Section 5 – Emissions Reduction Plan

Section 5 presents nine strategies for reducing emissions in Hayward; each strategy contains several actions that Hayward can deploy to reduce GHG emissions.

The nine strategies are:

Strategy 1 Transportation and Land Use – Reduce Vehicle Miles Traveled
Strategy 2 Transportation: Decrease the Carbon-Intensity of Vehicles
Strategy 3 Energy: Improve Energy Performance of Existing Buildings
Strategy 4 Energy: Improve Energy Performance of New Buildings
Strategy 5 Energy: Use Renewable Energy
Strategy 6 Solid Waste: Increase Waste Reduction and Recycling
Strategy 7 Sequester Carbon
Strategy 8 Climate Change Adaptation
Strategy 9 Engage and Educate Community

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

Goal

The goal of Strategy 1 is to reduce vehicle miles traveled (VMT) by encouraging residents and employees to use alternative modes of transit, by improving the effectiveness of the transportation circulation system, and through land-use and zoning mechanisms. The long-term goals of Strategy 1 are to:

Reduce VMT of passenger vehicles to 30 percent below business-as-usual projections by 2050
Reduce VMT of heavy trucks to 10 percent below business-as-usual projections by 2050 [55]

Strategy 1 is an important strategy because it addresses the specific recommendations CARB made to local governments in the AB 32 Scoping Plan. The Scoping plan points out that in order to meet state-wide emissions targets, local governments will have to make land use planning and urban growth decisions that minimize emissions. The Scoping Plan states "local governments have the primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth and the changing needs of their jurisdictions."[56] The decisions that local governments make will have a large impact on GHG emissions, particularly on emissions from personal automobiles. The State's desire for local governments to take action on reducing VMT was reiterated by the adoption of SB 375 on September 30, 2008. As discussed in Sections 1 and 4, SB 375 sets up a framework for local governments and regional planning organizations to work together to reduce GHG emissions from passenger vehicles. The bill requires CARB to set regional targets to reduce GHG emissions from

[55] It is not clear how Hayward will address reducing emissions from heavy trucks. However, emissions from heavy trucks account for 13 percent of 2005 emissions if state roads are included and 8 percent of 2005 emissions if state roads are not included. If emissions from trucks are not addressed, the City will not meet its 2050 goal.
[56] California Air Resources Board, 2008. Draft AB 32 Scoping Plan. http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm. Page 27.

passenger vehicles. It is anticipated that setting regional emissions targets and subsequently working to meet the targets, will increase the amount of regional collaboration on transportation-planning initiatives and will in turn, further reduce VMT and associated emissions in Hayward.[57]

If Hayward wants to be fully supportive of state-wide goals, the City should work diligently to implement the Strategy 1 actions. The City has already adopted a number of land use and zoning protocols that will help reduce emissions, including smart growth principles. The land use and zoning actions presented in Strategy 1 focus on how Hayward can continue its efforts to reduce travel in automobiles.

Ease of implementation

The Brookings Institute estimates that about half of the development that will exist in 2030 will have been built between 2000 and 2030.[58] If this estimate is correct, Hayward should be anticipating a substantial amount of new development to take place in the coming decades. Hayward, and other local governments, can use zoning and land-use mechanisms in parallel with development standards to influence how new developments will address the City's goal of reducing VMT.

Many Strategy 1 actions require individual initiatives and different choices, such as walking, biking, and choosing public transit, instead of driving. Measures to encourage these changes include: incentives, programs, and policies by businesses, agencies, and other organizations. This may include ride sharing programs, subsidized transit passes, and locating employment near transit and activity centers; institutional policies and programs, including K-12 health educational classes and promotional materials and venues; and governmental policies, programs, guidelines, and standards, such as municipal transit policies and zoning code standards that cap the maximum rather than minimum number of parking requirements. Several factors will greatly influence the ease with which actions that reduce VMT can be implemented. These factors include:

Fuel Prices

Rising fuel prices reduced driving frequency and trip length, whereas fuel price reductions spark an increase in driving. A UC Davis study shows that increasing auto costs by 50 percent decreased VMT by 16 percent.[59] It is clear that implementation will be greatly influenced by oil costs and other driving expenses.[60]

Regional and State Collaboration

To achieve the required reduction in VMT, Hayward will have to collaborate with other communities within the region, and with the state.

Resistance to Fees

Though drivers resist increases in auto operating costs and parking fees, reducing VMT by initiating new fees and taxes, such as parking fees, vehicle purchase and registration taxes, or fuel taxes, these fees and taxes discourage people from driving. Resistance to new fees could impede progress towards reducing

[57] Senate Bill 375, Steinberg, Chapter 728, Statues of 2008. http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf

[58] Brookings Institute. Arthur Institute. Arthur C. Nelson. http://www.citymayors.com/development/built_envrionment.usa.html

[59] Chester, Mikhail V., Life-cycle Environmental Inventory of Passenger Transportation in the United States. Institute of Transportation Studies, University of California Berkeley, August 1, 2008. The author's website includes related presentations, news coverage, and previous draft versions

[60] ICF International, Inc. Linda Bailey, Patricia L. Mokhtarian, and Andrew Little. The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction, March 2008.

VMT. One way to alleviate this potential impediment is to focus on financial incentives to reward "good" behaviors rather than financial disincentives to punish "bad" behaviors. A survey conducted by the 1992 University of California, Irvine, the *Orange County Annual Survey* asked employed solo drivers to rate their likelihood of changing from solo driving in response to various fees and incentives. Fewer say they would be very likely to stop solo driving if they were subject to fees than if their employers paid them a cash bonus for no longer driving alone. [61, 62]

Challenges in Integrating Expansion of Transit and Transit-oriented Development

Expanded transit with land use intensification around light rail (i.e., BART) stations generally decreases VMT about 5% with the collateral benefit of decreased travel costs. Generally, increasing land use density succeeds only when walking and biking modes are adequate. Thus, support for implementation will depend on integrating both the form of development and the convenience, economy, safety, and the attractiveness of its mobility systems.[63]

Competition with Roadway Infrastructure Improvements

Expanding road capacity generally increases auto travel and therefore, also increases emissions. In particular, new or expanded HOV lanes on freeways increase travel, so both provide significant constraints to other actions that reduce driving. As a result, ease of implementation will depend on other regional and State transportation decisions. Conversely, transportation demand management[64] provides a proven method for reducing local VMT, saving fuel, and reducing congestion, so its implementation should be supported by the community.[65]

Perceived Threat of Climate Change

A well-documented and significant shift in the observable impact of climate changes—the reporting of the collapse of the Antarctic Ice Sheets, for example—could greatly accelerate the public's willingness to change travel behavior, and support governmental policies and standards for reducing emissions. But absent a dramatic climate change event reported by the mainstream media, or a displacement of climate change news by economic or political news, for example, will likely reduce the ease of implementation.

Realizing Combined Benefits of Land Use, Transit, and Mobility Strategies

An American Public Transportation Association (APTA) study on public transit and land use found that switching from an auto trip to a transit trip not only saves a certain amount of fuel, but also the presence of transit itself helps create fuel-efficient neighborhoods. APTA found that having transit enabled built environments where people drove less, walked more, and used transit more. The secondary effect was twice the magnitude of the primary effect.[66] Thus, educating the public and policy makers on the combined benefits of both land use and transportation strategies will make implementation easier.

---

[61] Incentive or disincentive (% responding that it is very likely that incentive or disincentive would get them to stop driving along): parking fee (20%, smog fee (17%), congestion fee (16%), cash bonus to stop driving (28%), more public transit (33%) more carpools to work (35%). US Department of Transportation has published more information on Intelligent Transportation Systems (ITS): www.its.dot.gov, www.itsoverview.its.dot.gov

[62] US Department of Transportation has published more information on Intelligent Transportation Systems (ITS): www.its.dot.gov, www.itsoverview.its.dot.gov

[63] University of California, Davis. Robert A. Johnston. Review of U.S. and European Regional Modeling Studies of Policies Intended to Reduce Motorized Travel, Fuel Use, and Emissions. August 2006

[64] Transportation demand management is the application of strategies and policies to reduce demand for automobile travel or manage the demand for automobile travel at certain times and locations.

[65] Association for Commuter Transportation. *The Role Of Demand-Side Strategies: Mitigating Traffic Congestion*. 2004. Prepared for the Federal Highway Administration. Available from http://tmi.cob.fsu.edu/act/FHWA_Cong_Mitigation_11%202%2004.pdf.

[66] Journal of Public Transportation. *Transit Price Elasticities and Cross-Elasticities.* 2004, Vol. 7, No. 2, pp. 37-58. Available from www.nctr.usf.edu/jpt/pdf/JPT 7-2 Litman.pdf.

Estimated GHG Emissions Reductions

If program goals are achieved, it is estimated that Strategy 1 actions will result in an annual emissions savings of approximately 9,626 metric tons CO_2e/year in 2020 and 99,174 metric tons CO_2e/year in 2050, as measured from BAU projections. It is estimated that if long-term goals are achieved, emissions savings from Strategy 1 will contribute 6.2 percent of the emissions reductions needed to meet the 2020 target and 9.3 percent of the emissions reductions needed to meet the 2050 target. Estimated annual emissions reductions from specific actions are presented in Appendix B.

In 2005, gasoline-powered vehicles traveled a total distance of 1.29 billion miles on Hayward's roadways and diesel-powered vehicles traveled a total of 95 million miles.[67] As a result, 734,085 metric tons of CO_2e was emitted into the atmosphere. Reducing VMT will significantly decrease GHG emissions; for example, cutting the total VMT in gasoline-powered vehicles in half, to 615 million miles, would reduce transportation-related emissions by 40 percent to 443,065 metric tons of CO_2e. This alone is enough to achieve Hayward's 2020 reduction target.

Costs and Additional Benefits

Cost

Investment costs associated with implementing Strategy 1 include paying City staff to develop programs that aim to reduce VMT. The ongoing operation and maintenance costs include paying one person of a staff of people to coordinate all of numerous commuter programs and to administer the programs. Depending on how the City develops the programs, the City may not pay for operational costs. This is especially true if a third party organization is responsible for managing and coordinating all of Hayward's transportation-related programs.

To be successful, residents and businesses will have to participate in efforts to reduce VMT. To achieve the level of participation that is necessary to meet aggressive emissions reductions goals, the City will have to pay for ongoing outreach, education, and marketing.

Additional Benefits

Reducing VMT will result in a smaller amount of fuel burned within Hayward. Reduced fuel consumption will result in a reduction of not only GHGs but a number of hazardous air pollutants including nitrogen oxides, sulfur oxides, ozone, and particulate matter. These hazardous air pollutants cause, among other things, acid rain, smog, and increased asthma rates and other health issues. Reducing fuel consumption could result in health benefits and improved local and regional air quality.

Additional Benefits to Public Health

Emissions from motor vehicles include pollutants that impact regional and local air quality. Near-source air pollution impacts have the most serious health consequences and are more akin to occupational exposures. If the pollutant's travel time to a person is more than three minutes from the exhaust pipe, most of the health risk is greatly reduced. Transportation emissions are not only diluted and dispersed fairly rapidly, but they evolve even more rapidly. Fresh mobile air pollutants evolve furiously in the first three seconds and subsequently into much less dangerous size, composition, and concentration the first three minutes after exhaust. The ease of implementing reduction in VMT will be dependent on the success in educating the public and policy makers about health implications of tailpipe emissions from proximity to traffic congestion for drivers, passengers, cyclists, and pedestrians. For example,

[67] ICLEI. Hayward Baseline Emissions Inventory. VMT data from Metropolitan Transportation Commission

educational tools can be used to illustrate that those living within 100 yards of major congested highways or City streets can have occupational-scale exposures similar to long-haul truckers, urban delivery van drivers, or diesel rail engineers.

Strategy 1 Actions

Community-wide actions

Increase the Use of Alternative Modes of Transportation

Action 1.1 Assist businesses in developing and implementing commuter benefits programs. A commuter benefits program might consist of an offer to provide discounted or subsidized transit passes, emergency ride home programs, participation in commuter rideshare programs, parking cash-out or parking pricing programs, or tax credits for bike commuters.

Action 1.2 Assist businesses in developing and implementing car sharing programs, such as Zip Car® or City Car Share, and encourage large employers such as the colleges and Hayward Unified School District (HUSD) to implement such programs.

Action 1.3 Modify City parking ordinances to incentivize walking, biking, and public transit by employing parking strategies that include adding bicycle parking, increasing the number of parking spots with time limits, adjusting parking time limits to correspond with adjacent building uses, increasing the number of paid parking spaces, and making space location and fees consistent with demand targets.

Improve Effectiveness of Transportation Circulation System

Action 1.4 Collaborate with BART and AC Transit to explore short- and long-term opportunities to expand services (for example, to extend rapid bus service from Bay Fair to the South Hayward BART Station and pursue a hydrogen fueling station for both buses and personal vehicle use, and improve transit stations by expanding amenities at stations.

Action 1.5 Continue to implement and expand the City-wide bicycle master plan through aggressive pursuit of grants and other sources of funding which could be used to expand bike lanes and bike parking facilities. Assist businesses in creating or expanding bike-to-work incentive programs, including bike sharing, adequate secure bike parking, bike maps of the City, bike safety classes, and other incentives that reward bikers.

Action 1.6 Develop and implement a City-wide pedestrian master plan that improves the convenience, safety, and attractiveness of and access to pedestrian ways. Update the plan on a regular basis to ensure that walkability improves over time.

Action 1.7 Update the City's Circulation Element of the General Plan to locate, evaluate appropriate transit modes such as street car, bus rapid transit, or other modes that eventually decrease the need for personal vehicles for travel within the City. The Plan should integrate pedestrian, bicycles, and transit modes with motor and other vehicles. When proposing changes to the transportation system, the City should consider the climate impacts and give preference to solutions that reduce auto dependency and minimize GHG emissions.

Action 1.8 Improve traffic flow and reduce vehicle idling by means of synchronized signals, transit and emergency signal priority, and other traffic flow management techniques. When developing the program, Hayward should work with the Metropolitan Transportation Commission and the Alameda County Congestion Management Agency to expand roadway and intersection performance metrics to include pedestrian, bicycle, and level of service criteria to measure quantitative and qualitative metrics such as accessibility, intersection crossing times, and other relevant data. It is recommended that Hayward use evaluation criteria that consider costs and GHG reduction benefits of biking, walking, carpooling, and public transit.

Utilize Zoning & Land-use Mechanisms to Minimize Need for Auto Transportation

Action 1.9 In order to encourage non-automotive modes of travel, continue to implement and update the General Plan Circulation and Land Use Elements pertaining to smart growth principles that support higher-density, mixed-use, and well-designed development in areas within ½ mile of transit stations and ¼ mile of major bus routes. Amend the Municipal Code Zoning, Subdivision, and Off-Street Parking Standards to incorporate smart growth principles, policies, and development standards consistent with recommendations provided in the Appendix H and I of the CAP.

Action 1.10 Explore the development of zoning and development standards that consider both the land uses and the urban design and form of buildings and public space, where the new standards will result in reduced GHG emissions.

Action 1.11 Explore potential strategies related to the creation of additional affordable housing to sell to buyers employed in Hayward, but who currently reside in other areas and commute to work in Hayward. For example, consider implementing a community land trust to purchase and resell foreclosed properties. The program could potentially be coordinated with local businesses.

Action 1.12 Develop an incentive plan to maximize the number of residents that work within the City, and encourage filling local jobs first with local residents, to eliminate commutes.

Municipal Actions

Action 1.13 Reinstate commuter benefits such as Commuter Checks to City employees, and when possible expand or develop other commuter benefits programs such as parking cash-out or parking pricing programs, or taking advantage of the new tax credit for biking to work. The City will amend Administrative Rule 2.26 to reflect current transportation demand management opportunities.

Action 1.14 Explore options in developing a car-sharing and/or bike-sharing program for City employees. If private organizations like Zip Car are not interested in managing the car sharing program, it could be administered by the City as a benefit available to City employees only. A bike share program would also be administered by the City as a benefit to City employees.

Action 1.15 When making decisions about where to rent or build new City facilities, give preference to locations that are accessible to an existing public transit line.

Summary Table

Table 3: Strategy 1 – Transportation and Land Use: Reduce Vehicle Miles Traveled

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Community-wide Actions				
Increase the Use of Alternative Modes of Transportation				
Action 1.1	Assist businesses in developing and implementing commuter benefits programs. A commuter benefits program might consist of an offer to provide discounted or subsidized transit passes, emergency ride home programs, participation in commuter rideshare programs, parking cash-out or parking pricing programs, or tax credits for bike commuters.	• Success of program is highly dependent on how much marketing and outreach is dedicated to the program. • Implementation will be greatly influenced by oil costs and other driving expenses. • Regional and State transportation decisions on increasing road capacity could play a part in the perception of a need for commuter programs. If there is more road capacity, then commuters are less likely to participate in these programs. • The City used the Commuter Check program in the past. Future implementation will require careful consideration of administrative costs against potential tax benefits.	• The Green Bean Commuting Newsletter by Accor Services provides information on commuter benefits. http://accorservicesusa.com/enews.aspx • This document describes a recent commuter survey in which 44 percent of respondents report that rising fuel prices have affected their travel decisions: http://www.accorservicesusa.com/Images/email/commuting_habit_change.jpg	**Costs** • Salary for City staff to develop programs, set up a program operations plan, and seed funding • Little or no operation costs. • **Additional Benefits** • Decreased commuting costs; reduced traffic congestion. • Improved air quality.
Action 1.2	Assist businesses in developing and implementing car sharing programs, such as Zip Car® or City Car Share, and encourage large employers such as the colleges and Hayward Unified School District (HUSD) to implement such programs.	• Dependent upon whether car sharing companies are interested in expanding services to serve Hayward. At this time, local car sharing companies have not expressed significant interest in expanding their services to Hayward, but this may change in the future. • Success of the program is highly dependent on how much marketing and outreach is dedicated to the program.	• Worlds Changing - Tools: Models and Ideas for Building a Bright Green Future - My Other Car is a Bright Green City. • The L.E.K. Consulting Carbon Footprint Report 2007 Carbon Footprints and the Evolution of Brand-Consumer Relationships	**Costs** • Salary for City staff to develop programs, set up a program operations plan, and seed funding for efficiency finance program. Little or no operation costs. • **Additional Benefits** • Decreased commuting and non-commuting trip costs; reduced traffic congestion •
Action 1.3	Modify City parking ordinances to incentivize walking, biking, and public transit by employing parking strategies that include adding bicycle parking, increasing the number of parking spots with time limits, adjusting parking time limits to correspond with adjacent building uses, increasing the number of paid parking spaces, and making space location and fees consistent with demand targets.	• Parking protocol could have an impact on patronage to local businesses. At the moment, there is a significant concern that revamping parking ordinances could result in damage to local businesses, will likely face opposition, and is better suited for implementation in the future when the economy is more stable. • Costs of a Parking Management Plan and changes to other ordinances may dissuade the City from implementing this action. • Citizens may complain about increase in parking fees and the number of paid parking spaces. • Coordination with adjacent cities may reduce leakage of development and shoppers.	• Refer to City of Hayward CAP, Draft Municipal Code Recommendations, July 24 '08 in Appendix H • Putting on their Parking Caps.pdf Adam Millard-Ball, "Putting on their Parking Caps", Planning, April 2002, v68 i4 p16(6). • Donald Shoup, The High Cost of Free Parking (2005), Planners Press, American Planning Association; Chapter 20 • The San Mateo County Senior Mobility Action Plan, A broad coalition of concerned entities in San Mateo County, www.seniormobilityplan.com	**Costs** • Salary for City staff to rewrite appropriate Municipal Codes; labor and equipment to install and maintain an electronic parking management system. **Additional Benefits** • Reduced traffic congestion, increased parking fee revenues, potential for improved public health from walking and biking.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Improve Effectiveness of Transportation Circulation System				
Action 1.4	Collaborate with BART and AC Transit to explore short- and long-term opportunities to expand services (for example, to extend rapid bus service from Bay Fair to the South Hayward BART Station and pursue a hydrogen fueling station for both buses and personal vehicle use, and improve transit stations by expanding amenities at stations.	• These amendments should be incorporated in the next scheduled General Plan and Municipal Code updates and/or the next community transportation plan prepared by the Alameda County Congestion Management Agency. • The reduction in vehicle miles traveled (VMT) possible in the United States ranges between 20 to 40 percent reduction for each increment of new development or redevelopment, depending on the degree to which best practices are adopted. • 7 to 10 percent reduction in total CO_2 emissions by 2050 will accompany such a reduction in VMT compared to continuing sprawl.	• The San Mateo County Senior Mobility Action Plan, A broad coalition of concerned entities in San Mateo County, www.seniormobilityplan.com • UC Davis. Susan Shaheen. Easy Connect II: Integrating Transportation, Information, and Energy Technologies at TOD's, 2005 ITS • North Allston-Brighton Community-Wide Plan, Boston Redevelopment Agency (A TOD plan) • Cervero, Robert, et al. Transit-Oriented Development in the United States: Experience, Challenges, and Prospects. Washington, DC: Transit Cooperative Research Program, Transportation Research Board http://gulliver.trb.org/publications/tcrp • TRB's Transit Cooperative Research Program (TCRP) Report 128: Effects of TOD on Housing, Parking, and Travel, 2004.	**Costs** • Salary for City staff to coordinate with transit agencies. • Cost of design, engineering, labor, and material costs to add or improve transit stations and expand amenities. • Maintenance cost of station and amenities. • Cost to pay staff to operate and staff new shops or proved new services. • Could get funding from increase taxes. • Businesses around stations could benefit from development. **Additional Benefits** • Increase tax from business development around stations.
Action 1.5	Continue to implement and expand the City-wide bicycle master plan through aggressive pursuit of grants and other sources of funding which could be used to expand bike lanes and bike parking facilities. Assist businesses in creating or expanding bike-to-work incentive programs, including bike sharing, adequate secure bike parking, bike maps of the City, bike safety classes, and other incentives that reward bikers.	• Hayward has had a Bicycle Master Plan in place since 1979 and was last updated in 2007. The City has been successful at implementing the programs envisioned in the various iterations of the Plan. The City has already committed resources to implementing the Bike Master Plan, so implementing the Plan to fulfill the CAP recommendation will not require significant additional resources. • When updating the Bike Master Plan, the City should aim to take aggressive actions that will result in significant GHG emissions reductions. The challenge does not lie in updating the Plan; the challenge is updating the Plan with actions that are aggressive enough to allow the City to meet emissions goals. • In order to increase travel on bikes, the City will have to address safety concerns: not only general biker safety concerns, but also neighborhood safety concerns.	• Hayward Bicycle Master Plan – download from www.ci.hayward.ca.us/departments/publicworks/spublicworks.shtm • BAAQMD offers grants for bike facility upgrades through its Bicycle Facility Program. www.baaqmd.gov. • Bay Area Bike Coalition www.bayareabikes.org • Bike Alameda. www.bikealameda.org • California Bicycle Coalition http://www.calbike.org/ • Commuter Benefits Now Extended to Cover Bicyclist, http://blog.wired.com/gadgets/2008/10/bailout-bill-gi.html. • Rails-to-Trails and Bikes Belong. *Active Transportation for America: a Case for Increased Federal Investment in Bicycling and Walking.* www.railstotrails.org/afta. This report quantifies the transportation, energy, climate, public health, and economic benefits of bicycling and walking. • Washington DC has launched the first community-wide bike share program in the United States. https://www.smartbikedc.com • The Bike-sharing World Map shows bike sharing programs throughout the world and provides links to program websites. The Map is provided by The Bike-sharing Blog (http://bike-sharing.blogspot.com) and MetroBike, LLC (http://MetroBike.net).	**Costs** • Salary for City staff to design bike land and bike facilities. • Salary for City staff to pursue grants. • Cost to City for marketing, outreach and education (create bike maps of the City, maintain and expanded bike programs, etc.). • Design and construction cost of bike lanes and bike facilities including secure bike parking. • Cost of maintaining bike facilities. **Additional Benefits** • Reduced traffic congestion. • Improvements in overall air quality which has been linked to public health benefits. • Biking is a low-cost mode of transportation. • Potential for improved public health from exercise benefits of biking.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Action 1.6	Develop and implement a City-wide pedestrian master plan that improves the convenience, safety, and attractiveness of and access to pedestrian ways. Update the plan on a regular basis to ensure that walkability improves over time.	• This will need to take place very soon. The foreclosure crisis is not expected to last for years, and if the City is to pursue this opportunity they will have to act soon. • When developing a plan, the City should aim to take aggressive actions that will result in significant GHG emissions reductions. The challenge does not lie in creating and updating the Plan, the challenge is making the plan aggressive enough to allow the City to meet emissions goals. •	• Walkability metrics: Checklist-walkability.pdf, www.sfphes.org HIA_Tools_PEQI.htm • Greenwald, Michael & Marlon Boarnet, The Built Environment as a Determinant of Walking Behavior: Analyzing Non-Work Pedestrian Travel in Portland, Oregon. Institute of Transportation Studies, University of California, Irvine, July 2001. • Pedestrian Safety Audits: A Pedestrian Safety Guide http://www.walkinginfo.org/library/details.cfm?id=3955 • Bike Walk Twin Cities is an initiative designed to make it easier for people to move about without using a car. Armed with a $21.5 million federal grant, they are building new bike lanes, safer crosswalks, and other improvements to make it easier to walk and bike in Minneapolis and its neighboring communities. Bike Walk Twin Cities is a good model for Hayward www.bikewalktwincities.org	**Costs** • Salary for City staff to develop, implement and periodically update a Citywide pedestrian master plan. • Capital costs associated with implementation. **Additional Benefits** • Reduced traffic congestion. • Improvements in overall air quality which has been linked to public health benefits. • Walking is a low-cost mode of transportation. • Potential for improved public health from exercise benefits of walking.
Action 1.7	Update the City's Circulation Element of the General Plan to locate, evaluate appropriate transit modes such as street car, bus rapid transit, or other modes that eventually decrease the need for personal vehicles for travel within the City. The Plan should integrate pedestrian, bicycles, and transit modes with motor and other vehicles. When proposing changes to the transportation system, the City should consider the climate impacts and give preference to solutions that reduce auto dependency and minimize GHG emissions.	• Plan can be developed and initiated within next 5 years, but it will require a continued effort. • Success of program is dependent on how much marketing and outreach is dedicated to the program. • Implementation will be greatly influenced by oil costs and other driving expenses. • Ease of implementation will depend on regional and State decisions regarding subsidy for this type of program.	• Federal Transit Administration, John L. Renne, Thomas W. Sanchez and Todd Litman. National Study on Carless and Special Needs Evacuation Planning: A Literature Review. http://www.planning.uno.edu/docs/CarlessEvacuationPlanning.pdf • Pedestrian Safety Guide for Transit Agencies, February 2008, FHWA-SA-07-017 • Pedestrian and Transit-Friendly Design: A Primer for Smart Growth, www.epa.gov/dced/pdf/ptfd_primer.pdf	**Costs** • Salary for City staff to develop and periodically update a long-term transportation master plan, and, if required, consulting fees for assistance by transportation planners and engineers. • Other costs include implementation of the plan and construction of improvements. **Additional Benefits** • Motor vehicles cost about 1-8¢ per mile traveled. Many studies underestimate total costs by considering only a portion of total air pollution impacts. The full costs of air pollution, including all types of emissions, and their full impacts on human health (including premature deaths, illnesses, medical care, and reduced physical activity), agriculture productivity, ecological resources, and aesthetic quality leads to relatively high cost estimates.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Action 1.8	Improve traffic flow and reduce vehicle idling by means of synchronized signals, transit and emergency signal priority, and other traffic flow management techniques. When developing the program, Hayward should work with the Metropolitan Transportation Commission and the Alameda County Congestion Management Agency to expand roadway and intersection performance metrics to include pedestrian, bicycle, and level of service criteria to measure quantitative and qualitative metrics such as accessibility, intersection crossing times, and other relevant data. It is recommended that Hayward use evaluation criteria that consider costs and GHG reduction benefits of biking, walking, carpooling, and public transit.	• When developing intelligent transportation systems, the City should be cognizant of ensuring priority access to public safety officials • If successful, intelligent transportation systems will improve driving conditions (i.e. reduce travel time, reduce risk of accidents), which could ultimately encourage people to drive. The City should be aware of this when designing intelligent transportation systems, and make efforts keep VMT down even if driving conditions improve. • Implementing a regional intelligent transportation system will require collaboration with other jurisdictions. It is generally more difficult to manage projects that require a consensus from more than one jurisdiction.	• Improved Methods For Assessing Social, Cultural, And Economic Effects Of Transportation Projects http://www.statewideplanning.org/_resources/234_NCHRP-8-36-66.pdf • National Household Travel Survey, 2001-2002. Bureau of Transportation Statistics (BTS) www.bts.gov/programs/national_household_travel_survey • The Broader Connection between Public Transportation, Energy Conservation. and Greenhouse Gas Reduction. ICF International. www.apta.com/research/info/online/documents/land_use.pdf • Explanation: Intelligent Transportation Systems (ITS), US Department of Transportation. www.its.dot.gov and www.itsoverview.its.dot.gov • The Intelligent Transportation Systems initiative of the US Department of Transportation, Research and Innovative Technology Administration is a useful resource. www.its.dot.gov	**Costs** • Salary for City staff to investigate the changes to transportation, circulation system, consider the resulting climate impacts, and give preference to measures that minimize GHG emissions. • Salary for City staff to work with Metropolitan Transit Commission and Congestion Management Authority. • Clinton Climate Initiative reports that the City of Portland, Oregon invested $533,000 in its traffic signal optimization program. It is estimated that drivers save approximately $4.13 million per year in fuel savings. Source: Clinton Climate Initiative: http://www.c40cities.org/bestpractices/transport/portland_traffic.jsp **Additional Benefits** • Reduced traffic congestion • Reduced travel time • Improved air quality, which has health and environmental benefits.
Utilize Zoning & Land-use Mechanisms to Minimize Need for Transportation				
Action 1.9	In order to encourage non-automotive modes of travel, continue to implement and update the General Plan Circulation and Land Use Elements pertaining to smart growth principles that support higher-density, mixed-use, and well-designed development in areas within ½ mile of transit stations and ¼ mile of major bus routes. Amend the Municipal Code Zoning, Subdivision, and Off-Street Parking Standards to incorporate smart growth principles, policies, and development standards consistent with recommendations provided in the Appendix H and I of the CAP.	• These amendments should be incorporated in the next scheduled General Plan and Municipal Code updates. • The reduction in vehicle miles traveled (VMT) is possible in the United States ranges between 20 to 40 percent reduction for each increment of new development or redevelopment, depending on the degree to which best practices are adopted. • 7 to 10 percent reduction in total reduction in CO_2 emissions by 2050 will accompany such a reduction in VMT transportation relative to continuing sprawl.	• Rajamani, Jayanthi, et al. Assessing the impact of urban form measures in non-work trip mode, Transportation Research Board 2003 Annual Meeting. Schlossberg, Marc, et al • Urban Land Institute. *Growing Cooler: The Evidence on Urban Development and Climate Change*. 2007. www.1kfriends.com/documents/GrowingCooler9-18-07small.pdf • 2005 and 2008 CNU Transportation Summit Reports: Toward a New Urbanist Transportation Agenda, www.cnu.org • The Pedestrian and Bicycle Information Center (PBIC) is a national clearinghouse for information about health and safety, engineering, advocacy, education, enforcement, access, and mobility for pedestrians (including transit users) and bicyclists. The PBIC serves anyone interested in pedestrian and bicycle issues, including planners, engineers, private citizens, advocates, educators, police enforcement, and the health community. PBIC's websites include	**Costs** • Salary for City staff to help promote smart growth land-use planning in City development review, for interim City planning efforts, and for the next General Plan Update. **Additional Benefits** • Reduced traffic congestion, increased transit use, tax revenues and parking fees, potential for improved public health from walking and biking.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
			www.walkinginfo.org www.bicyclinginfo.org www.pedbikeinfo.org www.pedbikeimages.org www.saferoutesinfo.org	
Action 1.10	Explore the development of zoning and development standards that consider both the land uses and the urban design and form of buildings and public space, where the new standards will result in reduced GHG emissions.	• Ease of implementation will depend on regional and State decisions regarding development standards. • Costs of creating a form-based code may dissuade the City from implementing this action. • Implementation will be greatly influenced by oil costs and other driving expenses. Form-based codes offer the potential for residents to live closer to daily needs, thus the convenience to drive less. • A decline or displacement of climate change news by economic or political news, for example, will decrease the public's observed need for change in development patterns, thus decreasing the ease of implementation.	• Form-Based Code Institute: Form-based codes create a predictable public realm by controlling physical form, www.formbasedcodes.org • Form Based Codes : A Guide for Planners, Urban Designers, Municipalities, and Developers, Daniel G. Parolek, AIA, Karen Parolek, Paul C. Crawford, FAICP, ISBN: 978-0-470-04985-3 • "Green" Form-Based Codes, a summary of FBC's for sustainability. www.town-green.org • Zoning Reform Has Begun: Form-Based Codes. www.realtor.org/smart_growth.nsf/Pages/formbasedcodes	**Costs** • Salary for City staff to evaluate the development, adoption, and implementation of zoning and development standards that consider both the land uses and the urban design or form of buildings and public space, such as a form-based code, that includes the adoption and implementation estimates. **Additional Benefits** • Potential for decreased design and development costs and time for builders, and reduction in City staff development review time.
Action 1.11	Explore potential strategies related to the creation of additional affordable housing to sell to buyers employed in Hayward but who currently reside in other areas and commute to work in Hayward. For example, consider implementing a community land trust to purchase and resell foreclosed properties. The program could potentially be coordinated with local businesses.	• This will need to take place very soon. The foreclosure crisis is not expected to last for years, and if the City is to pursue this opportunity they will have to act soon. • Ease of implementation will depend on regional and State decisions regarding affordable housing regulations. • A decline in housing prices will have a direct effect on the perceived need for an expanded affordable housing program.	• Congress for the New Urbanism (CNU): CNU Report: Housing Affordability 2008, Ray Gindroz, Daniel Solomon, Emily Talen, John Norquist, CNUhousingreportfinal.pdf • Affordable Housing - CPD – HUD, www.hud.gov/offices/cpd/affordablehousing/index.cfm • Lincon Institute of Land Policy. Community Land Trusts: Leasing Land for Affordable Housing. www.lincolninst.edu • City of Lancaster Neighborhood Stabilization Program http://www.cityoflancasterca.org	**Costs** • Salary for City staff to explore the potential of implementing a community land trust to buy foreclosed properties and sell them to individuals who are employed in and commute to Hayward but reside in other areas, and, if required, consulting fees for assistance by economic advisors. • Cost to City to supply seed funds for purchasing homes **Additional Benefits** • Cost benefits would include increased property and sales tax revenues.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Action 1.12	In order to encourage non-automotive modes of travel, continue to implement and update the General Plan Circulation and Land Use Elements pertaining to smart growth principles that support higher-density, mixed-use, and well-designed development in areas within ½ mile of transit stations and ¼ mile of major bus routes. Amend the Municipal Code Zoning, Subdivision, and Off-Street Parking Standards to incorporate smart growth principles, policies, and development standards consistent with recommendations provided in the Appendix H and I of the CAP.	• Plan can be developed and initiated within next 5 years, but it will require a continued effort. • Success of program is dependent on how much marketing and outreach is dedicated to the program. • Implementation will be greatly influenced by oil costs and other driving expenses. • Ease of implementation will depend on regional and State decisions regarding subsidy for this type of program.	• SMARTRAQ is a Georgia Tech research project whose goal is to provide a framework for assessing which combinations of land use and transportation investment policies have the greatest potential to reduce the level of auto dependence while promoting the economic and environmental health of the Atlanta metropolitan region. www.act-trans.ubc.ca/smartraq/pages • Joint Policy Committee. Bay Area Focused Growth Initiative. www.bayareavision.org • Greenbelt Alliance and Sierra Club Loma Prieta Chapter. *Climate Change in General Plans:* • *Sample Language and Policies for Activists*. March 2009. http://lomaprietaglobalwarming.sierraclub.org/resources/General_Plans_and_Climate_Change-Complete.pdf	**Costs** • Salary for City staff to develop a plan to maximize the number of residents who work within the City. • Costs will vary dependent on the incentives created. **Additional Benefits** • Cost benefits would include increased property and sales tax revenues, and increased business for local shops and services.
Municipal Actions				
Action 1.13	Reinstate commuter benefits such as Commuter Checks to City employees, and when possible expand or develop other commuter benefits programs such as parking cash-out or parking pricing programs, or taking advantage of the new tax credit for biking to work. The City will amend Administrative Rule 2.26 to reflect current transportation demand management opportunities.	• The City will have to advertise the programs and encourage employees to take advantage of the programs. Without proper internal advertising, staff may not take advantage of the commuter benefits programs. • If the City is going to develop or revise its existing commuter benefits programs for City employees, the City may consider developing a resource center for local businesses in conjunction with its internal effort.	• 511.org offers a number of services to Bay Area employers, including government employers, that are developing or improving employee commuter benefits programs. www.511.org • Best Workplaces for Commuters℠ is a membership program that provides qualified employers with national recognition and an elite designation for offering outstanding commuter benefits, such as free or low cost bus passes, strong telework programs, carpooling matching and vanpool subsidies. They also provide best-practice case studies and resources. www.bestworkplaces.org • CommuterChoice.com's mission is to help employers connect with service providers in their local areas, who can help implement relevant Commuter Choice programs at their worksites. www.commuterchoice.com • Association of Commuter Transportation supports individual mobility management professionals and organizational members in their efforts to reduce traffic congestion, conserve energy, and improve air quality. www.actweb.org	**Costs** • Salary for City staff to develop or redesign commuter benefits programs. • Cost to City to pay for commuter benefits programs. • Cost savings to City employees who take advantage of programs. **Additional Benefits** • Could help with employee retention and employee satisfaction.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Action 1.14	Explore options in developing a car-sharing and/or bike sharing program for City employees. If private organizations like Zip Car are not interested in managing the car sharing program, it could be administered by the City as a benefit available to City employees only. A bike share program would also be administered by the City as a benefit to City employees.	• The City will have to advertise the car share and bike share programs. Without proper internal advertising, staff may not take advantage of the commuter benefits programs. • City may have to address the health and safety risks of providing a bike share and car share program. • City can explore opportunities for public-private partnerships to manage the municipal programs.	• Washington DC has launched the first community-wide bike share program in the United States. https://www.smartbikedc.com • The Bike-sharing World Map shows bike sharing programs throughout the world and provides links to program websites. The Map is provided by The Bike-sharing Blog (http://bike-sharing.blogspot.com) and MetroBike, LLC (http://MetroBike.net). • An international list of cities with car sharing programs is available at http://www.carsharing.net/where.html	**Costs** • Salary for City staff to develop program • Cost to purchase bikes or cars. This cost could be a cost to the City or a private sector entity. **Additional Benefits** • Could help with employee retention and employee satisfaction.
Action 1.15	When making decisions about where to rent or build new City facilities, give preference to locations that are accessible to an existing public transit line.	• It may help to establish a City-wide protocol for renting and/or purchasing buildings in proximity to public transit.	• None identified	**Costs** • Incremental cost to City for purchasing or renting buildings close to transit. **Additional Benefits** • City employees benefit from having an easier commute. • Could help with employee retention and employee satisfaction.

Strategy 2: Transportation: Decrease Carbon-Intensity of Vehicles

Goal

The goal of Strategy 2 is to reduce the carbon-intensity (or amount of GHG emissions released per mile traveled) of vehicles traveling on Hayward's roadways. This will be accomplished by encouraging people to switch to vehicles with higher fuel economy or cleaner-fueled vehicles and by advocating for state and federal programs and policies that would reduce the carbon-intensity of vehicles. This Strategy aims to reduce carbon-intensity of all vehicles that travel in or through Hayward: not just vehicles owned by Hayward's residents or owned by the City government.

Some examples of vehicles with low carbon-intensities include: [68]

- Hybrid vehicles
- Plug-in hybrid vehicles
- All-electric vehicles
- Compressed natural gas vehicles
- Diesel vehicles
- Ethanol-powered vehicles
- Bio-diesel vehicles
- Propane vehicles
- Fuel-cell vehicles
- Ultra-high fuel economy gasoline internal combustion vehicles

The long-term goals of Strategy 2 are to (1) increase the average fuel economy of passenger vehicles to 75 mpg by 2050 and (2) increase the average fuel economy of heavy trucks to 11.5 mpg by 2050. As mentioned in Section 4, 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.

Ease of implementation

Strategy 2 actions could be difficult to implement because Hayward does not have direct control over which vehicles people choose to purchase or the type of vehicles automobile manufacturers choose to build and sell. To successfully implement Strategy 2, Hayward will have to collaborate with nearby jurisdictions, state government, and Federal government. Recent state legislation (SB 375) could make it easier for Hayward to work with other governments and organizations on transpiration-related initiatives.

Strategy 2 actions will result in economic impacts. For example, the federal government and some state governments including California currently are or will provide tax credits for hybrid vehicles. This provides both a purchase incentive and motivation to save petroleum fuel costs. Some additional impacts of specific actions are listed below.

[68] EPA's website Fueleconomy.gov is a useful resource to learn more about passenger vehicles and their carbon impacts.

Purchase of, or conversion to, natural gas vehicles incentives and programs: Natural-gas fueled vehicles may result in cost-savings as compared to gasoline and diesel-powered vehicles. As crude-oil derived fuels (including gasoline and diesel) increase in cost and as natural gas fuel sources become more readily available, natural-gas powered vehicles could become less expensive to operate than traditional vehicles. Implementing programs and policies for natural gas fuel vehicles will be difficult without incentive programs and improved access to the fuel.

Purchase of, or conversion to, lower-carbon-fuel vehicles: Bio-diesel and other alternative-fueled vehicles may save fuel costs over time, as petroleum-based fuels increase in costs, and as alternative fuels become a market commodity. Implementing programs and policies for alternative fuel vehicles will be difficult without incentive programs and especially, increased access, to and reduction in the cost of, alternative fuels.

State and federal collaboration
Hayward does not have the authority to mandate fuel economy or biofuel use. Hayward will depend on the state and federal government to set regulations that direct automobile manufacturers to sell low-carbon vehicles.

Financial disincentives for purchasing high carbon intensity vehicles: Instituting surcharges on vehicle registration fees or other financial or non-financial disincentives to discourage the use of high-carbon intensity vehicles has proven difficult to reenact in California. In general, people are more receptive to financial incentives than financial disincentives. Instituting financial disincentives will be particularly difficult to do in an economic recession.

Estimated GHG Emissions Reductions

If program goals are achieved, it is estimated that Strategy 2 actions will result in an annual emissions savings of approximately 129,060 metric tons CO_2e/year in 2020 and 532,735 metric tons CO_2e/year in 2050, as measured from BAU projections. It is estimated that emissions savings from Strategy 2 will contribute 83.5 percent of the emissions reductions needed to meet the 2020 target and 49.8 percent of the emissions reductions needed to meet the 2050 target (see Appendix C).

Cost and Additional Benefits

Costs

Cost impacts will include cost to the City to pay staff to develop and maintain new programs, to coordinate and collaborate with other governmental agencies and regional planning organizations, and to continue to implement existing programs.

Cost impacts to residents and businesses may include the incremental cost of purchasing lower carbon-intensity vehicles instead of higher carbon-intensity vehicles.

To be successful, residents and businesses will have to participate in efforts to reduce the carbon-intensity of vehicles traveling on local roads. To achieve the level of participation that is necessary to meet aggressive emissions reductions goals, the City will have to pay for ongoing outreach, education, and marketing.

Additional Benefits

Reducing the amount of fuel burned within Hayward will result in decreases in emissions of not only GHGs but a number of hazardous air pollutants including nitrogen oxides, sulfur oxides, ozone, and particulate matter. These hazardous air pollutants cause, among other things, acid rain, smog, and increased asthma rates and other health issues. Reducing fuel consumption could result in health benefits and improved local and regional air quality.

If the fuel economy of vehicles improves while the initial cost of vehicles remains relatively constant, residents could save a significant amount of money from decreased fuel expenditures. It is possible that money residents do not spent on fuel could be spent within the community, thereby improving economic conditions within the City.

Strategy 2 Actions

Community-wide Actions

Action 2.1 Play an active role in collaborating with regional, state, and federal efforts to provide financial and non-financial incentives for residents to purchase low-carbon vehicles. For example, the City could host work sessions with regional transportation planners and policy makers, or the City may support pending legislation. They City could consider granting designated vehicles access to preferred parking spaces.

Action 2.2 Plan an active role in collaborating with regional, state, and federal entities to promote the use of alternative fuels and increased vehicle fuel efficiency standards. For example, Hayward may advocate for higher fuel-economy standards, or contribute to regional and state marketing and outreach efforts.

Municipal Actions

Action 2.3 Continue to procure fuel-efficient and alternative fuel vehicles for municipal vehicle fleet.

Action 2.4 Continue to, whenever possible, negotiate an alternative fuel requirement into new services provided by the City's franchisee.

Summary Table

Table 4: Strategy 2 – Transportation: Decrease Carbon-Intensity of Vehicles

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Community-wide Action				
Action 2.1	Continue to collaborate with regional, state, and federal authorities to provide financial and non-financial incentives for residents to purchase low-carbon vehicles. For example, the City could consider allowing designated vehicles to use preferred or free parking spaces. In future years, the City may also consider instituting disincentives for purchasing high emitting vehicles.	• Ease of implementation will depend on regional and state decisions regarding subsidy for this type of program. • Success of program is dependent on how much marketing and outreach is dedicated to the program. • Implementation will be greatly influenced by oil costs and other driving expenses. • Implementing programs and policies for alternative fuel vehicles will be difficult without incentive programs and especially, increased access to and reduction in the cost of alternative fuels. • Instituting surcharges on vehicle registration fees or other financial or non-financial disincentives has proven easier to enact initially, and much more difficult to reenact or reinstate, at least in California. • There may be a backlash against any program that causes higher fees for residents. This action will require a fiscal analysis to determine the cost/ benefit in order to persuade those affected of its benefit.	• DOE. *Clean Energy Resources Database for Local Governments.* http://cfpub.epa.gov/ceird/index.cfm?fuseaction=local.search_js#category_criteria • Building a Market for Low-Carbon Cars: Lessons from the UK: www.ec.europa.eu/enterprise/automotive/pagesbackground/competitiveness/cars21_hearing/est.pdf • Federal Tax Incentives (United States) | Hybrid Cars, www.hybridcars.com/federal-incentives.html • New Energy Tax Credit for Hybrids www.fueleconomy.gov/Feg/tax_hybrid.shtml • US Senate: "Incentives/disincentives should be put in place..", chris4senate.org/alternativeenergy.html • Climate Institute: Attempts to transform the system by creating disincentives. physics.harvard.edu/~wilson/energypmp/2007_MacCracken-Dingell.pdf • Green Vehicle Guide | US EPA, The US Environmental Protection Agency's Green Vehicle Guide provides vehicle ratings based on emissions and fuel economy, www.epa.gov/greenvehicle	**Costs** • Salary for City staff to create, launch, and maintain non-financial incentives, and/or for staff - with or without fees for consultants - to create, fund, launch, and maintain financial incentives for residents to purchase low-carbon vehicles. **Additional Benefits** • Improved public health as air quality improves. • Job creation from growth in alternative fuels industry.
Action 2.2	Continue to collaborate with regional, state, and federal authorities to promote the use of alternative fuels and increased vehicle fuel efficiency standards.	• Ease of implementation will depend on regional and state decisions regarding subsidy for this type of program. • Operational cost savings accrue with fuel-efficient vehicles, and the expansion of the business of improving the fuel efficiency of vehicles, alternative fuel vehicle conversions, and alternative fuel suppliers all provide economic incentives.	• www.lowcvp.org.uk/about-lowcvp/index.asp • Interested in Hybrid Cars? New Tax Incentives and Benefits, www.environment.about.com/od/greenlivingdesign/a/hybridcars.htm • UK Department for Transport - Low Carbon Vehicle Procurement Policies Nov 7, 2007, www.dft.gov.uk/pgr/scienceresearch/technology/lowcarbonvehicleprocurementprog • Union of Concerned Scientists. http://www.ucsusa.org/clean_vehicles/solutions/cleaner_cars_pickups_and_suvs/clean-car-discount.html	**Costs** • Salary for City staff to continue to collaborate with state and federal authorities to promote alternative fuels and vehicle fuel efficiency standards. **Additional Benefits** • Improved public health as air quality improves; supporting the emerging alternative fuels industry.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Municipal Actions				
Action 2.3	Continue to procure fuel-efficient and alternative fuel vehicles for municipal vehicle fleet.	• Hayward has already been making efforts to improve the fuel economy of the municipal vehicle fleet. • Many emergency vehicles and public safety vehicles run equipment off of the vehicle battery. City should be aware of this additional load when making purchase decisions. • It is recommended that Hayward track and publish the incremental cost of purchasing advanced vehicles as opposed to traditional vehicles, and track the fuel savings (or emissions savings) from each vehicle purchased. This information can help other fleet owners make informed decisions about transitioning to a lower carbon-intensity fleet.	• Government Fleet has up-to-date information on greening municipal fleets and published best-practices in fleet fuel management. http://www.government-fleet.com/Channel/Fuel-Management.aspx • National League of Cities. Alternative Fuel Programs for Municipal Fleets. http://www.nlc.org/ASSETS/4D4B15DC22EC4B0387E4F503AD9D39E3/CPB%20-%20Alternative%20Fuels%200808.pdf • San Francisco has one of the largest clean-air fleets in the country. Clinton Climate Initiative's reviewed the program and why it is successful can be viewed here: http://www.c40cities.org/bestpractices/transport/sanfran_vehicles.jsp	**Costs** • Incremental cost of purchasing fuel efficient vehicles or alternative-fuel vehicles as opposed to low-efficiency vehicles. • The cost savings from fuel consumption can be significant. San Francisco saves an estimated $150,000 per year in fuel and maintenance costs savings. • BAAQMD offers grants that could help fund Hayward's lower-emission fleet. Programs of particular interest include: (1) Lower-emission School Bus Program, (2) The Transportation Fund for Clean Air, and (3) Carl Moyer Memorial Air Quality Standards Attainment Program. http://www.baaqmd.gov
Action 2.4	Continue to, whenever possible, negotiate an alternative fuel requirement into new services provided by the City's franchisee.	• Fuel efficiency or low-carbon fuel requirements could impact service rates. City should evaluate impact to rate payers. • In the coming years, the City may have the opportunity to purchase biofuels from local sources. The City should, whenever possible, use local fuels to power fleet vehicles provided that the local fuel has lower lifecycle carbon emissions than the traditional fuel. For example, Waste Management now operates a facility at the Altamont Landfill collects landfill gas and converts it to vehicle-grade compressed natural gas. The compressed natural gas produced at the landfill is used to power collection vehicles.	• Government Fleet has up-to-date information on greening municipal fleets including information on negotiating fuel-efficiency with contractors.www.government-fleet.com/Channel/Fuel-Management.aspx • When Hayward re-negotiated its contracts with Waste Management in 2007, the contract included a requirement that Waste Management use alternative fuels to power the fleet used to haul solid waste.	**Costs** • Costs to negotiate use of fuel-efficient vehicles and alternative fuels are not expected to be significant. • Possible that ratepayers could be impacted.

Strategy 3: Energy: Improve Energy Performance of Existing Buildings

Goal

The goal of Strategy 3 is to reduce GHG emissions associated with energy use in existing buildings using regulations, incentives, and educational programs to reduce electricity and natural gas consumption in buildings. The long-term goals of Strategy 3 are to reduce electricity consumption to 65 percent below business-as-usual projections by 2050, and to reduce natural gas consumption to 50 percent below business-as-usual projections by 2050. In its *California Long Term Energy Efficiency Strategic Plan,*[69] CPUC sets goals for reducing energy use in existing buildings. The CPUC goals aim to eventually retrofit existing commercial and residential buildings to achieve zero net energy buildings. The CPUC has the political and legislative power to set state-wide policies and programs to help achieve its goals and having the CPUC on board will help Hayward achieve its own efficiency goals. Ease of implementation

Ensuring ordinances are aggressive enough to meet targets

The challenge of implementing the actions presented in Strategy 3 is not with developing energy conservation ordinances or designing an efficiency financing program: the challenge is in making energy conservation goals aggressive enough to result in significant GHG savings. Strategy 3 calls for the development and implementation of Residential and Commercial Energy Conservation Ordinances (RECO and CECO). Typically RECOs and CECOs will focus on the space heating system, hot water heating, lighting, attic insulation, weather-stripping, and replacing inefficient showerheads, toilets, etc. In multifamily buildings and non-residential buildings, RECOs and CECOs would also focus on improving energy use in public areas such as hallways. It is important that when developing the RECO and CECO, Hayward set aggressive goals that will maximize energy savings – and cost savings to residents and businesses.

Perception of energy costs as fixed costs

Another challenge of improving energy performance of existing buildings is that people tend to think of energy costs as a fixed cost that they have very little control over, and that the cost savings from efficiency improvements are rarely large enough to justify investment costs. In reality, energy efficiency can significantly reduce energy expenditures, and though the payback periods of some investments are long, the economics usually make sense when the long-term costs and benefits are considered. To successfully implement Strategy 3, the City will have to help residents and businesses understand and value the long-term cost savings efficiency improvements.

Community support

Community buy-in is especially important for this strategy because to successfully implement Strategy 3 actions, building owners need to make a commitment to energy conservation and energy efficiency. Residents and businesses will have to change consumption behavior and make financial investments in efficiency retrofits. To build community-support, the City may consider implementing Strategy 3 actions in a phased-in approach. A phased-in implementation plan that gradually increases energy conservation requirements will enable residents to become familiar with the program and get a better sense of cost and benefit implications when the stakes are minimal.

[69] CPCU. *California Long Term Energy Efficiency Strategic Plan.* September 2008. www.californiaenergyefficiency.com

Building upon existing programs

Hayward is already starting to encourage local businesses to embrace energy conservation and energy efficiency. Through a partnership with Pacific Gas and Electric Company (PG&E), the East Bay Energy Watch, KEMA Services, Inc, and the Hayward Chamber of Commerce, the City has been offering free energy audits to local businesses since 2006.[70] Many of Hayward's small and medium-sized businesses have received audits, and over 300 of these businesses voluntarily installed energy-saving equipment after receiving audit results. Hayward could leverage this voluntary program to gather support for a more aggressive program that would require audits and prescribed efficiency improvements. Between 2006 and 2008, the program saved local businesses 7.5 million kWh.

Financing efficiency retrofits

At the time the CAP was written, the financial barriers of efficiency improvements were of particular concern. The nation is facing an economic recession and a major home foreclosure crisis, so taking out new loans for efficiency improvements may not seem attractive to Hayward's citizens and businesses. Other typical financial barriers to improving the efficiency of existing buildings include long paybacks, expensive cost of capital, and split incentives between building owner and building tenants.

The efficiency financing program should be structured to enable building owners to pay for improvements required by the RECO and CECO. There are a number of ways to finance efficiency retrofits. It is recommended that Hayward evaluate the various existing programs and systematically select the financing program best-suited for the social, political, and economic needs of the community. Efficiency improvements are often a pre-requisite for solar financing and Hayward may want to consider requiring some efficiency improvements before offering solar financing.

Split incentives

A split incentive can occur when building owners do not pay the utility bill, so they do not realize the financial benefits of an energy efficiency retrofit and would therefore not be interested in investing in a retrofit. Similarly, if tenants do not pay the utility bill, they are not incentivized to conserve energy and may be opposed to the disturbance of construction during an efficiency retrofit.

Estimated GHG Emissions Reductions

If program goals are achieved, it is estimated that Strategy 3 actions will result in an annual emissions savings of approximately 8,723 metric tons CO_2e/year in 2020 and 205,890 metric tons CO_2e/year in 2050, as measured from BAU projections. It is estimated that emissions savings from Strategy 3 will contribute 5.6 percent of the emissions reductions needed to meet the 2020 target and 19.2 percent of the emissions reductions needed to meet the 2050 target. Estimated annual emissions reductions from specific actions are presented in Appendix B.

Cost and Additional Benefits

Costs

The initial investment costs associated with the actions presented in Strategy 3 include salary for City staff to develop programs and to set up operation plans for continuing the programs. Another cost is the seed funding for an energy efficiency finance program. Depending on how the efficiency financing program is designed, seed money may not come out of the City's budget. It could come from grants, a

[70] Energy Watch. http://www.calenergywatch.com/EastBay.htm

bond, and/or a private financing company. The operational costs of the programs include cost to the City for administering the energy conservation ordinances and the efficiency financing program. The City will also have to pay for community outreach throughout the lifetime of the program.

Strategy 3 actions will result in with some costs to residents and businesses that will be responsible for paying for efficiency upgrades. Residents and businesses that make upgrades will also benefit from the cost savings of lower energy bills.

To be successful, residents and businesses will have to participate in efforts to reduce energy consumption in existing buildings. To achieve the level of participation that is necessary to meet aggressive emissions reductions goals, the City will have to pay for ongoing outreach, education, and marketing.

Additional benefits

Some additional benefits associated with reducing energy consumption in existing buildings include minimizing the risk of energy crises and creating jobs in the energy audit, construction, and efficiency retrofit industries. In addition, building owners will also have the benefit of lower monthly energy bills. These savings can then be re-spent in Hayward's local economy. Other benefits of high-efficiency and green buildings most frequently cited include:[71, 72, 73]

Reduced building operations and maintenance costs

A typical opportunity to reduce operations and maintenance (O & M) costs may occur through the use of more efficient lighting systems, which for example, use lamps and/or other equipment with longer than average lifetimes. These reduce the frequency with which the equipment needs to be replaced, and so also reduce the demands on maintenance staff. This in turn should result in lower overall O & M costs.

Productivity and health benefits

Employees working in green buildings may have improved productivity and may enjoy better health, and therefore, lowered absenteeism. In some studies the value of these benefits are found to greatly outweigh the direct energy savings. These improvements should result in economic benefits to the employer. The benefits however, generally result from a combination of measures. For example, better indoor air quality may be the result of more energy efficient ventilation systems, together with the use of lower volatile organic compound (VOC) emitting construction and furnishing materials.

Improved work place comfort and local energy system controls

Many employees place a very high value on having better thermal control of their immediate workplace surroundings. In fact the most frequent complaints made especially of large office buildings (94%) have to do with air temperature and indoor air quality, and they are the primary reason for tenants moving out.[74] Local thermal controls, like convenient local lighting controls and operable windows are energy efficiency measures as well as measures that provide improvements to occupant comfort.

Other non-energy benefits

Other non-energy benefits of high performance buildings include:

---

[71] United States Green Building Council. www.usgbc.org
[72] EPA. Green Buildings. www.epa.gov/greenbuilding/
[73] Flex Your Power http://www.fypower.org/
[74] Lucuik, Mark. 2005. The Business Case for Green Buildings in Canada, Section 4.1 Morrison Hershfield. Ottawa, Ontario, Canada.

Water savings – especially those measures that result in less water heating demand and in reduced water pumping requirements

Improved indoor air quality from more sophisticated ventilation systems

Visual comfort resulting from better daylighting

Local air quality emissions reductions

Reduced health problems such as childhood asthma

Reduced problems of nuclear waste disposal and reactor safety

Improved electric system reliability

Contributions to local and national economic growth

Reduced impacts on energy transportation systems including power line capacity, and road, rail, and sea transportation

Local job creation [75]

Extended building lifetimes - better designed and built buildings last longer and therefore have lower long-term costs

Waste management impacts

Risk management, liability and loss benefits

Improved real estate values

Enhanced public image

Enhanced employee job satisfaction

More highly motivated employees

Reduced climate change impacts

Carbon trading value

Reductions in imported energy supplies

Enhanced global stability and improved national security

Reduced heat island effects

[75] An evaluation of a federal weatherization program suggested that the program generated 36 direct jobs and 15 supporting jobs for each $1million invested in weatherization. In contrast, each $1million spent on operating a new coal-fired power plan is associated with only 5 jobs – none of them local.

Strategy 3 Actions

Community-wide Actions

Action 3.1	Develop and implement a Residential Energy Conservation Ordinance (RECO) for detached single-family homes which would require improved energy efficiency and energy conservation in residential buildings. Update the RECO on a regular basis to ensure buildings become more energy efficient over time. Typical energy efficiency improvements may include updates to the lighting, heating, ventilation, and air conditioning systems and improvements that lead to water conservation.
Action 3.2	Develop and implement a Residential Energy Conservation Ordinance (RECO) for multiple-unit homes which would require improved energy efficiency and energy conservation in residential buildings. Update the RECO on a regular basis to ensure buildings become more energy efficient over time. Typical energy efficiency improvements may include updates to the lighting, heating, ventilation, and air conditioning systems and improvements that lead to water conservation.
Action 3.3	Develop a Commercial Energy Conservation Ordinance (CECO) which would require improved energy efficiency and energy conservation in commercial buildings. Continuously update the CECO to ensure buildings become more energy efficient over time. Typical energy efficiency improvements may include updates to the lighting, heating, ventilation, and air conditioning systems and improvements that lead to water conservation.
Action 3.4	Actively participate in local low-income weatherization initiatives with the goal of weatherizing all qualifying low-income homes in Hayward.
Action 3.5	Develop public information and education campaign to encourage every household and every business to reduce their energy consumption by 10 percent over ten years.
Action 3.6	Develop a program to encourage or require installation of Home Energy Monitors in existing residences. Home Energy Monitors monitor energy use and provide building occupants with feedback on their real-time and long-term average energy consumption. This may be done in conjunction with Actions 3.1, 3.2, or 3.4.
Action 3.7	Develop a residential energy efficiency retrofit financing program for single unit homes.
Action 3.8	Develop a residential energy efficiency retrofit financing program for multiple unit homes.
Action 3.9	Develop a commercial energy efficiency retrofit financing program.

Municipal Actions

Action 3.10	Take advantage of California Energy Commission's low interest loans for efficiency retrofits and LED street lighting (http://www.energy.ca.gov/efficiency/financing)
Action 3.11	Continue to implement energy conservation practices in City-owned buildings. Prepare an energy conservation plan and update it on a regular basis.
Action 3.12	Improve energy performance of City buildings. Begin by auditing City buildings to identify opportunities for efficiency improvements from both operations and equipment upgrades.

Summary Table

Table 5: Strategy 3 – Energy: Improve Energy Performance of Existing Buildings

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost and Benefits
Community-wide Actions				
Action 3.1	Develop and implement a Residential Energy Conservation Ordinance (RECO) for detached single-family homes which would require improved energy efficiency and energy conservation in residential buildings. Update the RECO on a regular basis to ensure buildings become more energy efficient over time.	• Several Cities including San Francisco and Berkeley have implemented RECOs. These RECOs can provide a model for Hayward's RECO. • A phased-in implementation plan that gradually increases energy conservation requirements will enable residents to become familiar with the program and get a better sense of cost and benefit implications when the stakes are minimal. • If the first phase of a phased-in approach requires energy audits and disclosure of audit results, data collected from the audits will help inform decisions on what efficiency measures may be recommended or required during subsequent phases of the program. For example, if audits results indicate that a number of buildings in the City are under-insulated, the City may consider requiring insulation retrofits at the point of sale. • In its *California Long Term Energy Efficiency Strategic Plan,* CPUC sets goals for reducing energy use in existing homes. The CPUC has the political and legislative power to set state-wide policies and programs to help achieve its goals and having the CPUC on board will help Hayward achieve its own efficiency goals.	• CPUC. *California Long Term Energy Efficiency Strategic Plan.* September 2008. www.California Energy Efficiency.com • DOE. List of tools various government and non-government organizations have developed to help state and local governments develop energy efficiency programs. http://www.epa.gov/cleanenergy/energy-programs/state-and-local/by-topic/efficiency.html • DOE. List of tools and resources for state and local governments on the topic of *Energy and Air Quality Policy Integration* http://www.epa.gov/cleanenergy/energy-programs/state-and-local/by-topic/integration.html • DOE. *Clean Energy Resources Database for Local Governments.* http://cfpub.epa.gov/ceird/index.cfm?fuseaction=local.search_js#category_criteria • Berkeley (http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=14294) • San Francisco Energy Watch (http://www.sfbaywindow.com/articles/1/4/146/1/show.html) • City of Boulder Residential Energy Audit Program http://www.beclimatesmart.com/programs/REAP.php • City of Austin TX (www.austinenergy.com/Energy%20Efficiency/resIndex.htm) • Flex-your-power www.fypower.org • American Council an Energy Efficient Economy www.aceee.org • Clinton Climate Initiative. Best Practice Policies for Energy Efficient Buildings. http://www.c40cities.org/bestpractices/buildings/	**Costs** • Cost to City to pay for staff to develop RECO and CECO. The RECO and CECO programs will likely be implemented in more than one phase. Each phase will require staff time to develop. Depending on the in-house expertise and budget available at the time, Hayward may hire consultant to help develop RECO & CECO. • Cost to City to pay for staff to maintain, implement, and administer RECO and CECO. • Cost to City for education and outreach associated with program • Cost to residents, businesses, and/or building owners to pay for efficiency improvements. **Additional Benefits** • Decreased energy demand will reduce risk of local impacts of future energy crisis. • Decreased energy demand will reduce need for new power plants • Decreased energy consumption will lead to lower energy bills, which is good for both residents and businesses • Efficiency upgrades could create local 'clean-tech', or green jobs. • Savings from improved energy efficiency may be reinvested in other local goods and services.
Action 3.2	Develop and implement a Residential Energy Conservation Ordinance (RECO) for multiple-unit homes which would require improved energy efficiency and energy conservation in residential buildings. Update the RECO on a regular basis to ensure buildings become more energy efficient over time.			
Action 3.3	Develop a Commercial Energy Conservation Ordinance (CECO) which would require improved energy efficiency and energy conservation in commercial buildings. Continuously update the CECO to ensure buildings become more energy efficient over time.	• There has been significant attention to economic development in Hayward, so any proposed CECO must ensure that negative impacts to businesses are minimized. • A phased-in approach where conservation requirements are increased over time would enable businesses to become familiar with the impacts of energy conservation on business revenues. • Through a partnership with PG&E, the East Bay Energy Watch, KEMA Services, Inc, and the Hayward Chamber of Commerce, the City has been offering free energy audits to local businesses since 2006. Many of Hayward's small and medium-businesses have received audits, and over 300 of these businesses voluntarily installed energy-saving equipment after receiving audit results. Hayward could leverage this voluntary program to gather support for a more aggressive program that would require audits and prescribed efficiency improvements. http://www.calenergywatch.com/EastBay.htm		

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost and Benefits
Action 3.4	Participate in local low-income weatherization initiatives with the goal of weatherizing all qualifying low-income homes in Hayward.	• The American Reinvestment and Recovery Act of 2009 (Stimulus Bill) provided $5 billion to the Weatherization Assistance Program. The Program enables low-income families earning less than 200% of the poverty level to permanently reduce their energy bills by making their homes more energy efficient. Each home may receive up to $6,500 in assistance for energy retrofits. Weatherization Assistance Program funding is distributed via formula to States who then divide the money further. • Hayward should consider mechanisms to help qualifying residents in its Jurisdiction to receive ARRA funding. This may involve working with the local Energy Service Provider, local non-profits, or developing City-run education and outreach campaigns to encourage residents to participate in the program. • Hayward should consider ways to leverage ARRA funding to raise more funds for low-income, or income-blind, efficiency retrofits.	• DOE Weatherization Assistance Program Technical Assistance Center http://www.waptac.org • Spectrum Community Services is the Energy Service Provider for the Weatherization Assistance Program in Hayward. www.spectrumcs.org	**Costs** • Federal funding available through DOE. • American Recovery and Reinvestment Act of 2009 allocated $5 billion to DOE's Weatherization Assistance Program • On average, weatherization reduces heating bills by 32% and overall energy bills by about $350 per year. These savings will make a lasting impact for low-income families. **Additional Benefits** • Weatherizing homes could create local 'clean-tech' jobs.
Action 3.5	Develop public information and education campaign to encourage every household and every business to reduce their energy consumption by 10 percent over ten years.	• Will require a significant marketing, outreach, and education campaign. • This action depends on residents and businesses to participate voluntarily. This means that the quantity of emissions savings will depend on how many residents or businesses participate in the voluntary program. This means the success of the program is directly linked to (1) how successful the marketing and outreach campaign is at getting stakeholder to commit to the program, and (2) how successful the City is at helping participants achieve the 10 percent reduction goal. • City may consider partnering with organizations that have expertise in community outreach and capacity to reach a number of people not only in Hayward, but throughout the Bay Area and the Country. Some examples of potential partners would be organizations like the Sierra Club or The Alliance for Climate Protection.	• Burlington Vermont's 10% Challenge: http://www.10percentchallenge.org/ • Minnesota Energy Challenge: http://www.mnenergychallenge.org/ • Lawrence Berkeley National Laboratory's Home Energy Saver software is a useful resource for residents who are interested in reducing their energy use. http://hes.lbl.gov	**Costs** • Cost to City for marketing, outreach, and education • Cost to residents and local businesses to invest in efficiency improvements and/or energy monitoring systems. Energy efficiency financing programs can reduce this impact on businesses. **Additional Benefits** • Savings from improved energy efficiency may be reinvested in other local goods and services. • Efficiency upgrades could create local 'clean-tech' jobs. • Will help build awareness o r energy efficiency among residents and businesses. • Means of engaging community and • Educates and empowers people to change their consumption behaviors.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost and Benefits
Action 3.6	Develop a program to encourage or require installation of Home Energy Monitors in existing residences. Home Energy Monitors monitor energy use and provide building occupants with feedback on their real-time and long-term average energy consumption. This may be done in conjunction with Actions 3.1, 3.2, or 3.4.	• Emissions savings will depend on whether residents that install monitors will change energy consumption behaviors. • City may consider working with PG&E to test emerging technologies that can track real-time energy use and allows utility control over energy demand.	• Lawrence Berkeley National Laboratory's Home Energy Saver software is a useful resource for residents who are interested in reducing their energy use. hes.lbl.gov	**Costs** • Cost to City for marketing, outreach, and education • Cost to residents to purchase and install home energy monitors • Cost savings to residents who reduce energy consumption because of program **Additional Benefits** • Will help build awareness or energy efficiency among residents and businesses. • Means of engaging community, and • Educates and empowers people to change their consumption behaviors.
Action 3.7 Action 3.8 Action 3.9	Develop a residential energy efficiency retrofit financing program for single unit homes. Develop a residential energy efficiency retrofit financing program for multiple unit homes. Develop a commercial energy efficiency retrofit financing program.	• Citizens are typically less excited about efficiency improvements than solar installations. However, efficiency improvements should be required before participating in solar financing programs: California Solar Initiative requires efficiency improvements to qualify for financing. This opens the door for efficiency improvements and makes them more attractive than they would have been without solar. It also lowers the cost of the solar installation to the homeowner if total energy demand is reduced. • Several efficiency financing programs exist, so Hayward will have several templates to work from. • Capital costs are a clear barrier that are preventing both businesses and residents from investing in efficiency improvements. • The American Reinvestment and Recovery Act (Stimulus Bill) authorized the allocation of $2.5 billion of Qualified Energy Conservation Bonds, zero interest bonds, which may be used to issue loans or grants for capital improvements that reduce energy use and where capital costs are recouped over time. • Hayward may consider a program similar to the CityFIRST program that allows property owners to install solar systems and energy efficiency upgrades with no upfront cost. CityFIRST is financed by taxable municipal bonds providing participants with low interest rates, fixed for 20 years. www.renewfund.com	• The Alliance to Save Energy has summarized a number of financing programs (mostly loan funds) for both municipal and private projects www.ase.org/section/topic/financingee • UK is offering free energy monitors: http://news.bbc.co.uk/1/hi/sci/tech/6550361.stm • Database of State Incentives for Renewables and Efficiency (DSIRE) is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency. www.dsireusa.org	**Costs** • Cost to City to pay for staff for financing programs. Depending on the in-house expertise and budget available at the time, Hayward may hire a consultant to help develop program. • If there is enough of an investment opportunity for a private company, the City may be able to contract a private company to design, finance, and operate program. • Cost to City to pay for staff to maintain, implement, and administer RECO and CECO. • Cost to somebody (maybe City, tax-payers, bank, lenders) to finance seed funding for program. • Cost to City for education and outreach associated with program. • Cost to borrowers. **Additional Benefits** • Savings from improved energy efficiency may be reinvested in other local goods and services. • Borrowers can gain access to capital. • Energy savings result in cost savings for building owners. • Efficiency upgrades could create local 'clean-tech' jobs.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost and Benefits
Municipal Actions				
Action 3.10	Take advantage of California Energy Commission's low interest loans for efficiency retrofits and LED street lighting (http://www.energy.ca.gov/efficiency/financing)	• City will have to secure funding for the retrofits. • Hayward can apply for a low interest (as low as 3.95%) loans from the CEC to fund streetlight retrofits.	• The City of Ann Arbor, Michigan has a self-sustaining Municipal Energy Fund that allows the City to continuously invest in energy efficiency improvements. The City started the fund by investing $500,000, and invests in projects with 3-5 year paybacks. By capturing 80 percent of the resulting savings, the fund replenishes and funding is reallocated to new efficiency projects. Information is from the City of Ann Arbor Energy Office: http://www.a2gov.org/government/publicservices/systems_planning/energy/Pages/EnergyFund.aspx. • City of Portland retrofitted 13,300 traffic lights within 3 months. Information on the program can be found here http://www.portlandonline.com/shared/cfm/image.cfm?id=111737	**Costs** • City of Portland, Oregon reported that it cost $2.2 million to retrofit 13,300 traffic signals. City reports saving $265,000 per year on electricity bills. Including reduced maintenance costs, the City saves $400,000 annually because of the program. http://www.portlandonline.com/shared/cfm/image.cfm?id=111737 • Cost savings from reduced energy consumption. • Investment cost of replacing lamps. • Cost savings from reduced energy consumption. • Cost savings from reduced maintenance requirements. LED lamps last longer than sodium vapor lamps. **Additional Benefits** • None identified
Action 3.11	Continue to implement energy conservation practices in City-owned buildings. Prepare an energy conservation plan and update it on a regular basis.	• Energy conservation will require operational changes, which are sometimes difficult to implement. This is especially true for operational practices that are well established. To be successful, the City may need to run an internal education, outreach, and marketing campaign or update internal office protocols. • Hayward may find that its mechanism for tracking energy use is not adequate for capturing energy savings from operational changes or efficiency upgrades. The City may need to re-visit its mechanism for tracking energy use in order to verify that programs are successful.	• Hayward Municipal Code. Article 21. Green Building Requirements for Municipal Buildings. http://www.ci.hayward.ca.us/municipal/HMCWEB/GreenBuildingRequirementsforMunicipalBuildings.pdf	**Costs** • Incremental cost of building energy-efficient green buildings as opposed to non-energy-efficient buildings. • Cost savings from reduced energy consumption. • Cost to prepare energy conservation plan for municipal buildings. **Additional Benefits** • See discussion of "additional benefits" in the discussion on pages 68 and 69.
Action 3.12	Audit all City buildings & identify opportunities for efficiency improvements from both operations and equipment upgrades.	• Local government plays an important role in demonstrating leadership. Efficiency retrofits in public facilities is a highly visible means of showing leadership in energy efficiency – especially if the City showcases efficiency measures in high-traffic buildings and demonstrates that efficiency retrofits are cost effective. • American Resource and Recovery Act funding could be an effective source of funding for efficiency improvements in municipal buildings.	• ABAG Energy Watch is a partnership designed to help local governments implement cost-effective, energy saving projects in public facilities. ABAG Energy Watch is a joint project of Pacific Gas and Electric Company and the Association of Bay Area Governments. Program funding has expired, but Energy Watch will likely remain a useful resource to local governments in the coming years. http://www.abag.ca.gov/abagenergywatch/index.html	**Costs** • Cost to City for conducting audits and making efficiency improvements. • Cost savings from reduced energy consumption resulting from audits. **Additional Benefits** • See discussion of "additional benefits" in the discussion on pages 68 and 69. • Efficiency upgrades could create local 'clean-tech' jobs.

Strategy 4: Energy: Improve Energy Performance of New Buildings

Goal

The goal of Strategy 4 is to minimize GHG emissions associated with new buildings by setting minimum energy and environmental performance standards for all new construction. The specific long-term goals of Strategy 4 include achieving net-zero electricity consumption and reducing natural gas consumption 75 percent below business-as-usual projections in all buildings constructed after 2030. This goal is in line with the United States Green Building Council's 2030 Challenge initiative which asks the global architecture and building community to adopt a target of all new buildings, developments and major renovations constructed after 2030 shall be designed to achieve carbon neutrality (using no fossil fuel GHG emitting energy to operate). The US Conference of Mayors, ICLEI, EPA, and the World Business Council for Sustainable Development are among the organizations that are contributing to and support the 2030 Challenge.[76]

CPUC's *California Long Term Energy Efficiency Strategic Plan* sets more aggressive targets for new residential buildings than both the 2030 challenge and Hayward's goals.[77] The Strategic Plan aims for all new residential construction to be zero net energy by 2020. The Strategic Plan also aims for all new commercial construction to be zero net energy by 2030. Hayward's goals are slightly less aggressive than CPUC's goals because it was determined that Hayward could meet its 2020 and 2050 emissions goal with the slightly less aggressive goals. However, if the CPUC is successful at achieving its goal, and Hayward meets the rest of its goals (as defined in Appendix C), Hayward will overshoot its goal. With the CPUC supporting an effort to achieve zero net energy buildings, it is likely Hayward will achieve its energy conservation and energy efficiency goals. CPUC has the legislative authority and political power to make changes on the state-level to support the shared vision of energy efficient buildings.

Ease of implementation

The Actions in Strategy 4 focus on maintaining the Private Development Green Building Ordinance to ensure that new buildings become more efficient over time. The Ordinance was adopted on November 25, 2008 with support from the community, including from developers.[78] The Ordinance is expected to take effect on August 1, 2009. Before the Ordinance can take effect, an approval from the California Energy Commission (CEC) must be obtained.

By adopting a Private Development Green Building Ordinance, Hayward joined a number of Bay Area Cities, including Berkeley and San Francisco, which have adopted ordinances that require developers to follow industry-accepted green building standards when designing and building new buildings.[79] When the Ordinance takes effect, developers of new residential and commercial buildings will be required to submit documentation verifying that the building has been rated by the GreenPoints Rating [80] system, or

---

[76] 2030 Challenge. http://www.architecture2030.org/2030_challenge/index.html

[77] CPUC. *California Long Term Energy Efficiency Strategic Plan.* September 2008. www.californiaenergyefficiency.com

[78] Ordinance added article 22 to chapter 10 of the Hayward Municipal Code and established green building requirements for new private development. The requirements apply, with some noted exceptions, to new construction, additions or remodels over 500 square feet for residential projects, or new construction, additions or remodels entailing 1,000 square feet or more of new or remodeled commercial space.

[79] Bay Area Cities that have adopted green building ordinances include San Francisco and Berkley. StopWaste.org has also developed a series of excellent guidelines and information on green building.
http://www.ci.hayward.ca.us/municipal/HMCWEB/GreenBuildingRequirementsforPrivateDevelopment.pdf

[80] Build It Green's GreenPoint Rated program is used to evaluate the energy and environmental performance of buildings. www.builditgree.org

a similar rating system like LEED.[81] The City will not grant a Certificate of Occupancy without the required documentation.

It is expected that third-party rating systems will update requirements to receive a certification. The requirements for certification will likely remain more stringent than state standards. Because Hayward's Green Building Ordinance requires buildings to perform in accordance to the third-party standards, buildings will have to become more efficient over time without any action from Hayward's policy makers. It is important, however, that Hayward evaluate its Green Building Ordinance regularly to ensure it is as effective as possible.

One challenge to consider when implementing Strategy 4, is that the State will likely increase State-wide energy performance standards (Title 24 standards) so much that State-mandate is more stringent that the local ordinance. AB 32 calls for net-zero energy buildings[82] as a potential target within CAP planning period, which is an indication that aggressive energy performance standards could be forthcoming. If the State comes out with super-aggressive standards, the City may find that a Green Building Ordinance is no longer necessary.

The Ordinance is effective and useful given the current State building standards. Hayward could make the Building Ordinances more stringent in the future by requiring:

- New buildings to be built solar ready, meaning that buildings are capable of taking the load of PV and/or solar thermal panels on the roof, and built to accommodate the electrical and plumbing systems necessary to support PV and solar thermal. Eventually, it could be required that all new buildings install solar systems.
- New buildings include the best-available cost effective lighting technologies.
- New buildings include the best-available cost-effective insulation and windows, or meet minimum insulation standards.
- New buildings to be plumbed for grey-water systems.

Estimated GHG Emissions Reductions

If program goals are achieved, it is estimated that Strategy 4 actions will result in an annual emissions savings of approximately 5,472 metric tons CO_2e/year in 2020 and 96,761 metric tons CO_2e/year in 2050, as measured from BAU projections. It is estimated that emissions savings from Strategy 4 will contribute 3.5 percent of the emissions reductions needed to meet the 2020 target and 9.0 percent of the emissions reductions needed to meet the 2050 target (see Appendix B).

Costs and Additional Benefits

Cost

Because the City has already adopted the Private Sector Green Building Ordinance, the investment costs to City government associated with this strategy are minimal. It cost the City approximately $125,000 to develop the Green Building Ordinance. Although each program will be different, this provides a sound estimate of how much it will cost the City to develop other programs that are proposed in the CAP. The

[81] The United States Green Building Council developed the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ to evaluate the energy and environmental performance of buildings. This third-party certification program is a nationally accepted benchmark for the design, construction and operation of high performance green buildings.
[82] Net-zero buildings are buildings that produce all the energy required to meet energy demand through on-site renewable energy.

operational costs of the program will include paying staff to monitor compliance and to update the ordinance as necessary to ensure buildings become more efficient over time.

This strategy may result in costs to developers if adhering to green building standards is more expensive than not following the standards. Most recent studies have indicated that constructing green buildings may increase construction costs by between 0 and 2 percent. These costs are soon recovered through lower building operating costs especially for energy and water use.[83]

To be successful, residents and businesses will have to participate in efforts to reduce energy consumption in new buildings. To achieve the level of participation that is necessary to meet aggressive emissions reductions goals, the City will have to pay for ongoing outreach, education, and marketing.

Additional benefits

Improving energy performance of new buildings will help minimize the risk of energy crises and will reduce energy bills for building occupants. Third-party rating systems value not only energy savings, but also award other green building principles such as water conservation and use of recycled or low-toxicity materials. Water conservation is an environmental benefit in itself, but it will also result in some emissions savings due to reductions in demand for treated water. Using low toxicity materials in buildings has been linked to health benefits. More benefits of energy efficient buildings are presented in the discussion of Strategy 3.

Strategy 4 Actions

Community-wide Actions

Action 4.1	Continue to implement the Private Development Green Building Ordinance for residential buildings. Evaluate the program on a regular basis to ensure new buildings are getting more efficient over time.
Action 4.2	Continue to implement the Private Development Green Building Ordinance for commercial and industrial buildings. Evaluate the program on a regular basis to ensure new buildings are getting more efficient over time.

Municipal Action

Action 4.3	Continue to implement the Municipal Green Building Ordinance. Evaluate the program every 5 years to ensure buildings are becoming more efficient over time.[84]

[83] A report to the California Sustainable Building Task Force indicated approximate average reductions in energy use of 20 – 40 percent for LEED certified buildings. Gary Katz et. al. *The Costs and Financial Benefits of Green Buildings*. Capital E. 2003.

[84] The City of Hayward has already adopted a Municipal Green Building Ordinance. The Municipal Sector Green Building Ordinance requires newly constructed municipal buildings or building renovations that exceed $5 million in construction costs or 20,000 square feet in area to achieve LEED Silver certification. The City plans on updating the Municipal Green Building Ordinance on a regular basis to ensure new municipal buildings are as energy efficient as possible. The Plan echoes the importance of continuing to update the municipal ordinance.

Summary Table

Table 6: Strategy 4 – Energy: Improve Energy Performance of New Buildings

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Community-wide Actions				
Action 4.1	Continue to implement the Private Development Green Building Ordinance for residential buildings. Evaluate the program on a regular basis to ensure new buildings are getting more efficient over time.	• Hayward adopted a private sector Green Building Ordinance in November 2008 that is expected to take effect in 2009. The City has already addressed the challenges of creating the ordinance. The challenge now is implementing the program. • It is important that when reviewing the Ordinance, the City is mindful that the Ordinance needs to be stringent enough to achieve the aggressive energy efficiency goals. If the Ordinance is not stringent enough, the City will not achieve its long-term GHG emissions targets. • Because the Ordinance is based on a third party rating system that is expected to become more stringent overtime, the City may not have to dedicate too much effort into making the Ordinance more stringent. It would behoove the City if the third party rating systems continue to require more aggressive efficiency measures in order to achieve certification. • City should be cognizant of the cost of efficiency improvements and make efforts to balance costs (to both the City and to residents and businesses) with benefits of reduced energy use. • In its *Long Term Energy Efficiency Strategic Plan,* the California Public Utilities Commission has set a goal that "new construction will reach "zero net energy" (including clean, onsite distributed generation) from all new single and multi-family homes by 2020." With CPUC's shared vision and legislative authority, Hayward's goal of achieving net zero energy buildings is within practical reach. http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf	• CPUC. California *Long Term Energy Efficiency Strategic Plan.* September 2008. www.California Energy Efficiency.com • Hayward's Private Development Green Building Ordinance http://www.ci.hayward.ca.us/municipal/HMCWEB/GreenBuildingRequirementsforPrivateDevelopment.pdf • Attorney General's list of *Local Government Green Building Ordinances in California.* http://ag.ca.gov/globalwarming/pdf/green_building.pdf • United States Green Building Council www.usgbc.org • Build it Green, GreenPoint Rated Program: www.builditgreen.org • Database of State Incentives for Renewables and Efficiency (DSIRE) is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency. www.dsireusa.org • DOE. *Clean Energy Resources Database for Local Governments.* http://cfpub.epa.gov/ceird/index.cfm?fuseaction=local.search_js#category_criteria • 2030 Challenge: http://www.architecture2030.org/2030_challenge/index.html • CPUC. *Long Term Energy Efficiency Strategic Plan* . September 2008. http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf	**Costs** • Costs to City to implement, maintain, and administer green building ordinance. • Cost to City for marketing, outreach, and education. • Cost to developers to finance additional costs of building using green building principles, though most studies indicate that any added construction costs are soon recovered through lower energy and water costs. **Additional Benefits** • Energy saving result in cost savings on energy bills. • Decreased water consumption. • Additional GHG emissions reductions: Green building program results in solid waste reductions, but reductions in waste-related emissions were not calculated for the Climate Action Plan. Green buildings can also earn credit for innovative means of encouraging alternative modes of transportation (i.e. credit for secure bike parking), but CAP does not account for emissions savings from transportation. Some of these savings will be captured through residential green building and the GreenPoint Rated Climate Calculator which estimate these types of emissions reductions. • Higher student and worker productivity in green buildings. • Green buildings often use low-toxicity materials, which likely has associated health benefits.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Action 4.2	Continue to implement the Private Development Green Building Ordinance for commercial and industrial buildings. Evaluate the program on a regular basis to ensure new buildings are getting more efficient over time.			

Municipal Actions				
Action 4.3	Continue to implement the Municipal Green Building Ordinance. Evaluate the program every 5 years to ensure buildings are becoming more efficient over time.[85]	• Ordinance already in place, and City already adhering to the terms of ordinance. This will make implementation relatively easy. • Challenge lies in ensuring that the ordinance is stringent enough to achieve the level of energy savings that will be required to meet the municipal and community-wide targets. • Local government plays an important role in demonstrating leadership. Constructing energy efficient buildings is a highly visible means of showing leadership in energy efficiency – especially if the City showcases municipal buildings to demonstrate the cost effectiveness and livability of efficient buildings.	• Hayward's Municipal Green Building Ordinance. http://www.hayward-ca.gov/municipal/HMCWEB/GreenBuildingRequirementsforMunicipalBuildings.pdf • See resources in Actions 4.1 and 4.2.	**Cost** • Cost to City for incremental cost difference between efficient building and non-efficient buildings. • Cost savings from reduced energy consumption. **Additional Benefits** • Water savings • Increased C& D debris recycling

[85] The City of Hayward has already adopted a Municipal Green Building Ordinance. The Municipal Sector Green Building Ordinance requires newly constructed municipal buildings or building renovations that exceed $5 million in construction costs or 20,000 square feet in area to achieve LEED Silver certification. The City plans on updating the Municipal Green Building Ordinance on a regular basis to ensure new municipal buildings are as energy efficient as possible. The Plan echoes the importance of continuing to update the municipal ordinance.

Strategy 5: Energy: Use Renewable Energy

Goal

The goal of Strategy 5 is to reduce GHG emissions associated with electricity use by increasing the amount of electricity being supplied from renewable sources. The long-term goal is to achieve100 percent of renewable energy generation by 2050. This means that all electricity consumed in Hayward would be generated from renewable sources. Renewable energy would not only help reduce emissions from electricity, but by transitioning natural gas appliances to electricity, it would also help offset emissions from natural gas.

Ease of implementation

Renewable energy economics

The most significant barrier to implementing Strategy 5 actions is cost. Although the cost of renewable energy technologies have historically continued to decrease over time, and current federal and state incentive programs have helped improve the cost-effectiveness of renewable energy, the levelized cost of energy from solar is still typically higher than average retail electricity rates. Placing a price on carbon emissions will help make renewable energy more cost competitive. At the time of 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.[86],[87] Regardless of what policy makes it through the 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, renewable energy projects will be cost competitive without state and federal incentive programs. It is recommended that the City of Hayward advocate for a federal carbon policy that aims to help citizens and businesses realize the true value of carbon.

In the absence of a mechanism to value carbon, federal and state incentive programs help address the economic barriers to renewable energy implementation, these incentives have been subject to cycles of expiration and renewal. These cycles have historically caused boom-and-bust cycles in the renewable energy industries. At the time of this writing, state and federal incentive programs are in full swing, so it is an optimal time for the City to implement its own local incentive programs because the overall effectiveness of City programs could be enhanced by combination with the existing state and federal programs. City financing can improve the economic feasibility of renewable energy far more when combined with federal and state incentives, than if the City program was implemented alone without federal and state incentives. At the time the CAP was written, federal tax credits for residential solar were expected to expire in 2016, the same year state-sponsored rebates for solar were expected to expire.[88],[89] The frequent expiration and renewal, and start-and-stop cycles of federal and state programs have created boom-and-bust cycles for the renewable energy industries. City programs should be designed to avoid such pitfalls.

---

[86] 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

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

[88] The Emergency Economic Stabilization Act of 2008 extended the federal tax credit for residential solar PV to 2016.

[89] California Solar Initiative. State Wide Trigger Point Tracker. www.csi-trigger.com

Achieving 100 percent renewable energy

To meet its 2050 target, most electricity in Hayward will have to be procured from renewable sources. The City has several options for achieving 100 percent, or near 100 percent, renewable electricity. These options include: using community choice aggregation (CCA) to procure renewable energy for resale to businesses and residents, creating a community-owned utility, advocating for more stringent state-wide renewable portfolio standards (RPS) so that electricity from conventional utilities may contribute toward Hayward's goals, and installing renewable energy on all viable city-owned sites, to power municipal agencies. Any of these programs can be implemented in conjunction with a solar financing program.

Community Choice Aggregation

The CCA program was established by the California legislature in 2002 (AB 117) to give cities and counties the authority to procure electricity in bulk for resale to customers within their jurisdictional boundaries. Unlike traditional utility services, the administrator of the CCA would determine the source of electric supply and the price of electricity generation services. The utility company would still provide electricity delivery services to the end-use customer, and the utility would continue to read the electric meters and issue monthly bills to customers enrolled in the CCA program. Customers would have the choice of being automatically enrolled in the CCA program following a notification process or opting out of the CCA program and keeping regular utility services.[90] The Sustainability Committee considered CCAs at its April and May meetings and decided to monitor progress on the development of CCAs in other jurisdictions, but not to take steps to further study a CCA for Hayward at this time.[91] For more information, see the Committee staff reports on CCAs available at www.hayward-ca.gov/citygov/meetings/csc/ccsc.shtm.

Community-Owned Utility

Hayward has the option of creating a city-owned electricity and natural gas utility. The community-owned utility model empowers communities to have more control over the source from which electricity is generated than it has when purchasing electricity from a private utility such as PG&E. There are over 2,000 community-owned utilities in the United States, so Hayward would have a well established model to follow. The American Public Power Association is a service organization for American public utilities and could be a valuable resource if Hayward chooses to switch to a community-owned utility.[92] The City of Palo Alto could also serve as a model for Hayward. Palo Alto has increased the amount of renewable energy supply by purchasing electricity from wind, solar, landfill gas, and hydroelectric projects. Palo Alto has helped fund its renewable energy procurements by offering a program, PaloAltoGreen, in which rate payers have an option of paying a higher rate for renewable energy. Palo Alto still relies on Western Area Power Administration, which is not as aggressive at producing electricity from renewable sources, to supply the deficit of electricity that Palo Alto's community-owned utility cannot currently supply from its own renewable projects.[93], [94]

Advocating for a State or Federal RPS of 100% by 2050

A more stringent statewide renewable portfolio standard (RPS), or a federal RPS, could contribute to Hayward's progress toward its local renewable energy targets. Currently the statewide RPS is set at 33

---

[90] http://www.communitychoice.info/

[91] For more information, see the Committee staff reports on CCAs available at http://www.hayward-ca.gov/citygov/meetings/csc/ccsc.shtm.

[92] American Public Power Association. http://www.appanet.org

[93] City of Palo Alto Utility. http://www.cityofpaloalto.org/depts/utl/default.asp

[94] http://www.City.palo-alto.ca.us/depts/utl/default.asp

percent renewable generation by 2020. If the state increased the RPS to 100 percent renewable generation by 2050, Hayward could meet its own goal of 100 percent renewable generation without altering its current method of purchasing electricity from PG&E. A federal RPS would have the same effect. In addition to setting long-term RPS goal, it is critical that the state or federal government work with utilities to accomplish the goals. Utilities will face a substantial challenge in achieving aggressive RPS goals, and these utilities may need support, both legislative and financial, to a meet the RPS goals.

Because the costs associated with advocating for aggressive state-level or federal RPS standards are relatively low, the CAP recommends that Hayward continue to advocate for more aggressive RPS goals.[95] However, the City should not rely upon the state to adopt a target this stringent, as the political feasibility of such a strong target is greater at the local than the state level. The City should work towards its local renewable energy target independently and in parallel with state-level efforts. The City's progress and leadership actions may serve as a demonstration to the rest of the state.

Renewable Energy Municipal Financing Program

The City should identify the financing method that is best-suited for Hayward's social, political, and economic needs. There are a number of ways to develop a renewable energy financing program, but if the program is not specifically tailored to Hayward's residents, the financing program will not be effective. One program the City may consider is a program like CityFIRST, which allows property owners to install renewable energy systems or make energy efficiency upgrades with no upfront cost then pay back the capital cost through property taxes.[96] The financing program should aim to provide funding for a number of renewable energy technologies including solar water heating, solar electricity generation, and wind energy. The City may consider requiring efficiency improvements as a pre-requisite for building owners to qualify for solar financing. Generally speaking, renewable energy tends to generate more public appeal than energy efficiency, so if Hayward can leverage the appeal of renewable energy to encourage simultaneous investments in efficiency, it will result in even larger emissions reductions.

Political Feasibility of Recommended Strategies

The City is currently exploring the possibility of participating in a regional or state-wide program such as the one being established by the California Statewide Communities Development Authority (or California Communities®) which is a joint powers authority sponsored by the California State Association of Counties and the League of California Cities and whose mission is to provide local governments and private entities access to low-cost, tax-exempt financing for projects that provide a tangible public benefit, contribute to social and economic growth and improve the overall quality of life in local communities throughout California.[97] Another program of interest is the Renewable Fund, which offers a turnkey administration and financing package for renewable energy.[98] The American Reinvestment and Recovery Act of 2009 authorized the allocation of $2.5 billion of Qualified Energy Conservation Bonds, zero interest bonds that may be used to issue loans or grants for capital improvements that reduce energy use and where capital costs are recouped over time. Hayward may

[95] Renewable Portfolio Standards require a specified percentage of electricity generated from renewable sources such as solar, wind, and geothermal.
[96] CityFIRST is the program Berkeley is using to finance renewable energy. CityFIRST is administered by Renewable Fund. www.renewfund.com.
[97] California Statewide Communities Development Authority. www.cacommunities.org
[98] Renewable Fund. www.renewfund.com

consider the using Qualified Energy Conservation Bonds as part of its renewable energy and energy efficiency financing package.

When the City Council Sustainability Committee discussed a solar financing program in December 2008, the group enthusiastically endorsed moving forward with a financing program. Council discussed solar financing programs in a work session in February. The Sustainability Committee's support is an indication that Strategy 5 has political support, and this will facilitate implementation.

Estimated GHG Emissions Reductions

If program goals are achieved, it is estimated that Strategy 5 actions will result in an annual emissions savings of approximately 14,598 metric tons CO_2e/year in 2020 and 80,409 metric tons CO_2e/year in 2050, as measured from BAU projections. It is estimated that emissions savings from Strategy 5 will contribute 9.4% percent of the emissions reductions needed to meet the 2020 target and 7.5 percent of the emissions reductions needed to meet the 2050 target. Estimated annual emissions reductions from specific actions are presented in Appendix B.

Costs and Additional Benefits

Cost

The cost of installing renewable energy systems would be met through the proposed renewable energy financing program.

The cost of advocating for state and federal programs and policies that will increase the amount of renewable energy utilities use to generate electricity as well as the cost of investigating other options for increasing the percentage of renewable electricity provided through the grid would be borne by the City.

To achieve the level of participation on the part of businesses and residents in the renewable energy financing program that is necessary to meet aggressive emissions reductions goals, the City will have to support the cost of ongoing outreach, education, and marketing.

Additional Benefits

Installing more renewable energy will increase the demand for local solar panel venders and installers. This may result in significant job creation for the City. Renewable electricity also displaces electricity from conventional fossil fuel generation, thereby reducing emissions of criteria pollutants such as NO_x (which causes urban smog), SO_x (which causes acid rain) and particulate matter or soot (which is a carcinogen), in addition to reducing greenhouse gas emissions.

Strategy 5 Actions

Community-wide actions

Action 5.1 Develop a program for the financing and installation of renewable energy systems on residential buildings including single and multiple family residential buildings and mobile homes.

Action 5.2 Develop a program for the financing and installation of renewable energy systems on commercial buildings.

Action 5.3 Incorporate a renewable energy requirement into Private Development Green Building Ordinance and the Residential and Commercial Energy Conservation Ordinances.

Action 5.4 Increase the renewable portion of utility electricity generation by advocating for increased state-wide renewable portfolio standards; and consider participating in community choice aggregation, or other means.

Municipal Actions

Action 5.5 Conduct a city-wide renewable energy assessment to estimate the total renewable energy potential and costs and benefits of developing that potential within City bounds. Develop a plan for capturing all cost-effective opportunities.

Action 5.6 Ensure that all new City owned facilities are built with renewable energy (i.e. PV and/or solar hot water) systems as appropriate to their functions.

Summary Table

Table 7: Strategy 5 – Energy: Use Renewable Energy

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost and Benefits
Community-wide Actions				
Action 5.1	Develop a program for the financing and installation of renewable energy systems on residential buildings including single and multiple family residential buildings and mobile homes.	• Model financing methods exist, though many of the programs have been developed for large communities. • Citizens are eager to develop a solar financing program: in drafting the CAP, there were many requests to incorporate a solar financing program. • State and federal financial incentives are available right now. Hayward should take advantage of these incentive programs now. • Financing is a clear barrier that is preventing both businesses and residents from installing solar. The financing program will help address this barrier. • The American Reinvestment and Recovery Act (Stimulus Bill) authorized the allocation of $2.5 billion of Qualified Energy Conservation Bonds, zero interest bonds that may be used to issue loans or grants for capital improvements that reduce energy use and where capital costs are recouped over time. • Hayward may consider a program similar to the CityFIRST program that allows property owners to install solar systems and energy efficiency upgrades with no upfront cost. CityFIRST is financed by taxable municipal bonds providing participants with low interest rates, fixed for 20 years. www.renewfund.com	• Recommendations from Staff to City of Hayward City Council Sustainability Committee January 7, 2009 Agenda and Report. Proposed Solar and Energy Efficiency Financing for Residential and Commercial, and mandatory Solar for New Residential, Commercial Development; and Industrial Development. http://www.hayward-ca.gov/citygov/meetings/csc/ccsc/2009/CSC-CCSC010709.pdf • US DOE Solar America Cities Partnership: www.solaramericacities.energy.gov • GoSolar.org: CEC & CPUC sponsored website for solar financing information applicable to California. http://www.gosolarcalifornia.org • Database of State Incentives for Renewables and Efficiency (DSIRE) is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency. www.dsireusa.org • DOE. *Clean Energy Resources Database for Local Governments.* http://cfpub.epa.gov/ceird/index.cfm?fuseaction=local.search_js#category_criteria • Berkeley FIRST is a solar financing program offered by the City of Berkeley: http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=26580 , www.renewfund.com	**Costs** • Cost to City to pay for staff to manage financing programs. Depending on the in-house expertise and budget available at the time, Hayward could hire consultant to help develop program. • If there is enough of an investment opportunity for a private company, the City may be able to contract a private company to design, finance, and operate program. • Cost to City to pay for staff to maintain, implement, and administer financing program. • Cost to City, bank, or private lender to finance seed funding for program. • Cost to City for education and outreach associated with program • Cost to borrowers to pay interest on loans, though ideally these costs are covered through the financing program. **Additional Benefits** • Lenders can make money on interest. • Borrowers can gain access to capital. • PV installations may create local 'clean tech' jobs. • May increase value of buildings.
Action 5.2	Develop a program for the financing and installation of renewable energy systems on commercial buildings.			
Action 5.3	Incorporate a renewable energy requirement into Private Development Green Building Ordinance and the Residential and Commercial Energy Conservation Ordinances.	• This action has huge potential for reducing emissions • A number of citizens are excited about Community Choice Aggregation, though this program is relatively new so it would likely require a significant effort to get a program off the ground. • State and federal action may result in increased Renewable Portfolio Standards. Hayward should work with other communities to advocate for state and federal action to increase RPS.	• Local Government Commission – Community Choice Aggregation Implementation Plan http://www.lgc.org/cca/ • CEC Renewable Portfolio Information: http://www.energy.ca.gov/portfolio/ • San Francisco Energy Resource Plan: Choosing San Francisco's Energy Future. www.sfenvironment.org	**Cost** • Cost to the City for advocating for increased renewable portfolio standards very low. • Cost to the City for developing a Community Choice Aggregation program is higher: includes the need to pay staff to work with other communities to develop program, for implementing, maintaining, and administering program. • Most cities interested in CCA program have also contracted a study to evaluate costs and benefits of the CCA program. These costs would be reduced if the study could be for multiple jurisdictions.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost and Benefits
				Additional Benefits • Better air quality if electricity is produced from renewables instead of fossil fuels.
Action 5.4	Increase the renewable portion of utility electricity generation by advocating for increased state-wide renewable portfolio standards; and consider participating in community choice aggregation, or other means.	• It is not likely that a PV requirement will be incorporated into the Green Building Ordinance in the near future. • Initially the requirement could be to build new buildings "solar ready" so that solar systems can be more easily installed later.	• The City of Vancouver, BC requires Pre-piping for Roof-mounted Solar Energy Generation: http://vancouver.ca/commsvcs/cbofficial/greenbuildings/greenhomes/solarenergy.htm • City of Tucson, AZ adopted an ordinance in June 2008 requiring solar ready: http://www.tucsonaz.gov/dsd/What_s_New/GET_READY_FOR_SOLAR.pdf	**Costs** • Cost to City to pay staff to update Green Building Ordinance • Cost to developers to pay for PV in new developments though with financing program, these costs may be covered. **Additional Benefits** • PV installations may create 'clean tech' jobs
Municipal Actions				
Action 5.5	Conduct a city-wide renewable energy assessment to estimate the total renewable energy potential and costs and benefits of developing that potential within City bounds. Develop a plan for capturing all cost-effective opportunities.	• California AB 2466, which was signed into law in September 2008 and became effective in January 1009, allows local governments to produce up to 1 MW of renewable energy on one site within its geographic boundaries and generate offsets that can be used to credit one or more electricity meters within the same geographic boundary. This legislation gives local governments some flexibility in how they can meet renewable generation goals. http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab_2451-2500/ab_2466_bill_20080928_chaptered.pdf	• Energy Watch provides free energy services to Cities. Historically, the program has focused on energy efficiency, but Hayward could encourage the program to expand services to renewable energy. http://www.abag.ca.gov/abagenergywatch/index.html	**Costs** • Cost to City to pay for assessment **Additional Benefits** • Identify opportunities for energy and water savings
Action 5.5	Ensure that all new City owned facilities are built with renewable energy (i.e. PV and/or solar hot water) systems as appropriate to their functions.	• City should be aware of the cost of renewable energy and make efforts to balance costs (to both the City and to residents and businesses) with benefits of reduced GHG emissions from energy use. City may start by establishing a means of determining whether or not a renewable energy project is cost effective. When developing a protocol, City should use metrics like life-cycle costs (instead of simple payback) and should place value (monetary or other) on environmental and health benefits like reduced emissions and improved air quality. • If renewable energy is not cost-effective at the time of construction, new buildings and major retrofits should be designed "renewable-energy ready," or with electrical systems suitable for renewable energy. • Incorporating renewable energy into new buildings and major building retrofits is a highly visible means of showing leadership in renewable energy – especially if the City showcases technologies in high-traffic buildings and educates public on costs and benefits of renewable energy.	• Energy Watch provides free energy services to Cities. Historically, the program has focused on energy efficiency, but Hayward could encourage the program to expand services to renewable energy. http://www.abag.ca.gov/abagenergywatch/index.html	**Costs** • Cost to City to develop ordinance. • Cost to City to pay for PV panels. • Eventual cost savings from reduced energy bills, only after panels are paid back. **Additional Benefits** • Reduced dependency on local utility to provide electricity. • More predictable electricity costs.

Strategy 6: Solid Waste: Increase Waste Reduction and Recycling

Goal

The goal of Strategy 6 is to reduce GHG emissions associated with the disposal of solid waste. The long-term goals are to eliminate emissions associated with waste disposal by 2050. This will be achieved by continuing to implement waste reduction and solid waste diversion programs.

Ease of implementation

The City has a well established recycling program and has recently implemented programs to collect organics from residents and businesses. Implementation of new programs requires evaluation of a variety of complex factors, including the extent of preparation required for the materials collected for recycling, the anticipated diversion levels for the targeted materials and, particularly important, the costs to implement those programs. Hayward residents and businesses have diligently participated in recycling programs and are receptive to new programs The resources provided by Stopwaste.org will continue to be invaluable in the City's efforts to further reduce waste generated and implement viable recycling programs.

Estimated GHG Emissions Reductions

If program goals are achieved, it is estimated that Strategy 6 actions will result in an annual emissions savings of approximately 21,851 metric tons CO_2e/year in 2020 and 68,798 metric tons CO_2e/year in 2050 It is estimated that emissions savings from Strategy 6 will contribute 14.1 percent of the emissions reductions needed to meet the 2020 target and 6.4 percent of the emissions reductions needed to meet the 2050 target . Estimated annual emissions reductions from actions are presented in Appendix B.

Cost and Additional Benefits

Cost

The City's franchisee has contracted with a compost facility outside of Alameda County because no compost facility exists in this County. Many other jurisdictions in Alameda County have also been required to contract with similar facilities located outside this County for the same reason. Costs to implement organics collection programs could be reduced if a compost facility were sited in Alameda County, rather than requiring jurisdictions or franchisees to contract with facilities located at more distant sites, resulting in increased transportation costs. The City has prepared a variety of outreach materials to residents and businesses to promote the recycling services offered and will continue to incur the expenses necessary to do so.

Additional Benefits

As more residents and businesses participate in the recycling and organics collection programs, additional jobs may be created and filled by Hayward residents.

Taking a broader look, recycling will result in GHG savings up-stream from Hayward's landfill. As discussed in Section 4, manufacturing products out of recycled materials requires less energy than manufacturing products from virgin materials. Energy savings from re-manufacturing recycled materials will result in GHG savings that are not accounted for in Hayward's inventory.

Strategy 6 Actions

Community-wide Actions

Action 6.1 Increase participation in the recycling services offered businesses through the City's contract with its franchisee.

Action 6.2 Increase participation in the recycling services offered single-family homes through the City's contract with its franchisee.

Action 6.3 Improve the City's construction and demolition debris recycling ordinance by evaluating other jurisdictions' provisions, as well as the processing capabilities of the various transfer stations and facilities in Alameda County and adjacent counties.

Action 6.4 Evaluate the viability of implementing a ban on certain materials from landfills, e.g., yard trimmings, untreated wood, cardboard, plastic bags, or polystyrene.

Action 6.5 Evaluate the viability of requiring that residents and/or businesses participate in the recycling programs offered through the City's franchisee.

Action 6.6 Develop a program that encourages overall reduction of solid waste in residential and commercial sectors. This would include increasing participation in recycling services at multi-family properties and to eventually make recycling by commercial businesses mandatory.

Action 6.7 Advocate for waste management strategies that aim to maximize the useful value of solid waste by, for example, utilizing landfill gas to create electricity.

Municipal Actions

Action 6.8 Continue to implement recycling programs in City-occupied buildings.

Action 6.9 Implement organics collection programs in City-occupied buildings.

Action 6.10 Develop an Environmentally Friendly Purchasing Policy.

Summary Table

Table 8: Strategy 6 – Solid Waste: Increase Waste Reduction and Recycling

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Community-wide Actions				
Action 6.1	Increase participation in recycling services offered businesses through the City's franchisee	• Will require businesses to be receptive and take an active role in participating in program. • Hayward already has a program developed. It is a lot easier to improve upon an existing program than it is to develop a new program.	• City of Hayward Recycling Services www.hayward-ca.gov • Stopwate.org www.stopwaste.org • Alameda County Green Business Program http://www.greenbiz.ca.gov/ • Zero Waste San Diego www.zerowastesandiego.org • CEC's Zero Waste California program www.zerowaste.ca.gov • California Integrated Waste Management Board www.ciwmb.ca.gov • DOE. *Clean Energy Resources Database for Local Governments.* http://cfpub.epa.gov/ceird/index.cfm?fuseaction=local.search_js#category_criteria • City of Hayward Construction and Demolition Debris Waste Reduction and Recycling Requirements. Chapter 5, Article 10 of Municipal Code. http://www.ci.hayward.ca.us/municipal/HMCWEB/ConstructionandDemolitionDebrisWasteReduction.pdf	**Costs** • Cost to City to provide outreach and technical assistance to businesses to implement programs • Cost to City to finance marketing and outreach associated with program • Cost to businesses to develop and improve recycling programs • To the extent possible, identify funds to contain increases in rates. **Additional Benefits** • May create jobs because of increased demand for collection and waste management services. • Will help City meet diversion goals
Action 6.2	Increase participation in recycling services, particularly food scraps collection, offered residents through the City's franchisee	• Hayward has already developed a residential food scraps collection program. It is easier to improve upon an existing program than it is to develop a new program • To be successful, residents will have to participate in the program.		**Cost** • Cost to City to fund marketing and outreach for program • To the extent possible, identify funds to contain increases in rates. **Additional Benefits** • May create jobs because of increased demand for collection and waste management services. • Will help City meet diversion goals.
Action 6.3	Improve the City's construction and demolition (C&D) debris recycling ordinance by evaluating other jurisdictions' provisions, as well as the processing capabilities of the various transfer stations and facilities in Alameda County and adjacent counties.	• Hayward's existing construction and demolition debris recycling ordinance requires applicants for all construction, demolition, and/or renovation projects valued at $75,000 or more recycle 100 percent of all asphalt and concrete and 50 percent of all other materials generated from the project. • Revising the ordinance requires evaluation of a variety of complex factors, as described, including the relative costs to private contractors. • Businesses may be resistant to more stringent C&D recycling standards. • The C&D Ordinance and the Green Building Ordinance may work well together: one making the other easier to implement.		**Cost** • Cost to City to update C&D ordinance. • Cost to City to implement and maintain existing C&D programs. • Cost to developers for adhering to ordinance. **Additional Benefits** • May create jobs because of increased demand for collection and waste management services. • Will help City meet diversion goals

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Action 6 4	Evaluate the viability of implementing a ban on certain materials from landfill, e.g., yard trimmings, untreated wood, cardboard, plastic bags, or polystyrene.	• Monitoring compliance by residents and businesses will require outreach materials emphasizing the reasons for the ban on the targeted materials. • Implementing bans on materials require obtaining the source of the banned materials and data from the disposal facilities. Banning materials from the landfill does not completely prevent these materials from being discarded at facilities not monitored for compliance.		**Cost** • Cost to City for researching and developing program. • Potential cost to businesses and residents for purchasing more expensive materials as opposed to purchasing materials that are banned. **Additional Benefits** • May create jobs because of increased demand for collection and waste management services. • Will help City meet diversion goals.
Action 6.5	Evaluate the viability of requiring that residents and/or businesses participate in the recycling programs offered through the City's franchisee.	• Ease of implementation will depend on whether residents and businesses support or resist the program.		**Cost** • Cost to City to develop, implement, and maintain program. • Cost to residents and businesses to pay for recycling services. • Cost to recycling companies for expanding services. **Additional Benefits** • May create jobs because of increased demand for collection and waste management services. • Will help City meet diversion goals.
Action 6.6	Develop program that encourages overall reduction of solid waste in residential and commercial sectors. This would include increasing participation in recycling services at multi-family properties and to eventually make recycling by commercial businesses mandatory.	• Would require resident and business participation to succeed.		**Cost** • Cost to City to pay staff to develop program. • Cost to City to pay for marketing and outreach. **Additional Benefits** • May create jobs because of increased demand for collection and waste management services. • Will help City meet diversion goals.
Action 6.7	Advocate for waste management strategies that aim to maximize the useful value of solid waste by, for example, utilizing landfill gas to create electricity. Advocate siting a compost facility in Alameda County in order to reduce costs to transport the materials to more distant facilities for composting.	• Waste management techniques such as gasification and incineration are generally faced with significant opposition. • Waste management facilities, like materials recovery facilities where recyclable materials are recovered from incoming waste, are more expensive to operate than landfills. • Waste Management and Linde will build a liquefied natural gas plant at the Altamont Landfill. Landfill gas will be captured, purified, compressed and used as transportation fuel. At full operation, it is expected that the plant will produce 13,000 gallons of liquefied natural gas per day.	•	**Cost** • Cost to pay City staff to advocate for franchises to use innovative waste management techniques. • Cost to franchises to operate more advanced facilities. • Potential cost to rate payers who are paying for a more expensive waste management facility. **Additional Benefits** • May create jobs because of increased demand for collection and waste management services. • Will help City meet diversion goals.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Municipal Actions				
Action 6.8	Continue to implement recycling programs in City-occupied buildings.	• City has already established a recycling program in municipal buildings and has been successful at getting city staff and visitors to City buildings to participate in recycling efforts. The City collects paper, glass, plastic, and aluminum.	• CIWMB Recycling Website. http://www.ciwmb.ca.gov/Recycle/ • Stopwaste.org's Recycling Links website. http://www.stopwaste.org/home/index.asp?page=525	**Cost** • Cost to City for internal outreach and marketing. **Additional Benefits** • Will help City meet diversion goals. • Will set a good example for the community.
Action 6.9	Implement organics collection programs in City-occupied buildings.	• At the time of writing, the City was exploring a food scraps collection service for municipal buildings. Some of the challenges include staffing and logistics for collection of organic materials. • The City could consider a program for composting paper towels in restrooms.	• Stopwaste.org's Food Scraps Recycling Website. http://stopwaste.org/home/index.asp?page=528 • CIWMB Organic Materials Management Website. http://www.ciwmb.ca.gov/organics/	**Cost** • Cost to City for internal outreach and marketing. **Additional Benefits** • Will help City meet diversion goals. • Will set a good example for the community.
Action 6.10	Develop an Environmentally Friendly Purchasing Policy.	• At the time of writing, the City was exploring an environmentally friendly purchasing policy for municipal purchases.	• Stopwaste.org's Environmentally Preferable Purchasing Website. http://stopwaste.org/home/index.asp?page=372 • Stopwaste.org. *A Resource Guide for Environmentally Preferable Products.* http://stopwaste.org/docs/resource_guide_for_ep_products_3-06.pdf • ABAG. Bay Area Hazardous Waste Committee. Environmentally Preferable Purchasing website. http://www.abag.ca.gov/hazwaste/environmentallypreferablepurchasing.html • EPA's Environmentally Preferable Purchasing program helps the federal government "buy green," and in doing so, uses the federal government's enormous buying power to stimulate market demand for green products and services. http://www.epa.gov/epp/index.htm • The Institute for Local Government Climate Action Network offers a sample Climate Friendly Purcashing Policy: • http://www.coolcalifornia.org/article/buy-green-0	**Cost** • Cost to City for internal outreach and marketing. • Cost to develop protocol. • Incremental cost of purchasing environmentally friendly products. **Additional Benefits** • Will help City meet diversion goals. • Will set a good example for the community..

Strategy 7: Sequester Carbon

Goal

The goal of this strategy is to develop and implant a program that aims to maximize carbon sequestration taking place within Hayward.

Ease of implementation

Promoting urban forestry should be a relatively easy task to complete. One of the challenges of implementing this Strategy is ensuring that tree planting activities — that trees are properly cared for and managed is occurring. If trees are not well managed they will not sequester as much carbon as they could if they were healthy.

Estimated GHG Emissions Reductions

The emissions reductions associated with carbon sequestration are relatively low. Sequestration from trees can range from 35 pounds CO_2e/year (0.02 metric tons CO_2e/year) for small, slow-growing trees to 600 pounds CO_2e/year (0.27 metric tons CO_2e/year) for larger trees growing at their maximum rate.[99] When compared to the annual GHG emissions from one passenger vehicle at about 8,000 lbs CO_2e/year (3.6 metric tons CO_2e/year),[100] it becomes clear that planting trees will make a much smaller contribution to GHG reductions than the other actions presented in the CAP. However, carbon sequestration is important because coupled with an effective education, outreach, and communication plan it can help raise awareness about climate science and encourage individuals to reduce their own emissions.

If program goals are achieved, it is estimated that Strategy 7 actions will result in an annual emissions savings of approximately 284 metric tons CO_2e/year in 2050. Estimated annual emissions reductions from specific actions are presented in Appendix B.

Costs and Additional Benefits

Costs

The investment costs associated with Strategy 7 include developing a carbon sequestration program and developing a protocol for purchasing carbon offsets. Depending on how the sequestration program is designed, Hayward could be responsible for financing some sequestration activities. However, the program could also be designed so developers are responsible for the cost of carbon sequestration on newly developed and re-developed land.

Additional Benefits

The most significant additional benefit of Strategy 7 is raising public awareness about climate change, and encouraging individuals to take action. If the carbon sequestration program creates a significant amount of green space, it could help make the City more livable and appealing for new residents. Planting trees in urban areas can reduce demand for space cooling: strategically placed trees can provide shade and reduce air conditioning demand, but shading can also increase demand for heating in the

[99] California Climate Action Registry. *Urban Forestry Project Reporting Protocol.* Version 1.0. August 2008. www.climateregistry.org.
[100] A passenger vehicle that travels 12,000 miles per year and gets 25 MPG will emit 7970 pounds CO_2e per year

winter. A 1990 study found that California could save about 47,000 GWh over 15 years by planting 50 million trees to shade east and west walls of residential buildings.[101]

Strategy 7 Actions

Community-wide actions

Action 7.1 Develop and implement a program to maximize carbon sequestration activities occurring within Hayward. Activities may include planting trees or managing wetlands.

Municipal Actions

Action 7.2 Develop a protocol for maximizing carbon sequestration on municipal property by way of planning trees or other methods.

[101] US Department of Agriculture. McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Maco, S.E.; Xiao, Q; Hoefer, P.J. 2003. *Northern Mountain and Prairie Community Tree Guide: Benefits, Costs, and Strategic Planting.* Albany, CA. Forest Service, Pacific Southwest Research Station.

Summary Table

Table 9: Strategy 7 – Sequester Carbon

Action #	Description	Notes on implementation	Model Programs & References	Notes on Costs and Benefits
Community-wide Actions				
Action 7.1	Develop and implement a program to maximize carbon sequestration activities occurring within Hayward. Activities may include planting trees or managing wetlands.	• Shade from trees reduces energy used for cooling, but the shade can also interfere with the effectiveness of solar systems. City will have to weigh the options between planting trees and installing solar. • City should consider not only the cost of planting trees, but also the costs associated with maintaining trees. Unhealthy trees will not sequester as much carbon as healthy trees.	• Winter 2008 newsletter of the Center for Urban Forest Research: www.fs.fed.us/psw/programs/cufr/products/12/psw_cufr755_winter2008newsbrief.pdf • US Forest Service's Climate Change Resource Center: www.fs.fed.us/ccrc/ • CCAR. *Urban Forest Project Reporting Protocol.* http://www.fs.fed.us/ccrc/topics/urban-forests/docs/Urban%20Forest%20Protocol%20081208.pdf • Cooperative Research Centre for Greenhouse Accounting. *The Tree Carbon Calculator.* http://svc237.bne113v.server-web.com/calculators/treecarbon.htm •	**Costs** • Cost to City to develop carbon sequestration plan. • Cost to City to pay for initial tree planting. • Cost to City to care for and maintain trees. • NCDC Imaging www.ncdcimaging.com/ can provide tree canopy surveys and carbon storage analysis via remote sensing technology. A rough estimate from a representative indicated that Hayward could spend $25K to $50K on such a survey. **Additional Benefits** • Strategically placed trees can provide shading and reduce air conditioning demand. • Green spaces can help communities thrive. •
Municipal Actions				
Action 7.2	Develop a protocol for maximizing carbon sequestration on municipal property by way of planning trees or other methods.	• At the time this CAP was prepared, the City was in the process of applying for a grant from the California Department of Forestry and Fire Protection to fund a tree inventory of publicly maintained and protected trees within the City of Hayward. An up-to-date inventory will help with tracking carbon sequestration.	• CCAR. *Urban Forest Project Reporting Protocol.* http://www.fs.fed.us/ccrc/topics/urban-forests/docs/Urban%20Forest%20Protocol%20081208.pdf • Cooperative Research Centre for Greenhouse Accounting. *The Tree Carbon Calculator.* http://svc237.bne113v.server-web.com/calculators/treecarbon.htm	**Costs** • Cost for planting trees. • Cost for continued tree maintenance. **Additional Benefits** • Green space can help communities thrive. • Additional energy savings if trees create shading in the summer.

Strategy 8: Climate Change Adaptation

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. During the preparation of the final version of the CAP, the Sea Level Rise Study had not been completed. A summary of the study will be included here when the CAP is updated.

Strategy 9: Engage and Educate Community

Goal

To meet aggressive GHG targets, it is imperative that individuals and businesses do what they can to reduce their own emissions. Hayward is relying on its constituents to be committed and engaged in efforts to reduce emissions. As outlined in the CAP, Hayward plans on developing policies and programs that will make it easier for people to minimize the amount of GHGs they emit, but these programs will only be successful if the community is receptive to new ideas and willing to change their behaviors. The successful implementation of each action presented in Strategies 1 through 8 depends on community participation. Because community participation is such a vital component of successful implementation, the CAP proposes specific actions that aim to maximize community participation.

The goal of Strategy 9 is to maximize community participation efforts to reduce emissions and continue harnessing residents' sense of commitment to environmental responsibility. This will be achieved by developing and implementing comprehensive education, outreach, and marketing programs. The City proposes to focus on improving access to information on energy and climate-related issues, and on improved communication between government, residents, and businesses.

Ease of implementation

Reducing emissions and achieving GHG targets will only be possible if the community is successfully engaged. Local government can institute policies and programs that make it easier for individuals and businesses to reduce emissions, but programs are only as effective as the community's commitment to reducing emissions.

Some of the challenges of effective public engagement include:

- Establishing and maintaining communication – generally speaking, people are more receptive to communication if they are engaged in an environment where they feel comfortable (school, places of worship, work, or social centers).
- Sending a clear and concise message – with so much information available about climate change, it can be difficult for people to discern what they should do to reduce emissions. It is important for the City to provide constituents with a consistent and clear message.
- Calling for action – when asking stakeholders to take action, it is important to spell out exactly what the City is asking and explain how this action will benefit the community and individuals.
- Concerns about cost – many residents may be concerned about the cost of reducing emissions, and may not participate in programs because of this fear. The City can address this by providing information on the costs of participating in specific programs, the financing opportunities available, and the cost savings associated with reduced energy use.
- Leadership by example – residents will likely be more receptive to make changes if they see prominent people in the community making changes. These prominent people may include elected officials, teachers, members of local boards and committees, heads of churches or other places of worship. Hayward may choose to make a concerted effort to encourage these prominent people to adopt climate-friendly practices early, and to be open with the community about their commitment to the climate. Another way Hayward can show leadership is by working to reduce emissions from government operations.
- Empowering people to make informed decisions – the decision to reduce personal emissions is not a trivial decision. People who make this decision will want to know what they will have to do to reduce emissions, if efforts will change their regular schedule or routine, how much it will cost,

and what resources are available. Because many people will want to do some research before making the decision, it is important that Hayward do what it can to make information accessible to residents.

It is recommended that Hayward use its existing resources to reach, engage, and educate the community. For example, the City could work with local universities (California State East Bay and Chabot College), non-profit organizations, the Hayward Chamber of Commerce, or the Keep Hayward Clean and Green Taskforce. Partnering with the private sector will enable the City to leverage staff efforts and will lead to a more effective education and outreach program. One idea that came out of the public comment period was to work with the universities and/or high schools to develop a multi-media curriculum, a set of lesson plans, or a day-long field trip, for younger children to learn about the local impact of climate change and ideas on how students and their families could reduce emissions. A program like this would encourage collaboration between the high schools and the universities and take pressure off of primary school teachers to develop lessons on climate change.

During the public comment period on the Draft CAP, a number of people recommended that Hayward demonstrate energy efficiency and renewable energy programs in highly visible and strategically placed "landmark" projects. The City could choose a number of ways to fulfill the request for highly visible landmark project. For example, the City may decide to focus its household energy efficiency retrofit efforts on one specific neighborhood to generate interest in the program and demonstrate the effectiveness of reducing energy use on a community scale. The City could also choose to retrofit several buildings (strategically place in various neighborhoods), and open these buildings up for public tours and tours for schools children. It is also recommended that the City retrofit all municipal buildings and make the costs and benefits of the energy retrofits available to the public.

Estimated GHG Emissions Reductions

The effects of community education and participation are difficult to quantify due to the large number of variables, and so may require a more qualitative than quantitative assessment. Without adequate community participation, however, Hayward can expect to see fewer emissions reductions. Simply stated, change "... is more likely to be successful and permanent when the people it affects are involved in initiating and promoting it."[102] In other words, a crucial element of community engagement is participation by the individuals, community-based organizations, and institutions that will be affected by the effort.

Cost and Additional Benefits

Costs

The cost impacts of implementing the actions proposed in Strategy 9 will consist of significant City staff time to develop and execute new communication, outreach, and education plans, and developing promotional and education tools. The costs associated with community engagement will be ongoing. Every time the City develops new programs or updates an existing program there will be costs associated with marketing, outreach, and education. Professional educators in public and private institutions may assist as volunteers and/or incorporate programs into their own curricula.

[102] Thompson B, Kinne S. *Social change theory: applications to community health.* In: Bracht N, (editor). Health promotion at the community level. Newbury Park (CA): Sage Publications; 1990.

Additional Benefits

If Hayward develops a comprehensive program to engage residents and local businesses in an effort to reduce emissions, the program could help the City communicate about climate-related issues but also communicate to constituents about initiatives outside of the CAP efforts. Hayward could piggyback on the CAP effort to engage the community to improve overall communication between government and the community.

If Hayward is successful at encouraging lasting changes in the way residents and businesses consume energy and fuel and generate solid waste, the City may see unexpected changes to the economy and to lifestyle. For example, residents who drive less may feel more connected with their neighborhoods. People will also be saving more from lower energy and fuel bills so they will have more money to spend in other areas of the economy. If Hayward successfully implements the CAP according to the proposed timeframe, the total cost savings from reduced fuel and energy consumption is estimated to be $32.7 million.[103] The economic analysis prepared for the AB 32 Scoping Plan economy would grow very slightly as a result of activities aimed at reducing emissions when compared to the business-as-usual case.[104]

Strategy 9 Actions

Community-wide Actions

Action 9.1 Create a stand-alone Green Portal, or website, that would serve as the City's hub for all things green. The site would contain a dedicated area for green building, all programs related to the climate action plan, and information about local green jobs and training. The portal will ensure that all residents and businesses have access to information on the City's climate-related initiatives.

Action 9.2 Develop and implement a plan that aims to engage residents in the City-wide effort to reduce emissions. The plan will be designed to reach residents of all ages, races, and classes on how to reduce GHG emissions and will introduce residents to City climate action programs. This plan will incorporate a long-term plan to involve K-12 schools and universities and utilize the most effective means of engaging the broader community.

Action 9.3 Develop and implement an outreach plan to engage local businesses in climate-related programs. This program should provide a benefit for both local government and businesses: the City will aim to provide businesses with information on local, state, and federal programs, and businesses should be given the opportunity to provide input on ways local government could help streamline their efforts to reduce emissions. In developing this plan, the City will explore options for engaging the Chamber of Commerce, the Keep Hayward Clean and Green Taskforce, the Alameda County Green Business Program, and other business councils.

[103] 11,426,719 gallons gasoline of fuel savings x $2.5/gallon + 570,597 gallons diesel x $3/gallon diesel + 15,604 MWh electricity savings x $120/MWh + 572,990 therms x $1/therm = $ 32.7 million

[104] AB 32 Scoping Plan reports an expected 2.8% increase in gross state product, a 2.8% increase in personal income, and a 0.9% increase in employment when comparing the business-as-usual case to the case where actions presented in the Scoping Plan are implemented.

Municipal Action

Action 9.4	Offer a GHG reductions education program in which employees will learn about programs the City already offers, and/or will offer in the future to residents and businesses.
Action 9.5	Show leadership by setting targets to reduce municipal emissions and work diligently to meet targets.
Action 9.6	When awarding contracts, professional service agreements, grants, etc. to businesses or non-profit agencies, the City will request proposals or applications to include information about the sustainability practices of the organization.

Summary Table

Table 10: Strategy 9 – Engage and Educate Community

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Community Actions				
Action 9.1	Create a stand-alone Green Portal, or website, that would serve as the City's hub for all things green. The site would contain a dedicated area for green building, all programs related to the climate action plan, and information about local green jobs and training. The portal will ensure that all residents and businesses have access to information on the City's climate-related initiatives.	• Web access that is easy to find, simple to understand, and hierarchical to allow access to several layers of information will improve support for the plan. • Success of the program is dependent on how much marketing and outreach is dedicated to supporting the program. • Cost of creating and hosting a website for residents and businesses to access this information may delay implementation of this action. • The website can include information about the City's progress toward meeting the CAP targets.	• Example websites www.beclimatesmart.com/ www.greenmartinez.org • Communicating about Climate Change: Challenges and Opportunities, Brownlash Communication about Climate Change: An Analysis of Recent Publications, www.fes.uwaterloo.ca/research/climateconference/ • Climate Change Action Plans: Sustainability: City of Vancouver. To reduce community green house gas emissions (GHG's), www.vancouver.ca/sustainability/climate_protection.htm	**Costs** • City staff and/or consultants costs for website design, hosting, and maintenance to create a stand-alone Green Portal. • City and other labor and material costs of creating and distributing this information in digital and hard copy to ensure that residents and businesses have access information on the City's climate-related initiatives. **Additional Benefits** • The Portal will serve as a clearinghouse and information resource for the CAP, and a venue for enabling interactive citizen participation. • Good communications access will attract interest and support for the CAP, and enable citizens to participate in the process.
Action 9.2	Develop and implement a plan that aims to engage residents in the City-wide effort to reduce emissions. The plan will be designed to reach residents of all ages, races, and classes on how to reduce GHG emissions and will introduce residents to City climate action programs. This plan will incorporate a long-term plan to involve K-12 schools and universities and utilize the most effective means of engaging the broader community.	• Education on the benefits of reduced emissions will increase the effectiveness and continued support for this effort. Without this, the plan could lack the support it needs to survive any changes in local opinion. • Without continued support by the City, the plan will be difficult to implement on an ongoing basis. The City must continue to support and realize the importance of outreach to enable this action to survive any local political change. • Costs of this outreach may dissuade the City from implementing this action. • The ease of helping citizens understand the value and implications of the proposed CAP strategies will be directly related to reporting and promotion of emission-related regulations, further evidence of the impacts of climate change, and the cost savings in conservation and building energy and fuel efficiency. • Ease of implementation will depend on regional and state decisions regarding subsidy for this type of program. • Success is dependent on how much marketing and outreach is dedicated to the program.	• Talk of the City: engaging urbanites on climate change, www.iop.org/EJ/article/1748-9326/1/1/014006/erl6_1_014006.html • Engaging residents. What we are looking for. Graeme Bennett. 20 November 2008 www.encams.org/events/downloads/Graeme_Bennett_Audit_Commission.pdf • Climate Change - Public Involvement Climate Change and related issues for the State of Utah. www.deq.utah.gov/Climate_Change/public_involvement.htm • Supporting Effective Participation in the Climate Change Debate, www.sustainer.org/pubs/siclimate.PDF • National Charrette Institute (NCI) Trainings and Certificate Program: Sustainable community and building design, and building design www.charretteinstitute.org/programs.html • Lesson Plans Global Warming: Earth Science, Physical Sciences ... K-12 School Lesson Plans, Curriculum and Materials, www.climatechangeeducation.org • BAAQMD has produced a curriculum targeted at 4th and 5th graders called *Protect Your Climate* http://www.baaqmd.gov/pln/documents/climatechange.htm#GrantProg	**Costs** • Costs for City staff and/or consultants to develop and implement a plan that aims to engage residents in the citywide effort to reduce emissions. **Additional Benefits** • The plan will provide a comprehensive educational venue to reach people where they can learn and participate. • Hayward citizens will benefit from individual and collective efforts to reduce GHG emissions in terms of personal and environmental health, cost savings, and greater awareness of the causes and effects of, and remedies to climate change.

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
			• • • ICLEI Outreach and Communications Guidebook: http://www.icleiusa.org/action-center/engaging-your-community/outreach-and-communications-guide • Behavior Matters! The Design, Implementation and Evaluation of Energy Efficiency Programs to Reduce Greenhouse Gas Emissions. A presentation by Edward Vine http://www.arb.ca.gov/research/seminars/vine/vine.pdf	
Action 9.3	Develop and implement an outreach plan to engage local businesses in climate-related programs. This program should provide a benefit for both local government and businesses: the City will aim to provide businesses with information on local, state, and federal programs, and businesses should be given the opportunity to provide input on ways local government could help streamline their efforts to reduce emissions. In developing this plan, the City will explore options for engaging the Chamber of Commerce, the Keep Hayward Clean and Green Taskforce, the Alameda County Green Business Program, and other business councils.	• Education on the benefits from reduced emissions will increase the effectiveness of the implementation and continued support of this effort. • Without continued support by the City, the plan will be difficult to implement on an ongoing basis. The City must continue to support and realize the importance of outreach to enable this action to survive any local political change. • Costs of this outreach may dissuade the City from implementing this action. • Success of program is dependent on how much marketing and outreach is dedicated to the program. • Business will have an incentive to evaluate the costs and benefits of each proposed action that impacts their business. • Ease of implementation will depend on regional and state decisions regarding available funding for this type of program. • Success of program is dependent on how much marketing and outreach is dedicated to the program.	• How to Communicate Climate Change: The business challenge, bis.lucita.org/node/2084 • International Business and Global Climate Change: Nov 14, 2008 www.routledgebusiness.com/books/International-Business-and-Global-Climate-Change-isbn9780415415538 • Sustainability and Climate Change - Community ., Engaging Local Communities www.tq.com.au/resource-centre/sustainability-and-climate-change/ community-engagement/community-engagement • Public Involvement Techniques for Business and Transportation Decision-making. www.mongabay.com/reference/environment/Public_involvement.html	**Costs** • The salary for City staff and/or consultants to develop and implement a plan to engage local businesses in climate-related programs. **Additional Benefits** • Businesses will learn how, where, when, and why to support and participate in CAP actions. • Increase local business awareness of the economic value in supporting the CAP
Municipal Actions				
Action 9.4	Offer a GHG reductions education program in which employees will learn about programs the City already offers, and/or will offer in the future to residents and businesses.	• Program could fit into City's existing internal education practices. • Success of program is dependent on whether employees take advantage of programs.	• None identified	**Costs** • Cost for internal outreach, marketing, and education program **Additional Benefits** • None identified
Action 9.5	Show leadership by setting targets to reduce municipal emissions and work diligently to meet targets.	• This CAP identifies an emissions reduction target and a number of actions the City can take to meet the target.	• None identified	**Costs** • Cost to City to develop and implement programs. **Additional Benefits** • None identified

Action #	Description	Notes on implementation	Model Programs & References	Notes on Cost
Action 9.6	When awarding contracts, professional service agreements, grants, etc. to businesses or non-profit agencies, the City will request proposals or applications to include information about the sustainability practices of the organization.	• Hayward negotiated a clean fuels agreement with Waste Management during the last contract negotiation. City can use this negation as a template for future negotiations.	• None identified	**Costs** • Cost to City to develop protocol. **Additional Benefits** • None identified

This page left intentionally blank for double sided printing.

Section 6 – Implementing the Plan

Section 6 focuses on mechanisms and approaches Hayward can use when implementing the Climate Action Plan. The Section begins with a discussion about managing City staff resources, and then discusses factors to consider when deciding which actions to prioritize. The Section concludes with ideas about mapping out a budget for climate programs and matching the budget with funding sources. It is important to note that, given the scope of the CAP, details for many of the actions identified remain to be resolved. The actions identified call for bold action, some of which will require significant staff analysis, public input, and further consideration by the City Council to ensure financial feasibility.

Managing City Staff Resources

Recommendations:

1. The City establish a Climate Action Management Team to support and guide efforts to reduce emissions.
2. The City appoint a permanent Climate Action Coordinator who will coordinate the Climate Action Management Team, develop and implement programs/actions, and be responsible for monitoring and reporting on progress toward meeting the long-term emissions reductions 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.

Successful implementation of the Plan will require participation and support from the community and multiple City departments. 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.

Climate Action Management Team

The Climate Action Management Team (CAM Team) will work in collaboration with residents and members of the business community to develop programs that can effectively reduce emissions while also minimizing adverse effects to the community at large. During the planning stage, the CAM Team can help identify potential barriers to implementation, and ensure that these barriers are addressed early before they hinder emissions reductions. The CAM Team can also help make implementation as straightforward as possible. Key requirements for success include:

A clearly defined long-term vision and direction

Strong political support from the City's top decision makers

Identifiable climate program champions at all levels (i.e. including decision makers, management, and staff) of all relevant departments

Strong community support

Key participants may vary depending on current project priorities, but are likely to include representatives from the following departments, commissions, and committees:

Finance Department – provides assistance on budgetary, accounting, and economic analysis of climate projects and assists in securing long-term financing for the climate action program.

Public Works Department – provides expertise on transportation, energy, and solid-waste-related issues. Also provides leadership on how to minimize energy consumption, fuel use, and solid waste generated within City operations.

Development Services Department – evaluates development proposals for compliance with climate action goals and policies and offers expertise in long-term planning.

City Manager's Office (Economic Development) – provides assistance on evaluating and managing the economic impacts of climate action programs.

Maintenance Services Department – provides insight into how the City may improve conditions for walkers and bikers, and provides experience for landscaping and tree-planting programs that will reduce emissions and also enhance the walking and biking experience.

Library and Neighborhood Services Department – provides expertise in communicating with the community about climate-related programs and services.

Other team members may be added on a project-specific basis to provide specialist skills: legal, human resources, purchasing and contracts, technology, etc.

The City should also consider inviting representatives from Hayward's various committees and commissions to serve on the CAM Team and provide guidance and support on specific projects and programs. Some of the obvious relevant committees and commissions include:

Keep Hayward Clean and Green Task Force

Economic Development Committee

Planning Commission

Hayward Redevelopment Area Committee

There are also local non-profit energy interest groups and community leaders who, while perhaps not permanent CAM Team members, can also be valuable supporters of local emissions-reductions efforts. Other possible community supporters include local environmental organizations, including those concerned with the relationships between emissions and human health. For example, childhood asthma is of growing concern, and has been strongly linked to local air quality, which is in turn directly impacted by local climate policies. California State University, East Bay is another obvious resource the CAM Team could consider utilizing.

Climate Action Coordinator

The CAM Team will be comprised of members of the public and individuals that work in various City departments and they will inevitably have responsibilities outside of the CAM Team. To ensure the CAM Team has access to dedicated staff resources, it is critical that there is at least one staff member whose primary job description includes coordinating the CAM Team. This Climate Action Coordinator can also be responsible for monitoring and reporting on progress towards meeting emissions targets; specific climate-related responsibilities should be written into that staff member's primary job description. Key job requirements include:

Recruiting members to the CAM Team.

Ensuring the CAM Team meets on a regular basis and that members are kept informed on progress of specific programs.

Coordinating the implementation of specific actions recommended by the Climate Action Plan. This includes developing work programs and budgets and working with the CAM Team and community members.

Coordinating the budget for climate programs and working to secure long-term financing for programs.

Annual monitoring of emissions reductions.

Reporting annually to the City's Sustainability Committee, and to other appropriate committees or boards on progress towards achieving the long-term emissions reductions goals.

Recommending new actions and programs, not included in the CAP, as new technology comes to market and as state and federal legislation changes.

Annual Progress Review

Recommendations:

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 reductions goals.

"What gets measured, gets done." This is the first principle listed in Hayward's 12 City Leadership Principles, which were adopted in 2007.[105] Measuring GHG emissions on a regular basis and verifying that climate programs are effectively reducing emissions is a critical step to ensuring that Hayward's programs are resulting in emissions reductions. It is recommended therefore, that the CAM Team report annually on progress towards meeting emissions reductions goals. Regular reporting has several benefits, including:

Provides the CAM Team with a reason to evaluate how effective programs are at reducing emissions.

Allows the CAM Team to make adjustments as necessary, to funding and program design, to keep the programs on track.

Keeps the CAM Team on task to meet both short-term and long-term goals

In addition to reporting on emissions reductions, it is recommended that the City develop a review process for evaluating the effectiveness of each program that aims to reduce emissions. Hayward should work within the City's existing review protocols and aim to create a review process that is rigorous enough to provide an accurate picture of the progress Hayward is making towards reducing emissions. The review process should not be so time-consuming that it significantly detracts from efforts to develop and administer emission-reduction programs.

[105] Human Resources Director. City of Hayward, California. http://www.peckhamandmckenney.com/pdfs/HaywardHRD-web.pdf

Citizen and Business Participation

Recommendations:

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.

Recommendation:

When prioritizing actions, the City should weigh the following factors: estimated emissions reductions, cost of implementation, ease of implementation, and the time required for the program to reach full implementation.

Hayward's citizens and businesses will play a critical role in the Climate Action Plan implementation. As discussed in Strategy 9, without active participation, climate programs will not be as effective as planned. Hayward will not meet emissions targets without community participation. Community participation is so essential to success that the CAP recommends specific actions to engage the community in the process (see Strategy 9).

Prioritizing Actions to Implement

Recommendation:

8. When prioritizing actions, the City should weigh the following factors: estimated emissions reductions, cost of implementation, ease of implementation, and the time required for the program to reach full implementation, and financial benefits or cost savings.

One of the challenges of implementing the CAP is determining which actions to implement first. To help determine which actions to prioritize, the City evaluated actions by scoring each one based on four criteria, which are described in more detail in the following pages:

1. Ease of implementation
2. Time to achieve full implementation
3. Potential emissions reductions
4. Cost

Table 11 presents the CAP actions, the scores they received during the prioritization process, and relative rankings of each action. The maximum possible score was 100 points, and the actions receiving highest scores were considered to be highest priority for implementation. The scoring process is described in more detail in Appendix D. The complete score-card for each action is also presented in Appendix D.

The scoring process is one tool the City can use to determine which actions to implement, but it should not be the only tool. More than anything else, the scoring process provides the City with a mechanism to review the actions and to identify potential barriers to implementation.

Based on the action prioritization, the City developed a recommended schedule for implementing the various actions. Depending on economic and other conditions at the time, the City may decide to adjust the implementation timing. If the City does adjust the implementation schedule in order to meet other City

priorities, it is important that where possible, implementation continues to occur across each of the transportation, energy, and waste sectors rather than focusing on implementing actions in one sector only.

Community-wide Actions – in order of priority

Table 11: Proposed actions for reducing community-wide emissions: listed in order of priority

Action Number	Short Description	Estimated Annual Emissions Reductions (metric tons CO2e) *assumes Scenario 2 fuel economy and renewable electricity generation and that program goals are achieved		Priority
		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 Number	Short Description	Estimated Annual Emissions Reductions (metric tons CO2e) *assumes Scenario 2 fuel economy and renewable electricity generation and that program goals are achieved		Priority
		2020	2050	
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	*Place holder - no actions defined for climate change adaptation*	not evaluated		--

Municipal Actions – listed in order of priority

Table 12: Proposed actions for reducing municipal emissions: listed in order of priority

Action Number	Short Description	Estimated Annual Emissions Reductions (metric tons CO2e) *assumes Scenario 2 fuel economy and renewable electricity generation and that program goals are achieved		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	*Place holder - no actions defined for climate change adaptation*	emissions reductions not quantified		9

Costs and benefits

When weighing the costs and benefits of a proposed action, it is recommended that the City take into consideration not only more traditional investment cost metrics such as simple payback, internal rate of return, and net savings, but also consider the life-cycle costs of the action. Traditional cost metrics are useful for evaluating the short-term cost effectiveness of programs, whereas life-cycle costs analysis[106] is helpful when looking at longer-term investments.

The most common metric for evaluating investments is simple payback; this metric ignores the time value of money and provides a straightforward estimate of the time it will take for an investment to pay for itself. The simple payback period is equal to the investment cost divided by the annual savings. For example, a $1,000 investment that saves $500 each year has a two-year simple payback.

The federal government has chosen to implement all efficiency projects with a payback of ten years or less, but in principle any project that pays back its initial investment in less than the measure's anticipated lifetime

[106] Life-cycle cost analysis takes into consideration all costs and benefits associated with a particular investment throughout the entire duration of the investment's useful life.

can reasonably be considered worthwhile. Many government agencies also have a policy of implementing comprehensive energy projects that include a range of different actions, where the shorter payback measures can subsidize the cost of longer payback items, to produce an overall payback period that is acceptable.

When evaluating benefits of a proposed action, it is suggested that the City place value not only on the GHG emission reductions, but also on non-GHG reductions benefits such as health benefits, decreases in water and air pollution, job creation, growth of the local "clean-tech" industry, improved worker or student productivity, or community and economic development. For example, reducing vehicle miles traveled will also improve overall air quality and may result in a decrease in air quality related health problems such as childhood asthma. Reducing the number of vehicles on the road may also reduce the risk of accident-related injury and may reduce local traffic-related noise pollution. Similarly, improving walkability in the community may result in improved pedestrian safety and have other general health benefits.

Time to full implementation

When prioritizing actions to implement, it is important to consider how long it will take for actions to be fully implemented and to plan ahead to ensure that emissions reductions are realized in time to meet the long-term emissions targets. Initially there is likely to be an emphasis on actions that are easy to implement and that result in immediate emissions savings. These short-term results will encourage early confidence in the Plan. However, it is also important that early work is begun on developing longer-term emissions reductions strategies that will require more extensive up-front work, but that will still result in emissions savings long after the low-hanging-fruit have been taken.

For actions that may take longer to implement, or where there may be some initial opposition, the Draft Plan recommends using a phase-in approach where the first phase of implementation may not result in major emissions savings, but provides a stepping stone for the next and more productive phase of the program. For example, when developing and introducing a residential energy conservation ordinance, Hayward could initiate implementation in stages. The first stage might only provide information on the cost saving benefits of certain retrofit measures; a later stage might require building owners to perform an energy audit before a building is sold, and require the owners to disclose the audit results to a prospective purchaser. Depending upon the success of the information-only and audit programs at reducing emissions, the City could then consider a stricter version of the ordinance which would require building owners to perform the audit and then also make prescribed efficiency improvements at the time the building is sold. Similar residential programs already successfully operate in San Francisco and Berkeley.

Although the audit-only program just provides the prospective building owner with information on the energy performance of the building and may not actually save much energy or reduce emissions, it can serve several other purposes. Over time the City will develop a better sense of how local residential buildings are performing. With this data, the City will be better informed when developing later phases of the program. In addition, the information may encourage building owners and realtors to become more aware of the value of energy efficiency in buildings and the contribution lower energy costs can make to increasing home ownership. This increased awareness may ease the introduction of subsequent and more demanding emissions reduction requirements.

The proposed timeline for implementing the CAP programs is presented in Appendix E.

Ease of implementation

In order to assess the ease with which a future emissions reduction action may be implemented, the City could consider the following:

- Is there widespread political and community support for the proposed action?

Are there existing policies such as the City's general plan that must be changed in order to fully implement the action?

Does the City have jurisdiction over any necessary changes that are required for full implementation?

Is the proposed measure an expansion of an existing program, or does a new program need to be developed to permit implementation of the proposed measure? Expansions of existing programs are preferred in the earlier stages of implementation as they generally provide quicker results.

Are there collateral benefits to the community such as local air quality, improved public health, lower health care costs, and improved worker and student performance, and can these benefits be assessed and used to support the introduction of the program?

Will the action encourage the development of local 'clean-tech' industries?

Finally, it is important to recognize that proposed beneficial actions should not be eliminated from the list even if the current social, political, or economic conditions make those actions difficult to implement. Since the Climate Action Plan is a long-term plan, it is hoped that conditions may change in the future and the proposed action will then become less challenging to implement.

Create and Follow a Financial Plan

Recommendation:

9. The City create a financial plan for the climate action program that takes into consideration the costs and staff resources needed throughout the implementation period as well as financial benefits and cost savings.

To effectively implement the Climate Action Plan, the City will need adequate, reliable, and consistent funding. Without reliable and consistent funding, the City's GHG reduction programs will not be able to meet the long-term targets, or comply with the state and federal GHG reduction mandates that are likely to emerge in the coming years.

Funding for climate programs and associated energy, transit, and solid waste management programs often fluctuate with the ups and downs of the national and local economies because they are often seen as amenities rather than necessities. Inevitably, it is easier to obtain funding and political support for climate-related programs during times of economic confidence than in times of economic distress. Because consistent funding is critical to the effectiveness of climate-related programs, it is important that the City develop a comprehensive financial plan that considers long-term budget needs and that identifies a specific plan to secure funding that is not heavily impacted by annual fluctuations in general fund budget constraints. The financial plan should include the following components:

Review of existing budget conditions

Hayward already has a number of climate-related programs that are receiving money from a variety of funding sources. When drafting the financial plan, Hayward should identify all of these programs, review their budgets, and evaluate their funding sources. This internal review process will enable Hayward to develop a clear picture of how its existing climate programs are funded and how the programs are performing from a financial perspective. After the review is complete, the City will have a better idea of what funding mechanisms are most successful.

Identify Costs and Funding Sources

Many of the actions in the Plan will eventually be developed into programs that will have their own budget and staffing needs. There will be costs associated with each individual program, costs associated with

coordinating the various climate-related programs, and costs for tracking and reporting. There will also be costs for marketing and education efforts that are critical for a successful program kick-off, and to encourage people to participate in the new programs.

Costs associated with coordinating the various climate-related programs include:

- Climate Action Coordinator's salary
- Marketing and outreach staff for ongoing marketing efforts
- Preparing emissions inventory and reporting on progress towards meeting emissions targets.
- Potential funding sources are discussed at the end of this Section of the Plan. Short-term funding sources, grants, and loans for example, are often effective ways to cover the up-front costs of developing programs, but are often not available for long-term program operations. Other longer-term funding sources are better for the more consistent and less expensive costs like program operational costs.

Coordinating budgets across various City departments

Climate-related programs are likely to be managed by individuals from different City departments, which means individual program budgets will likely to be housed in many different City departments. This can make it difficult to keep track of spending. It is recommended that the Climate Action Coordinator help facilitate program tracking. Tracking program budgets will also help the City make informed decisions about how to pursue future funding opportunities.

Financing the Climate Program

Recommendation:

10. The City evaluate alternative climate financing methods in order to provide adequate, reliable, and consistent long-term program funding.

Municipalities have responded to the need for consistent long-term energy and related climate program funding in a variety of ways. Some programs rely on the traditional local government budgeting process for funding, which may make the programs vulnerable to changing perceptions of the importance of continued emissions reductions efforts. Unfortunately, many of these programs cannot easily be stopped and restarted without a serious loss of momentum. Some cities have avoided the drawbacks of relying on the annual budgeting process by utilizing other funding mechanisms such as bonds, public works fees, grants, and a variety of other mechanisms. Several potential funding mechanisms are described below.[107]

Local Funding Sources

Taxes and Bonds

Hayward could consider public financing of climate projects through bonds and taxes. This funding mechanism has been developed in San Francisco, Berkeley, and Emeryville where voters have approved public bonds for solar investments, development of a climate action plan, and a property tax assessment on

[107] Public Policy Institute of California. Ellen Hanak, Louise Bedsworth, Sarah Swanbeck, and Joanna Malaczynski. *Climate Policy at the Local Level: A Survey of California's Cities and Counties.* November 2008.

commercial areas to fund a local shuttle to connect to BART, in the three cities respectively.[108] However, tax and bond measures can be difficult to pass as they often require approval by two-thirds of voters.[109]

In November 2006, the City of Boulder, Colorado's voters approved Initiative 202 – the Climate Action Tax Plan that went into effect on April 1, 2007. The revenues generated through the tax will be targeted at reducing greenhouse gas emissions generated by energy use in buildings, the operation of vehicles, and landfill gas emissions. The tax is a surcharge based on a per-kilowatt-hour electricity usage charge with an annual cap. The tax is collected by the local utility as part of the normal billing process; however, customers who subscribe to the utility's premium priced renewable energy portfolio are exempt.

Fees

Revenues from public services fees (e.g., parking fees, utility fees) can be used to fund programs such as transit improvements and water use efficiency. Hayward is already utilizing this funding mechanism: the City operates its own water utility and uses some of the proceeds from higher water rates to fund water conservation programs. Some fees (e.g. for water and wastewater) can be raised to cover costs without direct voter approval.

The City of Portland Oregon imposed a 1 percent surcharge (with a ceiling of $15,000 per department) on departmental energy bills. The money went into a central fund to support a City energy specialist who acts as the representative on energy issues for the departments, interfacing with the energy utilities, staying in touch with current utility energy rebates and other technical assistance available, and providing technical support for departmental energy projects.

Impact fees

Local governments have the authority to include emissions mitigation fees as impact fees on new development. For instance, The City of Chula Vista plans to fund energy retrofits of existing buildings with revenues generated from mitigation fees developers pay when new buildings do not meet a minimum energy performance threshold. The Sacramento Metropolitan Air Quality Management District is considering emissions mitigation fees for new development.[110]

Local residents are often more receptive to new mitigation fees than they are to increases in taxes or increases to existing fees; however, developers are often opposed to new mitigation fees increasing the cost of business.

Other Funding Sources

Grants and low-interest loans

Federal, state, and regional agencies provide grants and loans for investments in a variety of climate-related projects. Grants and loans are usually not a good source for long-term funding for on-going programs. However, the short-term funding they provide can be useful for short-term program development and program testing. Hayward could use grants and loans to pay for the up-front staff time required to develop programs, and then establish an alternative financial framework for the program's continued operation after the grant expires. Hayward has already been successful at securing grants for their emissions reductions efforts: this Climate Action Plan was funded, in part, by a grant from the Bay Area Air Quality Management District.

---

[108] Berkeley's voter-approved Measure G (2006) provides for the City to go forward with a climate action plan while recognizing that the costs of implementation are yet unknown.

[109] Local general obligation bonds (except for education) and special purpose taxes and property assessments all require a two-thirds voter majority. Property assessments can also be approved by a majority of property owners.

[110] Public Policy Institute of California. Ellen Hanak, Louise Bedsworth, Sarah Swanbeck, and Joanna Malaczynski. *Climate Policy at the Local Level: A Survey of California's Cities and Counties.* November 2008.

The most promising new source of funding for energy programs in cities is the Energy Efficiency and Conservation Block Grant (EECBG) program originally proposed in the 2007 Energy Independence and Security Act of 2007 and was funded by the American Recovery and Reinvestment Act of 2009. Hayward was allocated $1.37 million through the Block Grant program. Grant funds are available to support a wide range of energy related activities including energy program planning, policy making, public education, energy project financing, and installing energy measures in local government buildings (see Appendix F).

Greenhouse gas reduction measures included in Hayward's GHG reduction plan, such as bike lanes and pedestrian improvements, installing on-site renewable energy technologies, and providing initial start-up funding for local energy revolving funds are all specifically included as measures eligible for funding.

The California Energy Commission (CEC) has for many years provided a loan program to support local government energy retrofit and some new construction projects. The program provides low interest loans for feasibility studies and the installation of cost-effective energy projects in schools, hospitals, and local government facilities. The loans are repaid out of the energy cost savings and the program will finance lighting, motors, drives and pumps, building insulation, heating and air conditioning modifications, streetlights and traffic signal efficiency projects, and certain energy generation projects, including renewable energy projects and cogeneration. Loans can cover up to 100 percent of project costs and there is a maximum loan amount of $3 million. [111]

The City may also consider working with BAAQMD, MTC, and other organizations that provide funding for local transportation projects to establish more flexibility in their funding criteria.

The City of Hayward can leverage its locally available funding by participating in county-wide projects like the programs being coordinated by StopWaste.org. This could increase the likelihood of receiving competitive funding from federal, state and regional grantors. In addition, the City will benefit from economies of scale in program administration, bulk purchasing, and consumer outreach.

Support from local businesses, non-profits, and agencies

Hayward may find that partnering with local utilities, businesses, and non-profits can be useful. In various cities, including Walnut Creek and San Jose, businesses and non-profits are financing climate-related projects such as efficiency retrofits, tree planting, and educational programs.[112]

Self-funding and revolving fund programs

For programs that result in direct cash savings after an initial investment, such as energy efficiency retrofits and green building standards, it is possible to set up a self-funding loan program where loan payments are equal to, or proportional to, cost savings. This is the idea behind Berkeley's Solar Initiative, for which the City is obtaining initial program seed financing from a private bank. Residents can take out a loan to pay for installing a solar electric system, and they then repay the loan through a property assessment. Over time, the loan fund will be replenished from the loan repayments and the City will in turn repay the bank and will be able to fund further investments in solar.

The best-known local government example of a fully operational revolving fund is that operated by the City of Phoenix. The City began its energy management program following the energy crises of the late 1970's, and by 1983 the program had fully established its credibility and the City Council felt confident enough of the program's savings to establish a reinvestment program. This mechanism authorized 50 percent of the

[111] For more information see www.energy.ca.gov/efficiency/financing

[112] Public Policy Institute of California. Ellen Hanak, Louise Bedsworth, Sarah Swanbeck, and Joanna Malaczynski. *Climate Policy at the Local Level: A Survey of California's Cities and Counties.* November 2008.

documented energy avoided costs from retrofits of City municipal buildings to be reinvested in additional energy efficiency retrofit improvements in the City's departments. Any savings over a set amount would go to the City's general fund, and in general, the energy program is entirely self-supporting.[113]

Agreements with private investors

There are also private investors that can provide funding to local governments. For example, energy service companies (ESCOs) can finance the up-front investments in energy efficiency, for which the local government will then reimburse the company over an agreed period. Similarly, private companies will finance solar power installations, and then recoup their investment by selling the resulting power to the building owner.

Selling carbon offsets

In the future, for projects that are expected to reduce emissions significantly, the emerging carbon offset market could become a potential source of funding for projects. It is likely that the United States will institute a national carbon cap and trade system in the coming years. Cities like Hayward may then be able to sell carbon offsets to other communities or businesses that have not been as successful at reducing GHG emissions.

Cross-funding activities

Recognizing that some programs will cost money and some will save money, some communities are taking a comprehensive view to the funding issues identifying opportunities for cost sharing. For example, the City of Roseville is considering borrowing against future energy savings to fund a comprehensive climate action plan.[114]

[113] To help give the impression that money saved is not sitting around waiting to be spent, program staff in Phoenix refer to the monetary benefits of projects as "cost avoidance" rather than "cost savings."

[114] Public Policy Institute of California. Ellen Hanak, Louise Bedsworth, Sarah Swanbeck, and Joanna Malaczynski. *Climate Policy at the Local Level: A Survey of California's Cities and Counties.* November 2008.

This page left intentionally blank for double sided printing.

Section 7 – Ongoing Measurement and Verification

Why Measure and Verify

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

Enables informed decisions about climate-related programs

Without accurate up-to-date information on whether programs are effective and operating as planned, it may be difficult to make informed decisions about setting future priorities, determining appropriate program funding and scheduling, and identifying whether there is a need to adjust the program approach to ensure the long-term emissions targets are being achieved.

Provides credible and defensible data to prove accountability

Monitoring and reporting on progress will help the City demonstrate to the community and to other jurisdictions that Hayward is upholding its commitment to reducing emissions. In adopting the CAP, the City will be making a major commitment to reducing emissions by more than 170,000 metric tons CO_2e below business-as-usual projections by 2020. By measuring emissions, Hayward will have credible and defensible data to prove that the community is taking its emissions reduction campaign seriously.

Prepare for future reporting requirements

Regular monitoring will also help prepare Hayward for GHG reporting requirements that are likely to emerge in the future. It is probable that at some time cities and other government agencies, together with private sector businesses, will be asked to disclose annual GHG emissions. By voluntarily adopting standardized methodologies to measure community-wide GHG emissions, Hayward will be prepared if or when reporting becomes mandatory.

On August 27, 2007, Governor Schwarzenegger signed SB 85, which requires every state agency to prepare an annual report card, which lists actions the agency has implemented to reduce GHG emissions and reports actual emissions reduced by each action.[115] This illustrates that some government departments are already being asked to track GHG emissions, and it is not unreasonable to believe that local governments may be asked to report on their emissions in the near future.

[115] Senate Bill 85. Committee on Budget and Financial Review. Chapter 178. Statues of 2007. http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0051-0100/sb_85_bill_20070824_chaptered.pdf

What to Measure

Recommendations:

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

It is recommended 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 evaluation 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.

Community-wide Inventory

A community-wide emissions inventory should be completed on a regular basis to ensure that emissions are decreasing over time. It is important that each inventory be conducted using the same methodology that was used to prepare the baseline inventory. If future inventories follow a different methodology than the baseline inventory, it will be very difficult to compare program effectiveness over time. If, for example, the baseline inventory does not include GHG emissions from the airport and a future inventory does, it could appear that GHG emissions have increased substantially over the time period between the two inventories. In reality, emissions may have decreased, but the reduction was obscured by the changed methodology. It is important therefore, that the baseline and future inventories include emissions from the same sources, evaluate the same global warming gasses,[116] and maintain the same physical boundaries. As calculation methods improve, Hayward should update the baseline inventory using the new method.

To ensure that all inventories follow the same methodology, it is suggested that Hayward continue to use ICLEI's calculation methodology and its standardized calculation methods. This will provide a high degree of confidence in the results of the City's programs to reduce emissions, and also allow program comparisons to be made with the more than 700 cities across the world that are currently using, or plan on using ICLEI's methodology to calculate their emissions. ICLEI is working closely with other organizations that publish emissions inventory methodologies, such as California Climate Action Registry (CCAR), to ensure that the methodology remains credible, reliable, and coordinated with other emerging methodologies.

As ICLEI improves calculation methodologies, Hayward should update its baseline inventory to reflect changes. Similarly, as Hayward starts to include more emissions sources in their emissions calculation, the baseline inventory should be updated to include the new emissions sources. The baseline inventory should also be updated if the City's physical boundaries change.

Program indicators

Collecting and organizing data is generally the most time consuming, and thus most expensive, aspect of emissions monitoring. Costs can be minimized by having a responsible and organized individual coordinate the data collection process. It is recommended that the City's Climate Action Coordinator be responsible for managing the emissions monitoring and verification program. The data collection and management process

[116] There are hundreds gasses that are known to contribute to the greenhouse effect. Generally, inventories only account for emissions of the most common gases.

may also be simplified through the maintenance of good working relationships with other local agencies that collect and manage critical data. The key indicators and the responsible agencies are listed below:

Table 13: Indicators that can be used to evaluate programs

Transportation	
Indicator	**Data Source**
Vehicle Miles Traveled	Metropolitan Transportation Commission (MTC)
Mode of commute	MTC, City Analysis, Census Bureau
Transit Ridership	AC Transit, BART, MTC, City Analysis, Census Bureau
Transit passes sold	AC Transit, BART, MTC, City Analysis
Fuel economy of local fleet	National Highway Traffic Safety Administration, ICLEI
New smart-growth development	City Analysis
Energy	
Indicator	**Data Source**
Energy audits performed	City Analysis
Number of efficiency retrofits performed	City Analysis
Number of buildings installing solar panels	City Analysis
Number of energy monitoring systems installed	City Analysis
Electricity Consumed	PG&E
Natural Gas Consumed	PG&E
Emission factor of electricity supplied to City	PG&E
Water consumption	Public Works
Solid Waste	
Indicator	**Data Source**
Diversion rates	City Analysis
Waste characterization surveys	Stopwaste.org, Hayward Public Works Department, California Integrated Waste Management Board
Tonnage recycled and disposed, by sector	City Analysis
Recycling rates, i.e., capture rates for specific recyclable material types at the County and State level	Stopwaste.org, Hayward Public Works Department, California Integrated Waste Management Board
Community Participation	
Indicator	**Data Source**
Number of children & adults educated on GHG-related issues	City analysis, Hayward Unified School District
Businesses certified in Green Businesses	Alameda County Green Business Program
Number of businesses taking advantage of efficiency and solar financing programs	City analysis

When to Measure

It is recommended that Hayward, at a minimum, perform a complete community-wide emissions inventory five years after the Action Plan is adopted as well as in 2020 and 2050. The five-year inventory will enable the City to determine if their climate programs are resulting in real emissions savings. The 2020 and 2050 inventories will enable the City to verify emissions targets have been achieved. To track progress more closely, the City may decide to perform a full inventory more often. In the future as data sources and GHG information management processes become better developed, emissions inventorying may become streamlined and easier to manage than it is today, so the City may then be able to consider performing at least partial inventories of critical programs on an annual basis.

Calculating a community-wide invention can require a substantial time commitment from one or more staff members. Efforts to conduct inventories can detract from efforts to implement programs. Since the goal is to reduce emissions—not to report on emissions—it is important that Hayward find a balance between dedicating staff time to programs and dedicated staff time to evaluating the effects of programs. In future years, as inventory methodologies improve and as more practical tools are developed, calculating a community-wide inventory may be less time-intensive and less costly. Even if the City does not complete a full community-wide emissions inventory every year, it is recommended that the City develop a protocol for evaluating the effectiveness of the individual emissions reduction programs on an annual basis. The City can use the indicators listed above in Table 13 in the annual analyses.

Voluntary Reporting

The City may consider participating in organizations such as the California Climate Action Registry (CCAR), 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 these 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.

Hayward could also consider encouraging the development of a new local membership organization of East Bay cities and special districts, perhaps modeled on the very successful peninsula organization - Sustainable Silicon Valley, which offers tools and resources for members who pledge to reduce emissions. The benefits include guidance from other members, annual reporting tools to help measure progress, and public recognition.

Other groups include the Business Council on Climate Change (BC3), which hosts events at which members can share best practices for internal emissions reductions, and the EPA's Climate Leaders, which provides up to 60 hours of free technical assistance to participants who set GHG targets to be achieved over 5-10 years. Participation in one or more of these organizations can add value to the City's efforts in the form of technical assistance, venues for sharing of lessons learned, and best practices and recognition for the comprehensive and aggressive efforts planned for GHG reductions.

Appendices