



City of Carmel-by-the-Sea Climate Action Plan

The Path Forward

Adopted by the Carmel-by-the-Sea City Council
on _____

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INTRODUCTION

Rising concentrations of carbon dioxide and other greenhouse gases are altering temperature and rainfall patterns and contributing to rising sea levels globally. In California, recent historic wildfires, droughts, floods, mudslides, and public safety power shutoffs represent the types of climate change impacts that will continue to be experienced with increasing frequency and severity. Although climate change is a global issue, regional and local governments are uniquely positioned to identify the specific risks and most effective solutions for their communities.

Recognizing the importance of local action, the City of Carmel-by-the-Sea (City) Climate Action Plan (CAP) presents measures that will serve as a road map to meeting Carmel-by-the-Sea's greenhouse gas (GHG) emission reduction targets. It addresses government operations emissions under the City's control, as well as community-wide emissions. The emissions reduction measures build on existing plans, policies and practices already adopted by the City and other regulators, and are consistent with statewide climate legislation. This plan is a companion document to the City's Climate Adaptation Plan and includes several measures that not only reduce the community's GHG emissions but also improve public health and community resilience.

Scope of the Climate Action Plan

This Climate Action Plan consists of the following elements:

- (1) a greenhouse gas emissions inventory (summarized in this chapter and provided in full as Appendix A),
- (2) a 2030 greenhouse gas emissions target and forecast, and a 2045 carbon neutrality goal, in line with Statewide goals,
- (3) an action plan to meet these targets, and
- (4) implementation and monitoring recommendations to ensure continued success towards reaching GHG reduction goals.

The CAP identifies strategies to guide the development and implementation of GHG reduction measures in the City of Carmel-by-the-Sea, and quantifies the emissions reductions that result from these strategies. The overall benefits of the CAP are much greater than reducing GHG emissions; it includes quality of life and resilience improvements for the community, potential energy cost savings for residents and businesses, and protection of environmental and community assets for future generations.

The CAP proposes strategies to reduce GHG emissions from community-wide activities and government operations. Strategies are broken down into six goals:

- Goal 1:** Energy Efficiency and Electrification of Residential and Commercial Buildings
- Goal 2:** Improved Transportation Choices
- Goal 3:** Renewable Energy Sources
- Goal 4:** Water Efficiency
- Goal 5:** Waste Reduction
- Goal 6:** Urban Forest Protection and Heat Island Effect Reduction

GREENHOUSE GAS EMISSIONS INVENTORY AND FORECAST

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

Community GHG Inventory Scope

The Association of Monterey Bay Area Governments (AMBAG) has prepared community inventories for its member jurisdictions, including the City, for the years 2005, 2010, 2015, 2018, and 2019. The 2019 inventory is the most recent year for which data is available. Table A provides the sectors evaluated in the GHG inventories.

Table A: Community Sectors Evaluated

Community Sectors
Residential Energy (Electricity and Natural Gas)
Commercial Energy (Electricity and Natural Gas)
On-Road Transportation
Solid Waste
Wastewater

AMBAG calculated GHG emissions using the available activity data (e.g., kilowatt-hours of electricity) in the State Energy Efficiency Collaborative (SEEC) ClearPath tools to convert

activity data to emissions output using relevant emission factors.

Transportation GHG Analysis

LSA Associates (LSA) was retained by the City to develop an updated GHG emissions inventory to address specific concerns associated with the City's unique tourist-based economy that attracts visitors from around the State and the world (Appendix A). The City wanted to better understand the relationship between its tourist economy and GHG emissions resulting from tourism. The City had two specific goals: (1) understanding GHG emissions from on-road transportation based upon the origins and destinations of vehicle trips attributable to the City; and (2) developing GHG reduction strategies that will be effective for different types of vehicle trips including vehicle trips resulting from tourism, vacation homes, employee commutes, delivery services, and other local trips.

The analysis determined the following vehicle trip information:

- Local trips made up approximately 7 percent (%) of all vehicle trips in the City and averaged 6.5 miles.
- Commute trips represented 38% of all vehicle trips in the City and averaged 27 miles per trip.
- Delivery services providing supplies to local businesses and construction sites in the City made up approximately 10% of all vehicle trips and averaged 27 miles.

- 20% of vehicle trips result from the occupants of second homes in Carmel with an average trip length of 120 miles from their origin to the second home.
- Domestic tourists (primarily from the Bay Area and Salinas) make up 22.5% of vehicle trips. Their mileage varies depending on their origin from 27 miles for visitors from Salinas to 322 miles for those from Los Angeles and Orange Counties.
- International tourists make up approximately 2.5% of vehicle trips. Many of these visitors took a tour bus to arrive in Carmel from San Francisco International Airport.

In accordance with the United States Environmental Protection Agency (EPA) guidance protocols, GHG emissions associated with vehicle miles traveled within Monterey County boundaries are considered “Scope 1” emissions and are counted in the City’s GHG inventory and target setting. The EPA describes Scope 1 emissions as direct sources (smoke stacks or tailpipes that release emissions within an organizational boundary) of GHG emissions.

The GHG emissions associated with vehicle miles traveled outside of the Monterey County Boundaries are considered “Scope 3” indirect emissions. Although these indirect emissions are not included in the target setting, the City has developed strategies focused on reducing these emissions as well.

GHG Inventory Results

The City’s total emissions in 2019 were 30,962 metric tons of carbon dioxide equivalent (MT CO₂e). As shown in Figure 1 and Table B, the on-road transportation sector was the largest contributor to emissions in the 2019 inventory, with 45.8% of the City’s total GHG emissions. Natural gas made up 43.2% followed by solid waste at 10.3% of total emissions. Electricity (0.5%), and wastewater (0.2%) comprised the remainder of the emissions. As shown in Figure 2, electricity accounts for a low percentage of total emissions due to the power supply mix provided by Central Coast Community Energy (3CE).

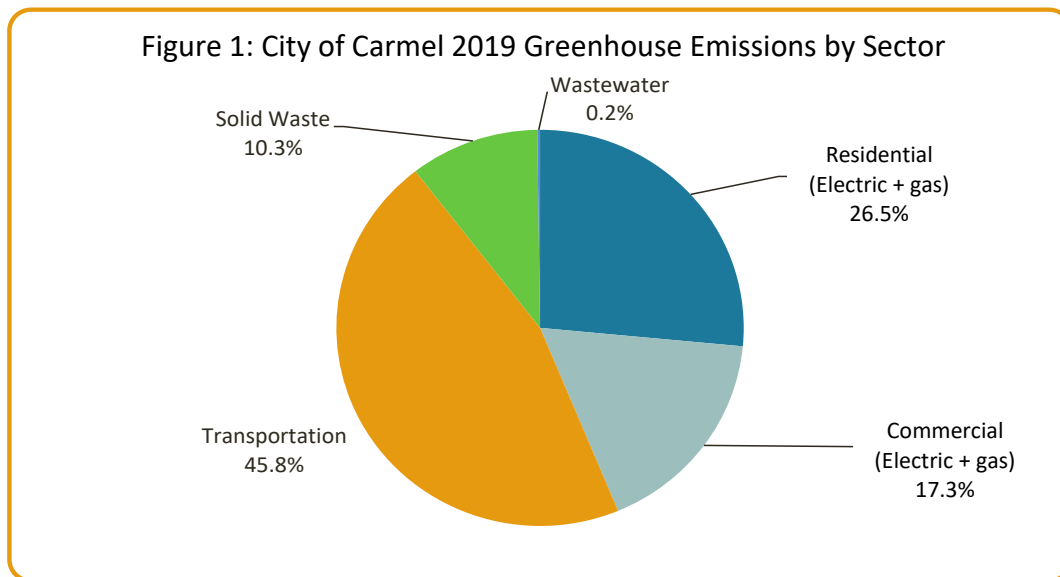
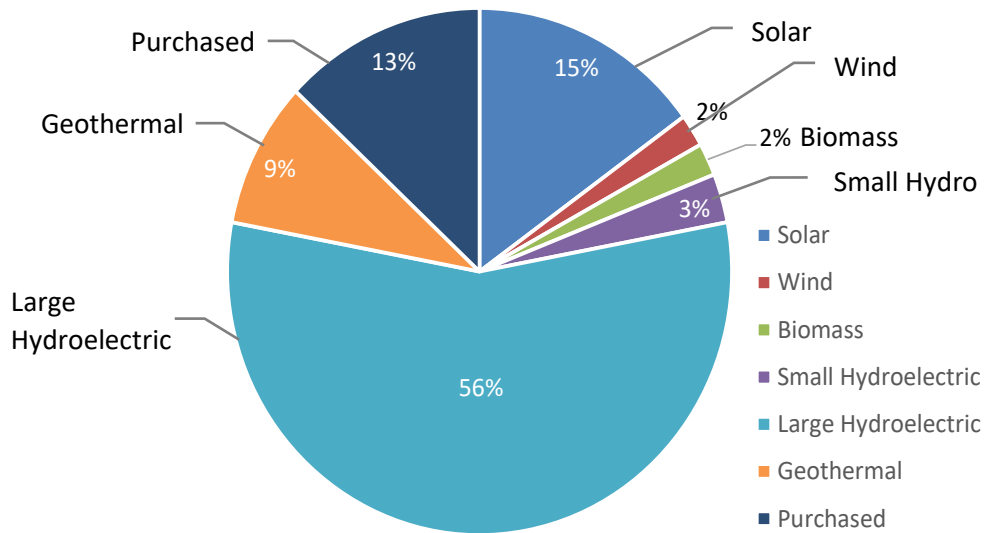


Table B: Communitywide GHG Emissions by Sector for 2019

Sector	2019 (MT CO ₂ e)	Percent of Total
On-road Transportation		
Scope 1	14,173	45.8
Scope 3	15,115	
Electricity		
Residential	63	0.5
Commercial	92	
Natural Gas		
Residential	8,138	43.2
Commercial	5,250	
Solid Waste	3,178	10.3
Wastewater	68	0.2
Total Scope 1 Emissions	30,962	100
Total with Scope 3 Emissions	46,076	

Source: AMBAG and LSA 2021.
 MT CO₂e = metric tons of carbon dioxide equivalent

Figure 2: 3CE Electric Power Generation Mix



GHG Emissions 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) scenario and an Adjusted BAU (ABAU) scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that would reduce emissions in the future (that is, the policies and related efficiency levels in place in 2019 are assumed to remain constant through 2045). The City’s projected growth is estimated using data from AMBAG’s adopted growth forecasts for Carmel by-the-Sea, which provides the City’s demographic growth indicators for the years 2030 and 2045. The growth rates for households, population, and employment were estimated based on the available data and used to estimate the growth in households, population, and employment into the year 2045. Table C shows the growth projections used to develop the emissions forecasts. As shown in this table, population, jobs, and energy consumption will experience very low growth rates in the City through 2045.

The ABAU scenario describes emissions based on projected growth *and* considers policies that will achieve GHG reductions in the future. By

evaluating the two scenarios, the City can evaluate the effect that existing policies may have on future emissions and determine which local measures would provide additional reductions.

Two future years are forecast for each scenario: 2030 and 2045. The 2030 forecast year is consistent with the goals identified in the Senate Bill (SB) 32, and the corresponding Statewide Scoping Plan, which identifies Statewide GHG reduction targets for 2030.

As shown in Table D, the 2030 BAU emissions are estimated to be 29,445 MTCO₂e. By 2045, emissions are estimated to decrease to 27,471MT CO₂e. This modest reduction in GHG emissions is due to changes over time as people purchase newer and more energy efficient automobiles and appliances.

As shown in Table E, the City’s ABAU emissions are estimated to be 23,013 MT CO₂e in 2030, and 19,013 MT CO₂e in 2045. The ABAU takes into account stringent State regulations related to transportation (vehicle efficiency and low carbon fuel standards) and energy sectors (renewable energy portfolio standards and requirements for a portion of the natural gas supply to be renewable natural gas).

Table C: Growth Indicators for 2020, 2030, and 2045

Sector	Demographic Indicator	2020	2030	2020–2030 CAGR ¹ Percent	2045	2020–2045 CAGR Percent
Residential Energy	Households	3,437	3,442	0.0002	3,459	0.0064
Commercial/Industrial Energy	Jobs	3,556	3,674	0.0033	3,915	0.0040
N/A ²	Population	3,949	3,954	0.0001	3,984	0.0035
VMT, Solid Waste and Wastewater	Service Population (Population + Jobs)	7,505	7,628	0.0015	7,899	0.0020

Source: AMBAG, 2022 Regional Growth Forecast

¹ CAGR = Compound annual growth rate.

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

Table D: Business As Usual (BAU) Forecast Emissions

Sector	2019 (MT CO ₂ e)	2030 (MT CO ₂ e)	Percent Change 2019–2030	2045 (MT CO ₂ e)	Percent Change 2019–2045
On-road					
Transportation					
Scope 1:	14,173	13,316	-5%	12,582	-11%
Scope 3:	15,115	14,201		13,418	
Electricity					
Residential	63	60	-5%	56	-11%
Commercial	92	87		82	
Natural Gas					
Residential	8,138	7,759	-4%	7,239	-11%
Commercial	5,250	4,961		4,628	
Solid Waste	3,178	3,033	4%	2,830	-11%
Wastewater	68	59	-5%	55	-12%
Total (Scope 1)	30,962	29,445	-5%	27,471	-11%
Total (Scope 3)	46,076	43,646		40,889	

Source: LSA forecasts for the City of Carmel by-the-Sea, 2021.
MT CO₂e = metric tons carbon dioxide equivalent

Table E: Adjusted Business As Usual (ABAU) Forecast Emissions

Sector	2019 (MT CO ₂ e)	2030 (MT CO ₂ e)	Percent Change (2019–2030)	2045 (MT CO ₂ e)	Percent Change (2019–2045)
On-road					
Transportation					
Scope 1:	14,173	10,407	-26.6%	8,708	-38.6%
Scope 3:	15,115	11,105		9,285	
Electricity					
Residential	63	47	-25.4%	39	-38.1%
Commercial	92	68		57	
Natural Gas					
Residential	8,138	6,138	-24.6%	5,010	-38.4%
Commercial	5,250	3,935		3,203	
Solid Waste	3,178	2,372	-25.4%	1,958	-38.3%
Wastewater	68	46	-32.4%	38	-44.1%
Total (Scope 1)	30,962	23,013	-25.7%	19,013	-38.6%
Total (Scope 3)	46,076	34,118		28,298	

Source: LSA forecasts for the City of Carmel by-the-Sea, 2021.
MT CO₂e = metric tons carbon dioxide equivalent

GREENHOUSE GAS EMISSIONS TARGETS

The State has set goals for reducing statewide GHG emissions by 2030 and 2045 through Assembly Bill (AB) 32, Senate Bill (SB) 32, SB 100, and Executive Order (EO)-B-55-18. The State has also provided guidance to local jurisdictions as “essential partners” in achieving the State’s goals by identifying a 2030 GHG emissions target 40 percent below 1990 levels. Additionally, continued reduction goals should be implemented beyond the 2030 target to keep the State on a path toward Statewide climate neutrality by 2045.

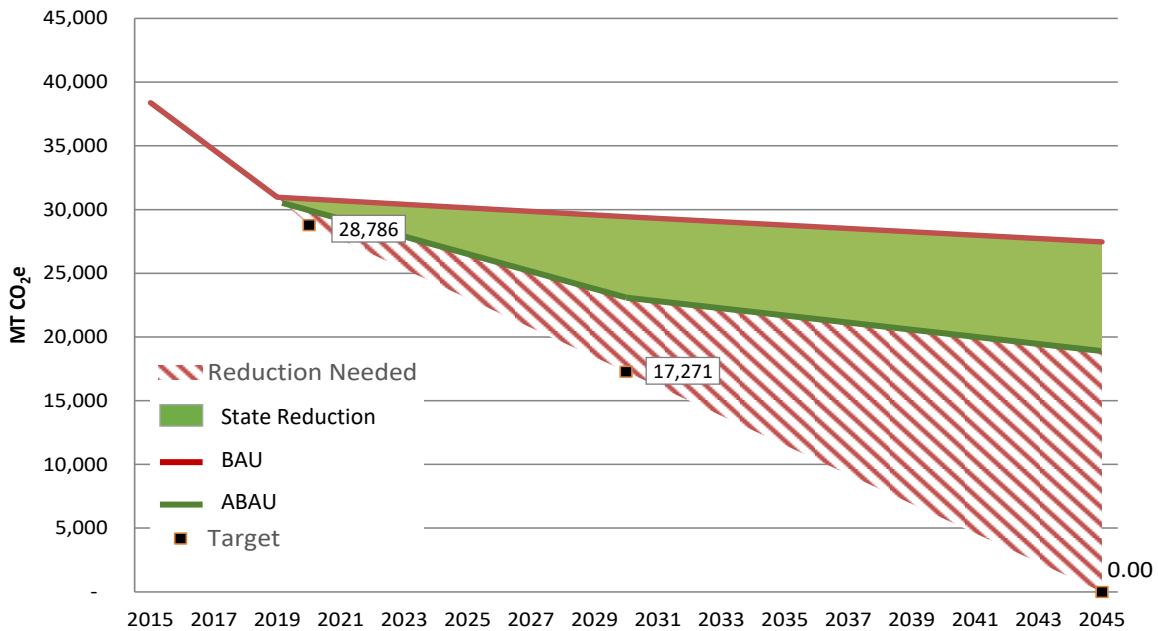
In the City of Carmel-by-the-Sea, the State’s target of 40 percent below 1990 levels by 2030 amounts to a reduction of 12,174 MT of CO₂ equivalent in annual emissions by 2030 compared to the BAU forecast and a reduction

of 5,742 MT CO₂e by 2030 compared to the ABAU forecast to meet the State target. The City needs to implement strategies and measures to meet the State’s 2030 GHG reduction target.

Additionally, the City’s long-term goal is to also meet the State’s 2045 carbon neutrality goal. As the City begins to implement the Climate Action Plan, additional measures will need to be identified and developed over time to meet this long-term goal.

Figure 3 depicts the BAU and ABAU forecasts, reduction targets, and additional GHG emission reductions required to meet the reduction targets.

Figure 3: BAU, ABAU forecasts, and Reduction Targets



GREENHOUSE GAS EMISSION REDUCTION STRATEGIES

Based on the City’s GHG emissions forecasts and identified targets, the City developed a strategy table (Table F) of community-wide goals, measures, and actions to meet its 2030 reduction target and work towards its 2045 carbon neutrality goal.

In the strategy table, goals describe overarching objectives in a particular sector of GHG emission reductions. There are six goal areas listed in the table:

Goal 1: Energy Efficiency and Electrification of Residential and Commercial Buildings

Goal 2: Improved Transportation Choices

Goal 3: Renewable Energy Sources

Goal 4: Water Efficiency

Goal 5: Waste Reduction

Goal 6: Urban Forest Protection and Heat Island Effect Reduction

Within each goal, one or more measures are presented. Each measure includes a GHG reduction potential by 2030 and one or more actions that indicate the steps the City plans to take in achieving the measure. Certain actions are noted as “supporting actions” that will enhance the effectiveness of program implementation and GHG reductions.

To facilitate implementation of each action by the City, additional information is included for each measure, as follows:

- **Metric:** A performance indicator to gauge progress on implementation of actions. Metrics are a key component of






implementing, monitoring, and evaluating the Climate Action Plan.

- **Timeframe:** The timeframe lays out a preliminary timeline for action implementation.
- **Implementation Lead:** The City department(s) that will lead the implementation of each action.
- **Cost:** Sorted into ranges of \$-Low (<\$25,000), \$\$-Medium (\$25,000 - \$100,000), and \$\$\$-High (>\$100,000), these estimates are used to determine the extent of funding and financing needed to implement these measures.

TABLE F: GHG Emissions Reduction Strategy Table

Goal 1. Energy Efficiency and Electrification of Residential and Commercial Buildings

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 1.1 Energy Efficiency Training, Education, Incentives and Recognition for Residential and Commercial							
<p>Action 1.1.1: Energy Efficiency Outreach Post links on website and social media and provide materials at public events re: energy efficiency and electrification resources for residential and commercial. Promote an annual energy efficiency fair. Promote PG&E energy center and online resources. Hold trainings on energy efficiency and Title 24 requirements.</p>	Supporting Action	Supporting Action	<ul style="list-style-type: none"> - Energy efficiency resources on website, Friday Letter, social media - Energy efficiency fair held (Earth Day) - Title 24 training held 	2022-2024	Building, Planning, PW, Community Activities	\$	1.3.6
<p>Action 1.1.2: Energy Efficiency and Electrification Incentives Partner with AMBAG, PG&E and 3CE to promote incentive programs for residential and commercial efficiency and electrification, including heat pump retrofits and gas appliance and fireplace retrofits.</p>	71.1	71.1	<ul style="list-style-type: none"> - Incentive programs posted on website, Friday Letter, social media - Incentive programs promoted at energy fair - Incentive program promoted thru Green Business and Green Citizen programs 	2023-2025	Building, Planning, PW	\$	1.3.2, 1.3.6, 1.3.7
<p>Action 1.1.3: Energy Efficiency Audits Promote PG&E energy audits and tools for residential and commercial</p>	Supporting Action	Supporting Action	<ul style="list-style-type: none"> - Audit Information on website, Friday Letter, social media - Information shared at annual fair 	2022-2024	Planning, PW	\$	
Measure 1.2 Energy Efficiency in Renovation Projects							
<p>Action 1.2.1: Feasibility Study for Existing Building Electrification and Back-up Power. Perform an electrification feasibility study/existing building analysis in order to understand the potential for, and associated costs of, electrification retrofitting, including heat pumps, along with on-site energy generation and battery storage to provide a more resilient back-up power supply. Establish a plan for reducing or eliminating natural gas from existing buildings, potentially through a reach code, and building resilience to potential electrical grid shutoffs.</p>	Supporting Action	Supporting Action	<ul style="list-style-type: none"> - Feasibility Study for Existing Building Electrification and Back-up Power completed 	2022-2024	Planning, PW	\$ \$	1.3.4

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
<p>Action 1.2.2: Residential Home Energy Renovations. Enhance enforcement of Title 24 compliance</p> <p>Promote participation in green building programs such as Leadership in Energy and Environmental Design (LEED), and Energy Upgrade California.</p> <p>Develop a Reach Code to require major home renovations/additions to convert to all-electric homes.</p> <p>Evaluate feasibility of streamlining online permitting to facilitate electrification retrofits</p>	1,217.5	1,294.6	<ul style="list-style-type: none"> - 100% of regulated projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - LEED information on City website and at energy fair 	2023-2025	Building, Planning	 	
<p>Action 1.2.3: Residential Home Energy Renovation Incentives. Develop a program to promote home energy efficiency and electrification benefits, advertise incentives, and recognize residents that implement retrofits, such as a Green Citizen Program.</p> <p>Promote financing programs for home upgrades, such as Home Energy Renovation Opportunity (HERO) and Property Assessed Clean Energy (PACE)</p> <p>Promote incentives available to homeowners to convert to all-electric homes. Evaluate the feasibility of providing additional incentives.</p>	Supporting Action	Supporting Action	<ul style="list-style-type: none"> - Green Citizen Program developed - Financing information on website, at energy fair - Incentive information on website, at energy fair 	2022-2024	Building, Planning, PW		1.3.6, 1.3.7
<p>Action 1.2.4: Commercial Energy Renovations. Enhance enforcement of Title 24 compliance</p> <p>Develop a Reach Code to require major commercial renovations/expansions to convert to all-electric building unless the business can show a need for natural gas (restaurants, pottery kilns etc.)</p> <p>Promote participation in green building programs such as Leadership in Energy and Environmental Design (LEED), and Energy Upgrade California.</p> <p>Evaluate the feasibility of streamlining online permitting to facilitate electrification retrofits</p>	1,206.2	1,666	<ul style="list-style-type: none"> - 100% of regulated projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - LEED information on City website and at energy fair 	2023-2025	Building, Planning	 	





Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
<p>Action 1.2.5: Commercial Energy Renovation Incentives. Partner with AMBAG and 3CE incentive programs to increase business participation in commercial energy efficiency programs</p> <p>Promote financing programs for home upgrades, such as Property Assessed Clean Energy (PACE)</p> <p>Initiate a Green Business Certification Program for businesses that follow the California Green Business Program standards (www.greenbusinessca.org).</p> <p>Promote existing incentives for businesses to convert to all-electric buildings. Evaluate the feasibility of providing additional incentives.</p>	69.4	69.4	<ul style="list-style-type: none"> - Green Business Program initiated - Financing information on website, at energy fair - Incentive information on website, at energy fair, and shared via GBP 	2022-2024	Building, Planning, PW	\$	1.3.6, 1.3.7
Measure 1.3 Energy Efficiency in New Construction Projects							
<p>Action 1.3.1: Energy Efficiency in New Residential Construction</p> <p>Educate City staff and developers on future Title 24 updates.</p> <p>Promote Tier 1 and Tier 2 green building ratings such as LEED, Build it Green or Energy Star certified buildings.</p> <p>Evaluate feasibility of streamlining online permitting.</p> <p>Develop a Reach Code to require new residential buildings to be all-electric homes.</p>	0.01	0.01	<ul style="list-style-type: none"> - 100% of projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - LEED information on City website and at energy fair 	2023-2025	Building, Planning	\$	
<p>Action 1.3.2: Energy Efficiency in New Commercial Construction</p> <p>Educate City staff and developers on future Title 24 updates.</p> <p>Promote Tier 1 and Tier 2 green building ratings such as LEED, Build it Green or Energy Star certified buildings.</p> <p>Evaluate feasibility of streamlining online permitting.</p> <p>Develop a Reach Code to require new commercial buildings to be all-electric with exemptions for business that can show a need for natural gas (restaurants, pottery kilns etc.)</p>	0.0	0.0	<ul style="list-style-type: none"> - 100% of projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - LEED information on City website and at energy fair 	2023-2025	Building, Planning	\$	

Goal 2. Improved Transportation Choices




Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 2.1. Alternative Transportation Options							
<p>Action 2.1.1: Reduce Reliance on Automobiles. Work with AMBAG, TAMC and Caltrans to remove barriers to alternative transportation such as safe pedestrian and bicycle access to the City across Highway 1. Promote and provide incentives for bus ridership Explore the feasibility of increasing land use density in downtown during the next General Plan Land Use Element update. Identify and promote within the hotels and visitors center existing shuttle services between Carmel and the airports. Work with Monterey Airport and AMBAG to explore the feasibility of an electric shuttle service between Monterey Airport and destinations in the City.</p>	Scope 1 563 Scope 3 89	Scope 1 563 Scope 3 89	<ul style="list-style-type: none"> - Outreach on shuttle services created and provided in Carmel hotels - Incentives developed and promoted to encourage bus use - Coordination meetings held with AMBAG, Monterey Airport on shuttle options - Coordination meetings held re: alternative transportation to Carmel - General Plan Land Use Element updated 	2023-2030	Planning, PW	\$ \$ \$	
<p>Action 2.1.2: Develop Bicycle Master Plan to Create Safe Bike Routes around the City Develop customized bike routes to improve bike transit. Provide signage, reduce speed limits as necessary, and develop safety education programs on “sharing the road” with bikes.</p>	10	10	<ul style="list-style-type: none"> - Bicycle master plan created - Signage installed - Outreach materials created and shared via City website, newsletters, local newspapers, and other outlets. 	2024-2026	Planning, PW	\$	
<p>Action 2.1.3: Ride-Sharing and Bike to Work Programs within City Operations and Businesses Promote ride-sharing and facilitate air district incentives for ride-sharing Provide reserved preferential parking spaces for ride-sharing, carpooling, and ultra-low or zero emission vehicles in City parking lots. Encourage the same at private businesses that have employee parking. Require businesses of a certain size to provide facilities such as bike racks and showers.</p>	Supporting Action	Supporting Action	<ul style="list-style-type: none"> - Incentives for ride-sharing created and advertised - Incentives for bike riding created and advertised - Reserved parking spaces created for ride-sharing, and low/zero emission vehicles - Bike racks included in design guidelines for commercial remodels 	2022-2024	Planning, PW	\$	

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 2.2. Electrify the Fleet							
Action 2.2.1: Prioritize Electric Vehicles (EVs)	Scope 1	Scope 1	<ul style="list-style-type: none"> - EV incentives shared on City website, newsletters, and at energy fair - EV chargers installed at City parking lots - Electric bus parking created and associated outreach - Green Visitor Program established - Outreach at Visit Carmel re: EV chargers on hotel properties - EV chargers included in design guidelines for commercial remodels 	2024-2026	Planning, PW, Community Activities	<ul style="list-style-type: none"> \$ \$ \$ 	
Promote electric vehicle incentive programs at outreach events.	1,511	1,538					
Apply for grants to install e-chargers at public facilities.							
Work with community groups and businesses to install additional e-chargers.	Scope 3	Scope 3					
Encourage hotels to provide priority parking for electric vehicles and provide e-chargers.	1,425	1,452					
Provide priority parking for bus tours that use electric buses.							
Work with Visit Carmel to develop and initiate a Green Visitor Program that rewards tourists that use electric vehicles, carbon credits for air-miles, and that adhere to the City's sustainability practices while visiting the City.							
Require or incentivize major commercial building renovations/expansions to install e-chargers.							
Measure 2.3 Initiate Origin/Destination Transportation Model							
Action 2.3.1: Develop Model	N/A	N/A	<ul style="list-style-type: none"> - ODTM Model developed - ODTM results incorporated in updated CAP 	2024-2026	Planning, PW	<ul style="list-style-type: none"> \$ \$ 	
Develop an Origin Destination Transportation Model focused on Carmel-by-the-Sea using the AMBAG regional model as a base.							
Update the CAP with new VMT data once the Origin Destination Model is completed.							




Goal 3. Renewable Energy Sources

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 3.1. Promote Clean Energy							
Action 3.1.1: Incentivize Clean Energy Installations Promote clean energy incentives to the community Incentivize solar panels installation on existing residential units Require or incentivize solar panel installation on major commercial building retrofits/expansions and commercial parking lots. Promote energy storage system installation with solar panels.	364	364	<ul style="list-style-type: none"> - Incentive information on website, at energy fair, and shared via new City outreach and recognition programs - Incentive for solar panel and/or energy storage installation developed 	2024-2026	Building, Planning, PW	 	1.3.7
Action 3.1.2: Increase uptake of 3CE Renewable Generation portfolio Switch the City's electricity to 3CE's 100 Percent Renewable Energy Option Promote 3CE's 100 Percent Renewable Energy Option by encouraging residents and businesses to participate in the program.	-	-	<ul style="list-style-type: none"> - City electricity accounts switched to 3CE's 100% renewable option - 3CE 100% renewable energy option promoted at energy fair and via City outreach and recognition programs 	2022-2024	PW, Planning	 	

Goal 4. Water Efficiency

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 4.1. Water Conservation in Landscaping							
<p>Action 4.1.1: Continued Implementation and Promotion of City and Model Water Efficient Landscaping Ordinance Water Conservation Standards</p> <p>Increase promotion of landscaping water conservation standards on website and social media</p> <p>Ensure all projects comply with the City's low-irrigation landscaping requirements.</p> <p>Work with the Monterey Peninsula Water Management District (MPWMD) to promote incentives for existing landscaping retrofits to reduce water use.</p>	2.9	3	<ul style="list-style-type: none"> - Landscaping water conservation information on website - 100% of projects including landscape retrofits comply with requirements - Landscape retrofit incentives developed and promoted in documents and outreach for development projects 	2023-2025	Planning, Forestry, PW	 	3.1.6
<p>Action 4.1.2: Exceed Water Efficiency Standards</p> <p>In partnership with the MPWMD, conduct direct outreach to HOAs, businesses, residents re: water conservation, grey water, rainwater harvesting</p> <p>Allow and promote recycled water for commercial and multi-family residential landscape irrigation.</p> <p>Allow and promote greywater systems and rainwater harvesting.</p>	Supporting Action	Supporting Action	<ul style="list-style-type: none"> - Direct outreach to HOAs, businesses, residents thru outreach and recognition programs - Recycled water Standard Operating Guidance developed and promoted for commercial and multi-family construction projects - Grey water systems and rainwater harvesting information promoted in documentation for development projects 	2024-2026	Building, Planning, Forestry		3.1.6

Goal 5. Waste Reduction

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 5.1. Reduce Waste that goes to the Landfill							
<p>Action 5.1.1: Increase the City's solid waste diversion</p> <p>Promote zero waste events, including the use of reusable rather than recyclable materials, and buy local to reduce waste.</p> <p>Work with the Monterey Regional Waste Management District and the waste hauler to implement the requirements of SB 1383, including organic waste collection for all commercial and residential properties.</p> <p>Conduct outreach to residents and businesses to ensure compliance and to minimize contamination.</p> <p>Promote home composting and community gardens.</p> <p>Educate the community on proper use of the City-provided grey/green/blue containers.</p>	1500	1500	<ul style="list-style-type: none"> - Develop zero waste event checklist and require City events to abide by it. - SB 1383 requirements implemented and waste diversion tracked - Outreach to residents and businesses through mailers, newsletters, City website, hauler website, letters, direct outreach. 	2022-2024	PW, Community Activities	  	

Goal 6. Urban Forest Protection and Heat Island Effect Reduction

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 6.1. Urban Forest Maintenance for Shade and Energy Savings							
<p>Action 6.1.1: Urban Forest Maintenance and Improvement</p> <p>Maintain the health of the urban forest tree canopy in the City.</p> <p>Continue to work with the Friends of Carmel Forest and the community to facilitate urban forest maintenance.</p> <p>Update the City’s Urban Forest Management Plan to include tree planting guidelines to promote tree health and maintain a healthy urban forest canopy.</p>	-	-	<ul style="list-style-type: none"> - Urban Forest Management Plan Updated - Tree planting and maintenance guidelines updated - Number of replacement trees planted 	2023-2025	Forestry, PW	<p>Ⓢ</p> <p>Ⓢ</p>	2.1.2
Measure 6.2. Light-reflecting Surfaces for Energy Savings							
<p>Action 6.2.1: Allow Cool Roof Options</p> <p>Evaluate the feasibility of allowing cool roof options in residential and commercial areas of Carmel.</p> <p>If feasible, revise existing ordinances to allow cool roof options on residential, commercial and office buildings.</p>	-	-	<ul style="list-style-type: none"> - Cool roof options researched and evaluated for consistency with Carmel design guidelines - Design Guidelines and/or ordinances revised 	2024-2026	Planning	Ⓢ	

Summary of GHG Emissions Reductions

By implementing the Statewide and local reduction measures described in Table F, the City would reduce its communitywide GHG emissions by 48 percent below 2019 levels of emissions by 2030. Table G below summarizes the strategies and the potential total GHG reductions for the community.

Figure 4 on the following page summarizes the 2015 through 2019 emission inventories, projected 2020, 2030, and 2045 emission forecasts, as well as the 2020, 2030, and 2045 reduction targets after implementation of the local reduction measures.

As shown in Figure 4, with implementation of the local reduction measures, emissions in 2030 are anticipated to be below the 2030 reduction target and provide additional reductions beyond 2030. However, even the proposed set of reduction strategies will not achieve carbon neutrality by 2045.

The City should track implementation of the Climate Action Plan over the next few years, update the 2045 ABAU forecasts, and provide local reduction strategy updates once the State has provided an updated Scoping Plan demonstrating how the State can achieve carbon neutrality by 2045.

Table G: Summary of Local GHG Reduction Strategies and Emissions Reductions

Goals and Measures	2030 Emission Reductions (MT CO ₂ e)
Goal 1: Energy Efficiency and Electrification of Residential and Commercial Buildings	
1.1: Energy Efficiency Training, Education, Incentives and Recognition for Residential and Commercial	71
1.2: Energy Efficiency in Renovation Projects	2,960
1.3: Energy Efficiency in New Construction Projects	0.01
Goal 2: Improved Transportation Choices	
2.1: Alternative Transportation Options	573
2.2: Electrify the Fleet	1,538
2.3: Initiate Origin-Destination Transportation Model	N/A
Goal 3: Renewable Energy Sources	
3.1: Promote Clean Energy	364
Goal 4: Water Efficiency	
4.1: Water Conservation in Landscaping	3
Goal 5: Waste Reduction	
5.1: Reduce Waste that Goes to the Landfill	1,500
Goal 6: Urban Forest Protection and Heat Island Effect Reduction	
6.1: Urban Forest Maintenance for Shade and Energy Efficiency	-
6.2: Light-reflecting Surfaces for Energy Savings	-
Total Community Measures	7,009

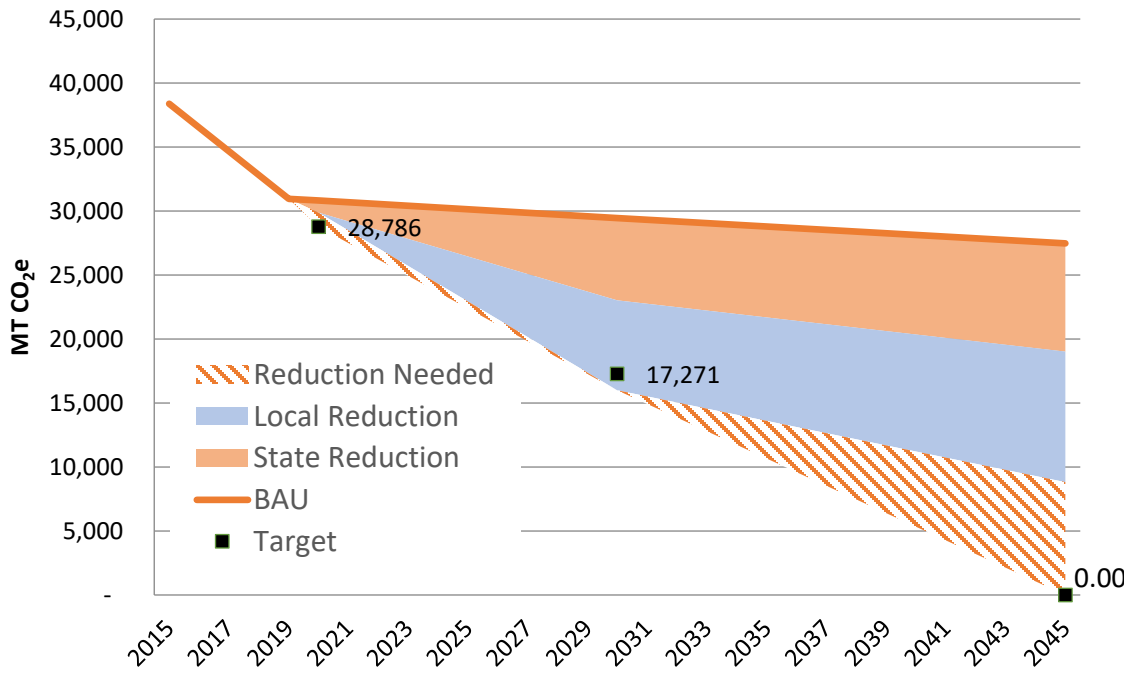
Source: Compiled by LSA 2022

MT CO₂e = metric tons of carbon dioxide equivalent

N/A = Not Applicable

- = Not quantified

Figure 4: Existing and Forecasted Emissions with Local Reduction Measure Implementation



IMPLEMENTATION

Implementation of the Climate Action Plan will require significant City staff time, consultants, and financial resources, along with collaboration with regulatory and utility partners to conduct community engagement. The successful implementation of the proposed actions will depend on the involvement of the whole community, including:

- City staff,
- Elected officials,
- Community group partners,
- Business community,
- Residents,
- Visitors.

This plan serves as a framework to strengthen the partnerships needed to meet the City's GHG reduction goals.

In addition to partnerships and community involvement, implementation of the Climate Action Plan will also require regular tracking and reporting to measure progress against the plan's goals. This section describes the guidance, tools, responsibilities, and analysis required to effectively implement and monitor progress with the adaptation strategy.

Strategies for Success

The strategies described below are recommended to ensure the successful implementation of this long-term multifaceted program:

- **Build on existing programs:** the Climate Action Plan focuses on building capacity based on existing programs and actions

already in progress rather than “reinventing the wheel.” There are many existing programs that the City can leverage, such as 3CE and PG&E incentive programs, LEED, and Energy Upgrade California, by ensuring businesses and residents have the knowledge and tools necessary to participate in them. Additionally, the CAP also builds on existing City policies and regulations that already provide GHG reduction benefits.

- **Leverage existing partnerships:** the CAP also prioritizes existing partnerships to leverage the expertise and resources that others, such as partner agencies and community groups, can bring to the table. This approach provides mutual benefits for the City and its partners.
- **Maintain communication:** it is essential to maintain communication within and between City departments, as well as with partners, elected bodies, and the community. A robust community outreach program, as well as regular updates to elected bodies, will be critical to the long-term success of the CAP.
- **Prioritize actions:** since the City and its partners cannot implement all the proposed measures and actions concurrently, each action has been prioritized for implementation over the next 10 years. Actions were prioritized in such a way that later actions could build on the outcomes of earlier actions. Early actions include those that can readily build on existing programs

and increase community awareness of necessary climate action measures to reduce the community's GHG emissions.

- **Regularly monitor implementation and evaluate success:** the Climate Action Plan will be monitored through tracking quantitative metrics, as described in the strategy table, to assess progress towards implementation of actions and measures. An annual report should be developed and should include an evaluation of the implemented actions and measures, assessing their effectiveness, and recommend modifications as needed. Elements that should also be considered in the evaluation include new regional and statewide programs and regulations, shifting community priorities, implementation hurdles, changes in best practice, and technological advances.
- **Seek guidance and leadership from elected bodies:** The City Council should consider establishing and appointing a new Sustainability Commission that could be responsible for reviewing the annual report, providing feedback on progress, and reviewing recommendations for enhancing the effectiveness of proposed measures. Based on feedback from the Sustainability Commission, City and partner staff, and the community, the City may conduct an update to the Climate Action Plan on or before 2030.
- **Funding:** although it is premature to estimate the overall cost of the CAP at this time, implementation will require significant staff time and capital investment. The City will ultimately

need to develop a funding plan to implement the more costly actions in the Climate Action strategy. The City should consider a variety of revenue sources, including:

- (1) adjusting existing fees to cover the costs associated with new or modified programs and services,
- (2) allocating portions of new fees, such as a downtown parking fee, to fund sustainability projects and programs,
- (3) exploring regional and state funding sources such as 3CE, the California Public Utilities Commission's California Solar Initiative, California Energy Commission and PG&E energy efficiency programs, the California Climate Action Corps Fellowship Program, CalRecycle grants and loans, and other similar programs.

Monitoring and Evaluation

The City should designate one department as the lead for carrying out implementation monitoring and evaluation of climate action. Although some GHG reduction measures and actions can be implemented using existing staff time, full implementation and coordination of efforts will require additional staff resources. For example, the City's Grant Writer/Climate Coordinator that is identified in the Climate Adaptation Plan could be tasked with carrying out implementation coordination, monitoring and evaluation of the CAP. The Grant Writer/Climate Coordinator could also lead the compilation of all monitoring data and an overall assessment of effectiveness annually.

Re-evaluation of GHG emissions reduction strategies should occur when new information indicates that a measure or action is either infeasible or ineffective. The CAP should be

monitored through tracking quantitative metrics as described in the strategy table (Table F). The CAP should be monitored and evaluated simultaneously with the City's Climate Adaptation Plan to measure the City's overall progress towards acting on climate change and increasing community sustainability and resilience.

Annually, the City should aggregate monitoring and evaluation results into an annual report describing achievements towards meeting the

GHG reduction goals and measures in the Climate Action Plan. The report should be posted on the City website and disseminated into the community, with support from engagement partners, to maintain awareness of success of the climate action strategies. Once implementation has been on-going for a few years and based on monitoring and evaluation results, as well as feedback from commissions, the City Council, and the public, the Climate Action Plan should be updated on or before 2030.



APPENDIX A

MEMORANDUM

DATE: April 11, 2022

TO: Agnes Martelet, City of Carmel By-The-Sea

FROM: Michael Hendrix, LSA

SUBJECT: Carmel By-The-Sea Greenhouse Gas Inventory Update, Forecast, Reduction Targets, and Strategies

The purpose of this technical memorandum is to present the City of Carmel-by-the-Sea (City) Greenhouse Gas (GHG) emissions inventory update, forecasts, targets, and reduction strategies to the City for review and feedback. The GHG emissions inventory update, forecasts and targets form the basis for the development of the GHG reduction strategies presented in this memorandum.

GREENHOUSE GAS EMISSIONS INVENTORY, FORECAST, AND TARGETS

An updated GHG emission inventory was prepared, as well as emission forecasts, and emission reduction targets as described in this section.

1.1 Greenhouse Gas Emissions Inventory Update

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

The Association of Monterey Bay Area Governments (AMBAG) prepared community inventories for the years 2005, 2010, 2015, 2018, and 2019. The 2019 inventory is the most recent year for which data is available. Table A provides the sectors evaluated in the GHG inventories.

Table A: Community Sectors Evaluated in the Inventories

Community Sectors
Residential Energy (Electricity and Natural Gas)
Commercial/Industrial Energy (Electricity and Natural Gas)
On-Road Transportation
Solid Waste
Wastewater

AMBAG calculated GHG emissions using the available activity data (e.g., kilowatt-hours of electricity) in the State Energy Efficiency Collaborative (SEEC) ClearPath tools to convert activity data to emissions output using relevant emission factors.

1.1.1 Vehicle Miles Traveled Analysis

One of the issues that needs to be resolved is the drastic reduction in the GHG emissions associated with the on-road transportation sector in years 2010 and 2015. LSA met with AMBAG and City staff to discuss the issue AMBAG stated that the transportation emissions were calculated by obtaining VMT data from the Caltrans California Public Roads Data (PRD) report. The PRD report uses Highway Performance Monitoring System (HPMS) Data to calculate the number of maintained miles for each jurisdiction in California and associated VMTs. In 2014 the HPMS data underwent methodology changes to assign the maintained miles of roadway to each jurisdiction using a GIS based system. Although the HPMS data is provided as is, and it is not possible to determine how much impact this methodology change had, AMBAG staff shared that the substantial reduction in GHG emissions may be artificial and due to this methodology change. Another issue to consider is that the HPMS allocated VMT is based on travel upon roads within the City boundaries rather than based upon vehicle trips origins or destinations.

AMBAG followed the International Council for Local Environmental Initiatives (ICLEI) protocols in developing the GHG inventories including the on-road transportation sector. Allocating VMT using the AMBAG Regional Travel Demand Model (RTDM) is an accepted practice.

However, the City has a unique tourist-based economy that attracts visitors from around the world and the State and the City wanted to better understand the relationship between its tourist economy and the GHG emissions resulting from tourism. There are two motivations the City has in understanding the relationship between tourism and GHG emissions. First, there is concern that the on-road transportation sector in the GHG inventories is underestimated because of the way the RTDM allocates VMT and the City wants to know the GHG emissions from the on-road transportation sector based upon the origins and destinations of vehicle trips attributable to the City. Second, the City wants to provide GHG reduction strategies that will be effective for different types of vehicle trips including vehicle trips resulting from tourism, vacation homes, employee commutes, delivery services, and other local trips. This second motivation requires that the City, not only know the origin and destination of the trip, but also be aware of the purposes of the vehicle trips.

There are several challenges in determining the origins and destinations of vehicle trips attributable to the City and its tourist economy as well as determining the types and purposes of vehicle trips. First, the schedule for completing the CAP does not allow for the time that would be required to develop, calibrate, and run an origin/destination traffic demand model for the City. In addition an origin/destination traffic demand model would not completely capture the full length of a visitor trip traveling from San Francisco to Carmel or other origins outside of the region.

To address these concerns and limitations, LSA proposed to evaluate the different types of trips and logical origins of trips associated with tourism, vacation homes, employee commutes, deliveries, as well as local trips, determine the distance between the trip origin and the City for each trip type,

estimate the number of vehicle trips per year using the RTDM, proportion the RTDM vehicle trips by trip type, and estimate VMT using the trip distances for each trip type.

First, LSA looked at tourists visiting Carmel-By-The-Sea. To do this LSA used several sources of information from the Carmel Chamber of Commerce and the Carmel Visitors Center including the Visit Carmel 2019 Annual Report,¹ and the Carmel Visitors Spending Report.²

These reports revealed that domestic tourists make up the majority (90.43 percent) of visitors and originated at the following locations:

- San Francisco Bay Area (41.95 percent with an average vehicle trip length of 110 miles),
- Salinas (39.79 percent with an average trip length of 27 miles),
- Los Angeles/Orange County (7.73 percent with an average trip length of 322 miles),
- Sacramento/Yolo County (5.31 percent with an average trip length of 190 miles),
- Fresno (2.21 percent with an average trip length of 157 miles), and
- New York/New Jersey/long Island (2.19 percent).

Salinas is a trip origin for a significant number of day visitors driving to Carmel-by-the-Sea. Visitors from San Francisco Bay Area, Los Angeles/Orange County, Sacramento/Yolo County, and Fresno also drove to Carmel-By-The-Sea; whereas visitors from New York, New Jersey and Long Island flew into San Francisco International Airport (SFO) and drove or took a tour bus with an average vehicle trip length of 110 miles.

The reports also reveal that approximately 9.57 percent of all visitors are international tourists who originated from the following locations:

- China (38.35 percent),
- Canada (26.38 percent),
- Brazil (9.3 percent),
- United Kingdom (15.74 percent),
- France (5.65 percent), and
- Australia (4.65 percent).

All of the international visitors flew into SFO and most (89.73 percent) took a tour bus. Each vehicle trip averaged 110 miles between SFO and Carmel-By-The-Sea.

¹ Carmel Visitors Center. Visit Carmel 2019 Annual Report. Website: https://www.carmelcalifornia.com/userfiles/file/Visit_Carmel_2019_Annual_Report_Final_LowRes.pdf (accessed December 2021)

² Carmel Chamber of Commerce. 2014. Carmel Visitor Spending Report. Website: <https://www.carmelchamber.org/carmel-visitor-spending-report/> (accessed December 2021)

Carmel Realty Company¹ assisted in providing generic information on second homes and vacation homes within the City, which resulted in an estimate of approximately 20 percent of vehicle trips result from the occupants of second homes with an average trip length of 120 miles between the origin of the trip and the second home/vacation home during the start and end of the visit. Vehicle trip lengths of the occupants of these homes during their stay averaged 6.5 miles.

Commute trips represented 38 percent of all vehicle trips in the City and averaged 27 miles per trip. Local trips (vehicle trips from local residents related to shopping, school, library and other local destinations) made up 6.5 percent of all vehicle trips in the City and averaged 6.5 miles.

Delivery services providing supplies to local businesses and construction sites within the City made up approximately 10 percent of all vehicle trips and averaged 27 miles.

Using the trip origins summarized above, it is estimated that a gross total of 134,607,473 VMT occurred in 2019. However, only local trips within the City are counted 100 percent. Vehicle trips with origins or destinations outside of the City are shared with the jurisdiction that the other end of the trip is located. The miles for these types of trips are multiplied by 0.5 to allocate half the trip length to Carmel-by-the-Sea. This results in a total of 67,439,064 VMT allocated to the City in 2019.

There is one final issue in estimating VMT using this method. Regional origin destination models are limited to the regional boundaries of the model. There is no origin destination model that would track vehicle trips between San Francisco, Los Angeles, Fresno, and the City. Such an analysis would require a statewide origin destination model. Because of this, the VMT distribution is limited to the regional model boundaries. Reviewing the AMBAG RTDM boundaries, the VMT attributable to the City is 32,658,143 in 2019.

Using the protocols^{1,2}, the GHG emissions associated with the VMT within the AMBAG RTDM boundaries are considered Scope 1 emissions and are counted in the GHG inventory and target setting. The United States Environmental Protection Agency (U.S. EPA) describes Scope 1 emissions as direct sources (smoke stacks or tailpipes that release emissions within an organizational boundary) of GHG emissions.² This definition fits well for on-road transportation related emissions within the RTDM boundaries.

The City is also interested in influencing tourist-related emissions and wants to provide strategies customized to reduce the emissions from vehicle trips originating in locations outside of the regional model limits. The U.S. Community Protocol for Accounting and Reporting GHG Emissions (version 1.2)³ describes Scope 3 emissions as indirect emissions not covered under Scopes 1 and 2. The GHG emissions associated with the remaining VMT (34,780,921) outside of the AMBAG RTDM boundaries

¹ <https://www.carmelrealtycompany.com/company-history.htm> (accessed December 2021)

² U.S. EPA. 2020. Scope 1 and Scope 2 Inventory Guidance. Website: <https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance> (accessed January 2022).

³ ICLEI. 2019. U.S Community Protocol for Accounting and Reporting GHG Emissions. Website: <https://urbandrawdown.solutions/resource-database/uscp-ghge-accounting-2019> (accessed January 2022).

are considered Scope 3 indirect emissions and the City will develop reduction strategies focused on reducing these emissions as well.

Table B summarizes the activity data inputs for updating the 2019 GHG inventory using the revised VMT values.

Table B: 2019 Community GHG Inventory Data Inputs Used

Sector	2019 Data Input	Source
Electricity (KWh)		
Residential	2,493	3CE
Commercial	2,928	
Natural Gas (Therms)		
Residential	7,194	PG&E
Commercial	5,073	
Transportation		
On-Road (VMT) Scope 1	32,658,143	AMBAG Model with Out of Model Adjustments
On-Road (VMT) Scope 3	34,780,921	
Solid Waste (tons/year)	1,527	GreenWaste Recovery
Wastewater (million gallons)	74	California American Water (CalAm)/ Carmel Area Wastewater

MT CO₂e = metric tons of carbon dioxide equivalent
 KWh: Kilowatt Hours
 VMT: Vehicle miles traveled
 PG&E: Pacific Gas & Electric
 AMBAG: Association of Monterey Bay Area Governments
 CARB: California Air Resources Board
 3CE: Central Coast Community Energy

1.1.2 2019 Greenhouse Gas Emissions Summary

The City’s total emissions in 2019 were 30,962 MT CO₂e. As shown in Table C, the on-road transportation sector was the largest contributor to emissions in the 2019 inventory, with 45.8 percent of the City’s total GHG emissions. Natural gas made up 43.2 percent followed by solid waste at 10.3 percent of total emissions. Electricity (0.5 percent), and wastewater (0.2 percent) comprised the remainder of the emissions.

Table C: Communitywide GHG Emissions by Sector for 2019

Sector	2019 (MT CO ₂ e)	Percent of Total
On-road Transportation:		
Scope 1	14,173	45.8
Scope 3	15,115	
Electricity		
Residential	63	0.5
Commercial	92	
Natural Gas		
Residential	8,138	43.2
Commercial	5,250	
Solid Waste	3,178	10.3

Table C: Communitywide GHG Emissions by Sector for 2019

Sector	2019 (MT CO ₂ e)	Percent of Total
Wastewater	68	0.2
Total Scope 1 and Scope 2 Emissions	30,962	100
Total with Scope 3 Emissions	46,076	

Source: AMBAG and LSA 2021.
 MT CO₂e = metric tons of carbon dioxide equivalent

Figure 1 shows the 2019 GHG emissions by sector with energy (electricity and natural gas) divided between residential and commercial/industrial land uses. Figure 2 shows the proportion of electricity and natural gas in the energy sector.

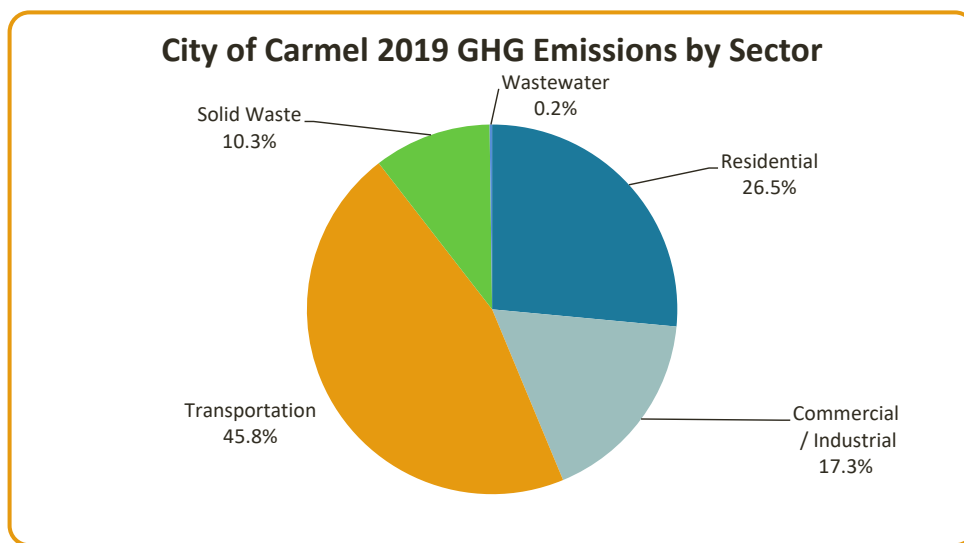


Figure 1: Communitywide GHG Emissions by Sector in 2019

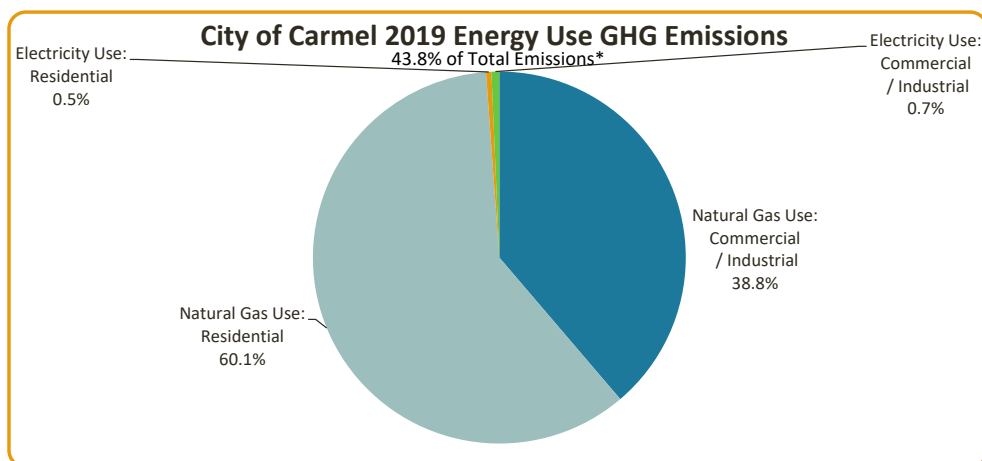


Figure 2: Energy Sector Emissions in 2019

Figure 3 breaks down the various sources of electrical generation by Central Coast Community Energy (3CE).

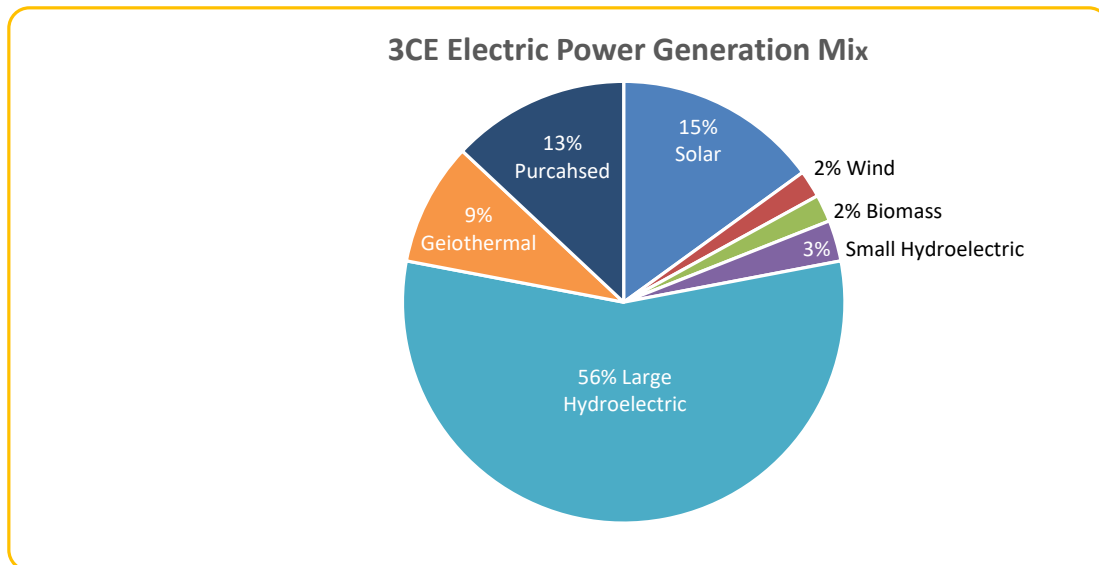


Figure 3: Sources of Electrical Power Generation

2.1 GHG Emissions 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) scenario and an Adjusted BAU (ABAU) scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that would reduce emissions in the future (that is, the policies and related efficiency levels in place in 2019 are assumed to remain constant through 2045). The City’s projected growth is estimated using data from the AMBAG’s adopted growth forecasts for Carmel-by-the-Sea, which provides the City’s demographic growth indicators for the years 2030 and 2045. The growth rates for households, population, and employment were estimated based on the available data and used to estimate the growth in households, population, and employment into the year 2045. Table D shows the growth projections used to develop the emissions forecasts.

Table D: Growth Indicators for 2020, 2030, and 2045

Sector	Demographic Indicator	2020	2030	2020–2030 CAGR ¹ Percent	2045	2020–2045 CAGR Percent
Residential Energy	Households	3,437	3,442	0.0002	3,459	0.0064
Commercial/Industrial Energy	Jobs	3,556	3,674	0.0033	3,915	0.0040
N/A ²	Population	3,949	3,954	0.0001	3,984	0.0035
VMT, Solid Waste and Wastewater	Service Population (Population + Jobs)	7,515	7,628	0.0015	7,899	0.0020

Source: AMBAG, 2022 Regional Growth Forecast

¹ CAGR = Compound annual growth rate.

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

The Adjusted BAU scenario describes emissions based on projected growth and considers policies that will achieve GHG reductions in the future. By evaluating the two scenarios, the City can evaluate the effect that existing policies may have on future emissions and determine which local measures would provide additional reductions.

Two future years are forecast for each scenario: 2030 and 2045. The 2030 forecast year is consistent with the goals identified in the Senate Bill (SB) 32, and the corresponding Scoping Plan, which identifies Statewide GHG reduction targets for 2030.

The 2030 BAU emissions are estimated to be 29,445 MT_{CO₂e}. By 2045, emissions are estimated to decrease to 27,471 MT_{CO₂e}. Table E shows the BAU emissions for different sectors. Table D shows a positive compounded annual growth rate (CAGR) of 0.0001 to 0.0033, which is extremely modest growth. The BAU forecast shows a modest reduction in GHG emissions (a modest negative percent change). This modest reduction of emissions within the BAU forecasts is due to changes over time as people purchase newer (and more efficient) automobiles and appliances.

Table E: Business As Usual (BAU) Forecast Emissions

Sector	2019 (MT CO ₂ e)	2020 (MT CO ₂ e)	Percent Change 2019– 2020	2030 (MT CO ₂ e)	Percent Change 2019– 2030	2045 (MT CO ₂ e)	Percent Change 2019– 2045
On-road Transportation							
Scope 1:	14,173	14,117	-0.4%	13,316	-5%	12,582	-11%
Scope 3:	15,115	15,055		14,201		13,418	
Electricity							
Residential	63	63	-0.6%	60	-5%	56	-11%
Commercial	92	91		87		82	
Natural Gas							
Residential	8,138	8,122	-0.2	7,759	-4%	7,239	-11%
Commercial	5,250	5,193		4,961		4,628	
Solid Waste	3,178	3,175	-0.09	3,033	4%	2,830	-11%
Wastewater	68	62	-0.1	59	-5%	55	-12%
Total (Scope 1)	30,962	30,824		29,445		27,471	
Total (Scope 3)	46,076	45,878	-0.04	43,646	-5%	40,889	-11%

Source: LSA 2021

MT CO₂e = metric tons carbon dioxide equivalent

As shown in Table F, the City’s ABAU emissions are estimated to be 30,287 MT CO₂e in 2020, 23,013 MT CO₂e in 2030, and 19,013 MT CO₂e in 2045. Table F shows the change in emissions from 2019 to 2045 under the ABAU scenario. Due to the stringent State regulations related to transportation (vehicle efficiency and low carbon fuel standards) and energy sectors (renewable energy portfolio standard and requirements for a portion of the natural gas supply to be renewable natural gas), emissions are expected to decrease significantly over time.

Table F: Community Adjusted Business As Usual (ABAU) Forecast Emissions

Sector	2019 (MT CO ₂ e)	2020 (MT CO ₂ e)	Percent Change (2019–2020)	2030 (MT CO ₂ e)	Percent Change (2019–2030)	2045 (MT CO ₂ e)	Percent Change (2019–2045)
Transportation							
Scope 1							
Scope 3	14,173	13,679	-3.5%	10,407	-26.6%	8,708	-38.6%
	15,115	14,646		11,105		9,285	
Electricity							
Residential	63	61	-3.0%	47	-25.4%	39	-38.1%
Commercial	92	89		68		57	
Natural Gas							
Residential	8,138	8,122	-0.2%	6,138	-24.6%	5,010	-38.4%
Commercial	5,250	5,193		3,935		3,203	
Solid Waste	3,178	3,077	-3.0%	2,372	-25.4%	1,958	-38.3%
Wastewater	68	66	-2.9%	46	-32.4%	38	-44.1%
Total (Scope 1)	30,962	30,287	-2.2%	23,013	-25.7%	19,013	-38.6%
Total (Scope 3)	46,076	44,933		34,118		28,298	

Source: LSA forecasts for the City of Carmel-by-the-Sea, 2021.
MT CO₂e = metric tons carbon dioxide equivalent

3.1 Reduction Targets

3.1.1 Statewide GHG Reduction Goals

The State has set goals for reducing statewide GHG emissions by 2030 and 2045 through Assembly Bill (AB) 32, Senate Bill (SB) 32, SB 100, and Executive Order (EO)-B-55-18. The State has also provided guidance to local jurisdictions as “essential partners” in achieving the State’s goals by identifying a 2030 GHG emissions target 40 percent below 1990 levels. Additionally, continued reduction goals should be implemented beyond the 2030 target to keep the State on a path toward Statewide climate neutrality by 2045.

3.1.2 Community Targets

In the City of Carmel-by-the-Sea, the State’s target of 40 percent below 1990 levels by 2030 amounts to a reduction of 12,174 metric tons of CO₂ equivalent in annual emissions by 2030 compared to the BAU forecast (see Table G).

Under the ABAU scenario, Carmel-by-the-Sea would need to reduce its emissions by 5,742 MT CO₂e by 2030 to meet the State target. The City needs to implement additional strategies and measures to adhere to these State GHG reduction goals.

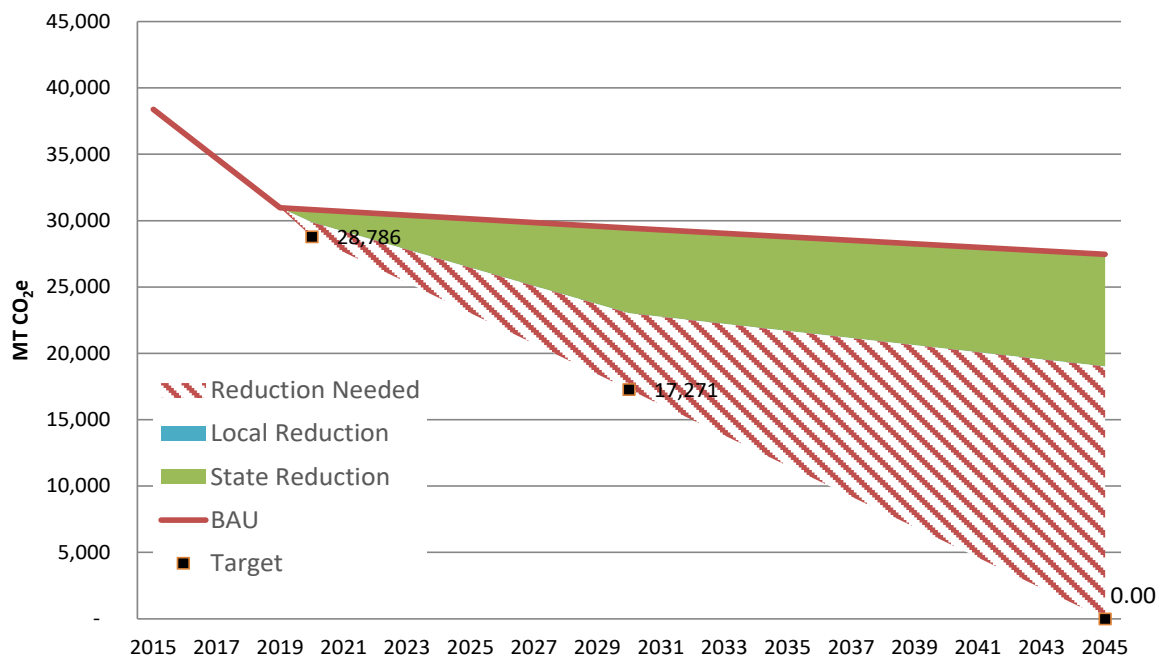
Table G: GHG Reduction Targets By Year

Sector	1990	2019	2030	2045
BAU Emissions (MT CO ₂ e)	28,786 ¹	30,962	29,445	27,471
ABAU Emissions (MT CO ₂ e)	N/A	N/A	23,013	19,013
State-Aligned Target	N/A	N/A	40% below 1990 levels of emissions	Carbon Neutral
State-Aligned Emissions Goal (MT CO ₂ e)	N/A	N/A	17,271	0
Reductions from ABAU needed to meet the State-Aligned Target (MT CO ₂ e)	N/A	N/A	5,742	19,013

Source: Compiled by LSA 2022
 MT CO₂e = metric tons carbon dioxide equivalent
 N/A = Not Applicable
¹ 1990 levels of emissions approximated as 25 percent below the updated 2018 inventory of GHG emissions

Figure 4 depicts the BAU and ABAU forecasts, reduction targets, and additional GHG emission reductions required to meet the reduction targets.

City of Carmel-By-The-Sea, 2015 - 2045



ABAU: adjusted business as usual
 BAU: business as usual
 MT CO₂e = metric tons of carbon dioxide equivalent

Figure 4: Community Emissions Inventory, Forecasts, and Targets

GHG REDUCTION STRATEGIES

The following details how the City would meet its GHG reduction target by implementing goals, measures, and actions at the community level. The goal describes the overarching objective. 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 will take in achieving the measure. Each measure includes the GHG reduction potential in 2030. Actions are designed to include the steps needed to implement the measure.

4.1 Goals, Measures and Actions for the Reduction of GHG Emissions

The City of Carmel-by-the-Sea has chosen a total 9 goals, 22 measures, and 75 actions designed to achieve the 2030 GHG reduction target and provide continued progress toward carbon neutrality. The goals, measures, and actions are as follows:

4.1.1 Increasing Energy Efficiency in Existing Residential

The following measures in Goal 1 are shown in Table H and focus on increasing energy efficiency in existing residential buildings through behavior modification of residents and encouraging and incentivizing home energy retrofits.

Table H: Goal 1: Increase Energy Efficiency in Existing Residential Units

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 1.1 Energy Efficiency Training, Education, and Recognition in the Residential Sector				
Actions	Post links on website and social media and provide materials at public events. Promote an annual energy efficiency fair. Promote PG&E energy centers. Building Inspectors to hold trainings on energy efficiency and Title 24 requirements.	Supporting Measure	Supporting Measure	Years 1-3
Measure 1.2: Increase Community Participation in Existing Energy Efficiency Programs				
Actions	Partner with AMBAG and 3CE to promote incentive programs	1.7	1.7	Years 2-4
Measure 1.3 Home Energy Evaluations				
Action	Promote and provide energy audits with PG&E	Supporting Measure	Supporting Measure	Years 1-3

Table H: Goal 1: Increase Energy Efficiency in Existing Residential Units

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 1.4 Residential Home Energy Renovations	<p>Actions Enhance enforcement of Title 24 compliance</p> <p>Promote participation in green building programs such as Leadership in Energy and Environmental Design (LEED), and Energy Upgrade California.</p> <p>Promote financing programs for home upgrades, such as Home Energy Renovation Opportunity (HERO) and Property Assessed Clean Energy (PACE)</p> <p>Evaluate feasibility of streamlining online permitting to facilitate electrification retrofits</p> <p>Initiate a Green Citizen Program for residents that initiate home renovations that include an all-electric home, improve energy efficiency, and install an e charger.</p> <p>Promote incentives available to homeowners to convert to all-electric homes. Evaluate the feasibility of providing additional incentives.</p> <p>Develop a Reach Code to require major home renovations/additions to convert to all-electric homes.</p>	1,217.5	1,294.6	Years 2-4

Source: Compiled by LSA 2022

MT CO₂e = metric tons carbon dioxide equivalent

¹ With Enhancing = increased participation due to supporting measures that result in greater reductions.

4.1.2 Increasing Energy Efficiency in New Residential

This goal supports City staff becoming resources in implementing energy efficiency building measures beyond those required in current Title 24 standards. This goal also ensures that, as Title 24 standards are updated, City staff are well informed and can implement updates quickly and effectively. Note that the growth assumptions (see Table D) provided by AMBAG show an increase of five households between 2020 and 2030. In addition, Title 24 will include three updates over that timeframe. Since Title 24 updates are already included in ABAU, the additional local GHG reductions associated with Goal 2 account for only 0.01 MT CO₂e. Table I on the next page summarizes Goal 2.

Table I: Goal 2: Increase Energy Efficiency in New Residential Units

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 2.1 Exceed Energy Efficiency Standards				
Actions	Educate City staff and developers on future Title 24 updates. Promote Tier 1 and Tier 2 green building ratings such as LEED, Build it Green or Energy Star certified buildings. Evaluate feasibility of streamlining online permitting. Require new residential buildings to be all-electric homes.	0.01	0.01	Years 1-3
Source: Compiled by LSA 2022 MT CO ₂ e = metric tons carbon dioxide equivalent ¹ With Enhancing = increased participation due to supporting measures that result in greater reductions.				

4.1.3 Increasing Energy Efficiency in Existing Commercial Land Uses

The following measures focus on increasing energy efficiency in existing commercial buildings through behavior modification of business owners and encouraging and incentivizing commercial energy retrofits. Table J summarizes Goal 3.

Table J: Goal 3: Increase Energy Efficiency in Existing Commercial Buildings

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 3.1 Energy Efficiency Training, Education, and Recognition in the Commercial Sector				
Actions	Post links on website and social media and provide materials at public events. Promote an annual energy efficiency fair. Promote PG&E energy centers. Building Inspector to hold trainings on energy efficiency and Title 24 requirements.	Supporting Measure	Supporting Measure	Years 1-3
Measure 3.2: Increase Business Participation in Existing Commercial Energy Efficiency Programs				
Actions	Partner with AMBAG and 3CE incentive programs	69.4	69.4	Years 1-3
Measure 3.3 Non-Residential Building Energy Audits				
Action	Promote and provide energy audits with PG&E	Supporting Measure	Supporting Measure	Years 1-3

Table J: Goal 3: Increase Energy Efficiency in Existing Commercial Buildings

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 3.4 Commercial Energy Renovations	<p>Actions Enhance enforcement of Title 24 compliance</p> <p>Promote participation in green building programs such as Leadership in Energy and Environmental Design (LEED), and Energy Upgrade California.</p> <p>Promote financing programs for home upgrades, such as Property Assessed Clean Energy (PACE)</p> <p>Evaluate the feasibility of streamlining online permitting to facilitate electrification retrofits</p> <p>Initiate a Green Business Certification Program for businesses that follow the California Green Business Program standards (www.greenbusinessca.org).</p> <p>Promote existing incentives for businesses to convert to all-electric buildings. Evaluate the feasibility of providing additional incentives.</p> <p>Develop a Reach Code to require major commercial renovations/expansions to convert to all-electric building unless the business can show a need for natural gas (restaurants, pottery kilns etc.)</p>	1,206.2	1,666	Years 3-5

Source: Compiled by LSA 2022

MT CO₂e = metric tons carbon dioxide equivalent

¹ With Enhancing = increased participation due to supporting measures that result in greater reductions.

4.1.4 Increasing Energy Efficiency in New Commercial Buildings

This goal will evaluate feasibility of streamlining online permitting to facilitate electrification retrofits and support City staff becoming resources in implementing energy efficiency within new commercial businesses. Note that the GHG emissions reductions for this goal includes some conservative assumptions that new businesses will be exempt from the requirement to be all-electric buildings and that Title 24 updates will include all of the energy efficiency reductions, which would mean no anticipated reductions from this goal. Table K on the next page summarizes Goal 4.

Table K: Goal 4: Increase Energy Efficiency in New Commercial Buildings

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 4.1 Exceed Energy Efficiency Standards				
Actions	Educate City staff and developers on future Title 24 updates. Promote Tier 1 and Tier 2 green building ratings such as LEED, Build it Green or Energy Star certified buildings. Evaluate feasibility of streamlining online permitting Create an energy award program for zero-net-energy businesses. Require new commercial buildings to be all-electric with exemptions for business that can show a need for natural gas (restaurants, pottery kilns etc.)	0.0	0.0	Years 2-4
Source: Compiled by LSA 2022 MT CO ₂ e = metric tons carbon dioxide equivalent ¹ With Enhancing = increased participation due to supporting measures that result in greater reductions.				

4.1.5 Increasing Energy Efficiency through Water Conservation

This goal will continue the water efficiency and conservation programs the City has already initiated. This goal also promotes education and website links encouraging residents to implement water efficiency and conservation measures. Table L summarizes Goal 5.

Table L: Goal 5: Increase Energy Efficiency Through Water Conservation

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 5.1 Water Efficiency Through Continued Implementation of SB X7-7				
Actions	Post links on website and social media Continue with the low-irrigation landscaping requirements the City has in place.	2.9	3.0	Years 2-4
Measure 5.2 Exceed Water Efficiency Standards				
Actions	Conduct direct outreach to HOA, businesses, and the public Allow recycled water for commercial and multi-family residential landscape irrigation. Allow greywater systems and promote rainwater harvesting.	-	-	Years 3-5
Source: Compiled by LSA 2022 MT CO ₂ e = metric tons carbon dioxide equivalent = Not quantified ¹ With Enhancing = increased participation due to supporting measures that result in greater reductions.				

4.1.6 *Decreasing Energy Demand through Reducing the Urban Heat Island Effect*

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. In addition, roofing and paving materials that reflect light (cool roofs and cool pavement) decrease the urban heat island effect which reduces energy use. Table M summarizes Goal 6. Note in Table M that the GHG reductions from this measure were not quantified. This is because the City already has a dense urban forest canopy and maintaining it ensures that shading will continue to reduce the urban heat island effect that would otherwise be present. Also, the City currently has roof and paving style ordinances that prevent the use of light reflecting roofing and paving. The City needs to revise these ordinances in order to be able to begin using light reflecting surfaces. For these reasons GHG reductions have not been quantified.

Table M: Goal 6: Decrease Energy Use through Reducing the Urban Heat Island Effect

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 6.1 Tree Planting for Shade and Energy Savings				
Actions	Maintain the health of the urban forest tree canopy in the City. Continue to work with the Friends of Carmel Forest and the community to facilitate urban forest maintenance. Update the City’s Urban Forest Management Plan to include tree planting guidelines to promote tree health and maintain a healthy urban forest canopy.	-	-	Years 1-3
Measure 6.2 Light-reflecting Surfaces for Energy Savings				
Actions	Revise existing ordinances to allow cool roof options on residential, commercial and office buildings where feasible.	-	-	Years 3-5

Source: Compiled by LSA 2022

MT CO₂e = metric tons carbon dioxide equivalent

- = Not quantified

¹. With Enhancing = increased participation due to supporting measures that result in greater reductions.

4.1.7 *Decrease GHG Emissions through Reducing VMT Traveled and Electric Vehicles*

On-road transportation emissions include emissions from light- and medium-duty vehicles and heavy-duty trucks associated with land use activity. Emissions originate from the combustion of fossil fuels (such as diesel and gasoline) to power the vehicles. These are direct emissions and accounted for approximately nearly 46 percent of total emissions in 2019. On-road transportation measures can achieve significant benefits for both individual residents and the City as a whole. Reductions in and

traffic congestion would reduce smog-forming emissions, toxic air contaminants, and diesel particulate matter.

The City has a unique tourist-based economy that attracts visitors from around the world and the relationship between its tourist economy and the GHG emissions resulting from tourism are a significant source of VMT and GHG emissions. As described in Section 1.1.1 of this document, tourist based VMT results in both Scope 1 direct source GHG emissions, and Scope 3 indirect GHG emissions. Because of this, some of the actions within Measure 7.1 and Measure 7.4 focus on tourism based GHG emissions and will reduce both Scope 1 and Scope 3 emissions. Table N summarizes the measures and actions within Goal 7. Measures that reduce both Scope 1 and Scope 3 emissions include quantification that shows both.

Table N: Goal 7: Decrease GHG Emissions through Reducing VMT and Electric Vehicles

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 7.1 Alternative Transportation Options				
Actions	Work with AMBAG to remove barriers to alternative transportation such as exploring ways to provide safe pedestrian and bicycle access to the City across Highway 1. Explore the feasibility of increasing land use density in downtown during the next General Plan Land Use Element update. Identify and promote within the hotels and visitors center existing shuttle services between Carmel and the airports. Work with Monterey Airport and AMBAG to explore the feasibility of an electric shuttle service between Monterey Airport and destinations in the City.	Scope 1 563 Scope 3 89	Scope 1 563 Scope 3 89	Years 2-10
Measure 7.2 Develop Bicycle Master Plan to Create Safe Bike Routes around the City				
Actions	Develop customized bike routes to improve bike transit. Provide signage, reduce speed limits as necessary, and develop safety education programs on “sharing the road” with bikes.	10	10	Years 3-5
Measure 7.3 Ride-Sharing and Bike to Work Programs within Businesses				
Actions	Promote ride-sharing and facilitate air district incentives for ride-sharing Provide reserved preferential parking spaces for ride-sharing, carpooling, and ultra-low or zero emission vehicles in City parking lots and private businesses that have employee parking. Require businesses of a certain size to provide facilities such as bike racks and showers.	-	-	Years 1-3
Measure 7.4 Electrify the Fleet				

Table N: Goal 7: Decrease GHG Emissions through Reducing VMT and Electric Vehicles

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Actions	Promote electric vehicle incentive programs at outreach events.			
	Apply for grants to install e-chargers at public facilities.			
	Work with community groups and businesses to install additional e-chargers.			
	Promote priority parking at hotels for electric vehicles and provide e-chargers.	Scope 1 1,511	Scope 1 1,538	Years 3-5
	Provide priority parking for bus tours that use electric buses.	Scope 3 1,425	Scope 3 1,452	
Work with Visit Carmel to develop and initiate a Green Visitor Program that rewards tourists that use electric vehicles, carbon credits for air-miles, and that adhere to the City's sustainability practices while visiting the City.				
Require or incentivize major commercial building renovations/expansions to install e-chargers.				
Measure 7.5 Initiate Origin/Destination Transportation Model				
Actions	Develop an Origin Destination Transportation Model focused on Carmel-by-the-Sea using the AMBAG regional model as a base.	N/A	N/A	Years 3-5
	Update the CAP with new VMT data once the Origin Destination Model is completed.			
Source: Compiled by LSA 2022				
MT CO ₂ e = metric tons carbon dioxide equivalent				
Scope 1 = Direct source emissions that require quantification.				
Scope 3= Indirect source emissions that are voluntarily quantified.				
N/A = Not Applicable				
¹ With Enhancing = increased participation due to supporting measures that result in greater reductions.				

4.1.8 Decreasing GHG Emissions through Reductions in Solid Waste Generation

According to Statewide Waste Characterization data, the commercial sector generates nearly three fourths of the solid waste in California¹. 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 addition to recyclables, it is also essential to focus on diverting organic waste from all the sectors as it can represent 30 percent of the total waste stream in the City. The SB 1383 requires Californians to reduce organic waste disposal by 50% by 2020 and 75% by 2025.

Table O summarizes the measures and actions within Goal 8.

¹ CalRecycle. 2020 Statewide Waste Characterization data. Website: <https://www2.calrecycle.ca.gov/WasteCharacterization/Study> (Accessed March 2022).

Table O: Goal 8: Decrease GHG Emissions through Reducing Solid Waste Generation

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 8.1 Reduce Waste at Landfills				
Actions	Promote zero waste events, use reusables rather than recyclable materials, and buy local to reduce waste. Require waste hauler to pick up organic waste in compliance with SB 1383 and conduct outreach to residents and businesses to ensure compliance and minimize contamination. Promote home composting and community gardens. Educate the community on proper use of the City-provided grey/green/blue containers.	1,500	1,500	Years 1-3
Source: Compiled by LSA 2022 MT CO _{2e} = metric tons carbon dioxide equivalent ¹ With Enhancing i= increased participation due to supporting measures that result in greater reductions.				

4.1.9 Decreasing Energy Demand through Clean Energy Use

Renewable energy sources especially those that have zero or near zero emissions such as photovoltaic (PV) solar and wind generation are clean energy. Distributed renewable energy generation such as rooftop PV solar provides locally important environmental and economic benefits because the clean energy is being generated within the City. Ability to store energy is also crucial for enabling widespread adoption, stabilization, and grid integration of renewable energy. Energy storage can reduce power fluctuations, enhance system flexibility, and enable the storage and dispatch of electricity generated by variable renewable energy sources. Energy storage also helps customers better prepare for outages and Public Safety Power Shutoffs (PSPS).

Besides distributed renewable energy generation, the City is also participating in 3CE, a Community Choice Aggregation (CCA) within Monterey, San Luis Obispo, Santa Barbara, and Ventura Counties that is delivering grid-based electricity comprising at least 31 percent renewable energy and 56 percent large hydroelectric generation to the City. 3CE is scheduled to increase renewable energy to 100 percent on or before 2030. Goal 9 will decrease GHG emissions by increasing the use of renewable and other clean energy sources. Table P summarizes the measures and actions within Goal 9.

Table P: Goal 9: Decrease GHG Emissions through Increasing Clean Energy Use

Measure	Actions	2030 GHG Reduction Achieved (MT CO ₂)		Timing (Phased Implementation)
		No Enhancing	With Enhancing ¹	
Measure 9.1 Promote Clean Energy				
Actions	Promote clean energy incentives to the community Incentivize solar panels installation on existing residential units Require or incentives solar panel installation on major commercial building retrofits/expansions (70 percent or more of the building area) and commercial parking lots. Promote energy storage system installation with solar panels.	364	364	Years 3-5
Measure 9.2 Continue Participation with 3CE to increase the Renewable Generation Portfolio of Electricity in Carmel				
Actions	Promote 3CE’s 100 Percent Renewable Energy Option in the City by encouraging residents and businesses to participate in the program.	-	-	Years 1-3
Source: Compiled by LSA 2022 MT CO ₂ e = metric tons carbon dioxide equivalent -= Not quantified ^{1.} With Enhancing i= increased participation due to supporting measures that result in greater reductions.				

4.2 GHG Reduction Summary and Comparison with the 2030 Reduction Target

By implementing the Statewide and local reduction measures described in Section 4.1, the City would reduce its communitywide GHG emissions by 48 percent below 2019 levels of emissions by 2030. Table Q summarizes the strategies and the potential GHG reductions for community and municipal operations, respectively.

Table Q: Summary of Community GHG Reduction Strategies and Emissions Reductions

Goals and Measures	2030 Emission Reductions (MT CO ₂ e)
Goal 1: Increase Energy Efficiency in Existing Residential	
1.1: Energy efficiency training, education, and recognition in the residential sector	Supporting Measure
1.2: Increase community participation in existing energy efficiency programs	1.70
1.3: Home energy evaluations	Supporting Measure
1.4: Residential home energy renovations	1,294.60
Goal 2: Increase Energy Efficiency in New Residential Units	
2.1: Exceed energy efficiency standards	0.01
Goal 3: Increase Energy Efficiency in Existing Commercial Units	
3.1: Energy efficiency training, education, and recognition in commercial sector	Supporting Measure
3.2: Increase business participation in existing energy efficiency programs	69.40
3.3: Non-residential building energy audits	Supporting Measure
3.4: Non-residential building retrofits	1,666.00

Table Q: Summary of Community GHG Reduction Strategies and Emissions Reductions

Goals and Measures	2030 Emission Reductions (MT CO ₂ e)
Goal 4: Increase Energy Efficiency in New Commercial Units	
4.1: Exceed energy efficiency standards	-
Goal 5: Increase energy efficiency through water efficiency	
5.1: Water efficiency through continued implementation of SBX7-7	3.00
5.2: Exceed water efficiency standards	Supporting Measure
Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect	
6.1: Tree planting for shading and energy efficiency	-
6.2: Light-reflecting surfaces for energy efficiency	-
Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled	
7.1: Alternative Transportation Options	563.00
7.2: Develop Bicycle Master Plan to Create Safe bike routes in the City	10.00
7.3 Ride-sharing and bike-to-work programs within businesses	-
7.4: Electrify the fleet	1,538.00
7.5 Initiate Origin/Destination Transportation Model	N/A
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation	
8.1: Reduce waste to landfills	1,500.00
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use	
9.1: Promote clean energy	364.00
9.2: Continue participation in 3CE Program	-
Total Community Measures	7,009.71

Source: Compiled by LSA 2022
 3CE = Central Coast Clean Energy
 MT CO₂e = metric tons of carbon dioxide equivalent
 N/A = Not Applicable
 SB = Senate Bill
 - = Not quantified

Figure 5 on the following page provides a summary graph of the local emission reductions.

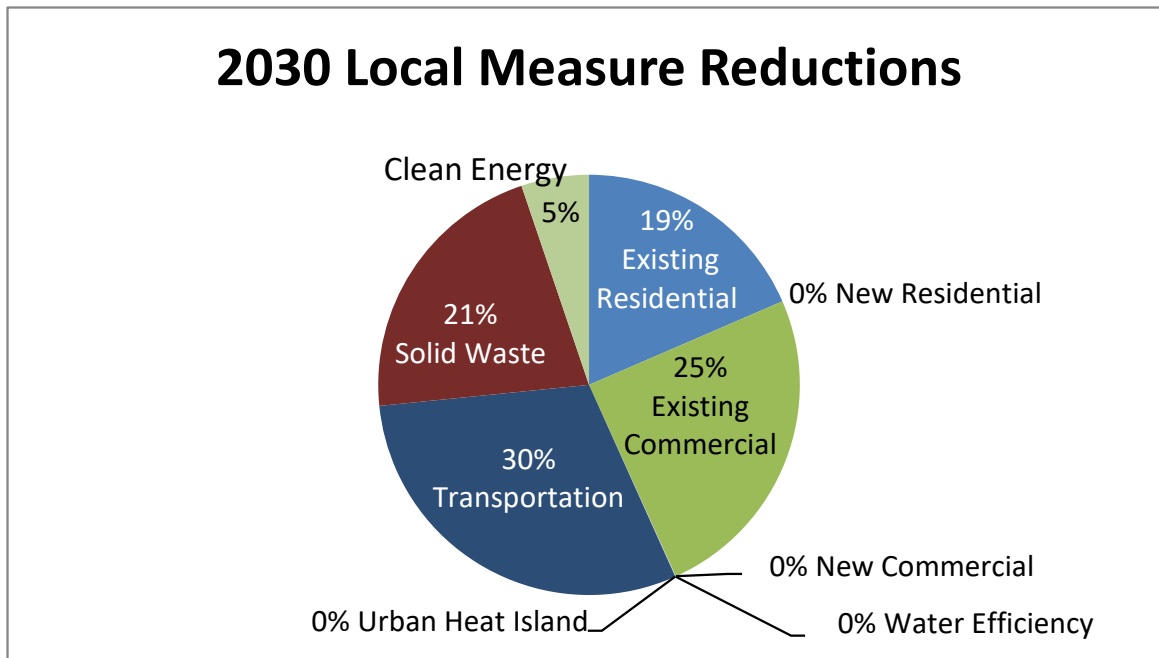


Figure 5: Local Reduction Measures

As shown in Figure 5, reductions in Transportation represent the largest (30 percent of total reductions) portion of reductions, followed by energy efficiency retrofits of existing commercial at 25 percent, solid waste diversion at 21 percent, energy efficiency retrofits of existing residential at 19 percent, and clean energy at 5 percent.

Figure 6 on the following page summarizes the 2015 through 2019 emission inventories, projected 2020, 2030, and 2045 emission forecasts, as well as the 2020, 2030, and 2045 reduction targets after implementation of the local reduction measures.

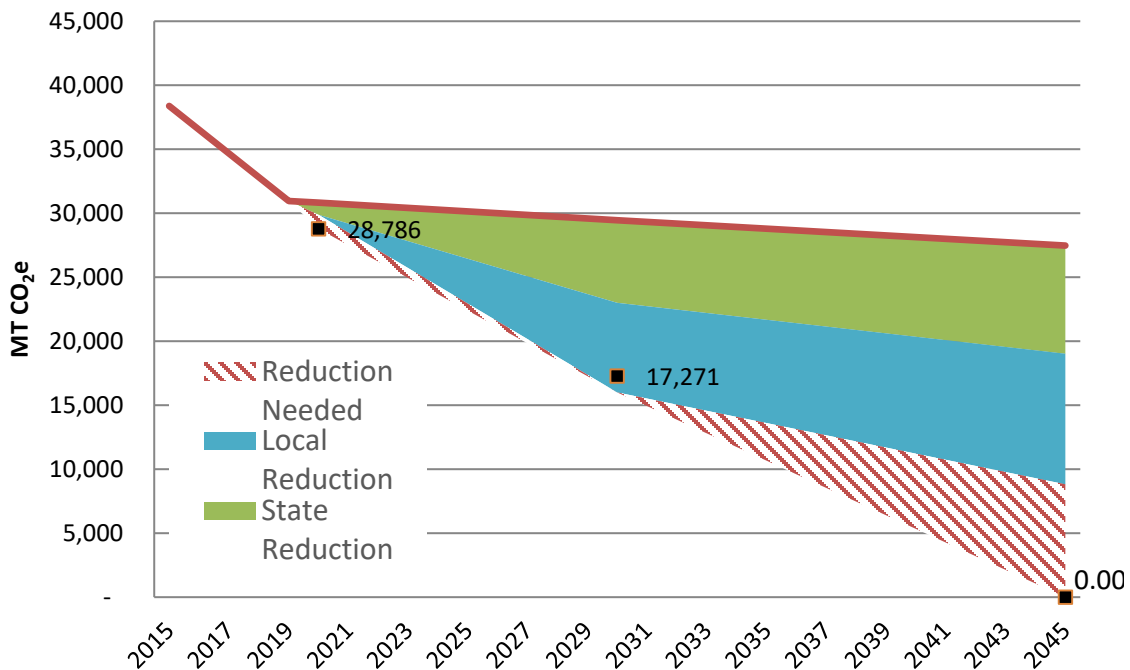


Figure 6: Existing and Forecasted Emissions with Local Reduction Measure Implementation

As shown in Figure 6, with implementation of the local reduction measures, emissions in 2030 will be below the 2030 reduction target and provide additional reductions beyond 2030. However, the current set of reduction strategies will not achieve carbon neutrality by 2045.

CONCLUSIONS

The City will see a total reduction of 13,442 MT CO₂e (6,432 MT CO₂e from State measures, and 7,010 MT CO₂e from local measures) in 2030 with implementation of all the measures. The remaining 2030 GHG emissions for the City after measure implementation will be approximately 16,003 MT CO₂e, which is below the 2030 reduction target of 17,271 MT CO₂e. However, with the current set of reduction strategies the City will not achieve carbon neutrality by 2045.

The City of Carmel-by-the-Sea should update the 2045 ABAU forecasts and provide local reduction strategy updates once the State has provided an updated Scoping Plan demonstrating how the State will achieve carbon neutrality.