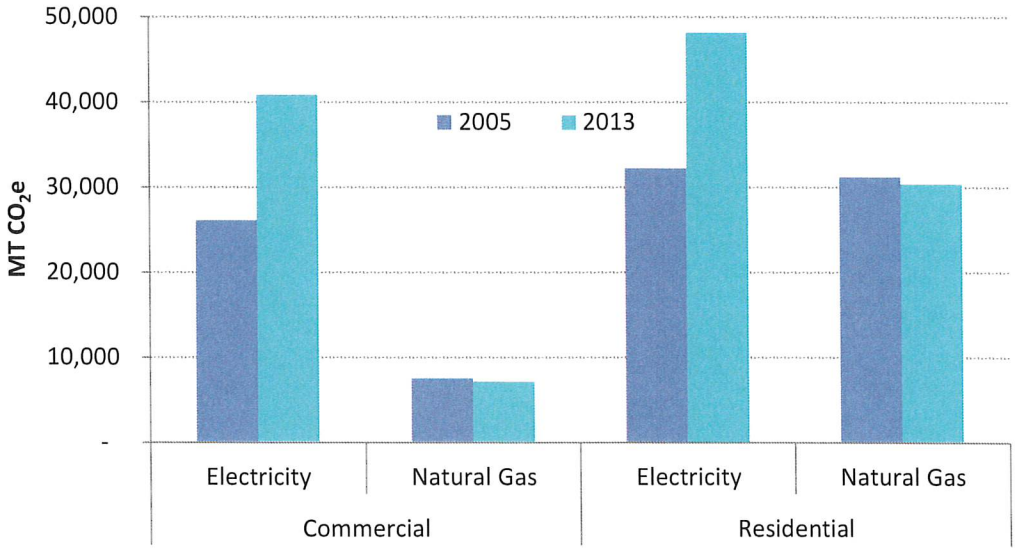


Figure 3. GHG Emissions for Community Electricity and Natural Gas, by Sector

Table 7. Activity Data and GHG Emissions of Energy in 2005 and 2013

Sector	2005		2013		% Change in Activity 2005–2013	% Change in Emissions 2005–2013
	Activity (kWh or therms)	Emissions (MT CO_2e)	Activity (kWh or therms)	Emissions (MT CO_2e)		
Commercial/Industrial						
Electricity	120,725,233	26,127	115,339,581	40,860	-4.5%	56.4%
Natural Gas	1,419,790	7,550	1,347,484	7,165	-5.1%	-5.1%
Residential						
Electricity	129,290,439	32,286	136,108,148	48,218	5.3%	49.3%
Natural Gas	5,878,287	31,258	5,723,205	30,433	-2.6%	-2.6%
Total (MT CO_2e)		**97,221**		**126,676**		**30.3%**

Municipal Emissions

As described earlier, a municipal GHG emissions inventory is a subset of the community inventory. The community inventory, as reported, includes the municipal emissions inventory. The municipal inventory includes emissions from activities conducted as part of government operations in the City. While emissions from government operations are normally a fraction of the overall community emissions, the City has the most direct control over municipal emissions and the City can demonstrate leadership in the community by adopting and implementing energy and GHG reduction strategies. This section presents

the findings of the municipal inventory for 2005 (the baseline year) and 2013. Interim data were not available for municipal operations.

2005—2013 Emissions Summary

Emissions from municipal activities increased 15% from 2005 to 2013, from 1,657 MT CO_2e to 1,909 MT CO_2e. As shown in Figure 4 and Table 8, the most significant change was from City-Owned Outdoor Lighting, whose emissions tripled over the period. All sectors of municipal emissions increased except SDG&E-Owned Streetlights (decreasing emissions by 42%) and Employee Commute (decreasing emissions by 10%). The decline in commute emissions is most likely due to a decline in the number of employees (7%). The distribution of emissions by sector remained relatively constant except for City- versus SDG&E-owned Outdoor Lights, as shown in Figure 4 and Table 8. Total emissions increased by 252 MT CO_2e and overall, municipal emissions account for less than 1% of the total community emissions.

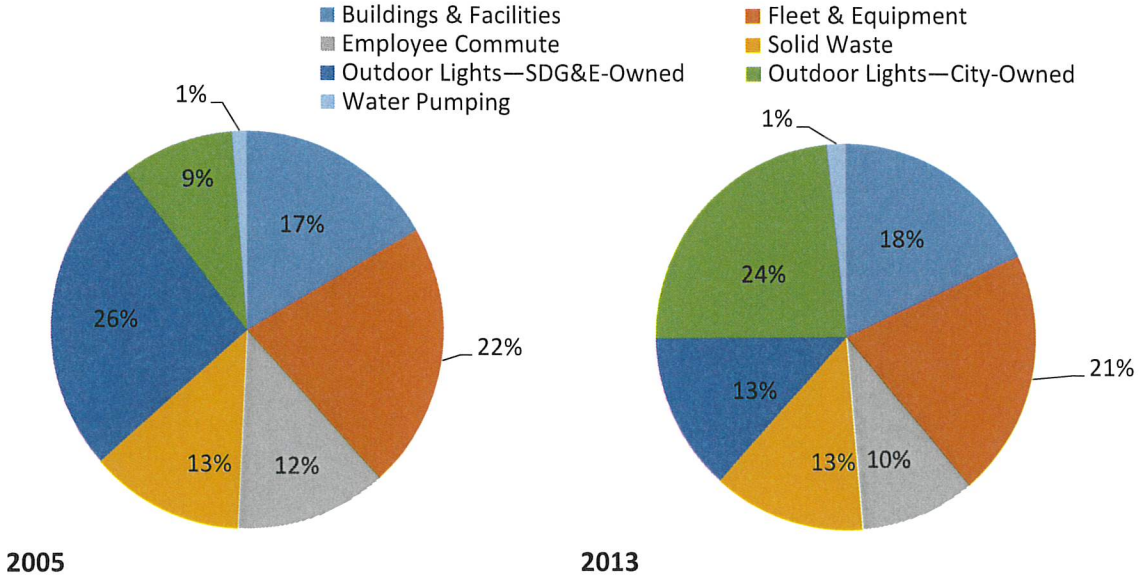


Figure 4. Municipal GHG Emissions by Sector for 2005 and 2013

Table 8. Municipal GHG Emissions by Sector for 2005 and 2013

Sector	2005 (MT CO_2e)	% of Total	2013 (MT CO_2e)	% of Total	% Change 2005–2013
Outdoor Lights–SDG&E-Owned	433	17%	252	18%	-42%
Fleet & Equipment	359	22%	396	21%	10%
Buildings & Facilities	275	13%	346	10%	26%
Solid Waste	210	13%	247	13%	18%
Employee Commute	208	26%	188	13%	-10%
Outdoor Lights–City-Owned	153	9%	450	24%	194%
Water Pumping	19.0	1%	30.0	2%	58%
Total	**1,657**		**1,909**		**15%**

Table 9 summarizes activity data for each sector and subsector.

Table 9. Activity Data used in 2005 and 2013 Municipal Inventories

Sector	2005	2013	% Change 2005–2013
Buildings & Facilities			
Electricity (kWh)	968,991	900,602	-7%
Natural Gas (therms)	6,136	5,013	-18%
Streetlights & Outdoor Lighting			
City-Owned Electricity (kWh)	613,342	1,271,181	107%
SDG&E-Owned (kWh)	1,735,514	712,155	-59%
Fleet & Equipment			
Gasoline Regular (gallons)	13,996	12,573	-10%
Gasoline Hybrid (gallons)	0	369	-
Diesel (gallons)	22,842	27,392	20%
Employee Commute			
Gasoline (vehicle miles traveled)	516,765	479,549	-7%
Diesel (vehicle miles traveled)	0	0	
# Full-Time Equivalent Employees	122	113	-7%
Solid Waste			
Generated Waste (tons)	864	1,006	16%
Water Pumping			
Electricity (kWh)	77,535	83,990	8%

Energy

As with the community energy, municipal energy use decreased but GHG emissions increased from 2005 to 2013 due to the emission factors for electricity. Municipal energy use includes Buildings & Facilities, SDG&E-owned Streetlights, City-owned Outdoor Lighting, and Water Pumping. Energy accounted for

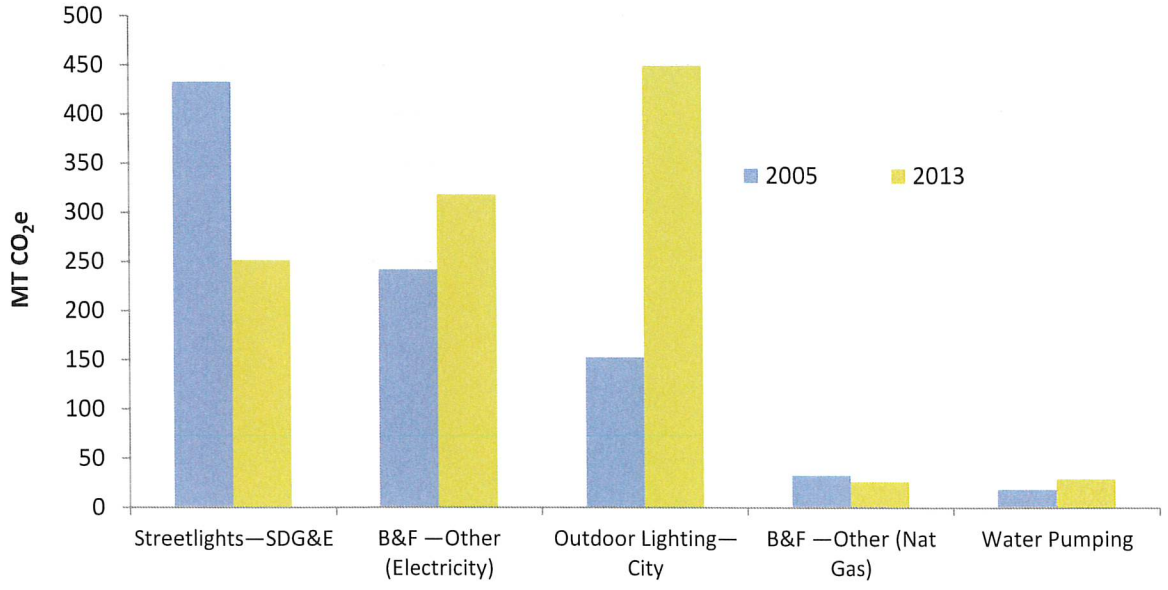
53% of total emissions in 2005 and 57% in 2013. While both electricity and natural gas are used for Building & Facilities, Streetlights and Water Pumping only use electricity. Emissions from energy increased 23% from 2005 to 2013 (Table 10). Electricity emissions increased for each sector except SDG&E-owned Streetlights. As with community energy, municipal emissions use variable electricity emission factors and constant natural gas emission factors.

Table 10. Activity Data and GHG Emissions of Energy in 2005 and 2013

Sector	2005		2013		% Change in Activity 2005–2013	% Change in Emissions 2005–2013
	Activity (kWh or therms)	Emissions (MT CO_2e)	Activity (kWh or therms)	Emissions (MT CO_2e)		
Buildings & Facilities						
Electricity	968,991	242	900,602	319	-7%	32%
Natural Gas	6,136	33	5,013	27	-18%	-18%
Streetlights—SDG&E-owned						
Electricity	1,735,514	433	712,155	252	-59%	-42%
Streetlights & Traffic Signals—City-owned						
Electricity	613,342	153	1,271,181	450	107%	194%
Water Pumping						
Electricity	77,535	19	83,990	30.00	8%	58%
Total (MTCO_2e)	**3,401,518**	**880**	**2,972,941**	**1,078**	**-13%**	**23%**

Electricity activity data are reported in kWh; Natural Gas activity data are reported in therms.

Figure 5 shows the trend in electricity and natural gas emissions from 2005 to 2013 for the municipal energy sectors.



Note: B&F is Buildings and Facilities

Figure 5. GHG Emissions for Municipal Electricity and Natural Gas, by Sector

Inventory Forecasts

GHG emissions are forecast using two scenarios: a Business-as-Usual (BAU) and an Adjusted BAU scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that will reduce emissions in the future (that is, the policies and related efficiency levels in place in 2013 are assumed to remain constant through 2035). The Adjusted BAU scenario describes emissions based on projected growth *and* considers policies that will achieve GHG reductions in the future. Policies, described in detail below, include State-adopted or approved legislation that will affect future emissions. By evaluating the two scenarios, the City can see the effect that existing policies may have on future emissions and be better able to determine how local measures can provide additional reductions. Three future years are forecasted for each scenario: 2020, 2030, and 2035. The 2020 forecast year is consistent with the goals identified in Assembly Bill (AB) 32, which identifies a statewide GHG reduction target by 2020. The 2030 and 2035 forecast years will allow the City to develop long-term strategies to continue GHG reductions beyond 2020.

Business-as-Usual Forecasts

The BAU forecasts estimate future emissions using current (2013) consumption patterns and emission factors with the anticipated growth in the City. Anticipated growth is estimated using data from regional planning scenarios developed by the SANDAG, the City, and other relevant sources (Table 11). The most relevant growth factors are used to project emissions by sector. For example, future Residential Energy emissions were developed using current energy use per household (from the 2013 inventory) and the anticipated number of households in the future. Actual energy use is a function of several variables, not only the number of households; however, this approach is supported by current protocols and best practices within the State and provides a consistent approach to forecasting. Compound annual growth rates were developed using the growth projections from 2013 to 2020 and from 2021 to 2035, as shown Table 11.

In general, the City is expecting modest growth to 2020 and 2035 as population, housing, jobs, and VMT are all expected to increase. At this time, the City expects its services to remain fairly constant over time. Please note the differences in growth rates used in the forecasts using the SANDAG Series 12 Transportation Model, EMFAC2014, and the energy related 2012 E-Grid values in these forecasts as discussed on page 2.

Table 11. Growth Factors for 2013, 2020, and 2035

Sector	Demographic Indicator	2013	2020	2035	2013–2020 CAGR[a]	2020–2035 CAGR[a]
Solid Waste, Water, Wastewater, Off-Road Sources	Service Population (Population + Jobs)	71,663	76,437	84,200	0.93%	0.65%
Population [b]	Population	55,033	59,488	63,518	1.12%	0.44%
Residential Energy	Households	19,725	20,995	24,165	0.90%	0.94%
Commercial/Industrial Energy	Jobs	16,630	16,949	20,682	0.27%	1.34%
Transportation [c]	VMT – Gas	458,785,827	493,494,150	576,966,520	25.76%	16.91%
	VMT – Diesel	27,822,637	32,536,348	45,500,895	16.94%	39.85%
Municipal Jobs	Municipal Emissions[d]	112.8	115	120	0.28%	0.28%

SOURCE: SANDAG
FTE: Full-time equivalent employees
a. Compound annual growth rate.
b. Population data are shown for informational purposes but are not used for forecasting any sector.
c. CAGR is calculated using 2013 and 2035 VMT data, and 2020 VMT is derived from the CAGR between 2013 and 2035.
d. The number of jobs in the City is used as an indicator for all municipal operation emissions.

Community Business-as-Usual Forecast

- **BAU community emissions are expected to increase 3% from baseline levels by 2020, 16% by 2030, and 23% by 2035.**

The City's BAU emissions in 2020 are estimated to be 432,982 MT CO_2e, or a 27.4% increase from baseline (2005) emissions. By 2030, emissions are estimated to increase 43.0% from the baseline level to 486,170 MT CO_2e. By 2035, emissions are estimated to increase 51.6% from the baseline level to 515,462 MT CO_2e (Table 12).

Table 12. Community BAU Forecast

Sector	2005 (MT CO_2e)	2013 (MT CO_2e)	2020 (MT CO_2e)	% Change 2013–2020	2030 (MT CO_2e)	%Change 2013–2030	2035 (MT CO_2e)	%Change 2013–2035
On-Road Transportation	181,812	242,499	264,162	8.9%	298,992	23.3%	318,334	31.3%
Residential Energy	63,544	78,651	83,753	6.5%	91,986	17.0%	96,401	22.6%
Commercial Energy	37,697	48,025	49,467	3.0%	56,486	17.6%	60,362	25.7%
Solid Waste	16,376	11,151	11,861	6.4%	12,651	13.5%	13,066	17.2%
Water & Wastewater	11,354	6,578	8,029	6.4%	8,565	13.5%	8,845	17.2%
Off-Road Sources	28,230	14,699	15,710	6.9%	17,490	19.0%	18,454	25.5%
Total	**339,972**	**402,574**	**432,982**	**7.6%**	**486,170**	**20.8%**	**515,462**	**28.0%**
% Change from 2005		**18.4%**	**27.4%**		**43.0%**		**51.6%**	

Municipal Business-as-Usual Forecast

- **BAU municipal emissions are expected to be 18% above baseline levels in 2020, 21% above baseline levels in 2030, and 23% above baseline levels by 2035.**

The City is anticipating approximately 2% growth in city utility use by 2020, 5% by 2030 and 6% by 2035, relative to 2013 levels. However, emission levels are expected to be 18, 21, and 23% higher, respectively, due to the higher electricity emission factor assumed under a BAU forecast compared to the 2005 factor as described above (Table 13 and Figure 6).

Table 13. Municipal BAU Forecast

	2005 (MT CO_2e)	2013 (MT CO_2e)	2020 (MT CO_2e)	% Change 2013–2020	2030 (MT CO_2e)	% Change 2013–2030	2035 (MT CO_2e)	% Change 2013–2035
Outdoor Lighting	586	702	716	2%	737	5%	747	6%
Vehicle Fleet	359	396	404	2%	416	5%	421	6%
Buildings & Facilities	275	346	353	2%	363	5%	368	6%
Solid Waste	210	247	252	2%	259	5%	263	6%
Employee Commute	208	188	192	2%	197	5%	200	6%
Water Pumping	19	30	31	3%	31	3%	32	7%
Total	**1,657**	**1,909**	**1,948**	**2%**	**2,003**	**5%**	**2,031**	**6%**
% Change from 2005			**15%**	**18%**	**21%**			**23%**

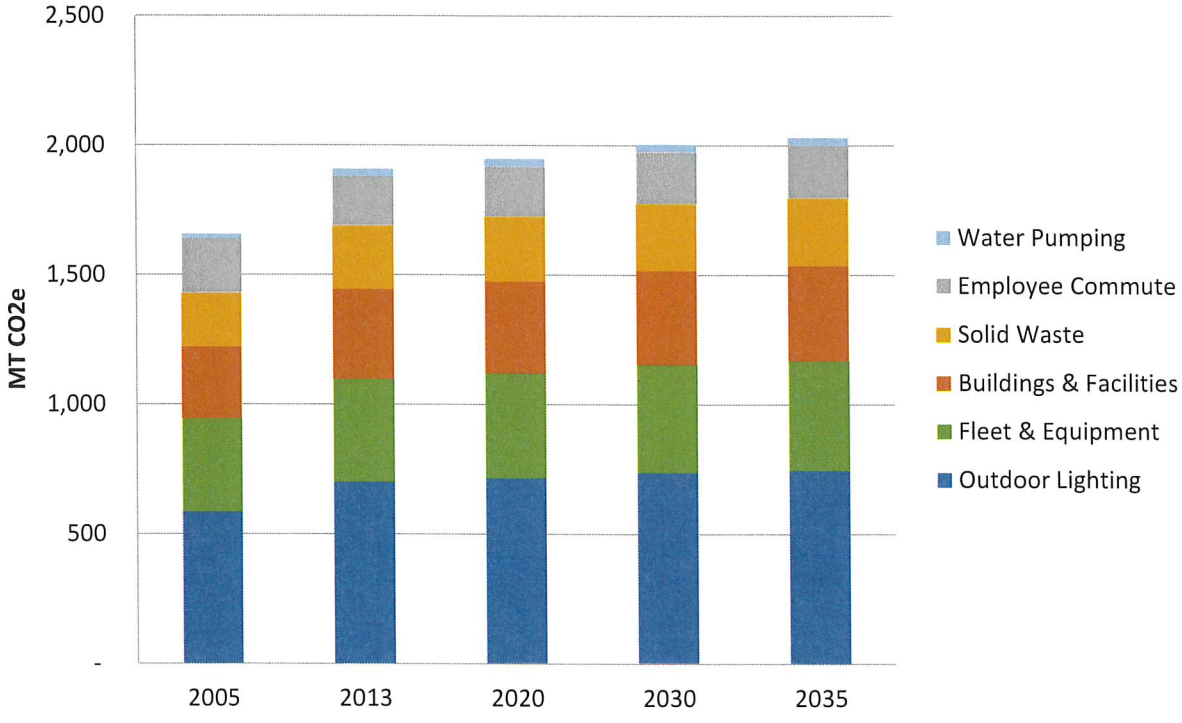


Figure 6. Municipal BAU Forecast

Adjusted Business-as-Usual Forecasts

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

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

Assembly Bill (AB) 1493 and Advanced Clean Cars. AB 1493 directed California Air Resources Board to adopt GHG standards for motor vehicles through model year 2015 that would result in reductions in GHG emissions by up to 25% in 2030. In addition, the State's Advanced Clean Cars program includes additional components that will further reduce GHG emissions statewide, including more stringent fuel efficiency standards for model years 2017—2025 and support infrastructure for the commercialization of zero-emission vehicles. CARB anticipates additional GHG reductions of 3% by 2020, 27% by 2035, and 33% by 2050.[3] CARB recently released a 2014 version of EMFAC, the standard mobile source emissions inventory tool, which includes current assumptions about how these regulations will increase fuel efficiency. Factors from EMFAC were applied to account for changes in mobile source emissions.

California Building Code Title 24. California's building efficiency standards are updated regularly to incorporate new energy efficiency technologies. The code was most recently updated in 2013 and went into effect for new development in 2014. For projects implemented after January 1, 2014, the California Energy Commission estimates that the 2013 Title 24 energy efficiency standards will reduce consumption by an estimated 25% for residential buildings and 30% for commercial buildings, relative to the 2008 standards. These percentage savings relate to heating, cooling, lighting, and water heating only; therefore, these percentage savings were applied to the estimated percentage of energy use by Title 24.

Renewable Portfolio Standard. The Renewable Portfolio Standard (RPS) requires energy providers to derive 33 percent of their electricity from qualified renewable sources by 2020 and 60 percent by 2030. This is anticipated to lower emission factors (i.e., fewer GHG emissions per kilowatt-hour used) from utilities across the state, including SDG&E. Reductions anticipated were modeled by the SEEC ClearPath software and are detailed in Attachment B.

Senate Bill X7-7. California's Senate Bill (SB) X7-7 requires water suppliers to reduce urban per capita water consumption 20% from a baseline level by 2020. Reductions in GHG emissions from SB X7-7 were calculated by applying the reduction goals established by Padre Dam to the City's population in 2020 and 2035.

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[3] CARB Advanced Clean Cars Summary Sheet, http://www.arb.ca.gov/msprog/clean_cars/acc%20summary-final.pdf

Community Adjusted Business-as-Usual Forecast

- **Emissions are expected to decrease under the Adjusted BAU forecast and will be 16.9% lower in 2020 than 2005, 14.8% lower in 2030 than 2005, and 13.2% lower than 2005 levels by 2035.**

The City's Adjusted BAU emissions are estimated to be 352,106 MT CO_2e in 2020, 339,514 MT CO_2e in 2030, and 336,543 MT CO_2e in 2035 (Table 14). This change represents 3.6% increase from 2005 by 2020, a very small reduction (0.001%) by 2030, and a 0.01% reduction by 2035. Due to the stringent State vehicle standards, while VMT is going up the emissions from the Transportation sector are expected to decrease over time. The RPS will also result in reductions in the electricity sector compared to BAU but emissions from energy are still anticipated to grow by 2035. Emissions from Solid Waste is expected to increase over time but account for less than 10% of total emissions.

Table 14. Community Adjusted BAU Emissions

Sector	2005 (MT CO_2e)	2013 (MT CO_2e)	2020 (MT CO_2e)	2020 % of Total	2030 (MT CO_2e)	2030 % of Total	2035 (MT CO_2e)	2035 % of Total
Transportation & Mobile Sources	181,812	242,499	234,283	67%	210,692	62%	201,729	60%
Residential Energy	63,544	78,651	65,424	19%	71,292	21%	74,483	22%
Commercial Energy	37,697	48,025	34,597	10%	38,543	11%	40,721	12%
Solid Waste	16,376	11,151	11,861	3%	12,651	4%	13,066	4%
Water & Wastewater	12,313	7,549	5,941	1%	6,336	2%	6,544	2%
Total	**339,972**	**402,574**	**352,106**	**100%**	**339,514**	**100%**	**336,543**	**100%**
% Change from 2005		**18.4%**	**3.6%**		**-0.001%**		**-0.01%**	

Municipal Adjusted Business-as-Usual Forecast

- **Under an Adjusted BAU forecast, the City's municipal emissions are projected to be 3% below 2005 levels in 2020. In 2030, emissions are projected to be equivalent to 2005 levels. In 2035, emissions are anticipated to be 1% higher than 2005 levels under an Adjusted BAU forecast.**

The City's Municipal Adjusted BAU emissions in 2020 are estimated to be 1,611 MT CO_2e, which is 3% lower than the 2005 baseline level (Table 15 and Figure 7). In 2030, emissions are projected to be equivalent to 2005 levels. In 2035, emissions are expected to be 1% higher than in 2005 (1,681 MT CO_2e). The Adjusted BAU emissions are lower than the BAU emissions due to the Low Carbon Fuel Standard and RPS policies described earlier. The Low Carbon Fuel Standard would lower the carbon intensity of fuels used in both the City's Fleet & Equipment and Employee Commute sectors and RPS would lower electricity-related emissions.

Table 15. Municipal Adjusted BAU Emissions

Sector	2005 (MT CO_2e)	2013 (MT CO_2e)	2020 (MT CO_2e)	2020 % of Total	2030 (MT CO_2e)	2030 % of Total	2035 (MT CO_2e)	2035 % of Total
Outdoor Lighting	586	702	514	32%	529	32%	536	32%
Fleet & Equipment	359	396	379	24%	390	24%	396	24%
Buildings & Facilities	275	346	261	16%	268	16%	272	16%
Solid Waste	210	247	252	16%	259	16%	263	16%
Employee Commute	208	188	180	11%	185	11%	188	11%
Water Pumping	19	30	25	2%	26	2%	26	2%
Total	**1,657**	**1,909**	**1,611**	**100%**	**1,657**	**100%**	**1,681**	**100%**
% Change from 2005		**15%**	**-3%**		**0%**		**1%**	

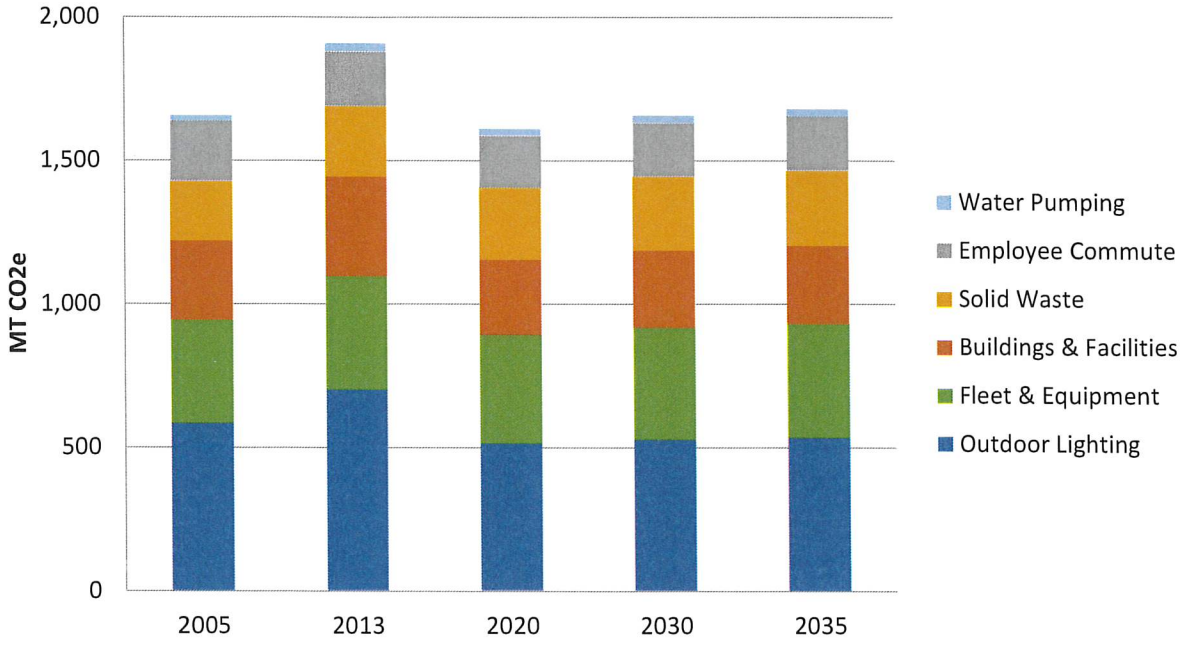

Figure 7. Municipal Adjusted BAU Emissions

Reduction Targets

The State has set goals for reducing GHG emissions by 2020 and 2050 through AB 32 and Executive Order (EO) S-3-05, respectively. The State has also provided guidance to local jurisdictions as "essential partners" in achieving the State's goals by identifying a 2020 recommended reduction goal. That goal, stated in the AB 32 Scoping Plan, was for local governments to achieve a 15% reduction below 2005 levels by 2020, which aligns with the State's goal of not exceeding 1990 emissions levels by 2020.[4] The State's long term target is to emit no more than 20% of 1990 levels by 2050 (or, a reduction of 80% below 1990 levels by 2050). On April 29, 2015, Executive Order B-30-15 set an interim reduction goal of

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

40% from 1990 levels by the year 2030. However, the state has not assigned a corresponding interim goal for local governments. The newly adopted interim state goal is not recommended for the City since some of the emission sources, such as major industrial processes, are not under the control of local governments. In this case, according to the Scoping Plan, a straight-line projection from the 2020 to 2050 goals would be recommended, which result in a reduction goal of 38% below 2005 levels by 2030, and 49% below 2005 levels by mid-2035.

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

Ultimately, the City will determine the level of reductions that it can and should achieve. Both mass emissions (performance target) and per capita emissions (efficiency target) GHG reduction targets are identified for 2020, 2030, and 2035. The targets provided below are guidance based on consistency with the State's goals for local governments and are provided to guide the City in determining targets.

Recommended Community Targets

In 2020, the City would meet the State-Aligned performance and efficiency GHG reduction targets under the Adjusted BAU scenario, but would need to reduce 63,130 MT CO_2e to meet the performance target. In 2030, under the Adjusted BAU scenario, the City would meet the State-Aligned efficiency target, but would need to reduce 135,531 MT CO_2e to meet the performance target. In 2035, under the Adjusted BAU scenario, the City would meet the State-Aligned efficiency target, but would need to reduce 163,157 MT CO_2e to meet the performance target (Table 16, Figure 8 and Figure 9).

Table 16. State-Aligned GHG Reduction Targets

Sector	2005	2013	2020	2030	2035
BAU Emissions (MT CO_2e)	339,972	402,574	432,982	486,170	515,462
Adjusted BAU Emissions (MT CO_2e)	339,972	402,574	352,106	339,514	336,543
Service Population (Population + Jobs)	70,152	71,663	76,437	81,499	84,200
Adjusted BAU Per Capita Emissions (MT CO_2e/SP)			2.65	2.55	2.51
State-Aligned Performance Target (% change from 2005)			-15%	-40%	-49%
State-Aligned Performance Target (MT CO_2e)			288,976	203,983	173,386
Reductions from Adjusted BAU needed to meet the Performance Target (MT CO_2e)			63,130	135,531	163,157
State-Aligned Efficiency Target (MT CO_2e/SP)			5.06	3.80	3.16
Reductions from Adjusted BAU needed to meet the Efficiency Target (MT CO_2e/SP)			Target Met	Target Met	Target Met

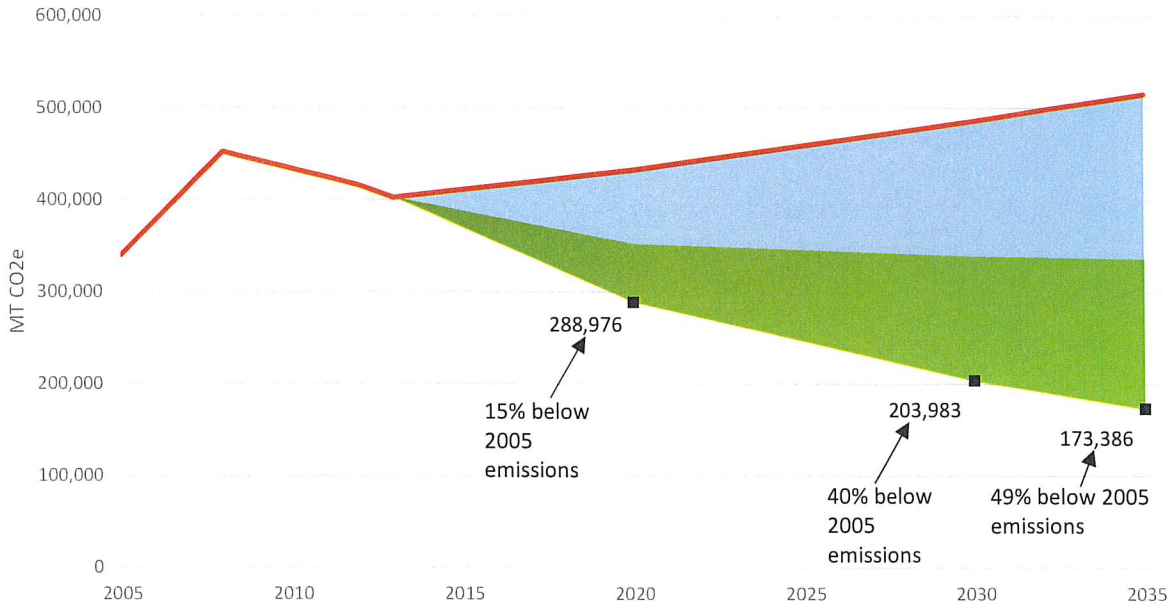

Figure 8. Community Emissions Inventories, Projections, and Performance Targets

Figure 9. Community Emission Inventories, Projections, and Efficiency Targets

The City of Santee controls over 63% of state-wide emission source types. This was determined by comparing the GHG inventories of the state (2018) with the GHG emissions in Santee (2015). This is summarized in Table 16A below:

Table 16A GHG Emissions by Source

Sector	2015 Statewide Emissions (MMT CO_2e)	Percent of Total 2015 Statewide Emissions
Commercial Natural Gas	10.50	2.38
Residential Natural Gas	21.90	4.97
Solid Waste	8.73	1.98

Sector	2015 Statewide Emissions (MMT CO_2e)	Percent of Total 2015 Statewide Emissions
On-Road Transportation	149.42	33.93
Residential and Commercial Electricity and Water	83.67	19.00
Wastewater	1.82	0.41
Off-Road	2.53	0.58
Above Sectors Total	**278.57**	**63.26**
Statewide Total	**440.36**	-

Source: CARB. California Greenhouse Gas Emission Inventory (2018).

Recommended Municipal Targets

In 2020, the City would need to reduce its emissions by 203 MT CO_2e from the Adjusted BAU forecast to achieve a reduction goal consistent with the State (Table 17 and Figure 10). The City will also need to implement measures to continue to achieve GHG reductions beyond 2020. Early implementation of measures demonstrates the City's commitment to the CAP, leadership in the community, and allows the City to phase implementation of new strategies so that ongoing reductions may be achieved. By 2030, the City will need to reduce municipal operation emissions by 1,033 MT CO_2e from an Adjusted BAU forecast to meet a 38% reduction goal below 2005 levels. By 2035, the City will need to reduce municipal operation emissions by 836 MT CO_2e from an Adjusted BAU forecast to meet a 49% reduction goal (below 2005 levels).

Table 17. State-Aligned Municipal GHG Reduction Targets

	2005	2013	2020	2030	2035
BAU Emissions (MT CO_2e)	1,657	1,909	1,948	2,003	2,031
Adjusted BAU Emissions (MT CO_2e)	1,657	1,909	1,611	1,657	1,681
State-Aligned Target (% change from 2005)			-15%	-38%	-49%
State-Aligned Target (% change from 2013)			-26%	-46%	-56%
State-Aligned Emissions Goal (MT CO_2e)			1,408	994	845
Reductions from Adjusted BAU needed to meet the Target (MT CO_2e)			203	663	836

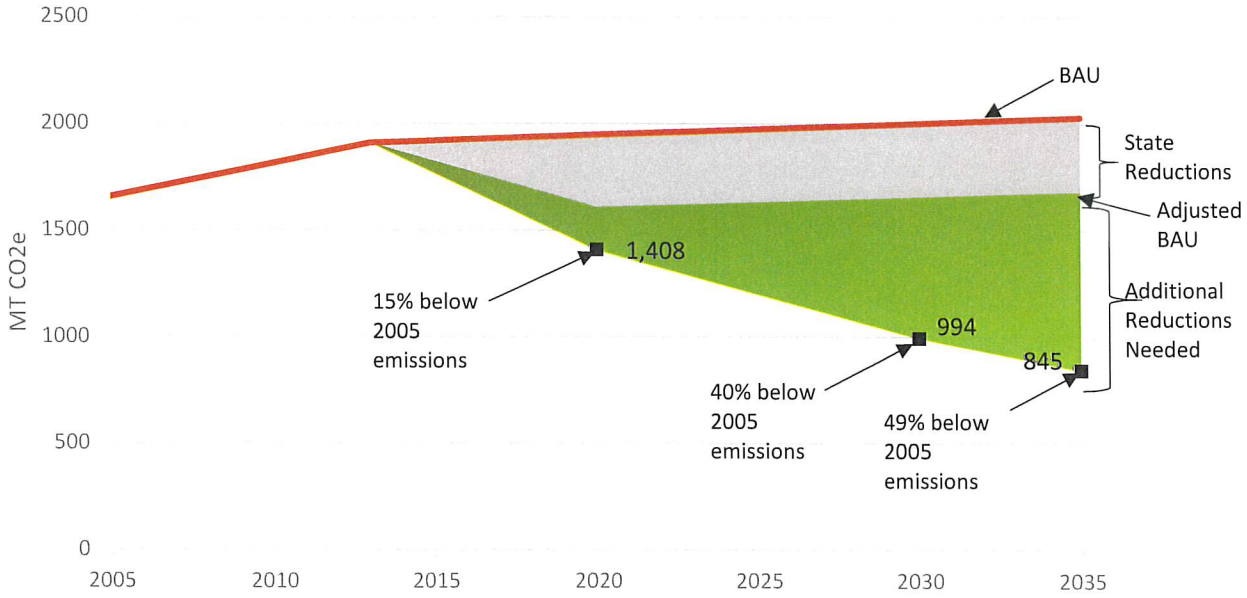

Figure 10. Municipal Emissions and Targets

Conclusions and Next Steps

This Report presents the City's community and municipal inventories, forecasts, and recommended reduction targets. It provides the City a first look at what will be needed to meet emissions reductions that are aligned with the State and to mitigate the City's impacts on climate change. This Report also helps to guide the City in determining feasible energy efficiency and GHG reduction opportunities by detailing the sources of emissions by sector.

The next steps in the CAP development process are to review the information provided in this Report and to determine preliminary GHG reduction targets for the community and municipal operations.

References

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

California Air Resources Board (ARB). 2010. Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories version 1.1.

California Air Resources Board (ARB). 2011. California Greenhouse Gas Emissions Inventory: 2000-2009.

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

Intergovernmental Panel on Climate Change. (IPCC) 1996. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Attachment A: Glossary of Terms

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

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

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

Carbon Dioxide Equivalent (CO_2e): This is a common unit for normalizing greenhouse gases with different levels of heat trapping potential. For carbon dioxide itself, emissions in tons of CO_2 and tons of CO_2e are the same, whereas one ton of nitrous oxide emissions equates to 298 tons of CO_2e and one ton of methane equates to 25 tons of CO_2e. The values are based on the gases' global warming potentials.

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

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

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

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

Municipal Inventory: GHG emissions that result from the activities performed as part of the government operations in the city and are a subset of the community inventory. An inventory reports emissions that occur over a single calendar year.

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

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

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Attachment B: Methodology

See Appendix B of the Sustainable Santee Plan.

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Attachment C: Vehicle Miles Traveled (VMT) Calculations

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Attachment B: Methodology

See Appendix B of the Sustainable Santee Plan.

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Attachment C: Vehicle Miles Traveled (VMT) Calculations

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2008 Base Year

JURISDICTION	TOTAL VMT	TOTAL City of Santee VMT	Two Trip End City of Santee VMT	One Trip End City of Santee VMT	NON-City of Santee VMT
			I-I	I-E and E-I	
CARLSBAD TOTAL	3,344,347	14,245	-	14,245	3,330,102
CHULA VISTA TOTAL	3,943,542	32,507	-	32,507	3,911,035
CORONADO TOTAL	431,181	2,874	-	2,874	428,307
DEL MAR TOTAL	97,064	264	-	264	96,800
EL CAJON TOTAL	2,167,286	282,301	-	282,301	1,884,985
ENCINITAS TOTAL	2,078,290	16,997	-	16,997	2,061,293
ESCONDIDO TOTAL	2,802,466	16,903	-	16,903	2,785,563
External TOTAL	347,582	3,127	-	3,127	344,455
IMPERIAL BEACH TOTAL	119,733	343	-	343	119,390
LA MESA TOTAL	1,831,122	163,686	-	163,686	1,667,436
LEMON GROVE TOTAL	834,635	53,702	-	53,702	780,933
NATIONAL CITY TOTAL	1,648,766	12,206	-	12,206	1,636,560
OCEANSIDE TOTAL	3,194,608	5,040	-	5,040	3,189,568
POWAY TOTAL	1,107,533	17,169	-	17,169	1,090,364
SAN DIEGO TOTAL	38,705,172	882,135	-	882,135	37,823,037
SAN MARCOS TOTAL	2,020,178	5,470	-	5,470	2,014,708
SANTEE TOTAL	881,909	627,655	200,301	427,354	254,254
SOLANA BEACH TOTAL	572,631	6,133	-	6,133	566,498
Unincorporated TOTAL	17,398,289	417,937	-	417,937	16,980,352
VISTA TOTAL	1,721,580	1,137	-	1,137	1,720,443
REGIONWIDE TOTAL	85,247,914	2,561,831	200,301	2,361,530	82,686,083
			100% * (I-I)+ 50% * (I-E + E-I)	1,381,066	

2013 Verification

JURISDICTION	TOTAL VMT	TOTAL City of Santee VMT	Two Trip End City of Santee VMT	One Trip End City of Santee VMT	NON-City of Santee VMT
		I-I, I-E and E-I	I-I	I-E and E-I	
CARLSBAD TOTAL	3,376,864	14,282	-	14,282	3,362,582
CHULA VISTA TOTAL	3,964,512	33,677	-	33,677	3,930,835
CORONADO TOTAL	431,668	2,948	-	2,948	428,720
DEL MAR TOTAL	95,056	254	-	254	94,802
EL CAJON TOTAL	2,055,440	265,255	-	265,255	1,790,185
ENCINITAS TOTAL	2,110,816	17,144	-	17,144	2,093,672
ESCONDIDO TOTAL	2,859,486	17,618	-	17,618	2,841,868
External TOTAL	353,337	3,275	-	3,275	350,062
IMPERIAL BEACH TOTAL	120,868	357	-	357	120,511
LA MESA TOTAL	1,745,064	168,487	-	168,487	1,576,577
LEMON GROVE TOTAL	842,238	54,908	-	54,908	787,330
NATIONAL CITY TOTAL	1,656,923	12,875	-	12,875	1,644,048
OCEANSIDE TOTAL	3,188,610	5,053	-	5,053	3,183,557
POWAY TOTAL	1,074,614	16,974	-	16,974	1,057,640
SAN DIEGO TOTAL	39,384,287	878,189	-	878,189	38,506,098
SAN MARCOS TOTAL	2,055,701	5,806	-	5,806	2,049,895
SANTEE TOTAL	1,121,191	667,430	210,476	456,954	453,761
SOLANA BEACH TOTAL	583,015	6,175	-	6,175	576,840
Unincorporated TOTAL	17,512,378	422,155	-	422,155	17,090,223
VISTA TOTAL	1,734,411	1,322	-	1,322	1,733,089
REGIONWIDE TOTAL	86,266,479	2,594,184	210,476	2,383,708	83,672,295
			100% * (I-I)+ 50% * (I-E + E-I)	1,402,330	

City Preferred 2035 Scenario A

JURISDICTION	TOTAL VMT	TOTAL City of Santee VMT	Two Trip End City of Santee VMT	One Trip End City of Santee VMT	NON-City of Santee VMT
		I-I, I-E and E-I	I-I	I-E and E-I	E-E
CARLSBAD TOTAL	4,280,026	21,770	-	21,770	4,258,256
CHULA VISTA TOTAL	5,642,301	48,222	-	48,222	5,594,079
CORONADO TOTAL	470,638	3,258	-	3,258	467,380
DEL MAR TOTAL	100,867	325	-	325	100,542
EL CAJON TOTAL	2,477,835	318,427	-	318,427	2,159,408
ENCINITAS TOTAL	2,554,267	24,559	-	24,559	2,529,708
ESCONDIDO TOTAL	3,491,727	23,639	-	23,639	3,468,088
External TOTAL	526,361	5,057	-	5,057	521,304
IMPERIAL BEACH TOTAL	134,250	348	-	348	133,902
LA MESA TOTAL	2,148,837	212,975	-	212,975	1,935,862
LEMON GROVE TOTAL	979,458	75,353	-	75,353	904,105
NATIONAL CITY TOTAL	1,987,933	15,640	-	15,640	1,972,293
OCEANSIDE TOTAL	4,055,786	7,782	-	7,782	4,048,004
POWAY TOTAL	1,312,994	22,861	-	22,861	1,290,133
SAN DIEGO TOTAL	47,645,328	1,075,221	-	1,075,221	46,570,107
SAN MARCOS TOTAL	2,721,799	6,797	-	6,797	2,715,002
SANTEE TOTAL	1,386,488	871,692	268,056	603,636	514,796
SOLANA BEACH TOTAL	717,427	8,690	-	8,690	708,737
Unincorporated TOTAL	24,372,628	575,904	-	575,904	23,796,724
VISTA TOTAL	2,216,087	1,132	-	1,132	2,214,955
REGIONWIDE TOTAL	109,223,037	3,319,652	268,056	3,051,596	105,903,385
			100% * (I-I)+ 50% * (I-E + E-I)	1,793,854	

Attachment D: Emission Factors

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Emission Factors

The emission factors for the built environment used in this analysis were the same as employed by the Energy Policy Initiatives Center (EPIC) in 2014.

GHG emissions associated with the on-road activity data was calculated using the California Air Resources Board (ARB) on-road emissions factor model 2014 (EMFAC2014).

Emission Factors

Built Environment		
Input Type	Value	Source
Natural Gas (MMT CO2e/ MM Therms)	0.0053052	ARB
Electricity (2010 lb/MWh)	680.4	FERC/SDG&E/EPA E-Grid
Electricity (2011 lb/MWh)	676.2	FERC/SDG&E/EPA E-Grid
Electricity (2012 lb/MWh)	778.5	FERC/SDG&E/EPA E-Grid

Source: Dr. Nilmini Silva-Send email of September 12, 2014.

APPENDIX B

SUPPORTING DATA

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

The following tables are provided in this appendix:

- Factor Sets
- Community Inventory Input (Excluding Off-Road and Water Sectors)
- Community Business-As-Usual Forecast Input
- Community Adjusted Business-As-Usual Forecast Input
- Community Inventory Input (Off-Road Sector)
- Community Inventory Input (Water Sector)
- Municipal Inventory and Forecasts Input (Excluding Vehicle Fleet Sector)
- Municipal Inventory Input (Vehicle Fleet Sector)
- Community Inventories, Business-As-Usual Forecast, and Adjusted Business-As-Usual Forecast Output
- Municipal Inventories, Business-As-Usual Forecast, and Adjusted Business-As-Usual Forecast Output

Factor Sets

Global Warming Potential

Year	GHG	Sector	Full Name	Units	Factor	Proxy Year	Source	SEEC Entry Name
ALL	CO2	GWP	GWP_AR4_CO2	NA	1	NA	IPCC AR4 2007	NA; Choose IPCC 4th AR in Parameters
ALL	CH4	GWP	GWP_AR4_CH4	NA	25	NA	IPCC AR4 2007	NA; Choose IPCC 4th AR in Parameters
ALL	N2O	GWP	GWP_AR4_N2O	NA	298	NA	IPCC AR4 2007	NA; Choose IPCC 4th AR in Parameters
ALL	CO2	NaturalGas	NaturalGas_CO2	kg CO2/MMBtu	53.02	NA	Community Protocol Appendix C B.1	N/A; embedded in Tool
ALL	CH4	NaturalGas	NaturalGas_CH4	kg CH4/MMBtu	0.005	NA	Community Protocol Appendix C B.3	N/A; embedded in Tool
ALL	N2O	NaturalGas	NaturalGas_N2O	kg N2O/MMBut	0.0001	NA	Community Protocol Appendix C B.3	N/A; embedded in Tool

SDG&E Electricity 550.488

Year	GHG	Sector	Full Name	Units	Factor	Proxy Year	Source	SEEC Entry Name
2005	CO2	Electricity	Electricity_SDGE_CO2_2005	lbs CO2/MWh	546.46	NA	Climate Registry/SDG&E	SDGE_2005
2005	CH4	Electricity	Electricity_SDGE_CH4_2005	lbs CH4/MWh	0.030	NA	Community Protocol Appendix C	SDGE_2005
2005	N2O	Electricity	Electricity_SDGE_N2O_2005	lbs N2O/MWh	0.011	NA	Community Protocol Appendix C	SDGE_2005
2008	CO2	Electricity	Electricity_SDGE_CO2_2007	lbs CO2/MWh	739.05	NA	Climate Registry/SDG&E	SDGE_2008
2008	CH4	Electricity	Electricity_SDGE_CH4_2007	lbs CH4/MWh	0.029	NA	Community Protocol Appendix C	SDGE_2008
2008	N2O	Electricity	Electricity_SDGE_N2O_2007	lbs N2O/MWh	0.010	NA	Community Protocol Appendix C	SDGE_2008
2012	CO2	Electricity	Electricity_SDGE_CO2_2010	lbs CO2/MWh	778.50	NA	EPIC - FERC/SDG&E/EPA E-Grid	SDGE_2012
2012	CH4	Electricity	Electricity_SDGE_CH4_2010	lbs CH4/MWh	0.029	NA	Community Protocol Appendix C	SDGE_2012
2012	N2O	Electricity	Electricity_SDGE_N2O_2010	lbs N2O/MWh	0.006	NA	Community Protocol Appendix C	SDGE_2012
2013	CO2	Electricity	Electricity_SDGE_CO2_2012	lbs CO2/MWh	778.50	NA	NA	SDGE_2013_2012proxy
2013	CH4	Electricity	Electricity_SDGE_CH4_2012	lbs CH4/MWh	0.029	NA	NA	SDGE_2013_2012proxy
2013	N2O	Electricity	Electricity_SDGE_N2O_2012	lbs N2O/MWh	0.006	NA	NA	SDGE_2013_2012proxy

Statewide Electricity--for Water-related Energy

Year	GHG	Sector	Full Name	Units	Factor	Proxy Year	Source	SEEC Entry Name
2005	CO2	Electricity	Electricity_CA_CO2_2005	lbs CO2/MWh	948.28	NA	Community Protocol Appendix C	CA_2005
2005	CH4	Electricity	Electricity_CA_CH4_2005	lbs CH4/MWh	0.03	NA	Community Protocol Appendix C	CA_2005
2005	N2O	Electricity	Electricity_CA_N2O_2005	lbs N2O/MWh	0.011	NA	Community Protocol Appendix C	CA_2005
2008	CO2	Electricity	Electricity_CA_CO2_2007	lbs CO2/MWh	919.64	2007	Community Protocol Appendix C	CA_2008_2007proxy
2008	CH4	Electricity	Electricity_CA_CH4_2007	lbs CH4/MWh	0.029	2007	Community Protocol Appendix C	CA_2008_2007proxy
2008	N2O	Electricity	Electricity_CA_N2O_2007	lbs N2O/MWh	0.01	2007	Community Protocol Appendix C	CA_2008_2007proxy
2012	CO2	Electricity	Electricity_CA_CO2_2012	lbs CO2/MWh	658.68	2009	Community Protocol Appendix C	CA_2012_2009proxy
2012	CH4	Electricity	Electricity_CA_CH4_2012	lbs CH4/MWh	0.02894	2009	Community Protocol Appendix C	CA_2012_2009proxy
2012	N2O	Electricity	Electricity_CA_N2O_2012	lbs N2O/MWh	0.00617	2009	Community Protocol Appendix C	CA_2012_2009proxy
2013	CO2	Electricity	Electricity_CA_CO2_2013	lbs CO2/MWh	658.68	2009	Community Protocol Appendix C	CA_2013_2009proxy
2013	CH4	Electricity	Electricity_CA_CH4_2013	lbs CH4/MWh	0.02894	2009	Community Protocol Appendix C	CA_2013_2009proxy
2013	N2O	Electricity	Electricity_CA_N2O_2013	lbs N2O/MWh	0.00617	2009	Community Protocol Appendix C	CA_2013_2009proxy

Waste Characterization Factor Sets

Name	ADC_EPA	CalRecycle_2005_2004proxy	CalRecycle_2007+2010+2012_2008proxy	
Year	2005/2008/2012/2013	2005	2008/2012/2013	
	Alternative Daily Cover (ADC)	Municipal Solid Waste (MSW)	Municipal Solid Waste (MSW)	Corresponding Name in California Integrated Waste Management Board Report
Unit	%	%	%	
Mixed MSW	0	0	0	
Newspaper	0	2.2	1.3	Newspaper
Office Paper	0	5.4	4.9	White/Colored Ledger Paper + Other Office Paper + Other Miscellaneous Paper
Cardboard	0	6.7	5.2	Uncoated Corrugated Cardboard + Paper Bags
Magazine/Third Class Mail	0	6.5	5.9	Magazines and Catalogs + Remainder/Composite Paper
Food Scraps	0	14.6	15.5	Food
Grass	30	2.1	1.9	Leaves and Grass
Leaves	40	2.1	1.9	Leaves and Grass
Branches	30	2.6	3.3	Branches and Stumps + Prunings and Trimmings
Lumber	0	9.6	14.5	Lumber

Conversions

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

g/mi	Gasoline On Road Average Factor	Gasoline On Road Average Factor	Gasoline On Road Average Factor	Diesel On Road Average Factor	Diesel On Road Average Factor	Diesel On Road Average Factor		
	CO2	CH4	N2O	CO2	CH4	N2O	% vehicles gasoline	% vehicles diesel
2005	460.853	0.03	0.034	1291.165	0.001	0.001	94.7%	5.3%
2008	464.489	0.028	0.029	1308.058	0.001	0.001	94.0%	6.0%
2012	449.894	0.028	0.029	1282.669	0.001	0.001	94.4%	5.6%
2013	442.092	0.028	0.029	1271.538	0.001	0.001	94.3%	5.7%

CH4 and N2O Community Protocol Appendix D Table TR.1.4
CO2 from EMFAC2014 for San Diego County
Division of gasoline and diesel: XX% VMT gasoline/diesel

Transportation

			2005	2008	2012	2013
Gasoline	**Passenger Vehicle**	MPG	22.91	22.92	23.17	23.50
		g CH4/mi	0.03	0.028	0.028	0.028
		g N2O/mi	0.034	0.029	0.029	0.029
	Light Truck	MPG	18.26	18.24	18.44	18.68
		g CH4/mi	0.035	0.031	0.031	0.031
		g N2O/mi	0.049	0.043	0.043	0.043
	Heavy Truck	MPG	7.45	7.46	7.38	7.39
		g CH4/mi	0.0333	0.0333	0.0333	0.0333
		g N2O/mi	0.0134	0.0134	0.0134	0.0134
Diesel	**Passenger Vehicle**	MPG	27.09	27.29	29.03	29.57
		g CH4/mi	0.001	0.001	0.001	0.001
		g N2O/mi	0.001	0.001	0.001	0.001
	Light Truck	MPG	21.23	21.70	23.55	23.78
		g CH4/mi	0.001	0.001	0.001	0.001
		g N2O/mi	0.001	0.001	0.001	0.001
	Heavy Truck	MPG	12.39	12.40	12.35	12.38
		g CH4/mi	0.0051	0.0051	0.0051	0.0051
		g N2O/mi	0.0048	0.0048	0.0048	0.0048

Note: MPG is from EMFAC2014 for San Diego County; CH4 and N2O emission factors are from US Community Protocal Version 1.0 October 2012 Appendix D; Passenger Vehicle and Light Truck emission factors only have data for 2005, and 2006 and after, Heavy Truck only have 2010, so that other years are approximate.

Community Inventory Input (Excluding Off-Road and Water Sectors)

Year	Variable	SEEC Entry Name	Santee	County	Data Source
2005	**Population**	Multiple Entries	54,370	3,034,388	GHG Emission inventory (ICLEI 2011)
2008	**Population**	Multiple Entries	55,850	3,131,552	SANDAG Data Warehouse online September 2014
2012	**Population**	Multiple Entries	54,643	3,143,429	SANDAG Series 13 e-mail
2013	**Population**	Multiple Entries	55,033	3,150,178	Local Profile 2013
2020	**Population**	NA (For Forecast Growth Rate Calculation Only)	59,488	3,435,713	SANDAG Series 13 e-mail
2035	**Population**	NA (For Forecast Growth Rate Calculation Only)	63,518	3,853,698	SANDAG Series 13 e-mail
2005	**Households**	Multiple Entries	18,563	1,058,265	GHG Emission inventory (ICLEI 2011)
2008	**Households**	Multiple Entries	19,080	1,074,896	SANDAG Data Warehouse online September 2014
2013	**Households**	Multiple Entries	19,725	1,105,120	Local Profile 2013
2020	**Households**	NA (For Forecast Growth Rate Calculation Only)	20,995	1,180,923	SANDAG Series 13 Housing Units and Local Profile 2013 vacancy rates (Per John's email: add 2,000 extra dwelling units as a growth buffer)
2035	**Households**	NA (For Forecast Growth Rate Calculation Only)	24,165	1,317,980	SANDAG Series 13 Housing Units and Local Profile 2013 vacancy rates
2005	**Jobs_Total**	Multiple Entries	15,782	1,498,781	GHG Emission inventory (ICLEI 2011)
2008	**Jobs_Total**	Multiple Entries	16,009	1,522,204	Estimated based on CAGR between 2005 and 2020 estimates
2012	**Jobs_Total**	Multiple Entries	16,316	1,554,005	Estimated based on CAGR between 2005 and 2020 estimates
2013	**Jobs_Total**	Multiple Entries	16,630	1,586,471	Estimated based on CAGR between 2005 and 2020 estimates
2020	**Jobs_Total**	NA (For Forecast Growth Rate Calculation Only)	16,949	1,619,615	CA Dept of Finance
2035	**Jobs_Total**	NA (For Forecast Growth Rate Calculation Only)	20,682	1,815,149	CA Dept of Finance
2005	**Jobs_Agricultural**	NA (For Off-Road Emissions Calculation Only)	73	10,700	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2008	**Jobs_Agricultural**	NA (For Off-Road Emissions Calculation Only)	73	10,700	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2012	**Jobs_Agricultural**	NA (For Off-Road Emissions Calculation Only)	73	10,700	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2013	**Jobs_Agricultural**	NA (For Off-Road Emissions Calculation Only)	73	10,700	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2005	**Jobs_Manufacturing**	NA (For Off-Road Emissions Calculation Only)	2,303	103,633	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2008	**Jobs_Manufacturing**	NA (For Off-Road Emissions Calculation Only)	2,303	103,633	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2012	**Jobs_Manufacturing**	NA (For Off-Road Emissions Calculation Only)	2,303	103,633	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2013	**Jobs_Manufacturing**	NA (For Off-Road Emissions Calculation Only)	2,303	103,633	Santee: City's Facts and Figures on website_2008-2012proxy; County: CA Dept of Finance_2006proxy
2005	**Building_Permits**	NA (For Off-Road Emissions Calculation Only)	284	8,208	US Census Bureau http://censtats.census.gov/bldg/bldgprmt.shtml
2008	**Building_Permits**	NA (For Off-Road Emissions Calculation Only)	157	2,524	US Census Bureau http://censtats.census.gov/bldg/bldgprmt.shtml
2012	**Building_Permits**	NA (For Off-Road Emissions Calculation Only)	41	2,490	US Census Bureau http://censtats.census.gov/bldg/bldgprmt.shtml
2013	**Building_Permits**	NA (For Off-Road Emissions Calculation Only)	32	2,817	US Census Bureau http://censtats.census.gov/bldg/bldgprmt.shtml
2005	**Income_Median**	NA (For Off-Road Emissions Calculation Only)	70,048	51,920	Santee: SANDAG local profile_2010proxy; County: SANDAG Regional Growth_2008proxy
2008	**Income_Median**	NA (For Off-Road Emissions Calculation Only)	70,048	51,920	Santee: SANDAG local profile_2010proxy; County: SANDAG Regional Growth_2008proxy
2012	**Income_Median**	NA (For Off-Road Emissions Calculation Only)	76,261	70,926	SANDAG local profile_2013proxy
2013	**Income_Median**	NA (For Off-Road Emissions Calculation Only)	76,261	70,926	SANDAG local profile
2005	**Electricity_Residential_Bundled_kWh**	Residential_Electricity_Bundled_2005	128,600,217	N/A	GHG Emission inventory (ICLEI 2011)
2005	**Electricity_Residential_Direct_kWh**	Residential_Electricity_Direct_2005	690,222	N/A	GHG Emission inventory (ICLEI 2011)
2005	**Electricity_Commercial_Bundled_kWh**	Commercial_Electricity_Bundled_2005	89,546,084	N/A	GHG Emission inventory (ICLEI 2011)
2005	**Electricity_Commercial_Direct_kWh**	Commercial_Electricity_Direct_2005	15,080,916	N/A	GHG Emission inventory (ICLEI 2011)
2005	**Electricity_Industrial_Bundled_kWh**	Industrial_Electricity_Bundled_2005	16,098,233	N/A	GHG Emission inventory (ICLEI 2011)
2005	**Electricity_Industrial_Direct_kWh**	Industrial_Electricity_Direct_2005	-	N/A	GHG Emission inventory (ICLEI 2011)
2008	**Electricity_Residential_Bundled_kWh**	Residential_Electricity_Bundled_2008	140,698,951	N/A	SDG&E 2014 e-mail through City of Santee
2008	**Electricity_Residential_Direct_kWh**	Residential_Electricity_Direct_2008	728,868	N/A	SDG&E 2014 e-mail through City of Santee
2008	**Electricity_Commercial_Bundled_kWh**	Commercial_Electricity_Bundled_2008	92,105,712	N/A	SDG&E 2014 e-mail through City of Santee
2008	**Electricity_Commercial_Direct_kWh**	Commercial_Electricity_Direct_2008	16,882,266	N/A	SDG&E 2014 e-mail through City of Santee
2008	**Electricity_Industrial_Bundled_kWh**	Industrial_Electricity_Bundled_2008	14,584,915	N/A	SDG&E 2014 e-mail through City of Santee
2008	**Electricity_Industrial_Direct_kWh**	Industrial_Electricity_Direct_2008	-	N/A	SDG&E 2014 e-mail through City of Santee
2012	**Electricity_Residential_Bundled_kWh**	Electricity_Residential_Bundled_kWh_2012	141,207,940	N/A	SDG&E 2014 e-mail through City of Santee
2012	**Electricity_Residential_Direct_kWh**	Electricity_Residential_Direct_kWh_2012	441,996	N/A	SDG&E 2014 e-mail through City of Santee
2012	**Electricity_Commercial_Bundled_kWh**	Electricity_Commercial_Bundled_kWh_2012	87,203,948	N/A	SDG&E 2014 e-mail through City of Santee
2012	**Electricity_Commercial_Direct_kWh**	Electricity_Commercial_Direct_kWh_2012	15,646,581	N/A	SDG&E 2014 e-mail through City of Santee
2012	**Electricity_Industrial_Bundled_kWh**	Electricity_Industrial_Bundled_kWh_2012	10,036,932	N/A	SDG&E 2014 e-mail through City of Santee
2012	**Electricity_Industrial_Direct_kWh**	Electricity_Industrial_Direct_kWh_2012	7,955,195	N/A	SDG&E 2014 e-mail through City of Santee
2013	**Electricity_Residential_Bundled_kWh**	Electricity_Residential_Bundled_kWh_2013	135,725,055	N/A	SDG&E 2014 e-mail through City of Santee
2013	**Electricity_Residential_Direct_kWh**	Electricity_Residential_Direct_kWh_2013	383,093	N/A	SDG&E 2014 e-mail through City of Santee
2013	**Electricity_Commercial_Bundled_kWh**	Electricity_Commercial_Bundled_kWh_2013	95,980,209	N/A	SDG&E 2014 e-mail through City of Santee
2013	**Electricity_Commercial_Direct_kWh**	Electricity_Commercial_Direct_kWh_2013	19,359,372	N/A	SDG&E 2014 e-mail through City of Santee
2013	**Electricity_Industrial_Bundled_kWh**	Electricity_Industrial_Bundled_kWh_2013	N/A	N/A	SDG&E 2014 e-mail through City of Santee
2013	**Electricity_Industrial_Direct_kWh**	Electricity_Industrial_Direct_kWh_2013	N/A	N/A	SDG&E 2014 e-mail through City of Santee
2005	**NatGas_Res_therms**	Residential_NatGas_2005	5,878,287	N/A	SDG&E 2014 e-mail through City of Santee
2005	**NatGas_Commercial_therms**	Commercial_NatGas_Bundled_2005	1,418,681	N/A	SDG&E 2014 e-mail through City of Santee
2005	**NatGas_Commercial_therms**	Commercial_NatGas_Direct_2005	1,109	N/A	SDG&E 2014 e-mail through City of Santee
2008	**NatGas_Res_therms**	Residential_NatGas_2008	5,797,758	N/A	SDG&E 2014 e-mail through City of Santee
2008	**NatGas_Commercial_therms**	Commercial_NatGas_2008	1,494,426	N/A	SDG&E 2014 e-mail through City of Santee
2012	**NatGas_Res_therms**	NatGas_Res_therms_2012	5,734,216	N/A	SDG&E 2014 e-mail through City of Santee
2012	**NatGas_Commercial_therms**	NatGas_Commercial_therms_2012	1,568,104	N/A	SDG&E 2014 e-mail through City of Santee
2013	**NatGas_Res_therms**	Residential_NatGas_2013	5,723,205	N/A	SDG&E 2014 e-mail through City of Santee
2013	**NatGas_Commercial_therms**	Commercial_NatGas_2013	1,347,484	N/A	SDG&E 2014 e-mail through City of Santee

2005	**Transportation_VehicleMilesTraveled**	On-road_Gasoline/Diesel_2005	352,711,238	N/A	City of Santee 2005 GHG Emissions Inventory by ICLEI
2008	**Transportation_VehicleMilesTraveled**	On-road_Gasoline/Diesel_2008	479,229,830	N/A	SANDAG 2014 e-mail through Chen Ryan
2012	**Transportation_VehicleMilesTraveled**	On-road_Gasoline/Diesel_2012	485,123,704	N/A	Estimated based on 2008 and 2013 data
2013	**Transportation_VehicleMilesTraveled_Gas**	On-road_Gasoline_2013	458,785,827	N/A	SANDAG 2014 e-mail through Chen Ryan
2013	**Transportation_VehicleMilesTraveled_Diesel**	On-road_Diesel_2013	27,822,637	N/A	SANDAG 2014 e-mail through Chen Ryan
2013	**Transportation_VehicleMilesTraveled_Total**		486,608,464	N/A	SANDAG 2014 e-mail through Chen Ryan
2020	**Transportation_VehicleMilesTraveled_Gas**	On-road_Gasoline_2020	493,494,150	N/A	Estimated based on 2013 and 2035 data
2020	**Transportation_VehicleMilesTraveled_Diesel**	On-road_Diesel_2020	32,536,348	N/A	Estimated based on 2013 and 2035 data
2020	**Transportation_VehicleMilesTraveled_Total**		526,265,689	N/A	Estimated based on 2013 and 2035 data
2035	**Transportation_VehicleMilesTraveled_Gas**	On-road_Gasoline_2035	576,966,520	N/A	SANDAG 2014 e-mail through Chen Ryan
2035	**Transportation_VehicleMilesTraveled_Diesel**	On-road_Diesel_2035	45,500,895	N/A	SANDAG 2014 e-mail through Chen Ryan
2035	**Transportation_VehicleMilesTraveled_Total**		622,467,415	N/A	SANDAG 2014 e-mail through Chen Ryan
2005	**SolidWaste_Landfilled_tons**	SolidWaste_Landfilled_2005	60,825	4,181,732	CalRecycle DRS Single-year Countywide Origin Deatail
2005	**SolidWaste_ADC_tons**	SolidWaste_ADC_2005	8,136	359,066	CalRecycle DRS Single-year Countywide Origin Deatail
2008	**SolidWaste_Landfilled_tons**	SolidWaste_Landfilled_2008	52,184	3,413,957	CalRecycle DRS Single-year Countywide Origin Deatail
2008	**SolidWaste_ADC_tons**	SolidWaste_ADC_2008	7,362	519,266	CalRecycle DRS Single-year Countywide Origin Deatail
2012	**SolidWaste_Landfilled_tons**	SolidWaste_Landfilled_2012	46,644	2,875,288	CalRecycle DRS Single-year Countywide Origin Deatail
2012	**SolidWaste_ADC_tons**	SolidWaste_ADC_2012	8,531	293,545	CalRecycle DRS Single-year Countywide Origin Deatail
2013	**SolidWaste_Landfilled_tons**	SolidWaste_Landfilled_2013	38,742	3,007,351	CalRecycle DRS Single-year Countywide Origin Deatail
2013	**SolidWaste_ADC_tons**	SolidWaste_ADC_2013	8,185	274,480	CalRecycle DRS Single-year Countywide Origin Deatail

Business-As-Usual Forecast

2020	**Annual Growth Rate_Jobs_2013-2020**	CAGR_Jobs_2013-2035	0.002721364
2035	**Annual Growth Rate_Jobs_2020-2035**	CAGR_Jobs_2013-2035	0.01335877
2020	**Annual Growth Rate_Households_2013-2020**	CAGR_Households_2013-2035	0.008952073
2035	**Annual Growth Rate_Households_2020-2035**	CAGR_Households_2013-2035	0.009420159
2020	**Annual Growth Rate_Population_2013-2020**	CAGR_Population_2013-2035	0.011182289
2035	**Annual Growth Rate_Population_2020-2035**	CAGR_Population_2013-2035	0.004379477
2020	**Annual Growth Rate_ServPop_2013-2020**	CAGR_ServPop_2013-2035	0.009256531
2035	**Annual Growth Rate_ServPop_2020-2035**	CAGR_ServPop_2013-2035	0.006469373
2035	**Annual Growth Rate_VMT_Gas_2013-2035**	CAGR_VMT_Gas_2013-2035	0.010472674
2035	**Annual Growth Rate_VMT_Diesel_2013-2035**	CAGR_VMT_Diesel_2013-2035	0.022610094

Adjusted Business-As-Usual Forecast

kWh/hh x 11.1% (residential savings from Title 24)	State_Title24_Res_Electricity_2013-2020/2021-2035	766
kWh/job x 16.8% (commercial savings from Title 24)	State_Title24_Comm_Electricity_2013-2020/2021-2035	1,375
therm/hhx 5% (residential savings from Title 24)	State_Title24_Res_NatGas_2013-2020/2021-2035	15
therm/job x 11.7% (commercial savings from Title 24)	State_Title24_Comm_NatGas_2013-2020/2021-2035	9
Primary Driver_2013-2020 (units/yr)	State_Title24_Res_Electricity/NatGas_2013-2020	181
Primary Driver_2013-2020 (jobs/yr)	State_Title24_Comm_Electricity/NatGas_2013-2020	46
Primary Driver_2021-2035 (units/yr)	State_Title24_Res_Electricity/NatGas_2021-2035	211
Primary Driver_2021-2035 (jobs/yr)	State_Title24_Comm_Electricity/NatGas_2021-2035	249
Renewable Portfolio Standards (Change Carbon Intensity)	State_Water_RPS	-3.4%/yr
Water Conservation SBX7-7 (Change Carbon Intensity)	State_Water_SBx7-7	-0.0177%/yr
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Gasoline_2013-2020	-2.70862%/yr
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Gasoline_2021-2035	-2.83902%/yr
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Diesel_2013-2020	-1.00156%/yr
On-Road Transportation (Change Carbon Intensity)	State_On-RoadTrans_Diesel_2021-2035	-0.49729%/yr

Community Inventory Input (Off-Road Sector)

I. Agriculture Equipment

2005	Offroad_Agriculture_2005	CO2	646.70886688
		CH4	0.13595977
		N2O	0.00815018
2008	Offroad_Agriculture_2008	CO2	621.05342982
		CH4	0.11237621
		N2O	0.00819854
2012	Offroad_Agriculture_2012	CO2	588.46580971
		CH4	0.08549678
		N2O	0.00814043
2013	Offroad_Agriculture_2013	CO2	580.60044987
		CH4	0.07697063
		N2O	0.00809648

II. Construction Equipment

2005	Offroad_Construction_2005	CO2	21826.26638092
		CH4	4.14028780
		N2O	0.14581015
2008	Offroad_Construction_2008	CO2	41225.76830578
		CH4	6.45366100
		N2O	0.27009424
2012	Offroad_Construction_2012	CO2	11609.15090898
		CH4	1.39999237
		N2O	0.07180479
2013	Offroad_Construction_2013	CO2	8126.98029351
		CH4	0.91856409
		N2O	0.04944612

III. Industrial Equipment

2005	Offroad_Industrial_2005	CO2	2952.69289979
		CH4	2.62138581
		N2O	0.25958183
2008	Offroad_Industrial_2008	CO2	3052.94061733
		CH4	1.95452538
		N2O	0.21802527
2012	Offroad_Industrial_2012	CO2	3139.04377381
		CH4	1.25373361
		N2O	0.18494107
2013	Offroad_Industrial_2013	CO2	3148.54644167
		CH4	1.14878796
		N2O	0.18123649

IV. Lawn and Garden Equipment

2005	Offroad_Lawn&Garden_2005	CO2	917.84749295
		CH4	1.78713075
		N2O	0.71393926
2008	Offroad_Lawn&Garden_2008	CO2	937.96489060
		CH4	1.60651933
		N2O	0.65032237
2012	Offroad_Lawn&Garden_2012	CO2	1045.32869629
		CH4	1.63260091
		N2O	0.69674675
2013	Offroad_Lawn&Garden_2013	CO2	1059.25927089
		CH4	1.63167235
		N2O	0.70138107

V. Light Commercial Equipment

2005	Offroad_Commercial_2005	CO2	771.34342212
		CH4	0.41933756
		N2O	0.13267233
2008	Offroad_Commercial_2008	CO2	797.21977639
		CH4	0.34173724
		N2O	0.13886125
2012	Offroad_Commercial_2012	CO2	819.30410668
		CH4	0.27755417
		N2O	0.13974122
2013	Offroad_Commercial_2013	CO2	821.63806142
		CH4	0.26400412
		N2O	0.13865934

VI. Recreational Equipment

2005	Offroad_Recreation_2005	CO2	295.90169994
		CH4	1.92934981
		N2O	0.56321666
2008	Offroad_Recreation_2008	CO2	316.17042500
		CH4	2.04575942
		N2O	0.60905296
2012	Offroad_Recreation_2012	CO2	311.31753057
		CH4	2.00750512
		N2O	0.59786287
2013	Offroad_Recreation_2013	CO2	311.23288667
		CH4	2.00542747
		N2O	0.59771265

Community Inventory Input (Water Sector)

Million Gallons of Water Consumed	2005	2008	2012	2013
Single Family	1257.56	1135.03	990.03	956.77
Multi Family	522.13	507.49	488.61	484.01
Government	101.48	87.81	72.41	69.00
Hotel	5.43	5.66	5.97	6.05
Commercial-Other	189.27	182.41	173.64	171.51
Construction-Conventional	12.32	13.37	14.92	15.33
Construction-Recycled	3.23	3.33	3.46	3.50
Irrigation-Conventional	108.81	112.54	117.71	119.04
Irrigation-Recycled	229.20	250.09	280.92	289.21
Fire-Conventional	0.0066	-	-	-
Total MG	**2,429**	**2,298**	**2,148**	**2,114**

kWh Electricity Used	2005	2008	2012	2013
Single Family	14861964.02	13413921.65	11700250.99	11307198.90
Multi Family	6170534.62	5997576.19	5774482.65	5720018.16
Government	1199297.74	1037761.31	855706.35	815420.40
Hotel	64180.39	66850.67	70584.64	71550.28
Commercial-Other	2236827.38	2155697.12	2052082.29	2026966.30
Construction-Conventional	145623.44	158059.82	176309.23	181191.77
Construction-Recycled	4463.63	4599.12	4786.20	4834.14
Irrigation-Conventional	1285902.92	1329968.80	1391081.20	1406793.13
Irrigation-Recycled	316990.10	345872.03	388515.58	399973.93
Fire-Conventional	73	-	-	-
Total kWh	**26,285,858**	**24,510,307**	**22,413,799**	**21,933,947**

Conversions for Water to Energy

	Indoor	Outdoor		San Diego
Supply and Conveyance	9727	9727	0.37	indoor
Treatment	111	111	0.63	outdoor
Dist	1272	1272		
WWTmt	1911	0		
Total	13022	11111		
Conventional kWh/MG	11,818.07	kWh/MG		
Recycled	1383	kWh/MG		

Notes:

1 Water usage data from Padre Dam Municipal Water District. Conversion from MG to kWh uses CEC 2006 Refining Estimates for Water-Related Energy Use in California for Southern California (CEC 2006)

2 Conventional water conversion uses assumptions for indoor vs. outdoor water use. Percentages according to http://bcn.boulder.co.us/basin/local/residential.html for San Diego. 37% indoor use (63% outdoor does not undergo wastewater treatment) and recycled water excludes energy for water supply and conveyance. Conversion: 11,818.07 kWh/MG

3 Recycled water conversion uses assumptions that all is for outdoor use and does not use energy for supply/conveyance. Conversion: 1,383 kWh/MG.

4 Fire use assumes conventional, outdoor.

Indoor/Outdoor water assumption is similar to California-wide 2010 report stating 57% residential water use is for outdoor. Likely higher in Southern California, which matches with the more specific information used.
http://www.cbia.org/go/cbia/?LinkServID=E242764F-88F9-4438-9992948EF86E49EA
Water Use in the California Residentail Home, 2010

Municipal Inventory and Forecasts Input (Excluding Vehicle Fleet Sector)

Year	Variable	SEEC Entry Name	Santee
2005	**Municipal Full-Time-Equivalent Employee**	Multiple Entries	121.5
2013	**Municipal Full-Time-Equivalent Employee**	Multiple Entries	112.8
2020	**Municipal Full-Time-Equivalent Employee**	Multiple Entries	115.0
2035	**Municipal Full-Time-Equivalent Employee**	Multiple Entries	120.0
2005	**Buildings & Facilities Electricity (kWh)**	Bld&Fac_Electricity_2005	968,991
2005	**Buildings & Facilities Natural Gas (therms)**	Bld&Fac_NatGas_2005	6,136
2005	**Street Lights, Area Lights & Traffic Control/Area Lights-City Owned (kWh)**	Streetlight&TC_City-Owned_Electricity_2005	613,342
2005	**Street Lights, Area Lights & Traffic Control/Area Lights-SDG&E Owned (kWh)**	Streetlight&TC_SDG&E-Owned_Electricity_2005	1,735,514
2005	**Water Delivery/Water Pumping (kWh)**	WaterPumping_Electricity_2005	77,535
2013	**Buildings & Facilities Electricity (kWh)**	Bld&Fac_Electricity_2013	900,602
2013	**Buildings & Facilities Natural Gas (therms)**	Bld&Fac_NatGas_2013	5,013
2013	**Street Lights, Area Lights & Traffic Control/Area Lights-City Owned (kWh)**	Streetlight&TC_City-Owned_Electricity_2013	1,271,181
2013	**Street Lights, Area Lights & Traffic Control/Area Lights-SDG&E Owned (kWh)**	Streetlight&TC_SDG&E-Owned_Electricity_2013	712,155
2013	**Water Delivery/Water Pumping (kWh)**	WaterPumping_Electricity_2013	83,990
2005	**Employee Commute VMT (miles)**	EmpComm_Gas_2005	516,764.6174
2013	**Employee Commute VMT (miles)**	EmpComm_Gas_2013	479,549.0585
2005	**Solid Waste (tons)**	Waste_Generated_2005	863.93
2013	**Solid Waste (tons)**	Waste_Generated_2013	1,005.58
2020	**Annual Growth Rate_Municipal_2013-2020**	CAGR_Muni_Growth	0.002826723
2035	**Annual Growth Rate_Municipal_2020-2035**	CAGR_Muni_Growth	0.002841337
2010	**Renewable Portfolio Standards (SDG&E) 2010-2014**	RPS_SDGE_33percent	-0.058
2015	**Renewable Portfolio Standards (SDG&E) 2015-2019**	RPS_SDGE_33percent	-0.053
2013-2020	**Low Carbon Fuel Standard**	LCFS	-0.010368573

Municipal Inventory Input (Vehicle Fleet Sector)

2005

	Gasoline	Diesel	Hybrid
Annual Fuel Usage	13996	22842	0
Annual VMT	193069	166596	0
% VMT Passenger Vehicle	20.1%	0.0%	0.0%
% VMT Light Truck	79.9%	5.6%	0.0%
% VMT Heavy Truck	0.0%	94.1%	0.0%

2013

	Gasoline	Diesel	Hybrid
Annual Fuel Usage	12573.14972	27392.13095	369
Annual VMT	174514	153460	12546
% VMT Passenger Vehicle	15.0%	0.0%	0.0%
% VMT Light Truck	84.7%	9.5%	100.0%
% VMT Heavy Truck	0.0%	89.2%	0.0%

Output from SEEC - Community Inventories

	2005	2008	2012	2013
Inventory Record	**CO2e (MT)**	**CO2e (MT)**	**CO2e (MT)**	**CO2e (MT)**
Commercial_Electricity	26127	36719	36436	40860
Commercial_NatGas	7550	7947	8338	7165
Industrial_Electricity	4020	4914	6374	0
Offroad_Agriculture	653	626	593	585
Offroad_Commercial	821	847	868	870
Offroad_Construction	21973	41468	11666	8165
Offroad_Industrial	3096	3167	3225	3231
Offroad_Lawn&Garden	1175	1172	1294	1309
Offroad_Recreation	512	549	540	539
On-Road_Diesel	24302	37798	34865	35387
On-Road_Gasoline	157510	213386	210306	207112
Residential_Electricity	32286	47648	50181	48218
Residential_NatGas	31258	30829	30492	30433
SolidWaste_ADC	1611	1458	1689	1621
SolidWaste_Landfilled	14765	12837	11474	9530
Wastewater_Digester	4	4	4	4
Wastewater_Effluent	890	914	895	901
Wastewater_NDN	65	67	65	66
Water_Conventional	11215	10089	6604	6457
Water_Recycled	139	146	118	121

Output from SEEC - Community Business-As-Usual Forecasts

Year	Usage	CO2e (MT)	Output Name
2013	464533	48218	Residential Electricity (MMBtu)
2020	494666	51346	Residential Electricity (MMBtu)
2030	543290	56393	Residential Electricity (MMBtu)
2035	569366	59100	Residential Electricity (MMBtu)
2013	572321	30433	Residential Natural Gas (MMBtu)
2020	609446	32407	Residential Natural Gas (MMBtu)
2030	669352	35593	Residential Natural Gas (MMBtu)
2035	701479	37301	Residential Natural Gas (MMBtu)
2013	393650	40860	Commercial Electricity (MMBtu)
2020	405467	42087	Commercial Electricity (MMBtu)
2030	463007	48059	Commercial Electricity (MMBtu)
2035	494770	51356	Commercial Electricity (MMBtu)
2013	134748	7165	Commercial Natural Gas (MMBtu)
2020	138793	7380	Commercial Natural Gas (MMBtu)
2030	158489	8427	Commercial Natural Gas (MMBtu)
2035	169362	9006	Commercial Natural Gas (MMBtu)
2013	1	14699	Off Road Energy Equivalent (MMBtu)
2020	1	15710	Off Road Energy Equivalent (MMBtu)
2030	1	17490	Off Road Energy Equivalent (MMBtu)
2035	1	18454	Off Road Energy Equivalent (MMBtu)
2013	458785827	207112	Gasoline - On Road VMT
2020	493494148	222780	Gasoline - On Road VMT
2030	547681085	247242	Gasoline - On Road VMT
2035	576966516	260463	Gasoline - On Road VMT
2013	27822637	35387	Diesel - On Road VMT
2020	32536349	41382	Diesel - On Road VMT
2030	40688302	51750	Diesel - On Road VMT
2035	45500896	57871	Diesel - On Road VMT
2013	20100803	4	Annual Gas Production (scf / Year)
2020	21380772	4	Annual Gas Production (scf / Year)
2030	22804944	5	Annual Gas Production (scf / Year)
2035	23552219	5	Annual Gas Production (scf / Year)
2013	55033	66	Process N2O Population Served
2020	58537	70	Process N2O Population Served
2030	62437	75	Process N2O Population Served
2035	64482	77	Process N2O Population Served
2013	74858	6578	Water Supply Energy Equivalent (MMBtu)
2020	79625	6997	Water Supply Energy Equivalent (MMBtu)
2030	84929	7463	Water Supply Energy Equivalent (MMBtu)
2035	87712	7707	Water Supply Energy Equivalent (MMBtu)
2013	1055	901	Daily N Load at Facility with Release to Environment (kg N/day)
2020	1122	958	Daily N Load at Facility with Release to Environment (kg N/day)
2030	1197	1022	Daily N Load at Facility with Release to Environment (kg N/day)
2035	1236	1056	Daily N Load at Facility with Release to Environment (kg N/day)
2013	46927	11151	Waste Generated (wet tons)
2020	49915	11861	Waste Generated (wet tons)
2030	53240	12651	Waste Generated (wet tons)
2035	54985	13066	Waste Generated (wet tons)

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

Year	Category	CO2e (MT)
2013	Residential Energy	78651
2020	Residential Energy	65424
2030	Residential Energy	71292
2035	Residential Energy	74438
2013	Commercial Energy	48025
2020	Commercial Energy	34597
2030	Commercial Energy	38543
2035	Commercial Energy	40721
2013	Solid Waste	11151
2020	Solid Waste	11861
2030	Solid Waste	12651
2035	Solid Waste	13066
2013	Water & Wastewater	7549
2020	Water & Wastewater	5941
2030	Water & Wastewater	6336
2035	Water & Wastewater	6544
2013	Transportation & Mobile Sources	257198
2020	Transportation & Mobile Sources	234283
2030	Transportation & Mobile Sources	210692
2035	Transportation & Mobile Sources	201774

Output from SEEC - Municipal Inventories

Inventory Record	2005	2013
	CO2e (MT)	CO2e (MT)
Bld&Fac_Electricity	242	319
Bldg&Fac_NatGas	33	27
EmpComm_Gas	208	188
Fleet_City_Diesel	233	280
Fleet_City_GasReg	126	113
Fleet_City_GasHyb	0	3
Streetlight&TC_City-Owned_Electricity	153	450
Streetlight&TC_SDG&E-Owned_Electricity	433	252
Waste_Generated	210	247
WaterPumping_Electricity	19	30

Output from SEEC - Municipal Business-As-Usual Forecasts

Year	Category	CO2e (MT)
2013	Water & Wastewater Treatment Facilities	30
2020	Water & Wastewater Treatment Facilities	31
2030	Water & Wastewater Treatment Facilities	31
2035	Water & Wastewater Treatment Facilities	32
2013	Buildings & Facilities	346
2020	Buildings & Facilities	353
2030	Buildings & Facilities	363
2035	Buildings & Facilities	368
2013	Street Lights & Traffic Signals	702
2020	Street Lights & Traffic Signals	716
2030	Street Lights & Traffic Signals	737
2035	Street Lights & Traffic Signals	747
2013	Vehicle Fleet	396
2020	Vehicle Fleet	404
2030	Vehicle Fleet	416
2035	Vehicle Fleet	421
2013	Employee Commute	188
2020	Employee Commute	192
2030	Employee Commute	197
2035	Employee Commute	200
2013	Solid Waste Facilities	247
2020	Solid Waste Facilities	252
2030	Solid Waste Facilities	259
2035	Solid Waste Facilities	263

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

Year	Category	CO2e (MT)
2013	Vehicle Fleet	396
2020	Vehicle Fleet	2020
2030	Vehicle Fleet	390
2035	Vehicle Fleet	396
2013	Buildings & Facilities	346
2020	Buildings & Facilities	261
2030	Buildings & Facilities	268
2035	Buildings & Facilities	272
2013	Street Lights & Traffic Signals	702
2020	Street Lights & Traffic Signals	514
2030	Street Lights & Traffic Signals	529
2035	Street Lights & Traffic Signals	536
2013	Employee Commute	188
2020	Employee Commute	180
2030	Employee Commute	185
2035	Employee Commute	188
2013	Solid Waste Facilities	247
2020	Solid Waste Facilities	252
2030	Solid Waste Facilities	259
2035	Solid Waste Facilities	263
2013	Water & Wastewater Treatment Facilities	30
2020	Water & Wastewater Treatment Facilities	25
2030	Water & Wastewater Treatment Facilities	26
2035	Water & Wastewater Treatment Facilities	26

APPENDIX C

City of Santee

GREENHOUSE GAS EMISSIONS

Screening Tables

~~February~~ August 2019

Prepared for:

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CONTENTS

TABLES

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Introduction

The Sustainable Santee Plan (Plan) includes reducing greenhouse gas emissions from new development by 2035 as compared to the 2035 Adjusted Business As Usual (ABAU) conditions. Reductions related to transportation, water, solid waste, energy, and renewable energy sources all play a part in gaining the level of efficiency needed within new development.

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

The California Environmental Quality Act ("CEQA") requires assessment of the environmental impacts of proposed projects including the impacts of GHG emissions. The purpose of this document is to provide guidance on how to analyze GHG emissions and determine the significance of those emissions during CEQA review of proposed development projects within the City. The analysis, methodology, and significance determination (thresholds) are based upon the Plan, the GHG emission inventories within the Plan, and the GHG reduction measures that reduce emissions to the SB-32 compliant reduction target of the Plan. The Screening Tables can be used by the City for review of development projects in order to ensure that the specific reduction strategies in the Plan are implemented as part of the CEQA process for development projects. The Screening Tables provide a menu of options that both ensures implementation of the reduction strategies and flexibility on how development projects will implement the reduction strategies to achieve an overall reduction of emissions, consistent with the reduction targets of the Plan.

California Environmental Quality Act

CEQA MANDATES FOR ANALYSIS OF IMPACTS

CEQA requires that Lead Agencies inform decision makers and the public regarding the following: potential significant environmental effects of proposed projects; feasible ways that environmental damage can be avoided or reduced through the use of feasible mitigation measures and/or project alternatives; and the reasons why the Lead Agency approved a project if significant environmental effects are involved (CEQA Guidelines §15002). CEQA also requires Lead Agencies to evaluate potential environmental effects based to the fullest extent possible on scientific and factual data (CEQA Guidelines §15064[b]). A determination of whether or not a particular environmental impact will be

significant must be based on substantial evidence, which includes facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines §15064f[5]).

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

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

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

Greenhouse Gas Impact Determination

STATEWIDE OR REGIONAL THRESHOLDS OF SIGNIFICANCE

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

QUANTITATIVE ANALYSIS RELATIVE TO THE CLIMATE ACTION PLAN

METHODOLOGY OVERVIEW

An individual project cannot generate enough GHG emissions to influence global climate change. The project participates in climate change by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together may have a significant impact on global climate change (AEP 2007). To address the State's requirement to reduce GHG emissions, the City prepared the Sustainable Santee Plan (Plan) with targets of reducing GHG emissions within the City by 15 percent below 2005 baseline emission levels by year 2020, 40 percent below 2005 baseline by 2030, and 49 percent below the 2005 baseline by 2035. The City's targets are consistent with AB 32, SB 32, and ensure that the City is providing GHG reductions locally that will complement the State and international efforts of stabilizing climate change.

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

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

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

The Plan satisfies the first condition by adopting targets of reducing GHG emissions within the City by 15 percent below 2005 levels by 2020, 40 percent by 2030, and 49 percent by 2035. The 2020 reduction target is compliant with AB 32; the AB 32 Climate Change Scoping Plan states: "In recognition of the critical role local governments will play in the successful implementation of AB 32, ARB recommended a

greenhouse gas reduction goal for local governments of 15 percent below existing levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target" (Scoping Plan page ES-5, CARB, December 2008). In this way, the City is teaming with the State's efforts to reduce GHG emissions globally and substantially lessen the cumulative impacts. The 2030 reduction target is compliant with SB 32 and the 2035 reduction target continues the GHG reduction trend (AEP 2012).

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

The Plan satisfies the third criteria by providing a set of community-wide GHG emissions inventories for existing conditions (2005 baseline), for future 2020, 2030 and 2035 GHG emissions that are anticipated without the reduction measures (Adjusted Business As Usual; ABAU), and reduced levels of 2020, 2030, and 2035 GHG emissions which demonstrates how the implementation of reduction measures achieves the reduction targets. These community-wide GHG emission inventories are found in Appendix A of the Plan.

THE DEVELOPMENT REVIEW PROCESS

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

- **Question 1:** Is the proposed activity a "Project" as defined by CEQA? If the activity is not a Project under CEQA no further action is required concerning GHG emissions in the development review process.
- **Question 2:** Is the Project exempt under CEQA? If it is, then the California Air Resources Board has determined that GHG emissions are less than significant and no additional GHG reductions are needed. A list of CEQA Exemptions are found in CEQA Guidelines §15300 through §15332.

There are also exemption opportunities associated with transit oriented development (TOD) associated with the Sustainable Communities Strategy (SCS) for the region developed by the San Diego Association of Governments (SANDAG) and first introduced in the 2012 Regional Transportation Plan (RTP). Exemptions associated with TOD are divided into two categories, transit priority projects (TPP), and Sustainable Community Projects (SCP). A TPP and SCP Checklist is provided in Appendix B of this document to assist project applicants in determining if a project qualifies for these exemptions under CEQA. If the Project does not qualify for a CEQA exemption, then move on to the Methods for the Calculation of GHG Emissions and Screening Thresholds Tables.

METHODOLOGY FOR THE CALCULATION OF GHG EMISSIONS

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

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

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

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

Analysis of development projects not using the screening tables should use the emission factors found in the latest version of the California Climate Action Registry (CCAR) General Reporting Protocol CCAR 2007), ~~and~~ guidance in the Association of Environmental Professionals (AEP) White Paper: Community-wide Greenhouse Gas Emission Inventory Protocols (AEP 2010), and the methodologies in the California Air Resources Board (CARB), Mobile Source Emissions Inventory (CARB 2019). Quantification of emissions from electricity used for potable water treatment and transportation as well as wastewater transport and treatment can be found in the California Energy Commission (CEC) document titled "Refining Estimates of Water-Related Energy Use in California (CEC December 2006).

Screening Threshold Tables

The purpose of this Screening Table is to provide guidance in measuring the reduction of greenhouse gas emissions attributable to certain design and construction measures incorporated into development projects. The analysis, methodology, and significance determination (thresholds) are based upon the Plan, which includes GHG emission inventories (2005, 2008, 2012, and 2013), forecasts for years 2020, 2030, and 2035,2020, 2030, and 2035 emission reduction targets, and the goals and policies to reach the targets. The methodology for the development and application of the Screening Table is set forth in Appendix C of this document and uses the California Air Pollution Control Officers Association (CAPCOA), guidance on quantifying project level GHG reductions (CAPCOA 2010).

Instructions for Residential, Commercial, or Industrial Projects

The Screening Table assigns points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as "feature"). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. The point levels are based upon improvements compared to 2017 emission levels of efficiency. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the Sustainable Santee Plan (Plan). As such, those projects that garner a total of 100 points or greater would not require quantification of project specific GHG emissions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Note that the Screening Tables use a base level of efficiency that corresponds to the California Building Energy Efficiency Standards for Residential and Non-residential Buildings (Title 24, Part 6) that became effective January 1, 2017. These are the statewide minimum requirements of efficiency that are currently (2018) in effect.

Instructions for Mixed Use Projects

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

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

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

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

Feature	Description	Assigned Point Values	Project Points
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	
	Modest Duct insulation (R-6)	4 points	
	Enhanced Duct Insulation (R-8)	5 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	7 points	
Space Heating/ Cooling Equipment	2017 Minimum HVAC Efficiency (SEER 13/75% AFUE or 7.7 HSPF)	0 points	
	Improved Efficiency HVAC (SEER 14/78% AFUE or 8 HSPF)	2 points	
	High Efficiency HVAC (SEER 15/80% AFUE or 8.5 HSPF)	4 points	
	Very High Efficiency HVAC (SEER 16/82% AFUE or 9 HSPF)	5 points	
Water Heaters	2017 Title 24 Minimum Efficiency (0.57 Energy Factor)	0 points	
	Improved Efficiency Water Heater (0.675 Energy Factor)	7 points	
	High Efficiency Water Heater (0.72 Energy Factor)	9 points	
	Very High Efficiency Water Heater (0.92 Energy Factor)	11 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	2 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	5 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within the living space have at least one window (required)	0 points	
	All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.)	1 point	
	All rooms daylighted	1 points	
Artificial Lighting	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficiency is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	5 points	
	High Efficiency Lights (50% of in-unit fixtures are high efficiency)	6 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficiency)	7 points	
Appliances	Energy Star Refrigerator (new)	1 point	
	Energy Star Dish Washer (new)	1 point	
	Energy Star Washing Machine (new)	1 point	

Feature	Description	Assigned Point Values	Project Points
Miscellaneous Residential Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	3 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on June 21st.	2 Points	
Energy Star Homes	EPA Energy Star for Homes (version 3 or above)	15 points	
~~Independent Energy Efficiency Calculations~~	~~Provide point values based upon energy efficiency modeling of the Project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.~~	~~TBD~~	
~~Other~~	~~This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.~~	~~TBD~~	
Residential Renewable Energy Generation Note: These points will not be available, once Zero Net Energy is adopted in a future version of the Building/Energy codes.			
Photovoltaic	Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments: 30 percent of the power needs of the project 40 percent of the power needs of the project 50 percent of the power needs of the project 60 percent of the power needs of the project 70 percent of the power needs of the project 80 percent of the power needs of the project 90 percent of the power needs of the project 100 percent of the power needs of the project	 9 points 12 points 17 points 21 points 23 points 25 points 28 points 31 points	
Wind turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the area's capability to support wind turbines should be evaluated prior to choosing this feature: 30 percent of the power needs of the project 40 percent of the power needs of the project 50 percent of the power needs of the project 60 percent of the power needs of the project 70 percent of the power needs of the project 80 percent of the power needs of the project 90 percent of the power needs of the project 100 percent of the power needs of the project	 9 points 12 points 17 points 21 points 23 points 25 points 28 points 31 points	

Feature	Description	Assigned Point Values	Project Points
~~Off-site renewable energy project~~	~~The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes that will help implement renewable energy within the City. These off-site renewable energy retrofit project proposals will be determined on a case by case basis and must be accompanied by a detailed plan that documents the quantity of renewable energy the proposal will generate. Point values will be determined based upon the energy generated by the proposal.~~	~~TBD~~	
~~Other Renewable Energy Generation~~	~~The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.~~	~~TBD~~	
Residential Water Conservation			
Irrigation, Landscaping, and Potable Water Supplies			
Water Efficient Landscaping	Limit conventional turf to < 50% of required landscape area Limit conventional turf to < 25% of required landscape area No conventional turf (warm season turf to < 50% of required landscape area and/or low water using plants are allowed) Only California Native Plants that requires no irrigation or some supplemental irrigation	0 points 2 points 4 points 5 points	
Water Efficient irrigation systems	Low precipitation spray heads < .75 inch/hour or drip irrigation Weather based irrigation control systems or moisture sensors (demonstrate 20% reduced water use)	1 point 2 points	
Recycled Water	Recycled connections (purple pipe) to irrigation system on site Recycled connections to entire water supply (feeds both irrigation systems and potable water supply) of residential units (requires additional requirements under the Direct Potable Reuse (DPR) framework (AB 547) to ensure uniform health standards are met).	4 points 7 points	
Water Reuse	Gray water Reuse System collects Gray water from clothes washers, showers and faucets for irrigation use.	7 points	
~~Storm water Reuse Systems~~	~~Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.~~	~~TBD~~	

Feature	Description	Assigned Point Values	Project Points
Potable Water Appliances			
Showers	Water Efficient Showerheads (2.0 gpm)	2 points	
Toilets	Water Efficient Toilets (1.5 gpm)	2 points	
Faucets	Water Efficient faucets (1.28 gpm)	2 points	
Dishwasher	Water Efficient Dishwasher (6 gallons per cycle or less)	1 point	
Washing Machine	Water Efficient Washing Machine (Water factor <5.5)	1 point	
WaterSense	EPA WaterSense Certification	7 points	
Land Use Based Trips and VMT Reduction			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon a Transportation Impact Analysis (TIA) demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges: • Diversity of land uses complementing each other (2-28 points) • Increased destination accessibility other than transit (1-18 points) • Increased transit accessibility (1-25 points) • Infill location that reduces vehicle trips or VMT beyond the measures described above (points TBD based on traffic data).	~~TBD~~1 to 4.5 Points	
Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT).	~~TBD~~1 to 4.5 Points	
~~Other Trip Reduction Measures~~	~~Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.~~	~~TBD~~	

Feature	Description	Assigned Point Values	Project Points
Bicycle Infrastructure			
Bicycle Infrastructure	Provide bicycle paths within project boundaries.	~~TBD~~1 point	
	Provide bicycle path linkages between residential and other land uses.	1 point~~s~~	
	Provide bicycle path linkages between residential and transit.	3 points	
Electric Vehicle Infrastructure			
Electric Vehicle Recharging	Provide circuit and capacity in garages of residential units for use by an electric vehicle. Charging stations are for on-road electric vehicles legally able to drive on all roadways including Interstate Highways and freeways.	1 point	
	Install one electric vehicle charging station per dwelling unit in the garages of residential units	5 points	
Neighborhood Electric Vehicle (NEV) Infrastructure	NEVs are electric vehicles usually built to have a top speed of 25 miles per hour, and a maximum loaded weight of 3,000 pounds.		
	Provide NEV safe routes within Project site.	4 points	
	Provide NEV safe routes between the Project site and other land uses.	5 points	
Total Points Earned by Residential Project:			

Table 2: Screening Table for Implementation of GHG Reduction Measures for Commercial / Industrial Development

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

Feature	Description	Assigned Point Values	Project Points
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	
	Modest Duct insulation (R-6)	5 points	
	Enhanced Duct Insulation (R-8)	6 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	8 points	
Space Heating/ Cooling Equipment	2017 Title 24 Minimum HVAC Efficiency (EER 13/75% AFUE or 7.7 HSPF)	0 points	
	Improved Efficiency HVAC (EER 14/78% AFUE or 8 HSPF)	4points	
	High Efficiency HVAC (EER 15/80% AFUE or 8.5 HSPF)	5 points	
	Very High Efficiency HVAC (EER 16/82% AFUE or 9 HSPF)	7 points	
~~Commercial Heat Recovery Systems~~	~~Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.~~	~~TBD~~	
Water Heaters	2017 Title 24 Minimum Efficiency (0.57 Energy Factor)	0 points	
	Improved Efficiency Water Heater (0.675 Energy Factor)	8 points	
	High Efficiency Water Heater (0.72 Energy Factor)	10 points	
	Very High Efficiency Water Heater (0.92 Energy Factor)	11 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	2 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	5 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within building have at least one window or skylight	1 point	
	All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.)	3 points	
	All rooms daylighted	4 points	
Artificial Lighting	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficiency is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	5 points	
	High Efficiency Lights (50% of in-unit fixtures are high efficiency)	7 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficiency)	8 points	

Feature	Description	Assigned Point Values	Project Points
Appliances	Star Commercial Refrigerator (new)	2 points	
	Energy Star Commercial Dish Washer (new)	2 points	
	Energy Star Commercial Cloths Washing	2 points	
Miscellaneous Commercial/Industrial Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	4 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on June 21st.	4 Points	
~~Other~~	~~This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.~~	~~TBD~~	
Commercial/Industrial Renewable Energy			
Photovoltaic	Solar Photovoltaic panels installed on commercial buildings or in collective arrangements within a commercial development such that the total power provided augments:		
	30 percent of the power needs of the project	8 points	
	40 percent of the power needs of the project	12 points	
	50 percent of the power needs of the project	16 points	
	60 percent of the power needs of the project	19 points	
	70 percent of the power needs of the project	23 points	
	80 percent of the power needs of the project	26 points	
	90 percent of the power needs of the project	30 points	
	100 percent of the power needs of the project	34 points	
Wind turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Wind turbines as part of the commercial development such that the total power provided augments:		
	30 percent of the power needs of the project	8 points	
	40 percent of the power needs of the project	12 points	
	50 percent of the power needs of the project	16 points	
	60 percent of the power needs of the project	19 points	
	70 percent of the power needs of the project	23 points	
	80 percent of the power needs of the project	26 points	
	90 percent of the power needs of the project	30 points	
	100 percent of the power needs of the project	34 points	

Feature	Description	Assigned Point Values	Project Points
~~Off-site renewable energy project~~	~~The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing commercial/industrial that will help implement reduction measures associated with existing buildings. These off-site renewable energy retrofit project proposals will be determined on a case by case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.~~	~~TBD~~	
~~Other Renewable Energy Generation~~	~~The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.~~	~~TBD~~	
Commercial/Industrial Water Conservation			
Irrigation and Landscaping			
Water Efficient Landscaping	Eliminate conventional turf from landscaping Only moderate water using plants Only low water using plants Only California Native landscape that requires no or only supplemental irrigation	0 points 2 points 3 points 5 points	
~~Trees~~	~~Increase tree planting in parking areas 50% beyond City Code requirements~~	~~TBD~~	
Water Efficient irrigation systems	Low precipitation spray heads< 0.75 inch/hour or drip irrigation Weather based irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)	1 point 3 points	
Recycled Water	Recycled water connection (purple pipe)to irrigation system on site ~~Recycled connections to entire water supply (feeds both irrigation systems and potable water supply) of residential units (requires additional requirements under the Direct Potable Reuse (DPR) framework (AB 547) to ensure uniform health standards are met).~~	3 points ~~TBD~~	
~~Storm water Reuse Systems~~	~~Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.~~	~~TBD~~	

Feature	Description	Assigned Point Values	Project Points
Potable Water			
Showers	Water Efficient Showerheads (2.0 gpm)	2 points	
Toilets	Water Efficient Toilets/Urinals (1.5 gpm) Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	2 points 3 points	
Faucets	Water Efficient faucets (1.28 gpm)	2 points	
Commercial Dishwashers	Water Efficient dishwashers (20% water savings)	2 points	
Commercial Laundry Washers	Water Efficient laundry (15% water savings) High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	2 points 4 points	
~~Commercial Water Operations Program~~	~~Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.~~	~~TBD~~	
Land Use Based Trips and VMT Reduction			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled.	~~TBD~~ 1 to 4.5 points	
Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	~~TBD~~1 to 4.5 points	
Bicycle Infrastructure			
Bicycle Infrastructure	Provide bicycle paths within project boundaries. Provide bicycle path linkages between project site and other land uses. Provide bicycle path linkages between project site and transit.	~~TBD~~1 point 1 point~~s~~ 3 points	

Feature	Description	Assigned Point Values	Project Points
Electric Vehicle Infrastructure			
Electric Vehicles	Provide public charging station for use by an electric vehicle (six points for each charging station within the facility).	6 points	
Neighborhood Electric Vehicle (NEV) Infrastructure	NEVs are electric vehicles usually built to have a top speed of 25 miles per hour, and a maximum loaded weight of 3,000 pounds. Provide NEV safe routes within the facility. Provide NEV safe routes between the Project site and other land uses.	 3 points 5 points	
Employee Based Trip &VMT Reduction Policy			
Compressed Work Week	Reduce the number of days per week that employees need to be on site will reduce the number of vehicle trips associated with commercial/industrial development. Compressed work week such that full time employees are on site: ~~5 days per week~~ 4 days per week on site 3 days per week on site	~~TBD~~ 1 point 2 points	
Car/Vanpools	~~Car/vanpool program~~ Car/vanpool program with preferred parking Car/vanpool with guaranteed ride home program Subsidized employee incentive car/vanpool program Combination of all the above	~~TBD~~ 1 point 2-3 points 2-3 points 5 points	
Employee Bicycle/ Pedestrian Programs	Complete sidewalk to residential within ½ mile Complete bike path to residential within 3 miles Bike lockers and secure racks Showers and changing facilities Subsidized employee walk/bike program (Note combine all applicable points for total value)	~~TBD~~1 point 1 point 0.5 point 0.5 point 2 points	
Shuttle/Transit Programs	Local transit within ¼ mile Light rail transit within ½ mile Shuttle service to light rail transit station Guaranteed ride home program Subsidized Transit passes Note combine all applicable points for total value	~~TBD~~1 point 2 points 2 points 1 point 1 point	

Feature	Description	Assigned Point Values	Project Points
CRT	Employer based Commute Trip Reduction (CRT). CRTs apply to commercial, offices, or industrial projects that include a reduction of vehicle trip or VMT goal using a variety of employee commutes trip reduction methods. The point value will be determined based upon a TIA that demonstrates the trip/VMT reductions. Suggested point ranges: Incentive based CRT Programs (1-8 points) Mandatory CRT programs (5-20 points)	~~TBD~~1 to 20 points	
~~Other Trip Reductions~~	~~Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.~~	~~TBD~~	
Total Points from Commercial/Industrial Project:			

References

Association of Environmental Professionals (AEP) White Paper: Alternative Approaches to Analyzing Greenhouse Gases and Global Climate Change Impacts in CEQA Documents, June 2007.

Association of Environmental Professionals (AEP) White Paper: Community-wide Greenhouse Gas Emission Inventory Protocols, September 2010.

Association of Environmental Professionals (AEP) White Paper: Next Steps, Projections and Target Setting in Climate Action Plans, March 2012

Association of Environmental Professionals (AEP) California Environmental Quality Act 2018 Statute & Guidelines, February 2018.

California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures, August 2010

California Air Resources Board, AB 32 Scoping Plan, December 2009.

California Air Resources Board, 2017 Scoping Plan Update, December 2017.

California Climate Action Registry, General Reporting Protocol, Version 2.2, March 2007

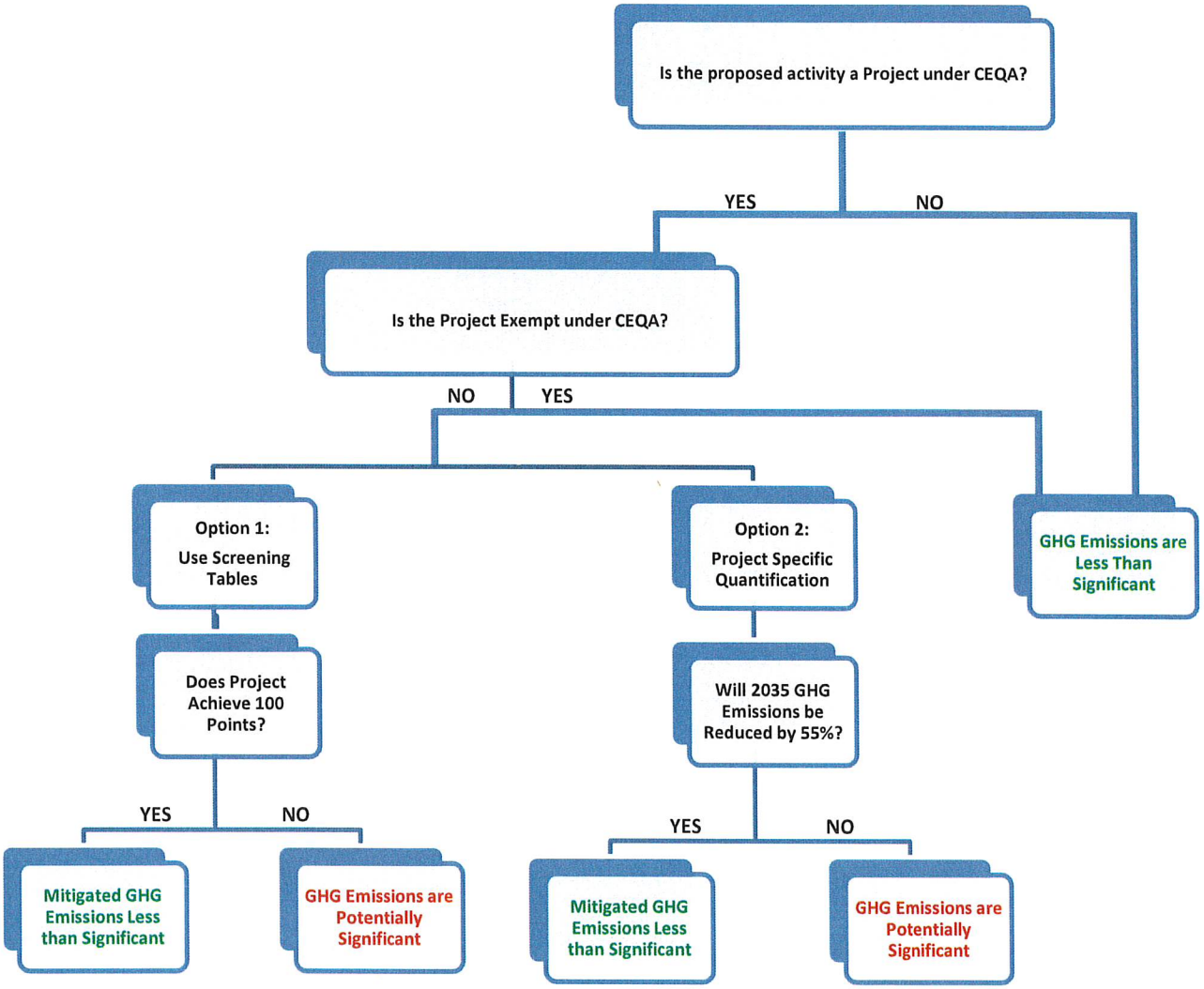
California Energy Commission (CEC), Refining Estimates of Water Related Energy Use in California, 2006.

City of Santee, Sustainable Santee Plan, December 2018.

San Diego Association of Governments (SANDAG), The 2012 Regional Transportation Plan, 2012.

ATTACHMENT A: THE GHG DEVELOPMENT REVIEW PROCESS FLOW CHART DIAGRAM

Approach to Implementation of GHG Development Review



ATTACHMENT B: TRANSIT PRIORITY PROJECT AND SUSTAINABLE COMMUNITY PROJECT CHECKLIST

TRANSIT PRIORITY PROJECT CHECKLIST

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

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

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

Yes	No		Does the Project:
☐	☐	5.	Contain sites on the Cortese List?
☐	☐	6.	Site contain any hazardous substances, contaminated soil or hazardous material?
☐	☐	7.	Site includes historical resources?
☐	☐	8.	Site contains wetlands, riparian areas or other areas significant as wildlife habitat?
☐	☐	9.	Project would harm any species protected by the Federal Endangered Species Act, California Endangered Species Act, Native Plant Protection Act, or those protected by local ordinance?
☐	☐	~~8~~10.	Have an unusually high risk of fire or explosion from material stored or used at properties within ¼ mile of the Project site?
☐	☐	~~9~~11.	Site currently developed as Open Space (parks, habitat, etc.)?
☐	☐	12.	Site is located on developed open spaces as defined by PRC 21155(b)(7)?
☐	☐	13.	Site is within a wildland fire hazard zone, unless mitigated by provisions of the General Plan or or zoning Ordinance?
☐	☐	14.	Site is within a landslide hazard zone, unless mitigated by provisions of the General Plan or or zoning Ordinance?
☐	☐	15.	Site is within a floodway, flood plain or restriction zone, unless mitigated by provisions of the General Plan or or zoning ordinance?

☐	☐	16.	Site is a seismic risk as a result of being within a delineated earthquake fault zone?

Continue with the next list of land use questions below:

Yes	No		
☐	☐	~~10~~17.	Does the Project design have all the buildings at least 15% more efficient than Title 24 energy standards and uses 25% or less water than average households?
☐	☐	~~11~~18.	Is the Project site eight acres or less in size?
☐	☐	19.	Project contains 200 residential units or less?
☐	☐	20.	Site is served by all existing utilities?
☐	☐	21.	Project does not result in any net loss in the number of affordable housing units withing the project area?
☐	☐	22.	Site is within a wildland fire hazard zone, unless mitigated by provisions of the General Plan or or zoning Ordinance.
☐	☐	~~12~~23.	Does the Project not include any single level of a building exceeding 75,000~~T~~ SF?
☐	☐	~~13~~24.	Project does not conflict with nearby industrial uses?
☐	☐	~~14~~25.	The Project will sell at least 20% of housing to families of moderate income, or 10% of housing will be rented to families of low income, or at least 5% of housing rented to families of very low income. Rental units shall be affordable for at least 55 years. Ownership units shall be subject to resale restrictions or equity sharing requirements for at least 30 years.
☐	☐	26.	Project provides open space equal or greater than 5 acres per 1,000 residents, or the developer will pay in-lieu fees sufficient to result in the development of affordable housing meeting one of the criteria described above?

Determining Eligibility based upon the answers:

Full CEQA Exemption for Sustainable Community Projects (SCPs)

If you answered **Yes** to all the TPP questions 1 through 4, **No** to all the environmental questions 5 through ~~9~~16, and **Yes** to all the land use questions ~~10~~ 17 through ~~14~~26, then your Project is a SCP and is eligible for a full CEQA Exemption under SB 375.

Transit Priority Projects (TPP)

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

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

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

Other Residential and Mixed Use Projects

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

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

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

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

METHODS SUMMARY

The point values in the Screening Tables were derived from the projected emissions reductions that would be achieved by each of the reduction measures associated with new development within the Sustainable Santee Plan (~~Plan~~SSP). The points within the Screening Tables were proportioned by residential unit or square feet of commercial/industrial uses. This was accomplished by taking the predicted growth in households and commercial uses in 2035 and proportioning the appropriate reduction quantities for new development to the residential, commercial, and industrial land use sectors within the Screening Table. The result is point values that are proportioned by residential unit or commercial/industrial square feet. Because of this, the size of the project is not relevant to the Screening Table. Regardless of size, each project needs to garnish 100 points to demonstrate consistency with the Plan. Efficiency, not size of the project, is critical.

Note that the Screening Table and point values are best used for typical development projects processed by the City. Examples of typical development projects include residential subdivisions, multi-family residential apartments, condominiums and townhouses, retail commercial, big box retail, office buildings, business parks, and typical warehousing. Mixed use projects can use the instructions at the beginning of the Screening Tables. Transit oriented development (TOD), and infill projects are able to use the Screening Tables, but the Screening Tables points are likely to underestimate total emission reductions afforded these types of projects.

~~Note that the Screening Tables include the opportunity to custom develop points (using the formula above) in order to provide points in the sections of the Screening Tables marked TBD and account for the predicted reductions in vehicle trips and vehicle miles traveled within a project specific traffic study and GHG analysis. TOD and infill projects can be more accurately assessed and allocated points using this method.~~

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

DEVELOPMENT OF THE POINT VALUES

Within the City measures 1,308 MT CO_2e will be reduced using the Screening Tables for new development. The Screening Tables and the point allocation within the Screening Tables are tied to 1,308 MT CO_2e of reductions.

The first step in allocating point values is to determine the number of new homes and commercial buildings that are anticipated by year 2035. The City predicts that a total of 4,440 new residential units will be needed by 2035 and a total of approximately 4,052,000 square feet of new commercial and industrial buildings within the City is needed to accommodate anticipated job growth.

Approximately 4,440 new residential units and 4,052,000 square feet of new commercial and industrial buildings within the City are anticipated to either use the screening tables or provide an independent analysis demonstrating reductions. Evaluating the growth in residential and commercial/industrial land uses, approximately 69 percent is attributable to residential and 31 percent attributable to commercial/industrial land uses. Using those ratios, the Screening Tables will need to reduce 903 MT CO_2e from residential development (69% of the total 1,308 $MTCO_2e$ assigned reductions) and 405 MT CO_2e from commercial/industrial development (31% of the total 1,308 $MTCO_2e$ assigned reductions) by 2035.

Residential

Dividing the 903 MT CO_2e reductions of emissions afforded the Screening Table ~~for new residential development~~ by the anticipated 4,440 new residential units that will be built, means that each new residential unit must ~~yields~~ provide a 0.2 MT CO_2e ~~per residential unit that needs to be reduced to reduction. fulfill the anticipated reductions of the Plan.~~ A standard residential energy efficiency measure in Santee's Climate Zone 10 yields a 0.002 $MTCO_2e$ reduction (CAPCOA, 2011). To achieve a 0.2 MTCO2e reduction per each residential unit, 100 such standard efficiency measures (or 100 points) are required. An example of a standard efficiency measure is installing low-precipitation spray heads for an irrigation system (1 point). However, some measures save more money. Installing a gray water reuse system achieves a 0.014 $MTCO_2e$ reduction and would result in 7 points (0.014 $MTCO_2e$ / 0.0002 $MTCO_2e$).

Commercial/Industrial

Using the same process, the Screening Tables for new commercial/industrial development needs to reduce 0.1 MT CO_2e per 1,000 gross square feet of commercial/industrial building area (405 $MTCO_2e$ / 4,052,000 S.F= 0.1 $MTCO_2e$/1,000SF . A standard commercial / industrial energy efficiency measure in Santee's Climate Zone 10 yields a 0.001 $MTCO_2e$ per 1,000 square feet reduction (CAPCOA, 2011). To achieve a 0.1 MTCO2e reduction for each 1,000 square feet, a project would have to achieve 100 standard efficiency measures (or 100 points). Some measures save more energy (and greater GHG reductions). For example, adding enhanced insulation would result in 11 points (0.011 MTCO2e reductions).

~~Levels of reduction efficiency for typical residential units in this climate zone yields:~~

~~**0.002 MT CO_2e per Point per Residential Unit**~~

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

~~**0.001 MT CO_2e per Point per 1,000 Sq. Ft. of gross Commercial/Industrial building area**~~

Since each residential unit needs to reduce 0.2 MT CO_2e and each 1,000 square feet of commercial/industrial building area needs to reduce 0.1 MT CO_2e, each project needs to gain 100 points to provide the expected reductions from the Screening Tables.

ATTACHMENT D: METHODOLOGY FOR CONVERTING VEHICLE MILES TRAVELED (VMT) REDUCTIONS INTO POINTS

METHODS SUMMARY

The transportation measures that show a range of point values in the Screening Tables correspond with the percentage range of reduced vehicle miles traveled (VMT) shown in the California Air Pollution Control Officers Association (CAPCOA) publication titled Quantifying Greenhouse Gas Mitigation Measures (August 2010). The ranges of point values show the minimum and maximum amount of points that can be allocated to a project. There are a series of conversions that need to take place in order to calculate the exact number of points to allocate to a project.

The first step is to determine the amount of VMT that will be reduced as a result of the project implementing the transportation related measure and to understand VMT reduction we need to look at specific measures. For example, Mixed Use development that has a mix of land uses that complement one another (such as residential with neighborhood commercial) will increase the chances of residents walking or biking to local retail, or at minimum reduce the amount needed to drive, both of which reduce VMT. To calculate the VMT reductions we look at pages 162 through 166 in Quantifying Greenhouse Gas Mitigation Measures (CAPCOA, 2010). These pages provide the formulas and instructions needed to calculate VMT reductions for this measure.

On page 162 of Quantifying Greenhouse Gas Mitigation Measures the document states that the range of effectiveness is 9-30 percent reduction in VMT and therefore 9-30% reduction in GHG emissions associated with VMT (CAPOA 2010). The document also states that urban mixed use projects are characterized by properties on which various land uses are combined into a single high-rise building or site. Suburban mixed use projects will have at least three of the following land use types within ¼ mile of each other. These land use types are residential, retail, parks/open space, institutional, offices. These different types of land uses can be onsite or offsite so long as they are ¼ mile or less from one another and have pedestrian and bicycle linkages. For the purposes of Santee, the suburban mixed use development is assumed in the Screening Tables.

Calculating the GHG emissions reduced due to mixed use development requires using the Baseline Method and Mitigation Method described on pages 162 and 163 of the CAPCA document (CAPCOA 2010) as follows: **Baseline Method**

$$\mathbf{CO_2 = VMT \times EF_{running}}$$

Where: VMT = vehicle miles, $EF_{running}$ = emission factor for running emissions.

Mitigation Method:

% VMT Reduction = Land Use * B (not to exceed 30%)

Where **Land Use** = percentage increase in land use index verses single use development which is calculated as follows: (Project land use index – single land use index)/single land use index,

B = elasticity of VMT with respect to land use index (0.09 from [1]) not to exceed 500% increase.

The land use index can be calculated as follows:

$$a = \sum_{i=1}^{6} a_i \, x \, ln(a_i)$$

a_i = building floor area of land use i / total square feet of area considered as follows:

- a_1 = single family residential
- a_2 = multifamily residential
- a_3 = commercial
- a_4 = industrial
- a_5 = institutional
- a_6 = park/open space

Discussion: In the above calculation, a land use index of 0.15 is used as a baseline representing a development with a single land use. There are two separate maximums noted: a cap of 500% on the allowable percentage increase of land use index, and a cap of 30% on the maximum percentage of VMT reduction allowed.

The following is an example project using these calculations:

The Mixed Use Project is 90% single family homes, 5% commercial, 5% school (institutional).

Land Use index = -[0.9*ln(0.9)+ 0.05*ln(0.05)+ 0.05* ln(0.05) + 3*0.01*ln(0.01)]/ln(6) = 0.3

Low Range % VMT Reduced = (0.3-0.15)/0.15*0.09 = 9%

As an example, a mixed use project includes 200 single family homes at an average of 1,800 sq. ft. each, and a small elementary school and neighborhood commercial with 20,000 sq. ft. of interior space each.

The trip generation rate for the single family homes are 9.57 trips per day with an average trip length of 7.9 miles per trip (SANDAG 2002): 200 single family homes x 9.57 trips per day x 7.9 miles per trip = 15,120 VMT per day. This is the amount of VMT a single land use project (residential only) would generate. Using the low range of nine percent reduction in VMT as calculated above, this project would reduce 1,360.85 VMT. The reductions as follows:

VMT Reductions:

Pedestrian linkages:	Home-Work	Home-Shop	Home-Other
Schools within ¼ mile	0.0	0.0	680.425
Local commercial within ¼ mile	0.0	680.425	0.0

Using the California Air Resources Board (ARB) On-Road Emissions Factor model (EMFAC 2016) the averaged emission factor for light duty autos and trucks in year 2020 are as follows:

CO_2/grams per mile = 386.451146949429

CH_4/grams per mile = 0.0175356228303186

N_2O/grams per mile = 0.01831733

These emission factors need to be converted into CO_2e using the global warming potentials of each gas as follows: (CO_2 x 1 + CH_4 x 28 + N_2O x 265) = 391.796236 grams per mile CO_2e

Converting grams per mile to Metric Tonnes (MT) per mile: 0.00039179 MT CO_2e per mile

Therefore, each mile reduced = 0.00039179 MT CO_2e

Converting the total VMT reduction into CO_2e: 1,360.854 VMT reduced X 0.00039179 MT CO_2e per mile = 0.533 MT CO_2e reduced.

Point values in the Screening Tables are dependent upon the size of the Project. Therefore, the first step in converting the reduction of CO_2e into points requires us to divide the emissions by the number of dwelling units (since this mixed use project is primarily residential): 0.533 MT CO_2e reduced annually/200 single family dwelling units (DU) = 0.00266 MT CO_2e per DU

The final step is to covert the MT CO_2e per DU into points using the conversion factor shown in Attachment C of this document. Attachment C shows that for Residential Projects each point = 0.002 MT CO_2e. 0.00266 MT CO_2e per DU x 0.002 MT CO_2e per point = 1.33 points for this project.

Putting this all together, here are the major factors needed to calculate VMT and MT CO_2e:

Average Daily trip rates for Single Family Residential is 9.57 trips per day

Average trip length is 7.9 miles per trip

Minimum VMT reduction for a mixed use project is 9 percent = approximately 1.33 points

Maximum VMT reduction allowed is 30 percent = approximately 4.5 points

Each mile reduced = 0.00039179 MT CO_2e reduced

0.002 MT CO_2e = 1 point for residential projects. Note that the total MT CO_2e reduced by the project needs to be divided by the number of Dwelling Units (DUs) when converting to points

0.001 MT CO_2e = 1 point for commercial and industrial projects. Note that the total MT CO_2e reduced by the project needs to be divided by the 1,000 sq. ft. of gross floor area when converting to points.