Hermosa Beach
Municipal Carbon Neutral Plan

Executive Summary

Prepared for the City of Hermosa Beach
and the Southern California Association of Governments
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Introduction

California's Executive Order S-03-05 sets a statewide goal of an 80% reduction in greenhouse gas emissions below 1990 levels by 2050. This requires an annualized 2.7% reduction in greenhouse gas emissions after the state meets its Global Warming Solutions Act (AB 32) goal of returning to 1990 levels by 2020. Successfully meeting this goal will require that municipalities, communities, and other entities lead the way to substantial reductions in greenhouse gas emissions. In considering a Carbon Neutral goal, Hermosa Beach is considering becoming one of these leaders.

Hermosa Beach has a head start on municipal climate action, having already produced municipal and community greenhouse gas inventories and a Sustainability Plan. Additionally, Hermosa Beach is in the process of creating an Energy Efficiency Element for its Climate Action Plan. Furthermore, being located in California gives Hermosa Beach access to additional programs and funding, as well as the benefit of the nation's most aggressive state-level energy and climate action policies.

However, the pursuit of municipal Carbon Neutrality will not come without challenges. Climate policy is a complex issue with multiple layers of governance affecting each other, sometimes producing counterintuitive outcomes. Precisely because Hermosa Beach seeks to be a leader, there is not yet a clear-cut pathway for municipalities to achieve this goal. Hermosa Beach will need to fully understand risks and opportunities in order to successfully achieve a Carbon Neutrality goal.

The greatest impact from the successful implementation of Hermosa Beach's Municipal Carbon Neutral Plan will come from the City demonstrating its success to others, as a shining beacon of a low-carbon future. When the community sees the municipal government's example, it will be easier for them to follow. Hermosa Beach can also show other municipalities that it's not only large cities like Seattle and Austin that can pursue municipal carbon neutrality.

There are many potential pathways that will take Hermosa Beach toward achieving the climate and renewable energy goals listed above. Several pathway objectives were determined through discussions with City staff and review of letters and discussion pertaining to the City's consideration of municipal climate goals at its March 9, 2014 study session.

Climate action pathway objectives incorporated into this plan:

- The City focuses on early actions that can be quickly implemented.
- The City demonstrates visible evidence of renewable energy generation, especially solar photovoltaic panels on municipal and school district buildings.
- The City makes visible alternative fuel vehicle additions to the municipal fleet.
- The City adopts an innovative program to address employee commutes.

- Any environmental claims the City makes are considered valid in California's complex policy environment.
- The City makes cost-effective reductions that don't crowd out expenditures on City services and infrastructure.
- The City demonstrates regular reductions in gross emissions through an ongoing, transparent monitoring program.

This plan expands on the existing Carbon Neutral Road Map for Municipal Facilities and Operations and supporting documents by presenting a strategy for the City to achieve "first-to" status. The plan will help position the City as a leader by further detailing options to procure renewable electricity, articulating a strategy for employee commutes, and recommending a specific plan to neutralize gross emissions in support of an aggressive Carbon Neutrality commitment. The plan presents a unified approach to neutralizing greenhouse gas emissions across local government operations sectors and emissions reductions projects. Hermosa Beach should continue to evaluate individual projects and programs to reduce gross greenhouse gas emissions, incorporating the full cost to offset carbon in its cost-benefit analysis.

This plan makes recommendations that answer a number of questions:

Key Questions answered in this plan:

- Which emissions should Hermosa Beach seek to address?
- Should Hermosa Beach use greenhouse gas offsets to accomplish its goal? Should Hermosa Beach use Renewable Energy Certificates (RECs)? If so, how should it use them?
- What goal must Hermosa Beach set in order to be seen as a top-tier climate action leader? What level of commitment must Hermosa Beach demonstrate for their goal to be seen as credible?
- What programs should Hermosa Beach implement in order to achieve that goal?
- How should Hermosa Beach navigate the somewhat complex world of California's Cap-and-Trade Program, Renewable Portfolio Standard, Low Carbon Fuel Standard and other environmental regulations that affect the City's goals and actions?

In support of answering those questions, Kaizenergy has consulted various greenhouse gas emissions protocols and state and federal regulations. Kaizenergy also performed extensive research on climate commitments by other cities, companies, and educational institutions to benchmark how outside stakeholders would perceive varying greenhouse gas emissions goals.

Determining the City's Climate Action Goal

Like many communities in California, the City of Hermosa Beach has developed a number of plans and strategies to address climate change and reduce the City's greenhouse gas emissions. The latest effort, an Energy Efficiency Climate Action Plan (EECAP), has provided the City of Hermosa Beach with a foundation to develop a comprehensive Climate Action Plan (CAP) by understanding community and municipal energy use, identifying local level strategies resultant in long term energy efficiency, developing implementation plans, and establishing progress reports.

The keystone of Hermosa Beach's existing climate action planning activities is the Hermosa Beach Sustainability Plan prepared by its Green Task Force and accepted by the City Council in 2011. This plan is estimated to support a 25% reduction in emissions below 2005 levels by 2020.

The City's next step is toward Carbon Neutrality. Local governments have various options in defining their climate commitment. The timeframe, magnitude, boundary, and control options are detailed in the table below. Goals with larger magnitude reductions and sooner future years are seen as more aggressive. For instance, an 80% reduction in emissions by 2030 is viewed as far more aggressive than an 80% reduction in emissions by 2050 or a 50% reduction in emissions by 2030.

Hermosa Beach's Choices for Climate Action Goals

Goal Element	Goal Choices
Time Frame	Choose both: ● a Base Year; typically in the past ● a Future Year by which the City commits to meeting its goal
Magnitude	Choose an absolute or percentage reduction, relative to the base year For neutralizing emissions, this is a 100% reduction or 0 absolute emissions. Thus, the base year is unimportant for a neutrality goal.
Applicable Boundary	Choose one depending on the type of goal: ● Organizational boundary (for entities) ● Geographic boundaries (for communities)
Control over Emissions	Determine which emissions are within and outside of control: ● Direct & indirect emissions (scopes 1 through 3, for entities) ● Activities & sources (communities)

Note: Communities and entities will typically use a greenhouse gas accounting protocol to aid in identifying applicable boundaries and control over emissions.

The most common local climate commitment is the U.S. Mayor's Climate Protection Agreement. Mayors from the 1,060 cities that have signed onto the agreement indicated their City's commitment to "strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities." Kyoto targets were 7% below 1990 levels by 2012. Former Hermosa Beach Mayor Sam Edgerton III signed onto this agreement.

Base Year

The base year becomes important if Hermosa Beach seeks to go beyond Carbon Neutral by offsetting additional emissions to become "Climate Positive" or "Carbon Negative".

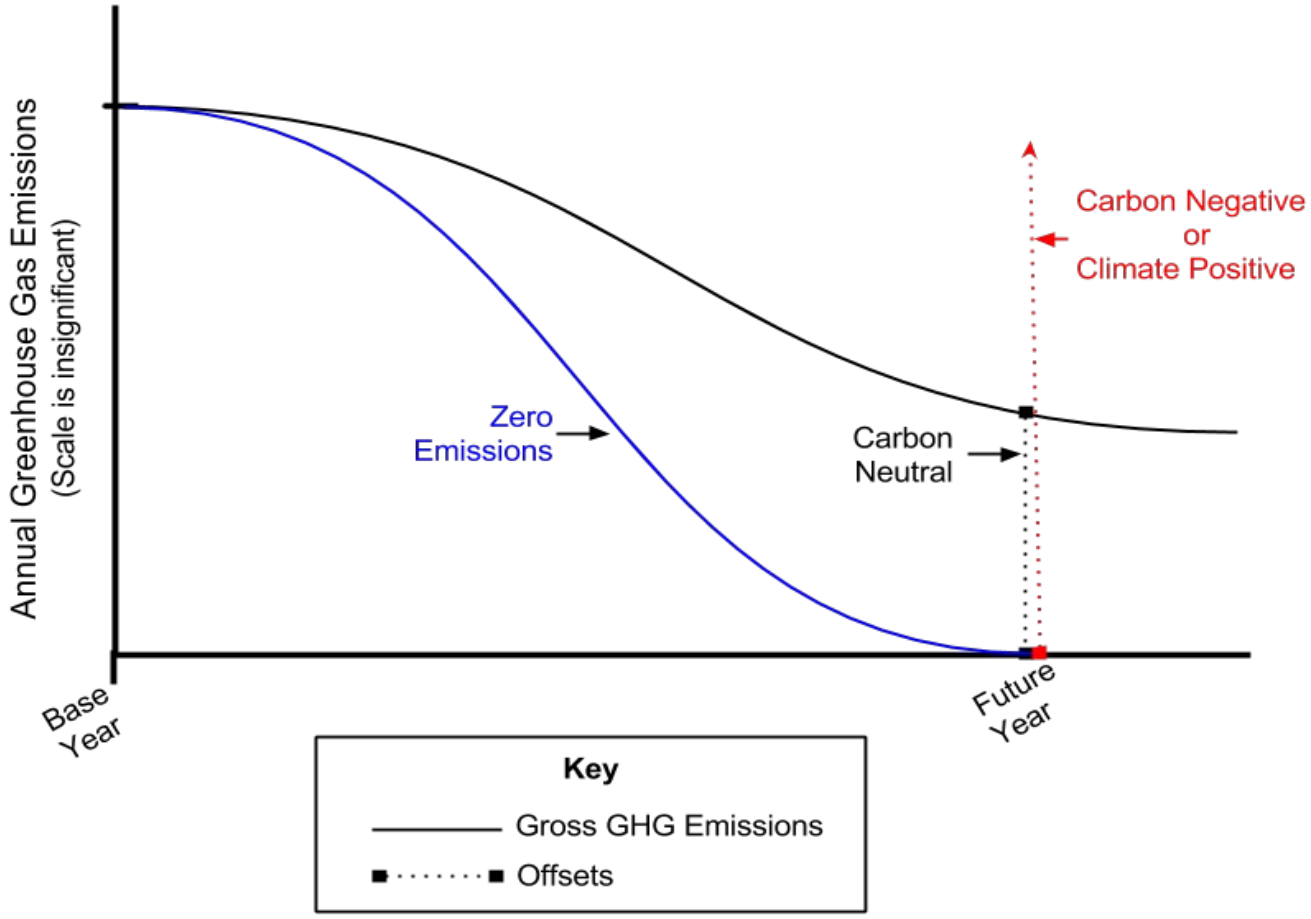
Magnitude of the Reduction

"Carbon Neutrality" is defined as a zero balance of net greenhouse gas emissions on a municipal inventory, after accounting for use of offsets and renewable energy certificates (RECs).

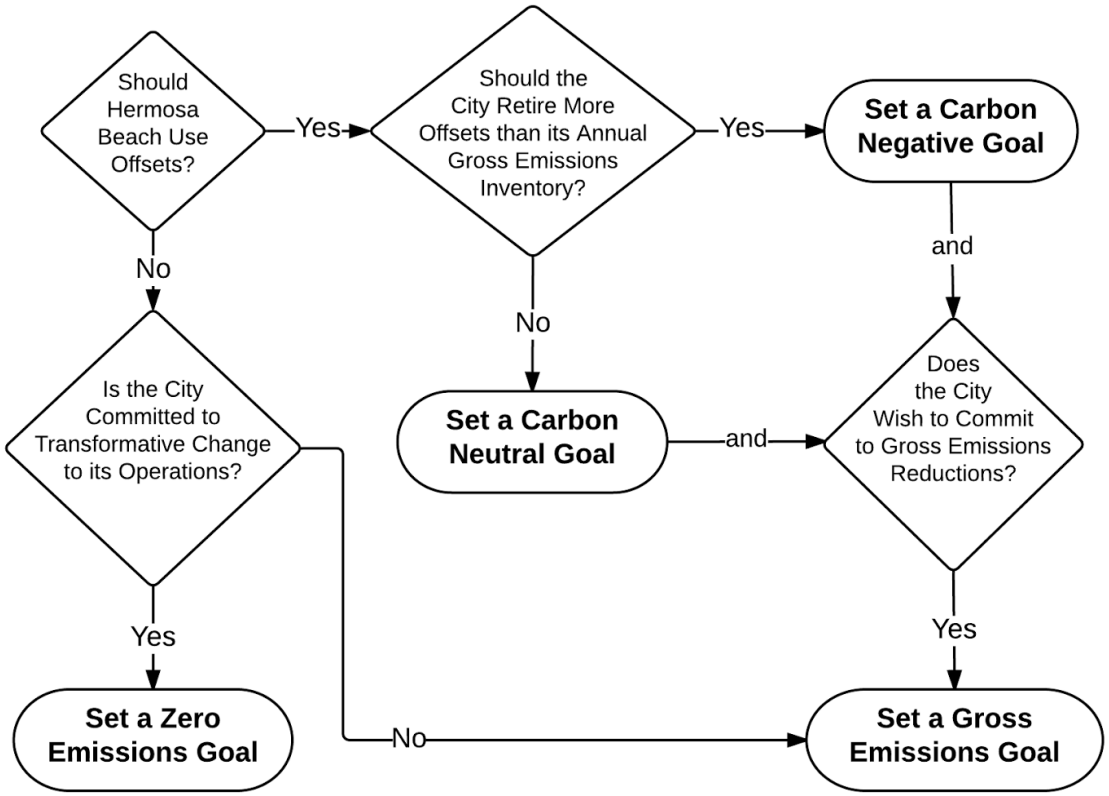
Possible Goals for Municipal Greenhouse Gas Emissions

Goal	What it means for municipal operations	What it means for the community
Zero Emissions	Zero gross scope 1, 2, or 3 emissions attributable to municipal operations, before accounting for offsets and RECs.	Zero gross greenhouse gas emissions from emissions-generating activities or emissions sources attributable to the community, before accounting for offsets and RECs.
Carbon Neutral or Climate Neutral	A zero balance of net emissions on a municipal greenhouse gas inventory after accounting for offsets and RECs.	A zero balance of net emissions on a municipal greenhouse gas inventory after accounting for offsets and RECs.
Carbon Negative	A real, additional, and verifiable reduction in California (and global) greenhouse gas emissions equivalent to a municipal baseline.	A real, additional, and verifiable reduction in California (and global) greenhouse gas emissions equivalent to a community baseline.

Possible Goals for Greenhouse Gas Emissions Reductions



Determining the Magnitude of the City's Greenhouse Gas Reduction Goal



Applicable Boundary and Control

The Local Government Operations Protocol is currently recommended and is the most likely candidate if municipal accounting and reporting were ever made compulsory. Hermosa Beach should use this protocol to determine which emissions from local government operations are subject to its Carbon Neutrality goal.

To become Carbon Neutral, Hermosa Beach would have to reduce or offset emissions from all sectors, activities, and sources for which it reports emissions.

The Local Government Operations Protocol suggests that municipalities report scope 1 and 2 emissions over which they have operational control from the following 9 sectors:

Local Government Operations Protocol Sectors and Reporting Recommendations for Hermosa Beach

Sector	Operational Control in Hermosa Beach	Recommendation
Buildings and other facilities	✔ Operational control over City-owned buildings.	Report these emissions.
Streetlights and traffic signals	✔ Operational control over City-owned streetlights. ✘ Limited or no operational control of streetlights provided by Southern California Edison.	Report these emissions, including emissions from SCE-owned street lighting.
Water delivery facilities	✘ No operational control.	Consider reporting emissions from water distribution.
Vehicle fleet	✔ Owned municipal vehicle fleet.	Report these emissions.
Transit fleet	✘ No operational control.	Consider these emissions as an informational item.
Power generation facilities	✘ Service provided by Southern California Edison.	Emissions reported in other sectors as scope 2.
Solid waste facilities	✔ Operational control via contracting. Athens Services provides haulage and sorting, landfills are owned by a third party.	Report community-wide collection and haulage emissions. Report landfill emissions from waste generated by municipal operations.
Wastewater facilities	✘ Services provided by the Southern California Sanitation Control District / South Bay Cities District.	Consider these emissions as an informational item.
Other process & fugitive emissions	These are cross-sectoral emissions. Control varies.	Report fugitive emissions of common high-GWP gases (refrigerants and fire suppression systems) over which the City has operational control.

Emissions from transit and wastewater are not currently included in Hermosa Beach's greenhouse gas inventory. We recommend they are included as an informational item because these services are provided in Hermosa Beach, but by other local government entities.

Entity-based accounting guidance classifies emissions into three scopes depending on the operational control possessed over the emissions. Hermosa Beach should report and neutralize all scope 1 and scope 2 emissions, and certain scope 3 emissions.

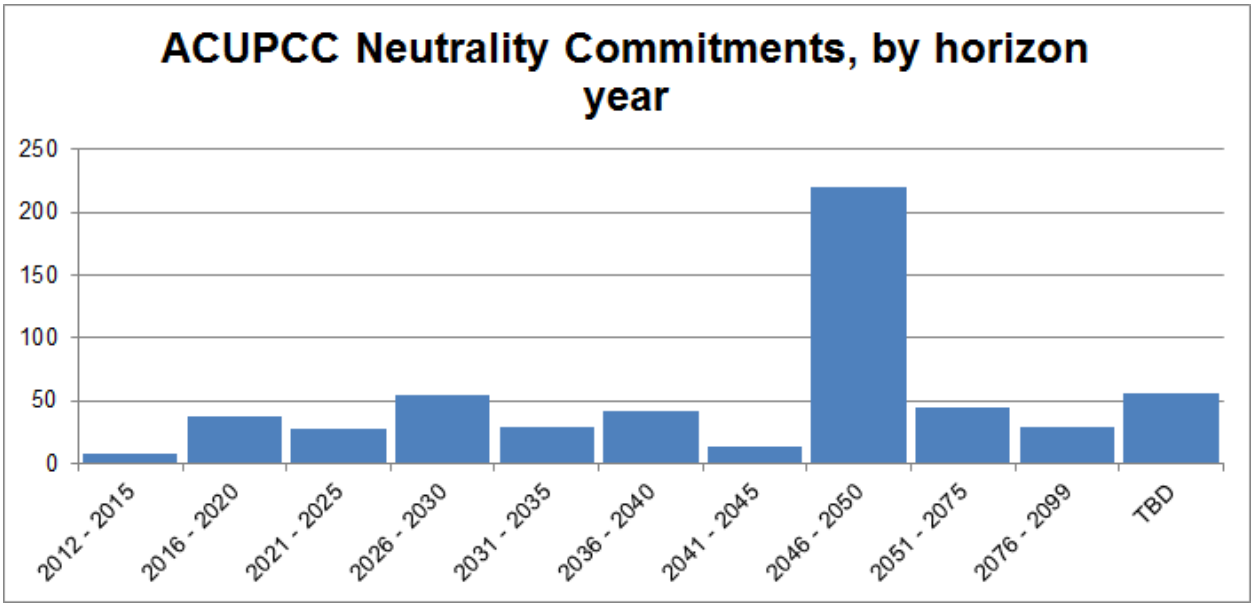
Emissions Scopes and Local Government Protocol Reporting Requirements

Emissions Scope	Reporting Recommendation for Selected Sectors
1 - Direct Emissions	Include per Local Government Operations Protocol.
2 - Indirect Emissions from Imported Energy, Steam, & Cooling	Include per Local Government Operations Protocol.
3 - Other Indirect Emissions	Optional per Local Government Operations Protocol. Hermosa Beach should include emissions from: ● waste generated by government operations, but disposed of outside its organizational boundary; ● emissions from employee commuting; and ● emissions from employee business travel (not currently included in the City's municipal inventories). Hermosa Beach should consider including: ● upstream life-cycle emissions from goods and services consumed by Hermosa's municipal government.

Future Year

The future year is the critical variable in Hermosa Beach's climate commitment. Hermosa Beach will be seen or not seen as a local climate action leader based on both the future year the City chooses and the depth of understanding the City has over its climate commitment.

The higher education sector is leading the way toward carbon neutrality. To date, 684 U.S. & Canadian Universities have made climate neutrality commitments. Climate Neutrality as a term unambiguously encompasses all six categories of greenhouse gases. The graph below displays the number of climate commitments by period.



The University of California System is seen as a leader in this effort. The System hopes to be the first research university to achieve carbon neutrality by 2025.

Climate Commitment Recommendation for Hermosa Beach

To be seen as a leader in municipal climate action, Hermosa Beach would need to commit to neutralizing emissions from municipal operations within the next 10 years. While a future year goal of 2025 would still help Hermosa Beach be seen as a leader, the City should match goals set by the City of Austin and County of Boulder and commit to a 2020 goal. Committing to the same goal as other leading local governments would unambiguously establish Hermosa Beach as a climate action leader.

While many British Columbia municipalities have already achieved Carbon Neutral status for 2010, many have backed off the use of offsets to neutralize greenhouse gas emissions. Hermosa Beach has an opportunity to achieve “first-to” status for municipal operations in the United States by committing to neutralize emissions as early as 2015.

Hermosa Beach should set a goal to become Carbon Neutral for municipal operations by the end of 2020.

Reducing Gross Emissions

Hermosa Beach should continue to make gross emissions reductions. The City's existing on-bill financing program for energy efficiency improvements and vehicle and supply procurement policies will help the municipal government address the "low-hanging fruit" of emissions from operations. The City should continue and expand upon existing energy efficiency programs. As the GSE Solutions report indicates, the City has opportunities to improve building energy efficiency by 40% or more. When evaluating energy efficiency and retrofit projects, the City should now include the additional cost to neutralize emissions from electricity (approximately 0.3 cents additional per kWh).

Opportunities to reduce gross emissions will continue to evolve with new developments in technology, new financing methods, and changing prices of equipment relative to energy. In setting a municipal Carbon Neutral goal, the City should strive to keep abreast of future opportunities for gross emissions reductions. This plan outlines several options for the City to reduce gross emissions from vehicles (both fleet and employee commutes) and building energy (primarily electricity).

A recent draft update to Hermosa Beach's greenhouse emissions inventory for municipal operations indicates that streetlights and traffic signals, vehicle fleet, and building and other electricity make up Hermosa Beach's top three municipal emissions sources. The 2005 inventory is compared to the draft 2012 inventory below.

Top Municipal Operations Emissions Sources in Hermosa Beach (2005 to 2012)

Emissions Source/Activity (Scope)	2005 MT CO_2e (% of total)	2012 MT CO_2e (% of total)	% Change in MT CO2e (2007-2012)
Streetlights and Traffic Signal Electricity (2)	405 (27%)	359 (26.2%)	-11.4%
Employee Commute (3)	348 (23.2%)	218 (15.9%)	-37.4%
Building & Other Facility Electricity (2)	301 (20%)	305 (22.2%)	1.3%
Vehicle Fleet (1)	227 (15.1%)	328 (23.9%)	44%
Solid Waste - Contract Services (3)	215 (14.3%)	162 (11.8%)	-24.7%
Total	1,501	1,372	-8.6%

Source: EECAP Draft Inventory, Forecasting, and Target-Setting Report. Draft figures for 2012 are subject to change. Note: Some 2005 figures in EECAP Draft inventory are inconsistent with 2005 & 2007 Inventories.

Summary of Recommendations

Sector	Recommendations
Electricity	• Purchase municipal electricity through CCA starting in 2017 • Dedicate $30,000 net costs toward Solar PV through PPA or municipal lease • Pursue any cost-effective solar PV project • Pursue GSE Solutions "Project 2" • Dedicate additional $236,094 to GSE Solutions retrofit projects with payback >10 years[1]
Municipal Fleet	• Continue to implement Clean Fleet Policy and Master Plan; dedicating an additional $250,000 for acceleration/implementation • Purchase 5 regular bicycles, 5 electric-assist bicycles, and 2 Neighborhood Electric Vehicles for shared fleet & employee commute use • Dedicate $50,000 for EV chargers and infrastructure for use by City fleet and employee vehicles[1]

[1] Employee Commute Reduction Strategies Document (6/2/2014) identifies a $30 to $50/month increase in alternative commute incentives, 0.1 FTE for employee commute coordinator, and $100,000 to $1,000,000 for EV charging stations.

Employee Commute	• Assign 0.2 FTE (assistant) as the City's Employee Transportation Coordinator • Increase commute reduction incentive from $30 to $50/month[2]
Other	• Dedicate 0.25 FTE analyst to municipal climate action initiatives

Cost of Recommendations

Implementation Measure	Range in Cost per MTCO2e	Recommended
Electricity		
Community Choice Aggregation	$10 to $18	Yes
Solar Photovoltaic Projects (ASE Solar Solutions Proposal)	-$5 to $20	Yes
GSE Solutions "Project 1"	-$125 to -$175	Yes
GSE Solutions "Project 2"	-$225 to -$275	Yes
GSE Solutions - Hot Water, HVAC	$20 to $35	Yes
Municipal Fleet		
Bicycle Parking		Yes
Employee Bicycles		Yes
Mode Switching		Yes
Bicycle Fleet Program (Summary)	$0 to -$200	Yes (Bundle)
EV Service Equipment		Yes
Accelerate Clean Fleet Master Plan		Yes
Fuel Switching		Yes
EV Fleet Program (Summary)	-$50 to -$150	Yes (Bundle)
Employee Commutes		
Employee Commute - Carpool Incentive	$100 to $200	Yes
Employee Commute - EV Incentive	$500 to $1,000	No

After accounting for savings from projects which reduce energy cost or vehicle operating costs, the 30-year estimated cost of recommended municipal carbon neutral programs is $59,130, or $1,971 per year. This low cost is made possible because many of the municipal climate action opportunities available to the City have a payback period of less than 5 years. In addition to the projects listed above, the recommended municipal climate action programs will fund and Employee Commute Coordinator (20% FTE Assistant), a Climate Programs Analyst (25% FTE

Analyst), and annual Greenhouse Gas Offsets required to make carbon neutral claims. The recommended plan is cash-flow positive by 2019.

The added cost of a "first-to" position, in which the city would achieve carbon neutrality in 2017 rather than 2020, would be approximately $52,475.

Electricity

The City should continue and expand upon existing energy efficiency programs. As the GSE Solutions report indicates, the City has opportunities to improve building energy efficiency by 40% or more. The City should now include the cost to neutralize emissions from electricity (approximately 0.3 cents additional per kWh) when evaluating whether to pursue electricity efficiency and retrofit projects.

To take a highly-visible climate action step, Hermosa Beach should take steps to install solar photovoltaic systems on municipal property. The City should continue to explore the options of a Power Purchase Agreement and a Solar Lease. The City should also request the retirement of greenhouse gas emissions allowances through the state's Voluntary Renewable Electricity Program in order to claim unambiguous emissions reductions.

RECs are a commonly-accepted element of a green or Carbon Neutral portfolio, and should be an element of Hermosa Beach's municipal carbon neutrality efforts. Some entities employ RECs as a short term strategy while they wait for new power-generating projects to be built. Hermosa Beach can retire Green-e RECs to make greenhouse gas reduction claims under The Climate Registry's General Reporting Protocol.

Over the long term, Hermosa Beach should establish a CCA program with a 100% renewable, emissions-free option and become one of program's first customers. This would allow for a unified approach to community and municipal greenhouse gas emissions reductions, with community members participating in the same program as the municipality.

Municipal Fleet

Consistent with the City Fleet Policy's guideline stating "Review available green vehicle options including: electric vehicles, hybrids, CNGs, hydrogen, biodiesels, and any other emission reducing vehicles," the City of Hermosa Beach should continue to consider the latest and lowest-emission alternative fuel technology when replacing fleet vehicles.

Hermosa Beach should continue to prioritize plug-in electric vehicle purchases where they are practical. The convenience and future expansion potential of electric vehicle supply

infrastructure and the low carbon intensity of electricity for vehicles makes plug-in electric vehicles an ideal choice for reducing gross emissions.

Hermosa Beach should also consider utilizing Neighborhood Electric Vehicles (NEVs) and electric-assist bicycles within its vehicle fleet. Hermosa Beach could establish a program for employees living near the City to take these vehicles home. Combined with Carbon Neutral electricity for charging, this program would reduce greenhouse gas emissions from commutes.

However, as identified in the City's Clean Fleet Policy, some fleets, particularly public safety, have limited or no alternative fuel options that meet their requirements. When this is the case, the City could look to purchase and retire greenhouse gas emissions credits produced under the Low Carbon Fuel Standard. This would allow Hermosa Beach to offset its own emissions with reductions within the transportation sector.

Employee Commute

The City of Hermosa Beach's current employee commute reduction challenges are twofold. First, Hermosa Beach is a relatively small employer, with only 142 employees across multiple sites. This limits the potential for rideshare matching. Second, the City's 2013 Employee Commute Survey indicated that due to the structure of existing incentives, their effectiveness is limited.

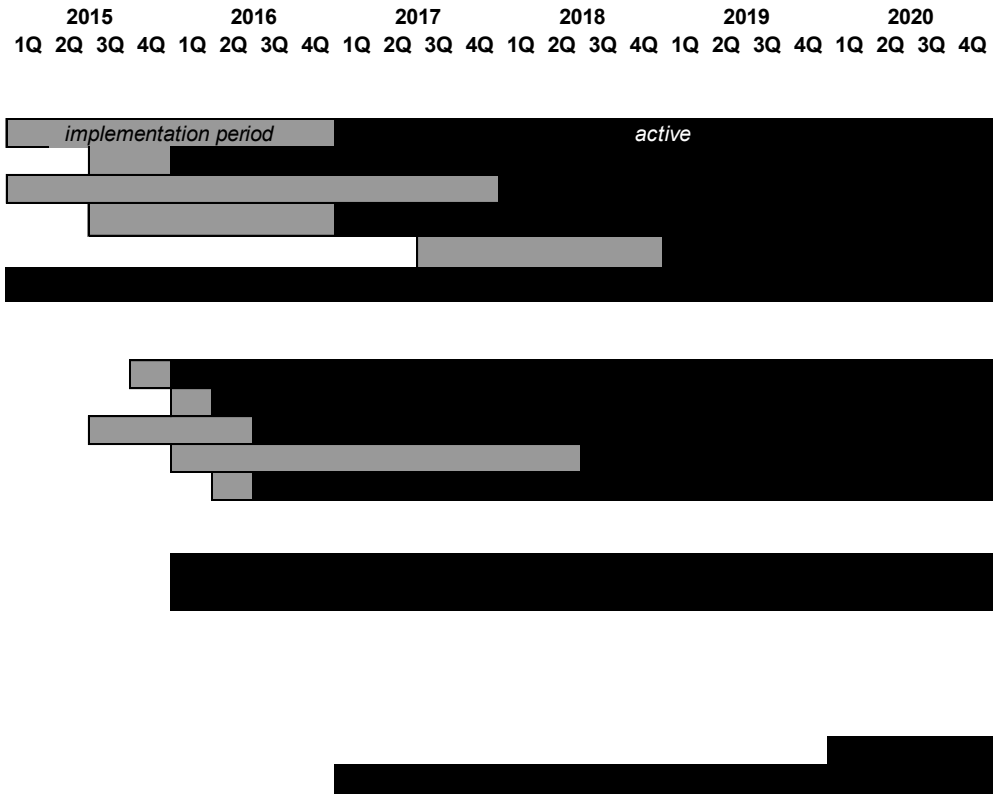
To reduce gross greenhouse gas emissions attributed to employee commutes, the City of Hermosa Beach should revise its Employee Commute Reduction Program (ECRP) to better incentivize employees to adopt alternative modes of commuting and to generate lasting program participation. Hermosa Beach can do this by appointing an Employee Transportation Coordinator to coordinate rideshare partnerships and restructure alternative commute incentives. Additionally, the City should consider adding bike accommodations and determining a telecommuting policy.

Hermosa Beach should seek to reduce gross emissions from municipal operations by 40% below 2015 levels by 2020.

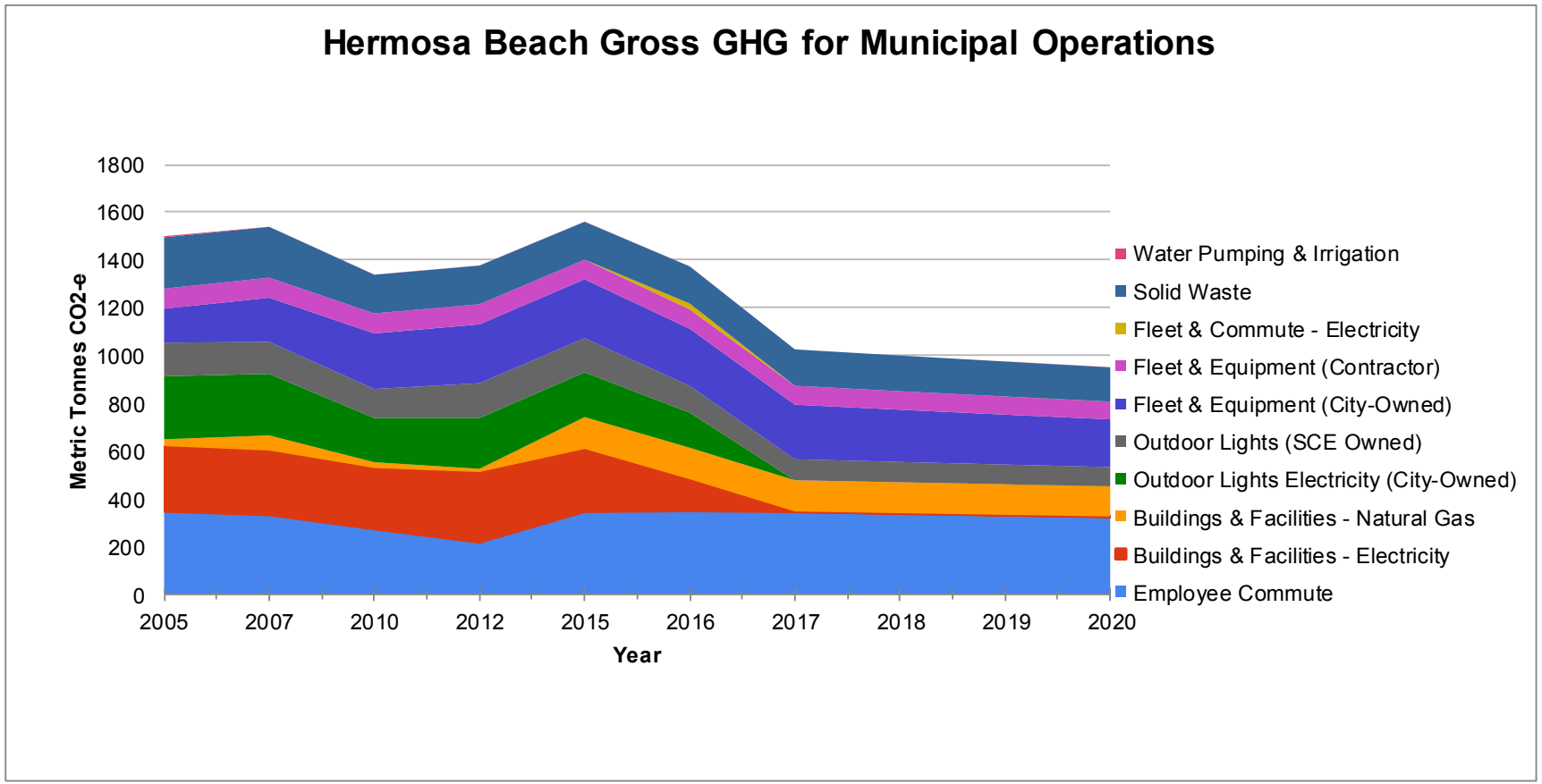
Recommended Scenario Details

Recommended Implementation Timeline

Implementation Measures	Implementation Period Begins	Duration
Electricity		
Community Choice Aggregation	1Q2015	8
Solar PV Procurement	3Q2015	6
GSE Solutions "Project 1"	1Q2014	12
GSE Solutions "Project 2"	3Q2015	8
GSE Solutions - Hot Water, HVAC	3Q2017	6
Municipal High Efficiency Procurement Policy	1Q2014	ongoing
Municipal Fleet		
Municipal Facility - Bicycle Parking	4Q2014	1
Bike Barn @ Work	1Q2016	1
Municipal Facility - EV Service Equip.	3Q2015	4
Electric Vehicle Procurement	1Q2016	10
NEV Procurement	2Q2016	
Employee Commute		
Carpool Incentive	1Q2016	ongoing
EV Incentive	1Q2016	ongoing
Municipal Service Contracts		
Amendment with Athens Services		
Other		
Purchase Offsets	1Q2017	ongoing
Climate & Commute Programs Staffing	1Q2016	ongoing



Forecast Gross GHG Emissions Reductions from Recommended Scenario & Implementation Timeline



The recommended scenario produces a 40% reduction in gross GHG emissions from 2015 to 2020.

Using Offsets

Offsets are an important part of an aggressive climate commitment, as demonstrated by other cities, corporations, and colleges that have claimed or plan to achieve carbon neutrality status. Offsets put a price signal on carbon emissions. By purchasing offsets, Hermosa Beach can claim that there is a real environmental cost of greenhouse gases emissions from municipal operations and that the City is looking for other ways to reduce its emissions.

However, offsets are not a free pass to emit; they are only effectively utilized as part of a larger climate action strategy. Hermosa Beach stakeholders may have a negative perception of the City's use of offsets, especially if they feel the City's efforts to reduce gross emissions are inadequate. Use of offsets alone will not accomplish the City's other objectives or lead to the desired co-benefits from the City's climate action efforts.

Transparency is exceedingly important in climate action, especially when offsets are used. Hermosa Beach should establish a performance monitoring program that includes regular reporting of the City's climate action efforts, along with publishing greenhouse gas emissions inventories. Offsets should be utilized within a public education and outreach campaign that focuses on the City's efforts to reduce its gross greenhouse gas emissions from municipal operations. The offsets should tell a story that people can connect to when understanding the City's climate actions and considering their own.

The experience of existing cities and entities, particularly the three educational institutions mentioned above, highlights the possibility to connect offsets with a community as part of a public education program about a City's climate action efforts. By investing in certain projects – projects whose stories resonate with residents – Hermosa Beach can communicate its own challenges in reducing gross emissions while connecting the community with specific projects they can also invest in to offset their own emissions.

While a wide range of offset project types exists, Hermosa Beach may find some more suitable than others if the City wishes to include its own offset purchases as part of a public education and outreach program. The public may feel more of a connection with offsets generated within the United States, especially those from projects in California.

Should Hermosa Beach Use Compliance or Voluntary Offsets?

Hermosa Beach must decide whether to use the cheaper voluntary emissions offsets or the more expensive California Compliance Offsets. The annual price of offsets to cover the City's 2007 municipal inventory in all cost projection scenarios is less than 0.1% of the City's general fund budget.

Range of Costs to Offset 1,552 Metric Tonnes of CO_2-e

Scenario	Offset Price per Metric Tonne	Annual Cost to Offset 1,552 MT
ARB - Current	$11.50 (August 2014 auction price)	$17,848
ARB - Future High	$21.51 (high-case projection for 2020)	$33,383
Voluntary - Current	$5.00	$7,760
Voluntary - Future High	$7.50	$11,640

Under this range of prices, the City will find that many of its opportunities to reduce gross greenhouse gas emissions are not cost competitive with offsets or allowances. For example, for $99.84, the City could retire the more expensive ARB-eligible allowances (at $11.50/metric ton) to offset the tailpipe greenhouse gas emissions of a 2002 Ford Expedition traveling 60 miles round trip, 4 days per week, 48 weeks per year. The annual cost of ARB-eligible offsets to neutralize the emissions from a Prius traveling 15 miles per day is approximately $7.74. Incidentally, the Expedition driver would save $2,051.30 per year in fuel costs (at $4.00/gallon) by switching to a Prius. This example illustrates both how inexpensive greenhouse gas emissions are, even within California's Cap-and-Trade system, and also the need for strategic climate action policies that are well-integrated within the City's existing municipal operations. It also illustrates that use of offsets can be the most cost-effective option to achieve a given level of reductions: the use of offsets allows Hermosa Beach to achieve Carbon Neutrality in the most cost-effective way possible.

Advantages and Disadvantages of ARB and Voluntary Offsets

	Advantages	Disadvantages
Voluntary	• Are 50% cheaper than California Compliance Offsets. • Offer a greater variety of projects.	• Most projects are located outside of California. • Voluntary offsets can be perceived to be lower quality than compliance offsets.
California Compliance	• California offsets are perceived as the highest quality offsets. • There exists a strong connection between Hermosa Beach and statewide actions: these offsets can help the City explain statewide actions including Cap-and-Trade program. • Their use creates additional emissions reductions within California; effectively reducing the cap. • Their use shows Hermosa Beach is willing to put a higher price on greenhouse gas emissions.	• California offsets are more expensive; and these additional expenditures could be used to reduce gross emissions. • It may be more difficult for consumers to acquire and retire offsets if households and businesses within Hermosa Beach want to invest in the same offset project as the City.

➤➤➤ **Hermosa Beach should rely on California Compliance Offsets, made available through the California Air Resources Board, to validate its emissions claims.**

Selecting Among California Offsets

Offsets have a story: a project location, emissions removal process, and organization associated with their production. As of September 2014, Hermosa Beach can choose from projects among the five ARB-approved offset protocols. Offsets from each type of project are functionally-equivalent in mitigating climate change: they are denominated in metric tonnes of CO_2-equivalent. However, each individual project can tell a different story. In choosing among project types, Hermosa Beach should consider how stakeholders can relate to the project's location, the type of project, and the organization that produces the offset and receives payment. In addition, attractive photographs of the project itself would aid in any public

education and outreach efforts the City conducts. Forest-based offsets provide a compelling story for a public education campaign. Offsets from livestock projects are another alternative.

U.S. Forest Projects

The link between trees and carbon dioxide emissions is well-established in middle school biology classes. Trees are tangible, beautiful, and provide a range of ecosystem services besides converting carbon dioxide into oxygen. Projects certified under the U.S. Forest Protocol provide for the preservation of large, contiguous forest lands in the United States, including some locations in California. These forests will provide for attractive photographs, and the sites could even be visited by Hermosa Beach stakeholders. The offsets are produced by non-profit conservation organizations or private landowners.

U.S. Forest Project

Harvego Bear River Preserve Project / Photo by Placer Land Trust

Urban Forest Offsets

Urban forests, including street trees, parks, and wildlands within city limits, are highly sought-after amenities that provide shade, mitigate the urban heat island effect, and give character to streets and parks. The Climate Action Reserve approved two Urban Forest protocols in June 2014. The Urban Forest Management Protocol offers a programmatic approach to the updated Urban Tree Planting protocol. The California Air Resources Board previously adopted the Climate Action Reserve's Urban Forest Protocol and will need to adopt the Urban Forest Management protocol for the programmatic approach to create California Compliance Offsets. The Reserve hopes that these new protocols facilitate implementation of more urban forest projects.

Because the annual amount of emissions sequestered from an urban forest in a 1.4 square mile city would be low relative to the municipality's emissions from operations, Hermosa Beach may wish to express interest in participating in any potential future SBCCOG-wide or countywide urban forest management protocol effort.

Hermosa Beach should prioritize U.S. Forest and Urban Forest offset projects. Other important considerations are whether Hermosa Beach stakeholders can invest in the same project as the city and how the specific project would fit within the city's outreach and education efforts.

Next Steps for the City

Following in the footsteps of Davis, Seattle, Austin, South Miami, and other cities, Hermosa Beach should adopt key decisions by resolution. The City should adopt the following by resolution:

Item	Options	Recommendation
Choose a Goal	Carbon Neutral, Carbon Negative, or Zero Emissions	**Carbon Neutral**
Consider a goal for "Gross" GHG Emissions	Any percentage below 1990 to 2015 levels by some future year	**40% below 2015 levels by 2020**
Determine the Future Year by which	2017 to 2050; By 2020 to be seen as leader; By 2017 to be seen as "first to"	**Carbon Neutral by 2020**

Upon adoption of the resolution, the City should report the City's climate goal, past inventories, indicators, plans, and actions to the Carbonn Cities Climate Registry. The City should continue to pursue reductions in gross greenhouse gas emissions, adjusting its payback analysis to incorporate the added cost of a California Emissions Allowance.

Within 6 months of adopting the resolution, the City should also implement a performance monitoring program using ICLEI's ClearPath tool to track municipal emissions and municipal climate action indicators. The City should also begin to implement recommendations for an employee commute reduction program, including designating an employee transportation coordinator.

Within 12 months of adopting the resolution, the City should solicit and enter into a power purchase agreement to install solar photovoltaic panels on a facility that meets several criteria (structural integrity, load sufficiency, absence of plans for redevelopment or reconstruction, and visibility of solar photovoltaic panels). This action will demonstrate the City's commitment and form the cornerstone of an education and outreach plan to explain the City's goal, actions, and use of offsets.

For each calendar year after adopting the resolution, the City should also report updated inventories, new actions, and the use of offsets and RECs to the Carbonn Cities Climate Registry. When Hermosa Beach completes an inventory for the first year it plans to achieve a greenhouse gas goal, it should have that inventory verified by an outside auditor to certify the City's claim.

All the while, Hermosa Beach should continue to pursue community climate actions, especially a Community Choice Aggregation, which can leverage buying power to offer 100% renewable zero-emissions power to all electricity accounts in Hermosa Beach.