
City of Menlo Park

Climate Action Plan Assessment Report

ADMINISTRATIVE DRAFT

June 2010

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Executive Summary

The purpose of Menlo Park's Climate Action Plan (CAP) is to provide strategies that reduce greenhouse gas (GHG) emissions and assist Menlo Park to meet or exceed the emissions reduction targets of AB 32 (California's Global Warming Solutions Act of 2006). AB 32 sets a goal for the state to reduce greenhouse gas emissions to 1990 levels by 2020, and 80% below 1990 levels by 2050.

The Climate Action Plan was approved by the City Council in May 2009 and the Council stated that the Climate Action Plan was intended to be a 'living document' to be updated periodically as current strategies are implemented and as new emission reduction strategies and technologies emerge that effectively reduce emissions. The City Council directed staff to complete 'Climate Action Plan Supplemental Research' in coordination with a consultant to complete additional research on the GHG reduction strategies. Staff and CSG Consultants completed a high level assessment of its 2009 Climate Action Plan that included the following tasks:

1. Complete a GHG Emissions Forecast for 2020
2. Re-inventory Community Greenhouse Gas Emissions to consider setting a target reduction goal
3. Complete a high level review of the existing community and municipal GHG emission reduction strategies
4. Identify potential new GHG emission reduction strategies for consideration
5. Develop a cost-benefit analysis that could provide a consistent metric to evaluate GHG emission reduction strategies

The work did not include applying the cost-benefit analysis to each updated GHG reduction strategy because the level of implementation could vary from strict to voluntary based on community engagement, available resources, and council priorities. The application of the cost-benefit analysis is intended to be utilized during the strategy evaluation timeline as specified in recommendations for greenhouse gas reduction strategies, and where applicable, be brought back to city council to consider for implementation.

It is also important to note that new requirements have recently been approved pursuant to SB 375 and the California Environmental Quality Act (CEQA) that have impacts on Menlo Park Climate Action Plan strategies and proposed development projects and long range plans, which are explained later in this report.

The following section provides the highlights of the analysis and recommendations.

Highlights

- Several of the 2009 strategies were outdated or needed modifications, and, additional GHG reduction strategies were needed to effectively reduce emissions. This report provides a table of updated community and municipal GHG reduction strategies, rationale for the recommendations, provides a relative priority ranking for implementation and provides a recommended evaluation timeline for implementation.
- Of the 723480 GHG tons from Menlo Park's 2009 Community GHG Emissions Inventory¹, only 0.004% tons are from municipal operations. Therefore, it is recommended that the limited staff

¹ 2005 Menlo Park's Community Greenhouse Gas Inventory, ICLEI Report, February 2008

and resources available for GHG emission reduction work focus on community strategies implementation since more than 99% of the emissions are from community sources.

- The recommended strategies in this report give priority to increase residential and commercial² energy efficiency since 34% of Menlo Park's greenhouse emissions are from these sectors. Residential and commercial energy efficiency strategies are important because Menlo Park has significant policy control over residential and commercial energy consumption (e.g. requiring new green building standards, energy efficiency standards for residential and commercial new construction/major renovations, etc.). In contrast, Menlo Park has limited policy control over the transportation sector which accounts for 46%³ of total emissions. Additionally, energy conservation strategies provide the most expedient method to reduce GHG emissions and provides costs savings after implementation.
- It is recommended that a new mandatory commercial recycling ordinance be considered to reduce waste to landfill, since 68% of Menlo Park's commercial waste is currently trucked to disposal at the Ox Mountain landfill⁴. This strategy is especially important because methane released from the decomposition of waste/organic waste is 20 times more potent than carbon dioxide in its global warming capacity.
- This report includes updated greenhouse gas inventories between 2005 and 2009, and information regarding a potential GHG reduction target for Menlo Park. Developing a specific target is an essential component of a Climate Action Plan⁵.
- The recommended cost-benefit analysis approach provides a consistent method to assist in the evaluation of potential GHG emission reduction strategies. After completion of a cost-benefit analysis, each of the emission reduction strategies (where applicable) would be presented to the City Council for consideration according to the evaluation timeline in the community and municipal strategy tables of this report.

² Residential and Commercial natural gas and electricity consumption

³ 71% of emissions from Menlo Park's transportation sector are from highway travel on Highway 280, Highway 101 and El Camino Real. 2005 Menlo Park's Community Greenhouse Gas Inventory, ICLEI Report, February 2008

⁴ City of Menlo Park Solid Waste Generation in Tons By Jurisdiction and Type, 2009 Data, Allied Waste

⁵ Menlo Park's Environmental Quality Commission Climate Action Plan Subcommittee completed a comprehensive assessment of other jurisdictions emission reduction targets in April 2010.

Impact of State and Regional Actions on Menlo Park's GHG Emission Projections for 2020

It is important to note that Menlo Park's projected emissions will be impacted by several state and regional actions that were included in the AB 32 Scoping Plan. Of particular importance are the Renewable Portfolio Standard (RPS) and the Pavley I and II regulations. The other AB Scoping Plan measures are also relevant, such as the Low Carbon Fuel Standard; however, the details and the regulations have not yet been developed. Therefore, the Bay Area Air Quality Management District states that assessing GHG impacts at the local level from these measures is fairly speculative at present time and states that jurisdictions may be able to quantify the GHG emissions impacts in 2011. The following details the current status of these state and regional actions that will impact Menlo Park and other jurisdictions:

Renewable Portfolio Standard

The State of California Renewable Portfolio Standard (RPS) requires electricity providers to increase the portion of electricity they deliver that comes from renewable energy sources to 20% by 2010 and by 33% by 2020. Menlo Park can develop assumptions on the impact of the RPS based on utility information. PG&E and other utilities have reported their GHG emissions data to the California Climate Action Reserve (CCAR) which provides information for each utility, including the amount of power produced by renewable energy for any given year. The BAAQMD is currently developing information to estimate the impact of the RPS on a community's future GHG emissions and states the data should be available 2011.

Pavley I and II

Assembly Bill 1493 (Pavley), signed into law in 2002, requires automakers to reduce greenhouse gas emissions from new passenger cars and light trucks beginning in 2011. The Air Resources Board (ARB) will implement the law in two phases of increasingly stringent standards. The ARB has developed a post-processing tool that incorporates the emissions impacts of Pavley I and II into the tool and states the tool will be released for jurisdictions by spring 2011.

SB 375

On September 23 2010, the California Air Resources Board (ARB) adopted new regional GHG reduction targets for California's metropolitan planning organizations as mandated by SB 375 (Stenberg, 2008). SB 375 mandates an integrated regional land use and transportation planning approach to reduce GHG emissions from cars and light trucks. Each of the metropolitan planning organizations (e.g. the Metropolitan Transportation Commission) are to develop a sustainable communities strategy that demonstrates how they will meet their regional target through integrated housing, land use and transportation planning. The land use policies encourage higher density near transit, increased mixed use development; Transportation policies include parking/pricing policies that encourage alternative modes of transportation other than single occupancy vehicles, etc. It is important to note that the regional targets are based on per capita emissions, rather than gross emissions, and they still allow for an increase in overall emissions due to population growth.

Although SB 375 is expected to reduce vehicle trips and transportation-related emissions, the BAAQMD does not recommend that these be included in emission projections to avoid 'double-counting' of GHG emission reductions. The BAAQMD does not recommend including additional GHG reductions resulting from SB 375 because a technical and defensible analysis of the bill's projected impact on the state or the Bay Area is not available at this time.

The California Air Resource Board and the BAAQMD state that tools are not currently available to enable jurisdictions to accurately project the impacts of these state and regional actions; these agencies report that the projection tools may be available in 2011. Therefore, it is recommended that these projections be assessed and incorporated into Menlo Park's GHG emission projections in spring or summer 2011.

California Environmental Quality Act (CEQA)

The Bay Area Air Quality Management District (BAAQMD) recently updated new California Environmental Quality Act (CEQA) Guidelines to assist jurisdictions in analyzing air quality impacts of proposed projects and plans. The Guidelines establish thresholds of significance for GHG emissions and other air pollutant emissions. The thresholds are based on achieving AB 32 goals for 2020 and provide GHG thresholds of significance for projects and plans for jurisdictions. The Guidelines also establish GHG thresholds of significance for a jurisdiction's 'GHG Reduction Strategy'. The BAAQMD states that a GHG Reduction Strategy could be included in jurisdictions planning documents such as general plan or other planning documents.

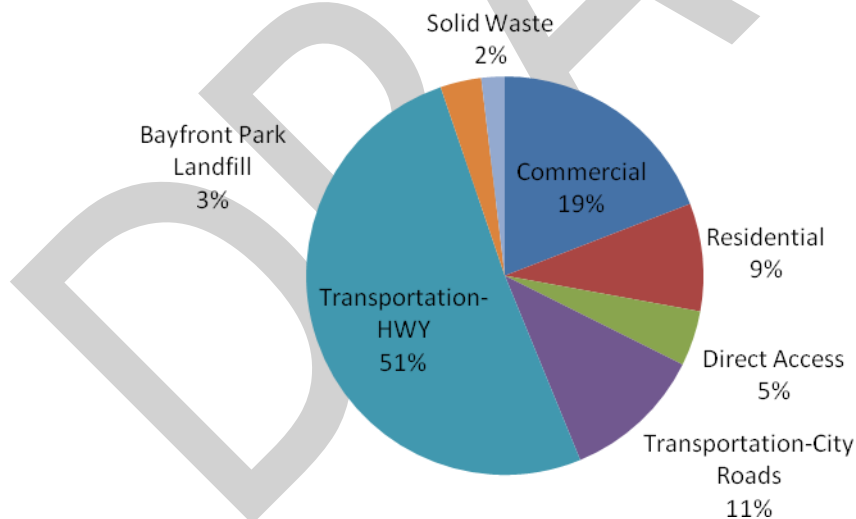
2005-2009 Community Greenhouse Gas Inventory Results

Using ICLEI's updated Clean Air and Climate Protection Software (CACAP), Menlo Park was able to complete greenhouse gas inventories between 2005 and 2009. Staff analyzed greenhouse gas (GHG) emissions that are generated from the building energy usage, solid waste sent to the landfill, vehicle miles traveled, and methane produced from a closed landfill (Bayfront Park).

Menlo Park's original 2005 greenhouse gas emissions were also re-evaluated for accuracy and consistency with new methodologies and practices. Two significant modifications were made that changed the original emissions inventory for 2005. These were the miles of roads, which were under reported in 2005, and use of a new landfill methodology provided by ICELI that is more accurate than the model previously used (LandGem).

The figure below displays Menlo Park's most recent community-wide greenhouse gas emissions inventory by source. The results show that the transportation sector is the leading contributor to CO₂e generating 62% of emissions, followed by the electricity use from the commercial and residential sector generating 24% of emissions in the community.

Figure 1. City of Menlo Park Community-Wide Greenhouse Gas Emissions by Source (723,480 GHG tons in 2009)



The graph below represents Menlo Park’s total community wide greenhouse gas emissions from all sources between 2005 and 2009. The GHG emissions are expressed in tons of carbon dioxide equivalents (CO₂e). The graph also includes the year to year percent change. All sources accounted for this graph include CO₂e generated from electricity and natural gas consumption in all buildings, solid waste sent to the landfills, and vehicle miles traveled. Emissions from the Bayfront Park Landfill were also included. Although Bayfront Park Landfill ceased to accept waste in 1984, the waste-in-place still continues to generate greenhouse gas emissions.

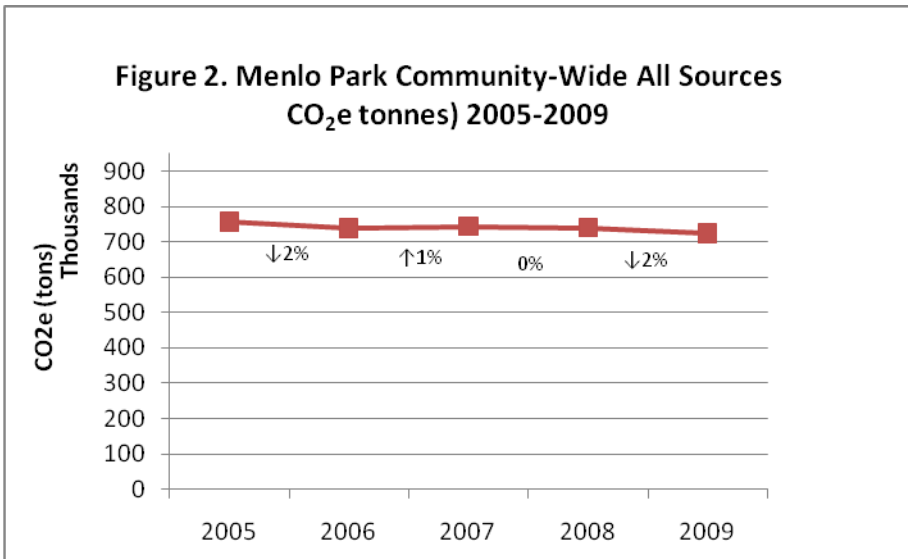
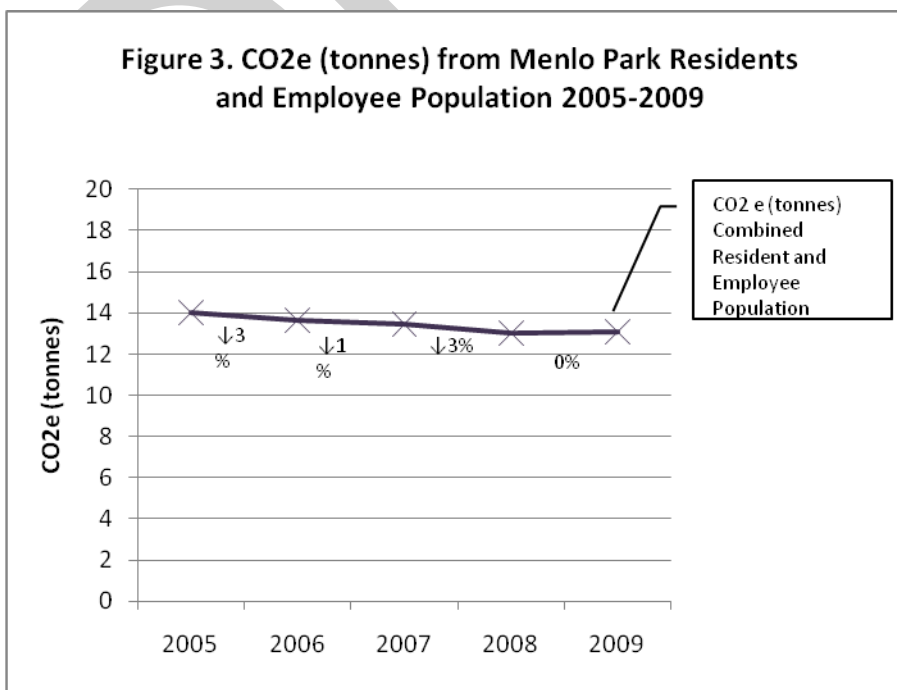
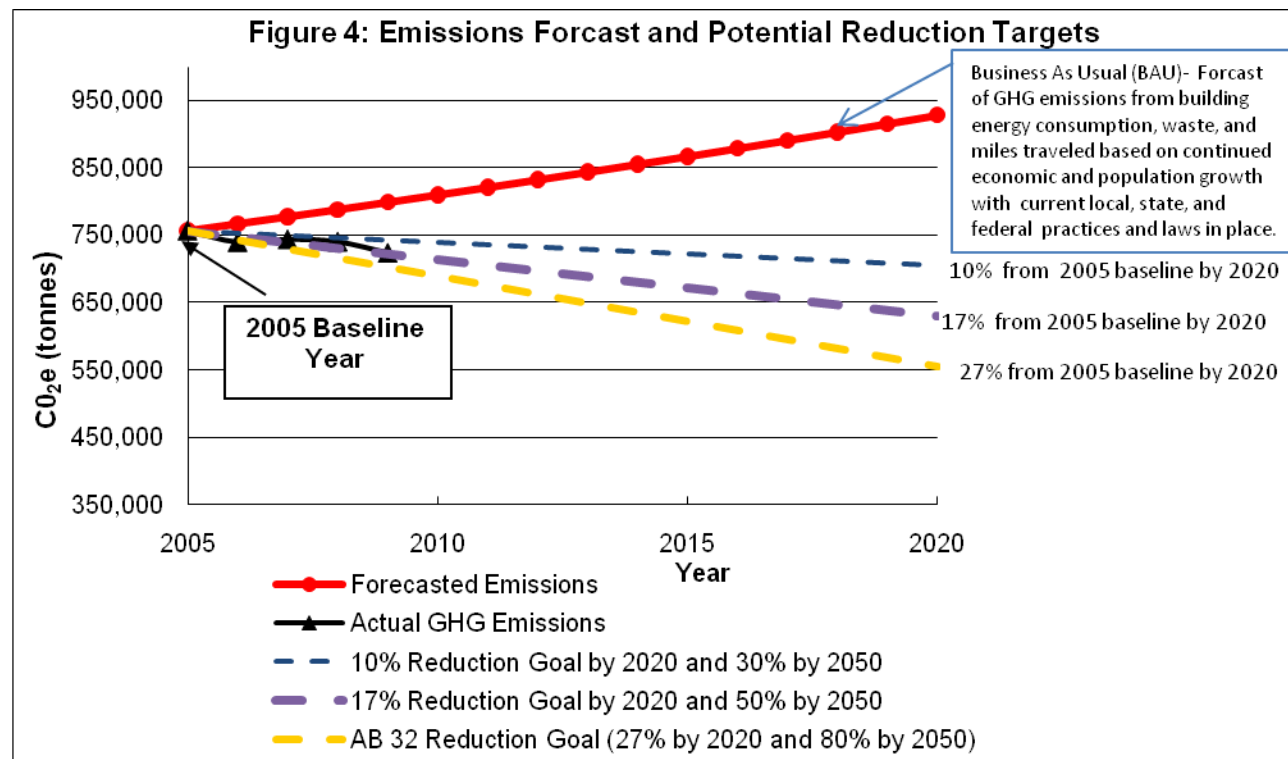


Figure three displays per capita of CO₂e tons generated from Menlo Park’s residents and work force population, and include emissions from all measured sectors. The trends show a continued decrease in CO₂e emissions. These continued decreases may be explained by the economic downturn shown that started in 2008.



GHG Emissions Forecast and Potential Reduction Targets

The intent of the GHG emissions forecast is to quantify the projected GHG emissions through the year 2020 to determine the estimated amount of GHG emission reductions that are necessary within the context of increased growth.



The figure below was developed using annual growth projection data from the Association of Bay Area Governments (ABAG) that was released in August 2010. The use of these projections has been recommended by the Bay Area Air Quality Management District (BAAQMD) for jurisdictions that are completing GHG emission projections.

Greenhouse Gas Emission Reduction Target

The following information below is intended to begin discussing a potential GHG reduction target for Menlo Park that would be consistent with the reduction targets of AB 32 and with the new California Environmental Quality Act (CEQA) requirements for GHG reduction targets for local development projects. Developing a specific target is an essential component of a Climate Action Plan⁶.

The BAAQMD recently stated that jurisdictions, in developing a GHG Reduction Strategy⁷ should establish a GHG reduction target that meets or exceed AB 32 goals and provides recommended target alternatives.

⁶ Menlo Park's Environmental Quality Commission Climate Action Plan Subcommittee completed a comprehensive assessment of other jurisdictions emission reduction targets in April 2010.

⁷ GHG Reduction Strategy can be a General Plan or other planning document.

Therefore, consideration could be given to a GHG emissions reduction target for Menlo Park, such as: reduce emissions by 27% below 2005 levels by 2020 and 80% below 2005 levels by 2050. This target is in line with AB 32 and the AB 32 Scoping Plan. It is also recommended that Menlo Park consider adopting interim emission reduction targets for 2015 and 2018 to enable the City to better monitor track performance toward meeting the 2020 target. These GHG reduction targets could be included in the General Plan update process that is currently planned for 2013-2014.

Table 1 indicates the total and annual emission reductions required to meet the AB 32 emissions reduction target of 15% below 2005 levels by 2020. If the community of Menlo Park continues with the current pattern of energy consumption, waste generation and vehicle miles traveled, known as “business-as-usual”, the greenhouse gas emissions are estimated to increase from 491,054 metric tons to 568,706 tons of CO₂e per year by 2020. Table 2 shows this “business-as-usual” forecast. Therefore, the emission reductions necessary to meet the 2020 target total 151,310 tons or 15,131 tons per year from the year 2010 through 2020.

Recommendations for Greenhouse Gas Reduction Strategies










Important Issues Regarding New Community and Municipal GHG Reduction Strategies Recommendations








The tables on the following pages outline the recommended community and municipal strategies for near-term and mid-term implementation. Please note that the GHG reduction strategies were recommended based on the following criteria:

- Provides significant GHG reduction potential (i.e. strategy focuses on the largest GHG sectors in Menlo Park’s GHG Inventory)
- Ease of implementation (i.e. strategy can be implemented with limited staff and other resources)
- Considered a “best practice for GHG reduction strategies” and successfully implemented in other jurisdictions
- Considered reasonable and cost-effective to the community and city operations
- Has significant environmental co-benefits for the Menlo Park community such as improved air quality, improved public health, reduced traffic congestion, reduced energy and water consumption, preserves natural resources and extends landfill life.







The recommended cost-benefit analysis approach that is included in this report can be applied to each strategy, and provide a consistent metric to evaluate GHG emission reductions. The next steps include presenting cost-benefit analysis of the selected individual FY 11-12 GHG reduction strategies for approval by the City Council before implementation. The City Council stated that the Climate Action Plan was intended to be a ‘living document’ to be updated periodically as current strategies are implemented and as new emission reduction strategies and technologies emerge that effectively reduce emissions.

Community Greenhouse Gas Reduction Strategies: This is a recommended timeline only; each GHG reduction strategy would require a comprehensive cost-benefit analysis and where applicable consideration by Council prior to implementation.





Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Energy Efficiency							
Consider adopting Sustainable Development/ Green Building standards that exceed California's 2010 Green Building Code (CalGreen) for Residential and Commercial	<p>34% of Menlo Park's emissions are from the residential and commercial sectors. Green buildings not only reduce GHG emissions by minimizing energy/water usage, but also reduce natural resource consumption and provide healthier indoor environments in comparison to non-green buildings. Building energy efficiency standards are important because Menlo Park has significant policy control over residential and commercial energy consumption, and this strategy has been implemented in many other cities in the bay area to level greenhouse gas emissions.</p> <p>The level of implementation can vary from strict to voluntary based on available resources, community feedback and city council priorities. In addition, the applicability can range to only new structures or include major renovations of buildings.</p>	2011-12					
Consider actively marketing and providing additional incentives for residents to participate in the new Regional Energy Upgrade California Program	The new regional program Energy Upgrade California for Menlo Park and other San Mateo County jurisdictions provides outreach, education, and up to \$4,000 rebates for homeowners to complete energy efficiency upgrades. The program provides rebates based on the percentage of increased home energy efficiency; this typically provides 50% of the funding for the actual upgrade. The program is funded through state, regional and federal grants. Menlo Park could increase participation by offering additional rebates and actively marketing the program.	2011-12					N/A

Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Expand Menlo Park Municipal Water District Conservation Programs	Expand water conservation programs. Consider new water conservation incentive programs that include researching a pilot program for graywater (water reuse) for onsite landscape irrigation or lawn replacement programs. The original graywater plumbing requirements in the California Plumbing Code were quite restrictive and have been updated to allow some graywater solutions for water conservation and irrigation. ⁸	Current and Ongoing					
Consider developing an Energy Efficiency/ Renewable Energy Program for Residential sector	<p>This would involve an incentive program for residents to complete home energy assessments and cost effective upgrades. This would be similar to the Green@Home program, but would include more comprehensive heating and cooling system tests and explore renewable energy options with the homeowners.</p> <p>One particular strategy could involve providing a rebate for half the cost of the energy analysis, and if upgrades are completed a rebate for the full cost of the assessment would be provided.</p> <p>The program can promote current state and utility financial incentives and add new incentives to maximize energy efficiency. This policy can be a valuable collaboration to the new Energy Upgrade California program. Consider participation in regional programs and or grants/incentives.</p>	2012-13					N/A

⁸ www.hcsd.ca.gov/codes/shl/Preface_ET_Graywater.pdf.
















Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Develop a commercial energy efficiency program to encourage businesses to participate in a free energy efficiency audit when business license is issued or renewed	Menlo Park's commercial sector produces 24% of GHG emissions through electricity and natural gas consumption. This program can be in coordination with PG&E and the Green Business Program. The audit can identify energy efficiency/water conservation opportunities at their facilities and promote rebates, incentives and financing programs. Business can receive a report with prioritized actions they can take to reduce energy/water costs. Businesses would be encouraged but not required to perform efficiency retrofits. Consider requiring free energy audits in future, e.g., 2017-18. Some jurisdictions such as the City of Chula Vista have implemented this program as mandatory ⁹ .	2015-16					
Consider local energy efficiency and renewable energy financing program	The city would provide a low-interest energy financing program to fund energy efficiency and clean energy upgrades. Currently, the program is on hold due to the Federal Housing Finance Agency (FHFA), Fannie Mae, and Freddie Mac challenging the seniority position of the local jurisdictions placing liens on properties, and that property owner participation in this program may violate mortgage contracts.	On Hold					
Consider development of an ordinance for energy and water efficiency standards for transfer of title transactions	Consider requiring a minimum standard of energy and water efficiency measures when a home or business has a transfer of title (e.g. sale of property). Consider starting with a voluntary education and promotion phase in 2015 and move to a mandatory phase starting in 2016 or later.	2013-14					















⁹ City of Chula Vista adopted a similar ordinance in 2009 with the Free Resource & Energy Business Evaluation (FREBE) www.chulavista.org











Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Transportation							
<p>Consider amending the City's General Plan to include new sustainability policies, goals and programs</p>	<p>Consider adding new sustainability policies, goals and programs during the City's General Plan revision process, either as a new separate element in the General Plan or added into the current General Plan elements. Identify, modify or eliminate policies that conflict with sustainability policies and goals, in the interest of maintaining internal consistency. General Plan amendment work is included in the Capital Improvement Projects for 2013-2014. The draft El Camino Real Downtown Specific Plan supports and advances the principles of sustainability, and incorporates sustainability strategies reflected in the 2009 Leadership in Energy and Design (LEED) for Neighborhood Development.</p> <p>Land Use: Consider including new sustainable land use policies¹⁰ during the planned General Plan review and revision process currently scheduled for 2013-2014¹¹. Consider policies that allow higher density residential and mixed use on sites currently zoned for industrial uses, as well as on sites primarily zoned and developed for commercial, where some residential may be accommodated. Consider policies that provide an effective use of mixed used and transit oriented development that would reduce the need for parking.</p> <p>Transportation: Consider new sustainable transportation policies that provide preferential parking for no or low emission vehicles on city streets, city garages and lots. Consider expanding parking policies as technology advances to increase accommodation of no or low emission vehicles. Expand policies that encourage bicycling, walking and other modes of transportation than single occupancy vehicles.</p>	2013-14					

¹⁰ The City currently plans to develop and adopt updated City CEQA Guidelines in FY 2012-13

¹¹ SB 375 mandates an integrated development/land use and transportation planning approach to achieve GHG reduction targets














Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Consider social marketing programs/campaigns to promote alternative transportation (walking, biking, public transit, etc.)	<p>Social marketing programs aim to uncover barriers that prevent individuals from engaging in sustainable behaviors and establishes a new social norm for the community to engage in. It provides a set of tools that social science research has demonstrated to be effective in fostering behavior change. A typical social marketing design includes surveying community or neighborhood attitudes to identify target audiences and their barriers. A program is then developed around this research that minimizes barriers through incentives, targeted message development, or direct neighborhood engagement activities.</p> <p>The public health sector has been a successful implementer of social marketing programs, such as anti-smoking campaigns. Social marketing is a relatively new tool for local governments to use in effectively engaging the community in sustainable behavior. However, there are past examples of effective environmental social marketing programs that include anti-littering and recycling campaigns during the 1980s until now.</p>	2011-12					
Consider implementation for City Car Sharing Program	Many cities (San Francisco, Berkeley, and Portland) have implemented a car sharing program and Zipcar.com may be a viable alternative for Menlo Park since local jurisdictions have these programs underway.	2013-14					
Implement Bike Improvements	Bicycle trips can generally replace vehicle trips up to five miles. Thus, increasing bicycle trips in Menlo Park could reduce up to 9,000 tons of GHG emissions by 2020.	Current and Ongoing					

Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Consider implementation for City Bike Sharing Program	A Bike Sharing Program provides publicly shared bicycles that can increase the usage of bicycles in an urban environment. Redwood City is currently participating in a pilot regional a bike sharing program in the bay area.	2013-14					
Expand Community Shuttle Service	The 2009 Climate Action Plan estimates that shuttle service contributes to reducing 0.5 tons of greenhouse gas emissions per rider per year. Expanding services would increase greenhouse gas emissions reductions.	Ongoing					
Consider installing Electric Plug-in Hybrid Vehicle Recharging Stations	Consider installing recharging electric vehicles (EV) and plug in hybrid electric vehicles (PHEV) and construct recharging stations in public parking facilities. The City can also encourage or require larger local businesses and multi-unit housing projects to install charging stations. \$2.5 million in grants for new electric vehicle charging stations and infrastructure will become available from the Bay Area Air Quality Management District (BAAQMD). The 2009 Climate Action Plan estimated that installing 30 recharging stations would reduce an estimated 7,000 metric tons of greenhouse gas emissions.	2012-13					














Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Solid Waste							
Consider adopting a Zero Waste Policy with 75% diversion by 2020 and 90% diversion by 2030.	Currently, the city is required by the State to divert 50% of community solid waste from the landfill. This policy would increase the diversion rate to 75% by 2020, and 90% by 2030. This strategy would also evaluate additional policies and ordinances needed to reduce waste to landfill to meet diversion goals. Menlo Park's current diversion rate is 43% ¹² . This program has the potential to reduce 20,000 metric tons of greenhouse gas emissions.	2011-12					
Consider adopting a mandatory Commercial Recycling Ordinance	67% of Menlo Park commercial waste (compared to 27% Menlo Park's residential waste) is currently going to landfill ¹³ . The commercial recycling rate has remained flat in the last several years. A commercial recycling ordinance can increase recycling by an estimated 10-20%. The program would not impact the City's General Fund and could be funded from commercial garbage rates (with negligible impact on garbage rates). The new single stream recycling, effective 1/3/2011, makes commercial recycling participation and ordinance compliance easier. Also, consider inclusion of mandatory recycling for Menlo Park public events in this ordinance. This program has the potential to reduce 10,000 metric tons of greenhouse gas emissions by 2020.	2012-13					

¹² Solid Waste Diversion in Tons by Jurisdiction & Type/City of Menlo Park 2009 Data





¹³ Recology Solid Waste and Recycling Report for City of Menlo Park for January, February, and March 2011.

Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Other							
Establish Climate Action Plan monitoring and progress reporting program	Consider completing an annual review of the GHG reduction strategies in the Climate Action Plan and provide a progress report to the city council that includes the following actions: A. Adopt a GHG reduction target for 2020 B. Monitor the current GHG reduction strategies and provide a progress report to the City Council on an annual basis. C. Identify new GHG reduction strategies and ensure implementation of the strategies has been assigned to appropriate department. D. Plan to re-inventory every year to monitor progress toward the 2020 GHG reduction target.	Current and Ongoing					
Expand Green Business Certification Program/Include Green Business education to new business permit applicants	Expand the County's Green Business Certification Program to reduce energy, water and solid waste consumption.	2012-13					
Consider amending the City's General Plan to include a "GHG Reduction Strategy" as outlined in the new CEQA ¹⁴ Guidelines	The Bay Area Air Quality Management District (BAAQMD) recently approved new CEQA Guidelines that establish thresholds of significance for GHG emissions on a project level and plan level (e.g. General Plan). These thresholds are based on achieving AB 32 goals for 2020. New CEQA Guidelines state a 'GHG Reduction Strategy' could be adopted by a jurisdiction and should contain the specific plan elements as noted in Section 4.3 of the CEQA Guidelines.	2013-14					

¹⁴ New CEQA Guidelines June 2010, www.baaqmd.gov

Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Develop social marketing campaign to educate residents on reducing their personal greenhouse gas emissions.	Social marketing programs aim to uncover barriers that inhibit individuals from engaging in sustainable behaviors and promote a new norm for the community to engage in. It also provides a set of tools that social science research has demonstrated to be effective in fostering behavior change. A typical social marketing design includes surveying community or neighborhood attitudes to identify target audiences and their barriers. A program is then developed around this research that minimizes barriers through incentives, targeted message development, or direct neighborhood engagement activities. Other cities have used this approach through green schools initiatives, or neighborhood carbon diet clubs or green teams.	2012-13					
Develop a promotion and education program to encourage local and or organic food production	Develop an education and/or social marketing program to promote locally grown and or organic food production and promote community gardens, school gardens and farmer's markets. This program can help reduce emissions from transporting, refrigerating and packaging food hauled from long distances (the average fresh food travels 1,500 miles ¹⁵ for use in California homes). Consider an 'Eat Local Campaign' similar to Portland, Oregon program that promotes eating foods grown within a specific mile radius.	2013-14					
Consider an educational program and/or local ordinance to limit vehicle idling	Exhaust from motor vehicles is a substantial contributor to air pollution and a source of greenhouse gas emissions. These pollutants are harmful to the environment and public health. An example standard would be to limit vehicle idling time to a maximum of three to five minutes.	2013-2014					

¹⁵ Center for Sustainable Agriculture data accessed 12/10/10











Community GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective to the community	Significant environmental co-benefits
Research opportunities to improve methane capture at Marsh Road Landfill (Methane Emissions Mitigation)	Due to methane’s high global warming capacity, this is a priority project. Research potential for new methods to efficiently capture methane even as methane emissions decline (methane is projected to decline to 16,779 tons in 2020).	2011-12					

Municipal GHG Reduction Strategies















The following table outlines the recommended municipal strategies for near-term and mid-term implementation. The table provides the priority ranking, the rationale for the recommendation and the suggested evaluation timeline. The strategies were ranked based on a relative priority scale from numbers 1 through 4, with 1 having the highest ranking and 4 having the lowest ranking. Note that the ranking system provides that GHG Reduction Strategies can be developed concurrently. The recommended strategies were ranked based on the following decision making criteria:

- Provides significant GHG reduction potential (i.e. strategy focuses on the largest GHG sectors in Menlo Park’s GHG Inventory)
- Ease of implementation (i.e. strategy can be implemented with limited staff and other resources)
- Considered a “best practice for GHG reduction strategies” and successfully implemented in other jurisdictions
- Considered reasonable and cost-effective to city operations
- Has significant co-benefits, such as improved air quality, improved public health, reduced traffic congestion, reduced energy and water consumption, preserves natural resources and extends landfill life.

Recommendations for Municipal GHG Reduction Strategies

Municipal GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective	Significant environmental co-benefits
<p>Adopt an Environmental Preferable Purchasing Policy (EPP)</p>	<p>Consider adopting an Environmental Preferable Purchasing Policy (EPP) that requires or encourages the purchase of sustainable products that minimize environmental impacts. Consider requiring a minimum of these 2 specific elements:</p> <ol style="list-style-type: none"> 1. All paper products have minimum 30% post consumer content 2. New city fleet purchased should be no or low emission vehicles, with some potential exceptions. <p>Menlo Park’s city fleet generates 28.4% of municipal emissions.</p>	2011-12					
<p>Implement a Civic Green Building Policy for new municipal construction and major renovations</p>	<p>Menlo Park’s city office buildings (electricity and natural gas consumption) account for 33% of Menlo Park’s municipal emissions. Consider implementing a green building policy that encourages or requires new green building standards such as Leadership in Energy and Environmental Design (LEED¹⁶) or the California Green Building Code (CalGreen) Tier 1 to encourage or require new energy efficiency requirements that exceed Title 24, Part 6 by 15% for new municipal construction and major renovations. Green building reduces energy, water and resource consumption. Many cities are adopting Civic Green Building Policies to reduce operating costs and be a green building leader for the public and private sector.</p>	2012-13					

¹⁶ www.usgbc.org Leadership in Energy and Environmental Design (LEED)

Municipal GHG Reduction Strategy	Rationale	Evaluation Timeline Before Implementation	Significant GHG Reduction potential	Ease of Implementation	Successfully Implemented in other jurisdictions	Reasonable and cost-effective	Significant environmental co-benefits
Energy Savings Performance Contracting and/or solar power purchase agreements	An energy performance contract is a method in which the contractor provides and finances energy improvements, and is repaid from the energy related cost savings the project generates. There are no upfront capital cost, and the city will experience overall savings as energy costs continue to increase.	2011-2012					
Maximize recycling and composting and all city facilities to a 75% measured diversion rate.	Expand current diversion and consider requiring minimum diversion level at city facilities (e.g. 75%). Ensure appropriate organic collection containers are at city facilities to increase diversion.	Current and Ongoing					
Continue to replace existing city streetlights with LEDs	Streetlights generate 12% of the municipal emissions in Menlo Park. The City is already replacing 22% of the existing streetlights in Winter 2010 with partial funding from the Energy Efficiency and Conservation Block Grant (EECBG) administered by the California Energy Commission (CEC) ; Replacing all streetlights is estimated to save 500,000 kWh of electricity and an estimated \$50,000 per year. Continue seeking grant funding to replace additional City lights from (CEC) or other entity. Funding is currently planned for Capital Improvement Project for FY 2010-2011.	2011-14					

Cost-Benefit Analysis for GHG Emission Reduction Strategies

Menlo Park's approved 2009 Climate Action Plan used various methods to determine the cost-effectiveness of recommended strategies. At the time of approval, the City Council requested a consistent methodology to evaluate the cost-benefit of each GHG reduction strategy. The methodology below can assist in evaluating the cost-benefit of each strategy before implementation.

It is important to note that conducting a cost effectiveness analysis for each strategy will be completed according to the **evaluation timeline** in the community and municipal strategy tables of this report. The City Council has stated that the Climate Action Plan is a living document to be updated periodically. Part of the rationale for this stems from the fact that many climate change strategies are relatively new, and state and federal regulations are also changing that can either create barriers or assist in making the strategies more or less feasible. For example, the state can mandate that all commercial businesses are required to recycle. This strategy could either be removed from Menlo Park's list of community GHG reduction strategies, or Menlo Park could adopt an ordinance that would enhance the state law by including materials, like food scraps, that may not be covered under state law.

In addition, there are numerous variables and conditions within a community that can vary the level of implementation of each strategy. For example, the green building strategy can vary in implementation from voluntary to very strict, depending on current staff resources and community support. Thus, reviewing each strategy completely and independently before implementation can save time and resources rather than attempting to evaluate all strategies at one time.

Cost-Benefit Analysis Methodology

Currently, there is no established cost effectiveness analysis or uniform set of benchmarks/estimation factors that jurisdictions follow to evaluate GHG reduction strategies. Jurisdictions currently use various data sources for calculating the costs and benefits of GHG reduction strategies. For example, the City of San Carlos's Climate Action Plan used first year costs only as the method to compare and evaluate the costs for a particular strategy.

The Rocky Mountain Institute's "Cost Benefit Methodology" report has established a well defined methodology for completing cost benefit analysis of greenhouse gas reduction strategies. Agencies that have used this methodology include the City of Palo Alto and the California Air Resources Board. Components of this methodology are included in the following steps for evaluating Menlo Park's GHG strategies. In addition, the methodology below provides a separate Benefit-Cost analysis for City operation and community impacts:

1. **Develop Draft Policy, Program or Project.** Include the essential details and specific components for the implementation of the strategy. Tasks include but are not limited to:
 - Analyzing the impacts of current or potential federal and state mandates related to the strategy
 - Developing two to three policy or program options that define standards and applicability
 - Identifying funding sources for the program or project (city funds, grants, or other)

- Developing Community Engagement Plan (identify stakeholders)

2. **Calculate GHG Reduction Benefit.** GHG reductions are measured in terms of CO2 equivalents (CO2e) and are quantified in short tons (2,000 lb). Most of Menlo Park’s GHG emission inventory and potential reductions involve CO2 emissions, resulting from fossil fuel energy use. The remainder involves other GHG emissions, such as methane, which is 20 times more potent to climate change than CO2 (methane emissions can be converted CO2 equivalents).

To calculate the CO2e emissions reductions from direct fossil fuel energy use depends on the type of fuel and the quantity used:

$$\text{GHG Reduction Benefit [tons/year]} = \text{Fossil Fuel Saved (MMBtu/year)} \times \text{Fuel Carbon Intensity (tons/year)}$$

The carbon intensity that will be used to evaluate Menlo Park strategies will be the same carbon intensities used to calculate Menlo Park’s annual GHG Inventory using the Clean Air and Climate Protection software developed by Local Governments for Sustainability (ICLEI). See table below for current carbon intensities used in the 2009 Community Greenhouse Gas Inventory.

2009 Menlo Park Carbon Intensities	
Fuel	Carbon Intensity (CO2e)
Natural Gas (per MMBTU)	0.085
Electricity (per MMBTU)	0.088
Landfill Waste (per ton)	0.471
Gasoline (per MMBTU)	0.023

3. **Determine Net Costs.** Use the following formula to determine net costs:

$$\text{Net Cost} = \text{Cost of GHG Reductino Action} - \text{non GHG benefits}$$

*Convert each future cost and benefit term to a present value
 **A negative result is possible

The cost of a GHG reduction strategy includes the initial capital, annual fuel, annual operating and/or maintenance costs of a particular strategy. Most reduction measures will include initial capital cost, such as installing charging stations for electric vehicles or cost to train staff and/or conduct a public outreach campaign for a new ordinance. Annual cost might include administration of program or project, enforcement, providing incentives, or maintaining systems.

Obtaining a value for non-GHG benefits can be a more challenging process. For most CO2 reduction strategies, the main benefit that can be calculated with certainty is the annual fossil fuel savings from increased efficiency or renewable power (e.g. reduced kWh or gasoline).

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Many other types of non-GHG benefits are also important to consider, and include:

- Transportation: Reduced traffic, improved safety, air quality benefits
- Public Health: improved air or water quality, reduced risk to chronic disease or illness (asthma, obesity, diabetes)
- Waste: Saved landfill costs, energy saved from producing less “one-time” use materials.
- Green Building: Improved indoor air quality, occupant comfort, increased work productivity resulting from better design of lighting and ventilation.
- Education: Conserves finite resources

These benefits are difficult if not impossible to monetize and quantify. Economists generally use surveys to establish what an individual is willing to pay for improved air quality. However, obtaining this data can be time consuming and costly. Another measure that could be considered by the City Council is placing a standardized weighted community value on “non-purchasable” benefits. For example, if the strategy would significantly improve public health, an additional five percent could be added to the strategy’s total greenhouse gas reduction.

Once the initial and future costs and non-GHG benefits have been determined they can be combined into a single cost-benefit metric (\$/ton).

4. **Calculate City Cost/Benefit of GHG Reduction Strategy.** This would only include costs directly related to city operations or infrastructure. The basic methodology for cost/benefit (C/B) analysis of a strategy should compare the GHG reduction benefit (calculated in step two) to the *city* net cost (calculated in step three), and is measured according to dollar per ton of CO₂e reduced.

For one time strategies, the following formula would apply:

$$\text{Cost/Benefit (C/B)} = \frac{\text{Sum of Net Present Value Cost (NPV) of GHG Reduction Cost (\$)}}{\text{Emissions Reduction Benefit (Tons)}}$$

The NPV of the net cost value “C” that occurs “t” years over the lifetime of the strategy depends on the discount rate. Menlo Park’s Finance Department has recommended a conservative 4% discount rate, which is higher than discount rates typically applied to other city cost benefit analysis. Agencies such as Palo Alto and the Air Resources board typically use a timeframe of 20 years of implementation for most strategies, and a discount rate of 4.8 to 5 percent. It is recommended that Menlo Park use timeframes that are specific to the life of the strategy with the caveat that the time frame does not exceed 20 years.

$$NPV (C) = \frac{C}{(1 + 0.04)^t}$$

For strategies that produce a stream of annual reductions, the following formula will be used:

$$\text{Annualized Cost Benefit (\$/ton)} = \frac{\text{Sum of Net Present Value Cost (\$)} \times \text{Capital Recovery Factor (CRF)}}{\text{Annual Emissions Reduction Benefit (Tons)}}$$

The capital recovery factor is defined as the product of the capital expenditure and the capital recovery amortized over a specified period of time at an annual discount rate of 4%. For example, strategies that use a 20-year capital life with a 4% discount rate, the CRF is 0.07358 or approximately \$0.07 annually for each dollar of capital expenditure.

5. Calculate Total Community Cost Benefit:

The Climate Action Plan strategies not only impact the costs and savings to the city, but also can impact costs and savings for the community. For example, a sustainable green building ordinance would involve costs to the city (e.g. ordinance implementation, staffing for ongoing enforcement) and cost impacts to the community. The building applicant may realize a cost premium of 0.5% to 2% for upfront costs in comparison to costs for a non-green building. This upfront investment of 0.5% to 2% can produce beneficial life cycle savings of 20% of total construction costs for the permit applicant. Additional non-monetized benefits include significantly improved indoor air quality (reducing health issues such as asthma, etc.) for the building occupant from implementation of this strategy. Moreover, the Menlo Park community benefits from the reduced GHG emissions and reduced energy, water and other natural resources consumption.

The following formula will apply to calculate total community cost benefit:

$$\text{Total Cost Benefit} = \frac{\text{Annualized net cost of GHG Strategy}}{\text{Annualized value of GHG benefits} + (\text{Annual GHG Reduction} \times \text{GHG Emission Value})}$$

*The GHG Emission Value is \$16/ton CO₂e, which is a standard value recommended by the Rocky Mountain Institute and is used in Palo Alto Climate Protection Plan.

Recommended Next Steps for Consideration of GHG Emission Reduction Strategies

This Climate Action Plan Assessment project was intended to complete a high level analysis of the 2009 Climate Action Plan's GHG reduction strategies and identify new strategies for consideration. An additional task was the development of a cost-benefit analysis approach that could provide a consistent metric to evaluate GHG reduction strategies. The next recommended steps include:

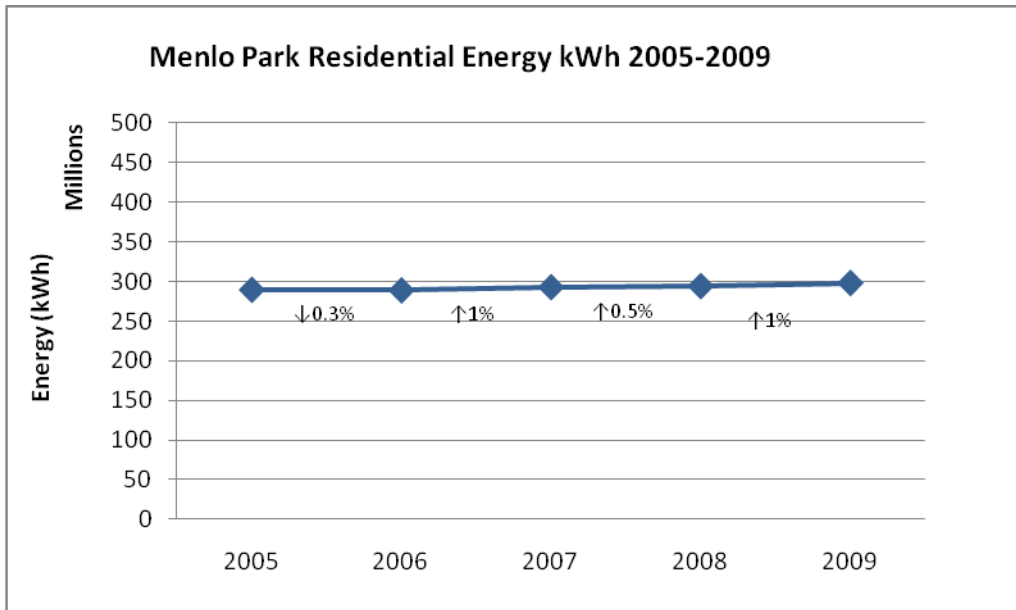
- Adopting a GHG emission reduction target
- Update inventory GHG inventory for 2010
- Completing a Cost Benefit Analysis for the following Community Reduction Strategies in FY 11-12 according to the evaluation timeline:
 1. Consider a Sustainable Building Ordinance- Consider adopting measures in addition to Energy Efficiency Ordinance.
 2. Consider actively market and provide additional incentives for residents to participate in Energy Upgrade.
 3. Commercial Recycling Ordinance.
 4. Consider participating in Lawn Replacement Program
 5. Consider social marketing campaign to promote alternative transportation.
 6. Consider increasing efficiency factor for methane capture at Bedwell Bayfront Park. (included in Capital Improvement Plan)

Bring back to council for council approval, when measure has a significant impact on community and city operations, the measures ranked one and two according to evaluation timeline. Include in the staff report reduced GHG emissions as a result of implementing a strategy and determine if these strategies are sufficient to meet the GHG reduction target for 2020.

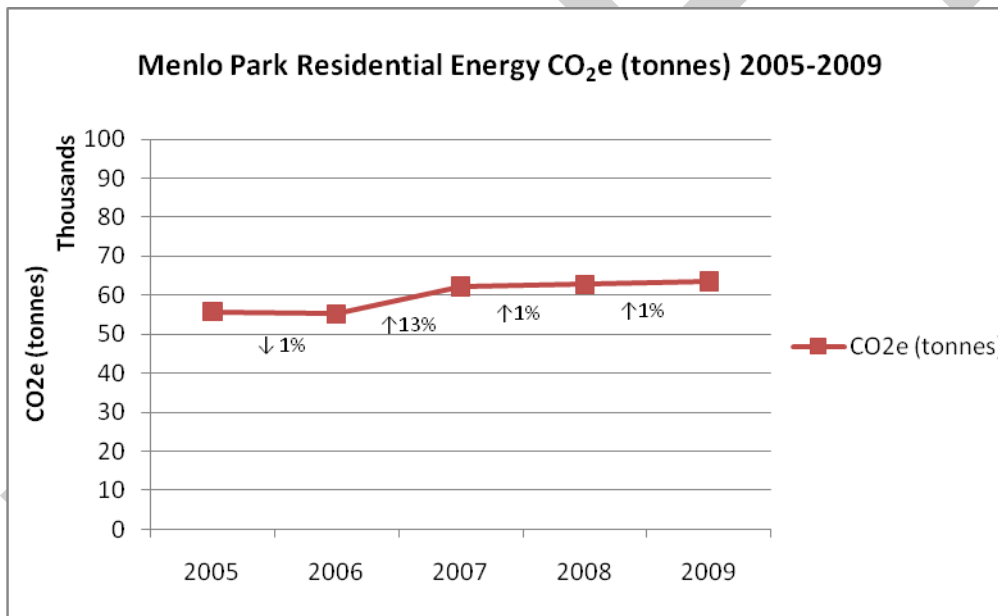
- Completing a Cost Benefit Analysis for the following Municipal Reduction Strategy Evaluations in FY 11-12 in accordance with the evaluation timeline.
 1. Developing an Environmental Purchasing Policy
 2. Continuing to install LED Streetlights
 3. Install water efficient water fixtures
 4. Install photovoltaic system on Onetta Harris Center

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Appendix



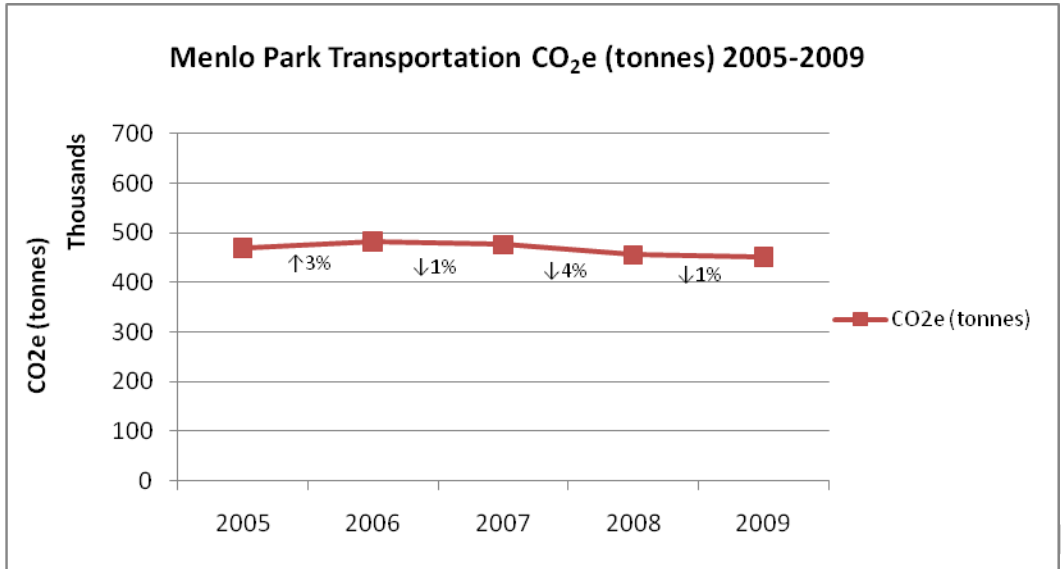
Displays Menlo Park’s Residential Energy kWh usage from 2005-2009.



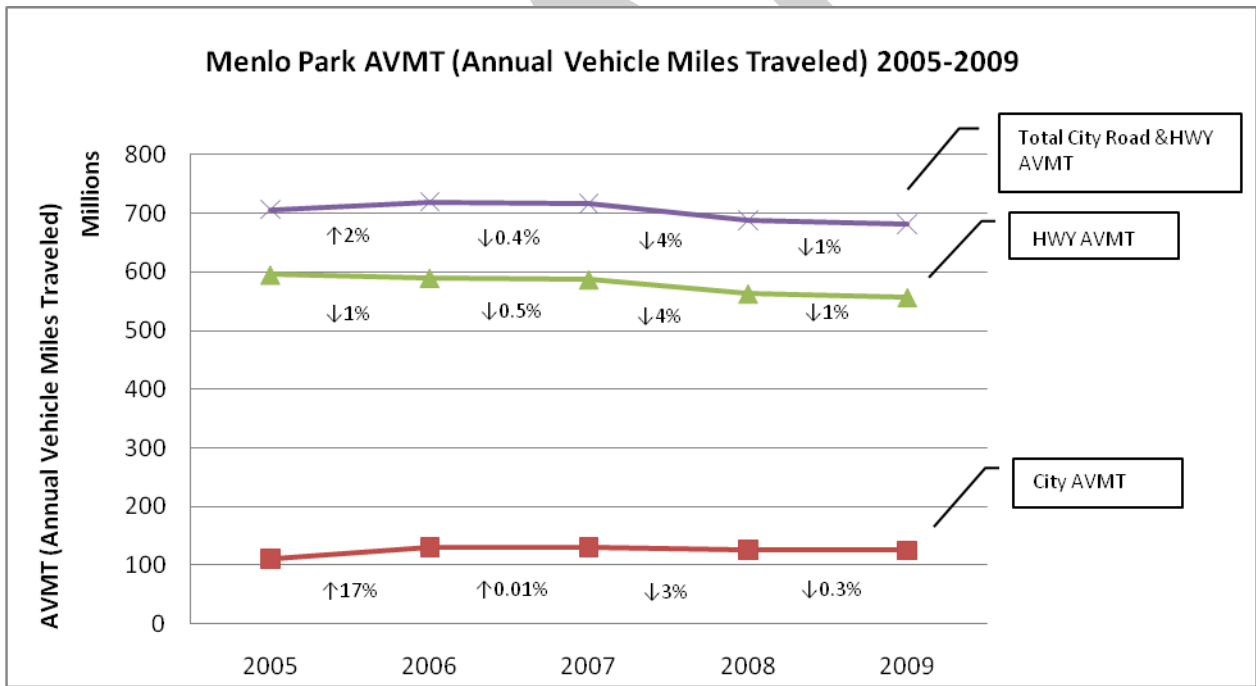
From 2006-2007, there is a 13% increase in kWh CO₂e emissions. This can be attributed to two variables;

- 1) PG&E’s change in emissions factors. For example, electricity emissions factors from 2006 to 2007 went from 0.4560lbs CO₂/kWh in 2006 to 0.6357lbs CO₂/kWh in 2007.
- 2) The energy provided from PG&E comes from a mix of energy sources. PG&E generates some of its energy from hydroelectric means which accounted for 35% of PG&E’s electricity source mix in 2007. Due to a reduction in the amount of water due to drought,

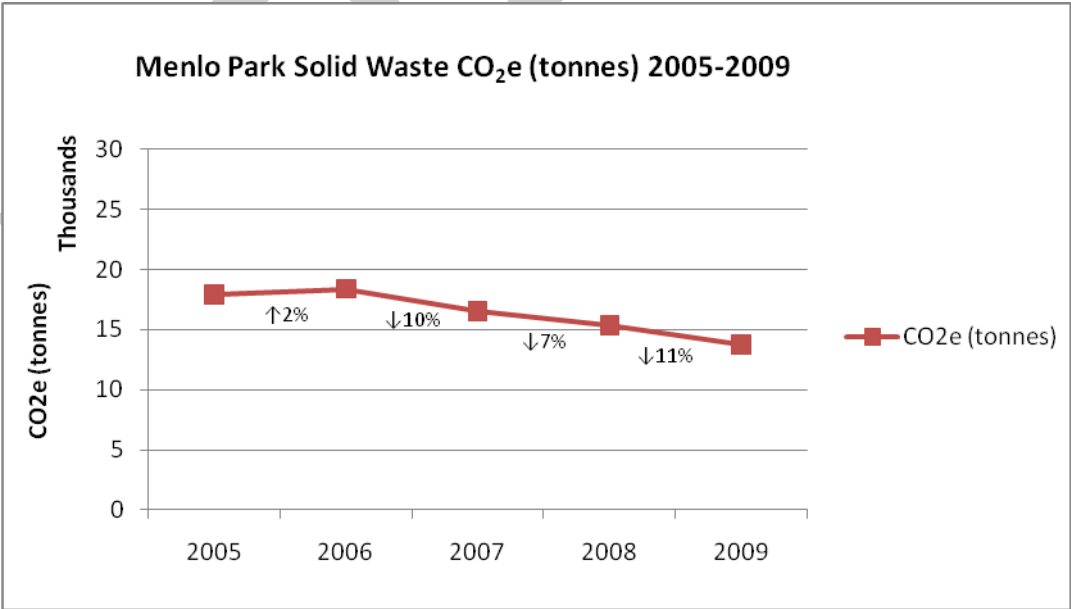
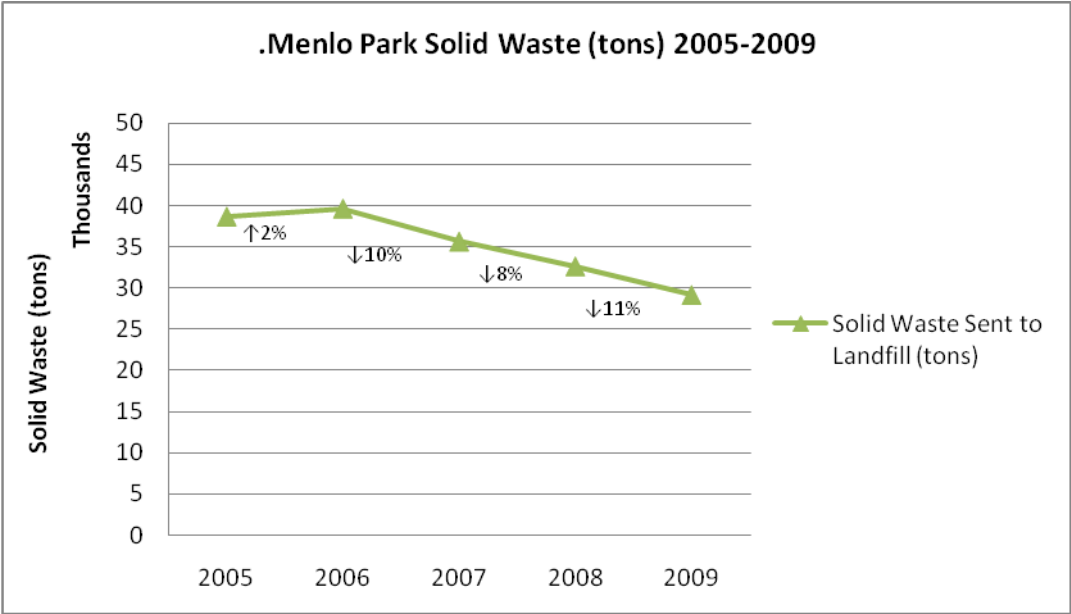
PG&E had to generate energy from other sources. This explains the increase in emissions factors.



Graph represents the CO₂e from the transportation sector for the years 2005-2009. After 2006,



the CO₂e begins to decline at an average of 2%. Between 2007 and 2008 there is a 4% decrease in CO₂e emissions which may be explained by CA average gas prices peaking in 2008 at an average of \$3.56/gal. The rise in gasoline prices causes residents to utilize other means of transportation such as public transportation, biking, walking, or carpooling. A decrease in gasoline burned leads to a decrease in CO₂e.



Data Sources:

- Electricity and natural gas data provided by PG&E.
- Direct Access data provided by the CEC (California Energy Commission).
- Population and Solid Waste data provided by Rebecca Fotu, Environmental Programs Manager.
- Gasoline data obtained from http://www.eia.gov/oil_gas/petroleum/data_publications/wrgp/mogas_history.html
- Menlo Park gasoline sales data provided by John McGirr, City of Menlo Park Finance.
- Transportation data provided by the MTC (Metropolitan Transportation Commission)
- Vehicle Mix data provided by the ARB (Air Resources Board).
- Solid Waste Breakdown obtained from the CIWMB (California Integrated Waste Management Board website).
- Methane data provided by Fortistar.

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