

CITY OF WALNUT CREEK CLIMATE ACTION PLAN ASSESSMENT REPORT

SEPTEMBER
2016

PREPARED FOR:
City of Walnut Creek
1666 North Main Street
Walnut Creek, CA, 94596

PREPARED BY:

Michael Baker

INTERNATIONAL

One Kaiser Plaza, Suite 1150
Oakland, CA 94612

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Executive Summary

In 2012, the City of Walnut Creek adopted a Climate Action Plan (CAP) to identify the sources of the community's greenhouse gas (GHG) emissions and to plan for ways to reduce these emissions. The CAP directs the City to reduce GHG emissions 15% below 2005 levels by the year 2020, in accordance with state law.

This report presents an assessment of the CAP's implementation status, including a review of the community's success in reducing GHG emissions through various programs and an update on current and projected community GHG emissions. The report also identifies specific steps the City can take to further reduce emissions and achieve its GHG reduction goal by 2020. The report examines existing actions and future options to reduce GHG emissions through energy efficiency, renewable energy, water conservation, transportation alternatives, and other key strategies.

This report will inform City officials, City staff, and members of the Walnut Creek community about the state of GHG reduction efforts in Walnut Creek. It provides updated information to help decision-makers select the best options to reduce GHG emissions while being consistent with community values and plans. This assessment report also looks forward to 2030, exploring the long-term GHG trends in Walnut Creek.

Rationale for the CAP

Walnut Creek adopted the CAP as a tool to achieve sustainability goals. The CAP is a voluntary strategy that provides benefits to the community. By helping the City achieve compliance with the California Environmental Quality Act, the CAP facilitates new environmentally responsible development in Walnut Creek. The CAP also allows the City to show environmental leadership and demonstrate its commitment to reducing GHG emissions. The CAP equips the City to evaluate and prioritize next steps to achieve local climate mitigation goals.

WALNUT CREEK AND CLIMATE CHANGE

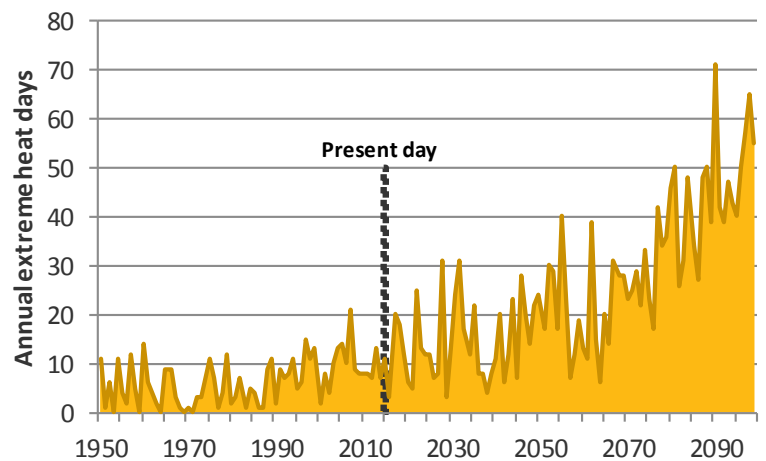


Introduction

2012 Adopted Climate Action Plan

Human-induced climate change is one of the great challenges facing California and the rest of the world today. Climate scientists have warned that the observed changes in the earth's climate system "are proceeding at a rate that is almost unprecedented when compared with climate change that human society has lived through to date" (CARB 2014). If these changes are not addressed, scientists warn that California may face increased droughts, more frequent and intense heat waves, and increases in extreme weather. In the Bay Area, scientists expect an increase in temperature, a decline in precipitation, and an increase in the frequency of extreme heat (CNRA and Cal OES 2012).

Despite the challenge, the City of Walnut Creek is serving as a leader to reduce the greenhouse gas emissions that cause climate change. The City has worked proactively in a manner that supports other local priorities,



Extreme heat is a potential consequence of climate change. The number of extreme heat days (96°F and above) in Walnut Creek may increase significantly in future years if nothing is done to reduce GHG emissions. This chart shows the estimated number of extreme heat days in Walnut Creek if GHG emissions continue to increase at recent rates (CEC 2015).

WALNUT CREEK AND CLIMATE CHANGE

meeting needs of local residents and helping local businesses. In 2012, the City took a key step with adoption of a Climate Action Plan, a comprehensive strategy to address climate change in Walnut Creek.

The CAP provides a framework and establishes an ongoing planning process to assess, prepare for, mitigate, and adapt to the effects of climate change. The Walnut Creek CAP accomplishes the following:

- Identifies sources of GHG emissions in Walnut Creek.
- Presents a forecast of future GHG emissions.
- Establishes a target for GHG reductions of 15% below 2005 GHG emissions levels by 2020, consistent with the statewide target established by the Global Warming Solutions Act of 2006, AB 32.
- Provides strategies, also referred to as “measures,” to achieve the GHG reduction target.

The City is implementing the CAP in coordination with diverse groups and stakeholders, including residents, businesses, and community institutions and organizations in Walnut Creek and the region. To ensure the plan’s effectiveness, CAP implementation strategies direct the City to assess and update the community’s current and future GHG emissions (known as an inventory and forecast) and GHG reduction measures on a regular basis, no more than five years apart.

Conducting an assessment of CAP progress allows the City to report on early successes and determine what approaches are working and opportunities for improvement. This review of progress allows the City to identify changes to GHG reduction measures where appropriate. The City conducted an analysis of CAP progress in 2015. This report summarizes that assessment, serving as the City’s 2015 Assessment Report. This assessment report builds on previous annual reports, providing a more comprehensive analysis of progress and recommendations to maintain momentum toward CAP targets.

Summary of 2015 CAP Assessment Effort

This CAP assessment report is the second report on CAP progress since adoption of the plan; however, unlike previous reports, this report provides a more comprehensive review of the CAP, containing elements to inform decision-makers, the public, and City staff. Past reports included estimates of recent GHG emissions and program highlights based on readily available data. These reports are available on the City’s Going Green website. The 2015 Assessment Report includes a new inventory of GHG emissions, in addition to recommendations for new tools and programs to achieve targets. This report includes a more in-depth assessment of Walnut Creek’s current GHG emissions, a look at how community-wide GHG emissions have changed over time, and actions the City and community members are taking to decrease GHG emissions. As a result of the assessment, this report recommends new options that the City can pursue in the future to both attain and exceed the City’s target for GHG reductions. Overall, this report supports the City by verifying progress and identifying a path forward for CAP implementation.

What is a greenhouse gas?

A greenhouse gas (GHG) is a gas that traps heat in the atmosphere. As the amounts of these gases in the earth’s atmosphere increase, they trap more heat, leading to climate change. The three main GHGs are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). All three are produced by burning coal, oil, natural gas, and other fuels. Methane and nitrous oxide are also produced by some types of agricultural activities and when organic waste decomposes.

LOCAL GHG EMISSIONS SCENARIOS



Current GHG Emissions

Sector Overview

Walnut Creek's GHG emissions come from seven types or sectors of local activities and land uses, as shown below. Walnut Creek's community-wide GHG emissions inventory presents total GHG emissions for a calendar year that result from these sectors in the community.



Residential built environment: electricity and natural gas use in homes



Nonresidential built environment: electricity and natural gas used in businesses, public buildings, schools, and other nonresidential buildings



Transportation: emissions from cars, trucks, buses, and BART



Off-road equipment: emissions from construction and landscaping equipment



Solid waste: trash thrown away by Walnut Creek community members



Water: energy used to move and treat water



Wastewater: energy used to move and process wastewater

LOCAL GHG EMISSIONS SCENARIOS

2005 Emissions

The first GHG inventory of community activity in Walnut Creek analyzed emissions for calendar year 2005. The 2005 GHG inventory serves as the baseline year to measure future emissions against. This 2005 baseline GHG inventory serves as the benchmark for calculation of the CAP target of attaining a 15% reduction below 2005 levels by 2020. Many communities in the Bay Area and throughout California prepared baseline GHG inventories for a 2005 baseline year for consistency with state guidance to calculate local targets that would be equivalent to the statewide AB 32 reduction target. In 2005, Walnut Creek's GHG emissions totaled 645,600 metric tons of carbon dioxide equivalent (MTCO_{2e}). The transportation, residential built environment, and nonresidential built environment sectors were the largest sources of emissions. Together these three sectors made up 95% of Walnut Creek's emissions in 2005.

2013 Emissions

As part of this report, City staff also assessed emissions for calendar year 2013. This analysis year was the most recent year with available data for all sectors to calculate GHG emissions. In 2013, Walnut Creek's GHG emissions rose to 710,780 MTCO_{2e}, an increase of 10% from 2005 levels. Growth in GHG emissions resulted from increases in the transportation and off-road equipment sectors. Emissions in all other sectors declined. The transportation, residential built environment, and nonresidential built environment sectors remained the largest sources of Walnut Creek's emissions, collectively making up 91% of all emissions in the community. **Figure 1** shows Walnut Creek's GHG emissions in 2013, while **Figure 2** shows how Walnut Creek's GHG emissions changed between 2005 and 2013.

How are GHG emissions calculated?

The calculations for Walnut Creek's GHG emissions follow the 2012 *US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions* (ICLEI 2012), as recommended by the Governor's Office of Planning and Research. This protocol creates a set of standards that many communities follow, making it easier to compare GHG inventories. The inventory is also consistent with protocols and methods vetted by the Bay Area Air Quality Management District (BAAQMD).

The local data for the Walnut Creek GHG inventory comes from local and regional agencies, state and federal government departments, and private companies such as PG&E.

LOCAL GHG EMISSIONS SCENARIOS

Figure 1: Walnut Creek 2013 GHG Emissions (MTCO₂e)

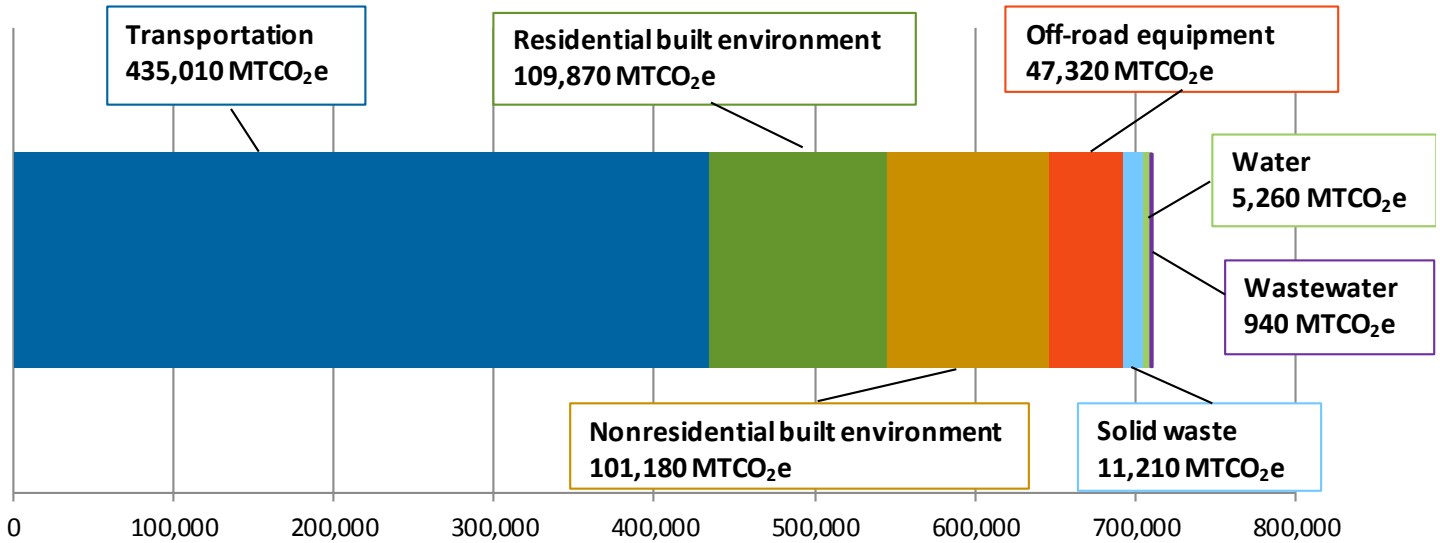
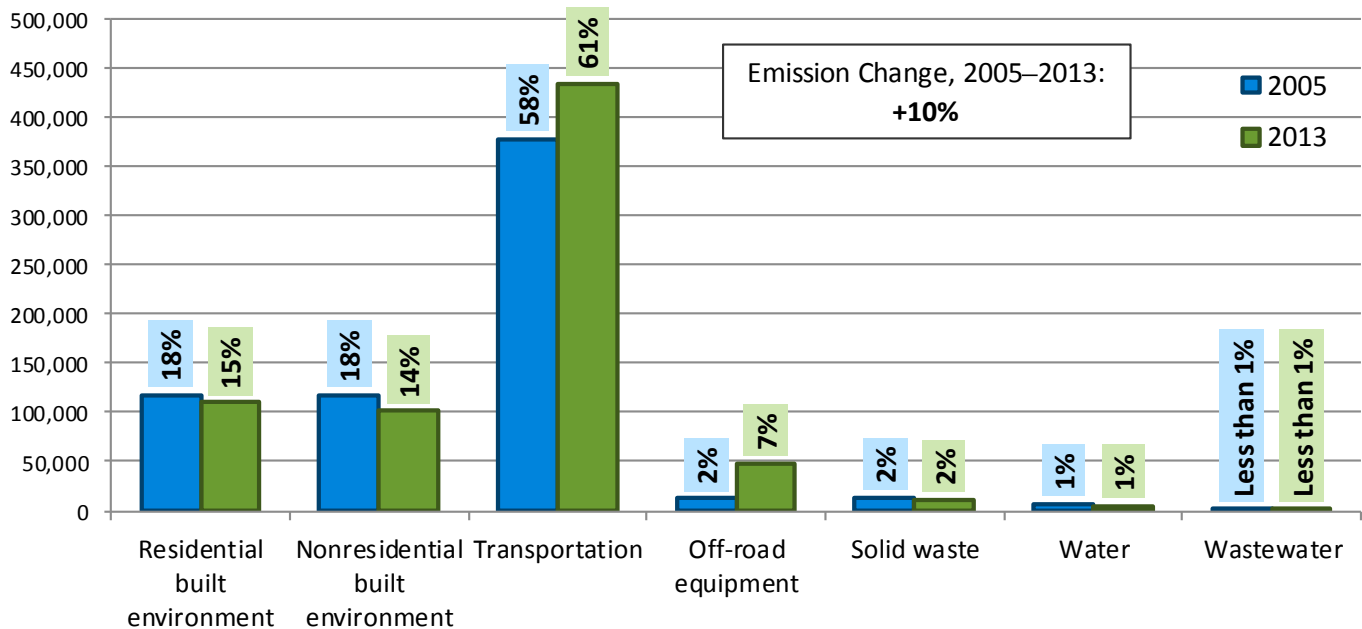


Figure 2: Walnut Creek GHG Emissions, 2005 and 2013 (MTCO₂e)



LOCAL GHG EMISSIONS SCENARIOS

Observed Changes in GHG Emissions

Numerous causes can contribute to changes in GHG emissions from year to year. Changes in population, shifts in behavior (for example, people driving more often), increases in economic activity, the penetration of energy-efficient appliances and lighting, new development activity, and technological innovations all contribute to increases and decreases in GHG emissions. While verification of exact causes for changes in GHG emissions can be problematic, it is likely that all of these factors contributed to the change in Walnut Creek's emissions between 2005 and 2013. Walnut Creek added approximately 1,030 people but lost 7,560 jobs between 2005 and 2013, according to the Association of Bay Area Governments (ABAG 2014).

The transportation sector is the largest contributor to GHGs in Walnut Creek. This sector consists of emissions from vehicles such as cars and trucks on highways and local roads within Walnut Creek, as well as trips on BART. These GHG emissions primarily reflect the number of miles people drive, known as vehicle miles traveled (VMT). VMT in Walnut Creek declined slightly between 2005 and 2012, but spiked significantly in 2013. Ongoing monitoring efforts will determine if this spike was unique to 2013 or if it indicates a long-term trend. A much smaller percentage of emissions in the transportation sector come from trips on BART that begin or end at the Walnut Creek BART station.

EARLY ACCOMPLISHMENTS



Future GHG Emissions

Forecast Scenarios and Methods

City staff reviewed how GHG emissions in Walnut Creek may change in the future, including whether future GHG emissions would be consistent with expectations in the CAP. These estimates of future emissions, called forecasts, project GHG emissions for the years 2020 and 2030. All forecasts begin with an estimate of future demographics in Walnut Creek, such as the number of residents, households, and jobs. The demographic assumptions in the CAP are supplied by ABAG. Yet new information since CAP adoption indicates slower rates of growth than shown in previous projections, which is reflected in new ABAG projections and local forecasts. This update relies on the local demographic forecasts, which were considered to be more accurate. To account for this new information and assess future GHG emissions, the City developed three different forecast scenarios that show how GHG emissions generated in Walnut Creek may change over time.

EARLY ACCOMPLISHMENTS

GHG Emissions Forecast Scenarios

The City of Walnut Creek developed three GHG emissions forecast scenarios to identify the community's likely future contribution of GHG emissions:

- A “worst-case” scenario that assumes there are no federal, state, regional, or local efforts to reduce GHG emissions through adopted policies, changes in behavior, or technological innovations. In this scenario, changes in GHG emissions are only affected by the number of people in the community. This is known as the business-as-usual (BAU) scenario. The Walnut Creek CAP establishes the City's BAU scenario.
- A locally adjusted forecast reflecting how GHG emissions in the community have changed since the baseline year. If there is evidence that GHG emissions have changed substantially and that these changes appear to represent long-term trends rather than temporary effects, this forecast assumes that the observed change continues. For Walnut Creek, the local adjustment accounts for a decrease in the amount of solid waste produced by the community and updated local population projections developed by the City since CAP adoption that recognize slower demographic growth than previously expected.
- A forecast with state reductions, which incorporates anticipated reductions in GHG emissions from adopted state policies. This forecast also includes the reductions in GHG emissions from the local adjustment. Although the CAP included calculations of state reductions, new information has since become available due to new regulations, policies, and program implementation.

Future GHG emissions scenarios account for regulatory state changes that will affect GHG emissions over time. Walnut Creek's GHG emissions forecasts include GHG emissions credits that will result from three adopted and enacted state programs:



The **Renewables Portfolio Standard (RPS)**, a requirement that utility companies procure 33% of the electricity they supply from eligible renewable sources by 2020. In 2015, the California legislature expanded this requirement to 50% by 2030.



The energy efficiency standards of the **California Building Code (Title 24)**, which set minimum energy efficiency requirements for new buildings. The state updates the standards approximately every three years with increasing levels of stringency.



The **Clean Car Standards**, which set minimum fuel efficiency standards for all new vehicles sold in California.

EARLY ACCOMPLISHMENTS

Future GHG emissions in Walnut Creek are highest under the business-as-usual (BAU) scenario, which is to be expected. Walnut Creek’s BAU scenario estimates that GHG emissions in Walnut Creek will rise approximately 13% above 2005 levels by 2020 and approximately 23% by 2030. Under the local adjustment scenario, GHG emissions decrease but are projected to be 9% above 2005 levels by 2020 and 17% above by 2030. The state reductions scenario presents net anticipated GHG emissions in future years, capturing credits from both the local adjustments scenario and additional state actions. Under the state reductions scenario, forecasts depict Walnut Creek’s GHG emissions at 8% below 2005 levels by 2020 and 6% below by 2030. The outcomes of these scenarios are shown in **Table 1**.

Table 1: Walnut Creek GHG Emissions by Scenario (MTCO₂e)

Scenario	2005	2013	2020	Change, 2005-2020	2030	Change, 2005-2030
Baseline *	645,600	645,600	645,600	-	645,00	-
Business as usual *	645,600	710,780	730,190	13%	793,050	23%
Local adjustment †	645,600	710,780	701,590	9%	755,240	17%
State reductions ‡	645,600	710,780	593,640	-8%	606,120	-6%

* Adjusted from the adopted CAP to account for changes in the relative potency of different GHGs, consistent with the findings of the IPCC 5th Assessment Report, and minor revisions to protocols and methods.

† Based on new demographic data and adjustments to account for local waste reduction efforts.

‡ Updated to account for new data on state policies at the time of analysis, including RPS implementation resulting in 33% renewable energy procurement by 2020 and 2030. Increases in RPS to 50% due to legislative action 2015 are credited later in this report.

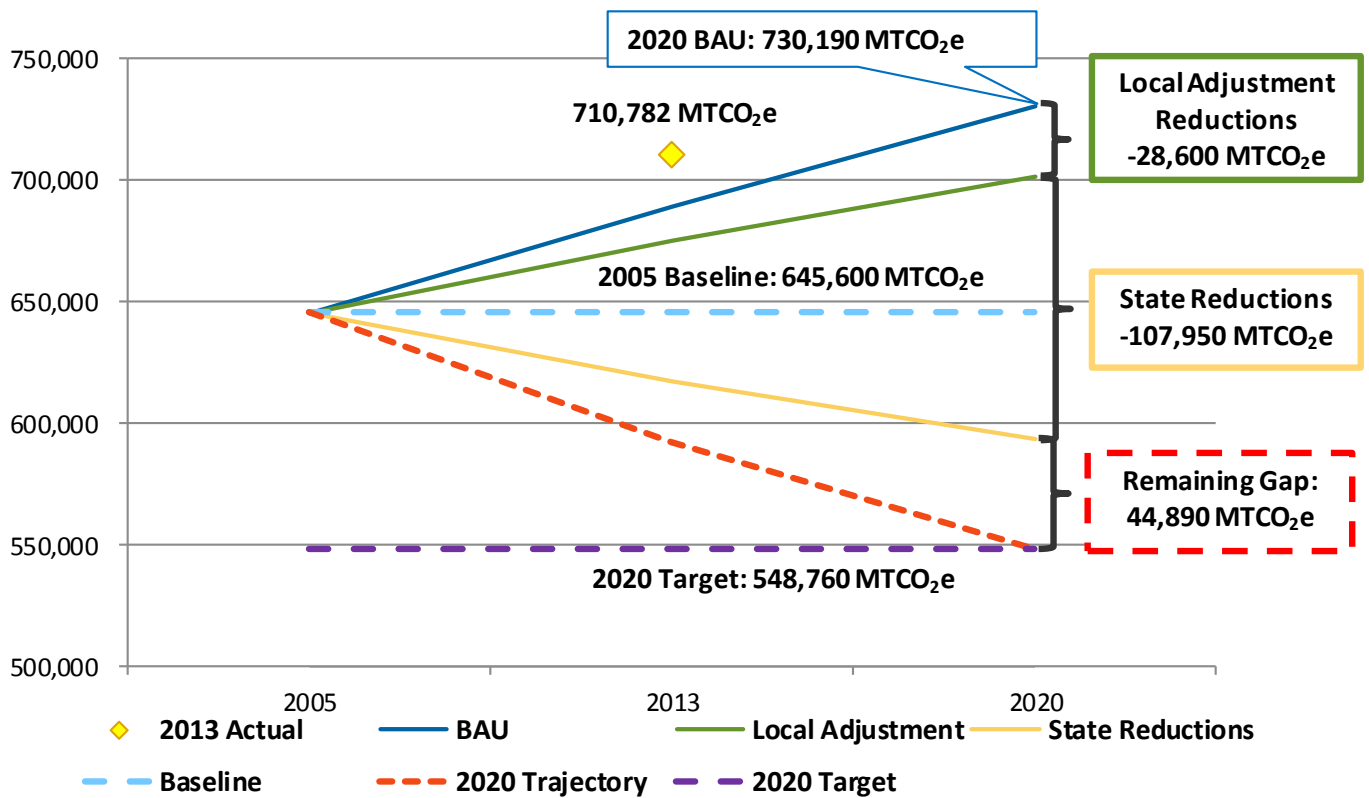
The final scenario, the state reductions scenario, provides the most realistic estimate of GHG emissions forecasts for Walnut Creek. The state reductions scenario is most reflective of observed changes since the baseline year, in addition to future GHG emission reductions that are already required by state law. This scenario summarizes the net GHG emissions anticipated in 2020 and 2030, accounting for the full outcome of enforceable state programs and regulations, in addition to the realistic growth levels anticipated by the City and other early local progress in the waste sector. Overall, the state reductions scenario shows that the City of Walnut Creek can expect substantial progress toward CAP targets, a part from CAP implementation.

EARLY ACCOMPLISHMENTS

2020 CAP Target

The adopted Walnut Creek CAP establishes a target for GHG reduction efforts. It directs Walnut Creek to reduce citywide GHG emissions to 15% below 2005 levels by 2020, equivalent to reducing GHG emissions to a level of 549,760 MTCO₂e. This goal is consistent with the target established by Assembly Bill 32, the Global Warming Solutions Act. The target is recommended for state and regional GHG reduction targets and is the 2020 target for the majority of California jurisdictions with GHG reduction strategies. This target requires Walnut Creek to reduce its GHG emissions by 44,890 MTCO₂e below the 2020 emissions under the state reductions scenario. **Figure 3** shows the emissions reductions under each scenario and the remaining gap to the 2020 target.

Figure 3: 2020 Emission Reductions and GHG Targets by Scenario (MTCO₂e)



Existing Accomplishments

Walnut Creek’s forecast scenarios indicate the City has made progress to attain an 8% reduction below baseline levels by 2020, leaving an anticipated gap of 44,890 MTCO₂e to achieve the 2020 CAP target. The City has begun to implement a number of different strategies. Walnut Creek has a successful history of developing and implementing sustainability policies, and these existing actions are already contributing to measurable GHG reductions in the community. These are actions initiated since CAP adoption in 2012, which are either ongoing or have been completed. In 2014, the City Council allocated nearly \$500,000 to invest as seed funding in key CAP strategies. The City has conducted a two-year work plan that identifies minimum expected outcomes by 2016. These early accomplishments are summarized below, based on completed or in-progress funded efforts. Because some of these actions have not yet been finished, the actual target metrics and GHG reductions may ultimately differ from what is reported here.

Local Renewable Energy

Unlike conventional fuel sources such as fossil fuels, which generally require large power plants to generate electricity, renewable energy sources such as sunlight can be used to generate smaller amounts of electricity to serve an individual home or nonresidential building. These small-scale renewable energy installations can be placed on the roofs of buildings and help to reduce the amount of energy the building needs to receive from power lines, saving money on utility bills. Walnut Creek has two programs focused on increasing localized renewable energy generation. These strategies implement Measure EU 2.1 in the adopted CAP.



Existing Local Renewable Energy Programs

- **2016 milestones:** 650 kW of solar energy systems on government buildings; 1,008 homes with rooftop solar installations.
- **2020 reductions:** 1,510 MTCO₂e
- The Regional Renewable Energy Partnership (R-REP) is a joint effort of communities in Alameda, Contra Costa, San Mateo, and Santa Clara counties to install solar panel arrays on local government facilities. The City of Walnut Creek plans to install solar panels generating the equivalent of the annual electricity use of 95 homes.
- Walnut Creek’s second effort to increase local renewable energy generation is focused on single-family homes. A number of statewide incentives, financing programs, and laws reducing regulatory hurdles make it easier to install rooftop solar panels on a private home. The City has chosen to go beyond these minimum requirements and initiated a local group bulk purchase program for solar energy systems through East Bay SunShares. Through this bulk buying effort, residents can have their rooftop solar panels installed at a price below the market rate. East Bay SunShares and other existing residential solar programs are anticipated to install enough solar panels in Walnut Creek by the end of 2016 to generate the equivalent of the annual electricity use of 1,450 homes.

EARLY ACCOMPLISHMENTS

Energy Efficiency

While Walnut Creek is helping generate more electricity locally from renewable sources of energy, the City is also working to reduce electricity and natural gas use in homes and businesses through energy efficiency and conservation efforts. These energy efficiency and conservation programs can range from basic education campaigns to complete retrofits of existing buildings. There are five different existing programs in Walnut Creek to improve energy efficiency and conservation. These items implement Measures EU 1.1, EU 1.2, and S 1.1 in the adopted CAP.



Existing Local Energy Efficiency Programs

- **2016 milestones:** 108 BayREN retrofits; PACE home retrofits; 330 homes participating in CYES; 35 businesses participating in retrofits; 330 public streetlights replaced
- **2020 reductions:** 660 MTCO₂e
- The Bay Area Regional Energy Network (BayREN) is part of the statewide Energy Upgrade California program, which provides information about rebates for residential energy efficiency upgrades and connects homeowners to contractors. Through BayREN-supported retrofits, homeowners can receive as much as \$6,500 for energy efficiency renovations and save a significant amount of money on their utility bills each month.
- Property Assessed Clean Energy (PACE) programs are ways for building owners to make energy efficiency retrofits and other sustainability-related improvements. Rather than paying the cost of the improvements all at once, PACE allows building owners to make annual payments through a temporary increase in property taxes. There are three PACE programs operating in Walnut Creek: the Home Energy Renovation Opportunity (HERO) program, Figtree, and CaliforniaFIRST.
- The California Youth Energy Services (CYES) program is a summer program to engage young people in energy auditing and retrofits. Participants make house calls to interested residents, installing minor upgrades such as energy-efficient lighting and water aerators for free. CYES participants also audit homes to identify opportunities for more extensive energy efficiency retrofits.
- The City's energy efficiency programs are not focused only on homes. Walnut Creek also has a rebate program partnering with an ongoing PG&E program to improve the efficiency of lighting in nonresidential buildings, which typically offers the most energy reductions for the least investment. Businesses participating in this effort by the end of 2016 should save as much electricity annually as 89 Walnut Creek homes use in a year.
- Walnut Creek's public lighting renovation program is aimed at reducing the amount of energy used in public spaces, replacing existing streetlight bulbs with energy-efficient LED bulbs. The City anticipates that, by 2016, this effort will save enough electricity to power over 140 Walnut Creek homes for a year.

Water Conservation

Walnut Creek's existing water conservation efforts include a variety of education programs and financial incentives to reduce water use, both indoors and outdoors, conducted in partnership with water suppliers such as the East Bay Municipal Utility District (EBMUD) and the Contra Costa Water District. The community also has a recycled water system, which supplied 3,123,275 gallons of recycled water to Walnut Creek in 2015. Although no specific GHG reduction value is associated with the recycled water program, this effort supports overall water efficiency strategies, helping to conserve water resources



and decrease the amount of energy associated with transporting and processing water. These water conservation efforts support Measure EU 4.1 in the adopted CAP.

In addition, The City Council approved a Drought Action Plan in May 2015 outlining water conservation strategies at City facilities, and Public Works staff implemented the plan. During the 2015 Community Service Day, volunteers helped spread over 400 cubic yards of mulch at City parks resulting in a savings of approximately 2 million gallons per year. These efforts support Measures B2.2 and B3.5 in the adopted CAP.

Transportation

As in many communities, transportation is the single largest source of GHG emissions in Walnut Creek, almost exclusively from personal vehicles. Multiple transportation options are available, both within Walnut Creek and to surrounding communities, making it easier for community members to reduce their vehicle use. Walnut Creek benefits from extensive multimodal options for alternative transit throughout the community and nearby, including buses, two BART stations, and regional biking and pedestrian networks. There are five key transportation strategies in Walnut Creek, which help to implement Measures TLU 1.1, TLU 1.2, TLU 3.1, TLU 3.3, TLU 3.4, and TLU 3.5 in the adopted CAP.



Existing Local Transportation Programs

- **2016 milestones:** Increased BART and County Connection ridership; employees participating in TDM efforts; 25 miles of new bike lanes; 10 publicly accessible EV chargers; 22,000 gallons of renewable diesel annually for City vehicles
- **2020 reductions:** 4,760 MTCO₂e
- Transit services in Walnut Creek are provided by the County Connection bus system and BART. Increased ridership on these services is helping to keep the number of vehicles on the road lower than it would be otherwise. Transit ridership is also boosted by a community-wide transit subsidy program and efforts to locate below-market-rate housing nearer Walnut Creek's urban core, making it easier for residents in these homes to use public transit for most or all of their transportation needs.
- Walnut Creek's transportation demand management (TDM) ordinance is a program currently being developed to help employers make it easier for employees to get to work through alternative transportation, which can include public transit, bicycling, and carpooling, and helps support strategies such as telecommuting and flexible schedules. These efforts can reduce commute time and cost by decreasing the number of cars on the road.
- Walnut Creek's Bicycle Master Plan lays out planned improvements to the city's bicycle network, such as new bike lanes. These improvements expand the number of homes and businesses served by the bicycle network, making it easier for people to use bicycles instead of cars.
- Alternative fuel vehicles are those that rely on fuels other than gasoline or diesel, such as electricity, hydrogen, and biofuels, which are typically cleaner choices. There are a variety of regional and state efforts to increase use of alternative fuel vehicles, especially electric vehicles (EVs).
- Although diesel fuel is traditionally derived from petroleum, it can also be produced from various types of renewable biomass, such as waste fat, oil, and grease. Walnut Creek is switching from petroleum-based diesel to renewable diesel to fuel vehicles in the municipal fleet. This renewable diesel emits significantly fewer GHGs than conventional diesel and is cost-competitive under federal and state programs.

EARLY ACCOMPLISHMENTS

Results of Existing Efforts

In total, the City's and the community's existing local accomplishments completed since adoption of the CAP are expected to yield annual GHG emissions reductions of **6,930 MTCO₂e**. These reductions provide important early progress toward the reduction target, resulting in a reduction of future GHG emissions to 9% below the 2005 baseline. Accounting for these early efforts, the City must further reduce additional GHG emissions by an additional 37,950 MTCO₂e to achieve the target of a 15% reduction below baseline levels by 2005.



Local Renewable Energy
1,510 MTCO₂e



Energy Efficiency
660 MTCO₂e



Water Conservation
Supportive of other reduction activities



Transportation
4,760 MTCO₂e



All Existing Actions
6,930 MTCO₂e



Future Actions

Walnut Creek's existing accomplishments and efforts under way provide an extensive foundation for the City to build on and continue implementation of the adopted CAP. New critical opportunities have emerged since CAP adoption that further support and strengthen the City's ability to implement CAP measures. A summary of new programs and opportunities follows. By taking advantage of these new opportunities, the City is expanding its toolbox for CAP implementation. Achievement of the implementation targets described below would allow the City to attain the 2020 CAP target of a 15% reduction below baseline 2005 levels by 2020.

Local Renewable Energy

Walnut Creek has already achieved considerable success with voluntary, private installations of small-scale renewable energy systems on homes and nonresidential buildings in the community. The City can take a stronger role in the facilitation of installation of renewable energy systems on private buildings through education efforts and the availability of financial incentives such as PACE programs.



FUTURE STRATEGIES

Residential Renewable Energy

What can the City do?

By the end of 2016, the City estimates that an additional 1,000 homes will install on-site solar photovoltaic (PV) systems to produce electricity. The average size of a solar array on these homes is approximately 5.7 kilowatts (kW), which over the course of a year is capable of producing more electricity than the average Walnut Creek home uses.

- **2020 implementation target:** Foster installation of solar PV systems on an additional 1,600 homes.
- **2020 GHG reduction potential: 2,060 MTCO₂e**

Nonresidential Renewable Energy

What can the City do?

Although a nonresidential building will often use electricity and natural gas in a very different way than a home, efforts to improve the amount of small renewable energy systems on nonresidential buildings can also be very successful. Nonresidential buildings are usually larger than homes and so can accommodate larger solar energy installations.

- **2020 implementation target:** Work to install solar PV systems on an additional 60 businesses.
- **2020 GHG reduction potential: 2,330 MTCO₂e**

Community Choice Energy

Community choice energy (CCE) is a program that gives local governments more control over where their electricity comes from and how energy efficiency programs are implemented. In most places in California, an investor-owned utility company such as the Pacific Gas and Electric Company (PG&E) buys electricity from sources it chooses, sets the electricity rates, distributes the electricity through power lines it owns, and is responsible for billing and customer service. Under a CCE model, the CCE is responsible for buying electricity from sources it chooses and setting the electricity rates, while the utility company continues to maintain the transmission and distribution networks and handle customer service and billing. CCEs can be run by a single community or multiple communities working together, often times as part of a Joint Powers Authority (JPA). They are different from public utilities because they do not own the power lines or handle billing. CCEs are required to comply with the Renewable Portfolio Standard (RPS) -- their power content must be 33% renewable power by 2020 and 50% by 2030. CCEs frequently exceed those mandates and offer customers a higher percentage of renewable power. Additionally, customers may choose to continue receiving electricity service from the investor-owned utility company by opting out of the CCE program (per state enabling legislation).



All three of California's CCEs offer multiple levels of renewable energy, a default level that exceeds the amount offered by the region's investor-owned utility company, and a higher tier of 100% renewable energy. Some offer another level that is guaranteed to be 100% locally generated (within the CCE's service territory). Typically, a home or business will pay less or a similar amount for a CCE's default level of renewable energy than they would if they purchased electricity from the investor-owned utility company, while the 100% renewable energy option is often slightly more expensive than what the utility company could charge for its default service. Customers can continue to take advantage of incentives and rebates offered by the CCE and investor-owned utility, but cannot take advantage of both at the same.

What is a CCE?

A CCE is a public agency or non-profit that provides electricity to customers within its territory. Unlike an investor-owned utility company, CCEs do not own power lines or other energy grid infrastructure. CCEs utilize existing infrastructure to distribute energy it purchases and its customers continue to pay the investor-owned utility to use that infrastructure.

California has three functional CCEs. Marin Clean Energy, Sonoma Clean Power, and Lancaster Choice Energy. CleanPower SF and Peninsula Clean Energy will complete enrollment in 2016 and many other communities are evaluating the option to create their own CCE.

FUTURE STRATEGIES

What has the City done?

In February 2016, the Walnut Creek City Council voted unanimously to join Marin Clean Energy (MCE), introducing the first reading of the ordinance to join. A month later, the Council voted again (3-1) in favor of finalizing its application to join MCE. The City and MCE will work together to conduct outreach to residents and businesses in Walnut Creek and explain how MCE works and customers' options. Enrollment for all customers will happen in September 2016. The City will have an opportunity to work closely with MCE to design local programs that reduce energy use.

- **2020 implementation target:** The City modeled the GHG reduction benefits of a CCE with these characteristics:
 - ❖ 65% of community members choose to participate in the “light green” tier of the CCE, which will supply 50% of its electricity from renewable sources by 2020.
 - ❖ 5% of community members will participate in the “dark green” tier of the CCE, which will supply 100% of its electricity from carbon-free renewable sources by 2020.
 - ❖ 30% of community members do not participate in the CCE and remain with PG&E, which must supply 33% of its electricity from renewable sources by 2020 as required by the RPS.

These numbers are conservative estimates. MCE (the City's CCE program) estimates that 80% of customers will remain with MCE instead of opting out and staying with PG&E. In addition, MCE has already exceeded the 2020 renewable target and supplies light green customers with 50% renewable energy.

- **2020 GHG reduction potential:** With a CCE in place under the above scenario, the anticipated reduction is **15,960 MTCO₂e**.

Energy Efficiency

Walnut Creek's energy efficiency programs have already contributed to significant improvements in community homes and businesses. For example, a typical home or business in Walnut Creek used approximately 7% less electricity in 2013 than in 2005, helping to reduce emissions from electricity use by 30,700 MTCO₂e. Energy efficiency continues to be a focus at municipal facilities. Public Works staff will conduct a review of HVAC units in all facilities to identify opportunities for greater energy efficiency. Walnut Creek has opportunities to build on these successes and achieve further reductions through energy efficiency under a number of programs.



Zero Net Energy

What can the City do?

Zero net energy (ZNE) is an emerging trend in buildings. These buildings have extensive energy efficiency features and on-site renewable energy systems, allowing their net energy use over the course of a year to be zero. The State has indicated that all new homes in California should be built to ZNE standards starting in 2020 and all new nonresidential buildings should be built to ZNE standards starting in 2030. Some property owners can choose to construct new buildings to ZNE standards before these standards apply. Although ZNE may require a higher upfront cost to build than a standard building, the ZNE features will pay for themselves by reducing energy bills, and the upfront cost is coming down due to technological improvements and available financial incentives.

- **2020 implementation target:** 10 ZNE homes in Walnut Creek.
- **2020 GHG reduction potential:** With very conservative assumptions about ZNE performance, the anticipated reduction is **less than 10 MTCO₂e** through demonstration projects and education. These preliminary efforts will help support much higher reductions after 2020, when ZNE standards are required for new buildings.

Residential Retrofits

What can the City do?

Programs such as BayREN and PACE reduce the upfront cost of a home energy efficiency retrofit and assist with financing, making it easier for homeowners to afford upgrades. These rebates can include improved insulation, high-efficiency windows, and more energy-efficient appliances. Based on results from the BayREN program, the average home energy efficiency retrofit in Walnut Creek can reduce a house's electricity use by approximately 35% and natural gas use by almost half.

- **2020 implementation target:** 830 additional homes conducting energy efficiency retrofits (not including BayREN retrofits already concluded or in progress).
- **2020 GHG reduction potential:** **1,180 MTCO₂e**

Nonresidential Retrofits

What can the City do?

Nonresidential energy efficiency retrofits can take a number of forms. These can include maintenance for a building's heating, cooling, and ventilation (HVAC) system, improvements to insulation, upgraded lighting, energy-efficient appliances, and improvements to a building's mechanical systems. Depending on the type of upgrades, the type of nonresidential building, and the local climate, nonresidential energy efficiency retrofits can reduce a building's energy use by more than half.

- **2020 implementation target:** 460 businesses conducting energy efficiency retrofits.
- **2020 GHG reduction potential:** **3,630 MTCO₂e**

FUTURE STRATEGIES

Water Conservation

California's Water Conservation Act of 2009 requires that urban water suppliers, such as EBMUD and the Contra Costa Water District, reduce their water use 20% from a baseline year by 2020. Water providers may choose any number of strategies to help meet this target, working with the communities they serve.



What can the City do?

Recycled water programs such as the ongoing efforts in Walnut Creek are one such strategy, although there are many others. Communities can work to reduce the amount of water used for landscaping, an effort which was helped by a recent update to the California Water Efficient Landscaping Ordinance. Rebates and other incentives are available to help people reduce water use in their homes and businesses by installing more water-efficient sinks, showers, toilets, and various appliances. California is continuing to reduce water use in new buildings through the state Building Standards Code, which is updated regularly and contains water efficiency standards for all new construction. In response to drought conditions, EBMUD and the Contra Costa Water District have both passed restrictions on water use. The Public Works Department will continue to implement the strategies in the adopted Drought Plan and has set an internal water conservation goal of proactively reducing use 20% by the year 2020 at City facilities. Water suppliers and their partner communities can continue these policies and identify opportunities for new strategies to meet the water use reduction goal in the Water Conservation Act of 2009.

- **2020 implementation target:** Reduce water use 20% below baseline levels.
- **2020 GHG reduction potential:** 950 MTCO₂e

How does saving water reduce GHGs?

It takes energy to pump water from its source, send it up to hundreds of miles through pipes and aqueducts, treat it so it is safe for people to use, and send it through pipes to homes and businesses. It also takes more energy to pump, treat, and discharge wastewater from communities. The State estimates that 15% of all of California's electricity is used to move and treat water, not including water used by agriculture. By reducing water use, community members help conserve electricity, which reduces GHG emissions.

Transportation

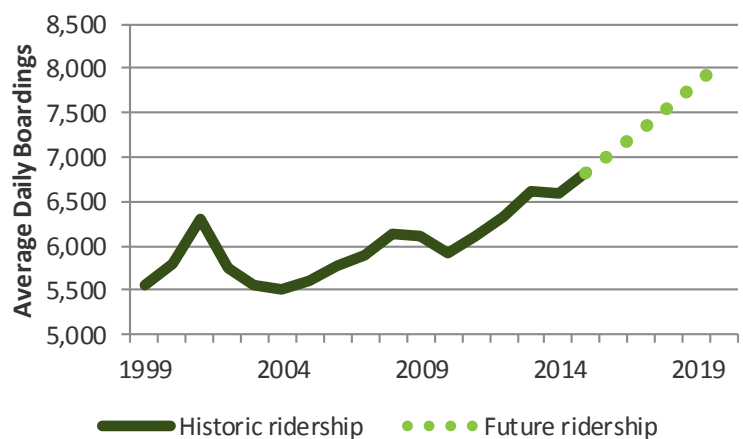
Emissions from transportation made up 58% of Walnut Creek’s GHG inventory in 2005 and are expected to increase to 61% by 2020 even with the benefits from existing state and local activities. To help reduce emissions from this sector, the City can continue to implement successful existing programs and identify new ways to achieve further reductions through improved access to transportation, increased availability of alternative fuels, and smart land use planning.



Transit Ridership

What can the City do?

Transit ridership in Walnut Creek, on both BART and County Connection, is already above the projected levels from the GHG forecast. The City expects that ridership on BART and County Connection will continue to increase as more people live and work in transit-accessible areas. Transit ridership should also benefit from new additions to the BART system, which will soon expand into cities such as Antioch and San Jose, where a number of Walnut Creek workers live.



Ridership at the Walnut Creek BART station is already at historic highs and is expected to continue to increase in the future (BART 2015).

- **2020 implementation target:** Continue to increase transit ridership at 2015 per-capita rates.
- **2020 GHG reduction potential: 2,950 MTCO₂e**, not including savings from transit ridership improvements already accounted for.

Transportation Demand Management (TDM) Ordinance

What can the City do?

Walnut Creek is in the process of developing a TDM ordinance to reduce the number of miles people drive to work. While some existing TDM efforts such as transit subsidies have already helped to cut down on commute miles, the City’s forthcoming TDM ordinance should expand these efforts for future developments. Workplace carpool networks, employee shuttles, changing facilities for bicyclists, flexible schedules, and easy access to public transit are some of the programs that future businesses can pursue to help reduce congestion and improve the commute for their employees.

- **2020 implementation target:** 400 employees participating in TDM efforts.
- **2020 GHG reduction potential: 220 MTCO₂e**, not including reductions from existing TDM efforts or other future or existing transportation-related actions.

FUTURE STRATEGIES

Bicycle Improvements

What can the City do?

By 2016, the City expects to have 56 miles of bike lanes throughout the community. This number is expected to continue to increase as the City continues to carry out the recommended improvements in its Bicycle Master Plan. With an expanded bicycle network, more homes, businesses, and other destinations are easily accessible by bicycle. A removal of land use and connectivity barriers allows biking to stand as a more viable option for community members. The City can also promote these actions by seeking recognition as a bicycle-supporting community, such as the Bicycle Friendly Community designation from the League of American Bicyclists. Planned bicycle improvements in 2016 and 2017 include bike lockers at City garages, bicycle improvements to streets, and slurry seals on streets.

The City is also finalizing the Walnut Creek Pedestrian Master Plan, which will make walking in Walnut Creek safer, easier, and more popular. Physical improvements, education programs, and design guidelines will help make the City more walkable. Ideally, improving pedestrian conditions will reduce the number of miles travelled by vehicle. If possible, future GHG analyses will seek to quantify the impacts of the implementation of the Pedestrian Master Plan.

- **2020 implementation target:** 68 miles of bike lanes.
- **2020 GHG reduction potential:** 140 MTCO₂e, not including reductions from the existing bicycle network.

Alternative Fuels

What can the City do?

The use of electric vehicles and other alternative fuel vehicles has increased dramatically since they first became available. From constituting only a few hundred vehicles nationwide at the end of 2010, nearly 400,000 electric vehicles are currently estimated to be in use in the United States, with almost half of them in California. With improvements to alternative fuel technology, economics, and supporting infrastructure, the rate of adoption of these vehicles is expected to increase.

In Walnut Creek, the “Free Trolley” bus (Route 4) will convert from using diesel fuel to being electric in the near future. Four new electric buses will be used on Route 4. The estimated GHG reductions associated with the switch to electric buses is 50 MT CO₂e, assuming the bus is charged using electricity that is from 33% renewable sources.

- **2020 implementation target:** 1,320 households with a plug-in electric vehicle and 30 total publicly accessible EV charging stations.
- **2020 GHG reduction potential:** 7,720 MTCO₂e

Waste Reduction

Walnut Creek, like most communities in California, has taken a number of steps to reduce the amount of waste it sends to a landfill, following Measure WR 1.1 in its adopted CAP. Since adoption of the CAP, the City has expanded solid waste diversion from 62% to an anticipated 65%. The City has additional opportunities to increase its diversion rate by expanding the diversion of compostable materials such as food waste, improving the effectiveness of its recycling programs, and helping to minimize the amount of non-compostable and non-recyclable waste generated by community members. For example, RecycleSmart will be conducting a public outreach campaign to multi-family buildings to reduce waste and the City will be contributing additional funds to expand the campaign's focus to the commercial sector and ensure greater emphasis within Walnut Creek. The City will also work to ensure new development projects have adequate space for bins.



What can the City do?

In 2013, 62% of the waste generated by Walnut Creek community members did not end up in a landfill, up from only 48% in 2005. The waste that was not sent to a landfill was instead recycled, composted, or in some way reprocessed, which has a direct impact on GHG emissions and can also help to conserve valuable natural resources. Many cities are moving forward to reduce waste generation even more, helped by a number of state goals and programs. California has set a goal of keeping 75% of its waste out of landfills by 2020. Walnut Creek's early successes equip it to exceed the state target for landfill diversion.

- **2020 implementation target:** Divert 80% of community-generated waste from a landfill.
- **2020 GHG reduction potential:** 1,620 MTCO₂e, not including reductions already achieved between 2005 and 2013.

FUTURE STRATEGIES

Results of Future Actions

Together, these CAP implementation strategies can reduce 2020 GHG emissions an additional **38,760 MTCO₂e**, above and beyond the reductions anticipated due to existing accomplishments. This level of progress would achieve the CAP target of a 15% reduction below baseline 2005 levels.



Local Renewable Energy
4,390 MTCO₂e



Community Choice Aggregation
15,960 MTCO₂e



Energy Efficiency
4,810 MTCO₂e



Water Conservation
950 MTCO₂e



Transportation
11,030 MTCO₂e



Waste Reduction
1,620 MTCO₂e



All Future Actions
38,760 MTCO₂e

IMPLEMENTATION OUTCOMES



Combined GHG Reductions and Next Steps

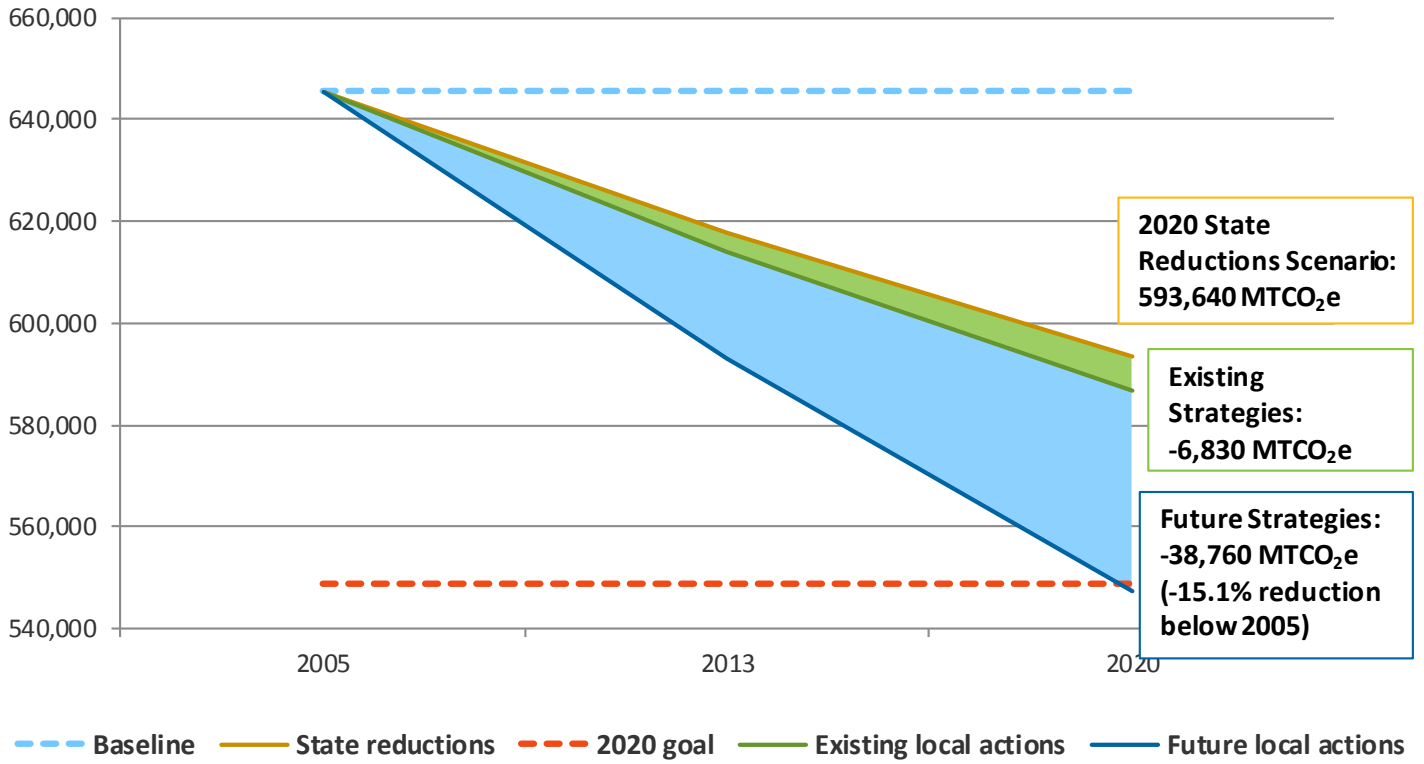
Progress to 2020 Goal

In order for Walnut Creek to meet the 2020 GHG reduction goal in its adopted CAP, the community must reduce 2020 GHG emissions an additional 44,890 MTCO₂e. Attaining these reductions must be in addition to those efforts already under way at the state level, as described earlier in this report. The combined reductions from Walnut Creek's local existing actions and the future strategies described above are anticipated to result in total net reductions of **46,280 MTCO₂e**. Attainment of these reductions will allow the City to meet and exceed the 2020 target, as shown in **Figure 4**. With implementation of CCA, the City is anticipated to reduce 2020 GHG emissions to approximately 15.1% below baseline levels.¹

¹ The City may achieve a greater than 15.1% reduction since the assumptions used to estimate CCA emissions reductions are conservative compared to current MCE enrollment and opt-out estimates and the percentage of renewable power offered to light green customers.

IMPLEMENTATION OUTCOMES

Figure 4: 2020 Reductions from Local Existing and Future Strategies (MTCO₂e)

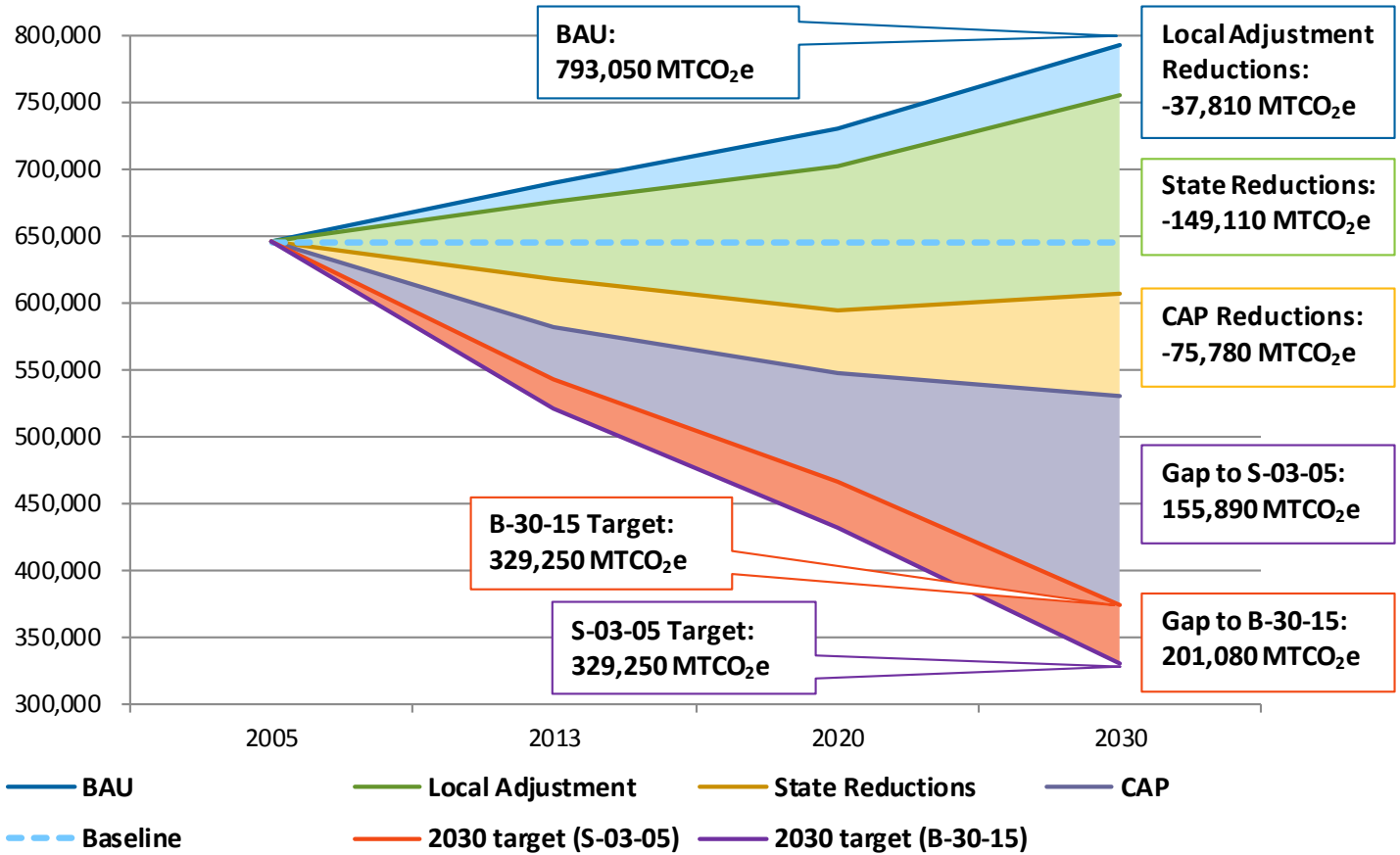


Progress to Post-2020 Goals

Walnut Creek has not yet adopted any GHG reduction target for a year after 2020, and there is no mandatory state target for local governments. The adopted CAP suggests a reduction goal of 42% below 2005 levels by 2030. While the CAP does not officially direct the community to achieve this level of reduction, it offers the goal as a possibility for City officials and community members to consider. California does not have any adopted statewide GHG reduction goal after 2020, nor is there any state or regional guidance for local communities to adopt a post-2020 GHG reduction target. However, state and regional government bodies may soon provide a post-2020 target for local communities. The City can choose to adopt from a range of potential post-2020 GHG reduction goals, but recent state-level action indicates two priority options. The first goal, consistent with the proposal put forward by Governor Schwarzenegger in Executive Order (EO) S-03-05, is the same goal of 42% below baseline levels that is suggested in the adopted CAP. The second goal, consistent with a proposal by Governor Brown in EO B-30-15, is a more stringent target of 49% below baseline levels. **Figure 5** shows these two 2030 goals relative to the 2030 forecast scenarios.

If the City chooses to adopt a target for 2030, the existing state and local actions, along with the focused local strategies described in this report, are not expected to be enough to fully reach either of the proposed goals. Walnut Creek will need to achieve reductions of **155,890 to 201,080 MTCO₂e** in order to meet these potential 2030 targets, as shown in **Figure 5**. These reductions can be met by future state and local measures.

Figure 5: 2030 GHG Reductions and Targets



The future strategies in this assessment report are not the only way for Walnut Creek to reduce its GHG emissions. These strategies illustrate current opportunities for the City to continue a strategic approach to CAP implementation, focusing on items that are likely to result in the largest, most cost-effective GHG reductions. These strategies can also benefit the community in other ways. Other community benefits include reductions in household utility bills, improvement in local air quality, support of a healthy lifestyle, and conservation of natural resources. City officials, working with City staff, members of the public, and local and regional agencies, can prioritize individual items and select the approach that makes the most sense for Walnut Creek. The City is preparing tools that will allow City staff to track the performance of CAP strategies. Based on the outcome of these monitoring efforts, the City of Walnut Creek will continue regular evaluation of options for cost-effective implementation.

Monitoring Progress

As discussed earlier, the City prepares annual CAP monitoring reports with an estimate of recent GHG emissions, a highlight of the City’s recent and current efforts to reduce GHG emissions, and recommendations for future GHG reduction actions. These recommendations are based on effectiveness of programs and efforts under way. For example, a measure may exceed expectations and prove to be more cost-effective at reducing emissions than City staff previously thought, and so staff may recommend the measure be expanded. At other times, a measure may not be performing as well as expected, allowing City staff to identify ways to improve the measure or suggest alternative ways to achieve the GHG reduction.

IMPLEMENTATION OUTCOMES

Monitoring reports are supported by the City's CAP monitoring tool, an Excel-based analytical tool that allows City staff to evaluate outcomes of programs and overall changes in community-wide GHG emissions. This tool supports staff with calculation of progress toward the GHG reduction target. City staff enters several basic, publicly available data points about the community, which the monitoring tool uses along with some key assumptions to prepare estimates of annual GHG emissions since the baseline year of 2005. The tool uses this information to identify progress in reducing GHG emissions toward the 2020 reduction target. Several primary pieces of data used by the tool to estimate these emissions are:

- Traffic volumes in Walnut Creek
- Electricity and natural gas used in Walnut Creek, along with PG&E's "emissions factor" (a number that refers to where PG&E obtains its electricity from)
- The amount of solid waste thrown away in Walnut Creek
- Water use in Walnut Creek
- The population of Walnut Creek

City staff also uses the tool to identify the implementation status and quantitative results of programs and strategies. These calculations rely on key, performance-level indicators such as the number of retrofits. Based on program-level indicators, the tool estimates GHG reductions achieved to date. This information allows the identification of program barriers or successes.

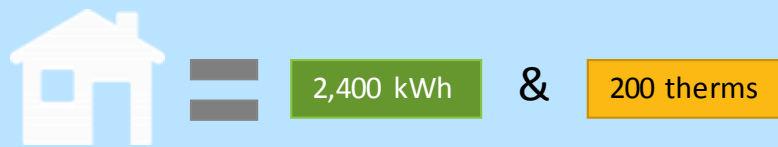
Implementation Tools and Partnerships

To implement the strategies in the CAP, City staff will prepare an implementation plan every two years, consistent with the timeline for the City budget. These implementation plans identify the prioritized CAP measures that City staff plans to put into effect or continue implementing over the next few years, separated between community-focused measures and municipal-level strategies. In these implementation plans, City staff identifies GHG reduction accomplishments to date based on the results of the monitoring process and responsible City departments or other agencies. The implementation plans also identify the ultimate outcome of the measures and the implementation timeline.

Tracking Measure Progress

The monitoring tool tracks measure progress using metrics called **performance indicators**, a measure of the participants or level of involvement for each GHG reduction measure. Each measure in the adopted CAP, as well as the focused measures in this assessment report, includes a performance indicator. For an example of how performance indicators are used, consider the residential home retrofit measure, where the performance indicator is the number of retrofitted homes.

Based on data from completed home retrofits under the BayREN program, the average home energy retrofit saves homes approximately 2,400 kilowatt-hours (kWh) of electricity and 200 therms of natural gas each year.



Looking at expected sources of energy in 2020, saving this amount of energy translates to a GHG reduction of about 1.4 MTCO₂e for each home.



Imagine that, by 2018, the City has retrofitted 500 homes. When City staff enters this data into the monitoring tool, the tool reports that the annual GHG savings from this action so far is approximately 700 MTCO₂e.



The home energy retrofit measure has an **implementation target**, or goal, of retrofitting 830 homes. If Walnut Creek has retrofitted 500 homes by 2018, the monitoring tool reports that the City has achieved approximately 60% to its goal.



City staff will pull this information from the monitoring tool and use it to continue to carry out the home energy retrofit program, including helping to inform any changes to the program.

Sources

ABAG (Association of Bay Area Governments). 2014. Projections 2013 [data table].

BART (Bay Area Rapid Transit District). 2015. “Monthly ridership reports.” <http://www.bart.gov/about/reports/ridership>.

CARB (California Air Resources Board). 2014. *First Update to the Climate Change Scoping Plan, Building on the Framework Pursuant to AB 32: The California Global Warming Solutions Act of 2006*.
http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

CEC (California Energy Commission). 2015. “Cal-Adapt: Exploring California’s Climate Change Research.” <http://cal-adapt.org/>.

CNRA and Cal OES (California Natural Resources Agency and California Office of Emergency Services). 2012. *California Adaptation Planning Guide: Understanding Regional Characteristics*.
http://resources.ca.gov/climate/safeguarding/adaptation_policy_guide/.

ICLEI (ICLEI USA – Local Governments for Sustainability). 2012. *US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. <http://icleiusa.org/publications/us-community-protocol/>.