ANTIOCH

COMMUNITY CLIMATE ACTION PLAN

2011

Acknowledgements

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1.0 Creating a Better Future for Antioch & the Earth

The debate is over.
The overwhelming scientific consensus is that human-induced climate change is among the most pressing environmental and social problems facing this generation and those to come.

The time to act is now.
Never in the past 1000 years has the planet warmed at a faster rate than during the 20th century, and the most recent decade has been the warmest ever on record. Allowing this trend to continue could result in decreased agricultural output, increased catastrophic weather events such as forest fires, drought and floods, species loss, and displacement of entire populations due to rising sea levels.

Antioch must do its part.
Although the United States accounts for a mere 4% of the world's population, it produces more than 20% of the world's greenhouse gases. Antioch released 357,698 metric tons of carbon dioxide equivalents (MT CO_2e) in 2005. Without reductions, Antioch emissions are projected to rise by 80,000 MT CO_2e in 2020. To address these concerns the City of Antioch has committed to reducing community-wide greenhouse gas (GHG) emissions by 25% below the baseline year of 2005 by the year 2020, and 80% below by 2050.

1.1 About Antioch's Community Climate Action Plan

Antioch's Community Climate Action Plan (CCAP) should be seen as a road map to guide potential GHG reduction strategies that seek to accomplish the community's goals over the next 40 years.

This document is a malleable, non-binding guide that details policies and programs that can be implemented to help reduce the community's GHG emissions as funds and/or the political will to do so become available.

Antioch's CCAP:

- Provides background on the science and impacts of climate change.
- Presents Antioch's baseline GHG emissions inventory and emissions reduction target.
- Outlines the policies and measures that Antioch may implement and/or is already implementing to achieve its target.
- Presents next steps required to implement the plan.

The delta has shaped life in Antioch for more than a century.

1.2 Climate Action Opportunities

The Antioch CCAP includes strategies focused on green building, renewable energy, transportation and land use, education, and waste management. Together these strategies can help Antioch reach its GHG reduction goals. Moreover, implementing these strategies will have additional positive impacts for the local environment, economy and community. GHG reduction strategies will contribute to new job creation, healthier homes, and more resilient neighborhoods for the long term. Creating the Antioch CCAP is another step in guiding Antioch toward a sustainable future.

1.3 Antioch CCAP Strategy Summary

Land Use & Transportation	Projected GHG Reduction (MT CO_2e)
L1. Transit Oriented Development	8,820
L2. Establish HOV Lanes on Highway 4 - Daily Driving	24,631
L3. Establish HOV Lanes on Highway 4 - Peak Hours	20,870
L3. Adopt a Water Conservation Ordinance	1,889
L5. Low-Maintenance Landscaping	857
T1. Build eBart System	7228
T2. Create an Antioch Car Share Program	5,792
T3. Increase Tri Delta Transit Ridership	417
T4. Tri Delta Rapid Transit	1,638
T5. Antioch Unified School District Safe-Routes to School program	270
T6. Provide Free High School Bus Passes	700
T7. Antioch Bicycle Master Plan	497
T8. Hybrid Vehicles	9,869
T9. Electric Vehicles	5,752
T10. Biodiesel Vehicles	2,717
T11. Compressed Natural Gas Vehicles	26
Green Building & Energy	**Projected GHG Reduction (MT CO_2e)**
G1. Green Building Assistance & Incentives for Residential Construction	2,274
G2. Contra Costa County Green Building Requirements	7,307
G3. Energy Efficient Affordable Housing	795
G4. Increase Commercial Energy Code Efficiency by 10%	1,460
G5. Increase Residential Energy Code Efficiency by 10%	953

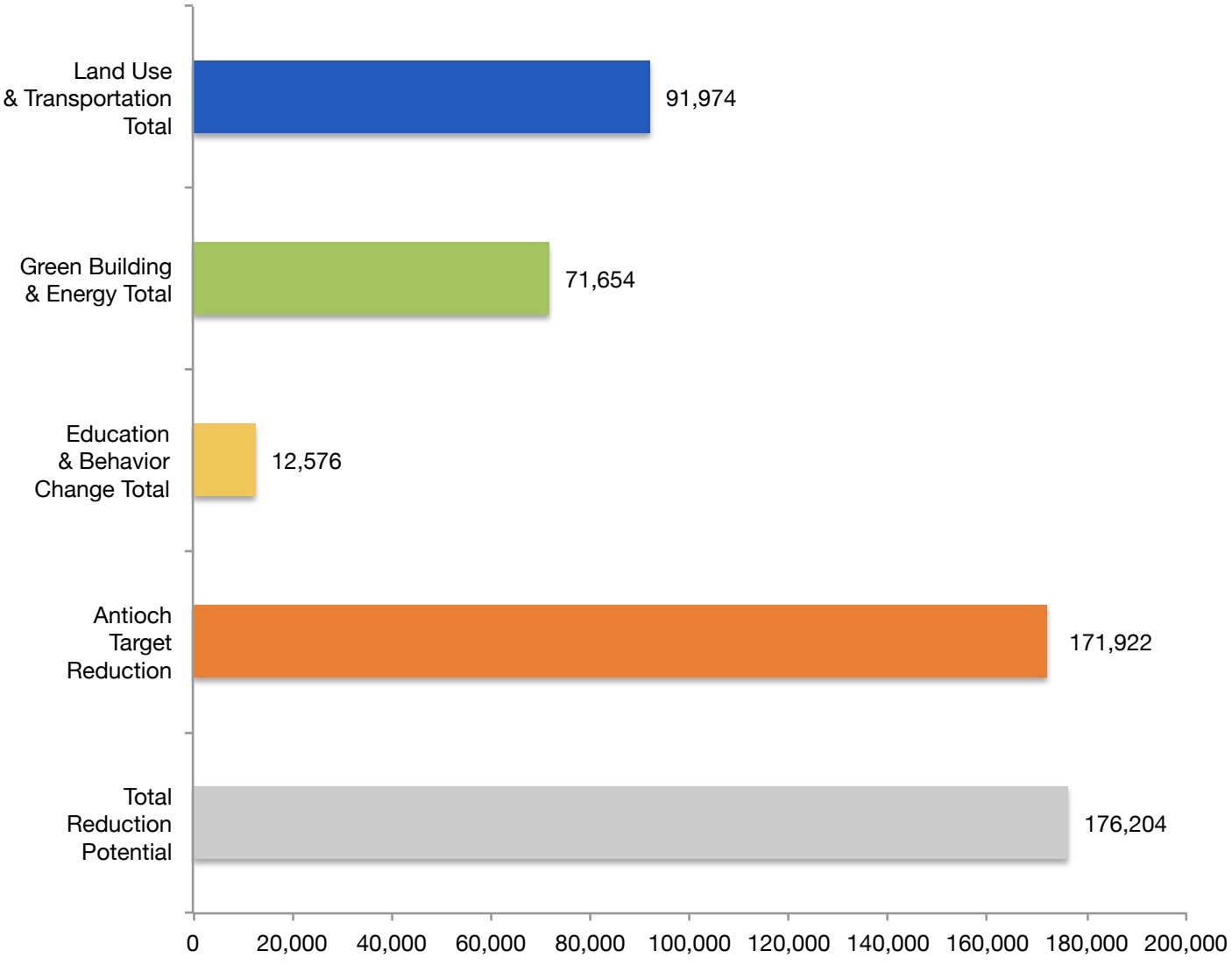
1.3 Antioch CCAP Strategy Summary

Green Building & Energy (continued)	Projected GHG Reduction (MT CO_2e)
G6. Require Energy Efficiency Retrofit at Time of Sale	4,131
G7. Solar Hot Water Heaters	3,619
G8 - G10. High Efficiency Water Fixtures	247
E1. Offer Loans for Energy Efficient Improvements	1,832
E2. Affordable Housing Weatherization Program	1989
E3. Energy Efficiency Retrofits of Existing Facilities	1,095
E4. Plant Trees to Shade Buildings	350
E5 - E13. Energy Efficient Appliances & Technology	7,868
E14. Energy Efficient Lighting Retrofits	704
E15. LED Holiday Lights	51
E16. Install Solar Photovoltaic (PV) Energy	5,003
E17. Geothermal Heat Pumps	2,144
E18. Wind Energy	1,302
E19. Purchase Electricity via the Grid	28,530
Education & Behavior Change	**Projected GHG Reduction (MT CO_2e)**
B1. Education on Low Carbon Transportation	4,931
B2. Energy Efficiency Education Targeted at Businesses	1,499
B3. Energy Efficiency Education Targeted at Residents	1,696
B4. Increase Participation in Green Business Program	2,999
B5-B10. Waste Management	208
B11. Walking Once-A-Week	1,242

1.3 Antioch CCAP Strategy Summary

Total Potential CCAP Reductions	**176,204**
Goal	**171,922**
% Reduction Toward Goal	**102%**

Strategy Area Total Reduction Potential (MT CO_2e)



2.0 Background: Antioch's Climate Change Initiative

Antioch's commitment to mitigating climate change began in September 2007 when the City Council unanimously approved Resolution 2007/69, authorizing the City of Antioch to join ICLEI's (Local Governments for Sustainability) Cities for Climate Protection Campaign (CCP). Antioch is one of over 600 cities around the world to participate in the (CCP) campaign sponsored by ICLEI; as part of the campaign, member cities have committed to:

- Inventory their GHG emissions;
- Set reduction targets;
- Develop comprehensive strategies to meet these targets;
- Implement these emissions reduction actions;
- Measure the results.

Antioch's baseline community wide GHG emissions inventory was completed as part of a grant from ICLEI in February 2008. City staff have also completed the baseline municipal emissions inventory for the year 2005. On June 23, 2009, the City Council of Antioch unanimously approved Resolution 2009/57, adopting GHG reduction targets by reducing overall carbon emissions by 25% by 2020 and 80% by 2050.

2.1 About the City of Antioch

Antioch is one of the oldest cities in California, founded in 1850. Circa 1859, coal was discovered in several places in the hills south of Antioch and formed the first substantial industry aside from farming and dairying. This new industry resulted in the founding of the towns of Nortonville, Somersville, Stewartsville, and Black Diamond (now Pittsburg), and added greatly to the prosperity of Antioch.

Today, Antioch is mainly a "bedroom" community, with most adults working in larger cities toward Oakland and San Francisco. With a current population of approximately 100,000, Antioch has seen an enormous amount of growth in the last 30 years as relatively lower real estate prices have allowed families to move toward the eastern portions of the Bay Area.

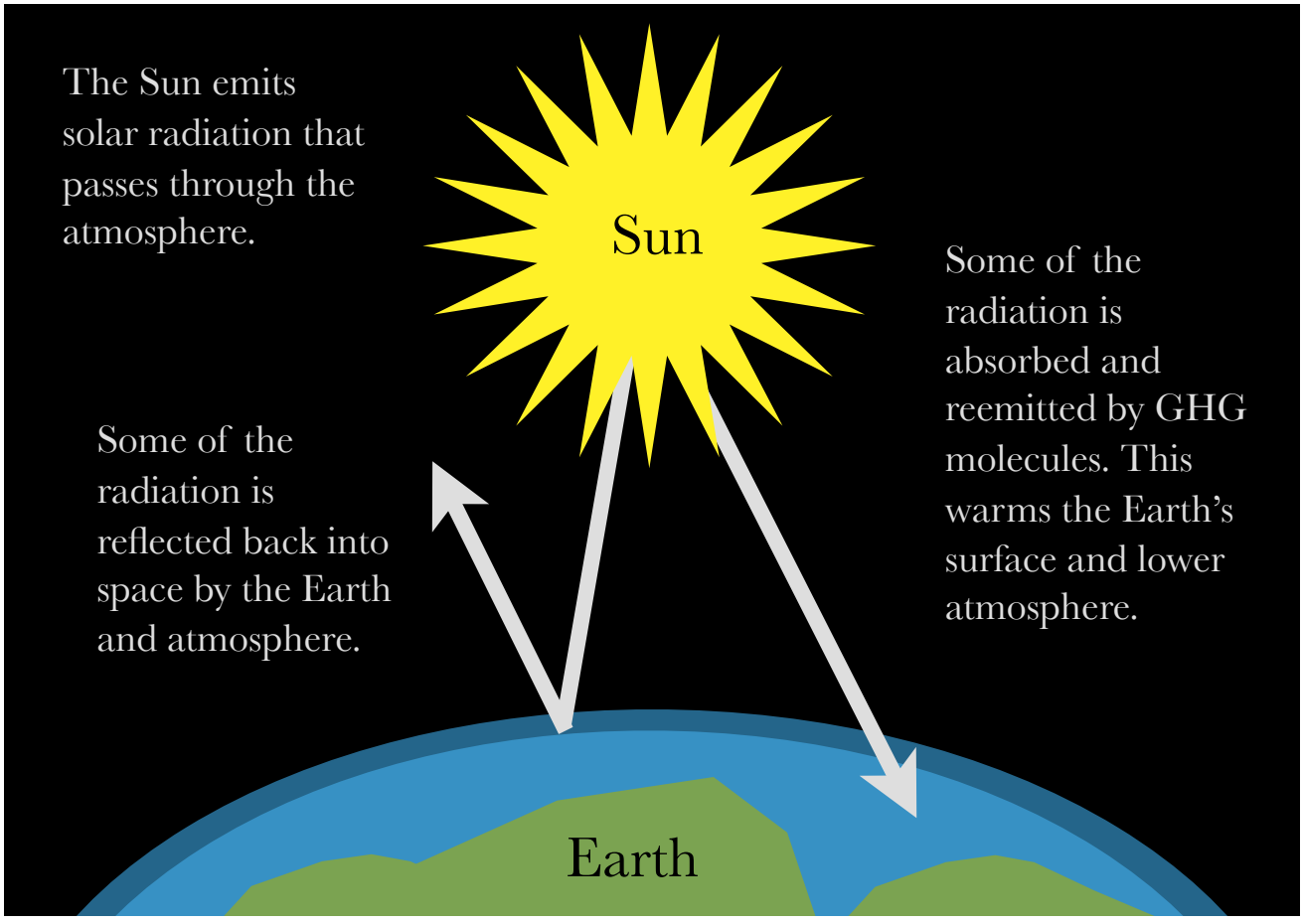
The energy consumed and the waste produced within Antioch's boundaries result in thousands of tons of heat-trapping greenhouse gas emissions every year. However, as evidenced by the community and municipal involvement in Antioch, people are committed to building on existing efforts to reduce GHG emissions.

Local businesses will be essential to addressing climate change and building a more sustainable community.

2.2 The Science of Climate Change

The Earth's atmosphere is naturally composed of several gases that act like the glass panes of a greenhouse, retaining heat to keep the temperature of the Earth stable and hospitable for life at an average temperature of 58°F. These gases are referred to as greenhouse gases (GHG). Carbon dioxide (CO_2) is the most abundant of these gases. Other contributing gases include methane (CH_4), nitrous oxide (NO_2), ozone (0_3) and halocarbons. Without the natural warming effect of GHG, the average surface temperature of the Earth would be around 14°F.

However, human use of fossil fuels has caused elevated concentrations of GHG in the atmosphere. These gases have had a destabilizing effect on the global climate, fueling the phenomenon commonly referred to as climate change (or global warming). The global average surface temperature has increased during the 19th and 20th centuries by about 2°F. According to NASA scientists, the 1990s were the warmest decade of the century, and the first decade of the 21st century is well on track to be another record-breaker. The years 2002, 2003, 2004 and 2005, along with 1998, were the warmest five years since the 1890s, with 2005 being the warmest year in over a century. From sea level rise to crop failure to public health emergencies, the impacts of climate change will be dire in California and around the world if nothing is done.



2.3 California Leading on Climate Change

California led the nation in climate change legislation when it passed the Global Warming Solutions Act, which set mandatory GHG reduction targets for the State. Senate Bill 375 was subsequently passed in 2008, providing additional guidance and substance to AB 32 by tying regional greenhouse gas reduction targets to land use practices. The California Environmental Quality Act (CEQA) was amended in 2009 to further align the environmental review process with GHG reduction imperatives set by AB 32 and SB 375. This legislation is building the foundation for more sustainable development and reduction of GHG emissions in communities throughout California.

Notable Climate Change Legislation in California

California Climate Change Senate Bill 1771 Sher, 2000 Requires the California Energy Commission (CEC) to prepare an inventory of the State's GHG emissions, to study data on global climate change, and to provide government agencies and businesses with information on the costs and methods for reducing GHG's. It also established the California Climate Action Registry to serve as a certifying agency for companies and local governments to quantify and register their GHG emissions for possible future trading systems.

Senate Bill 1078 Sher, 2002 Established renewable portfolio standards requiring electricity providers to increase purchases of renewable energy resources by 1% per year until they have attained a portfolio of 20% renewable resources.

Assembly Bill 1493 Pavley, 2002 Requires the State California Air Resources Board (CARB) to develop and adopt regulations that achieve the maximum feasible reduction of GHGs from vehicles primarily used for non-commercial transportation by January 2005.

Executive Order #S-3-05. 2005 Establishes a GHG reduction target of reducing emissions to 2000 levels by 2010, to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. In April 2006, the California Climate Action Team released its Report to Governor Schwarzenegger and the State Legislature, outlining recommendations and strategies to achieve those reductions.

Assembly Bill 32 Núñez & Pavley, 2006 Institutes a mandatory limit on GHG emissions; reducing emissions in California to 1990 levels by the year 2020, or 25% below forecasted levels. The bill also directs CARB to establish a mandatory reporting system to track and monitor emission levels and requires CARB to develop various compliance options and enforcement mechanisms.

Senate Bill 375 Steinberg, 2008 Builds on the existing regional transportation planning process (which is overseen by local elected officials with land use responsibilities) to connect the reduction of GHG emissions from cars and light trucks to land use and transportation policy.

2.4 Antioch Municipal Climate Action Plan

The City of Antioch is currently drafting a Municipal Climate Action Plan (MCAP)-separate from the Community Climate Action Plan- to address GHG emissions resulting from municipal operations. By proactively reducing emissions generated by its own activities, the City takes a visible leadership role in the effort to address climate change. The MCAP will be posted to the city website after it is complete.

Current Municipal Climate Action Initiatives

Energy Efficient Lighting Retrofit Project The City of Antioch has begun Phase II of its $4.65 million Building and Street Light Energy Efficient Retrofit Project. Over 8700 High Pressure Sodium (HPS) street, park and public parking lot lights will be retrofitted with Induction Lighting. The project, being managed by Honeywell, is believed to be the biggest project of its type in the country. In addition to saving the City over $500,000 per year in energy costs and reducing CO2 emissions by over 1800 tons per year, with tax exempt financing the project will pay for itself over a ten year period.

LED Traffic Signal Retrofit Project Beginning in 2000 and extending into 2001 the City of Antioch underwent an LED traffic signal retrofit to save money and energy. At the time the City owned and operated over 80 traffic signal lights in the City. From 2001 to 2005 the City increased the number of traffic signal lights from 80 to around 100; all new traffic signals had LED lights installed for the green and red signals.

Grass-cycling Project Prior to 1999 the City of Antioch implemented a grass-cycling program for all of its parks and recreation areas. In grass-cycling, cut grass clippings are left on the area that was mowed versus trapping the clippings in bags for off-site disposal. By grass-cycling, the City diverts over 8 metric tons of yard waste from the landfill annually.

C&D recycling ordinance In 2004 the City of Antioch adopted a construction and demolition debris (C&D) recycling ordinance. This C&D recycling ordinance requires the redirection from the waste stream of at least 50% of the total construction and demolition debris generated by a project via reuse or recycling. This ordinance also requires a Waste Management Plan (WMP) to be completed and approved by the City of Antioch for the purposes of complying with this ordinance. A completed WMP contains actual weight or volume of the material disposed or recycled.

Local Governments for Sustainability (ICLEI) In 2007 the City of Antioch joined Local Governments for Sustainability or ICLEI, a group consisting of over 500 cities whose goals are to adopt long-term GHG reduction targets and develop a Climate Action Plan to meet those targets, and monitor and reevaluate those efforts.

GHG Reduction Targets On June 9, 2009 the City Council of Antioch unanimously adopted GHG reduction targets of 25% below baseline year by the year 2020, and 80% reductions by 2050. These targets adopted by Antioch are in accordance with California State Law AB 32 Global Warming Solutions Act.

2.5 Goals of Antioch's CCAP

The goal of the Antioch CCAP is to provide GHG reduction strategies that will meet the community's stated emission targets. These strategies have been chosen based on their potential to meet the targets while preserving or enhancing the economic, social and environmental assets of the community.

Antioch will have the opportunity to incorporate the CCAP into the City's General Plan and develop an Environmental Impact Report (EIR) as part of the next round of general plan revisions.

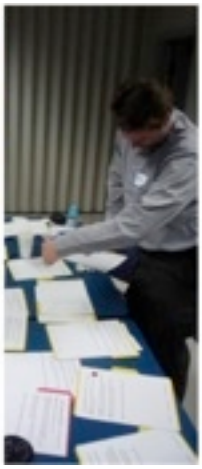
To assist with implementation the CCAP includes potential funding sources for many of the proposed measures. The United States Housing and Urban Development Department (HUD) and the U.S. Department of Transportation (DOT), among others, have incentives that can be directly linked to the implementation of GHG reduction measures. Such programs will be critical to help the citizens and the City of Antioch attain the reduction targets.

2.6 CCAP Strategy Design Process

The City of Antioch worked with a consulting team from Dominican University of California's Green MBA program to complete the CCAP. The Green MBA team designed an outreach plan that focused on connecting with community leaders and local organizations, and engaging a broad range of organizations such as schools, non-profits, and professionals in the plan writing process. A website was also created to assist in communications.

Public workshops were held to educate the community about climate change and Antioch's GHG inventory and to empower people to create reduction strategies for the CCAP. Three community-wide workshops were held in March and April at Prewett Family Park, Antioch High School, and the City of Antioch Maintenance Services office. A fourth workshop with high school students was held in May at Deer Valley High School. A preliminary set of strategies was also presented to the Antioch City Planning Commission in June.

The Green MBA team assessed strategies developed in the workshops in the context of triple bottom line criteria-economic, environmental and social value. These criteria included but were not limited to: projected GHG reductions, capital and operational costs, potential for generating jobs, amount of time and resources needed to implement the measure, indications of similar efforts having been successful in similar communities, and other impacts on the community. The set of strategies was chosen based on all of these criteria.



3.0 Antioch Community Emissions Inventory

The City of Antioch's community inventory was completed in partnership with ICLEI. The purpose of the baseline emissions inventory is to determine the levels of GHG emissions that Antioch emitted in its base year of 2005.

3.1 Methodology

ICLEI's CCP inventory methodology allowed Antioch to systematically estimate and track greenhouse gas emissions from energy, transportation and waste related activities at the community-wide scale. These inventories provide the basis for creating an emissions forecast and reduction target, and enable the quantification of emissions reductions associated with implemented and proposed measures.

3.2 ICLEI's Emissions Analysis Software

To help local governments identify and reduce GHG emissions, ICLEI developed the Clean Air and Climate Protection (CACP) software package with Torrie Smith Associates. This software estimates emissions derived from energy consumption and waste generation within a community. The CACP software determines emissions using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of Metric Tons of Carbon Dioxide equivalents ($MTCO_2e$). Converting all emissions to carbon dioxide equivalent units allows for the consideration of different GHGs in comparable terms.

The CACP software has been and continues to be used by over 250 U.S. local governments to reduce their GHG emissions. However, it is worth noting that, although the software provides Antioch with a sophisticated and useful tool, calculating emissions from energy use with precision is difficult. The model depends upon numerous assumptions, and it is limited by the quantity and quality of available data. With this in mind, it is useful to think of any specific number generated by the model as an approximation rather than an exact value.

3.3 Inventory Data Sources

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. For electricity and natural gas data, ICLEI consulted Pacific Gas & Electric Company (PG&E). The Metropolitan Transportation Commission (MTC), Bay Area Air Quality Management District (BAAQMD), and Bay Area Rapid Transit (BART) served as sources of transportation data. Solid waste data was gathered from California Integrated Waste Management Board (CIWMB), Allied Waste, and Contra Costa County. City staff, including: Jeff Glover, Willy Frasier, Nicholas Tagas, Julie Haas-Wajdowicz, Chris Alvarez, and Mike Bechtholdt, were instrumental in providing data for municipal operations.

The data was entered into the software to create a community and a municipal emissions inventory. The community inventory represents all the energy used, vehicle miles traveled and waste produced within Antioch along with its contribution to GHG emissions.

Data reflect calendar year 2005, which is the baseline year used by most participating cities in the Contra Costa County Climate Leaders group. 2005 is recent enough for data to still be maintained and accessible, and often available in electronic formats.

At the same time, 2005 allows trend analyses to show the GHG reduction impacts of conservation actions taken in recent years.

When calculating Antioch's emissions inventory, all energy consumed in Antioch was included. This means that, even though the electricity used by Antioch residents is produced elsewhere, the energy and emissions associated with it appear in Antioch's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community. This is also the reasoning behind local power plant emissions not being included in the inventories.

3.4 Community Emission Inventory Sectors

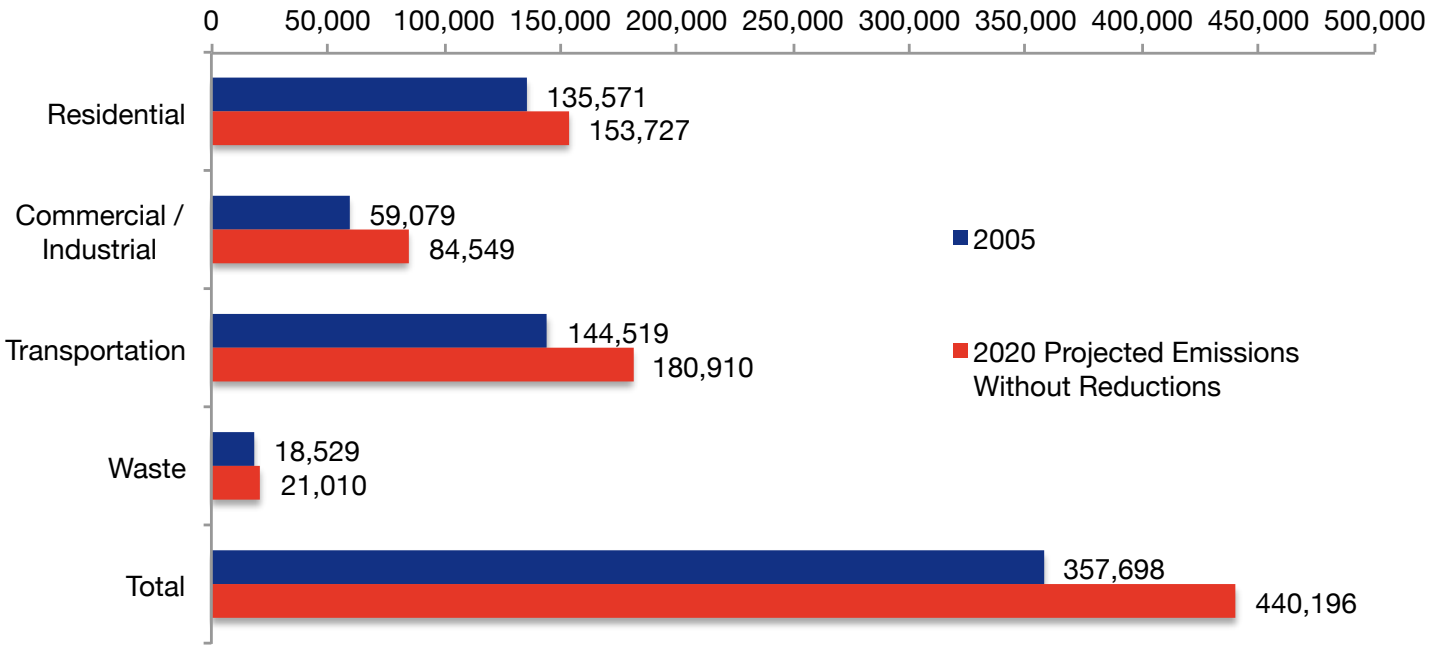
The CACP software divides the community emissions inventory into four categories:

- Residential
- Commercial & Industrial
- Transportation
- Waste

The baseline year for the inventory was 2005 (the earliest year for which adequate data is available). AB 32 has set a reduction target of 20% below1990 emission levels by 2020. The city's target for reducing GHG emissions is 25% below 2005 levels to account for the increase in emissions since 1990. The inventory data provides the framework on which the GHG reduction targets and strategies are based.

The chart below outlines Antioch's total community emissions. As a suburban center and bedroom community, Antioch's emissions reflect the use patterns of many cities in the Bay Area where the majority of the population

Community Emissions Projected Growth by Sector (MT CO_2e)



commutes to work. It is evident from the chart that the majority of emissions result from the transportation and residential sectors. All emission sectors can work toward the reduction targets by focusing on how people live and commute to work. Behavior change and citizen involvement are critical to the implementation of the GHG reduction strategies set forth in this CCAP.

3.5 Community Emissions Forecast

Antioch's baseline emissions of 335,236 MT CO_2e will likely increase as a result of growth in population, business development, and traditional transportation patterns. GHG emissions from 2005 to 2010 are forecast to increase 23.6%; this increase is outlined in the table below. By accounting for expected growth in the community, we can better ensure that the reduction target set by the City can be met.

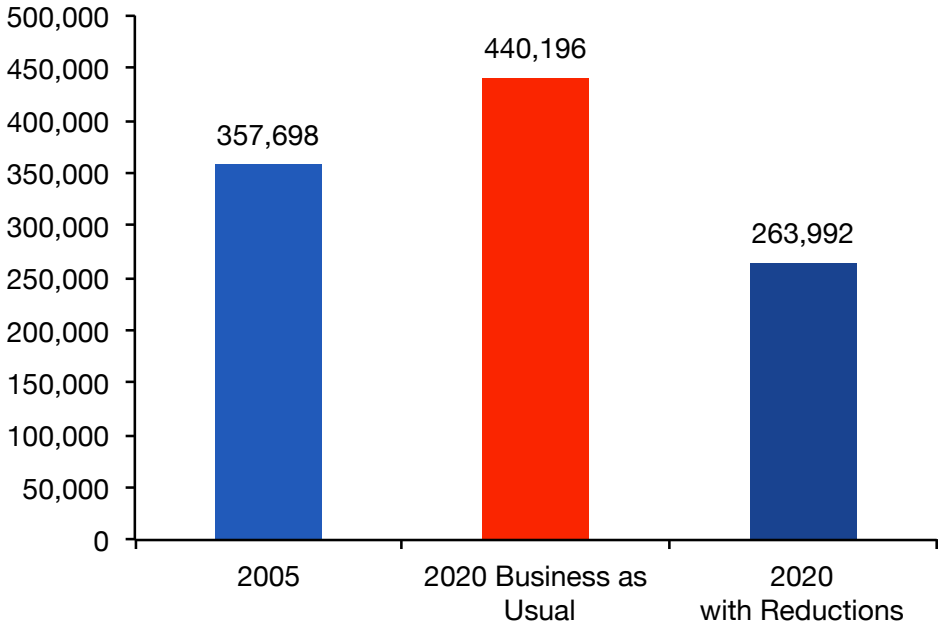
BASE YEAR 2005 Community Emissions Growth Forecast by Sector

Sector	2005 (MT CO_2e)	2020 Projected Emissions (MT CO_2e)	Annual Growth Rate	Projected Percent Change from 2005 to 2020
Residential	135,571	153,727	0.84%	13.4%
Commercial / Industrial	59,079	84,549	2.42%	43.1%
Transportation	141,635	180.910	1.51%	25.2%
Waste	18,529	21,010	0.84%	13.4%
TOTAL	357,698	440,196	--	23.1%

3.6 Emissions Reduction Target

The overall reduction needed in order to achieve Antioch's target emission reductions from 2005 levels is 171,922 MT CO_2e. This CCAP is focused on 2020 level reductions. A second CCAP will be developed to update emission forecasts and reduction strategies for 2050.

2005 Baseline Emission Levels, 2020 Emission Projections & 2020 Target Emission Level (MT CO_2e)



4.0 Proposed GHG Reduction Strategies

The CCAP organizes reduction strategies under three broad areas:

- **Land Use & Transportation**
- **Green Building & Energy**
- **Education & Behavior Change**

A brief overview of each strategy is included in the following sections. Implementation assumptions made as part of the calculations are indicated after each strategy along with the projected GHG reductions that implementation will result in.

4.1 Land Use & Transportation

Land use and transportation strategies are closely related. Land use policies guide development in Antioch and influence local transportation options. Land use policies also impact air quality and quality of life.

According to the Department of Transportation, transportation was the second greatest source of greenhouse gas emissions in the United States in 2006, accounting for nearly a third of all greenhouse gases nationwide. This is second only to generation of electricity. The GHG emissions from transportation account for 42% of Antioch's emissions.

If Antioch is to achieve significant emission reductions, we need to address how people get to where they need to go. Land use considerations will influence the types of development that the City will promote in the next decade.

Increasing the availability of local transportation options, working with the Metropolitan Transit Authority, and revising the City's General Plan are critical steps towards achieving the GHG reduction goals for Antioch. Decreasing the number of miles we travel in personal vehicles will only happen when alternative transportation, housing, and land options are in place.

Land Use Strategies

L1. Transit Oriented Development (TOD)

Incorporating high-density development into the General Plan will help prevent suburban sprawl and encourage mixed-use residential and commercial development in Antioch. The City Council has approved the Hillcrest Area Specific Plan, a high-density zoned area to be served by eBart. The implementation of Transit Oriented Development (TOD) at Hillcrest will also provide further incentives for better public transportation measures.

Implementation projection: This strategy assumes 1,500 new housing units will be built at Hillcrest in the next 10 years.

Reduction Potential: 8,820 MT CO_2e

Land Use Strategies

L2. HOV Lanes on Highway 4 - Daily Driving

A high occupancy vehicle (HOV) lane provides carpools and buses with exclusive use of city streets and highways. HOV lanes on Highway 4 can encourage carpooling and reduce traffic congestion throughout Antioch. By sharing cars the community will reduce vehicle miles traveled and lower fuel and car maintenance costs. This strategy is focused on the off-peak driving of all Antioch residents.

Implementation projection: This strategy estimates a 5% reduction in vehicle miles traveled per person.

Reduction Potential: 24,631 MT CO_2e

L3. HOV Lanes on Highway 4 - Peak Hours

Commuters that pass through Antioch are significant contributors to Antioch's GHG emissions. The HOV lanes will encourage carpooling especially during peak driving hours.

Implementation projection: This strategy estimates a 33% reduction in vehicle miles traveled per person during peak hours.

Reduction Potential: 20,870 MT CO_2e

L4. Adopt a Water Conservation Ordinance

Water must be transported to consumers, returned to the treatment plant, treated, and then re-distributed. This requires significant energy investments. In Northern California, 10,000 gallons of water takes 54 kWh for indoor use and 35 kWh for outdoor use (outdoor water uses less because it does not require wastewater treatment). By reducing our water use we can avoid increased energy expenditures and reduce GHG emissions.

Implementation projection: This strategy assumes a 20% reduction in household water use.

Reduction Potential: 1,889 MT CO_2e

L5. Low-Maintenance Landscaping

Low-maintenance landscaping strategies can reduce the carbon footprint of our yards. Methods include using native plants, reduced pesticide and chemical use, grass alternatives, and human-powered lawn care equipment.

Implementation projection: This strategy assumes 2,000 residences using low-maintenance landscaping.

Transportation Strategies

T1. Build eBart System

The eBart extension will help get more cars off the road by giving commuters in Antioch a viable option for reaching BART. This will also reduce the traffic load on Highway 4 and so will contribute to more efficient fuel use by the remaining cars as well.

Implementation projection: This strategy assumes 5,400 new daily transit passengers.

Reduction Potential: 7,228 MT CO_2e

T2. Create an Antioch Car Share Program

A car share program can help people reduce their driving by providing an alternative to personal car ownership. ICLEI research shows that people who participate in a car share program drive 30-60% less than people who own cars. Car share programs work best in areas with good public transit and walking and biking conditions.

Implementation projection: This strategy assumes 5,000 community participants.

Reduction Potential: 5,792 MT CO_2e

T3. Increase Tri Delta Transit Ridership

Buses near full capacity are much more fuel efficient that personal vehicles with 1-2 riders. Working with Tri Delta Transit, Antioch can reduce GHG emissions from travel by increasing the number of people who take the bus each day. This can be accomplished through increased marketing and education through outlets such has school, work, and neighborhood organizations.

Implementation projection: This strategy assumes an increase in daily bus ridership of 750 people.

Reduction Potential: 417 MT CO_2e

T4. Tri Delta Rapid Transit

Bus Rapid Transit is designed to replicate many of the advantages of rail transit at a much lower capital cost. Buses may operate in their own lanes separate from other traffic, or may be on regular streets but given priority by traffic signals that detect the bus coming and hold a green light for it.

Implementation projection: This strategy assumes an increase in daily bus ridership of 750 people.

Reduction Potential: 1,638 MT CO_2e

Transportation Strategies

T5. Antioch Unified School District Safe-Routes to School program

Families and students can be encouraged to walk or ride bikes to school by increasing access to route information and designing infrastructure to increase safety. This information would include suggestions on keeping children safe and coordination tools for group commutes. Popular routes can also be targeted for reduced traffic speeds, crossing signals and cross guards. Walking and biking to school reduces vehicle miles traveled and also helps children and parents exercise.

Implementation projection: This strategy assumes 4,000 student participants.

Reduction Potential: 270 MT CO_2e

T6. Free Tri Delta Transit Passes for Students

By giving bus passes to students for their daily commutes we can avoid the emissions that come with car trips. Students also have an easier time attending social functions, sports practices and other extra-curricular activities.

Implementation projection: This strategy assumes 1,000 bus passes are given to students.

Reduction Potential: 700 MT CO_2e

T7. Antioch Bicycle Master Plan

Expanding bicycle use in Antioch can reduce GHG emissions and improve the health of people within the community. As part of the next revision of the Antioch General Plan, this strategy suggests Antioch continue to implement infrastructure for bicycling. Cycling can also be supported through education programs and collaboration with Safe-Routes to School, Delta Peddlers and the East Bay Bike Coalition.

Implementation projection: This strategy assumes the community replaces 5,000 4-mile car trips with bike rides each year.

Reduction Potential: 497 MT CO_2e

T8. Hybrid Vehicles

With two to three times the fuel economy of standard gas engine cars, hybrids can play a significant role in reducing Antioch's GHG emissions. Hybrids combine an electric battery-powered drive with a gas engine.

Implementation projection: This strategy assumes 3,000 cars in Antioch will be hybrids.

Reduction Potential: 9,869 MT CO_2e

Transportation Strategies

T9. Electric Vehicles

All electric vehicles are joining hybrids as alternatives to gas-only automobiles. The Chevy Volt and Nissan Leaf are now available. Electric vehicles can greatly reduce emissions when charged with energy generated from renewable resources.

Implementation projection: This strategy assumes 1,000 cars in Antioch will be electric.

Reduction Potential: 5,742 MT CO_2e

T10. Biodiesel Vehicles

The Bay Area is a national leader is biodiesel manufacturing and use. Biodiesel made from waste cooking oil reduces GHG emissions and eliminates waste. This calculation assumes a conservative 20% biodiesel blend.

Implementation projection: This strategy assumes 500 vehicles in Antioch use biodiesel.

Reduction Potential: 2,717 MT CO_2e

T11. Compressed Natural Gas Vehicles

Eventually Allied Waste will use compressed natural gas vehicles for all of its waste management in Antioch. Natural gas is a fossil fuel, however its emissions are lower than petroleum based fuels.

Implementation projection: This strategy assumes 17 trucks in Antioch will be compressed natural gas.

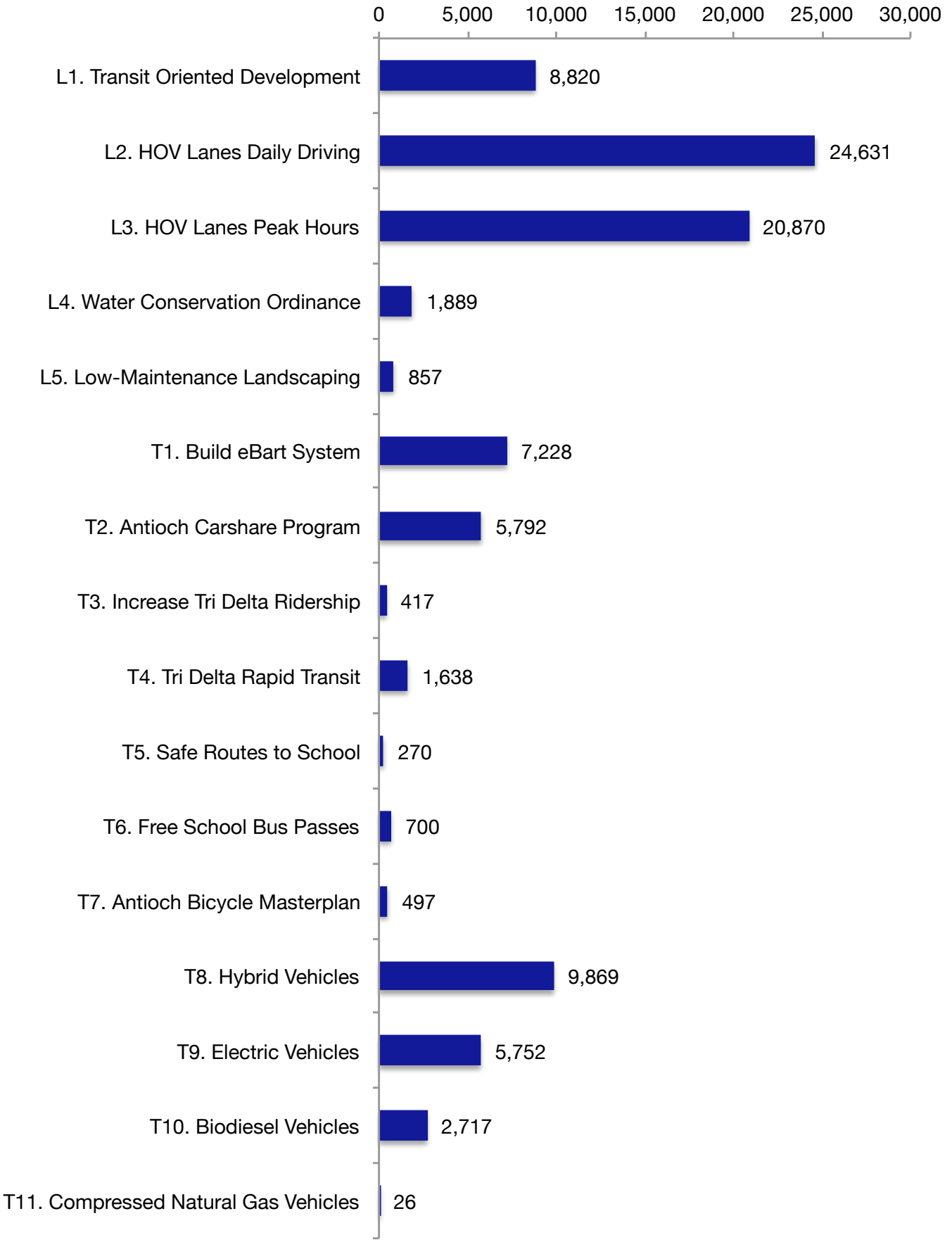
Reduction Potential: 26 MT CO_2e

SB 375: California's Sustainable Communities and Climate Protection Act

In 2008 California passed SB 375, the nation's first to address greenhouse gas emissions (GHG) by curbing sprawl. This new law directs the California Air Resources Board to set regional targets for reducing greenhouse gas emissions, it also builds on the framework of regional land use planning to tie together the allocation of housing needs and transportation planning in an effort to reduce GHG from motor vehicle trips.

SB 375 is critical to improve the way we live, get to work, get to school, and do business. The Land Use (L) and Transportation (T) strategies that are part of this CCAP provide some of the most significant reduction in GHG emissions in the Plan. Strategies under this category also offer an opportunity to significantly impact the local economy as more housing and businesses are planned for higher density transit centers such as the Transit Oriented Development (TOD) at Hillcrest.

Land Use & Transportation Emission Reduction Potential (MT CO_2e)



4.2 Green Building & Energy

Green Building and energy efficiency require a broad range of integrated strategies focused on the design, construction, and operation of homes and buildings. Green Building includes energy efficiency measures along with water reduction, indoor air-quality considerations, landscaping, and ongoing building operations.

Reducing energy consumption in buildings is the most efficient way to reduce energy costs and conserve resources. The following measures offer a combination of Green Building and energy efficient policies that have the potential to reduce energy costs, save resources, create healthier homes and work environments, and provide jobs in the new green economy. As more Federal and State incentives are available for retrofits of existing facilities, these industries will continue to see growth.

Green Building Strategies

G1. Antioch Green Building Assistance & Incentives

Antioch could offer Green Building technical assistance to help homeowners and developers incorporate Green Building practices into their projects that go beyond the 2010 California Green Building Standards Code, or "CALGreen".

Implementation projection: This strategy assumes 1.245 million Square Feet of Green Building Construction.

Reduction Potential: 2,274 MT CO_2e

Green Building Strategies

G2. Contra Costa County Green Building Requirements

CALGreen already makes provision for Green Building practices in its new 2010 Green Building Standards. However, existing buildings can also be retrofitted to incorporate energy saving measures. In particular, there is an opportunity to retrofit properties left unused as a result of the recent recession. Retrofitting existing buildings is also good for business. By establishing these requirements at the county level, companies will be discouraged from choosing their location based on local building codes.

Implementation projection: This strategy assumes 4.0 million Square Feet of Green Building New Construction and Retrofit

Reduction Potential: 7,307 MT CO_2e

G3. Energy Efficient Affordable Housing (EEAH)

Building energy-efficient affordable housing will reduce energy costs, reduce GHG emissions, and save money for low-income residents. Implementing an EEAH program will help Antioch become the recipient of Federal funds for low-income housing, which bring jobs and needed affordable housing units to local populations. Other benefits to the development of an EEAH program include community pride, increased property values, and better health for the residents of energy efficient and "Green" housing development.

Implementation projection: This strategy assumes 500 new energy efficient affordable housing units will be built in the next 10 years.

Reduction Potential: 795 MT CO_2e

G4. Increase Commercial Energy Code Efficiency by 10%

The City of Antioch can promote energy efficient Green Building by offering technical assistance with building design and incentives such as easier permitting and reduced permitting fees.

Implementation projection: This strategy assumes 2,000,000 square feet of new energy efficient construction and renovation.

Reduction Potential: 1,460 MT CO_2e

G5. Increase Residential Energy Code Efficiency by 10%

The City of Antioch and local organizations can promote residential green building by offering technical assistance with building design. Incentives can also be offered, such as easier permitting and reduced permitting fees from the city, and technology education from local green building contractors.

Implementation projection: This strategy assumes 1,500 new energy efficient homes built.

Reduction Potential: 953 MT CO_2e

Green Building Strategies

G6. Require Energy Efficiency Retrofit at Time of Sale

One way to implement improvements to existing buildings is to promote energy efficient upgrades when renovations are made or when buildings are sold.

Implementation projection: This strategy assumes 5,000 homes will be sold and retrofitted over ten years. Input from stakeholders including developers, contractors, realtors and property owners shall be sought to develop a plan for this strategy which will meet the reduction target while at the same time not negatively affecting renovation and real estate markets.

Reduction Potential: 4,131 MT CO_2e

G7. Solar Water Heaters

Solar water heaters offer an extremely effective and affordable form of renewable energy. Heaters use both passive and active designs to provide water storage that is heated by the sun.

Implementation projection: This strategy assumes 5,000 homes will install solar water heaters over ten years.

Reduction Potential: 3,619 MT CO_2e

G8 - G11. Water Saving Fixtures

Water movement, treatment and heating is a significant source of energy use in our communities. Water heating is the second largest energy user in homes, after space heating and cooling. Using water efficiently reduces energy use and emissions.

G8. High Efficiency Toilets

Implementation projection: This strategy assumes 10,000 high efficiency toilets will be installed over ten years.

Reduction Potential: 72 MT CO_2e

G9. Water Saving Shower Heads

Implementation projection: This strategy assumes 10,000 low flow shower heads will be installed.

Reduction Potential: 58 MT CO_2e

G10. Water Saving Faucets

Implementation projection: This strategy assumes 10,000 low flow faucets will be installed.

Reduction Potential: 117 MT CO_2

Energy Strategies

E1. Loans for Energy Efficient Improvements

Antioch could seek funding to offer energy efficiency upgrades. Technologies can be applied to existing buildings to improve energy efficiency, including using efficient light bulbs and fixtures, replacing appliances with more efficient ones, increasing insulation, replacing windows, and upgrading HVAC systems. With funding, the City could encourage efficiency improvements by offering low or zero interest loans to building owners for improvements.

Implementation projection: This strategy assumes that 5,000 homes would be retrofitted through loans.

Reduction Potential: 1,832 MT CO_2e

The Antioch Lighting Retrofit will save the city $500,000 annually in electricity costs while also reducing GHG emissions by 1,800 MTCO_2e each year.

E2. Affordable Housing Weatherization Program

Weatherization programs for low-income earners reduce emissions while saving money for residents in need. A weatherization program can reduce energy costs, leaving more income to be spent on necessities while reducing GHG emissions through decreased energy use. Weatherization projects can also create local jobs.

Implementation projection: This strategy assumes 2,000 homes would be weatherized.

Reduction Potential: 1,989 MT C02e

E3. Energy Efficiency Retrofits of Existing Facilities

Antioch or Contra Costa County could facilitate retrofits of existing facilities by providing technical assistance to building owners and contractors. Municipalities can also encourage efficiency improvements by offering low or zero interest loans to building owners for improvements.

Implementation projection: This strategy assumes 1,500,000 square feet of community space would be retrofitted with energy efficiency technology.

Reduction Potential: 1,095 MT CO_2e

Energy Strategies

E4. Plant Trees to Shade Buildings

Trees properly planted with energy savings in mind can reduce the amount of energy (electricity, natural gas, or other fuel) used to cool and heat buildings. This reduces associated emissions and saves money. The shade from a single well-placed mature tree reduces annual air conditioning use two to eight percent (in the range of 40-300 kWh), and peak cooling demand two to ten percent (as much as 0.15-0.5 kW).

Implementation projection: This strategy estimates 5,000 trees planted to shade buildings.

Reduction Potential: 350 MT CO_2e

E5 - E12. Energy Efficient Appliance & Technology Retrofits

ENERGY STAR is a partnership between the U.S. Environmental Protection Agency and industry to voluntarily label products that meet certain energy efficiency criteria. ENERGY STAR products include home electronic appliances, office equipment, and light fixtures and bulbs. The following strategies propose incentives for appliance changes that can be implemented through Pacific Gas & Electric (PG&E) programs, appliance suppliers, and other state and local Incentives.

E5. Refrigerators

Implementation projection: This strategy assumes 10,000 energy efficient refrigerators will be purchased.

Reduction Potential: 1,590 MT CO_2e

E6. Energy Efficient Washing Machines

Implementation projection: This strategy assumes 10,000 energy efficient washing machines will be purchased.

Reduction Potential: 530 MT CO_2e

E7. Energy Efficient Water Heaters

Implementation projection: This strategy assumes installation of 5,000 energy efficient water heaters.

Reduction Potential: 3,300 MT CO_2e

E8. Energy Efficient Air Conditioners

Implementation projection This strategy assumes that 10,000 energy efficient air conditioners will be installed

Reduction Potential: 326 MT CO_2e

Energy Strategies

E9. Energy Efficient Dish Washers

Implementation projection This strategy assumes that 10,000 energy efficient dish washers will be installed.

Reduction Potential: 781 MT CO_2e

E10. Energy Efficient Computers

Implementation projection This strategy assumes that 5,000 energy efficient computers will be purchased.

Reduction Potential: 344 MT CO_2e

E11. Energy Efficient Computer Monitors

Implementation projection This strategy assumes that 5,000 energy efficient computer monitors will be purchased.

Reduction Potential: 105 MT CO_2e

E12. Energy Efficient Printers

Implementation projection This strategy assumes that 5,000 energy efficient printers will be purchased.

Reduction Potential: 635 MT CO_2e

E13. Energy Efficient Copiers

Implementation projection This strategy assumes that 10,000 energy efficient copiers will be purchased.

Reduction Potential: 257 MT CO_2e

E14. Energy Efficient Lighting Retrofits

Lighting is typically the largest electricity user in commercial buildings. Most commercial buildings use fluorescent lighting, which is relatively efficient, but many buildings still have older fixtures with magnetic ballasts and T-12 size fluorescent tubes. New electronic ballasts with T-8 size tubes use 30% less energy and can provide better light quality without flicker

Implementation projection: This strategy assumes 1,000,000 square feet lit by energy efficient lighting.

Reduction Potential: 704 MT CO_2e

Energy Strategies

E15. LED Holiday Lights

LED holiday lights are brighter than standard lights and also save energy.

Implementation projection This strategy assumes that 10,000 LED light strings will be purchased.

Reduction Potential: 51 MT CO_2e

E16. Install Solar Photovoltaic (PV) Energy

Solar photovoltaic (PV) power harnesses sunlight to generate electricity. By substituting solar energy for fossil fuels, energy can be produced without generating GHG emissions.

Implementation projection: This strategy assumes 10,000kW of solar installed.

Reduction Potential: 5,003 MT CO_2e

E17.Geothermal Heat Pump

Geothermal heat pumps use the consistent temperature of underground air to circulate warmer or cooler air aboveground depending on the weather conditions.

Implementation projection: This strategy assumes 2,000 homes using geothermal energy.

Reduction Potential: 2,144 MT CO_2e

E18. Wind Energy

Wind energy uses wind to move a turbine and generate electricity. By substituting wind energy for fossil fuels, energy can be produced without generating GHG emissions. Area wind maps indicate that Antioch does have potential for small and medium scale wind turbines.

Implementation projection: This strategy assumes 2,500kW of wind installed.

Reduction Potential: 1,302 MT CO_2e

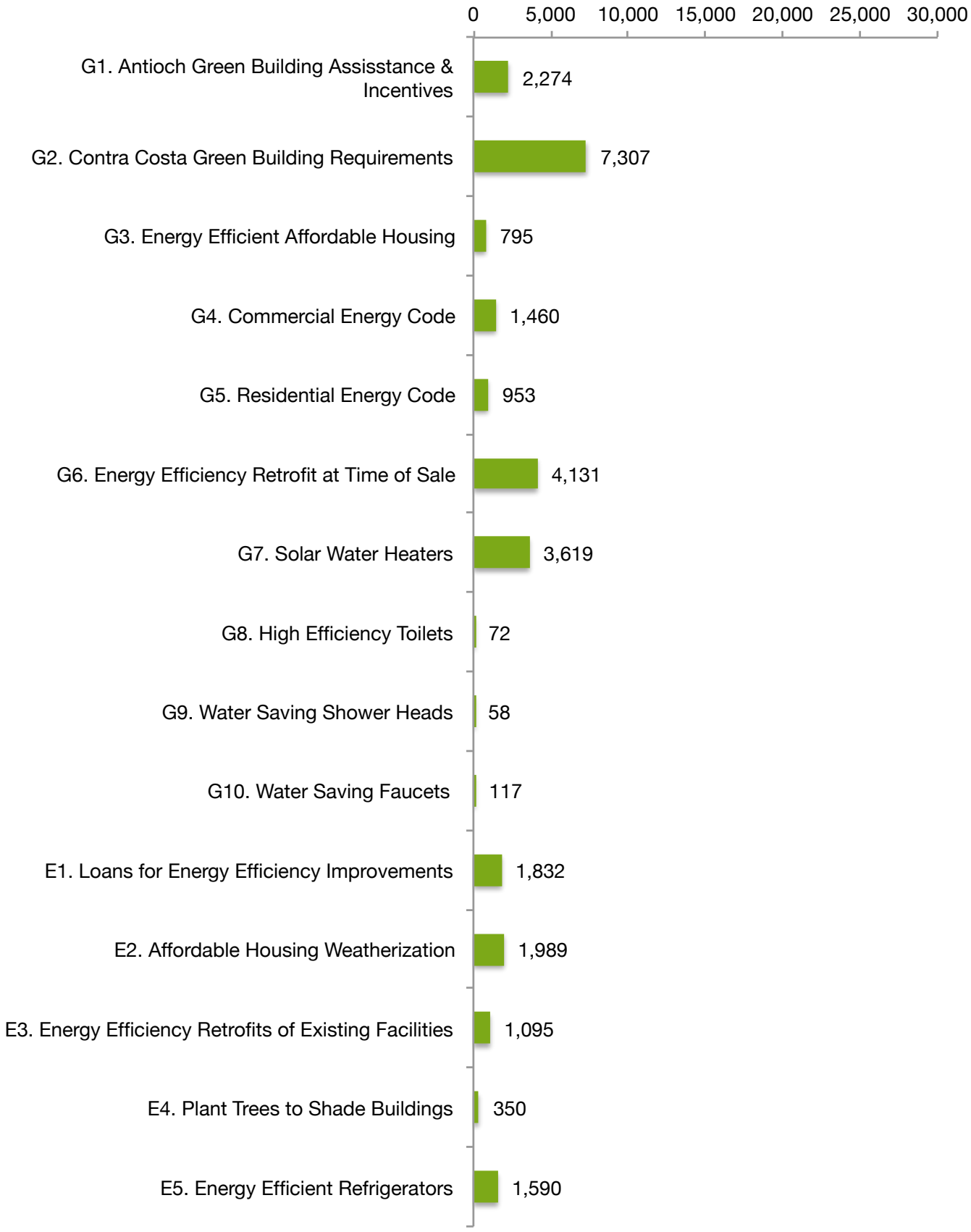
E12. Purchase Electricity via the Grid from Solar, Geothermal, Wind

Green energy purchases allow an institution or home to use energy from renewable energy sources such as solar, wind, and biomass generation, without having to generate that energy themselves. In Antioch, PG&E offers their Climate Smart program to give consumers a chance purchase more renewable electricity than PG&E's standard mix. PG&E pays third party energy produces and then sells this electricity to customers who are part of the program.

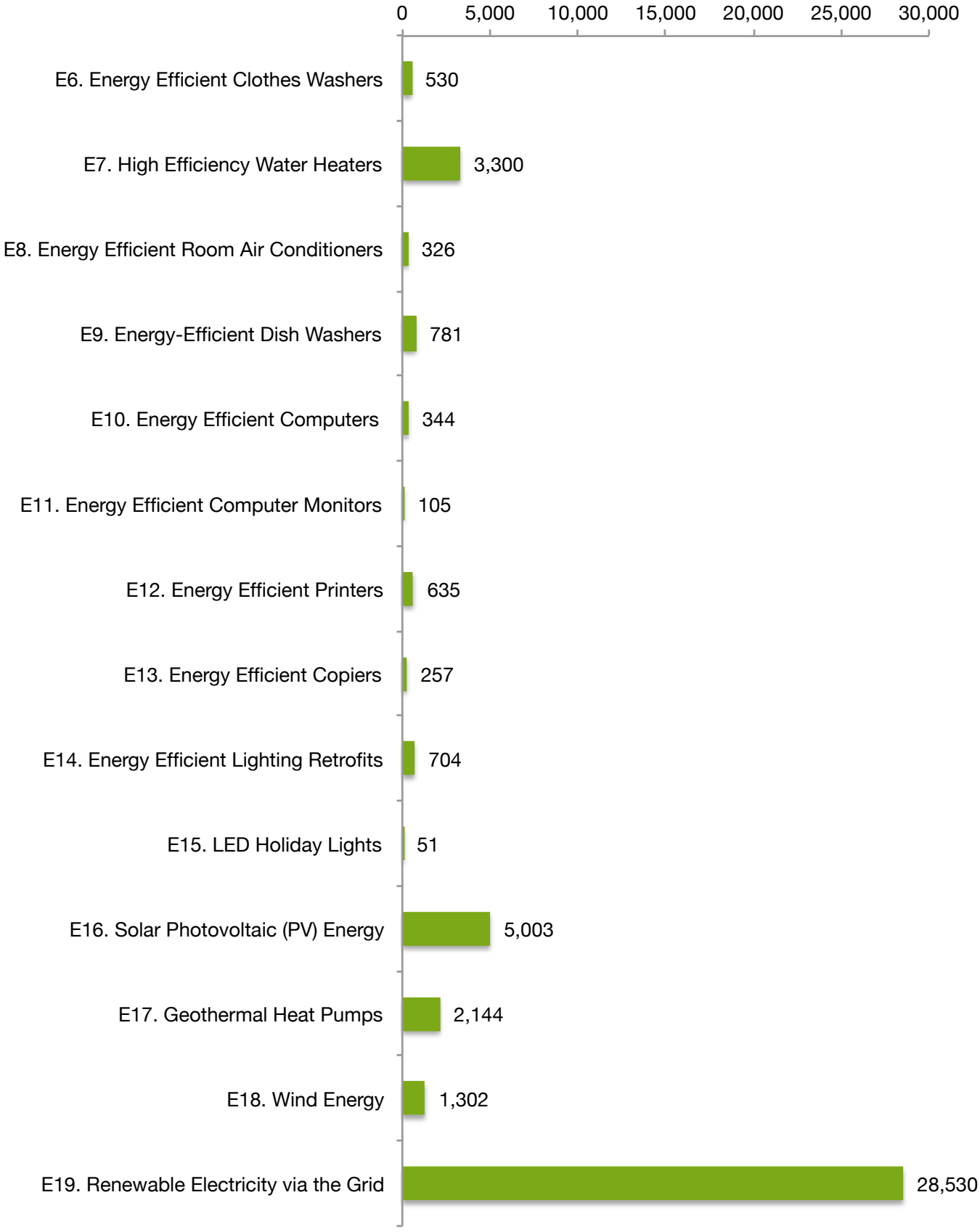
Implementation projection: This strategy assumes 20% of community electricity would be purchased green.

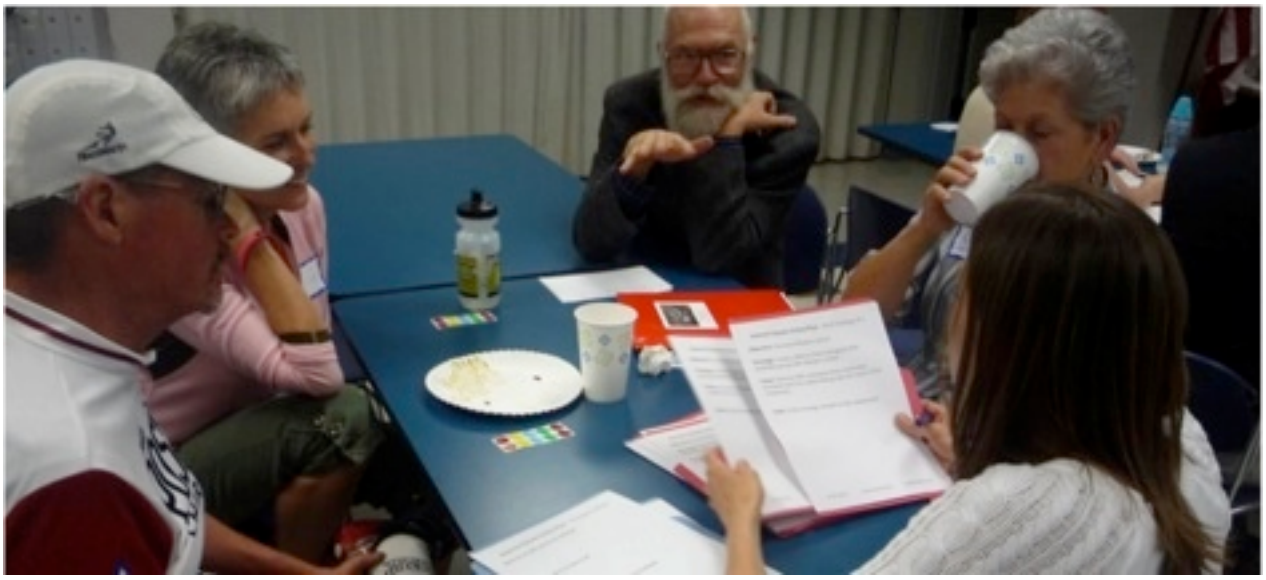
Reduction Potential: 28,530 MT CO_2e

Green Building & Energy Emission Reduction Potential (MT CO_2e)



Green Building & Energy Emission Reduction Potential (MT CO_2e)





4.3 Education & Behavior Change

Learning about how we impact the planet can help us make better decisions about our consumption of natural resources. The following strategies focus on education programs related to energy, waste, and green building. By learning new behaviors we can break down many of the obstacles to reducing our GHG emissions and living more sustainably.

Education & Behavior Change Strategies

B1. Education on Low-carbon Transportation

Outreach and education programs that offer information about transportation options encourage conservation measures by demonstrating new ways to get to work, school, and fun.

Implementation projection: This strategy assumes 5,000 Antioch residences will participate.

Reduction Potential: 4,931 MT CO_2e

B2. Energy Efficiency Education Targeted at Businesses

Businesses can enact many simple measures to save energy. Outreach and education programs that offer information about and encourage conservation measures can tap into this potential and bring a significant reduction in electricity use.

Implementation projection: This strategy assumes 250 Antioch businesses will participate.

Reduction Potential: 1,499 MT CO_2e

Education & Behavior Change Strategies

B3. Energy Efficiency Education for Residents

Residents can enact many simple measures to save energy: efficient appliances, insulation and sealing leaks, unplugging items when not in use, even simply turning the thermostat down in cold weather and up in hot weather. Outreach and education programs that offer information about and encourage conservation measures can tap into this potential. Incentives and prizes increase interest in conservation.

Implementation projection: This strategy assumes 2,500 households will participate.

Reduction Potential: 1,696 MT CO_2e

B4. Increase Participation in Green Business Program

Green business programs are voluntary programs to encourage businesses to go beyond standard regulations and to conduct business in an environmentally friendly manner. Green business programs typically look at pollution reductions, energy savings, recycling, and waste reduction. Businesses receive a checklist of measures, and implement a certain number of them to be certified.

Implementation projection: This strategy assumes 500 Antioch businesses will participate.

Reduction Potential: 2,999 MT CO_2e

Solid Waste and Climate Change

Solid waste is an important contributor to greenhouse gas emissions. Organic solid waste decomposes in landfills and generates methane, which is released into the atmosphere. Methane has 21 times the global warming potential of carbon dioxide.

Antioch residential and commercial solid waste is primarily transported to Keller Canyon landfill in Pittsburg, where it is processed and stored. The facility captures some of the methane generated by organic matter decomposition and produces approximately 3.8 megawatts of electricity with it, enough to power nearly 2,200 homes.

Methane not captured by the gas-to-electricity project goes into the atmosphere. Additional contribution to GHG emissions comes from the transportation of the waste. Strategies for reducing emissions focus on reducing the waste generated and more efficient transport. Making the public more aware through public education programs and incentives will ultimately reduce the amount of solid waste generated.

Allied Waste, the waste hauler for Antioch changed their recycling practices and garbage pickup in July 2010. Pricing has changed to give incentives to residents for downsizing their garbage cans and recycling more. Recycling is now picked up for residential areas every week as opposed to every other week.

Education & Behavior Change Strategies

B5 - B10. Waste Management

Recycling and composting are successful only when people are informed about best practices and regularly encouraged until it is a normal way of life. Neighborhood education campaigns and competitions to increase recycling/composting rates can be successful in engaging communities and divert organic waste from the landfill to become compost as well as inorganic materials that can be recycled.

When organic matter like wood, paper, food, and yard wastes is placed in landfills, it decomposes anaerobically, producing methane. Composting yard waste rather than sending it to landfills prevents these emissions. Antioch currently directs yard waste to be used as landfill cover.

B5. Kitchen Organics Composting at the Residential Level

This strategy will require adding organic food scrap collection to curbside recycling services. Residents would separate food scraps from their trash, and the scraps would be sent to a composting facility.

Implementation projection: This strategy assumes a total annual food scrap diversion of 2500 tons in the residential community.

Reduction Potential: 13 MT CO_2e

B6. Send Yard Waste to Composting Facility

Currently Antioch uses yard waste as alternative daily cover for the land fill. That same yard waste could be composted.

Implementation projection: This strategy assumes that material that is currently used as alternative daily cover is composted for a total annual diversion of 10,000 tons.

Reduction Potential: 28 MT CO_2e

B7. Expand Business Recycling Programs

Businesses can save money and resources by reducing their waste stream and increasing their recycling ratios.

Implementation projection: This strategy assumes a total annual diversion of 0.075 tons per business.

Reduction Potential: 41 MT CO_2e

Education & Behavior Change Strategies

B8. Promote variable rate structure

Antioch waste company Allied is already implementing a variable rate structure. The city could promote or direct residents to online videos and flyers that suggest tips for increased diversion. If residents know that they can save money by using a smaller waste bin, they will be encouraged to reduce the amount of waste they generate and purchase items that have less packaging.

Implementation projection: This strategy assumes 50 pounds/person/year diverted from the landfill.

Reduction Potential: 110 MT CO_2e

B9. Expand Curbside Recycling Programs

By expanding the use of curbside recycling by residents and businesses we can divert more waste from the landfill.

Implementation projection: This strategy assumes 50 pounds/person/year diverted from the landfill.

Reduction Potential: 14 MT CO_2e

B10. Reuse & Recycling of Construction Materials

Recycling and reusing materials on construction sites can save landfill space and reduce GHG emissions.

Implementation projection: This strategy assumes 2 pounds of waste diverted per square foot of construction.

Reduction Potential: 2 MT CO_2e

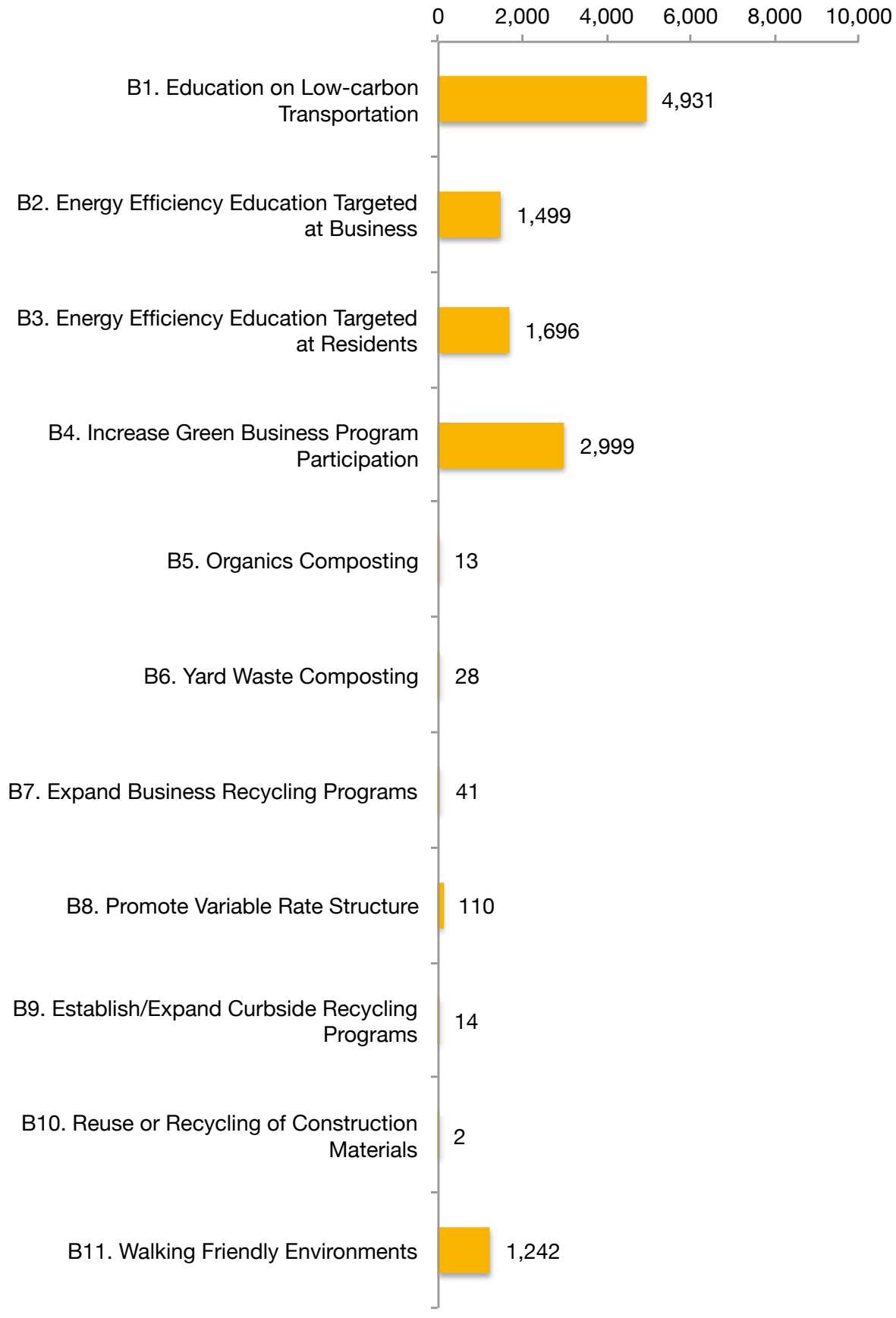
B11. Walking Once-A-Week

Walking instead of taking a car is a great way to get exercise, save money, and reduce GHG emissions! This strategy is focused walking instead of driving for a one-mile trip each week.

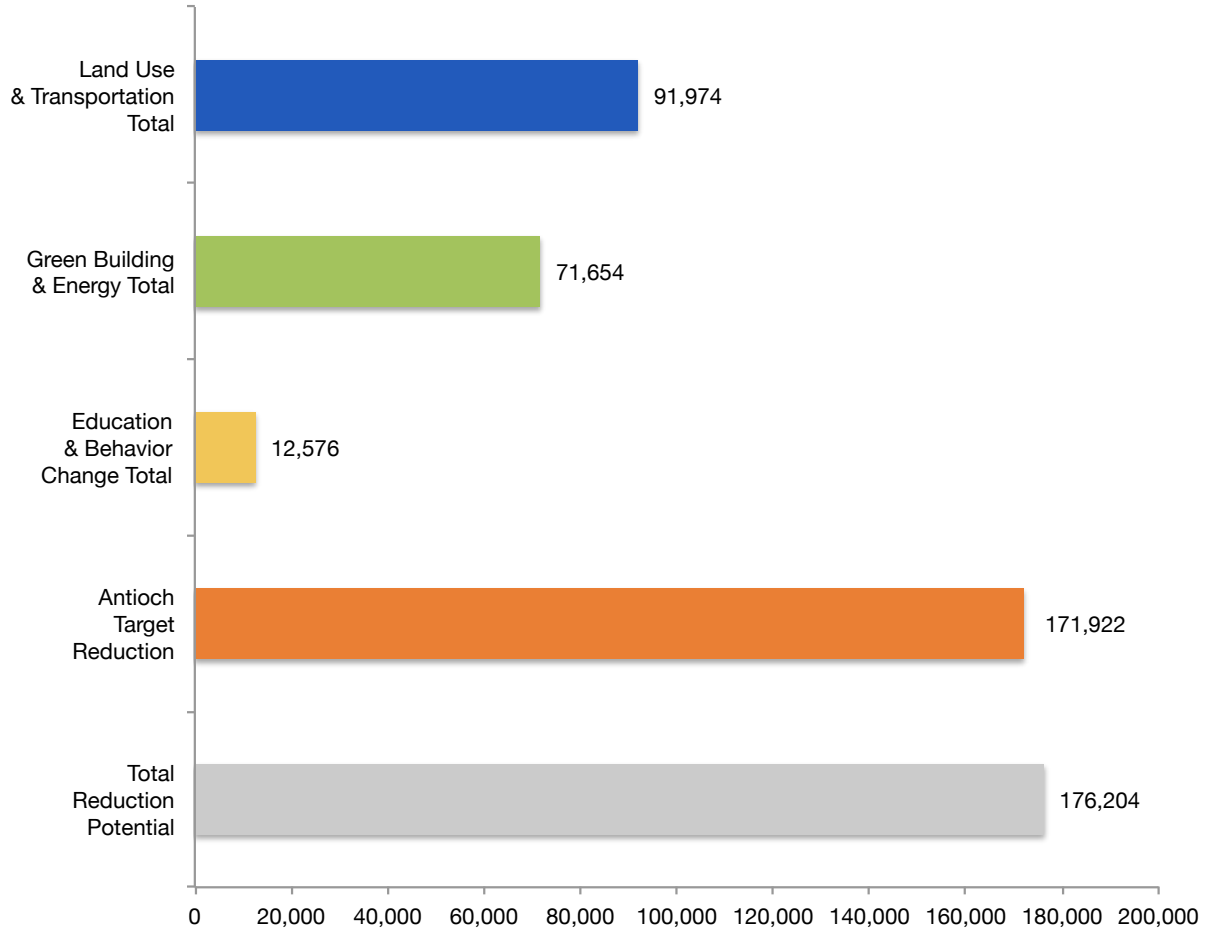
Implementation projection: This strategy assumes 50,000 mile-long car trips are replaced by walking each week. Or one half-mile trip for every Antioch resident.

Reduction Potential: 1,242 MT CO_2e

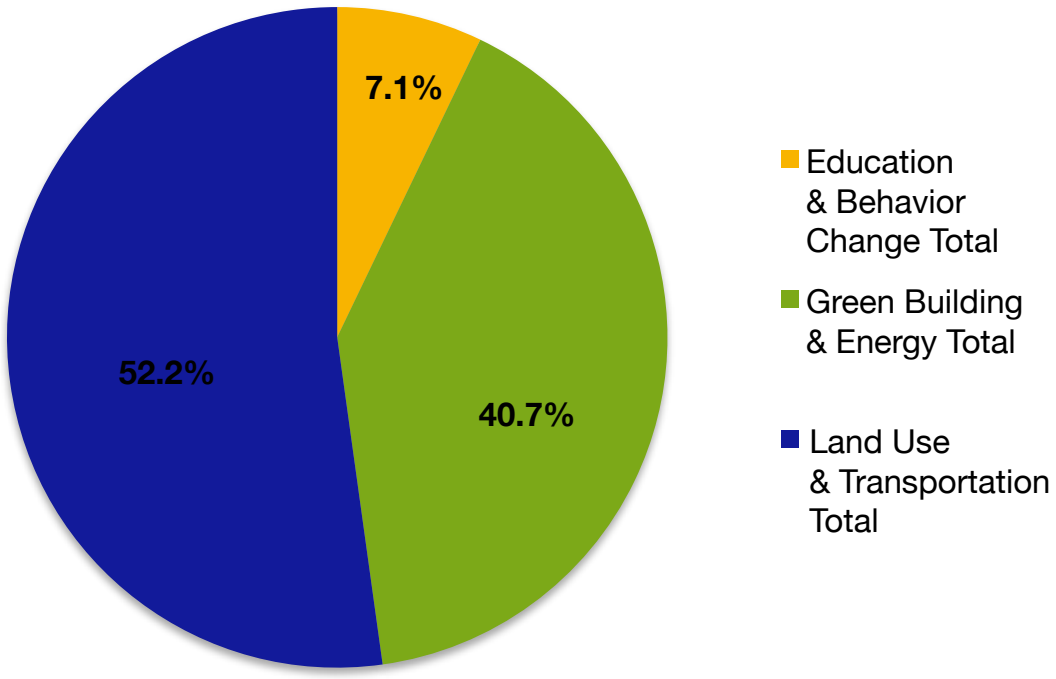
Education & Behavior Change Strategy Emission Reduction Potential (MT CO_2e)



Strategy Area Total Reduction Potential (MT CO_2e)



Strategy Area Comparative Reduction Potential



5.0 Next Steps: Implementing Antioch's CCAP

The Antioch CCAP provides a framework for the GHG reduction strategies that need to be implemented to meet the community reduction targets. The strategies will require significant investments of time, resources and community support to be successful. Over the coming years the City will explore grant opportunities that could help fund these initiatives. In addition, the strategies outlined in the CCAP present an excellent opportunity for community groups, students, faith-based organizations, and concerned citizens to band together for the common good of Antioch.

A new GHG emission inventory based on GHG emissions for the year 2010 is planned in 2011. This updated inventory will show changes in the GHG emissions for the City and will also help inform the GHG projections for 2020 and 2050. With the recent downturn in the economy, current GHG projections that are based on 2005 emission numbers may be need to be significantly altered.

Strategies in the CCAP will be reevaluated with the updated inventory and growth projections to ensure the strategies will continue to lead Antioch toward meeting its 2020 GHG reduction goals. A second CCAP will also be developed to design additional strategies to meet the 2050 reduction targets..