



October 8, 2009

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Call to Action

“Delay is no longer an option. Denial is no longer an acceptable response. The stakes are too high; the consequences too serious.”

-Barack Obama on Climate Change
November, 2008

There is no longer any doubt in the international scientific community that human induced climate change is real. Heat trapping emissions released by fossil fuel use, deforestation, industrial processes, and other human activities are causing a warming of global average surface temperatures. This temperature rise is associated with a host of impacts that will significantly alter human life including:¹

- Increased water stress and frequency of drought in mid-latitudes
- Increased species extinction and range shifts
- Decreased agricultural productivity
- Increased damage from floods and storms
- Increased rates of respiratory and infectious disease, and mortality from heat waves, floods, and droughts

The good news is that technical solutions to the climate crisis exist. We have low-carbon energy sources. Better land management and agricultural practices exist. There are alternative processes and materials that can reduce the impact of industry. Moreover, human ingenuity is constantly producing new approaches to providing the goods and services we need to prosper at a lower environmental cost. However, to reduce emissions at a scale necessary to avoid the most catastrophic impacts above, it will take a concerted effort at all levels to overcome cost and political barriers to the effective implementation of both existing and to-be-developed solutions.

Federal policy must be developed to create a U.S. reduction strategy that is compatible with global initiatives and one that demonstrates leadership. Regional policies and commitments are critical to the success of reduction strategies at the lowest cost, and the implementation of reform in such areas as transportation and energy, which are frequently provided at a regional scale. Local governments have a great deal of responsibility for the implementation of climate change mitigation strategies because many planning, infrastructure, and investment decisions happen at the local level. Local governments also have a unique ability to engage citizens and support individual efforts. Private businesses must recognize the triple bottom line and take voluntary actions to support mandatory ones. Finally, individual citizens – by civic engagement and personal behavior – have some of the greatest responsibility and power to affect change. Each one of us is capable of protecting the health and happiness of future generations.

With this sense of urgency and collaboration in mind, the City of Hayward has developed this Climate Action Plan. We sincerely appreciate the efforts of each individual that tackles climate change, at every level, and are grateful to all who aid in the successful implementation of this Plan.

¹ International Panel on Climate Change, 2007. “Climate Change 2007: Synthesis Report – Summary for Policymakers.” http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

10 Steps to Reduce your Carbon Footprint and Save Money

From CoolClimate.org

1. Change your commute!

Did you know that one third of the CO₂ produced in the US is from the transportation of people or goods? Pick one day a week to walk, bike, take public transportation or carpool to work or when you're running errands. If possible, live close to your workplace. When driving, remember to combine several car trips into one trip and avoid idling. Additionally, you can get better fuel efficiency by following the speed limit. Exceeding the speed limit by just 5 mph during highway travel results in an average fuel economy loss of 6%.

2. Be a better consumer!

Did you know that the average American generates about 4.4 lbs of trash each day? To reduce the amount of trash you generate, follow these few easy steps. Use re-usable coffee mugs and shopping bags. If you forget your mug or bag at the store, buy a new reusable mug or bag and keep the extra one in your purse or car for use the next time you're out. Alternatively, set aside \$1 each time you forget your mug or bag; depending on your memory, you'll have enough funds to purchase a reusable item sooner or later. Also, reuse as many things as possible and recycle at home, work, and school.

3. Shop local!

The shorter the distance your food travels to your plate or that product travels to your home, the fewer greenhouse gases are produced. Declare one day a week "Local Day" and eat foods produced within 50 miles of your house.

4. Dry-up Household Water Consumption!

Did you know that water-related energy use consumes 19% of California's electricity, 30% of its natural gas, and 88 billion gallons of diesel fuel every year? To reduce your water consumption at home, turn off your water when it's not being used, take shorter showers, stop unseen leaks by reading your meter, install low-flow shower heads and aerators on your faucet, install and use water efficient landscaping and irrigation methods (for example, plant drought tolerant plants and/or install permeable surfaces and drip irrigation systems), and use EnergyStar appliances.

5. Unplug it!

Did you know that appliances, chargers, home theater equipment, stereos and televisions use electricity even when their power is "off"? Eliminating this "leaking" electricity could save you 6–26% on your average monthly electricity bill. Take a walking tour of your home and unplug seldom-used appliances and install power strips so that the power to frequently used items can be easily turned off.

6. Change the lights!

Replace any incandescent light bulbs that remain in your home with compact fluorescent lights (CFLs). Replacing one incandescent light bulb with a CFL can save \$30 or more in electricity costs over the bulb's lifespan.

7. Set your Thermostat for the Season!

Set your thermostat in winter to 68° or less during the daytime, and 55° before going to sleep (or when you're away for the day), to save 5-20% of your space heating costs. During the summer, set thermostats to 78° degrees or more to save 5-20% of your cooling costs. For an easy fix, purchase an inexpensive programmable thermostat that makes these changes for you.

8. Increase Energy Efficiency at home!

Did you know that you can save up to 350 lbs of CO₂ and \$150 per year at home by simply keeping air filters clean? To determine more ways to increase energy efficiency, take advantage of free home energy

audits offered by many utility companies. When you are ready to purchase an appliance, ensure that you purchase an EnergyStar appliance. To reduce carbon emissions associated with energy use, install or purchase alternative energy for your electricity needs.

9. Stop Unwanted Services!

Did you know that junk mail production in the US consumes as much energy as 2.8 million cars? Stop your junk mail at www.directmail.com/junk_mail. Stop unwanted catalogs at www.catalogchoice.org.

10. Get your friends and families to reduce their carbon emissions!

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The Hayward Community

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Executive Summary

Introduction

The City of Hayward and its citizens recognize that climate change poses a potential threat to the community and to the larger environment. The City and its citizens also recognize that activities taking place within the City result in the release of the heat-trapping global warming gasses that contribute to climate change. Hayward, therefore, wishes to take a stance against climate change by reducing the amount of greenhouse gas (GHG) emissions from activities taking place within the City.

Hayward made this intention clear in 2005, when the Mayor of Hayward signed the U.S. Conference of Mayors Climate Protection Agreement, which states, “We will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities.”² In June 2006, the City joined ten other local governments in Alameda County participating in the Alameda County Climate Protection Project (ACCPP). By joining ACCPP, Hayward embarked on an ongoing coordinated effort to reduce the emission of gasses that cause global warming. ACCPP was launched by the Alameda County Waste Management Authority & Recycling Board (StopWaste.Org) in partnership with the Alameda County Conference of Mayors and ICLEI - Local Governments for Sustainability (ICLEI).

The Climate Action Plan (CAP) provides a roadmap for achieving a measurable reduction in GHG emissions; so adopting the CAP will be a discernible step towards emissions reductions. The CAP recommends GHG emissions targets that will align Hayward’s reduction targets with those of the State of California and presents a number of strategies that will make it possible for the City to meet the recommended targets. The CAP also suggests best practices for implementing the Plan and makes recommendations for measuring progress.

The CAP will be implemented over an extended period of time. Hayward recognizes that it may not be possible to implement some of the ideas presented in the Plan with the current economic conditions. Nevertheless, it is important to keep ideas on the table that could make a cost-effective contribution to reducing emissions at some future time in the life of the Plan.

Hayward’s Approach to Climate Protection

Hayward has adopted ICLEI’s Cities for Climate Protection methodology for managing GHG emissions. This performance-based methodology provides five milestones to assist local governments in developing and implementing local approaches for reducing global warming. The milestone process consists of the following five milestones:

- Conduct a baseline emissions inventory and emissions forecast
- Adopt an emissions reduction target
- Develop a Climate Action Plan for reducing emissions
- Implement policies and actions that will reduce emissions
- Monitor and verify results

ICLEI assisted Hayward in completing a baseline emissions inventory (Milestone 1) in 2006, and subsequently updated the inventory in June 2008. The inventory is summarized in Section 2 and details are presented in Appendix A. Milestone 2 (adopting targets) and Milestone 3 (develop Climate Action Plan) will be completed when this Climate Action Plan is adopted by the Hayward City Council. This

² US Conference of Mayors Agreement <http://www.usmayrs.org/climateprotection/documents/mcpAgreement.pdf>

Plan also includes recommendations on how to achieve the fourth and fifth milestones: implementation, monitoring, and verification.

In addition to signing on to ACCPP and developing this CAP, the City of Hayward has already adopted a number of programs that will help reduce emissions. A summary of these programs including the Private Development Green Building Ordinance, the Environmentally Friendly Landscaping Guidelines, and policies supporting transit-oriented development, is provided in Section 1 of the CAP.

Overview of the Climate Action Plan

Purpose of the Plan

The purpose of the CAP is to provide direction for the community's efforts to reduce greenhouse gas (GHG) emissions in the coming decades. The Plan recommends specific actions that the City can take to meet its emissions reductions targets. With the Plan as a framework, the City can make informed decisions about which actions should be implemented immediately, and which actions are better suited for implementation at some time in the future.

Because the Plan is intended to be implemented over an extended period, it is important to realize that the costs and benefits of implementing specific actions will change over time due to changes in economic conditions, new and/or improved technology, changes in public opinion, or for other reasons. Many of the recommended actions will require public investments that may be difficult to justify in the current economic climate, but may be easier to justify at some future time. This means that although a proposed emissions reduction action may seem impossible to implement today, it should not be eliminated from the list forever. Instead, those actions can be retained as potentially valuable reduction actions that may prove feasible and be implemented at some time in the future.

How the Draft Plan was Developed

City staff and its consultants worked with members of the community, elected officials, and representatives from various departments within the City government to develop the CAP. In July 2008, the City hosted a public workshop to solicit ideas for the Plan. Based on feedback received from the community during and after the workshop, the City and its consultants developed a list of recommended actions. This list of potential actions was also reviewed with City staff, and the proposed actions were analyzed in more detail. Emissions savings resulting from these actions were estimated, and assessments were made of how easy or difficult it would be to implement each action. A draft was reviewed by City staff in early 2009, and was circulated for public comment in February and March 2009. A community workshop to discuss the Draft CAP and to solicit feedback from the community was held on March 19, 2009.

Plan Outline

This CAP recommends nine strategies to guide the City's effort in reducing GHG emissions. Each strategy is comprised of several action items. It is anticipated that each of these action items will turn into a multiple-year program that will require its own budget and staff resources to develop and implement. The CAP offers direction in the form of reference material and a recommended implementation strategy, but does not attempt to specifically design programs or policies.

Of the nine strategies presented in the CAP, two strategies focus on reducing emissions from transportation and three strategies address emissions reductions from building energy use. One strategy focuses on reducing waste-related emissions, and one on maximizing carbon sequestration within the City. A future version of the CAP will contain a strategy on climate change adaptation, which will include actions necessary to address rising sea level. At the time of this writing, the Hayward Area

Shoreline Planning Agency had not yet released its sea level rise study. The remaining strategy focuses on community outreach and education.

Summary of Baseline GHG Inventory

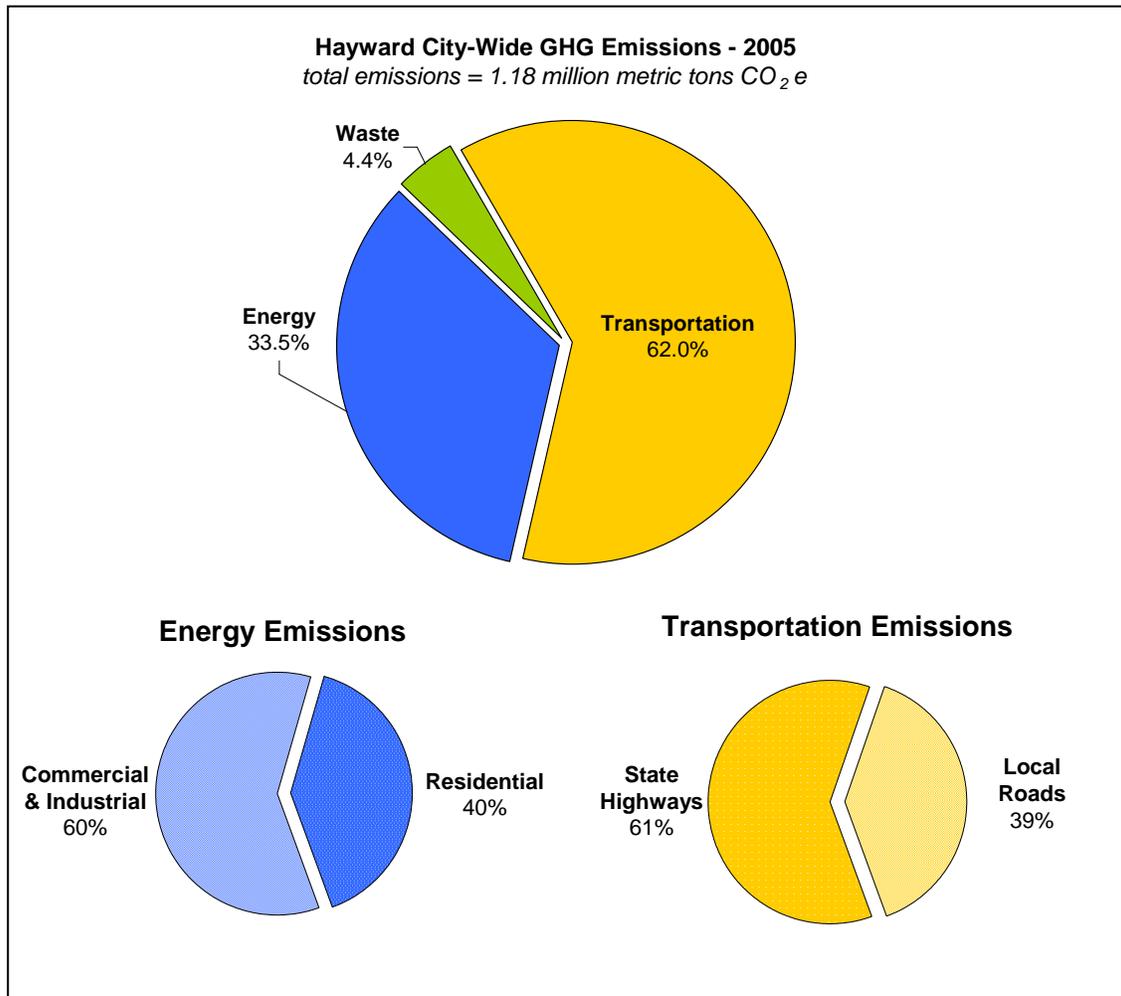


Figure 1: City-wide GHG emissions in 2005

Source: ICLEI

The baseline inventory provides an estimated appraisal of emissions for a given year. The inventory indicates the sources of Hayward's emission, and establishes a solid basis for comparisons between the City's current emissions and future emissions levels. Planners use the baseline inventory to set reasonable reduction targets and to prioritize actions to reduce emissions. To verify that emissions reductions have been achieved, planners can compare future inventories to the baseline inventory.

Findings from the baseline inventory, which was conducted for emissions in 2005, are summarized in the following pages. The community-wide inventory includes emissions from activities taking place within City limits, and the municipal inventory only includes emissions associated with Hayward's government operations.

Community Emissions Inventory Results

Figure 1 illustrates that in the base year 2005, the City of Hayward emitted 1,183,274 metric tons of equivalent carbon dioxide (CO₂e).³ The transportation sector is the single largest source of emissions, contributing 62 percent of total emissions. Energy in the form of natural gas and electricity accounted for 33.5 percent of Hayward's emissions. The landfilled portion of the City's solid waste accounted for 4.4 percent of Hayward's 2005 emissions.

Municipal Emissions

In the base year of 2005, municipal emissions constituted 0.8 percent of Hayward's total emissions, or 9,647 metric tons of CO₂e (see Figure 2). For comparison, local government emissions typically fall between one and five percent of overall community emissions. As a minor contributor to total City-wide emissions, actions to reduce municipal energy use will have a limited impact on Hayward's overall community emissions levels. However, municipal action can help reduce City government's operating costs and has important symbolic value demonstrating leadership that extends far beyond the magnitude of emissions actually reduced.

³ Carbon dioxide is not the only gas that contributes to the greenhouse effect. Each greenhouse causes a discrete amount of heating. For example, one ton of CH₄ causes the same amount of warming as 23 tons of CO₂ (1 ton of CH₄ = 23 tons CO₂e). To simplify reporting, it is standard practice to report the carbon equivalent emissions (CO₂e) as opposed to the actual emissions of each gas

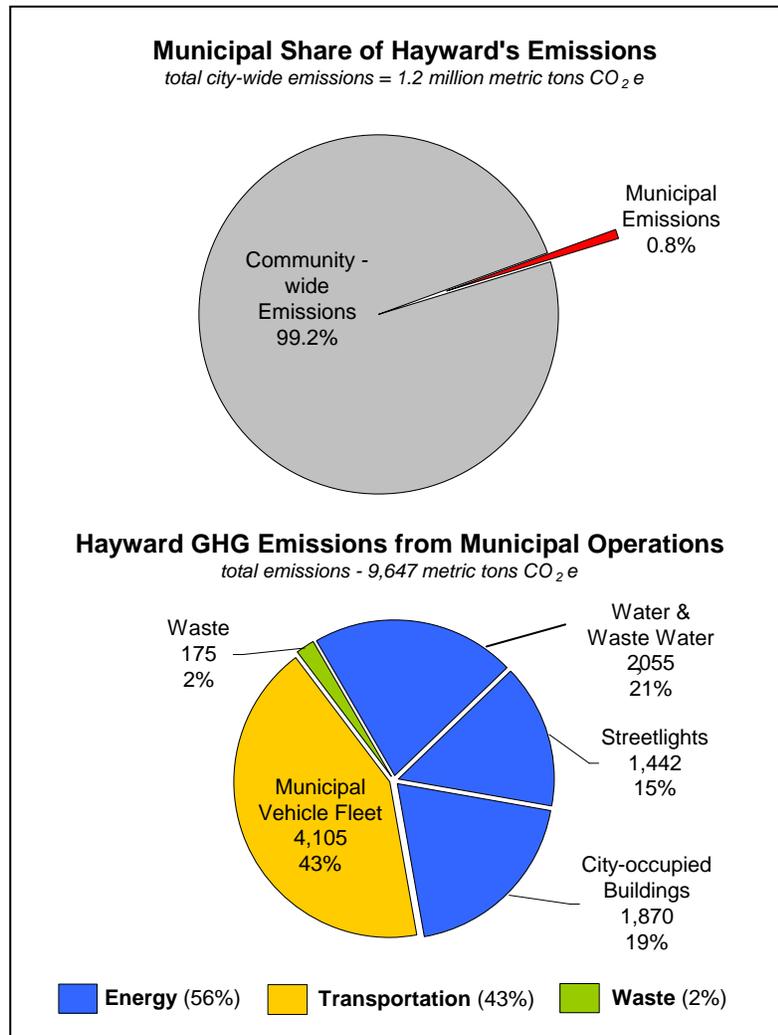


Figure 2: Municipal GHG emissions in 2005
Source: ICLEI

Projected Emissions

The emission forecast includes predictions of how GHG emissions may change in the City of Hayward over time if no emissions reductions programs are implemented. The forecast projects the growth in GHG emissions that will occur in future years. The emissions growth is based on estimated population growth and on changes in the employment mix. The City has used the emissions forecast to estimate the required emissions reductions to meet emissions targets.

Two emissions forecast scenarios are presented. The Scenario 1 forecast uses ICLEI's methodology which assumes that the number of drivers, electricity and natural gas use, and solid waste generation will increase over time in proportion to population, number and type of jobs, and housing availability. ICLEI's methodology assumes that fuel economy and the percent of electricity generated from renewable sources remains constant throughout the forecast period. At the time ICLEI developed their estimate, it was reasonable to assume that both vehicle fuel economy and the percentage of renewable

generation in PG&E's electric generation mix would remain constant, but recent legislative activity has created a scenario where emissions will likely be reduced as so cited with these two factors.

The Scenario 2 forecast takes recent legislation into consideration and assumes that both vehicle fuel economy and utility renewable electricity generation will increase over time. Scenario 2 maintains the Scenario 1 assumptions about an increased number of drivers, electricity, and natural gas use, as well as an increase in waste generation.

Figures 3 and 4 show Hayward's emissions projections based on Scenario 1 and Scenario 2 assumptions. There is a significant difference between these two emissions forecasts. Scenario 1 predicts that emissions will increase by 0.28 million metric tons CO₂e between 2005 and 2020, whereas Scenario 2 predicts emissions will only increase by roughly 30,000 tons in that time. The difference in Scenario 1 and Scenario 2 emissions forecasts illustrates that state and federal legislation is expected to have a measurable impact on local emissions. It also exemplifies the importance of advocating for even more aggressive state and federal policies.

Because Scenario 2 is more plausible given the recent changes to state and federal policy, the Scenario 2 forecast is used as a basis for all analyses in the CAP.

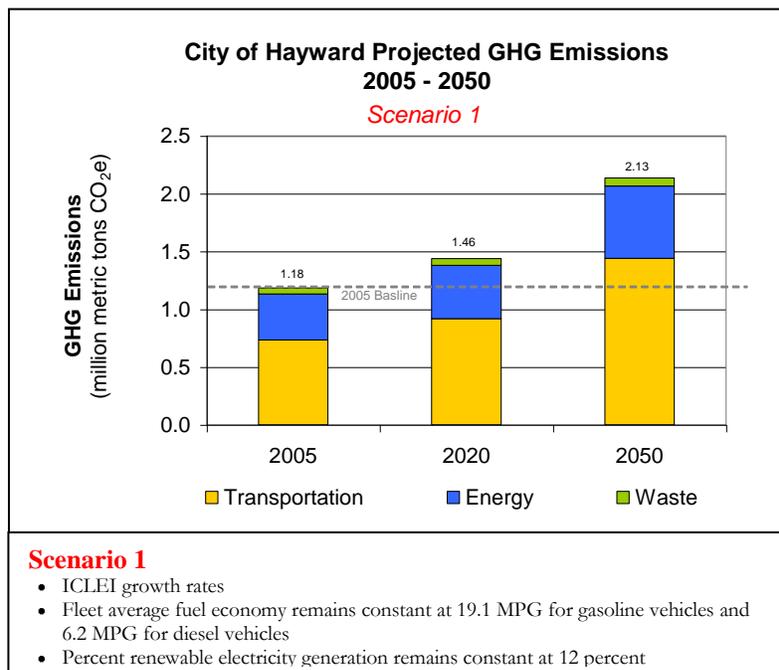


Figure 3: Scenario 1 projected City-wide GHG emissions 2005, 2020, and 2050

Source: ICLEI, City Analysis

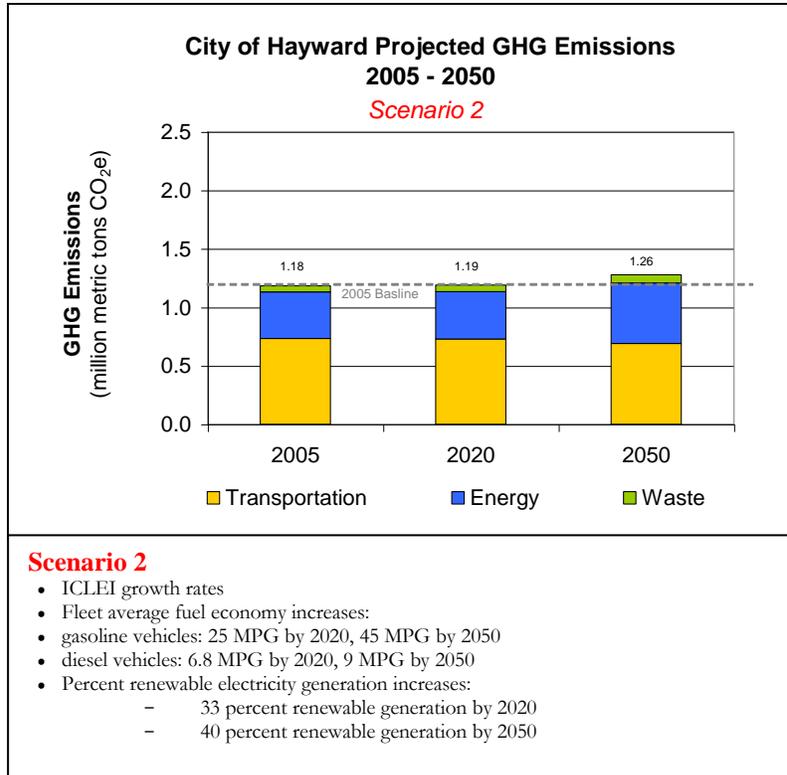


Figure 4: Scenario 2 projected City-wide GHG emissions 2005, 2020, and 2050
Source: ICLEI, City Analysis

Hayward's Emissions Reduction Targets

Hayward's emissions reduction target represents a percentage by which the community aims to decrease emissions below the 2005 baseline, by the target years of 2020 and 2050. The City aims to reduce emissions by the following amounts:

- 6 percent below 2005 levels by 2013 (interim target)
- 12.5 percent below 2005 levels by 2020
- 82.5 percent below 2005 levels by 2050

The difference between Hayward's 2020 projected emissions and its 2020 emissions goal is about 154,642 metric tons CO_{2e}. This means that if Hayward meets the 2020 target, the City will have prevented 154,642 metric tons CO_{2e} from being emitted into the atmosphere. This is equivalent to:

- The CO₂ emissions from 28,323 cars driving for one year.
- The CO₂ emissions from electricity use of 20,482 homes for a year.
- The CO₂ emissions from burning 808 railcars worth of coal.
- The carbon sequestered annually from 35,146 acres of pine or fir forest.⁴

⁴ Equivalencies calculated with EPA's Greenhouse Gas Equivalencies Calculator (www.epa.gov/cleanenergy/energy-resources/calculator.html).

The interim GHG reductions target in 2013 was established to enable Hayward to set a short-term goal for the first five years of the program. This short-term goal will enable Hayward to benchmark its progress towards meeting the more aggressive longer-term goals.

Hayward based its GHG reductions goals on the goals established in the state’s Global Warming Solutions Act (AB 32).⁵ Hayward adopted state emissions reductions goals for the following reasons:

- AB 32 goals are backed by detailed analyses which consider, among other things, costs and benefits, technical feasibility, and impact on the economy and environment.
- AB 32 sets aggressive reduction goals, which align with Hayward’s commitment to combat climate change.
- By adopting the state’s emissions reduction goals, Hayward can help make AB 32 a stronger initiative. AB 32 has already gained the support from several cities, and as more cities adopt their goals, it becomes easier for other cities to join the initiative. By showing support for AB 32, Hayward is sending a strong message to other cities that the initiative is worth supporting.

Reducing Emissions

Approach for Reducing Transportation, Energy, and Solid-Waste-Related Emissions

Section 4 of the CAP describes the general approach taken in each major sector contributing to Hayward’s footprint – transportation, energy use in buildings, and solid waste management. These are summarized below:

Approach for Reducing Transportation Related Emissions

1. **Reduce Vehicle Miles Traveled**
When you don't have to drive, don't drive.
2. **Improve Fuel Efficiency of**
If you have to drive, drive in a vehicle that does not emit a lot of greenhouse gases.

Approach for Reducing Energy-Related Emissions

1. **Conserve Energy**
When you don't need the energy, don't use it.
2. **Increase Energy Efficiency**
When you do need energy - use it efficiently.
3. **Use On-site Renewable Energy**
Use energy generated from low-emissions or no-emissions sources like solar, wind, or geothermal, that are attached to the building (on-site).
4. **Use Off-site Renewable Energy**
When you can't produce needed energy on-site, produce low- or no-emissions energy elsewhere (off-site).

⁵ AB 32 set the state-wide goal of reducing GHG emissions to: (1) 2000 levels by 2010; (2) to 1990 levels by 2020, which is equivalent to 12 percent below 2005 levels by 2020; and (3) to 80 percent below 1990 levels by 2050, which is equivalent to 83 percent below 2005 levels by 2050.

Approach for Reducing Waste-Related Emissions

1. Reduce Waste

Avoid creating waste when possible.

2. Reuse and Recycle what you can

If you have to create waste, use things that can be reused or recycled – and be sure you can actually reuse or recycle.

3. Decrease amount of organics going to landfill

If you have to create organic waste, avoid sending organics to the landfill where organics decompose into methane: a potent global warming gas.

Emissions Reductions Strategies

In Section 5, the CAP presents the nine strategies for reducing emissions in Hayward. Each strategy contains several actions that Hayward can deploy to reduce GHG emissions.

Strategy 1 – Transportation and Land Use: Reduce Vehicle Miles Traveled

The goal of Strategy 1 is to reduce vehicle miles traveled (VMT) by encouraging residents to use alternative modes of transit, by improving the effectiveness of the transportation circulation system, and through land-use and zoning mechanisms. In the context of this report, alternative mode of transit means any mode that is not driving alone. This could include walking, biking, carpooling, or riding public transit.

Strategy 2 – Transportation: Decrease the Carbon-Intensity of Vehicles

The goal of Strategy 2 is to decrease GHG emissions from motor vehicles by reducing the carbon-intensity, or emissions per mile traveled, of vehicles driven on Hayward’s roads. The Strategy targets all vehicles traveling in Hayward, including private, commercial, and City-owned vehicles.

Strategy 3 – Energy: Improve Energy Performance of Existing Buildings

The goal of Strategy 3 is to reduce GHG emissions associated with energy consumed in existing buildings through education programs, regulations, and incentives that aim to reduce electricity and natural gas use.

Strategy 4 – Energy: Improve Energy Performance of New Buildings

The goal of Strategy 4 is to minimize GHG emissions associated with energy consumed in new buildings by setting minimum energy and environmental performance standards for all newly constructed buildings.

Strategy 5 – Energy: Use Renewable Energy

The goal of Strategy 5 is to reduce GHG emissions associated with electricity use by increasing the amount of electricity supplied by renewable sources.

Strategy 6 – Solid Waste: Increase Waste Reduction and Recycling

The goal of Strategy 6 is to reduce GHG emissions associated with the disposal of solid waste. This will be achieved by continuing to implement waste reduction and recycling programs.

Strategy 7 – Sequester Carbon

The goal of Strategy 7 is to encourage activities, such as planting trees, which will maximize the amount of carbon sequestration taking place in the City.

Strategy 8 – Climate Change Adaptation

This Strategy will eventually address ways for Hayward to adapt to the rising sea level. The three member agencies of the Hayward Area Shoreline Planning Agency (City of Hayward, Hayward Area Recreation and Park District, and the East Bay Regional Park District) have contracted with a consultant to prepare a Sea Level Rise Study. The study will evaluate the potential impacts of sea level rise on the Hayward shoreline and the feasibility of making improvements to prevent or mitigate potential flooding. At the time of this writing, the study was not yet available. Staff expects to include a summary of the study in a future version of the CAP.

Strategy 9 – Engage and Educate Community

Hayward’s residents and businesses will have to play an active role in reducing emissions. Strategy 9 focuses on specific actions Hayward plans on using to engage residents and businesses in the necessary and vital effort to reduce community-wide emissions.

Community-wide Actions - in order of priority

Table 1: Proposed actions for reducing community-wide emissions: listed in order of priority

Action Number	Short Description	Estimated Annual Emissions Reductions (metric tons CO2e)		Priority
		<i>*assumes Scenario 2 fuel economy and renewable electricity generation and that program goals are achieved</i>		
		2020	2050	
Community-wide Actions - potential emissions reductions calculated and City has direct control over implementation				
Action 3.9	offer energy efficiency financing program for commercial buildings	1,630	132,025	1
Action 3.3	develop and implement Commercial Energy Conservation Ordinance	5,164	105,152	2
Action 3.7	energy efficiency financing program for single-family homes	181	40,248	3
Action 3.8	offer energy efficiency financing program for multiple-family homes	126	33,617	4
Action 5.2	offer renewable energy financing program for commercial buildings	10,768	22,822	5
Action 6.3	improve construction and demolition debris program	1,953	15,634	6
Action 4.2	continue to implement private development green building ordinance for commercial buildings	4,493	77,925	7
Action 5.3	add solar requirement into private development green building ordinance	2,980	24,660	8
Action 4.1	continue to implement private development green building ordinance for residential buildings	979	18,836	9
Action 1.8	prioritize traffic-flow management practices to reduce idling time	23,061	21,875	10
Action 3.1	develop and implement Residential Energy Conservation Ordinance for single-family homes	639	39,304	11
Action 3.2	develop and implement Residential Energy Conservation Ordinance for multiple-family homes	983	33,033	12
Action 6.2	increase participation in food-scraps collection programs	1,495	11,963	13
Action 6.1	increase participation in recycling programs	15,916	38,216	14
Action 5.1	offer renewable energy financing program for residential buildings	850	2,149	15
Action 1.4	expand public transit services to encourage reductions in vehicle travel	3,062	15,199	16
Action 5.4	increase portion of electricity provided by renewable energy		30,779	17
Action 1.2	assist businesses in establishing car share / bike-share programs	416	7,283	18
Action 6.6	encourage waste reduction and promote recycling participation at multi-family properties	253	304	19
Action 7.1	maximize carbon sequestration within City		284	20
Action 1.1	assist businesses in providing commuter benefits programs	2,286	8,106	21
Action 1.5	continue to implement bike master-plan	2,419	7,610	22
Action 1.3	update parking policies to encourage reduction in vehicle travel		9,471	23
Action 1.6	develop and implement pedestrian master-plan	1,394	7,121	24
Action 6.4	ban certain materials from landfills	2,487	2,986	25
Community-wide Actions - potential emissions reductions not calculated, or City does not have direct control over implementation				
Action 3.4	actively participate in low-income weatherization programs	emissions reductions not quantified		1
Action 2.2	collaborate the state and federal government on policies that promote low-carbon vehicles and low-carbon fuels	129,060	532,735	2
Action 2.1	provide incentives for low-carbon vehicles and low-carbon fuels	129,060	532,735	3
Action 1.10	align zoning policies to minimize vehicle travel	emissions reductions not quantified		4
Action 3.5	promote a voluntary commitment for businesses and residents to reduce energy consumption	emissions reductions not quantified		5
Action 6.7	prefer waste management strategies that maximize the useful value of waste streams	emissions reductions not quantified		6
Action 6.5	require residents / businesses to participate in recycling programs	emissions reductions not quantified		7
Action 1.11	increase availability of affordable housing for people employed in Hayward	emissions reductions not quantified		8
Action 9.1	create green-portal website	emissions reductions not quantified		9
Action 9.2	develop and implement plan to engage residents in emissions reductions activities	emissions reductions not quantified		10
Action 9.3	develop and implement plan to engage businesses in emissions reductions activities	emissions reductions not quantified		11
Action 3.6	promote use of home energy monitors	emissions reductions not quantified		12
Action 1.7	update the Circulation Element of the General Plan to evaluate expansions of appropriate modes of transit	emissions reductions not quantified		13
Action 1.9	encourage high density, mixed-use, smart-growth development in areas near public transit stations	emissions reductions not quantified		14
Action 1.12	incentivize filling local jobs with local residents	emissions reductions not quantified		15
Action 8.1	<i>Place holder - no actions defined for climate change adaptation</i>	not evaluated		--

Note: Emissions reductions were not estimated for several actions due to their overlapping effects with other actions and to prevent double-counting

Municipal Actions - listed in order of priority

Table 2: Proposed Actions for reducing municipal emissions: listed in order of priority

Action Number	Short Description	Estimated Annual Emissions Reductions (metric tons CO ₂ e)		Priority
		2020	2050	
Municipal Actions - potential emissions reductions calculated and City has direct control over implementation				
Action 3.10	upgrade streetlights to LEDs	969	1054	1
Action 2.3	procure fuel-efficient and low-carbon fuel vehicles for municipal fleet	54	108	2
Action 3.12	audit city buildings and identify energy savings opportunities	330	1542	3
Action 3.11	prepare and implement energy conservation plan for municipal buildings	330	1542	4
Action 2.4	negotiate alternative-fuel and fuel economy requirements into new contracts and franchise agreements	54	108	5
Action 6.9	implement food scraps collection programs in city buildings	73	163	6
Action 5.5	audit city buildings and identify buildings best-suited for solar	76	2227	7
Action 5.6	install renewable generation on municipal property	76	2227	8
Action 4.3	continue to implement municipal green building ordinance	47	328	9
Action 7.2	maximize carbon sequestration on municipal property	5	32	10
Action 6.8	implement recycling programs in city buildings	27	28	11
Municipal Actions - potential emissions reductions not calculated, or City does not have direct control over implementation				
Action 1.13	provide commuter benefits to government employees	emissions reductions not quantified		1
Action 1.15	prefer facilities with convenient access to public transit	emissions reductions not quantified		2
Action 9.4	offer climate education programs to City employees	emissions reductions not quantified		3
Action 4.4	ensure new city buildings are built with photovoltaics and solar hot-water whenever possible	emissions reductions not quantified		4
Action 9.6	when awarding contracts, request applicants provide information about sustainability practices	emissions reductions not quantified		5
Action 9.5	demonstrate leadership by setting municipal reduction targets. Work to achieve these targets	emissions reductions not quantified		6
Action 6.10	develop environmentally friendly purchasing program	emissions reductions not quantified		7
Action 1.14	develop car-share and/or bike-share program for city employees	emissions reductions not quantified		8
Action 8.2	<i>Place holder - no actions defined for climate change adaptation</i>	emissions reductions not quantified		9

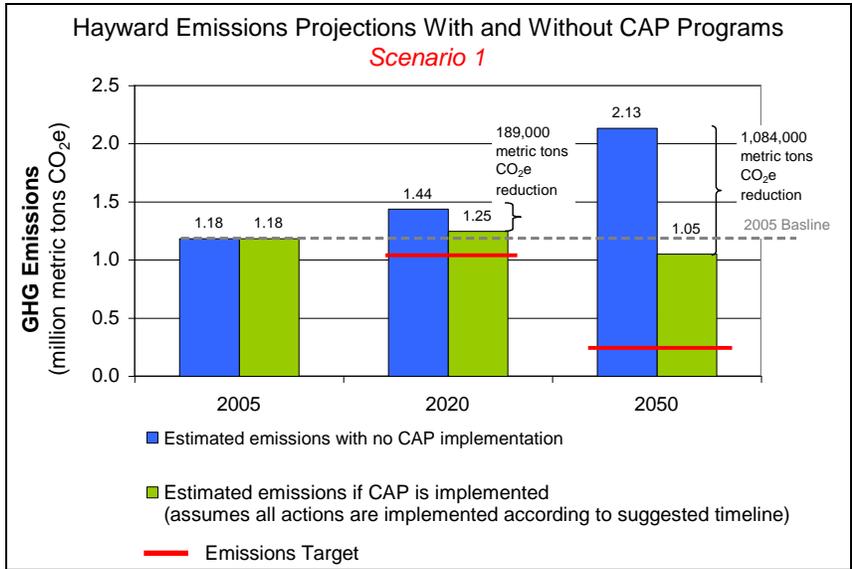
Note: Emissions reductions were not estimated for several actions due to their overlapping effects with other actions and to prevent double-counting

Achieving Target through Cumulative Emissions Savings

No single action will enable Hayward to meet its long-term emissions reduction targets. To meet the target, Hayward will have to implement a wide range of actions in each of the major emissions producing sectors – transportation, energy use in buildings, and solid waste management. Figure 5 shows Hayward’s emissions in 2005, the emissions projections for 2020 and 2050, and how emissions savings with CAP implementation will help Hayward meet the 2020 and 2050 emissions targets. Appendix B includes tables with each action and the estimated emissions reductions expected for the year 2020 and 2050.

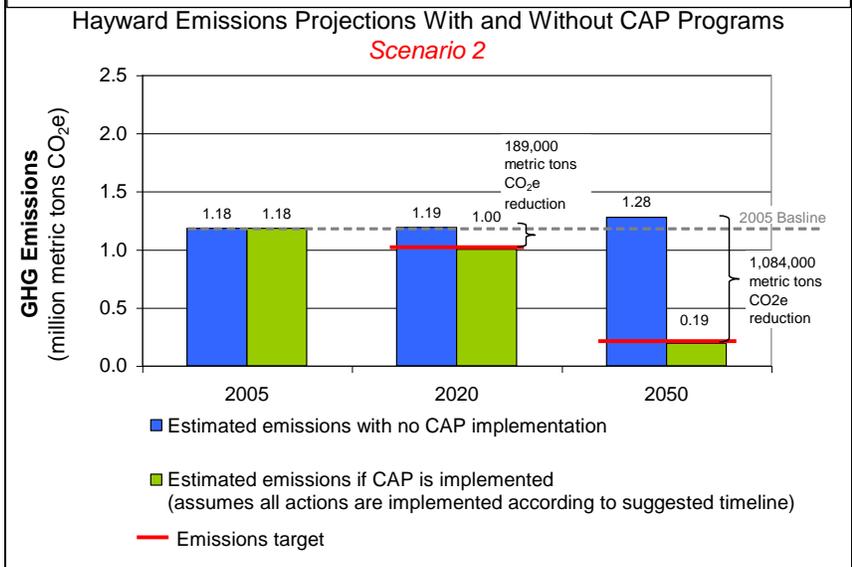
If Hayward designs the recommended CAP programs so they achieve the programs goals, as presented in Appendix C, and implements the CAP programs according to the suggested timetable, as presented in Appendix E, the estimated annual emissions savings will be approximately 189,000 metric tons CO₂e and 1,084,000 metric tons CO₂e in 2020 and 2050, respectively. Figure 5 shows estimated emissions with and without implementing the Climate Action Plan. The top chart shows these emissions savings subtracted from the Scenario 1 case where the average fuel economy remains at 19.1 mpg indefinitely and the amount of renewable energy generation will remain constant at about 12% renewable generation. The bottom chart shows emissions savings subtracted from the Scenario 2 BAU case where fuel economy and percent renewable generation increase over time. See Section 3 for a detailed explanation of Scenario 1 and Scenario 2 assumptions.

Although Hayward’s emissions target is to reduce emissions to 12.5 percent below the 2005 level by 2020, the City will have to reduce emissions by more than just 12.5 percent. If Hayward does nothing, or continues on the business-as-usual path, GHG emissions will continue to increase in proportion to population, number of jobs, and housing availability. To meet targets, Hayward will have to prevent the expected emissions growth, reduce emissions back to 2005 levels, and then eliminate another 12.5 percent of emissions. For this reason, emissions reductions are subtracted from the projections, not the 2005 baseline. Appendix B includes a table with each action and the estimated emissions reductions expected for the years 2020 and 2050.



Scenario 1

- ICLEI growth rates
- Fleet average fuel economy remains constant at 19.1 MPG for gasoline vehicles and 6.2 MPG for diesel vehicles
- Percent renewable electricity generation remains constant at 12 percent



Scenario 2

- ICLEI growth rates
- Fleet average fuel economy increases:
 - gasoline vehicles: 25 MPG by 2020, 45 MPG by 2050
 - diesel vehicles: 6.8 MPG by 2020, 9 MPG by 2050
- Percent renewable electricity generation increases:
 - 33 percent renewable generation by 2020
 - 40 percent renewable generation by 2050

Figure 5: Projected annual City-wide emissions with and without CAP programs
Source: ICLEI, City Analysis

Meeting the 2020 target

Given the estimated quantity of emissions reductions possible if Hayward achieves all program goals and implements programs according to the suggested timeline as outlined in Appendix C, the City will likely meet its 2020 target. However, to achieve the program goals, Hayward will have to be diligent. Actively contributing to regional and state-wide initiatives will help Hayward leverage other jurisdictions' efforts and allow the City to build on regional efforts to develop strategies that will be useful in other communities as well.

Meeting the 2050 target

To achieve the 2050 target, Hayward will have to meet aggressive long-term goals including:

- Reduce VMT of passenger vehicles to 30 percent below the projected emissions level⁶
- Reduce VMT of diesel vehicles (heavy trucks) by 10 percent below projected emissions level
- Increase average fuel economy of passenger vehicles to 75 mpg
- Increase average fuel economy of diesel vehicles to 11.5 mpg
- Supply 100 percent of electricity from renewable sources
- Reduce electricity consumption to 65 percent below emissions projections
- Reduce natural gas consumption to 50 percent below emissions projections
- Eliminate emissions from methane produced from waste decomposition

These goals are not out of reach. The technology required to meet these goals is available today. Electric vehicles are rolling off of assembly lines, and renewable power is becoming more common. Appliances, like TVs, refrigerators, fans, toasters, stereos, hair dryers, and drills are becoming increasingly more energy efficient. Developing technology is not the biggest challenge to achieving the 2050 goal. The biggest challenge is creating the conditions for the existing technologies to penetrate the culture. Hayward faces the challenge of using its resources to help direct its residents and businesses to embrace new technologies and new ways of thinking about our collective impact on the climate. Hayward can help achieve the 2050 goals by actively participating in local, regional, state, and federal initiatives that aim to reduce emissions from the transportation, energy, and solid waste sectors.

The transportation-related goals listed above are stated in terms of reducing VMT in conventional gasoline- and diesel-powered vehicles and increasing the fuel economy of gasoline-powered passenger vehicles and diesel-powered heavy trucks. The CAP did not attempt to evaluate the climate impacts of switching to lower-carbon fuels or transitioning to electric or hybrid vehicles. However, equivalent emissions reductions can be achieved using a number of different vehicle technologies. In the coming decades, it is very likely that there will be more variety in the types of vehicles on the road. It is difficult to predict which vehicles will be most popular, but it is certain that vehicle manufactures will explore offering electric, hybrid, plug-in hybrid, compressed natural gas vehicles, diesel and biodiesel vehicles, and (if there is a breakthrough in fuel-cell technology) hydrogen vehicles. Though the CAP did not attempt to quantify the emissions impacts of these alternative vehicles, the City should work to promote a transportation plan that will result in emissions savings, regardless of technologies deployed.

Hayward should re-evaluate the CAP regularly to incorporate new technologies and new ideas that are not included in this iteration of the plan, including adaptation strategies and programs. In the future there may be more effective ways to sequester carbon, or better energy efficiency or renewable energy technologies that Hayward would benefit from adopting. Technology improvements to track include

⁶ If Hayward achieves its long-term VMT reduction goal and its long-term fuel economy goal, the City will reduce overall gasoline use by over 78 percent below emission projections.

advances in battery technology (which could be applicable to both renewable energy and electric vehicles), higher efficiency and lower cost solar panels, advances in wind turbines to reduce noise, fuel-cell technologies, waste management strategies that convert waste streams to renewable and non-renewable energy, and advances in energy-efficient appliances, lighting, heating, and cooling. It is recommended that Hayward update its CAP at least once every 10 years to ensure that the City is taking advantage of the most up-to-date technologies and the most effective methods for reducing community-wide emissions. When updating the CAP, Hayward should aim to identify specific technologies and operational practices that will enable the City to meet its long-term 2050 reduction target.

Cooperation with State and Federal agencies

The largest percentages of Hayward's GHG emissions are from vehicle use and from electricity and natural gas consumption. To be successful in meeting its emissions reduction goals, substantial reductions will be necessary from all of these sources. When looking at the estimated emissions reductions from various proposed actions, it becomes clear that a few critical actions can have a large impact on the reduction effort. For example, in the transportation sector, actions 2.1 and 2.2 - increasing the fuel economy of vehicles; and in the energy sector, action 5.3 - increasing the percentage of renewable energy used to generate electricity, are expected to result in more emissions reductions than other actions identified in the CAP.

These actions (actions 2.1, 2.2, and 5.3) are also the actions that the City has the least direct control over. Hayward does not have the authority to mandate fuel economy of vehicles sold in its jurisdiction, nor does it have the authority to increase the amount of electricity a utility produces from renewable sources. Hayward can, however, influence these federal and state-level decisions by acting in cooperation with other communities.⁷ As vital components of Hayward's emissions reduction strategies, it is critical that Hayward do what it can to support the federal and state efforts to increase fuel economy and to increase the amount of electricity generated from renewable sources.

Perhaps the most important state or federal policy Hayward should actively advocate for is placing a price on carbon emissions. At the time of this writing, the country is beginning a debate on what federal-level carbon legislation will be most effective at reducing emissions. The discussion tends to focus on whether a cap-and-trade system or a carbon tax will be a more effective policy.^{8,9} Regardless of what policy makes it through the U.S. House and Senate (cap-and-trade, carbon tax, or something different), it is critical that carbon is assigned a monetary value. Further, the value of carbon needs to be set high enough so citizens and businesses make a concerted effort to reduce emissions. When the true value of carbon is realized, energy efficiency, renewable energy, alternative vehicles and alternative fuels, and advanced waste management projects will be cost competitive without state and federal incentive programs. It is recommended that the City of Hayward advocate for carbon policies that aim to help citizens and businesses realize the true value/impacts of carbon.

Implementing the Plan

Meeting the aggressive emissions reductions targets will require a team of key participants to come together with a unified vision and a collective motivation to achieve emissions reductions. Section 6 of

⁷ As discussed on pages 80-87 of the CAP, Hayward does have options for pursuing programs that may result in an increase of the renewable portion of electricity used in the City that would not depend on state or federal action. Hayward does have the option of participating in a Community Choice Aggregation program and thereby securing more electricity from renewable sources (see www.communitychoice.info or www.lgc.org/cca for information on Community Choice Aggregation) but Hayward does not have the authority to mandate the percent of electricity that PG&E produce from renewable sources.

⁸ Yale Environmental 360. *Putting a Price on Carbon: An Emissions Cap or A Tax?*. May 7, 2009. <http://e360.yale.edu/content/feature.msp?id=2148>

⁹ Thomas Friedman. *Show us the Ball*. New York Times Opinion and Editorial. April 8, 2009. Page A25 of New York edition. http://www.nytimes.com/2009/04/08/opinion/08friedman.html?_r=2

the CAP discusses recommendations for implementing the Action Plan. The major recommendations are listed below.

Recommendations for Implementing the Plan:

1. The City establish a Climate Action Management Team (CAM Team) to support and guide efforts to reduce emissions.
2. The City appoint a permanent Sustainability Coordinator who will, among other duties, coordinate the CAM Team, develop and implement programs/actions, and be responsible for monitoring and reporting on Hayward's progress toward meeting the long-term emissions reduction goals.
3. The City develop a protocol for annual reporting on progress towards meeting emissions targets. Reporting should be rigorous enough to provide an accurate analysis, but should not be so demanding that it takes away from efforts to reduce emissions.
4. The City develop a review process for evaluating the effectiveness of emissions reduction programs.
5. The CAM Team report annually to the City Council on progress towards meeting emissions reduction goals.
6. The City encourages individual businesses and business groups to participate in efforts to reduce GHG emissions by the commercial sector.
7. The City encourages residential sector developers, multi-family building owners, and residents to participate in reducing emissions by the residential sector.
8. When prioritizing actions, the City weigh the following factors: estimated emissions reductions, cost of implementation, ease of implementation, the time required for the program to reach full implementation, and financial benefits or cost savings.
9. The City create a financial plan for the climate action programs that takes into consideration the costs and staff resources needed throughout the implementation period.
10. The City evaluate alternative climate financing methods in order to provide adequate, reliable, and consistent long-term program funding.
11. The City complete a full emissions inventory every three to five years to measure and verify that emissions are actually decreasing over time.
12. The City collect information about and evaluate the effectiveness of climate programs on a regular basis.

Ongoing Measurement and Verification

The success of the long-term carbon reduction program depends on regular monitoring. Regular monitoring is important because it:

- Enables informed decision-making about climate-related programs for setting future priorities, determining appropriate program funding and scheduling, and identifying whether there is a need to adjust the program approach to ensure that the long-term emissions targets are being achieved.
- Provides credible and defensible data to prove that the community is meeting targets and can be held accountable for its commitment to reduce emissions.
- Prepares the City for GHG reporting requirements that are likely to emerge in the future.
- Recognizes the accomplishments of the community.

What to Measure

The CAP recommends that Hayward complete a full emissions inventory every three to five years to measure and verify that emissions are actually decreasing over time as planned. It is also recommended that Hayward collect other program-specific information on all of the individual programs that are contributing to the emissions reduction effort, so that each program can also be regularly evaluated. The

evaluations will inform City decision-making on appropriate future funding levels; help identify any need for adjustments to the program design, and enable the City to evaluate the effectiveness of the individual programs.

Voluntary Reporting

Hayward might consider participating in programs, such as the California Climate Action Registry (CCAR) and/or EPA's Climate Leadership program. There are several reasons to consider participation in one or more of these programs. First, it will provide the City with a mechanism to obtain independent third-party verification that the City's inventories are accurate, complete, and diligent. Second, following standard protocols will ensure that the City's inventory is consistent, and therefore comparable with the inventories of other participants. Third, it will provide the City with an incentive to complete inventories on a regular basis. Finally, many of these organizations offer a variety of services to help members calculate emissions and meet reduction targets, and Hayward will have access to these services if the City becomes a member.

Appendices

The appendices of the Plan include:

- Appendix A: Baseline Emissions Detailed Reports
- Appendix B: Estimated Emissions Reductions
- Appendix C: Methodology Report: Calculation of Estimated Emissions Reductions
- Appendix D: Action Prioritization
- Appendix E: Recommended Implementation Timing
- Appendix F: Energy Efficiency and Conservation Block Grant Information
- Appendix G: California Executive Orders and Legislation Pertaining to Climate Change
- Appendix H: Recommended Changes to the Hayward Municipal Code
- Appendix I: Recommended Changes to to the Hayward General Plan
- Appendix J: Public Comments on the Draft Climate Action Plan

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List of Acronyms and Abbreviations

AB 32.....	Assembly Bill 32: California Global Warming Solutions Act of 2006
ABAG	Association of Bay Area Governments
ACCPP	Alameda County Climate Protection Project
APTA	American Public Transportation Association
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BAU.....	business-as-usual
CARB	California Air Resources Board
CAFE	Corporate Average Fuel Economy
CAP	climate action plan
CCAR	California Climate Action Registry
CCP.....	Cities for Climate Protection
CEC	California Energy Commission
CH ₄	methane
City.....	city of Hayward
CIWMB	California Integrated Waste Management Board
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalents
C&D	construction and demolition
DOE.....	Department of Energy
EPA	Environmental Protection Agency
GHG	greenhouse gas
GWh.....	Gigawatt hour
HOV.....	high occupancy vehicle
HUSD.....	Hayward Unified School District
ICLEI	Local Governments for Sustainability
IPCC.....	Intergovernmental Panel on Climate Change
MPG.....	miles per gallon
MTC	Metropolitan Transportation Commission
MW	megawatt
MWh.....	megawatt hours
N ₂ O.....	nitrous oxide
NASA	National Aeronautics and Space Administration
O ₃	ozone
O&M	operation and maintenance
PG&E.....	Pacific Gas & Electric Company
PV	photovoltaic
RPS	Renewable Portfolio Standards
StopWaste.Org.....	Alameda County Waste Management Authority & Recycling Board
UNFCCC	United Nations Framework Convention on Climate Change
VMT	vehicle miles traveled
VOC	volatile organic compound
WARM	Environmental Protection Agency Waste Reduction Model
WCI	Western Climate Initiative