



## CITY OF CARMEL-BY-THE-SEA CLIMATE COMMITTEE

Contact: 831.620.2000 [www.ci.carmel.ca.us/carmel](http://www.ci.carmel.ca.us/carmel)

All meetings are held in the City Council Chambers  
East Side of Monte Verde Street  
Between Ocean and 7th Avenues

### REGULAR MEETING Thursday, June 16, 2022

3:30 PM

Governor Newsom's Executive Order N-29-20 has allowed local legislative bodies to hold public meetings via teleconference and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to observe and to address the local legislative body. Also, see the Order by the Monterey County Public Health Officer issued March 17, 2020. The health and well-being of our residents is the top priority for the City of Carmel-by-the-Sea. To that end, this meeting will be held via teleconference and web-streamed on the City's website ONLY.

To attend via Zoom [https://ci-carmel-ca-us.zoom.us/j/93340805428? Meeting ID 93340805428](https://ci-carmel-ca-us.zoom.us/j/93340805428?MeetingID=93340805428), Passcode 669209; or to attend via telephone dial 1-312-626-6799. The public can also email comments to [amartelet@ci.carmel.ca.us](mailto:amartelet@ci.carmel.ca.us). Comments must be received 2 hours before the meeting in order to be provided to the committee. Comments received after that time and up to the beginning of the meeting will be added to the agenda and made part of the record.

#### CALL TO ORDER

#### PUBLIC APPEARANCES

Members of the public are entitled to speak on matters of municipal concern not on the agenda during Public Appearances. Each person's comments shall be limited to 3 minutes, or as otherwise established by the Chair. Matters not appearing on the agenda will not receive action at this meeting and may be referred to staff. Persons are not required to provide their names, and it is helpful for speakers to state their names so they may be identified in the minutes of the meeting.

#### ANNOUNCEMENTS

#### ORDERS OF BUSINESS

Orders of Business are agenda items that require Committee discussion, debate, direction to staff, and/or action.

1. Discuss feedback received from the Planning Commission, Forest and Beach Commission, City Council, and through other outreach meetings and correspondence on the pre-final Climate Adaptation Plan and Climate Action Plan

## **FUTURE AGENDA ITEMS AND ADJOURNMENT**

This agenda was posted at City Hall, Monte Verde Street between Ocean Avenue and 7th Avenue, outside the Park Branch Library, NE corner of Mission Street and 6th Avenue, the Carmel-by-the-Sea Post Office, 5th Avenue between Dolores Street and San Carlos Street, and the City's webpage <http://www.ci.carmel.ca.us> in accordance with applicable legal requirements.

## **SUPPLEMENTAL MATERIAL RECEIVED AFTER THE POSTING OF THE AGENDA**

Any supplemental writings or documents distributed to a majority of the Climate Committee regarding any item on this agenda, received after the posting of the agenda will be available at the Public Works Department located on the east side of Junipero Street between Fourth and Fifth Avenues during normal business hours.

## **SPECIAL NOTICES TO PUBLIC**

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the City Clerk's Office at 831-620-2000 at least 48 hours prior to the meeting to ensure that reasonable arrangements can be made to provide accessibility to the meeting (28CFR 35.102-35.104 ADA Title II).



# CITY OF CARMEL-BY-THE-SEA

## Climate Committee

### Staff Report

June 16, 2022  
ORDERS OF BUSINESS

<b>TO:</b>	Climate Committee Members
<b>SUBMITTED BY:</b>	Evan Kort, Associate Planner
<b>SUBJECT:</b>	Discuss feedback received from the Planning Commission, Forest and Beach Commission, City Council, and through other outreach meetings and correspondence on the pre-final Climate Adaptation Plan and Climate Action Plan

#### RECOMMENDATION:

Discuss feedback received from the Planning Commission, Forest and Beach Commission, City Council, and through other outreach meetings and correspondence, and consider which comments should be incorporated into the final Climate Adaptation Plan and Climate Action Plan for upcoming adoption by the City Council.

#### BACKGROUND/SUMMARY:

The pre-final versions of the Climate Adaptation Plan and Climate Action Plan (Plans) were presented to the Planning Commission on May 11, 2022, the Forest and Beach Commission on May 12, 2022, and the City Council on June 7, 2022 for input. The Climate Committee also hosted two development workshop outreach meetings on April 26 and 28, 2022 to review and discuss the draft Plans. In addition, a community meeting was held on May 24, 2022 as another opportunity for community members to provide input on the draft Plans.

Additionally, staff received a communication from the Monterey Peninsula Water Management District stating their interest in being a partner as described in the Implementation and Monitoring chapter of the Climate Adaptation Plan, and a letter was received from the Carmel Area Wastewater District.

All applicable input received from the two Commission meetings, public workshops, City Council meeting, and additional correspondences have been included in Attachment 1. The comments received from the Planning Commission and Forest and Beach Commission meetings had already been incorporated into the pre-final versions of the Plans (refer to Attachments 2 and 3) which were presented to the City Council.

The comments received from the City Council, and other recent comments and correspondence received on the Plans have yet to be incorporated into the final Plans. These comments, and staff suggested report edits to capture those comments, have been identified in Attachment 1.

The Climate Committee will be requested to review:

- Comments received by the Commissions and at the workshops and community meetings prior to the June 7, 2022 Council meeting, and the changes that were already incorporated into the pre-final Plans

- Comments received from the City Council and recent correspondence, and the suggested actions to reflect those comments into the final Plans.
- Discuss initial implementation strategies as outlined by the City Council.

Once all final comments are included into the final Climate Adaptation and Climate Action Plans, these Plans will be presented to the City Council for official adoption.

### **FISCAL IMPACT:**

Cost ranges to implement the actions included in the plans are included in the report. Some actions will require minimal capital investment and will primarily rely on staff time to implement, while other actions will require large capital investments in excess of \$100,000 for each action to complete.

### **ATTACHMENTS:**

Attachment 1 - Matrix of Comments Received from Public and Community Meetings - Amended 6/9/22, 2:30 PM

Attachment 2 - Updated Prefinal Climate Adaptation Plan with feedback from meetings

Attachment 3 - Updated Prefinal Climate Action Plan with feedback meetings

**Comments Received from Public and Community Meetings – Amended June 9, 2022 at 2:30 PM  
June 16, 2022**

Comment Date	Meeting	Comment	Response / Suggested Report Edit
5/11/2022	PC	Support for electrification in new commercial and residential buildings	Added to Planning Commission feedback in outreach section
5/11/2022	PC	Support for reducing the use of automobiles, including higher development density in the downtown to provide housing for people who work in Carmel	Added to Planning Commission feedback in outreach section
5/11/2022	PC	Recommendation for a shuttle service, especially for special events	Added to Planning Commission feedback in outreach section
5/11/2022	PC	Support for further outreach on food waste composting, including solutions for common implementation issues	Added to Planning Commission feedback in outreach section; included in GWR and the City's implementation plan for SB 1383
5/11/2022	PC	Support for increasing forest health and wildfire mitigation, including in Pescadero Canyon	Added to Planning Commission feedback in outreach section; added reference to Pescadero Canyon in the natural resources sections and in Climate Adaptation Measure 2.1.3
5/11/2022	PC	Support for the use of green roofs as cool roofs	Added to Planning Commission feedback in outreach section. <b>Suggested Action: Add green roofs in Climate Action Measure 6.2, Action 6.2.1</b>
5/11/2022	PC	Support for prioritized implementation to ensure success.	Added to Planning Commission feedback in outreach section
5/12/2022	FBC	Support for a Grant Writer/Climate Coordinator position	Added to Forest & Beach Commission feedback in outreach section
5/12/2022	FBC	Support for a prioritized implementation to ensure success	Added to Forest & Beach Commission feedback in outreach section
5/12/2022	FBC	Recommendation to add Pescadero Canyon to the list of natural resources	Added to Forest & Beach Commission feedback in outreach section; added reference to Pescadero Canyon in the natural resources sections and in Climate Adaptation Measure 2.1.3
5/12/2022	FBC	Suggestion to expedite bluff monitoring	Added to Forest & Beach Commission feedback in outreach section; engineering evaluation of the bluff is included in the FY 2022-23 CIP
4/26 & 4/28/22	CON	Construction Outreach Meetings held at City Hall.	No additional feedback on the Plans was received.
5/17/2022	CON	Comment from David Knight (Monterey Energy Group) as a follow-up to Construction Outreach meeting:	

PC: Planning Commission

FBC: Forest and Beach Commission

CC: City Council

CO: Community Outreach Meeting.

CON: Construction Outreach Meeting

MPWMD: Monterey Peninsula Water Management District

CAWD: Carmel Area Waste Water District

		<p>Going all electric in Carmel is not without challenges:</p> <ul style="list-style-type: none"> <li>• Locating heat pump compressors on small lots. At least 1 compressor for HVAC and likely 1 for Domestic Hot Water.</li> <li>• Tree shading = limited solar access. Given PG&amp;E electric rates, without adequate solar, will likely lead to operating cost 2 or 3 times higher for space heating and DHW.</li> <li>• As opposed to mandating all electric homes, the City might want to look at a reach code that encourages greater comfort, Indoor Air Quality, better acoustics, energy efficiency, and sustainable construction. The new Active House program will help insure all of those features while maintaining architectural freedom.</li> </ul>	<p><b>Suggested Action: Add "Active House" to list of outreach materials in CAP Measure 1.1, Action 1.1.1; feasibility analysis (CAP Action 1.2.1) should evaluate issues associated with tree shading and heat pump compressors on small lots</b></p>
5/24/2022	CO	Community Outreach Meeting held at Hofsas House	No additional feedback on the Plans was received.
6/6/2022	MPWMD	<p>Emailed comment from Maureen Hamilton, Water Resources Engineer:</p> <p>MPWMD is interested in being a Partner as described in the Implementation and Monitoring chapter. Climate change and water are inextricably linked, and we would like to be helpful framing and integrating immediate and long term water planning into climate change adaptation. If the Committee is open to including MPWMD as a partner, please email or call and I'll coordinate next steps on our end.</p>	<p><b>Suggested Action: Add MPMWD to the list of "Partners" listed in the Climate Adaptation Plan.</b></p>
6/7/2022	CAWD	<p>Letter from Barbara Buikema, General Manager</p> <p>Carmel Area Wastewater District has reviewed your Climate Adaptation Plan and would like to offer two comments. We work closely with the City and believe that we have many of the same goals, please accept our comments in that spirit.</p> <ul style="list-style-type: none"> <li>• Your report focuses on the critical nature of electrical and natural gas infrastructure, but little on sewer infrastructure. We believe sewer is critical to the city, and that climate change impacts that effect the sewer also effect the city. For example, coastal bluff erosion that threatens streets also threatens sewer lines that may be in those streets.</li> </ul>	

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		<ul style="list-style-type: none"> <li>Increased rainfall intensities (that may be brought on by climate change) can increase the amount of stormwater that inadvertently enters the sewers potentially leading to sewer overflows. Ongoing awareness of stormwater impacts to the sewer by the City and its staff will continue to aid CAWD in managing this potential impact of climate change. We have a program whereby upon sale or remodel of a home more than \$50K we require a sewer lateral inspection. These inspections have been instrumental in helping to identify cracks in private laterals that allow stormwater to enter the sewer. We appreciate the coordination that we already receive from City Planning in regard to these efforts.</li> </ul> <p>We would also like to bring attention to our upcoming pipeline rehabilitation project planned for the sewer line in Scenic Road that will improve the resiliency of this pipeline. Furthermore, the District has an aggressive 15-year plan to replace sewer lines throughout our service area that should go a long way towards making sure the system is stronger and more resilient. We want to again, ensure the City that we are ready to collaborate on projects where our interests intersect.</p>	<p><b>Suggested Action: Maintain CAWD on the list of Partners and amend description, opportunities and Action 3.1.9 to include associated infrastructure (ex. sewer lines) in addition to the primary CAWD facility.</b></p>
6/7/2022	CC	<p><b>Staff Question #1 to Council:</b> The Climate Committee was assembled to develop the Climate Adaptation and Action Plans. As the Plans near completion, Climate Committee members have discussed the possibility of continuing meeting on a reduced schedule to oversee the implementation of certain projects, in particular the coastal engineering study, which will guide coastal infrastructure maintenance and improvement projects in the face of Sea Level Rise. Should the Climate Committee be tasked with this oversight?</p>	<p>Council supports the Climate Committee’s continuing oversight of the Coastal Engineering Study.</p> <p><b>Suggested Action: Revise the Climate Adaptation Plan to state the Climate Committee will be tasked with oversight of the Coastal Engineering Study.</b></p>
6/7/2022	CC	<p><b>Staff Question #2 to Council:</b> The Adaptation Plan recommends the establishment of a Sustainability Commission to oversee the plans’ implementation. Does Council support the establishment of a Sustainability Commission? If not, which elected or appointed body(ies) should be tasked with reviewing and providing feedback on implementation and monitoring?</p>	<p>Council stated that if a Design Review Board (DRB) is re-established, the Planning Commission may be the best body to support implementation of the Plans as the Commission would no longer be responsible for design review responsibilities.</p> <p>If a DRB is not re-established, the Forest and Beach Commission may be the best body because of the natural resources affected by climate change.</p>

			<p>Council was hesitant to appoint a new Sustainability Commission at this time due to Commissioner volunteer availability, staffing resources, and cost.</p> <p>Council noted that all City Departments should be involved in the implementation of the plans, and each Department Director should be involved in the implementation.</p> <p>The Plans recommend a Grant Writer/Climate Coordinator (Action 1.4.4.) as a key position to ensure that the City is making progress on the adaptation actions.</p> <p><b>Suggested Action: Add above City Council feedback in outreach section and revise Climate Adaptation Plan to reflect that an existing Board or Commission should take responsibility to oversee the Plans' implementation as opposed to the establishment of a new Sustainability Commission.</b></p> <p><b>Retain the recommendation of a Grant Writer/Climate Coordinator for consideration for a future year budget, but also assess staffing capacity to perform this work once Public Works staffing returns to pre-pandemic levels.</b></p>
6/7/2022	CC	<p><b>Staff Question #3 to Council:</b> Staff has already started to implement these plans by incorporating certain projects in the Capital Improvement Plan and by taking into account Climate Action and Adaptation in City projects such as wildfire mitigation in the Mission Trail Nature Preserve, the Forest Management Plan Update, and Design Guidelines Update. Some of the projects identified in the Climate Adaptation and Action Plans will require significant funding. What additional funding source(s) should be prioritized to implement these projects?</p>	<p>Council did not identify specific or additional funding sources in detail, though the possibility of grants or assessment districts were briefly discussed.</p> <p>A Councilmember stated that because Climate Change is happening, implementing the strategies in the Plans must be achieved, and that there needs to be a commitment of funds as specific projects and measures are ready to be implemented.</p> <p>Future capital improvement projects are to be included in the 5-year Capital Improvement Program</p> <p><b>Suggested Action: Add above City Council feedback in outreach section.</b></p>
6/7/2022	CC	<p><b>Staff Question #4 to Council:</b> The development of these Plans was on the list of Council strategic priorities. As this task gets completed and removed from the strategic priorities, should any action(s) be added to the list to ensure continued emphasis on long-term implementation?</p>	<p>Council stated that the Plans should serve as a "road map," and strategies should pursued and revisited, with the possibility of periodic updates provided to Council.</p>

			<p>The importance of ongoing implementation was continually emphasized by Council.</p> <p>The City Administrator suggested that once the Plans are adopted, that they can be removed from Council's Strategic Priorities list as a completed initiative, and that another initiative, including potentially specific adaptation project(s), could re-populate the list.</p> <p><b>Suggested Action: Add above City Council and City Administrator comments in outreach section.</b></p>
6/7/2022	CC	<p><b>Miscellaneous City Council Comment:</b> Suggested holding a Community Workshop to generate excitement about serving on a commission and/or supporting the various Adaptation strategies and initiatives.</p>	<p><b>Suggested Action: Add City Council comment in outreach section, and revise Action 1.2.3 to include community workshops as an effort to enhance public participation.</b></p>
6/7/2022	CC	<p><b>Miscellaneous City Council Comment:</b> Specifically stated support of Actions 1.3.3-1.3.5</p>	<p><b>Suggested Action: Add City Council comment in outreach section.</b></p>
6/7/2022	CC	<p><b>Miscellaneous City Council Comment:</b> Recommended the implementation of a public solar project to show leadership in building electrification.</p>	<p><b>Suggested Action: Add City Council comment in outreach section, and add an Action item under Policy 3.1, similar to Action 3.1.2, to consider green infrastructure projects to be incorporated into the Capital Improvement Plan.</b></p>
6/7/2022	CC	<p><b>Public Comment:</b> A member of the public expressed concern regarding potential impacts to the built and natural environment associated with the increase of wireless and cellular infrastructure.</p>	<p><b>Suggested Action: Add public comment in outreach section..</b></p>

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# Climate Adaptation Plan



Pre-final Draft  
April 2022



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# Acknowledgements

This Climate Adaptation Plan was a coordinated effort among:

- Carmel-by-the-Sea Community Members
- Carmel-by-the-Sea Climate Committee Members
- Carmel-by-the-Sea Planning Commission and Forest & Beach Commission
- Carmel-by-the-Sea City Council
- Carmel-by-the-Sea City Staff
- Agency Partners and Experts who presented at Climate Committee Members
- Rincon Consultants, Inc.

Thank you for participating. We appreciate your feedback, insight, and passion – the Climate Adaptation Plan is better because of you.

## Climate Committee Members

Jeff Baron, Council Member  
Carrie Theis, Council Member  
John Hill  
Michael LePage  
Scott Lonergan  
LaNette Zimmerman  
Evan Kort, Associate Planner  
Agnes Martelet, Environmental Compliance Manager

## Agency Partners and Experts

Citizens Climate Lobby  
Association of Monterey Bay Area Governments (AMBAG)  
Carmel Area Wastewater District (CAWD)  
City of Monterey Fire Department  
Monterey County Sustainability Program  
Monterey County Office of Emergency Services  
U.S. Geological Survey  
Monterey Chapter of the American Institute of Architects  
Monterey Regional Waste Management District  
Monterey Peninsula Water Management District  
Central Coast Community Energy  
Carmel High School Environmental Club  
Ecology Action  
David Schonman, coastal ecologist  
Sara Davis, City Forester  
Bob Harary, Public Works Director  
Greg D'Ambrosio, former City Forester & Assistant City Administrator

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# Introduction

# Introduction and Purpose

This Climate Adaptation Plan establishes an adaptation strategy for the City of Carmel-by-the-Sea (the City) to prepare for the anticipated impacts associated with climate change. Climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which traps heat near the earth's surface increasing global average temperatures in what is referred to as the greenhouse effect. This rise in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry.<sup>1</sup> According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million in the last 150 years.<sup>2</sup> The dramatic increase in GHGs is attributed to human activities<sup>3</sup> beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian and handicraft-based economy to one dominated by industry and machine manufacturing.<sup>4</sup>

Carmel-by-the-Sea is a coastal town, located on the Monterey Peninsula, with vegetation consisting mostly of evergreen and deciduous trees as well as coastal chaparral. Carmel-by-the-Sea, like many cities throughout California, is expected to experience increased climate hazards because of climate change. These include stronger storms, increasing wildfire risk, rising sea levels, extended drought conditions, and increasing temperatures. The impacts of climate change are already being felt throughout California and at least some increase in these impacts is expected even under aggressive global GHG reduction scenarios.<sup>5</sup> However, Carmel-by-the-Sea can adapt by taking

steps to prepare the community and its infrastructure for these expected climate changes. Virtually all people and assets in the city will be affected by climate change in some way. Identifying the expected severity of these impacts and steps to adapt to these changes will be critical to minimizing future costs and community impacts. The purpose of the Climate Adaptation Plan is to identify and prioritize climate adaptation actions the City can implement to improve the resilience of its community members, natural environment, critical infrastructure, and built environment.

## City Setting

Carmel-by-the-Sea is located on the Monterey Peninsula in northwest Monterey County, California, along the Pacific Ocean. The renowned scenic environment of Carmel-by-the-Sea stems from its two dominant features, the coastline and the central ridge of wooded hills. Highway 1 is the primary roadway linking Carmel-by-the-Sea to surrounding cities. Carmel-by-the-Sea is an area rich in coastal resources and cultural heritage and is popular for visitors across California and the United States. Approximately one square mile in area, the City's elevation ranges from sea level to 500 feet above sea level, sloping gently from Carmel-by-the-Sea Bay up to Highway 1. Vegetation in the vicinity of Carmel-by-the-Sea generally consists of evergreen trees, most notably the native Monterey Pine, in the City and along the coast, deciduous trees along the Carmel River, and coastal chaparral on the Carmel Valley hills. Various species of wildlife inhabit the area, especially in reserves and in undeveloped gulches. Carmel-by-the-Sea's land is largely forested and contains a substantial amount of open space. There are several areas in and around the City that qualify as wildland fire hazard areas. These areas are located to the north and east of the City boundaries and includes Pescadero Canyon, Forest Hill Park, and Del Monte Forest to the north, and Mission Trails Nature Preserve to the east.<sup>6</sup>

1. <https://climate.nasa.gov/effects/>

2. [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf)

3. <https://climate.nasa.gov/scientific-consensus/>

4. <https://www.acs.org/content/acs/en/climatescience/greenhousegases/industrialrevolution.html>

5. [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Full\\_Report\\_smaller.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report_smaller.pdf)

6. [https://ci.carmel.ca.us/sites/main/files/file\\_attachments/environmental\\_safety\\_cc\\_adopted\\_9-1-09.pdf?1510257865](https://ci.carmel.ca.us/sites/main/files/file_attachments/environmental_safety_cc_adopted_9-1-09.pdf?1510257865)



## Adaptation Strategy Lexicon

Several key climate adaptation-related words and phrases are used throughout the plan. The following definitions will be helpful in understanding the overall strategy and the process which led to its development.

- **Mitigation:** An act or sustained actions to reduce, eliminate, or avoid negative impacts or effects.<sup>7</sup>
- **Adaptation:** The process of adjustment to actual or expected climate and its effects. In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.<sup>8</sup>
- **Vulnerability:** The propensity or predisposition to be adversely affected.<sup>9</sup>
- **Resilience:** The capacity of an entity (an individual a community, an organization, or a natural system) to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience.<sup>10</sup>
- **Climate Hazard:** A dangerous or potentially dangerous condition created by the effects of the local climate.<sup>11</sup> Climate hazards of concern for Carmel-by-the-Sea are wildfire, increased temperature, drought, intense precipitation, and sea level rise.
- **Impacts:** Effects on natural and human systems. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate hazards and the vulnerabilities of the system or asset effected.<sup>12</sup>
- **Asset/Population:** Asset refers to a community structure or service that is relied on broadly by the City. Population groups are also identified. The purpose of including this information is to indicate which asset or population group the action would protect.
- **Implementation:** The process of putting a decision or plan into effect; execution.

7. <https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf>

8. [https://www.ipcc.ch/site/assets/uploads/2018/03/SREX\\_FD\\_SPM\\_final-2.pdf](https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf)

9. [https://www.ipcc.ch/site/assets/uploads/2018/03/SREX\\_FD\\_SPM\\_final-2.pdf](https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf)

10. <https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf>

11. <https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf>

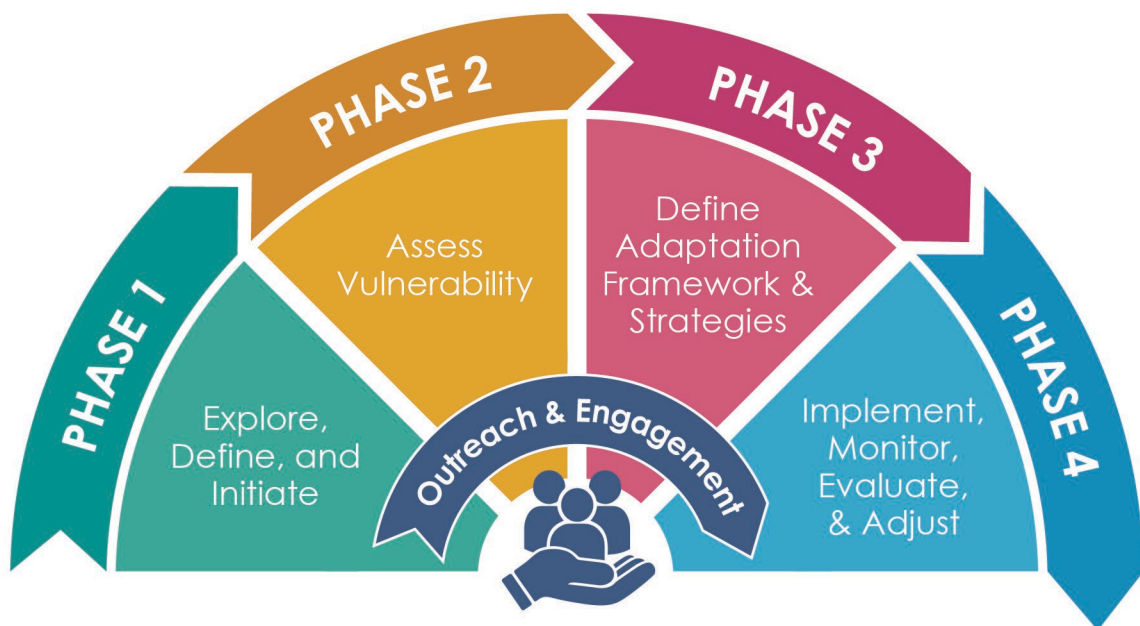
12. [https://www.ipcc.ch/site/assets/uploads/2018/03/SREX\\_FD\\_SPM\\_final-2.pdf](https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf)

# Climate Adaptation Plan Process

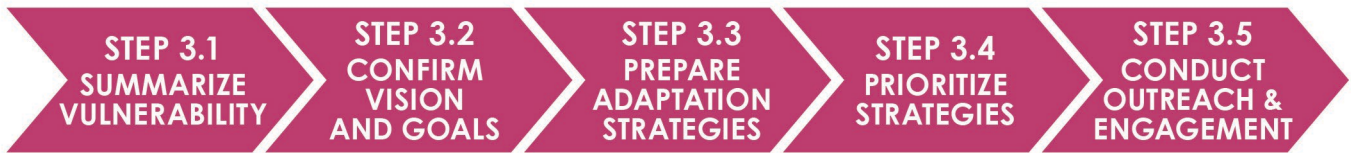
## Background

In September 2019, the City began the process of developing Climate Action and Adaptation Plans that would establish a roadmap to reducing local GHG emissions and identify opportunities to adapt to climate change. The Climate Action Plan is included as Appendix A to the Climate Adaptation Plan. The City followed the climate adaptation planning process recommended by the California Governor’s Office of Emergency Services, as documented in the 2020 California Adaptation Planning Guide (2020 CalOES APG), illustrated in the graphic below, and specifically described below.

- **Phase 1.** The City began by convening a Climate Committee to guide the preparation of the Climate Action and Adaptation Plans. The Climate Committee is composed of members of the Carmel-by-the-Sea community, including residents, business owners, and professional experts. The Climate Committee began monthly meetings in November 2019.
- **Phase 2.** To identify the climate hazards specific to Carmel-by-the-Sea and establish a common understanding of the potential climate change impacts in the Carmel-by-the-Sea community, the City completed a Climate Change Vulnerability Assessment (Vulnerability Assessment) in July 2021 (see Appendix B). The Vulnerability Assessment characterizes hazards associated with climate change that are anticipated to impact the community and City-owned assets, describes the community’s major climate vulnerabilities, and identifies work that has already been done by the City to improve its resilience to climate impacts. Although the City has a variety of policies and programs already in place to address climate change impacts, policy gaps were identified in the Vulnerability Assessment.
- **Phase 3 and Phase 4.** The City prepared this Climate Adaptation Plan to establish adaptation goals, policies, and actions to address gaps identified in the Vulnerability Assessment. The Climate Adaptation Plan also establishes a roadmap to implementation. Implementing, monitoring, evaluating, and adjusting the Climate Adaptation Strategy (Phase 4), will be led by the City as described in the Implementation and Monitoring Plan section of the report.



Graphic: 2020 California Adaptation Planning Guide (Adaptation Planning Process)



Graphic: 2020 California Adaptation Planning Guide (Phase 3)

The Climate Adaptation Plan was developed pursuant to the steps in Phase 3 of the 2020 CalOES APG, shown in the graphic above.

**Step 3.1.** The City summarized the findings from the Vulnerability Assessment to aid in developing new policies and actions.

**Step 3.2.** The City confirmed the goals with the Climate Committee and community members.

**Step 3.3.** and **Step 3.4.** The City prepared and prioritized adaptation actions based on adaptation action selection criteria.

**Step 3.5.** The City incorporated input from stakeholders and community members.

The sections below detail the methodology used to shape the Climate Adaptation Plan.

## Vulnerability Assessment Summary

The purpose of the Vulnerability Assessment is to characterize climate hazards that will impact the community and City assets in Carmel-by-the-Sea, determine the community's major climate vulnerabilities, and identify work that has already been done to improve community resilience. The Vulnerability Assessment uses information and

modeling projections provided by the State of California to support climate adaptation efforts including the Cal-Adapt modeling tool and the Fourth California Climate Assessment. The City determined that Carmel-by-the-Sea is most vulnerable to the following climate change impacts: stronger storms, wildfires, sea level rise, extended droughts, and increased temperature.

The Vulnerability Assessment also evaluated the impact these climate hazards could have on the following **asset classes** (or types of resources) and *specific assets* present in the city.

- **Natural Assets:** *Mission Trail Nature Preserve, North Dunes, Pescadero Canyon, Urban Forest, Marine Sanctuary, and Carmel Beach*
- **Community:** *Elderly Population and People with Disabilities, Residents, Visitors, Local Businesses, Service Industry Workers, Second Homes*
- **Utilities:** *Water Supply, Sanitary Sewer System, Power Grid, Overhead Communication, Pacific Gas & Electric Company, Underground Lines (Gas, Cable)*
- **Regional Infrastructure:** *Wastewater Treatment Facility, Transportation Infrastructure (Caltrans), Hospital and Emergency Medical Care Facilities, Landfill & Waste Management*
- **Local Infrastructure:** *Shoreline Access Infrastructure, Seawalls and Revetments, Storm Drain System, Emergency Response Facilities*



Stronger storms



Wildfire



Sea Level Rise



Extended Drought



Increased heat





Within each asset class, specific assets were evaluated, as listed in Table 1 below. Each asset was categorized with one of the following climate impacts categories:

- already causing observable impacts or near-term significant risk
- mid- to long-range impacts
- not enough data
- no anticipated impacts

The City reviewed adopted policies and programs for each of the assets and indicated whether the City had already initiated policies or actions to address the climate hazard. This analysis assumes that existing adaptation policies and actions will continue to be implemented. Table 1 presents the results of this analysis, for more details on the vulnerability analysis see Appendix B.

**Table 1 Vulnerability Scoring Matrix**

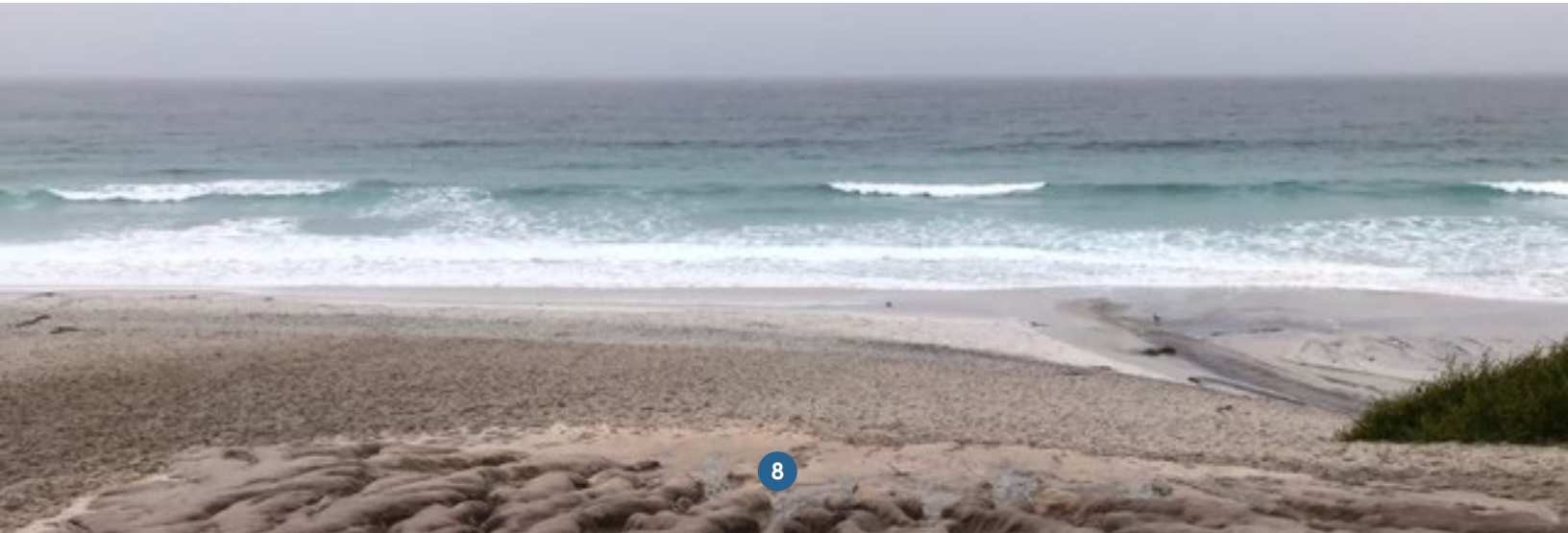
Color coding:

-  Climate change is already causing observable impacts or a near-term significant risk
-  Climate change poses mid- to long-range impacts
-  Not enough data
-  No anticipated impacts
- Yes** Some policy/action initiated
- No** No policy/action initiated

Priority Assets at Risk	Priority Climate-Related Hazards				
	Stronger Storms	Wildfires	Sea Level Rise	More Droughts	Increased Temp
<b>Natural Assets</b>					
Mission Trail Nature Preserve	Yes	Yes		Yes	Yes
North Dunes			No	Yes	Yes
Urban Forest	Yes	No		Yes	No
Marine Sanctuary					
Carmel Beach	Yes		Yes		
<b>Community</b>					
Elderly Population and People with Disabilities	No	No		No	No
Residents	Yes	Yes		Yes	No
Visitors	No	No			
Local Businesses	No	No	No	Yes	No
Service Industry Workers	No	No	No		No
Second Homes	Yes	Yes	No		

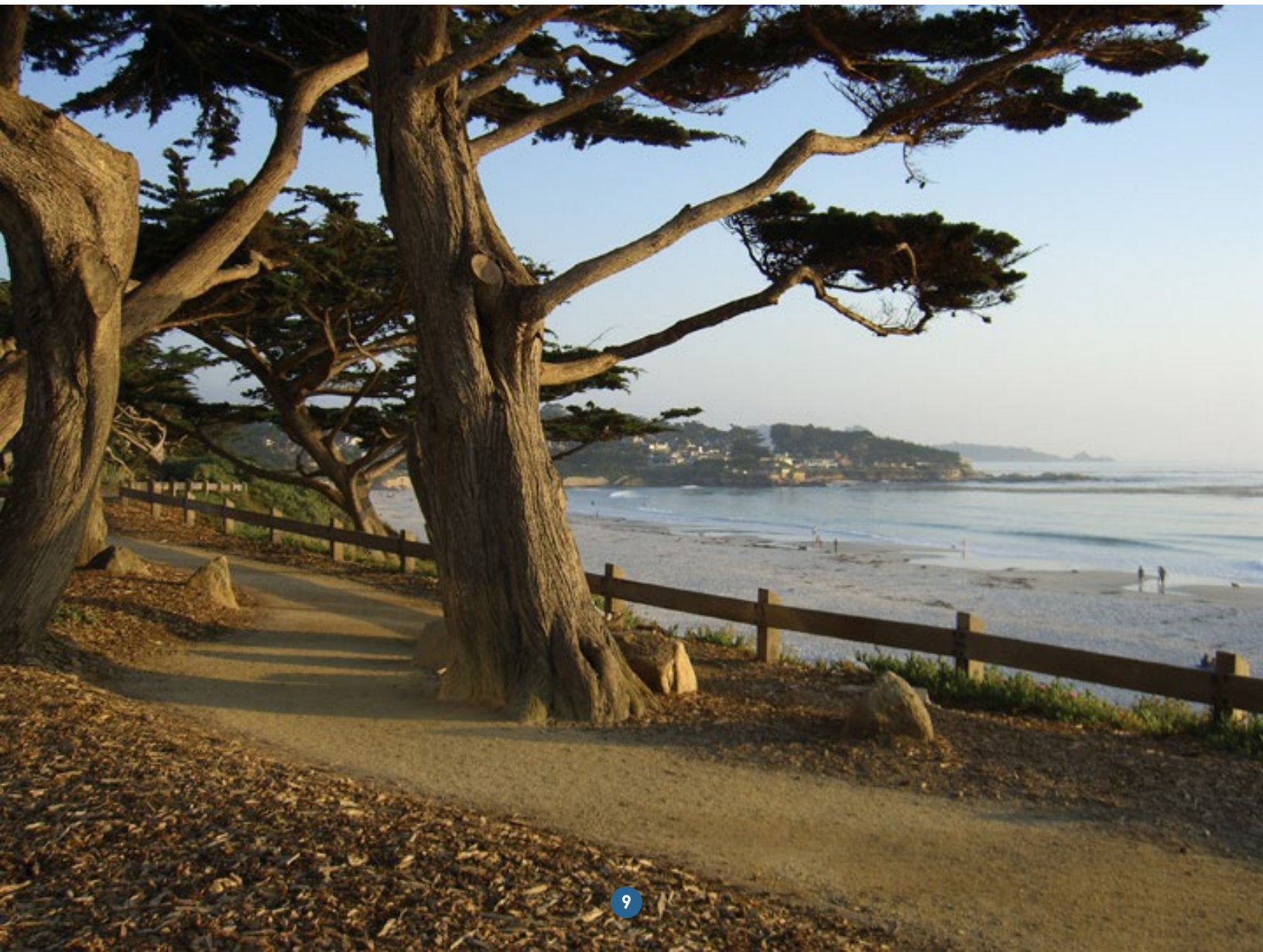
Priority Assets at Risk	Priority Climate-Related Hazards				
	Stronger Storms	Wildfires	Sea Level Rise	More Droughts	Increased Temp
<b>Utilities</b>					
Water Supply		Yes	Yes	Yes	Yes
Sanitary Sewer System			Yes		
Power Grid	No	No			No
Overhead Communication	No	No			
PG&E/Communication Underground Lines (gas, cable)		No	No		
<b>Regional Infrastructure</b>					
Wastewater Treatment Facility	Yes		Yes		
Transportation Infrastructure (Caltrans)	Yes	Yes	Yes		
Hospital and Emergency Medical Care Facilities					
Landfill & Waste Management	Yes				
<b>Local Infrastructure</b>					
Shoreline Access Infrastructure	Yes		Yes		
Seawall and Revetments	Yes		Yes		
Storm Drainage System	Yes		Yes		
Emergency Response Facilities (Fire station, EOC, PD, PW, City Hall, etc..)	Yes	Yes			No

Notes: Shoreline Access Infrastructure = Scenic trail, public restrooms, beach stairs, coastal roadways, and parking; EOC = Emergency Operations Center; PD = Police Department; PW = Public Works; PG&E = Pacific Gas & Electric Company  
 Source: Adapted from the July 2021 City of Carmel-by-the-Sea Climate Change Vulnerability Assessment (Appendix B)



Based on identified policy gaps in the Vulnerability Assessment, the Climate Adaptation Plan identifies new policies and programs for the assets considered to be most vulnerable to climate change. Assets and communities that are considered most vulnerable are those that have no policies/actions for increasing resilience and are either currently experiencing observable or near-term risks or those that are expected to experience mid- to long-range impacts (this corresponds to cells in Table 1 that are highlighted orange or yellow and labeled No). Key findings of the Vulnerability Assessment include:

- Carmel-by-the-Sea's natural assets are most vulnerable to wildfire, sea level rise, and increased temperature.
- Carmel-by-the-Sea's communities are vulnerable to all priority climate-related hazards.
- Utilities are most vulnerable to stronger storms, wildfire, sea level rise, and increased temperature.
- Regional infrastructure assets, including the Carmel Area Wastewater Treatment Facility and Highway 1, were determined to be vulnerable to climate change, however, policies and actions have been initiated to address vulnerabilities.
- Policy and actions have been initiated to reduce local infrastructure's vulnerability to stronger storms, wildfires, and sea level rise. No action has been taken to address vulnerability to increased temperature.
- The Climate Committee determined that a coastal engineering study would be necessary to fully assess the potential impacts of sea level rise on City assets and to identify policies and actions to address those impacts.



# Stakeholder and Public Input

# Outreach

The Climate Adaptation Plan was developed and refined through a stakeholder engagement process with the Carmel-by-the-Sea Climate Committee and the public. Draft versions of the adaptation strategy (goals, policies, and actions) were presented in September and October 2021 to the Climate Committee. Comments received during and following these meetings were incorporated into an updated set of goals, policies, and actions that were then presented at a virtual public workshop in November 2021. Comments received during and following the public workshop were incorporated into the goals, policies, and actions, and presented at the January 2022 Climate Committee meeting for final input. See Appendix C for meeting slides, interactive activity results, and responses to comments.

The Carmel-by-the-Sea Climate Committee provided input along the following themes:

- Support for additional strategies that would improve emergency evacuation, and relieve traffic and congestion
- Identification of additional actions to support vulnerable populations
- Additions to actions to address tree maintenance and protect native species, particularly the Monterey Pines
- Augment actions to include stormwater runoff reduction and increase resilience of the Carmel Area Water District facility

The community provided input along the following themes:

- Support to include a clear evacuation plan for elderly residents
- Applying updated City Planning Guidelines and Development Standards citywide, not just in the Very High Fire Hazard Severity Zone
- Additional opportunities for partnership in adaptation-related community engagement efforts

- Increasing City staff resources to increase staff time for implementation of the strategy

The Climate Adaptation Plan was presented to the Forest & Beach Commission and the Planning Commission in May, and City Council in June 2022 for input, and adopted in **June** 2022.

The Planning Commission was supportive of the plan and provided input on the following:

- Support for electrification,
- Support for reducing the use of automobiles, including higher development density in the downtown to provide housing for Carmel workforce, and the provision of shuttle services, especially for special events,
- Support for further outreach on food waste composting, including solutions for common implementation issues,
- Support for increasing forest health and wildfire mitigation, including in Pescadero Canyon,
- Support for the use of green roofs as cool roofs,

The Forest & Beach Commission provided input on the following:

- Support for the Grant Writer/Climate Coordinator position and for prioritizing implementation to ensure success,
- Suggestion to add Pescadero Canyon to the list of natural resources and to consider it in the adaptation plan,
- Suggestion to expedite bluff monitoring if feasible.

City Council provided input on the following:

- **XX**

Input from the Forest & Beach Commission, the Planning Commission, and City Council were incorporated into the Climate Adaptation Plan, and the Plan was adopted in **May 2022**.

# Adaptation Strategy

# Strategy Overview

The Adaptation Strategy presented in this section identifies goals, policies and actions that seek to contribute to increasing resilience to climate change in Carmel.

Goals, policies, and actions are defined as:

- **Goals:** Broad statements describing community desires. The Carmel-by-the-Sea adaptation goals are modeled after the Adaptation Vision and Principles developed by the California Governor’s Office of Planning and Research (OPR) Integrated Climate Adaptation & Resiliency Program (ICARP).<sup>13</sup> Each goal is focused on increasing the resilience of one of the following broad asset categories: community, natural assets, and infrastructure

(including utilities) and the built environment.

- **Policies:** Specific position statements that support the achievement of goals and serve as guides to City Council, Planning Commission, and City staff, when making decisions.
- **Actions:** Specific methods to incrementally implement and achieve policies and goals.

The intent of the goals, policies, and actions is to address the key vulnerabilities identified in the Vulnerability Assessment, including assets at risk from near-term or mid-term climate change impacts and that lack existing adopted policies or established programs. It is expected that existing adaptation-related policies and actions identified in the City’s Vulnerability Assessment will continue to be implemented and re-assessed in the next update of the Climate Adaptation Plan and Vulnerability Assessment, by 2030 at the latest.

13. <https://opr.ca.gov/planning/icarp/tac/>



# Carmel-by-the-Sea's Adaptation Goals

Based on the results of the vulnerability analysis and input from the community and Carmel-by-the-Sea Climate Committee three primary goals were identified. These goals served as a guide for the development of the adaptation actions and policies contained in the Adaptation Strategy.

With these goals in mind, the City, stakeholders, and community provided input on a suite of policies and specific actions that would achieve these goals and result in a more adaptive and resilient Carmel. These specific policies and actions can be found in the Adaptation Policies and Actions section.

## Goal 1. A Healthy, Safe, and Resilient Community

Goal 1 is a healthy, safe, and resilient community in the face of climate change. The policies and actions under this goal improve community health, safety, and resilience through equitable and effective emergency preparedness, targeted actions to improve the resilience for vulnerable populations, minimization of negative health impacts from climate change, and economic resilience in the form of support for service industry workers and local businesses. The policies and actions for Goal 1 are provided in Table 2 of the Adaptation Strategy. Goal 1 policies and actions should be prioritized given that community assets are those that have

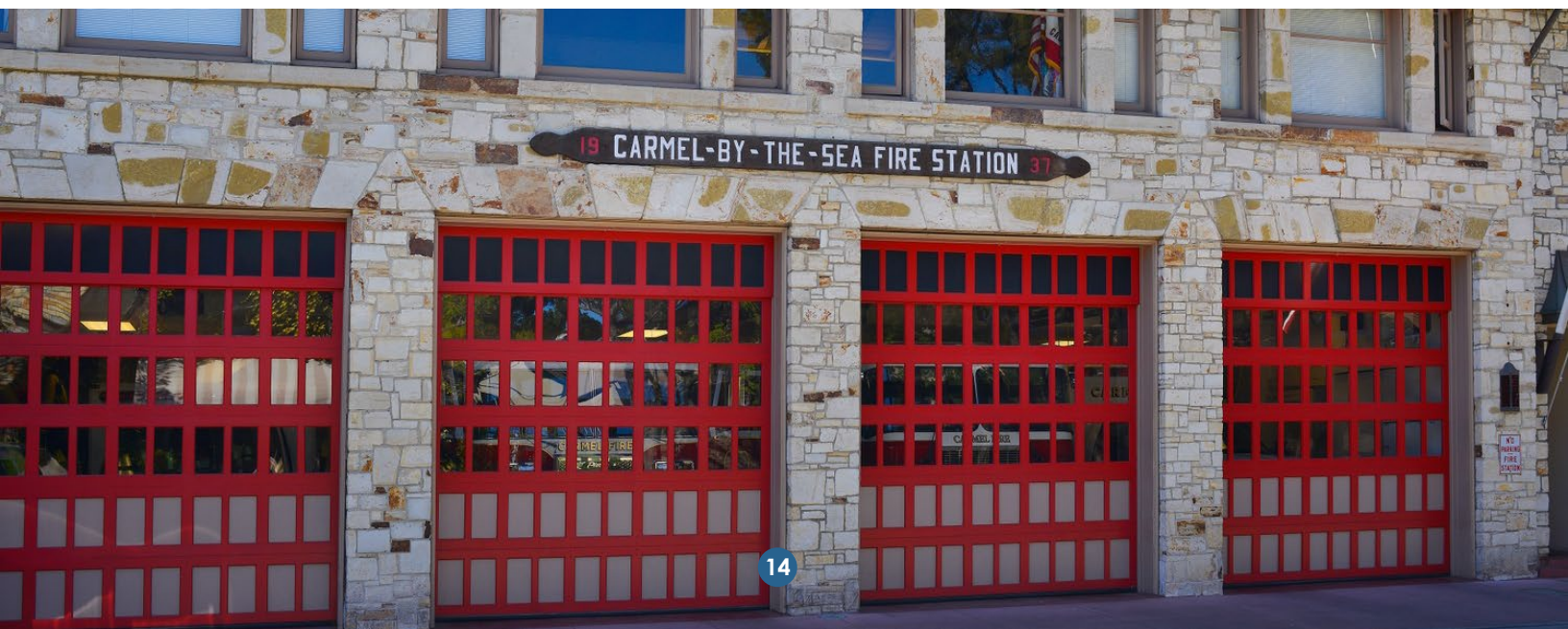
the greatest vulnerability based on the number of hazards they are exposed to and not having policies or actions currently in place to increase resilience (see Appendix B).

## Goal 2. A Natural Environment Resilient to Climate Hazards

Goal 2 of Carmel's adaptation strategy is a resilient natural environment. The City's beaches, urban forestry, and parks are all vulnerable to climate hazards. The policies and actions under this goal aim to improve resilience of the community's habitats and ecosystems using studies, partnerships, funding, and structural actions. The policy and actions for Goal 2 are list in Table 3 of the Adaptation Strategy.

## Goal 3. Resilient Infrastructure and Built Environment

Goal 3 in the City's adaptation strategy is a resilient built environment. This goal involves policies that address infrastructure redundancies and incorporation of climate change into built environment planning. The actions under these policies are organized by climate hazard-related improvements with each addressing improvements needed to increase infrastructure resilience to climate change. Actions like green infrastructure and storm drain repairs target intense precipitation while actions like bluff monitoring and the hiring of a coastal engineer help the community adapt to sea level rise. The policies and actions for Goal 3 are provided in Table 4 of the Adaptation Strategy.



# Adaptation Policies and Actions

# Policy and Action Development

In order to achieve each of the three adaptation goals identified in the Adaptation Strategy section above, a suite of adaptation policies and actions were developed. The policies and actions focus on the most vulnerable assets within Carmel-by-the-Sea which were identified through the vulnerability matrix. To guide the creation of effective adaptation strategies for these assets, the City developed selection criteria to prioritize the selection of goals, policies, and actions. These criteria were established to guide the development of policies and specific actions and help promote implementation, equity, and effectiveness. Every Goal contains at least one action that meets each of the criteria established. The following criteria were used to develop and ultimately select Carmel's adaptation actions:

1. Implement adaptation actions that result in **measurable increase in resilience** and reduction in climate change risks.
2. Implement actions that respond to continual changes in climate, ecology, and economics using **adaptive management** that incorporates regular monitoring.
3. Establish governance policies, **institutional structures**, and monitoring processes to implement adaptation actions.
4. Identify **funding** needs, establish funding mechanisms, and allocate adequate funding to support adaptation policy development and implementation.
5. Focus meaningful and active **engagement** with the most impacted communities.
6. Employ adaptive and flexible governance approaches by maximizing collaborative **partnerships** among sectors to accelerate effective problem solving.
7. Prioritize actions that promote **equity**, foster community resilience, and protect the City's most vulnerable populations, including the elderly. Explicitly prioritize communities that are disproportionately vulnerable to climate impacts.

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

- **Metric:** A way to gauge progress of an action through measurable indicators or benchmarks of progress. This involves quantifying increases in resilience. The metric is a key component of *Phase 4: Implement, Monitor, Evaluate, and Adjust* of the 2020 CalOES APG.<sup>14</sup>
- **Timeframe:** Sorted into phases of near-term (1-2 years, or by 2024), mid-term (3-5 years, or by 2027), and long-term (5-10 years, or by 2023) this categorization helps plan for timing of implementation.
- **Implementation Lead:** The City department or entity that will lead the implementation of the action.
- **Cost:** Sorted into ranges of \$-Low (<\$25,000), \$\$-Medium (\$25,000 - \$100,000), and \$\$\$-High (>\$100,000) these estimates are used to determine type and extent of funding and financing needed.

Policies and actions are organized by goal in the following tables.

14. <https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf>

**Table 2 A Health, Safe, and Resilient Community**

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<b>Policy 1.1. Provide effective emergency preparedness and response in anticipation of potential climate-related disasters</b>							
<b>Action 1.1.1. Maintain and Update Evacuation Plan.</b> Maintain and update an Evacuation Plan every 8 years at a minimum to account for all types of emergencies. The plan should focus on the most vulnerable groups including the elderly community and persons with disabilities.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Adaptive Management, Equity	Evacuation Plan updated every 8 years, with the first update by 2023	Near-term (by 2024) and Ongoing	Police and Fire	
<b>Action 1.1.2. Update Emergency Preparedness.</b> Incorporate climate change risk and impact considerations into Carmel-by-the-Sea CERT programming and materials to promote emergency preparedness at a neighborhood block-by-block scale. CERT to promote block-by-block scale emergency preparedness by organizing City by blocks and recruiting Block Captains.		Residents, Local Businesses, Second Homes	Adaptive Management, Engagement, Measurable Increase in Resilience	Number of block captains formed, climate change risk incorporated into CERT materials	Near-term (by 2024)	Police and Fire	
<b>Action 1.1.3. Collaborate with Monterey Fire.</b> Collaborate with Monterey Fire on its inspection and outreach efforts to reduce fire risks. Continue to coordinate with the CERT program and reach out to new potential outreach partners such as local businesses, community groups, and utilities to help distribute information to increase resident and homeowner awareness and knowledge of how to prepare for emergencies.		Residents, Local Businesses, Second Homes	Engagement, Partnerships	Number of meetings held with Monterey Fire and CERT program; educational materials distributed	Near-term (by 2024)	Police and Fire	
<b>Action 1.1.4. Publicize Local Evacuation Routes.</b> Publicize both City and Monterey County evacuation routes for the community on the City's website, and in the newsletter and brochures. Target additional outreach to the most vulnerable such as the elderly and people with disabilities in the event of a wildfire or other disaster.		Elderly Population and People with Disabilities, Residents	Engagement, Equity	Educational materials distributed	Near-term (by 2024)	Police and Fire	
<b>Action 1.1.5. Evaluate Evacuation Route Capacity.</b> Evaluate evacuation route capacity, safety, and viability under a range of emergency scenarios and identify and implement mitigating actions in 2022, in accordance with Assembly Bill 747.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Adaptive Management	Analysis evaluating evacuation route capacity completed	Mid-term (by 2027)	Police and Fire	 

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<p><b>Action 1.1.6. Evacuation Alternatives and Access.</b> Identify neighborhoods that have single ingress/egress, pursuant to Senate Bill 99, and develop and employ evacuation alternatives, such as a gathering facility, and/or alternative emergency access routes in those neighborhoods. Evaluate potential congestion issues in the event of an evacuation and develop and maintain a list of residents who may have difficulty evacuating. Evaluate options to provide evacuation, such as a shuttle service, for residents with mobility challenges.</p>		<p>Elderly Population and People with Disabilities, Residents, Service Industry Workers</p>	<p>Adaptive Management, Engagement, Equity</p>	<p>Analysis identifying neighborhoods that have single ingress/egress and evacuation alternatives completed; List of limited-mobility residents developed</p>	<p>Mid-term (by 2027)</p>	<p>Police and Fire</p>	<p>\$ \$</p>
<p><b>Action 1.1.7. Develop Local Partnerships to Increase Resistance to Wildfire Structural Damage.</b> Work with local community groups to publicize the Firewise Community Certification program (e.g., on the City website and in the newsletter and brochures) and encourage resident involvement.</p>		<p>Residents, Second Homes</p>	<p>Engagement, Partnerships</p>	<p>Number of meetings held to publicize Firewise Community Certification</p>	<p>Mid-term (by 2027)</p>	<p>Police and Fire</p>	<p>\$</p>



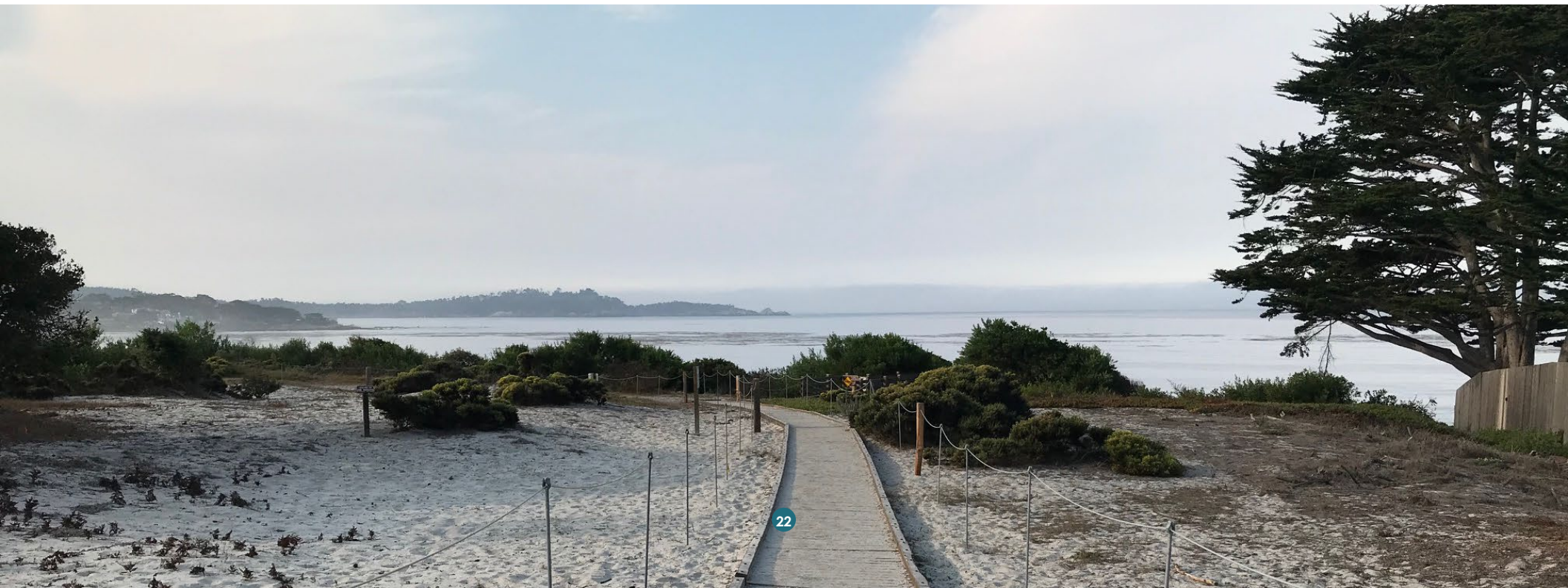
Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<b>Policy 1.2. Focus adaptation efforts and engagement on the most vulnerable populations.</b>							
<b>Action 1.2.1. Establish a Resilience Hub.</b> Formally designate a physical resilience hub, such as the Youth Center or Public Library, and make it available during extreme heat events, poor air quality, severe weather events, and other highly hazardous conditions for use by the community. Provide the following essential resources in the resilience hub(s): health programming and resources, food, refrigeration, charging stations, basic medical supplies, and other emergency supplies. Electrified heating and cooling paired with backup power sources like battery storage provides redundancy and continues services in the event of a power outage. Designate a virtual resilience hub on the City website where residents can access information about the physical resilience hub and resilience efforts.			Elderly Population and People with Disabilities, Residents, Service Industry Workers	Adaptive Management, Equity	Physical and virtual Resilience Hubs established; Existing facilities upgraded to provide all essential resources	Near-term (by 2024) Public Works/Police and Fire/Library	\$ \$
<b>Action 1.2.2. Limit the Impacts of Climate Change on the Most Vulnerable Populations.</b> Develop a framework to define equity in Carmel-by-the-Sea and develop adaptation approaches that are equitably implemented.			Elderly Population and People with Disabilities, Residents, Service Industry Workers	Equity	Carmel-by-the-Sea Equity Framework developed	Mid-term (by 2027) Community Planning and Building	\$
<b>Action 1.2.3. Engage the Community.</b> Develop educational materials notifying the community about the resilience hub and how to access it by sharing updates across city and community channels. Partner with the CERT program and block captains, and community groups, to prioritize disadvantaged/marginalized communities including the elderly and individuals with disabilities.			Elderly Population and People with Disabilities, Residents, Service Industry Workers	Engagement, Equity	Community engagement plan developed	Near-term (by 2024) Library/City Hall/Police Department	\$
<b>Action 1.2.4. Social Support Network.</b> Collaborate with the Carmel Foundation and other community-based organizations (e.g., Carmel Residents Association) to develop an inventory of locations with isolated elderly residents and people with disabilities and develop a plan for a social support network to increase resilience to climate change, for example by promoting home electrification.			Elderly Population and People with Disabilities	Partnerships, Equity, Engagement	Social support network created; Inventory of locations created	Mid-term (by 2027) Police Department/CERT/Community Planning and Building	\$
<b>Action 1.2.5. Back-up Power for Vulnerable Populations.</b> Coordinate with 3CE, PG&E, and emergency management services to establish backup power and emergency grid shutdown protocols that protect the most vulnerable populations.			Elderly Population and People with Disabilities	Partnerships, Equity, Measurable Increase in Resilience	Number of households with backup power established	Long-term (by 2032) Police and Fire/Public Works	\$ \$ \$

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<b>Policy 1.3. Minimize health impacts of climate change.</b>							
<b>Action 1.3.1. Partner with Monterey County Health Department.</b> Coordinate with Monterey County Health Department to develop and enhance disaster and emergency early warning systems to incorporate objective data and information for potential health threats such as heat-illness, and illnesses complicated by low air quality due to climate change hazards. Include information on early warning systems and other resilience efforts on the City's virtual resilience hub (Action 1.2.1.)		Elderly Population and People with Disabilities, Residents, Local Businesses, Service Industry Workers	Partnerships, Measurable Increase in Resilience	Emergency early warning systems updated	Near-term (by 2024)	Police and Fire	\$
<b>Action 1.3.2. Initiate a Heat Pump Retrofit Program.</b> Create a program to help fund property owners to convert HVAC units to heat pumps, which provide water heating and space heating in addition to cooling and can improve indoor air quality and community adaptation to extreme heat. Include a microgrid energy storage component to increase power reliability. Prioritize at-risk populations for retrofit incentives.		Elderly Population and People with Disabilities, Residents, Local Businesses, Service Industry Workers	Measurable Increase in Resilience	Number of heat pumps installed; Number of heat pumps serving at risk residents	Mid-term (by 2027)	Community Planning and Building	\$ \$ \$
<b>Action 1.3.3. Invest in Improving Resilience in Critical Facilities.</b> Invest in sustainable backup power sources to provide redundancy and continued services for critical facilities, including City Hall, Carmel Police Department, Carmel Fire Department, the Libraries, and assisted living facilities, in the event of a power outage triggered by a climate event.		Elderly Population and People with Disabilities, Residents	Measurable Increase in Resilience	Number of critical facilities with sustainable backup power sources.	Mid-term (by 2027)	Public Works	\$ \$ \$
<b>Action 1.3.4. Conduct a Feasibility Study for Existing Building Electrification and Back-up Power.</b> 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.		Elderly Population and People with Disabilities, Residents	Adaptive Management	Feasibility Study for Existing Building Electrification and Back-up Power completed	Mid-term (by 2027)	Public Works	\$ \$
<b>Action 1.3.5. Improve Resilience in Existing Building Stock.</b> Develop a program for identifying funding and incentives to weatherize residential and commercial buildings that addresses severe weather protection, energy efficiency, indoor air quality improvements, and other housing improvements. Include an outreach campaign as part of this program to advertise the benefits of weatherizing and electrifying buildings.		Elderly Population and People with Disabilities, Residents	Funding, Measurable Increase in Resilience, Adaptive Management	Number of retrofitted structures	Long-term (by 2032)	Community Planning and Building	\$ \$



Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<p><b>Action 1.3.6. Promote Funding Opportunities.</b> Work with partners like 3CE and PG&amp;E to identify and promote potential resilience opportunities and accessible funding and financing mechanisms to pay for building electrification, weatherization, and battery backups.</p>		<p>Elderly Population and People with Disabilities, Residents, Local Businesses</p>	<p>Funding, Partnerships, Engagement</p>	<p>Funding identified and promoted to community; Number of projects initiated with incentives</p>	<p>Near-term (by 2024)</p>	<p>Community Planning and Building/Police and Fire/Public Works</p>	<p>\$</p>
<p><b>Policy 1.4. Increase Economic Resilience</b></p>							
<p><b>Action 1.4.1. Develop Partnerships to Provide Support to Displaced Workers.</b> Work in partnership with the Monterey County Workforce Development Board and the Carmel Chamber of Commerce to develop a plan to provide support for displaced workers that establishes education and training partnerships for workers displaced or workers negatively impacted by climate change or climate adaptation policies.</p>		<p>Service Industry Workers, Local Businesses</p>	<p>Partnerships, Equity</p>	<p>Commitment from business community to develop a plan to support displaced workers</p>	<p>Near-term (by 2024)</p>	<p>Community Planning and Building/City Hall</p>	<p>\$</p>
<p><b>Action 1.4.2. Establish Partnerships to Develop a Resilient Economy.</b> Partner with the County of Monterey Economic Development Department, Carmel Chamber of Commerce, and the Monterey County Workforce Development Board, to develop more integrated strategies for protection of jobs, economic sustenance, and for the protection of vulnerable populations more at-risk of temporary or permanent job dislocation due to climate change.</p>		<p>Service Industry Workers, Local Businesses</p>	<p>Partnerships, Equity</p>	<p>Number of meetings held to develop strategies for job protection</p>	<p>Mid-term (by 2027)</p>	<p>Community Planning and Building/City Hall</p>	<p>\$</p>

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<p><b>Action 1.4.3. Business Resilience Outreach Program.</b> Collaborate with businesses in the city to better understand shared climate risks and identify opportunities to advance shared climate resilience priorities. Partner with the Carmel Chamber of Commerce and Visit Carmel to pilot and implement a local business resilience initiative to build small business capacity before a time of crisis by increasing the awareness of, and preparedness for, business continuity risks faced by the city's local businesses, providing a toolkit of intervention to help local businesses manage risks and enhance business resilience, and conducting outreach campaigns to engage leaders from the business, government, and community sectors to enhance preparedness for economic resilience.</p>		Service Industry Workers, Local Businesses	Engagement, Partnerships	Toolkit of intervention developed to help support local businesses manage risks and enhance resilience	Near-term (by 2024)	Community Planning and Building/City Hall	 
<p><b>Action 1.4.4. Hire a Grant Writer/Climate Coordinator.</b> Hire a grant writer/climate coordinator to pursue available grants to fund climate adaptation implementation and track progress.</p>		All	Funding	Grant writer hired	Near-term (by 2024)	City Hall	  



**Table 2 Goal 2. A Natural Environment Resilient to Climate Hazards**

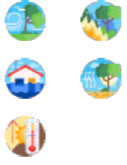


Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<b>Policy 2.1. Protect and restore climate-vulnerable habitat and ecosystems.</b>							
<b>Action 2.1.1. Increase Funding for Climate Adaptation.</b> Earmark Capital Improvement Program (CIP) funding for design, permitting, and implementation of adaptation projects and strategies, such as those in the 2021 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) and Integrated Regional Watershed Management Program (IRWMP).		Urban Forest, Mission Trail Nature Preserve, North Dunes, Carmel Beach, Water Supply	Funding	Number of adaptation projects funded through CIP	Near-term (by 2024)	Public Works	
<b>Action 2.1.2. Increase Urban Forest Resilience.</b> Update and implement the Forest Management Plan to: <ol style="list-style-type: none"> <li>Review and consider modifications to the preferred urbanized tree species that would result in improved resilience in the context of the expected climate of the second half of the century, reduce wildfire hazard, and that takes into account aesthetics and the ecological benefits of natives or near-natives (e.g., native species from the Southwestern US or Mexico would likely be preferred to European species).</li> <li>Include planting and maintenance guidelines to improve tree health, particularly in the public right-of-way</li> <li>Incorporate tree species that have greater drought and wildfire resistance</li> <li>In addition to drought-tolerant landscaping, include landscaping guidelines that reduce wildfire hazard on private property.</li> <li>Enhance carbon sequestration potential</li> </ol> Update of the Plan should include collaboration and engagement with stakeholders, such as the Monterey Pine Forest Watch, California State University, Monterey Bay, and vulnerable communities.		Urban Forest	Engagement, Equity, Measurable Increase in Resilience, Adaptive Management	Forest Management Plan Updated	Near-term (by 2024) and Ongoing	Public Works Forestry and Beach Commission	
<b>Action 2.1.3. Increase Resilience of the Mission Trail Nature Preserve and Pescadero Canyon.</b> Update and implement the Mission Trail Nature Preserve Master Plan to consider the potential impacts of climate change and to reduce wildfire risk for neighboring private properties. Coordinate with CalFire and the Monterey Fire Departments to incorporate Best Practices into an annual maintenance plan, including cost estimates for implementation and revenue sources for implementation. Continue to coordinate with CalFire and the Pebble Beach Community Services District on wildfire mitigation in Pescadero Canyon.		Mission Trail Nature Preserve	Adaptive Management, Partnerships, Funding	Mission Trail Nature Preserve Master Plan updated	Mid-term (by 2027) and Ongoing	Community Planning and Building and Public Works	



Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<b>Action 2.1.4. Increase Resilience of the North Dunes.</b> Continue to fund maintenance and monitoring at the North Dunes to determine how the changing climate will affect dune habitats. Implement enhancement efforts to improve resilience of the North Dunes.		North Dunes	Funding, Adaptive Management, Measurable Increase in Resilience	Regular maintenance and monitoring occurring at North Dunes	Ongoing	Community Planning and Building and Public Works	 
<b>Action 2.1.5. Increase Resilience to Stronger Storms.</b> When designing projects in the city, including those recommended in the Mission Trail Stream Stability Study, size improvements to handle larger storms consistent with best available climate change projections.		Mission Trail Nature Preserve	Institutional Structures, Adaptive Management, Measurable Increase in Resilience	Number of projects sizing improvements to handle larger storms.	Near-term (by 2024)	Public Works	 
<b>Action 2.1.6. Beach Sand Monitoring Program.</b> Reinstate beach sand monitoring program described in the Shoreline Management Plan.		Carmel Beach	Adaptive Management	Active beach sand monitoring program in place	Near-term (by 2024)	Public Works	 
<b>Action 2.1.7. Carmel Cove Sand Supply.</b> Partner with local researchers (e.g., California State University Monterey Bay) or other sources to conduct Carmel Cove sand supply dynamics analysis.		Carmel Beach	Partnerships	Carmel Cove sand supply dynamics analysis completed	Long-term (by 2032)	Community Planning and Building and Public Works	 

**Table 3 Resilient Infrastructure and Build Environment**

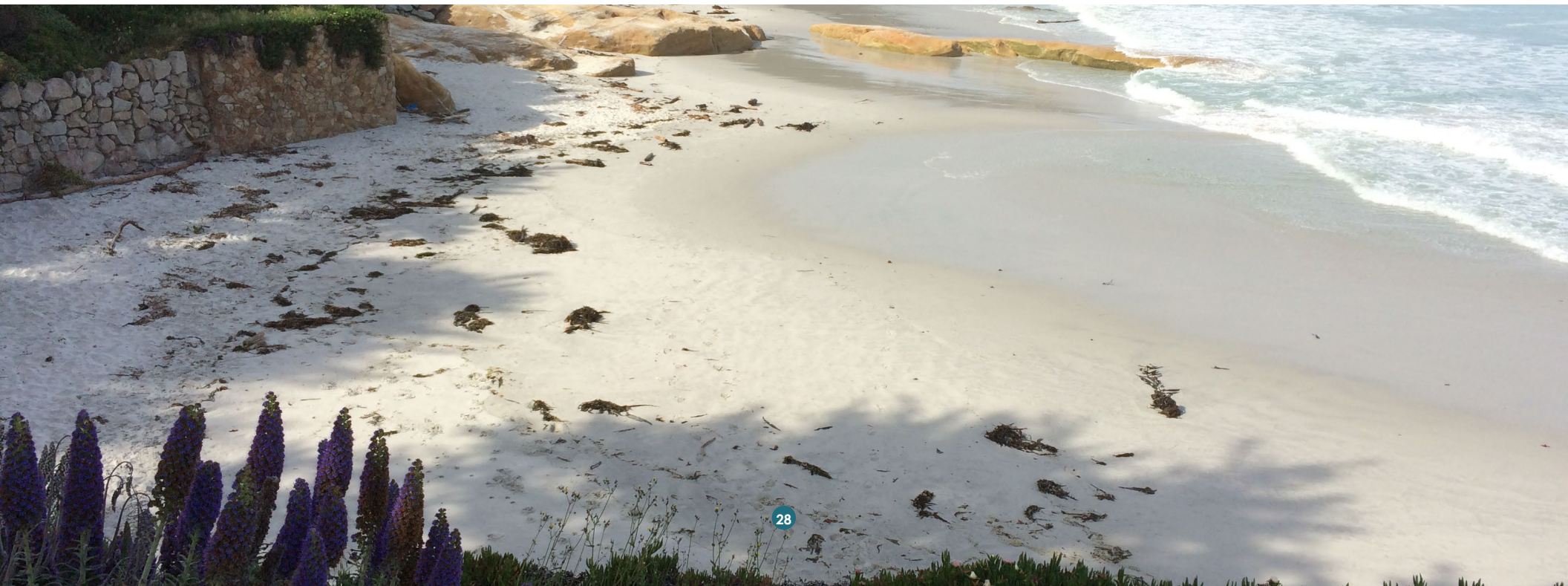
Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<b>Policy 3.1. Support greater resilience, redundancy, and reliability of local and regional infrastructure and the built environment.</b>							
<b>Action 3.1.1. Underground Utilities in Fire Hazard Zones.</b> Determine the feasibility of, and community support for, undergrounding power lines in the Mission Trail Nature Preserve, designated evacuation routes, and in other high priority areas in the Very High Fire Hazard Severity Zone. Develop a plan for undergrounding utilities based on results from the feasibility study and begin implementation in the most vulnerable communities.		Water Supply, Sanitary Sewer System, Power Grid, Overhead Communication, PG&E/Communication Underground Lines- gas, cable	Measurable Increase in Resilience, Equity	Feasibility Study completed; Plan developed based on Feasibility Study; Number of utilities moved underground	Near-term (by 2024)	Community Planning and Building and Public Works	  
<b>Action 3.1.2. Increase Green Infrastructure.</b> Modify Capital Improvement Program (CIP) project design to consistently evaluate the potential for green infrastructure to be incorporated in CIP projects in the public right-of-way and on public lands. Identify and develop a green infrastructure pilot project that will reduce runoff volume and capture and infiltrate stormwater, based on projected changes in precipitation amounts due to climate change, and incorporates tree and shrub planting to increase carbon sequestration in the city.	 	Urban Forest, Storm Drain System	Institutional Structures, Measurable Increase in Resilience	Change in impervious surface coverage.	Near-term (by 2024)	Public Works	 
<b>Action 3.1.3. Reduce Stormwater Runoff.</b> Reduce stormwater runoff through implementation of stormwater diversion and infiltration projects that reduce pollution problems caused by more frequent and intense storms and more extreme flooding events.		Storm Drain System, Carmel Beach	Measurable Increase in Resilience	Stormwater diversion project implemented	Long-term (by 2032)	Public Works	  
<b>Action 3.1.4. Storm Drain Repair Funding and Improvements.</b> Earmark Capital Improvement Program (CIP) funding for design, permitting and implementation of storm drain repairs. Include strategies in the 2021 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) for potential regional funding. Upsize Storm Drain Master Plan (SDMP) improvements, especially when making repairs in the lower reaches of watersheds, to handle larger storms.		Storm Drain System	Funding	Number of adaptation projects funded through CIP	Near-term (by 2024)	Public Works	  

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<p><b>Action 3.1.5. Retrofit Existing Critical Buildings and Related Infrastructure.</b> Conduct an evaluation of all first-responder and municipal facilities to determine retrofits that may be needed for long-term resilience to climate change hazards including sea-level rise related flooding and erosion, increased wind/storm events, an increase in high heat days, and/or wildfire depending upon location and risk factors. Develop a budget and schedule for retrofits based on the findings of the municipal facilities. Retrofit existing critical buildings as detailed in the program schedule.</p>		<p>Emergency Response Facilities – Fire station, EOC, PD, PW, City Hall, etc., Hospital and Emergency Medical Care Facilities</p>	<p>Measurable Increase in Resilience, Funding</p>	<p>List of critical buildings and related infrastructure requiring retrofits</p>	<p>Near-term (by 2024)</p>	<p>Public Works</p>	<p>\$ \$ \$</p>
<p><b>Action 3.1.6. Water Conservation.</b> Partner with the Monterey Peninsula Water Management District to reduce water demand and increase water recycling, such as stormwater capture and grey water reuse, through education and outreach. Provide information and incentives for residential water use reduction, focusing engagement on vulnerable communities first.</p>		<p>Water Supply</p>	<p>Partnerships, Equity, Engagement</p>	<p>Water demand reduced, incentives for grey water reuse developed and shared</p>	<p>Near-term (by 2024)</p>	<p>Community Planning and Building and Public Works</p>	<p>\$</p>
<p><b>Action 3.1.7. Bluff Structural Monitoring Program.</b> Implement bluff structural monitoring program and do follow-up monitoring post-storm to identify additional footing stability issues.</p>		<p>Carmel Beach</p>	<p>Measurable Increase in Resilience</p>	<p>Bluff structural monitoring program implemented</p>	<p>Mid-term (by 2027)</p>	<p>Public Works</p>	<p>\$ \$</p>



Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<p><b>Action 3.1.8. Sea Level Rise Coastal Vulnerability Study.</b> Hire coastal engineer with experience in planning for climate change to:</p> <ol style="list-style-type: none"> <li>1. Conduct research and prepare a Sea-Level Rise Vulnerability Study to further assess the risks to the city's coastal assets, including the beach, sea walls, revetments, bluffs, stairs and access, public bathrooms, parking areas, drainage infrastructure, and utilities.</li> <li>2. Determine adaptation measures and Local Coastal Program policy options, including but not limited to: a) Mostly natural, unarmored North Dunes area; b) mostly armored bluffs along Scenic Roach south of 8<sup>th</sup> Avenue; c) Unarmored dunes along private property between 8<sup>th</sup> Avenue and Del Mar Parking Lot; d) Armored private properties on the bluffs at the north end of the City (Pescadero Canyon area).</li> <li>3. Evaluate the use of thresholds for phasing adaptation projects based on changing coastal conditions. Consider applying an adaptive pathways approach which establishes trigger thresholds for different adaptive measures based on the severity of the impact from flooding and erosion associated with sea-level rise.</li> </ol>		Carmel Beach, Shoreline Access Infrastructure, Seawall and Revetments	Adaptive Management	Sea-level rise vulnerability study completed	Near-term (by 2024)	Public Works	  
<p><b>Action 3.1.9. Wastewater Treatment.</b> Collaborate with the Carmel Area Wastewater District (CAWD) to increase the facility's resilience to sea level rise and stronger storms. Maintain staff/council personnel as liaisons to CAWD.</p>		Water Supply, Storm Drain System	Partnerships	Number of collaboration meetings with CAWD regarding facility's resilience	Near-term (by 2024) and Ongoing	Community Planning and Building and Public Works	
<b>Policy 3.2. Incorporate climate change adaptation into relevant plans and standards.</b>							
<p><b>Action 3.2.1. Development Standards.</b> Evaluate City's development standards for consistency with best practices for reducing climate change risk (e.g., wildfire risk) for both new and existing development, including but not limited to incorporating defensible space design in landscaping guidelines and permitting the use of fire-resistant building materials that may conflict with current Design Guidelines. Develop a project checklist for building and site adaptation measures. The checklist, included with permit applications, should serve to provide education to permit applicants on modifications to site plans and structures that can improve a project's resilience to existing and potential future climate change hazards.</p>		Residents, Local Businesses, Second Homes	Institutional Structures, Adaptive Management	Number of projects implementing adaptation measures, City development standards consistent with best practices for reducing wildfire risk	Mid-term (by 2027)	Community Planning and Building	 

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
<b>Action 3.2.2. Update City Planning Guidelines.</b> Update the City's municipal code to maintain consistency with current California codes (California Building Code Chapter 7 and California Residential Code R337) throughout the City.		Residents, Local Businesses, Second Homes	Institutional Structures, Adaptive Management	City municipal code consistent with current California codes	Near-term (by 2024)	Community Planning and Building	\$ \$
<b>Action 3.2.3. Incorporate Climate Change Adaptation into Local Plans.</b> Prioritize the update of local plans, including the Climate Change Vulnerability Assessment, Local Coastal Program, General Plan, Mission Trails Nature Reserve Master Plan, Del Mar Master Plan, Shoreline Management Plan, and drought planning to promote climate change resilience as new information is available.		All	Adaptive Management	Number plans updated to incorporate adaptation	Mid-term (by 2027)	Community Planning and Building/Public Works	\$ \$
<b>Action 3.2.4. Update Shoreline Management Plan.</b> Update Shoreline Management Plan and Local Coastal Program based on results of Sea-level Rise Vulnerability Study.		Carmel Beach	Adaptive Management	Shoreline Management Plan and Local Coastal Program updated	Long-term (by 2032)	Community Planning and Building and Public Works	\$ \$
<b>Action 3.2.5. Multi-Jurisdictional Hazard Mitigation Plan.</b> Maintain a comprehensive list of projects, based on existing plans and gaps identified in the Vulnerability Assessment, to provide to Monterey County during updates to the Monterey County Multi-Jurisdictional Hazard Mitigation Plan in 2022 and beyond.		All	Adaptive Management	Number of adaptation projects included in the Multi-Jurisdictional Hazard Mitigation Plan	Near-term (by 2024)	Community Planning and Building, Police, and Public Works	\$



# Implementation and Monitoring

## Implementation

Implementation of the Climate Adaptation Plan will require City staff time and resources, along with strategic collaboration and leadership among key partners and regular and meaningful community engagement. Implementation of actions will require regular tracking and reporting to measure progress against established goals. This section describes the guidance, tools, responsibilities, and analysis required to effectively implement and monitor progress with the adaptation strategy. An implementation guide, which provides each adaptation action sorted by timeframe for implementation and organized by goal and policy, can be found in Appendix D. The appendix includes relevant case study examples to illustrate how policies and actions are being transformed into specific projects and programs.

### Implementation Roles and Responsibilities

Effective implementation of the Climate Adaptation Plan will not only require coordination and leadership from the City and its partners, but also the active engagement and development of partnerships with community stakeholders, local businesses, and residents to achieve steady progress towards the City's climate resilience goals.

#### City's Role

The City will serve as the direct lead in the implementation and monitoring of the Climate Adaptation Plan. The City should incorporate the actions of the Climate Adaptation Plan into the operations, financial decision-making, community engagement, and overall planning processes. In alignment with the climate adaptation goals and policies, the City should update city services,

building codes, and related programs, and pursue revenue and funding sources for implementing adaptation actions and projects. The City will be responsible for ensuring that the plan remains a relevant document informed by the best available science and is reviewed, evaluated, and updated on a consistent basis. Through the implementation, review, and updating process, the City should continue to actively engage vulnerable populations, such as the elderly and individuals with disabilities, through public workshops and other engagement opportunities to develop adaptation strategies that are inclusive, equitable, and effectively addressing community needs. City departments and entities tasked with leading implementation of adaptation actions include Public Works, Police & Fire, Community Planning & Building, the Library, City Hall, and the Community Emergency Response Team (CERT). See Appendix D, which shows which department is responsible for leading each action. The Adaptation Strategy identifies a Grant Writer/Climate Coordinator (action 1.4.4.) as a key position to ensure that each City department lead is making progress on their adaptation actions. Appendix D provides a detailed implementation guide indicating the appropriate City lead for each action with actions sorted by timeframe for implementation. The City Council should also consider establishing and appointing a new Sustainability Commission to support the implementation of the Climate Adaptation Plan by providing feedback on progress reports as described below in the Reporting on Progress section.

#### The Role of Partners

Partnerships will allow for efficient problem solving, regional collaboration for feasibility studies and other adaptation-related work, and the ability to widely communicate resources. To facilitate implementation of some of the actions, the City should coordinate with several key partners, as identified below.

**Table 5 Partner Role**

Organization	Partner Description and Opportunities
<b>Fire Protection</b>	
Firewise USA	Firewise USA provides as framework of communities and neighbors to organize and participate in wildfire risk mitigation efforts. Once a local fire safe council/neighborhood has been certified, the City should partner with the group to increase community resilience to wildfire.
California Department of Forestry and Fire Protection (CAL FIRE)	CAL FIRE protects and stewards over 31 million acres of California’s privately owned wildlands. The Department also provides emergency services in 36 of the State’s 58 counties through contracts with local governments and prevents wildfires in the State Responsibility Area (SRA). The City should apply for grant funding from CAL FIRE to better prepared for wildfires.
Monterey Fire	Monterey Fire serves an area of about 400 square miles and provides fire and emergency services as well as community education programs to Carmel and other jurisdictions in Monterey County. The City should regularly partner with Monterey Fire on defensible space code enforcement, education and outreach, and emergency preparedness.
<b>National and Statewide Partners</b>	
The U.S. Army Corps of Engineers	The U.S. Army Corps of Engineers provides engineering solutions to reduce disaster risk and energize the economy. They also have a regulatory program to protect the nation’s aquatic resources and navigable capacity. The City should coordinate with the U.S. Army Corps of Engineers to implement projects related to coastal flood hazard reduction and/or habitat restoration that would serve as adaptation strategies.
California Department of Transportation (Caltrans)	Caltrans is responsible for designing, building, and maintaining the State’s transportation system, including Highway 1. The City should partner with them to discuss feasible sea-level-rise adaptation strategies.
The California Coastal Commission	The California Coastal Commission plans and regulates the use of land and water in the coastal zone. The City should continue to collaborate with the California Coastal Commission regarding planning for sea level rise and climate change through Local Coastal Program updates.
Utilities	Electric, gas, cable, telephone, and other utility companies contain assets that will be affected by climate hazards. The City should coordinate with these utilities to discuss feasible adaptation strategies.
<b>Regional Partners</b>	
Association of Monterey Bay Area Governments (AMBAG)	AMBAG leads regional collaboration and services to analyze, plan and implement regional policies for Counties and Cities of Monterey, Santa Cruz, and San Benito. The City should collaborate with AMBAG to plan and implement regional-scale adaptation strategies.
Central Coast Community Energy (3CE)	3CE is a Community Choice Energy agency that sources clean and renewable electricity for Monterey, San Benito, and Santa Cruz and parts of San Luis Obispo and Santa Barbara counties. The City should collaborate with 3CE to plan and implement adaptation strategies that increase electricity reliability in the face of climate hazards.

Organization	Partner Description and Opportunities
The Central Coast Climate Collaborative	The Central Coast Climate Collaborative is a membership organization cultivating a network of local and regional community leaders throughout six Central Coast counties to address climate change mitigation and adaptation. The City could consider participating in the Central Coast Climate Collaborative to share best practices and information with other local and regional agencies.
<b>County-based Partners</b>	
The Monterey County Health Department	The Monterey County Health Department is a membership organization cultivating a network of local and regional community leaders throughout six Central Coast counties to address climate change mitigation and adaptation. The City could consider participating in the Central Coast Climate Collaborative to share best practices and information with other local and regional agencies.
The Monterey County Workforce Development Board (WDB)	The Monterey County Workforce Development Board coordinates with public and private partners to train and place individuals with the skills that employers need. WDB provides job seekers with connections, services, and resources needed to successfully join the workforce. The City should partner with WDB to establish education and training partnerships for workers displaced or negatively impacted by climate change.
The County of Monterey Economic Development Department	The County of Monterey Economic Development Department coordinates and facilitates the County's efforts to attract, return, and grow businesses and jobs and provide affordable housing throughout the County. The City should work with the County of Monterey Economic Development Department to develop more integrated strategies for job protection, economic sustenance, and the protection of vulnerable populations more at risk of temporary or permanent job dislocation due to climate change.
California State University (CSU) Monterey Bay	CSU Monterey Bay, founded in 1994, is a public, coeducational institution that provides undergraduate degrees, graduate degrees, and teacher certifications. The City should partner with CSU Monterey Bay to conduct local adaptation-related studies.
<b>City-based Partners</b>	
Carmel Area Wastewater District (CAWD)	CAWD provides wastewater treatment services Carmel-by-the-Sea and is owned, operated, and managed by the community via an elected Board of Directors. The City should maintain staff or council personnel as liaisons to CAWD to increase the facility's resilience to sea level rise and stronger storms.
Neighboring Cities	Neighboring cities include Monterey, Pacific Grove, Salinas, Del Rey Oakes, Marina, Sand City, and Seaside. The City should stay in regular communication with neighboring jurisdictions to share best practices and information on adaption planning, to jointly conduct needed monitoring, and to coordinate on issues that cross jurisdictional boundaries.
Carmel Unified School District	Carmel Unified School District serves communities in Carmel-by-the-Sea, Carmel Valley, and Big Sur, and has three elementary school, one middle school, one high school, one continuation high school, adult programs, preschool, and before/after school programs. The City could coordinate with the school district to provide resilience hubs in the community.
The Carmel Foundation	The Carmel Foundation is a Carmel-based membership organization with over 3,000 members 55 years of age and older that facilitates interactive programs, activities, and classes for its members. The City should partner with the Carmel Foundation to develop and plan for a social support network to increase resilience to climate change.

Organization	Partner Description and Opportunities
Local community and volunteer groups	Local community and volunteer groups can help disseminate adaptation-related information and workshops to all residents and communicate information back to the City.
The Carmel Chamber of Commerce	The Carmel Chamber of Commerce provides programs, workshops, and networking to promote the businesses in the City of Carmel. The City should partner with the Carmel Chamber of Commerce to increase economic resilience by developing strategies for job protection in the face of climate change.
Visit Carmel-by-the-Sea	Visit Carmel-by-the-Sea provides exclusive offers, itineraries, and resources for visitors to utilize when planning a visit to the City. The City could coordinate with Visit Carmel-by-the-Sea to distribute evacuation information to visitors, in the event of a climate change-induced disaster.



These partners are well positioned to support implementation of adaptation actions from the Plan that align with the respective expertise or jurisdictional mandate of each partner organization. For example, the Monterey County Health Department is best positioned to provide City emergency providers with information and data regarding potential health threats associated with climate change hazards for incorporation into disaster and emergency early warning systems. Similarly, the Carmel Foundation and Carmel Residents Association have the connections and expertise to support the development of a plan for a social support network that improves communication among vulnerable populations regarding climate change. Climate Adaptation Plan partners can utilize their expertise, relationships, and resources to work with the City on implementing adaptation-related engagement efforts, planning, and other related projects.

### The Role of Business

A large portion of local businesses in the City is in the hospitality industry. Businesses, such as restaurants, hotels, and art galleries, can serve as key Climate Adaptation Plan partners by promoting outreach events and campaigns that center the engagement of the community in conversations around climate risks and concerns. The City should partner with the Carmel Chamber of Commerce, the Monterey County Workforce Development Board, and the County of Monterey Economic Development Department to support businesses in developing continuity plans and guidelines that support economic resilience, protect vulnerable workers, and prepare for emergency and disaster events. Businesses should explore opportunities to build resilience to climate hazards through improving emergency preparedness, electrifying equipment and procuring battery storage to prepare for potential electrical grid shutoffs.

### The Role of Residents

Residents of the City should focus on utilizing the resources and programs developed as a result of the Climate Adaptation Plan to become better informed on ways to prepare for climate change hazards events. Residents can participate in outreach campaigns and local programs to build personal and community resilience.

Residents can create a buffer, or defensible space, between their properties and grass, trees, shrubs, or any wildland area that surround them to help slow or stop the spread of wildfire and help protect their homes. They can also become involved in Carmel-by-the-Sea CERT programming to become better informed on emergency preparedness and promote community scale awareness and disaster mitigation. Another possible avenue for resident participation in the Adaptation Strategy is to convert HVAC units to heat pumps for water heating and space heating in addition to cooling, which can improve indoor air quality and community adaptation to extreme heat.

## Funding and Financing Mechanisms

Effective implementation of the Climate Adaptation Plan will require capital investment, funding, and staff time to update and create plans, develop standards and best practices, design programs, conduct studies, maintain projects, and upgrade and institute infrastructure improvements. While some actions have significant costs, some costs can be reduced through the utilization of grants, incentive programs, subsidies, and low interest financing, lessening the financial burden on the City and community.

The City should develop a funding and financing plan to fund the more costly actions in the adaptation strategy. In this plan, the City should consider the following revenue sources.

- **Assessment and Abatement Districts**, often financed through the collection of supplemental tax assessments, allow for the better assessment of hazards and increased funding for maintenance, repairs, and improvements. An example of an Abatement District is provided in Appendix E.
- **Infrastructure Financing Districts**, allow for incremental property tax revenues to be devoted to a specific purpose. Once an infrastructure financing district is established and priority projects have been identified as part of the business plan, funds can be drawn from changes in local tax revenues occurring as part of redevelopment or rezone, or can be used to apply for grant funds.

- **A Shoreline Account** can serve as the primary account where funds generated for future adaptation programs and maintenance would be kept in reserve.
- **Development Impact Mitigation Fees or In-Lieu Fees** can generate funds for implementing adaptation strategies. The City could consider establishing a fee program, similar to those established by the California Coastal Commission, to administer fees for habitat damages. These fees could be used to implement habitat restoration projects and maintenance.
- **Bonds** allow municipalities to borrow money from investors, which is then repaid to the investor over an established period at a certain rate. Green bonds are a new market that has emerged to specifically fund adaptation infrastructure.
- **Taxes** can be imposed to fund adaptation strategies. The City can impose a special tax with two-thirds majority voter approval. The taxing agency must publish an annual report including the tax rate, the amounts of revenues collected and expended, and the status of any project funded by the special tax.
- **Grants.** The City should also explore state and federal funding sources such as FEMA’s Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program, Caltrans Adaptation Planning Grant Program, CAL FIRE’s Fire Prevention Grants Program, and the California Coastal Commission and California Coastal Conservancy – Local Coastal Program Local Assistant Grant Program and Climate Ready Grants.

The appropriate revenue source option should consider applicability to climate adaptation, revenue potential, and ease of authorization.

## Monitoring and Evaluation

The City will lead the monitoring of the Climate Adaptation Plan to assess the effectiveness of the adaptation and resilience strategies and to confirm alignment with changing climate conditions and associated risks. To maintain consistency with the 2020 CalOES APG, the City should designate one department as the responsible agency for carrying out monitoring activities for adaptation action. As noted in the Adaptation Strategy (action 1.4.4), a Grant Writer/Climate Coordinator should be hired within the Public Works Department to lead monitoring and evaluation of the Climate Adaptation Plan. While some adaptation actions can be implemented using existing staff time, full Climate Adaptation Plan implementation will require additional staff and consultant time to coordinate implementation of the Climate Adaptation Plan and monitor progress. Responsibilities will include collecting and compiling all monitoring data and conducting an overall assessment of effectiveness annually. The City should follow monitoring with annual evaluation of the adaptation actions to be able to adjust in line with community needs. Re-evaluation of adaptation strategies should occur when an adaptation strategy is identified as losing effectiveness. When an adaptation action loses effectiveness, the vulnerability and susceptibility of the populations, assets, resources, and/or operations it affects should be reassessed.

The Climate Adaptation Plan should be monitored through tracking quantitative metrics to assess progress towards achieving the adaptation goals. For example, for Action 1.3.2, the City would track the number of heat pumps installed and for Action 3.1.2, the City would track the change in impervious surface coverage.



Annually, policy performance should be monitored and reported to determine the extent to which the City is achieving the adaptation policies and goals. The City should also track quantitative metrics that gauge compliance with the policies. For example, for Policy 3.2, the City would track the number of relevant plans and standards that were updated to incorporate climate change adaptation. To evaluate how adaptation strategies are considering and addressing the concerns of vulnerable populations, the City should consider defining and annually measuring a series of equity-related metrics and communicating findings through an online reporting system. The Climate Adaptation Plan should be monitored and evaluated simultaneously with the City's greenhouse gas reduction actions to measure the City's overall progress towards acting on climate change and increasing community resilience.

## Reporting on Progress

The City should produce an annual report describing achievement towards the Climate Adaptation goals, policies, and actions. The report could be posted on the City website and disseminated into the community, with support from engagement partners, to maintain awareness of success of the adaptation strategies. The report should contain quantitative information regarding metric tracking as well as a narrative of lessons learned and future plans to address challenges faced. It is recommended that a new Sustainability Commission be established and appointed by the City Council to be responsible for reviewing the report, providing feedback on progress, and sharing any concerns around the strategies for increasing community resilience. Based on feedback from the Sustainability Commission, City and partner staff, and the community, the City could conduct an update to the Climate Adaptation Plan on or before 2030.

## Updating the Climate Adaptation Plan and Vulnerability Assessment

The Vulnerability Assessment and Climate Adaptation Plan should be updated to incorporate

new climate science data, shifting community priorities, implementation hurdles, changes in best practice, and technological advances. The Climate Committee determined that a coastal engineering study will be necessary to fully assess the impacts of sea level rise on City assets and to determine policies and actions to address those impacts. The Climate Adaptation Plan should be updated once this study has been completed. It is important that through each iteration of the Vulnerability Assessment and Climate Adaptation Plan, the City continue to engage key stakeholders, the community, and vulnerable populations.

### Data Gaps

In the next update of the Vulnerability Assessment, the City should reassess impacts for which not enough data was available during the July 2021 update (see Appendix B). These include:

- Impacts of stronger storms on
  - Marine sanctuary, sanitary sewer system, hospital and emergency medical care facilities
- Impacts of wildfires on
  - Hospital and emergency medical care facilities
- Impacts of sea level rise on
  - Mission Trail Nature Preserve, landfill and waste management, coastal natural assets, coastal infrastructure assets
- Impacts of more drought on
  - Marine sanctuary
- Impacts of increased temperature on
  - Marine sanctuary, overhead communication, hospital and emergency medical care facilities
- Impacts of fog on
  - Mission Trail Nature Preserve, North Dunes, urban forest, marine sanctuary
- Impacts of ocean warming on
  - Marine sanctuary, visitors, local businesses



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

## *The Path Forward*

Adopted by the Carmel-by-the-Sea City Council  
on \_\_\_\_\_

Pre-final Draft  
April 2022

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## Credits and Acknowledgments

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Many thanks to the members of the public who have attended the Climate Committee meetings starting in November 2019 and provided valuable input throughout the plan development process.

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### **Appendix A – Greenhouse Gas Inventory and Forecasting Technical Memo**

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## INTRODUCTION

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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

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## GREENHOUSE GAS EMISSIONS INVENTORY AND FORECAST

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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.

There are three types of GHG emissions that the United States Environmental Protection Agency (EPA) defines in their guidance protocols: Scope 1 GHG emissions are “direct” emissions from sources that are controlled by the jurisdiction; Scope 2 emissions are “indirect” emissions from sources controlled by the jurisdictions, such as emissions from the generation of electricity; Scope 3 emissions are from sources not controlled by the jurisdiction.

According to the EPA 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 GHG emissions associated with vehicle miles

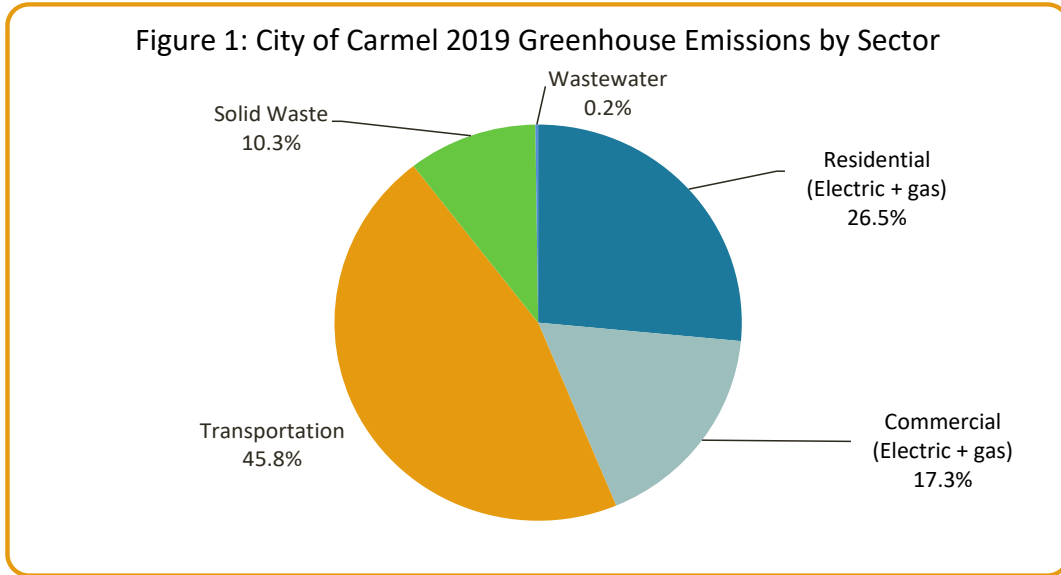
traveled outside of the Monterey County boundaries are considered Scope 3 emissions. Although these emissions are not included in the target setting, the City has developed strategies focused on reducing these emissions as well.

## GHG Inventory Results

The City’s total emissions in 2019 were 30,962 metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e). 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 from residential and commercial buildings made up 43.2% of the City’s GHG emissions.

The third most significant category of emissions was solid waste at 10.3% of total emissions. Solid waste emissions are associated with the decomposition of organic waste material in landfills, which generates methane gas, a greenhouse gas 84 times more potent than carbon dioxide.

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), which relies largely on low-carbon energy sources.



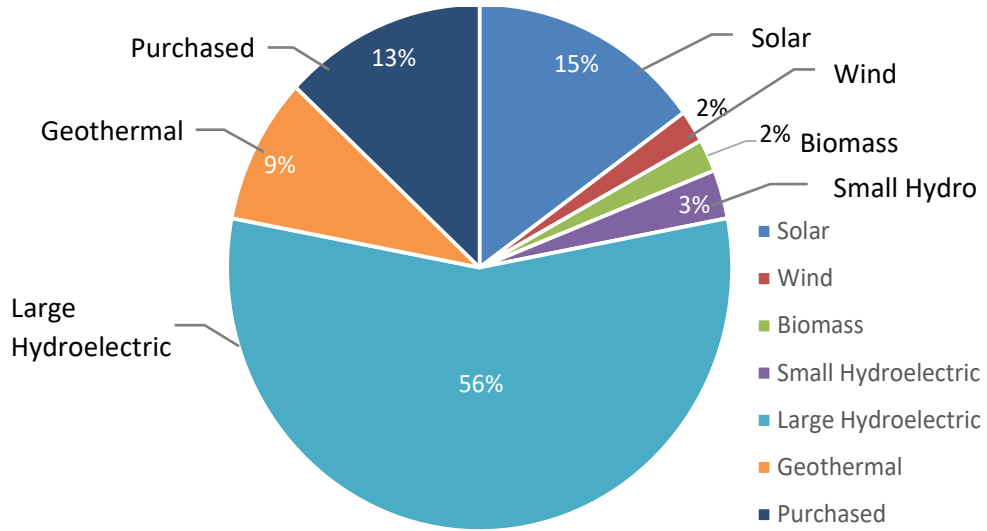
**Table B: Communitywide GHG Emissions by Sector for 2019**

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

Source: AMBAG and LSA 2021.

MT CO<sub>2</sub>e = 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 MTCO<sub>2</sub>e. By 2045, emissions are estimated to decrease to 27,471MT CO<sub>2</sub>e. This modest reduction in GHG

emissions is due to changes over time as people purchase newer and more energy efficient automobiles and appliances.

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).

As shown in Table E, the City’s ABAU emissions are estimated to be 23,013 MT CO<sub>2</sub>e in 2030, and 19,013 MT CO<sub>2</sub>e in 2045. The ABAU takes into account stringent State regulations related

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

Sector	Demographic Indicator	2020	2030	2020–2030 CAGR <sup>1</sup> 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 <sup>2</sup>	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

<sup>1</sup> CAGR = Compound annual growth rate.

<sup>2</sup> 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 <sub>2</sub> e)	2030 (MT CO <sub>2</sub> e)	Percent Change 2019–2030	2045 (MT CO <sub>2</sub> 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%
<b>Total (Scope 1)</b>	<b>30,962</b>	<b>29,445</b>	<b>-5%</b>	<b>27,471</b>	<b>-11%</b>
<b>Total (Scope 3)</b>	<b>46,076</b>	<b>43,646</b>	<b>-5%</b>	<b>40,889</b>	<b>-11%</b>

Source: LSA forecasts for the City of Carmel by-the-Sea, 2021.

MT CO<sub>2</sub>e = metric tons carbon dioxide equivalent

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

Sector	2019 (MT CO <sub>2</sub> e)	2030 (MT CO <sub>2</sub> e)	Percent Change (2019–2030)	2045 (MT CO <sub>2</sub> 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%
<b>Total (Scope 1)</b>	<b>30,962</b>	<b>23,013</b>	<b>-25.7%</b>	<b>19,013</b>	<b>-38.6%</b>
<b>Total (Scope 3)</b>	<b>46,076</b>	<b>34,118</b>		<b>28,298</b>	

Source: LSA forecasts for the City of Carmel by-the-Sea, 2021.

MT CO<sub>2</sub>e = 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.

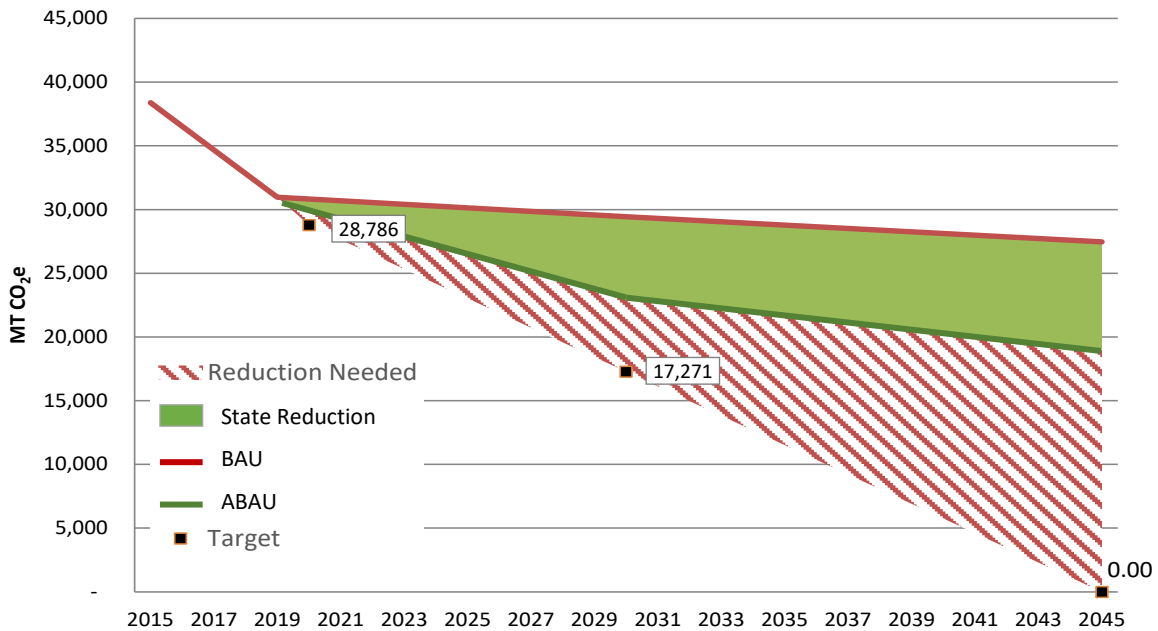
In the City of Carmel-by-the-Sea, the State’s target of 40 percent below 1990 levels by 2030 amounts to a reduction of 12,174 MT of CO<sub>2</sub> equivalent in annual emissions by 2030 compared to the BAU forecast and a reduction

of 5,742 MT CO<sub>2</sub>e 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**



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## GREENHOUSE GAS EMISSION REDUCTION STRATEGIES

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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					
<b>Measure 1.1 Energy Efficiency Training, Education, Incentives and Recognition for Residential and Commercial</b>							
<b>Action 1.1.1: Energy Efficiency Outreach</b> 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.	Supporting Action	Supporting Action	<ul style="list-style-type: none"> <li>- Energy efficiency resources on website, Friday Letter, social media</li> <li>- Energy efficiency fair held (Earth Day)</li> <li>- Title 24 training held</li> </ul>	2022-2024	Building, Planning, Public Works, Community Activities	\$	1.3.6
<b>Action 1.1.2: Energy Efficiency and Electrification Incentives</b> 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.	71.1	71.1	<ul style="list-style-type: none"> <li>- Incentive programs posted on website, Friday Letter, social media</li> <li>- Incentive programs promoted at energy fair</li> <li>- Incentive program promoted thru Green Business and Green Citizen programs</li> </ul>	2023-2025	Building, Planning, Public Works	\$	1.3.2, 1.3.6
<b>Action 1.1.3: Energy Efficiency Audits</b> Promote PG&E energy audits and tools for residential and commercial	Supporting Action	Supporting Action	<ul style="list-style-type: none"> <li>- Audit Information on website, Friday Letter, social media</li> <li>- Information shared at annual fair</li> </ul>	2022-2024	Planning, Public Works	\$	
<b>Measure 1.2 Energy Efficiency in Renovation Projects</b>							
<b>Action 1.2.1: Feasibility Study for Existing Building Electrification and Back-up Power.</b> 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, battery storage, and electric car readiness to provide a more resilient back-up power supply. Establish a plan for reducing or eliminating natural gas from existing buildings, through a reach code, and building resilience to potential electrical grid shutoffs.	Supporting Action	Supporting Action	<ul style="list-style-type: none"> <li>- Feasibility Study for Existing Building Electrification and Back-up Power completed</li> </ul>	2022-2024	Building, Planning, Public Works	\$ \$	1.3.4

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
<p><b>Action 1.2.2: Residential Home Energy Renovations.</b> Enhance enforcement of Title 24 compliance</p> <p>Promote participation in green building programs such as Leadership in Energy and Environmental Design (LEED), Passive House, and Energy Upgrade California.</p> <p>Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should require electrification retrofits, including electric car readiness, in major home renovations/additions.</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"> <li>- 100% of regulated projects are Title 24 compliant</li> <li>- Reach Code Adopted by City Council</li> <li>- Online permitting streamlined for electrification-only retrofits</li> <li>- Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair</li> </ul>	2023-2025	Building, Planning	<p>Ⓢ</p> <p>Ⓢ</p>	
<p><b>Action 1.2.3: Residential Home Energy Renovation Incentives.</b> 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 and install EV chargers. Evaluate the feasibility of providing additional incentives.</p>	Supporting Action	Supporting Action	<ul style="list-style-type: none"> <li>- Green Citizen Program developed</li> <li>- Financing information on website, at energy fair</li> <li>- Incentive information on website, at energy fair</li> </ul>	2022-2024	Building, Planning, Public Works	Ⓢ	1.3.6

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
<p><b>Action 1.2.4: Commercial Energy Renovations.</b> Enhance enforcement of Title 24 compliance</p> <p>Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should require electrification retrofits in major commercial renovations/expansions, 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), Passive House, 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"> <li>- 100% of regulated projects are Title 24 compliant</li> <li>- Reach Code Adopted by City Council</li> <li>- Online permitting streamlined for electrification-only retrofits</li> <li>- Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair</li> </ul>	2023-2025	Building, Planning	<p>Ⓢ</p> <p>Ⓢ</p>	
<p><b>Action 1.2.5: Commercial Energy Renovation Incentives.</b> 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 (<a href="http://www.greenbusinessca.org">www.greenbusinessca.org</a>).</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"> <li>- Green Business Program initiated</li> <li>- Financing information on website, at energy fair</li> <li>- Incentive information on website, at energy fair, and shared via GBP</li> </ul>	2022-2024	Building, Planning, Public Works	Ⓢ	1.3.6
<b>Measure 1.3 Energy Efficiency in New Construction Projects</b>							





Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
<p><b>Action 1.3.1: Energy Efficiency in New Residential Construction</b></p> <p>Educate City staff and developers on future Title 24 updates.</p> <p>Promote CalGreenTier 1 and Tier 2 green building ratings such as Passive House, LEED, Build it Green or Energy Star certified buildings.</p> <p>Evaluate feasibility of streamlining online permitting.</p> <p>Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should require new residential buildings to be all-electric homes.</p>	0.01	0.01	<ul style="list-style-type: none"> <li>- 100% of projects are Title 24 compliant</li> <li>- Reach Code Adopted by City Council</li> <li>- Online permitting streamlined for electrification-only retrofits</li> <li>- Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair</li> </ul>	2023-2025	Building, Planning	\$	
<p><b>Action 1.3.2: Energy Efficiency in New Commercial Construction</b></p> <p>Educate City staff and developers on future Title 24 updates.</p> <p>Promote CalGreen Tier 1 and Tier 2 green building ratings such as Passive House, LEED, Build it Green or Energy Star certified buildings.</p> <p>Evaluate feasibility of streamlining online permitting.</p> <p>Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should 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"> <li>- 100% of projects are Title 24 compliant</li> <li>- Reach Code Adopted by City Council</li> <li>- Online permitting streamlined for electrification-only retrofits</li> <li>- Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair</li> </ul>	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					
<b>Measure 2.1. Alternative Transportation Options</b>							
<p><b>Action 2.1.1: Reduce Reliance on Automobiles.</b>                      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"> <li>- Outreach on shuttle services created and provided in Carmel hotels</li> <li>- Incentives developed and promoted to encourage bus use</li> <li>- Coordination meetings held with AMBAG, Monterey Airport on shuttle options</li> <li>- Coordination meetings held re: alternative transportation to Carmel</li> <li>- General Plan Land Use Element updated</li> </ul>	2023-2030	Planning, Public Works	\$ \$ \$	
<p><b>Action 2.1.2: Develop Bicycle Master Plan to Create Safe Bike Routes around the City</b>                      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"> <li>- Bicycle master plan created</li> <li>- Signage installed</li> <li>- Outreach materials created and shared via City website, newsletters, local newspapers, and other outlets.</li> </ul>	2024-2026	Planning, Public Works	\$	
<p><b>Action 2.1.3: Ride-Sharing and Bike to Work Programs within City Operations and Businesses</b>                      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"> <li>- Incentives for ride-sharing created and advertised</li> <li>- Incentives for bike riding created and advertised</li> <li>- Reserved parking spaces created for ride-sharing, and low/zero emission vehicles</li> <li>- Bike racks included in design guidelines for commercial remodels</li> </ul>	2022-2024	Planning, Public Works	\$	

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
<b>Measure 2.2. Electrify the Fleet</b>							
<b>Action 2.2.1: Prioritize Electric Vehicles (EVs)</b>	Scope 1	Scope 1	<ul style="list-style-type: none"> <li>- EV incentives shared on City website, newsletters, and at energy fair</li> <li>- EV chargers installed at City parking lots</li> <li>- Electric bus parking created and associated outreach</li> <li>- Green Visitor Program established</li> <li>- Outreach at Visit Carmel re: EV chargers on hotel properties</li> <li>- EV chargers included in design guidelines for commercial remodels</li> </ul>	2024-2026	Planning, Public Works, Community Activities	<ul style="list-style-type: none"> <li>Ⓢ</li> <li>Ⓢ</li> <li>Ⓢ</li> </ul>	
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.							
<b>Measure 2.3 Initiate Origin/Destination Transportation Model</b>							
<b>Action 2.3.1: Develop Model</b>	N/A	N/A	<ul style="list-style-type: none"> <li>- ODTM Model developed</li> <li>- ODTM results incorporated in updated CAP</li> </ul>	2024-2026	Planning, Public Works	<ul style="list-style-type: none"> <li>Ⓢ</li> <li>Ⓢ</li> </ul>	
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					
<b>Measure 3.1. Promote Clean Energy</b>							
<b>Action 3.1.1: Incentivize Clean Energy Installations</b> 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"> <li>- Incentive information on website, at energy fair, and shared via new City outreach and recognition programs</li> <li>- Incentive for solar panel and/or energy storage installation developed</li> </ul>	2024-2026	Building, Planning, Public Works	 	1.3.6
<b>Action 3.1.2: Increase uptake of 3CE Renewable Generation portfolio</b> 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"> <li>- City electricity accounts switched to 3CE's 100% renewable option</li> <li>- 3CE 100% renewable energy option promoted at energy fair and via City outreach and recognition programs</li> </ul>	2022-2024	Public Works, Planning	 	

## Goal 4. Water Efficiency

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
<b>Measure 4.1. Water Conservation in Landscaping</b>							
<p><b>Action 4.1.1: Continued Implementation and Promotion of City and Model Water Efficient Landscaping Ordinance Water Conservation Standards</b></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"> <li>- Landscaping water conservation information on website</li> <li>- 100% of projects including landscape retrofits comply with requirements</li> <li>- Landscape retrofit incentives developed and promoted in documents and outreach for development projects</li> </ul>	2023-2025	Planning, Forestry, Public Works	 	3.1.6
<p><b>Action 4.1.2: Exceed Water Efficiency Standards</b></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"> <li>- Direct outreach to HOAs, businesses, residents thru outreach and recognition programs</li> <li>- Recycled water Standard Operating Guidance developed and promoted for commercial and multi-family construction projects</li> <li>- Grey water systems and rainwater harvesting information promoted in documentation for development projects</li> </ul>	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					
<b>Measure 5.1.</b> Reduce Waste that goes to the Landfill							
<p><b>Action 5.1.1: Increase the City's solid waste diversion to reduce landfill methane emissions</b></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 to process into compost.</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"> <li>- Develop zero waste event checklist and require City events to abide by it.</li> <li>- SB 1383 requirements implemented and waste diversion tracked</li> <li>- Outreach to residents and businesses through mailers, newsletters, City website, hauler website, letters, direct outreach.</li> </ul>	2022-2024	Public Works, 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					
<b>Measure 6.1. Urban Forest Maintenance for Shade and Energy Savings</b>							
<p><b>Action 6.1.1: Urban Forest Maintenance and Improvement</b></p> <p>Maintain the health of the urban forest tree canopy in the City to keep streets shaded and maintain cool surface and ambient air temperatures.</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"> <li>- Urban Forest Management Plan Updated</li> <li>- Tree planting and maintenance guidelines updated</li> <li>- Number of replacement trees planted</li> </ul>	2023-2025	Forestry, Public Works	<p>Ⓢ</p> <p>Ⓢ</p>	2.1.2
<b>Measure 6.2. Light-reflecting Surfaces for Energy Savings</b>							
<p><b>Action 6.2.1: Allow Cool Roof Options</b></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"> <li>- Cool roof options researched and evaluated for consistency with Carmel design guidelines</li> <li>- Design Guidelines and/or ordinances revised</li> </ul>	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 <sub>2</sub> e)
<b>Goal 1: Energy Efficiency and Electrification of Residential and Commercial Buildings</b>	
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
<b>Goal 2: Improved Transportation Choices</b>	
2.1: Alternative Transportation Options	573
2.2: Electrify the Fleet	1,538
2.3: Initiate Origin-Destination Transportation Model	N/A
<b>Goal 3: Renewable Energy Sources</b>	
3.1: Promote Clean Energy	364
<b>Goal 4: Water Efficiency</b>	
4.1: Water Conservation in Landscaping	3
<b>Goal 5: Waste Reduction</b>	
5.1: Reduce Waste that Goes to the Landfill	1,500
<b>Goal 6: Urban Forest Protection and Heat Island Effect Reduction</b>	
6.1: Urban Forest Maintenance for Shade and Energy Efficiency	-
6.2: Light-reflecting Surfaces for Energy Savings	-
<b>Total Community Measures</b>	<b>7,009</b>

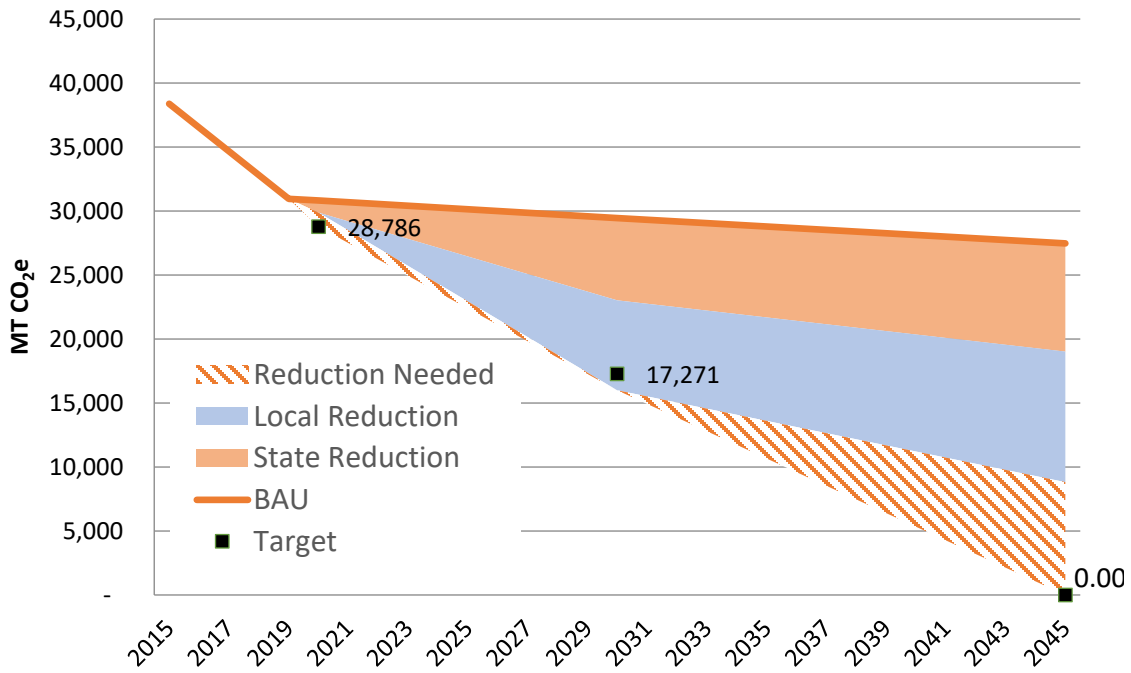
Source: Compiled by LSA 2022

MT CO<sub>2</sub>e = metric tons of carbon dioxide equivalent

N/A = Not Applicable

- = Not quantified

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



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## IMPLEMENTATION

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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's 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. As part of the Climate Action Plan update, the City should re-evaluate the ABAU forecast based on the latest State Scoping Plan, and should update its GHG emissions reduction strategy to reach Carbon Neutrality in 2045.



# 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,<sup>1</sup> and the Carmel Visitors Spending Report.<sup>2</sup>

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.

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<sup>1</sup> Carmel Visitors Center. Visit Carmel 2019 Annual Report. Website: [https://www.carmelcalifornia.com/userfiles/file/Visit\\_Carmel\\_2019\\_Annual\\_Report\\_Final\\_LowRes.pdf](https://www.carmelcalifornia.com/userfiles/file/Visit_Carmel_2019_Annual_Report_Final_LowRes.pdf) (accessed December 2021)

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

Carmel Realty Company<sup>1</sup> 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<sup>1,2</sup>, 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.<sup>2</sup> 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)<sup>3</sup> 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

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

<sup>2</sup> 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).

<sup>3</sup> 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 CO <sub>2</sub> e = 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 CO<sub>2</sub>e. 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**

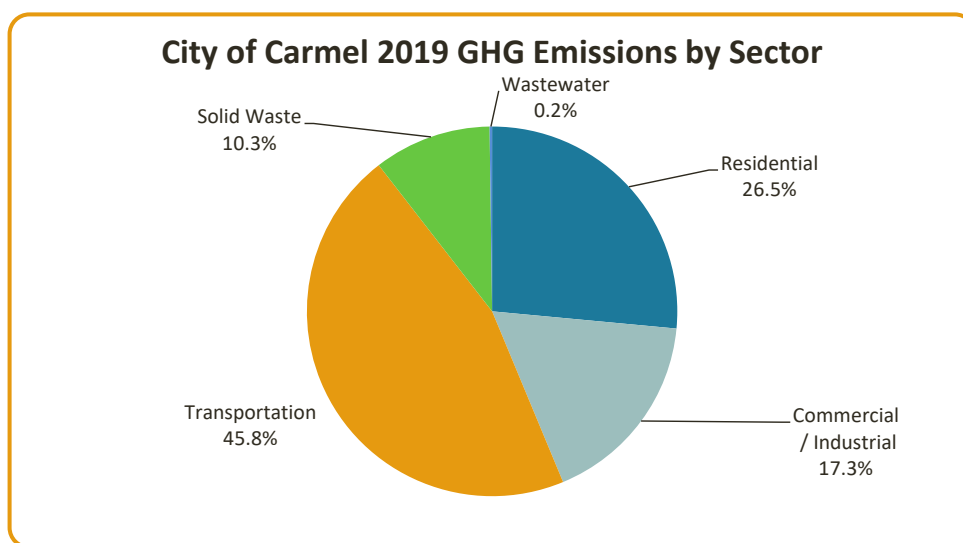
Sector	2019 (MT CO <sub>2</sub> e)	Percent of Total
On-road Transportation:		
Scope 1	14,173	45.8
Scope 3	15,115	
Electricity		
Residential	63	0.5
Commercial	92	
Natural Gas		
Residential	8,138	43.2
Commercial	5,250	
Solid Waste	3,178	10.3

**Table C: Communitywide GHG Emissions by Sector for 2019**

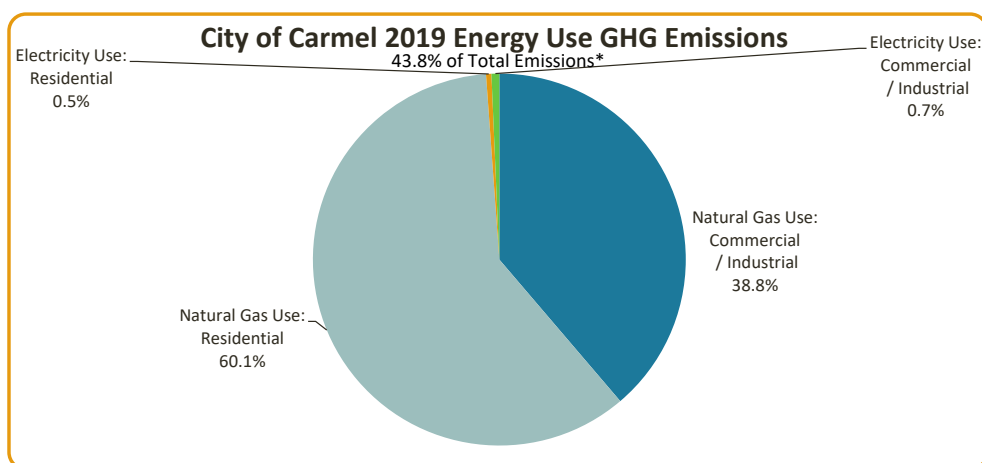
Sector	2019 (MT CO <sub>2</sub> e)	Percent of Total
Wastewater	68	0.2
<b>Total Scope 1 and Scope 2 Emissions</b>	<b>30,962</b>	<b>100</b>
<b>Total with Scope 3 Emissions</b>	<b>46,076</b>	

Source: AMBAG and LSA 2021.  
MT CO<sub>2</sub>e = 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.

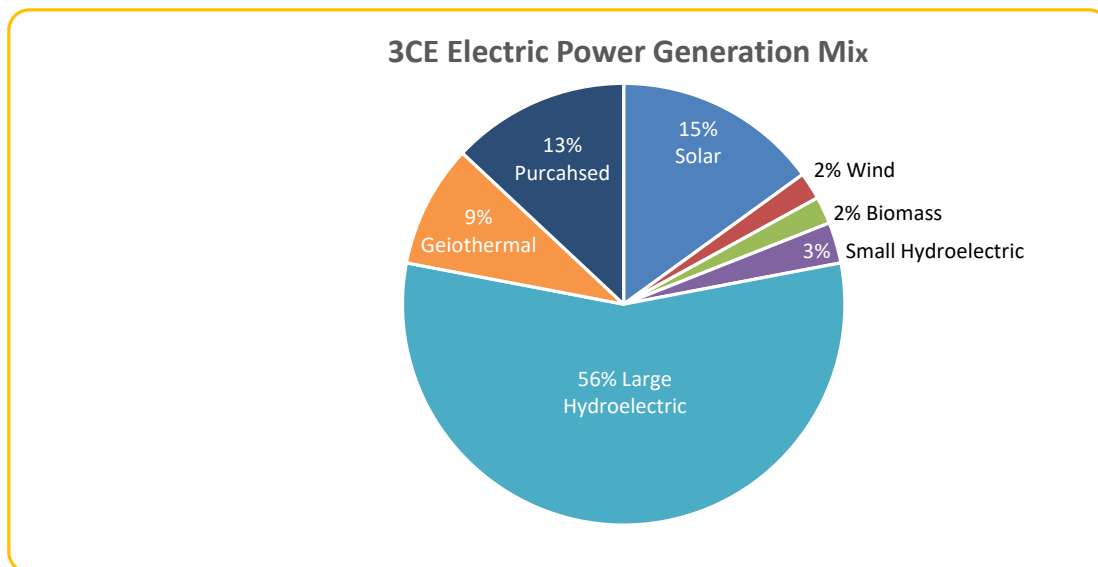


**Figure 1: Communitywide GHG Emissions by Sector in 2019**



**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 <sup>1</sup> 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 <sup>2</sup>	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

<sup>1</sup> CAGR = Compound annual growth rate.

<sup>2</sup> 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 MTCO<sub>2</sub>e. By 2045, emissions are estimated to decrease to 27,471MT CO<sub>2</sub>e. 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 <sub>2</sub> e)	2020 (MT CO <sub>2</sub> e)	Percent Change 2019– 2020	2030 (MT CO <sub>2</sub> e)	Percent Change 2019– 2030	2045 (MT CO <sub>2</sub> 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%
<b>Total (Scope 1)</b>	<b>30,962</b>	<b>30,824</b>		<b>29,445</b>		<b>27,471</b>	
<b>Total (Scope 3)</b>	<b>46,076</b>	<b>45,878</b>	-0.04	<b>43,646</b>	-5%	<b>40,889</b>	-11%

Source: LSA 2021

MT CO<sub>2</sub>e = metric tons carbon dioxide equivalent

As shown in Table F, the City’s ABAU emissions are estimated to be 30,287 MT CO<sub>2</sub>e in 2020, 23,013 MT CO<sub>2</sub>e in 2030, and 19,013 MT CO<sub>2</sub>e 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 <sub>2</sub> e)	2020 (MT CO <sub>2</sub> e)	Percent Change (2019–2020)	2030 (MT CO <sub>2</sub> e)	Percent Change (2019–2030)	2045 (MT CO <sub>2</sub> 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%
<b>Total (Scope 1)</b>	<b>30,962</b>	<b>30,287</b>	<b>-2.2%</b>	<b>23,013</b>	<b>-25.7%</b>	<b>19,013</b>	<b>-38.6%</b>
<b>Total (Scope 3)</b>	<b>46,076</b>	<b>44,933</b>		<b>34,118</b>		<b>28,298</b>	

Source: LSA forecasts for the City of Carmel-by-the-Sea, 2021.  
MT CO<sub>2</sub>e = 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 CO<sub>2</sub> 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 CO<sub>2</sub>e by 2030 to meet the State target. The City needs to implement additional strategies and measures to adhere to these State GHG reduction goals.

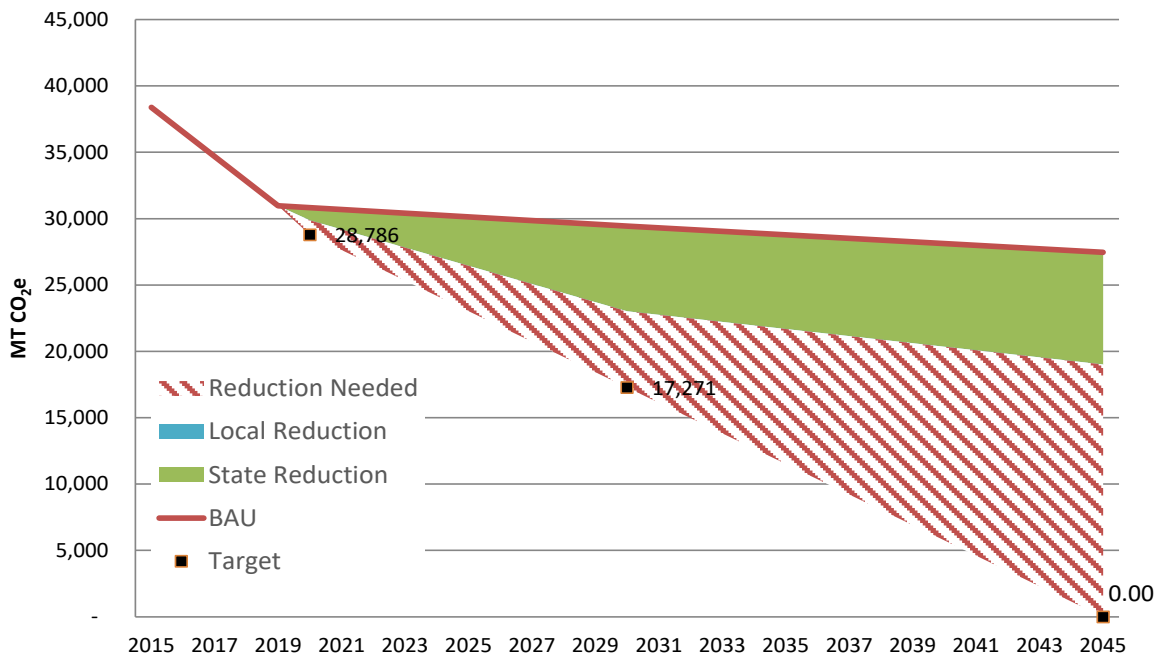
**Table G: GHG Reduction Targets By Year**

Sector	1990	2019	2030	2045
BAU Emissions (MT CO <sub>2</sub> e)	28,786 <sup>1</sup>	30,962	29,445	27,471
ABAU Emissions (MT CO <sub>2</sub> 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 <sub>2</sub> e)	N/A	N/A	17,271	0
Reductions from ABAU needed to meet the State-Aligned Target (MT CO <sub>2</sub> e)	N/A	N/A	5,742	19,013

Source: Compiled by LSA 2022  
 MT CO<sub>2</sub>e = metric tons carbon dioxide equivalent  
 N/A = Not Applicable  
<sup>1</sup> 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 CO<sub>2</sub>e = 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
Measure 1.4 Residential Home Energy Renovations	<p>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 CO<sub>2</sub>e = metric tons carbon dioxide equivalent

<sup>1</sup> 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 CO<sub>2</sub>e. 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
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 <sub>2</sub> e = metric tons carbon dioxide equivalent <sup>1</sup> 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
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 (<a href="http://www.greenbusinessca.org">www.greenbusinessca.org</a>).</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 CO<sub>2e</sub> = metric tons carbon dioxide equivalent

<sup>1</sup> 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
<b>Measure 4.1 Exceed Energy Efficiency Standards</b>				
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 <sub>2</sub> e = metric tons carbon dioxide equivalent <sup>1</sup> 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
<b>Measure 5.1 Water Efficiency Through Continued Implementation of SB X7-7</b>				
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
<b>Measure 5.2 Exceed Water Efficiency Standards</b>				
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 <sub>2</sub> e = metric tons carbon dioxide equivalent = Not quantified <sup>1</sup> 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
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 CO<sub>2</sub>e = metric tons carbon dioxide equivalent

- = Not quantified

<sup>1</sup>. 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
<b>Measure 7.1 Alternative Transportation Options</b>				
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
<b>Measure 7.2 Develop Bicycle Master Plan to Create Safe Bike Routes around the City</b>				
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
<b>Measure 7.3 Ride-Sharing and Bike to Work Programs within Businesses</b>				
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
<b>Measure 7.4 Electrify the Fleet</b>				

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

Measure	Actions	2030 GHG Reduction Achieved (MT CO <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
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.				
<b>Measure 7.5 Initiate Origin/Destination Transportation Model</b>				
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 <sub>2</sub> 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				
<sup>1</sup> 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 California<sup>1</sup>. 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.

<sup>1</sup> 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
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 <sub>2e</sub> = 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 <sub>2</sub> )		Timing (Phased Implementation)
		No Enhancing	With Enhancing <sup>1</sup>	
<b>Measure 9.1 Promote Clean Energy</b>				
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
<b>Measure 9.2 Continue Participation with 3CE to increase the Renewable Generation Portfolio of Electricity in Carmel</b>				
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 <sub>2</sub> e = metric tons carbon dioxide equivalent -= Not quantified <sup>1</sup> 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**

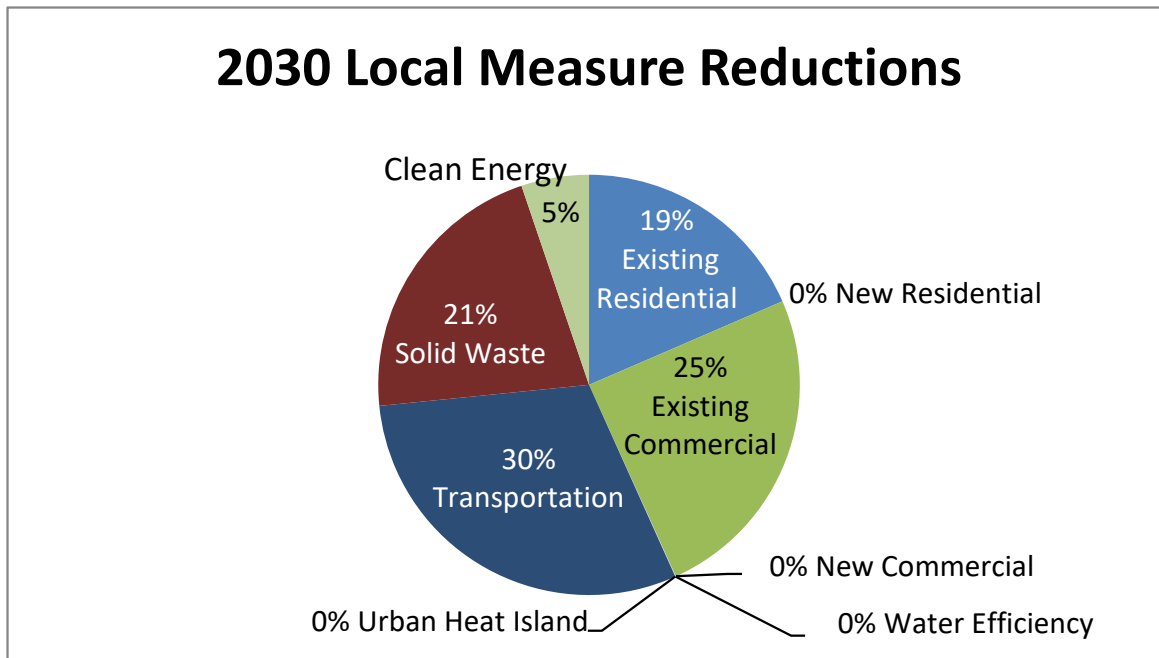
Goals and Measures	2030 Emission Reductions (MT CO <sub>2</sub> e)
<b>Goal 1: Increase Energy Efficiency in Existing Residential</b>	
1.1: Energy efficiency training, education, and recognition in the residential sector	Supporting Measure
1.2: Increase community participation in existing energy efficiency programs	1.70
1.3: Home energy evaluations	Supporting Measure
1.4: Residential home energy renovations	1,294.60
<b>Goal 2: Increase Energy Efficiency in New Residential Units</b>	
2.1: Exceed energy efficiency standards	0.01
<b>Goal 3: Increase Energy Efficiency in Existing Commercial Units</b>	
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 <sub>2</sub> e)
<b>Goal 4: Increase Energy Efficiency in New Commercial Units</b>	
4.1: Exceed energy efficiency standards	-
<b>Goal 5: Increase energy efficiency through water efficiency</b>	
5.1: Water efficiency through continued implementation of SBX7-7	3.00
5.2: Exceed water efficiency standards	Supporting Measure
<b>Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect</b>	
6.1: Tree planting for shading and energy efficiency	-
6.2: Light-reflecting surfaces for energy efficiency	-
<b>Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled</b>	
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
<b>Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation</b>	
8.1: Reduce waste to landfills	1,500.00
<b>Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use</b>	
9.1: Promote clean energy	364.00
9.2: Continue participation in 3CE Program	-
<b>Total Community Measures</b>	<b>7,009.71</b>

Source: Compiled by LSA 2022  
 3CE = Central Coast Clean Energy  
 MT CO<sub>2</sub>e = metric tons of carbon dioxide equivalent  
 N/A = Not Applicable  
 SB = Senate Bill  
 - = Not quantified

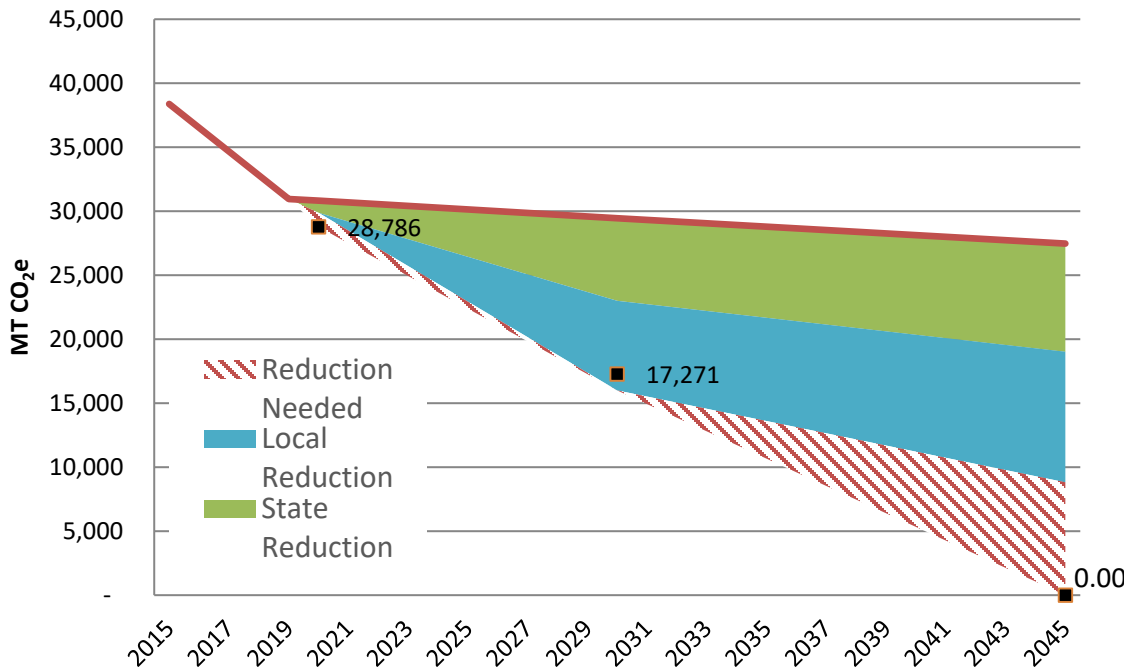
Figure 5 on the following page provides a summary graph of the local emission reductions.



**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 CO<sub>2</sub>e (6,432 MT CO<sub>2</sub>e from State measures, and 7,010 MT CO<sub>2</sub>e 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 CO<sub>2</sub>e, which is below the 2030 reduction target of 17,271 MT CO<sub>2</sub>e. 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.