City of Piedmont
COUNCIL AGENDA REPORT

DATE: July 18, 2022

TO: Mayor and Council

FROM: Sara Lillevand, City Administrator

SUBJECT: Receipt of a Report on the 2020 Greenhouse Gas Emissions Inventory, and Piedmont's Climate Action Plan 2.0 Implementation Status

RECOMMENDATION

Receive an informational update on the 2020 greenhouse gas emissions inventory and the status of the implementation of Piedmont's Climate Action Plan (CAP) 2.0. No action required.

BACKGROUND

On January 4, 2016, Council approved joining the Compact of Mayors, a global coalition of mayors and city officials with the mission to reduce local greenhouse gas (GHG) emissions, enhance resilience to climate change, and track progress publicly. This initial 3-year commitment turned into an ongoing commitment with the same organization under a new name: Global Covenant of Mayors for Climate & Energy, under which the City set a new GHG reduction target, completed an updated Climate Action Plan (CAP) that includes new adaptation strategies for addressing climate hazards, and commits to completing annual GHG inventory updates. On March 19, 2018 Council adopted the Piedmont CAP 2.0, which includes the goal of reducing GHG emissions 40% below 2005 levels by 2030 and 80% below 2005 levels by 2050.

This report provides information on the 2020 GHG emissions inventory, including estimates for both community and municipal emissions. Compiling annual GHG inventories allows Piedmont to track progress towards meeting its climate action goals, and it also fulfills the Covenant of Mayors reporting requirements. Previous inventories were completed in 2005, 2010, and annually from 2014 through 2019.

PREVIOUS GREENHOUSE GAS EMISSIONS INVENTORIES

Included below in Table 1 are the inventories for 2005 (baseline year), 2010 (year CAP was first adopted), as well as 2014-2019. Please note that our priority goal is to reduce emissions 40% below 2005 levels by 2030, which would mean the City cannot emit more than 29,291 metric tons of carbon dioxide equivalent (CO_2e) in a year.

Table 1: Piedmont's GHG Emissions Inventories and Relative Emissions Reductions Since 2005

Year	In-Territory Emissions in Metric Tons of CO_2e	% Emissions Reduction Relative to 2005 Baseline
2005	In 2005, GHG emissions in Piedmont totaled approximately 48,818 metric tons of CO_2e. Within this total, municipal facilities emitted approximately 1,025 metric tons of CO_2e. The 2005 inventory is used as the City's baseline, against which later inventories are compared in order to measure the City's progress towards meeting its GHG emissions reduction goals.	--
2010	The 2010 inventory indicated that GHG emissions were approximately 46,901 metric tons of CO_2e. The City's municipal activities in 2010 resulted in approximately 1,056 metric tons of CO_2e.	4%
2014	In 2014, Piedmont produced approximately 39,456 metric tons of CO_2e. The decrease in GHG reductions was due in part to ongoing conservation and energy efficiency efforts by Piedmonters and the result of fewer heating degree days (reduced gas consumption) due to exceptionally warm seasonal temperatures that year. The City's municipal activities in 2014 resulted in approximately 1,076 metric tons of CO_2e. This increase was driven almost exclusively by the addition of energy consumption at the Aquatics Center and the Center for the Arts to the City's municipal building portfolio in 2010 and 2011, respectively.	19%
2015	The 2015 inventory indicated Piedmont emitted approximately 38,492 metric tons of CO_2e. The primary driver of this reduction was warmer weather in 2015, which resulted in a decreased demand for residential heating and, consequently, less natural gas usage. Municipal activities resulted in approximately 960 metric tons of CO_2e. Community and municipal results from the 2015 GHG inventory were used as the basis for Piedmont's CAP 2.0.	21%

2016	In 2016, Piedmont produced approximately 37,025 metric tons of CO_2e. Municipal activities resulted in approximately 864 metric tons of CO_2e. Municipal and community emissions decreased slightly from 2015 to 2016. These decreases seem to have been mainly due to outside factors, particularly the increase in renewable sources in PG&E's energy mix. This caused significant decreases in emissions in the residential and commercial electricity sectors since 2015.	24%
2017	In 2017, Piedmont produced approximately 38,101 metric tons of CO_2e, of which 879.5 metric tons are attributed to municipal activities. This is an increase of 3% from 2016 total emissions.	22%
2018	In 2018, Piedmont produced approximately 34,340 metric tons of CO_2e, of which 934 metric tons of CO_2e are attributed to municipal activities. This was a reduction of 9.8% from 2017 in-territory emissions.	29%
2019	In 2019, Piedmont's emissions were approximately 34,197 metric tons of CO_2e, of which 1,139 metric tons of CO_2e are attributed to municipal activities. This was a very slight reduction (less than 1%) below 2018 in-territory emissions.	30%
2020	In 2020, Piedmont's emissions were approximately 33,402 metric tons of CO_2e, of which 722 metric tons of CO_2e are attributed to municipal activities. This was a 2.3% reduction below 2019 in-territory emissions. The report below provides a further breakdown and explanation of Piedmont's 2020 emissions.	32%

2020 GREENHOUSE GAS INVENTORY

Piedmont City staff completed the 2020 GHG emissions inventory in the spring of 2022, attached as Exhibit A. In 2020, Piedmont's in-territory emissions (i.e., emissions occurring within City boundaries) were approximately 33,402 metric tons of CO_2e, of which 722 metric tons of CO_2e are attributed to municipal activities. This was a reduction of 32% below 2005 levels and a very slight reduction (2.3%) below 2019 emissions. The reductions since 2005 are largely attributed to continued global warming trends, which require fewer heating days, as well as localized decreases in emissions from building appliances and Piedmont's community and municipal enrollment in East Bay Community Energy's (EBCE) 100% renewable energy service plan. Figure 1 below shows the City's emissions trend since 2005. For a more detailed comparison of the results of the 2020 GHG inventory to previous years, please refer to Exhibit A, pages 20-31.

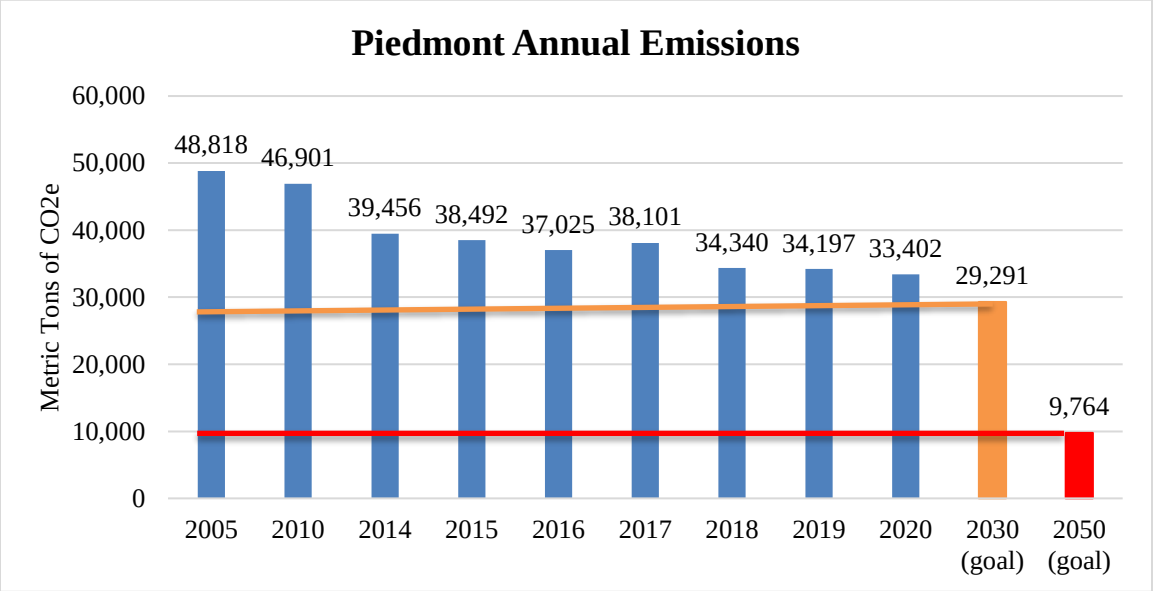


Figure 1

What follows is an overview of the two sectors included in the 2020 GHG Emissions Inventory: the Community Inventory, which includes residential and commercial business activities in Piedmont, and the Municipal Inventory, which only covers activities stemming from City staff and facilities. Both inventories were conducted by City Staff.

Community Emissions Update

In 2020, as seen in Figure 2 below, the sectors that contributed most to Piedmont's in-territory community GHG emissions were Transportation & Mobile sources[1] (50%) and Residential Energy (46%). Transportation emissions in 2020 resulted in approximately 16,407 metric tons of CO_2e, while residential energy resulted in approximately 14,877 metric tons of CO_2e. This is the second consecutive year transportation emissions are the primary source of Piedmont's total community emissions as a result of reductions in other sectors – particularly residential energy emissions –

[1] Mobile sources include both on and off road sources such as passenger cars, trucks, buses, lawn and garden equipment, construction, and more. https://www.arb.ca.gov/msprog/msprog.htm

over the last couple of years. The overwhelming majority of transportation emissions are attributed to the use of gasoline and diesel-powered passenger vehicles (i.e., vehicles powered by an internal combustion engine). These emissions are the result of travel that begins or ends in the City and are calculated through vehicle miles traveled (VMT) and on-road emission factors. In the area of residential energy, 97% of emissions in this sector are attributed to natural gas use; the remaining 3% of emissions derive from residential electricity use. Emissions from natural gas appliances include furnaces, water heaters, stovetops, dyers, gas fireplace inserts, gas fire tables on patio, and gas patio heaters. Emissions from residential electricity stem from electricity production and increased 64% from 2019. This is likely attributed to changes in the power content of PG&E's energy service plans and EBCE's Brilliant 100 and Bright Choice plans. For instance, in 2019, the power content of EBCE's Bright Choice service plan was 85% carbon free; in 2020, the plan was 50% carbon free. Power content changes such as this impact the associated GHG emissions intensity tied to the energy service plan, and subsequently, the GHG emissions calculated in this sector. Despite the year-to-year fluctuation, it is notable that residential electricity emissions have decreased significantly since 2005 (a 95% reduction) mostly due to the majority of Piedmont customer's enrollment in EBCE's Renewable 100 energy service plan.

Additionally, a new sector was included in this year's GHG emissions inventory calculations: fugitive emissions. The U.S. Environmental Protection Agency (EPA) defines fugitive emissions as unintended emissions from facilities or activities that "could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening".[2] Examples include fine particles, aerosols, and leaks or releases from valves, pumps, and compressors. Common sources of fugitive emissions include refrigeration, air conditioning, and fire suppression systems. While fugitive emissions comprise a small share of Piedmont's total community emissions, it is an important source to measure and monitor.

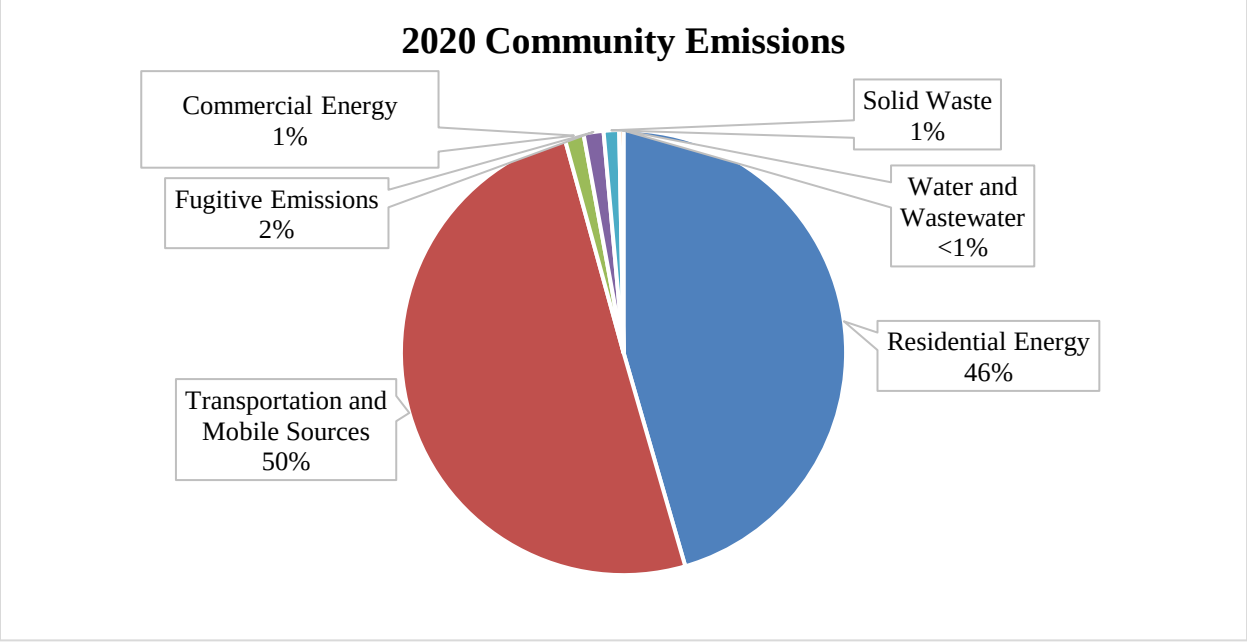


Figure 2

[2] United States Environmental Protection Agency (2015): https://www.epa.gov/sites/default/files/2015-07/documents/fug-def.pdf

As shown in Figure 3 below, transportation and residential energy have consistently remained the biggest sectors in terms of contributions to GHG emissions since 2005. Figure 3 shows the emissions in 2020 compared to previous years. In each sector in 2020 emissions remained at approximately the same level as previous years or were lower, except for transportation, in which emissions increased slightly.

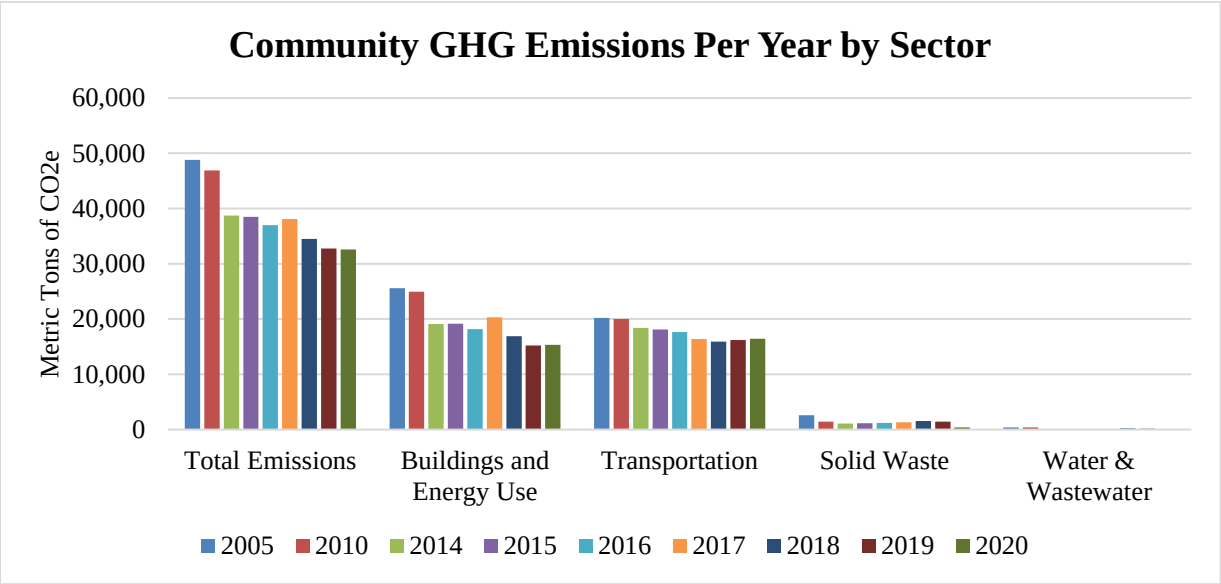


Figure 3

Figure 4 below is a comparison of 2019 and 2020 community emissions. Between 2019 and 2020, emissions largely remained unchanged, with slight increases to transportation and residential and commercial energy.

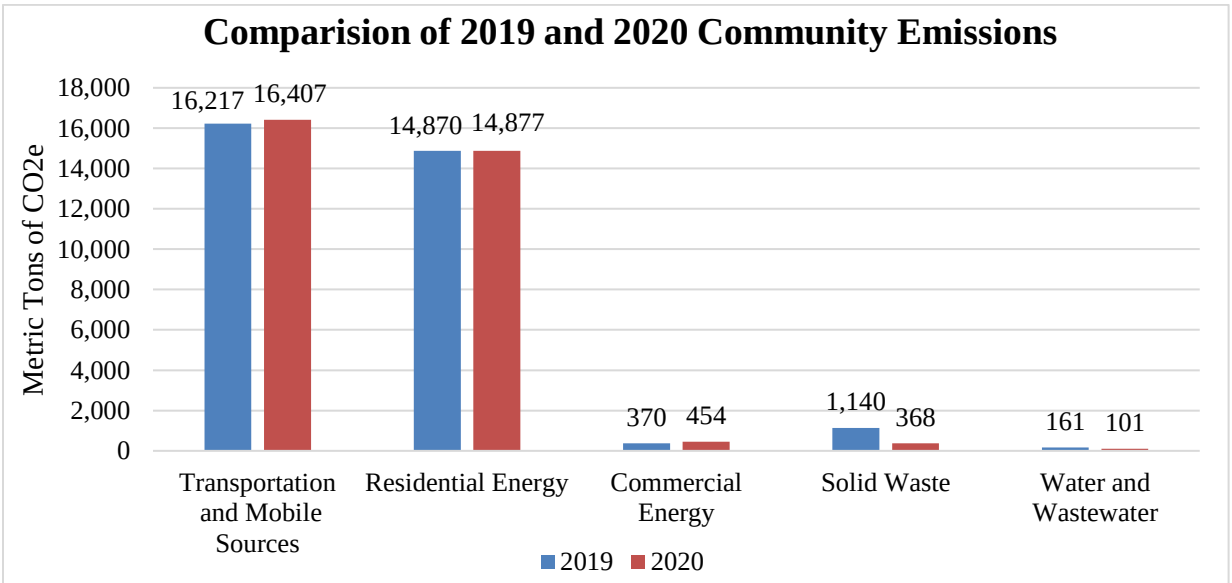


Figure 4

Water and wastewater have always constituted a very small portion of community-wide emissions: since 2014 the portion has ranged from 0.1-1% of community-wide emissions. With the state of California facing continued reduced water supplies and drought as a result of weather extremes brought on by climate change, this sector will be closely monitored by City staff.

Similarly, solid waste constitutes a small share of community-wide emissions. According to Republic Services Annual Report, Piedmont's solid waste diversion rate in 2020 was 74.66%, meaning that three quarters of residential waste was diverted from landfills and either composted or recycled. The City's diversion rate has remained consistent during the past decade. Since 2019, solid waste emissions decreased 68%. This can be attributed to changes in the landfill Methane (CH_4) collection scenario calculated by staff, which reflect updated statewide metrics associated with the Landfill Methane Regulation.

The method of GHG emissions inventory used by staff does not take into account emissions generated outside the City's boundaries (i.e., consumption-based emissions). If consumption was included in the inventory, emissions would be about seven times higher than they are currently.[3] According to data from a UC Berkeley study of consumption-based emissions, Piedmont is the highest emitter per capita in Alameda County and one of the highest throughout the Bay Area.

Municipal Emissions Update

Municipal activities in 2020 resulted in approximately 722 metric tons of CO_2e, or 2.2% of total in-territory community emissions. This is a decrease of 37% from total in-territory municipal emissions since 2019. This decrease can largely be accounted for by a reduction in City vehicle use and fewer employees working on-site at City facilities due to the COVID-19 pandemic. Figure 5 below shows a breakdown of 2019 and 2020 municipal emissions.

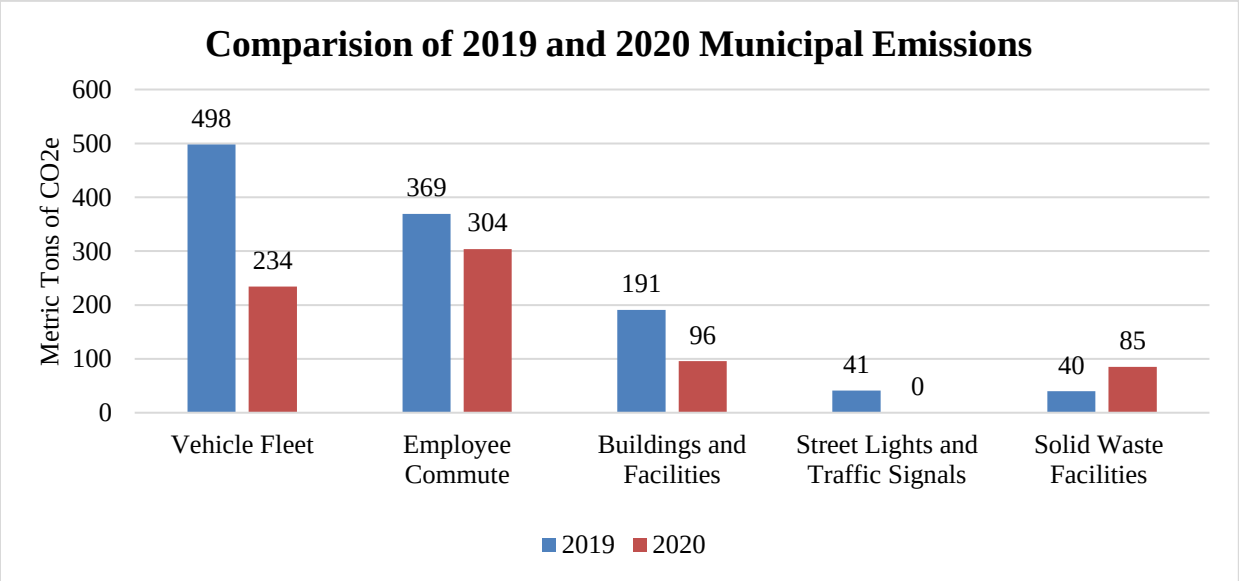


Figure 5

[3] Jones, C. M, & Kammen, D. M. (2015). A Consumption-Based Greenhouse Gas Inventory of San Francisco Bay Area Neighborhoods, Cities and Counties: Prioritizing Climate Action for Different Locations. *UC Berkeley*. Retrieved from https://escholarship.org/uc/item/2sn7m83z

Figure 6 shows a further breakdown of the sectors calculated in municipal emissions in 2020. Like previous years, the biggest sector contributing to total municipal emissions were transportation related activities (74% of the total), followed by building and facilities (13%) and solid waste (12%). The 2020 municipal emissions from transportation are separated into two sectors: vehicle fleet and employee commute.

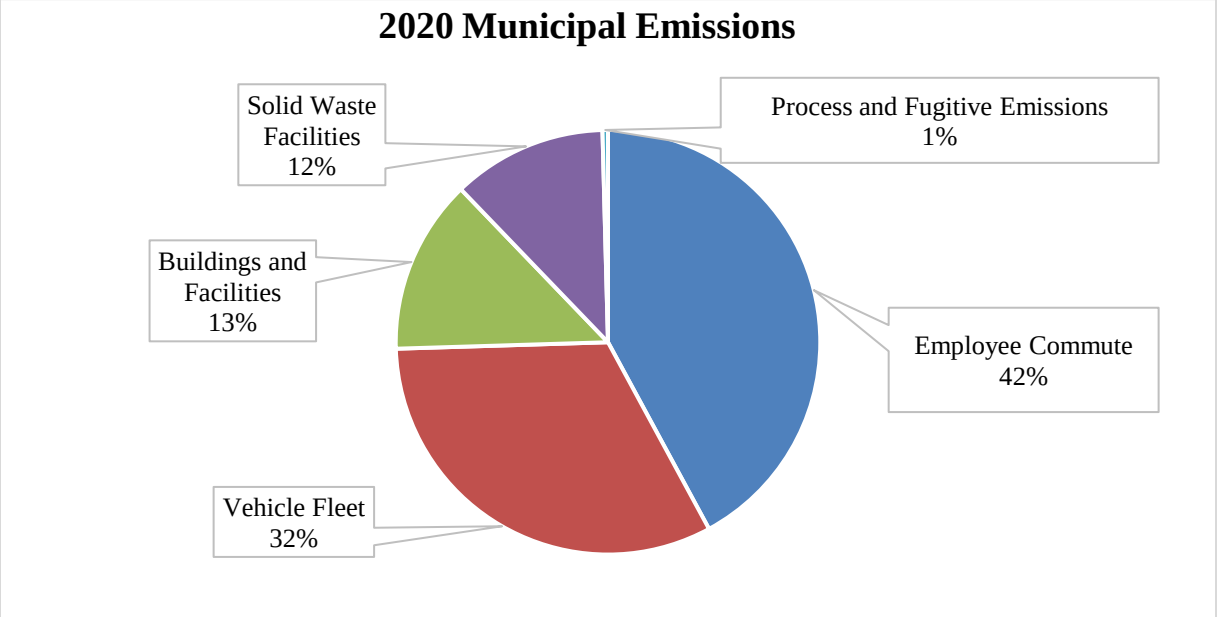


Figure 6

In 2020, employee commutes comprised over 40% of municipal emissions, possibly attributed to the high cost of living in Piedmont and nearby communities, causing employees to live further away, and thus drive greater distances. Almost half of employees reported a one-way drive to work of over 20 miles. Driving a car can be more convenient than public transit for such a distance, which could explain the high mileage. This was also likely impacted further by the pandemic. With respect to the City's vehicle fleet, emissions decreased 52% since 2019. This reduction in fleet emissions can be partially attributed to the retirement of old vehicles, fewer new employees requiring training, and shifts in vehicle usage. Municipal emissions also decreased in the buildings and facilities sector. Since 2019, building emissions decreased approximately 59%. The most significant area within this sector that experienced reductions is natural gas use in City facilities. This reduction is likely attributed to decreased occupancy in City buildings by staff and the public during the pandemic, as well as the decommissioning of the former Piedmont Community Pool, which was historically the largest user of natural gas across City facilities.

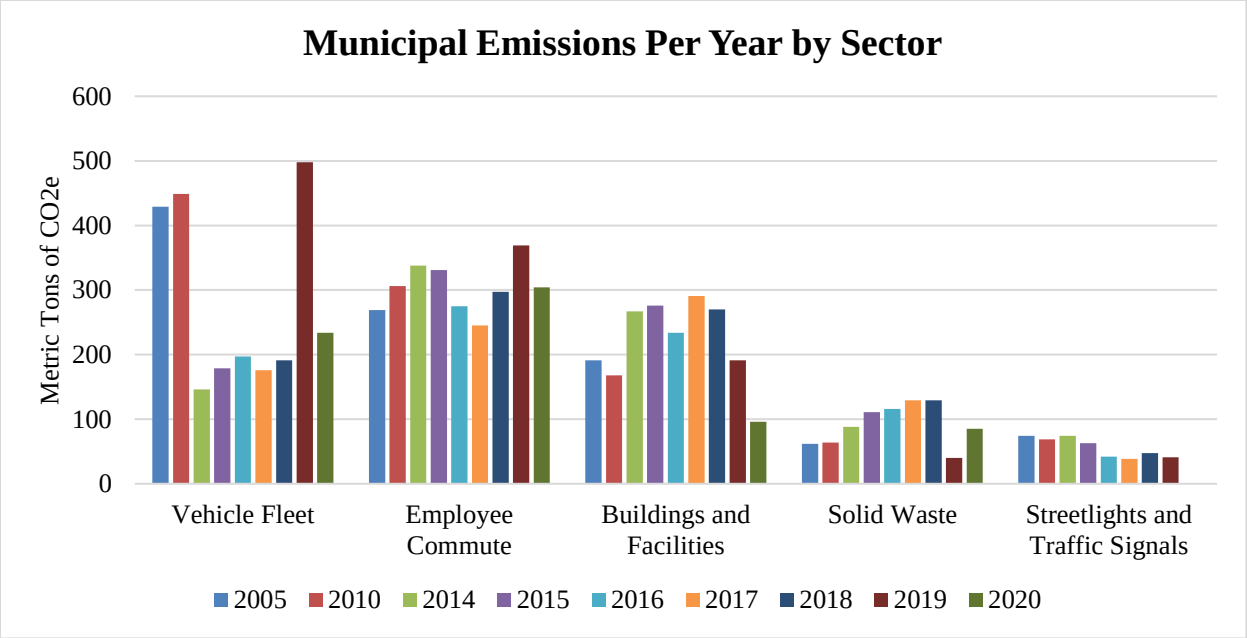


Figure 7

While municipal emissions decreased since 2019, it is important to reiterate that municipal emissions account for just 2.2% of Piedmont's total in-territory emissions. In spite of the small footprint, municipal activities and facilities can continue to be improved so that the City government leads by example. Recent efforts in this area include replacement of all remaining gas-powered water heaters with electric heat pump water heaters in City buildings and the Council's decision to construct the new Piedmont Community Pool to be an all-electric facility. Additional areas where efforts can be focused include reducing natural gas usage in City facilities through electrification projects, reducing emissions from the City vehicle fleet by transitioning to an all-electric fleet, and finding ways to reduce emissions associated with the vehicles employees use to commute to and from work.

GHG INVENTORY CONCLUSIONS

Between 2019 and 2020, Piedmont experienced a 2.3% decrease in metric tons of CO_2e. While any decrease in emissions is promising, larger improvements need to be made. Community-wide total emissions decreased, yet sector-specific emissions increased across the transportation and buildings and energy use sectors. Ultimately, in order for Piedmont to make meaningful progress toward meeting the CAP 2.0 goals, the broader community, including all residents of Piedmont, will need to make significant reductions in natural gas use in their homes, vehicles, and daily lives. These reductions will be centered on decarbonization efforts by transitioning residents from gas-powered vehicles to electric vehicles and shifting from natural gas to electric appliances in their homes. Decarbonization efforts will need to be paired with significant education, outreach, and awareness building efforts, along with financial and human resources. Additionally, equitable adaptation efforts must be made that recognize the historical harms and structural and institutional systems that are the root causes of the social and economic inequities climate change exacerbates.

On the municipal side of the inventory, building energy use, vehicle fleet, and employee commute emissions all decreased, but solid waste emissions increased. The increase in solid waste emissions can be likely attributed to increased use of municipal waste bins throughout the City, as in 2020, many Piedmonters sought out recreational time in Piedmont's parks and public spaces. Emissions from solid waste can be reduced by continuing education on and implementation of sustainable purchasing and procurement, as well as proper sorting of recyclables and organics. In the area of transportation, working with employees to reduce their mileage and switch to zero-emission vehicles both in their work tasks and in their commuting habits can have a sizable impact on municipal emissions. Further, emission reductions may be made if the City were to provide incentives to reduce emissions in commuting, such as providing charging stations for electric vehicles, promoting work from home, providing subsidized public transit passes, or maintaining a daily reporting system to keep track of mileage. Emissions from the City vehicle fleet can be minimized by reducing vehicle miles traveled, the retirement of gas and diesel-fueled vehicles, and the adoption of zero-emission vehicles.

The GHG emission inventories completed so far reveal that, for the most part, the changes from year to year are caused by external forces, and that the Piedmont community still has a long way to go to make substantive changes to the building energy sector and the transportation sector so that it can meet the CAP 2.0 goals. Although education and outreach efforts are important and should be continued, it appears that significant reductions in emissions will not occur without incentives or regulatory efforts from local, State and Federal governments. If Piedmont wants to reach its CAP 2.0 goal of reducing its emissions by 40% from 2005 levels by 2030 (29,291 metric tons of CO_2e annually), it needs to decrease 2020's emissions by 14% (approximately 4,111 metric tons of CO_2e). However, it should be noted that the CAP 2.0 emissions reduction goals are currently not aligned with state and federal reduction targets. Executive Order B-55-18 set a statewide goal to achieve carbon neutrality (i.e., net zero emissions) in California no later than 2045. At the national level, the U.S. aims to achieve a 50-52% reduction in GHG emissions by 2030 and achieve carbon neutrality by 2050.

Finally, although Piedmont conducts a GHG inventory annually, the current methodology does not account for consumption by community members that results in emissions outside the City border. If consumption emissions were included in this report, the emissions numbers would be roughly 7 times greater. A consumption-based emissions inventory would reveal that personal choices related to the purchase of products and travel services have as much, if not more, impact on global emissions than do in-boundary activities and energy use. In areas not already captured in staff's GHG emissions inventory, Piedmont is the highest per capita emitter in Alameda County in the following areas: air travel, goods (e.g., clothing, furniture, small appliances), and services.

CAP 2.0 IMPLEMENTATION UPDATE

The CAP 2.0 provides actions and strategies to achieve reductions in GHG emissions. Since the CAP 2.0 was adopted in March 2018, the City has engaged in outreach efforts to implement some of the transportation and energy efficiency measures as well as looked for opportunities to expand its municipal climate actions. Below are some highlights.

Implemented

Piedmont Community Pool to be Designed as All-Electric Facility
In April 2022, the Piedmont City Council directed that the new Piedmont Community Pool be designed as an all-electric facility. The entire facility will be electrified through a combination of electric heat pumps, photovoltaic/thermal (PVT) panels, and integration with the clean electrical grid. Piedmont will be one of the first cities in California to support heating large commercial pools with electricity. This project represents a market transformation model for the rest of the state and beyond. The accompanying pool facility will be the City's first LEED Certified Building. This effort is in line with Municipal Measure 2-1 and Action-2.1E.

Recognition as Global Leader on Climate Action "A" List
In 2021, the City of Piedmont was recognized as one of 95 cities across the globe demonstrating bold leadership in environmental transparency and action. Piedmont was placed on the 2021 "A List" for climate action by CDP, a not-for-profit global environmental disclosure platform. The City's leadership was recognized for a clear understanding of future climate risks and progress towards achieving ambitious adaptation goals, emissions reduction targets, and actions. The 2021 CDP scoring methodology assessed 965 cities around the world, ranking cities on their management, measurement, and action on addressing greenhouse gas emissions and adaptation to the climate crisis. To score an A from CDP, a city must have strategic, holistic plans in place to ensure the actions they are taking will reduce climate impacts and vulnerabilities of the citizens, businesses and organizations residing in their city. This includes having to disclose publicly and have a city-wide emissions inventory, have set an emissions reduction target and a renewable energy target for the future; have published a climate action plan; have completed a climate risk and vulnerability assessment; and have a climate adaptation plan to demonstrate how it will tackle climate hazards. Less than 10% of cities scored in 2021 received an A.

Beacon Program Participation and Recipient of Environmental Awards
In 2021, the City of Piedmont joined the Institute for Local Government's (ILG) Beacon Program. ILG established the Beacon Program to provide recognition and year-round support for California local agencies that are working to build more vibrant and sustainable communities. The Beacon Awards honor voluntary efforts by cities, counties, and special districts that are reducing greenhouse gas emissions, saving energy and adopting polices that promote sustainability. At the 2021 League of California Cities Annual Conference, the City of Piedmont accepted three awards for its commitment to addressing climate change. City of Piedmont received a Gold Level Beacon Spotlight Award for reducing greenhouse gas emissions within city facilities by 12% from 2010 to 2019, Platinum Level Spotlight Award for reducing communitywide greenhouse gas emissions by 30% from 2010 to 2019, and a Gold Level Spotlight Award for sustainability best practices. A link to the City's sustainability best practice activities can be found here.

Public EV Charging Stations
In October 2021, the Council signed an agreement with East Bay Community Energy (EBCE) for the installation of electric vehicle (EV) charging stations on Magnolia Avenue. The Magnolia Avenue site will consist of 4 publicly accessible EV fast charging stations, also known as Direct Current Fast Chargers (DCFC). The chargers will serve 4 parking spaces, including one ADA space. The EV chargers will be installed, owned, maintained, and operated by EBCE. To further incentivize EV adoption, City staff will continue researching the demand for publicly accessible EV charging stations in residential neighborhoods and assessing the feasibility of their installation. In the winter of 2021, City staff launched a community-wide online survey on residential EV preferences. More than 150 residents completed the online survey with an overwhelming majority in favor of the City installing additional publicly accessible DCFCs. City Sustainability staff shared the results of the community survey along with information on EV charging funding opportunities in a virtual Town Hall held on November 22, 2021. In December 2021, staff applied for state funding for additional DCFCs through the CALeVIP Program. Due to the substantial number of applications for DCFCs in Alameda County, the City was not able to secure funds for those chargers through the program. All of these efforts are in line with Transportation Measure-4.1 in the CAP 2.0. The City also maintains a streamlined permitting process for the installation of EV chargers on private property. Information about EVs can be found on the City's website here.

Gas Water Heaters Replaced with Heat Pump Water Heaters at City Facilities
The City's Sustainability staff initiated a project in spring 2022 to replace all remaining gas-powered water heaters in City facilities with electric heat pump water heaters (HPWH). The City participated in PG&E's Government and K-12 Schools Program. The program is funded by California ratepayers and is designed to support and incentivize local government, educational, and federal agency efforts to improve the energy efficiency of their buildings while reducing ongoing operational and maintenance costs. The City benefited from this program through the installation of 6 HPWHs at 5 sites: Community Hall, Veterans Hall, Fire Department, Police Department, and the Recreation Building. The City leveraged PG&E incentive funds and EBCE Municipal Electrification Assistance gap funding to make these improvements at zero out-of-pocket cost to the City. The 10-year lifetime GHG reductions of this project is 226.5 metric tons of CO_2e. This effort is in line with Municipal Measure-2.1 in the CAP 2.0.

Earth Day Events
Staff held several Earth Day events to highlight the CAP 2.0 and teach the community about our changing climate. About 20 residents participated in the City's second annual Earth Day scavenger hunt, which included clues regarding Piedmont's environmental and social history. In addition to the scavenger hunt, City staff organized a free compost giveaway for residents and hosted an in-person community forum on the City's reach codes. City staff presented an overview of Piedmont's current reach codes, the 2022 Energy Code, and initial considerations for the next set of reach codes, followed by a community workshop where attendees provided comments and recommendations.

Organics and Recycling Ordinance Adopted in Light of SB 1383 Regulations
A new California State law (SB 1383) requires residents and businesses to keep food and other compostable materials out of landfills to help fight climate change. The law aims to achieve a

statewide reduction in emissions of short-lived climate pollutants, particularly emissions resulting from decomposition of organic materials. California local jurisdictions have significant, new requirements to implement additional waste reduction programs and enhanced reporting and enforcement protocols to comply with state law. State law is implemented in Alameda County under the Organics Reduction and Recycling Ordinance in partnership with the Alameda County environmental health departments, StopWaste, its member agencies and their solid waste service providers. In 2021, City Sustainability staff provided informational reports to the Council and Park Commission about the law. In December 2021, the Council adopted Ordinance 763 N.S. – Adopting by Adopting by Reference and Opting into the Alameda County Waste Management Authority's Organics Reduction and Recycling Ordinance (2021-02); Repealing and Replacing Divisions 9.02, 9.03, 9.05, 9.10 and 9.11 and adding a new Division 9.12, "Organics Reduction and Recycling" of the Piedmont City Code. City staff continue to participate in a regional task force convened by StopWaste to assess the impacts of SB 1383 to current programs and policies. Staff also continue to promote education on ways to reduce consumption and divert waste from the landfill in accordance with Solid Waste Measure-1.2 of the CAP 2.0. Information about SB 1383 can be found on the City's website here.

Adoption of Update to Sustainable Procurement Purchasing Policy

In December 2021, the Council adopted an update to the Piedmont Sustainable Procurement Policy (formerly named the Environmentally Preferable Purchasing Policy). The original policy was adopted in 2011 with the intent to encourage and increase the use of environmentally preferable products and services whenever practical. In light of the new requirements contained in the SB 1383 Regulations, City staff updated the Policy. The updates support the City's compliance with the Regulations in the areas of organic waste product procurement and recycled-content paper requirements. Beyond SB 1383 compliance, additional updates were incorporated into the Policy to address CAP 2.0 waste prevention goals, to better reflect products and services that may not have been widely available since the adoption of the policy in 2011, and to align with international best practices in the area of sustainable procurement. One of the notable updates includes Policy 3.7.4: The City of Piedmont shall not purchase, acquire, distribute or issue permit approval for the use of single-use plastic beverage bottles for use at City facilities, projects, events, or for staff use. Exemptions may be approved on a case-by-case situation. Following the adoption of the Policy update, Sustainability staff held trainings for City Department Heads and Purchasing Staff to discuss the update and new requirements. Sustainability staff continue to work with Department Heads and their respective employees to adhere to the Policy's requirements and convene regular meetings to review and discuss the progress of implementation. These efforts are in line with Municipal Measure-4.1 of the CAP 2.0.

Free Compost Giveaway Program

In the fall of 2021, the City's Sustainability staff launched a free compost giveaway program for Piedmont residents. Staff held five giveaway events (September and October 2021, February, March, and April 2022) distributing over 85 cubic yards of compost to more than 200 residents. The compost originally came from the green waste (yard trimmings and food waste) that is collected in Republic Services communities participating in curbside organics collection services. The green waste is brought to a processing plant in Richmond where it is converted into a highly aerobic, microbial compost. As the compost is locally based and free, it models the concept of a circular economy, where a resource is used and reused in a cycle that turns "waste" back into new

products or materials than can reenter the supply chain. This process helps to keep organic materials from emitting greenhouse gasses in the landfill and creates opportunities to use these nutrient-rich resources to regenerate our soils. These efforts are in line with Solid Waste Action-2.1D and Consumption Objective-2 of the CAP 2.0.

Piedmont Evergreen at Community Events

As in-person events began to resume, City Sustainability staff provided on-site technical assistance at the Harvest Festival, Turkey Trot, and Food Festival. This included partnering with community groups and stakeholders to ensure events had the resources and assistance to maximize recycling and composting. This entailed organizing local student Eco-Ambassadors to help at the events with procurement and placement of containers, signs, stickers, and bags to ease proper sorting. Through these efforts, the Harvest Festival achieved an 80% diversion rate, the Turkey Trot achieved a 75% diversion rate, and the Food Festival achieved a 95% recycling rate. These efforts are in line with Municipal Action-4.1F of the CAP 2.0.

Performance Audit of Republic Services

In May 2021, the City Council approved an agreement for consulting services between the City and R3 Consulting Group, Inc. (R3) to conduct a billing audit and performance review of the City's Collection Services Agreement with Richmond Sanitary Services, Inc (Republic). Republic is the City's franchise waste-hauler under a Collection Services Agreement (Agreement) with the City which began July 1, 2018 and which will expire June 30, 2028. Per Article 20 of the Agreement, the City may conduct periodic performance reviews of Republic, paid for by Republic. R3 completed the performance audit of Republic in spring of 2022. City staff will provide a report to Council on the audit findings in the coming months.

Continuing and Upcoming Events and Efforts

Reach Codes

In February 2021, the City Council adopted reach codes (Ordinance 750 N.S.) designed to reduce natural gas usage in residential buildings. Ordinance 750 N.S. requires certain energy efficiency measures to be included in new construction and existing residential building renovations. This effort is in line with Buildings and Energy Actions-1.2E, 1.3C, and 6.1C of the CAP 2.0. The City was one of the first in California to adopt reach codes that apply to existing residential buildings. Piedmont was featured as a Frontrunner by the CA Local Energy Codes in their October 2021 newsletter series. Piedmont's reach codes are a local amendment to the 2019 Energy Code and became effective on June 1, 2021. Starting January 1, 2023, the 2022 Energy Code will go into effect. When the Energy Code is updated, all cities and counties need to adopt the new Code and any local amendments to the Code. In preparation for the adoption of the 2022 Energy Code, City staff are conducting ongoing monitoring and evaluation of the reach codes enacted in 2021. The evaluation process has entailed collecting quantitative and qualitative data through an online survey with building permit applicants, conducting in-person interviews with City staff involved in the reach code intake and permitting process, and reviewing building permit applications which had reach codes applied to them from the beginning of June 2021 to the end of January 2022. Staff presented an informational update on the implementation of the reach codes to the Council in May 2022. With the reach codes requiring re-adoption by the City Council prior to January 1, 2023 in order to comply with the 2022 Energy Code, staff have begun stakeholder engagement to inform the development of the draft next set of codes. Most recently, this has included an in-person Reach

Code Community Forum held on April 20, 2022 and the development of an online reach code community survey available to all those who live and work in Piedmont. Nearly 100 Piedmonters completed the online survey with majorities indicating support for the reach codes. Additional public processes and subsequent revisions to the draft Ordinance will follow in the summer and fall. Staff plan to introduce a first reading of the reach code Ordinance to the Council in the fall. Information about the City's reach codes can be found here.

Home Energy Assessment Policy
Concurrent with the reach codes, Council passed a Home Energy Assessment Policy (Ordinance 751 N.S.) in February 2021. Ordinance 751 N.S. requires each person who sells or transfers an interest in real property in Piedmont to provide a Home Energy Score or a Home Energy Audit prepared in the past five years to potential buyers and the City's Planning & Building Department, in addition to all other disclosure documents. This effort is in line with Buildings and Energy Action-1.1.A and Building and Energy Measure-2.1 in the CAP 2.0. Between the period of March 3, 2021 (the effective date of Ordinance 751 N.S.) and January 31, 2022, the City received 42 Home Energy Score Reports. Staff presented an informational update on the implementation of the home energy assessment policy to the Council in May 2022. Information about the City's home energy assessment policy can be found here.

Municipal Fleet Electrification Assessment
In Spring 2022, City staff began a project to develop a fleet electrification assessment with the assistance of EBCE. This effort is in line with Municipal Measure 3.2 of the CAP 2.0. The results of the fleet electrification assessment, which are anticipated to be completed by the end of this year, will provide baseline, critical information, including the evaluation of short- and long-term cost savings associated with the transition to light-duty electric vehicles (EVs), impacts and benefits to the City, and outlines steps to efficiently integrate EVs and charging infrastructure at municipal facilities in a fiscally responsible manner. Medium and heavy-duty vehicles will be evaluated during the 2023-2030 timeframe via pilot programs until EVs in these classes are cost effective and can meet the same duty cycle of existing vehicles.

Induction Cooktop Lending Program
In collaboration with EBCE, the City continues to run an induction cooktop lending program for Piedmont residents. This effort is in line with Buildings and Energy Use Measure-1.2, 1.3, and 3.2. Any resident can try out an induction cooktop for free. Each kit includes a state-of-the-art induction cooktop, a compatible pot and pan, a magnet to test out cookware to see if it will work on the cooktop, and informational pamphlets. Induction cooktops heat the pan instantly and deliver twice the thermal efficiency of gas cooktops. They also eliminate the carbon monoxide and other toxins emitted by gas stoves. Paired with EBCE's 100% renewable energy service plan, the induction cooktop is carbon neutral. More information can be found on the City's Cooktop Lending Program website page.

Climate Fellowship and Sustained Emissions Reduction Efforts
Although not a measure within the CAP 2.0, continued participation in the Climate Corps or CivicSpark Fellowship programs advances staff's capacity to achieve CAP 2.0 measures and goals. With this support, City staff continues to conduct annual GHG inventories to track the City's progress in meeting the 2030 and 2050 emissions reduction goals. Participation in the fellowship programs also serve to sustain awareness of the CAP 2.0 and help identify areas of improvement.

As the GHG inventorying methodology advances to include consumption-based emissions, staff will endeavor to incorporate these emissions into future community inventories. Since 2015, the climate fellows have been and continue to be critical to staff's capacity in completing emissions inventories and in implementing the City's Climate Action Plan.

On-going Community Engagement

The City, with the help of the Climate Fellow, has continued to conduct CAP 2.0 community engagement and education events during the pandemic. Given pandemic restrictions, these engagement and educational events have been focused on virtual formats and print materials. This has included the formation of a weekly feature in the Piedmont Post, the 'Climate Corner', focused on raising awareness of CAP 2.0 actions and issues, as well as partnering with Piedmont Connect on informational events. The City also maintains a webpage to keep residents up to date on the CAP and what measures City staff are undertaking. Also see the description of the Community Climate Challenge below.

Continued partnership with Piedmont Connect (https://www.piedmontconnect.org)

Piedmont Connect is a not-for-profit collaborative community organization supporting resident initiatives and City efforts to build a sustainable future. Piedmont Connect has partnered with the City on several recent efforts, including an event titled Living with Drought, the Piedmont Climate Challenge, and bolstering community support for community climate action efforts such as the new community pool, reach codes, and electric vehicle charging stations. Piedmont Connect maintains an active newsletter and has been instrumental in ongoing sustainability outreach, especially during the COVID-19 pandemic. City staff meets with Piedmont Connect monthly to collaborate on projects and work towards a more environmentally-friendly future.

Piedmont Community Climate Challenge (www.piedmontclimatechallenge.org)

The Piedmont Climate Challenge is an online GHG tracking platform where residents can log and track any actions they take to reduce GHG emissions in their lives. This platform was first used in late 2019 and helps fulfill Building Energy Action-1.2G, Solid Waste Action-1.2F, Water and Wastewater Action-1.2D, and Municipal Action-6.1A in the CAP 2.0. While more than 320 users have enrolled to participate in the Climate Challenge, there has been few new sign-ups in the last year. Accordingly, while we have not seen meaningful differences in natural gas usage in spite of this platform, determining a way to tie it with incentives could be worthwhile. Staff will explore the feasibility of doing just that with the rollout of a new electrification incentive fund in 2023. If participation and engagement with the platform still lags by the end of 2023, staff will discontinue use of the platform.

NEXT STEPS AND RECOMMENDATIONS

Based on the findings from the 2020 GHG emissions inventory, actions considered to be "low-hanging fruit" have already been taken and further action is needed in order for the City to be on track to meet its CAP 2.0 goals. The City Council may want to direct staff to pursue some or all of the following list of actions intended to accelerate progress towards CAP implementation.

Reduction in Natural Gas Use Through Building Electrification Efforts

As demonstrated in the City's GHG emissions inventories, residential buildings – particularly natural gas use – consistently account for nearly half of Piedmont's in-territory community emissions. Piedmont's 2030 goals for buildings and energy use identified in the CAP 2.0 include sourcing 100% of electricity from renewable sources, increasing efficiency of electricity use, and reducing natural gas consumption by 50% below the 2005 baseline. Based on Piedmont's 2005 baseline, the 2030 goal for natural gas consumption for residential buildings is approximately 8,386 metric tons of CO_2e – this would require a 42% reduction from 2020 levels. Natural gas is responsible for indoor air pollution in buildings – several times higher than national outdoor air quality standards.[4] The pollutants released by natural gas can have negative health effects, often exacerbating respiratory illness including asthma.[5] Natural gas is also getting more expensive. Coupled with a declining demand for fuel as appliances become energy efficient, it will be critical to have a transition plan in place. At the community level, this may entail the following:

Development of an Existing Buildings Electrification Strategy

While evaluating the current Reach Code and Home Energy Assessment Policy, it is evident additional building electrification policy options will need to be analyzed to scale up Piedmont's electrification efforts to reduce carbon emissions. This may include requirements for retrofitting appliances at time of equipment replacement, retrofits or upgrades at time of major renovation, and building performance standards. At a higher level, the City should consider developing an existing buildings electrification strategy to encapsulate said policy options and delineate a detailed, actionable plan for transitioning Piedmont towards a fossil fuel-free future. The purpose of an existing buildings electrification strategy would be to analyze the existing building stock of the City, with a focus on low-rise residential, and identify a pathway for an equitable transition to all-electric buildings. The strategy would be based on an in-depth analysis of Piedmont's building stock and a building-by-building energy model that can be used to assess the likely scale of fuel switching processes and their associated costs. This strategy would be in line with the CAP 2.0 Buildings and Energy Objectives-1, 2, 4, and 5. The City of Berkeley spearheaded the development of an Existing Buildings Electrification Strategy in 2021. Nearby cities of Oakland and Alameda are currently working on the development of a strategy and are anticipated for completion by 2023.

Development of Electrification Incentive Opportunities

Incentives and rebates to promote electrification can help establish a transition to electric appliances and technologies by alleviating financial barriers. These efforts are in line with Buildings and Energy Action-1.3B of the CAP 2.0. City Council approved $50,000 in the FY 2022-23 Budget to pilot an Electrification Rebate Program for residents. Additional areas that could be considered include:

[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7503605/
[5] https://rmi.org/insight/gas-stoves-pollution-health

a. Reduced building permit fees for the installation of photovoltaic systems, heat pump water heaters, and heat pump furnaces.
b. Recognizing that reduced building permit fees may not be much of a financial incentive because fees are a small part of the up-front costs, City staff could explore the feasibility of revenue generating instruments to finance rebates for the replacement of gas-fueled furnaces and hot water heaters with electric heat pumps, and other energy efficiency or electrification building improvements. Revenue generation instruments utilized in other cities to fund electrification incentives include an increase in the Utility User's Tax (Albany, CA) or establishment of a carbon tax on natural gas (Long Beach, CA; Boulder, CO). (Action MUN-7.1B)

Municipal Facilities and Opportunities to Reduce Emissions

While municipal activities in 2020 resulted in 2.2% of Piedmont's total in-territory emissions, the City has opportunities to demonstrate leadership and commitment to reducing GHG emissions through implementing energy efficiency and electrification efforts in municipal facilities and operations. Investing in electric City vehicles and working with employees to reduce their mileage both in their work tasks and in their commuting habits can have a sizable impact on municipal emission reductions, as transportation is the biggest sector contributing to municipal emissions. Providing incentives for electric vehicles and increasing the availability of charging infrastructure could help promote lower emission methods of getting to and from work. Additionally, promoting working from home when possible, providing subsidized transit passes, and maintaining a daily system to report mileage could aid in lowering employee emissions. Emissions from the City vehicle fleet can be reduced by decreasing vehicle miles traveled, the retirement of gas and diesel-fueled vehicles, and the adoption of zero-emission vehicles. Emissions from building appliances and systems can be reduced by conducting an Energy Audit of City Facilities to help identify opportunities for cost- and GHG emission- savings.

Research and Development

The speed and magnitude of climate change has increased exponentially since the CAP 2.0 was adopted in 2018. Due to these factors, continuous research and exploration of innovative technologies to understand and adapt to the climate crisis, along with ongoing stakeholder engagement at the local and regional levels is necessary. The following are actions in this area the Council may want to direct staff to pursue:

Adoption of Science-Based Targets to Align with State GHG Emission Reduction Goals

As defined by ICELI – Local Governments for Sustainability, science-based targets are climate goals in line with the latest climate science and represent a community's fair share of the ambition necessary to meet the Paris Agreement commitment to keep warming below 1.5°C.[6] Science-based targets build internal and external support needed to achieve ambitious GHG reductions and boost public confidence in local climate action. Per the City Council's adoption of Resolution No. 39-17 in June 2017, the City is committed to supporting the goals of the Paris Agreement and to continue the City's progress toward reducing GHG emissions. To achieve this goal, the Intergovernmental Panel on Climate Change (IPCC) states we must reduce global emissions by 50% by 2030 and achieve carbon neutrality by 2050. Equitably reducing global emissions by 50%

[6] https://icleiusa.org/resources/science-based-targets-for-u-s-communities/

requires that high-emitting wealthy nations such as the U.S. reduce their emissions by more than 50%. The GHG emission reduction targets currently set in the CAP 2.0 are outdated with those set by the state and federal government. Executive Order B-55-18 set a statewide goal to achieve carbon neutrality (i.e., net zero emissions) no later than 2045. At the national level, the U.S. aims to achieve a 50-52% reduction in GHG emissions by 2030 and achieve carbon neutrality by 2050. Staff recommends the adoption of science-based emission targets and advancing the City's GHG emissions reductions goals to 50% by 2030 and net zero emissions by 2045 to be in alignment with US and IPCC targets.

Development of a Consumption-Based GHG Inventory

Moreover, as noted in the GHG inventory updates, the method of GHG emissions inventory used in Piedmont does not take into account consumption completed outside the City. A consumption-based inventory would be an additional tool by which the City could help reduce global emissions and slow climate change by accounting for emissions to be placed with the source of the demand rather than the supplier of goods and services to Piedmonters. Staff could research the feasibility, costs and benefits of conducting a consumption-based GHG inventory (Action C-1.1A) in addition to the traditional in-boundary emissions inventory.

Formation of a City Council-appointed Advisory Body

With most of the CAP 2.0 measures considered to be "low-hanging fruit" having already been taken, further actions necessary for significant emission reductions will require substantial, community-wide engagement, effort, and expense. An advisory body could be critical to achieving wide-scale community change because it could help integrate and permeate a culture of sustainability by connecting a diverse array of stakeholders to collaboratively innovate, educate, communicate, and plan for the benefit of present and future generations. Given the evolving and dynamic nature of the changing climate, this requires a partnership with all residents, businesses, and government to balance development, commerce, and resource conservation and to ensure Piedmont is utilizing the most current, comprehensive, and creative approaches in implementing the CAP. Therefore, to provide broader intentional community engagement, the Council may want to consider the formation of an advisory body focused on sustainability issues. Such a committee could serve as a technical advisory body and a liaison to the community on matters relating to sustainability and implementation of the CAP 2.0 and other sustainability measures. An advisory body comprised of Piedmont residents could help bring focus, deep knowledge, and expertise towards determining the most effective and efficient ways to achieve significant GHG emission reductions and goals of the CAP 2.0. The advisory body could also assist in engaging the community in an ongoing dialogue about sustainability and advise on the integration of sustainability with existing Piedmont programs, policies, and organizations.

ATTACHMENTS

Exhibit A	Pages 20-31	City of Piedmont 2020 Greenhouse Gas Emissions Inventory
Exhibit B	Pages 32-54	City of Piedmont CAP 2.0 Implementation Progress

By: Alyssa Dykman, Sustainability Program Manager

City of Piedmont: 2020 Greenhouse Gas Emissions Inventory Update

Executive Summary

In 2010, the City of Piedmont adopted its Climate Action Plan (CAP), which set a goal of reducing greenhouse gas (GHG) emissions occurring within Piedmont (hereafter called "in-territory emissions") 15% below 2005 levels by 2020. In 2014 and 2015, the City of Piedmont met its 15% reduction target, however in both years this was principally the result of extensive reductions in natural gas use in response to warmer weather. In 2018, the City of Piedmont adopted its CAP 2.0, which provided an update to the original plan. The CAP 2.0 sets new targets of reducing in-territory GHG emissions 40% below 2005 levels by 2030 and 80% below 2005 levels by 2050.

In order to determine the City's progress in meeting both the previous and current emissions reduction goals, a greenhouse gas inventory was conducted in 2005 in order to establish a baseline emissions level. Subsequent inventories were completed for the years 2010, and 2014 onwards. Most recently, Piedmont's Climate Action Fellow completed the 2020 GHG inventory. Performing annual GHG inventories helps fulfill the City's commitment to the Global Covenant of Mayors for Climate & Energy (formerly known as the Compact of Mayors). The chart below shows in-territory emissions from the past years and the current in-territory emissions goals laid out in the CAP 2.0: to reduce in-territory emissions to just 29,291 metric tons of Carbon Dioxide equivalent (CO_2e) by 2030, and just 9,764 metric tons of CO_2e by 2050. The red line indicates the 2030 goal and the green line indicates the 2050 goal.

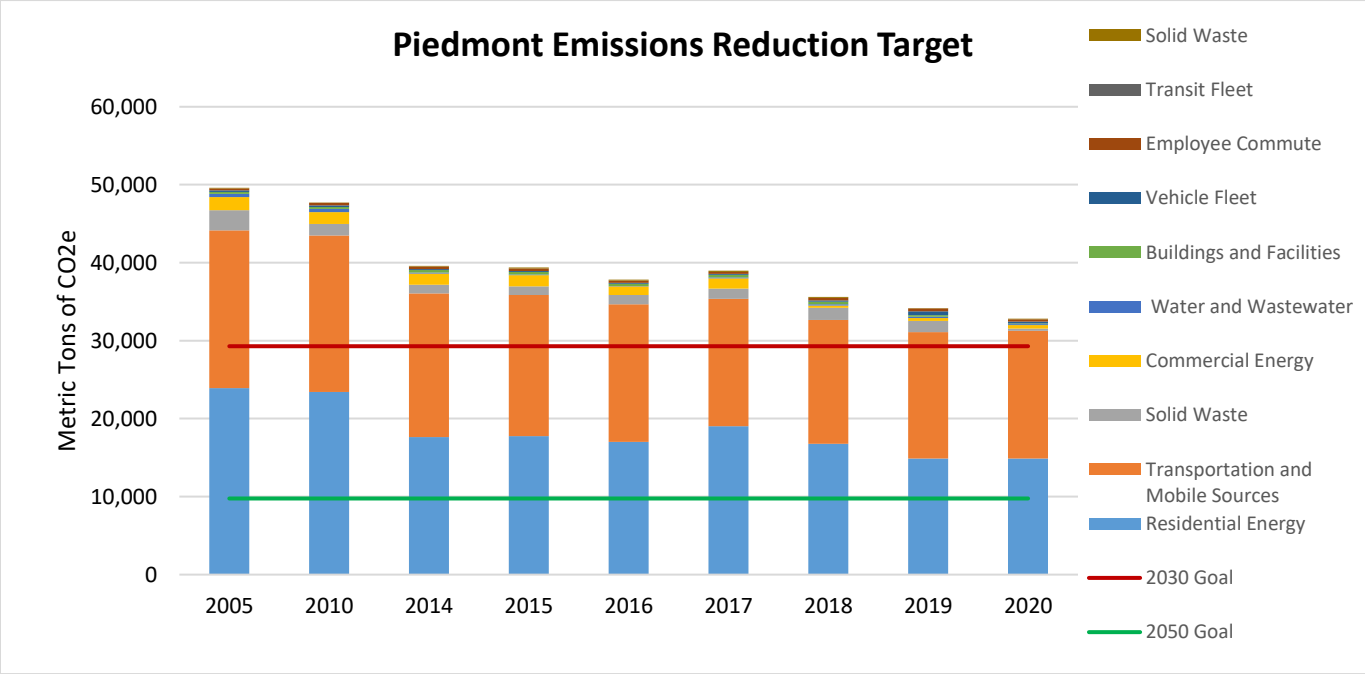


Figure 8

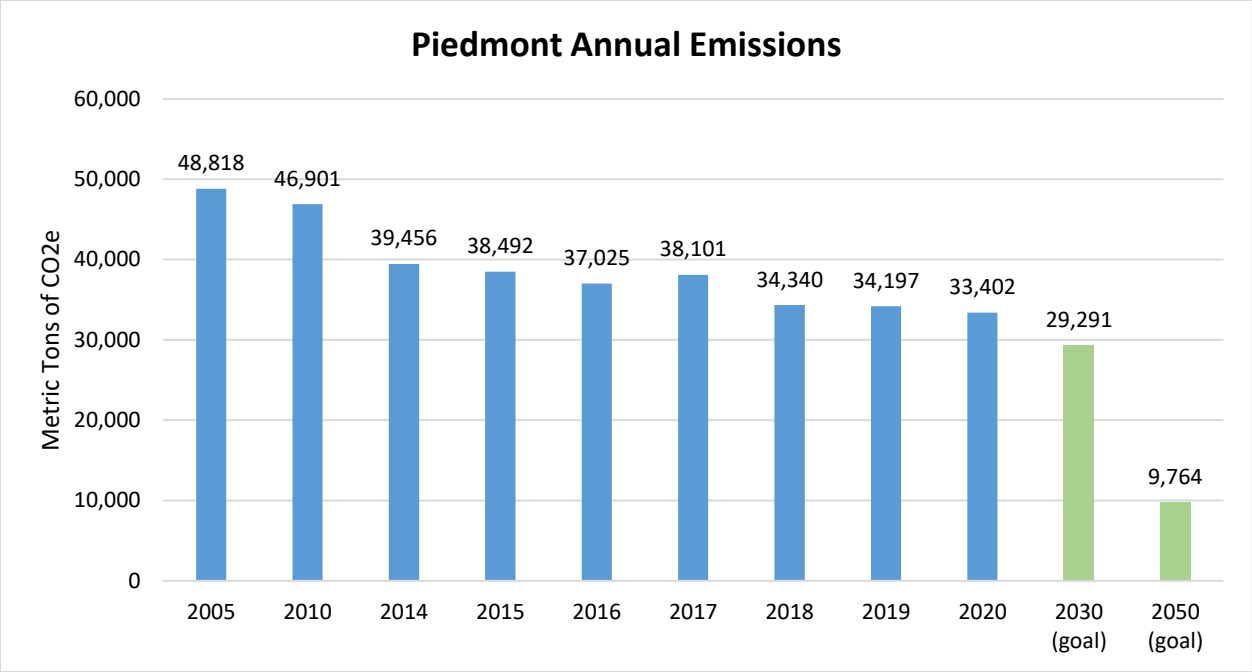


Figure 9

Previous Inventories

A base year GHG inventory for the City of Piedmont was completed by independent consultant AECOM for the year 2005. The results of this inventory indicated activities in Piedmont resulted in in-territory emissions of approximately 48,444 metric tons CO_2e. As a primarily residential community, Piedmont's largest source of in-territory emissions was building energy consumption. The second largest contributor was the transportation sector. Together, non-residential energy use, water consumption, and waste sent to landfills contributed less than 10% to overall in-territory emissions.

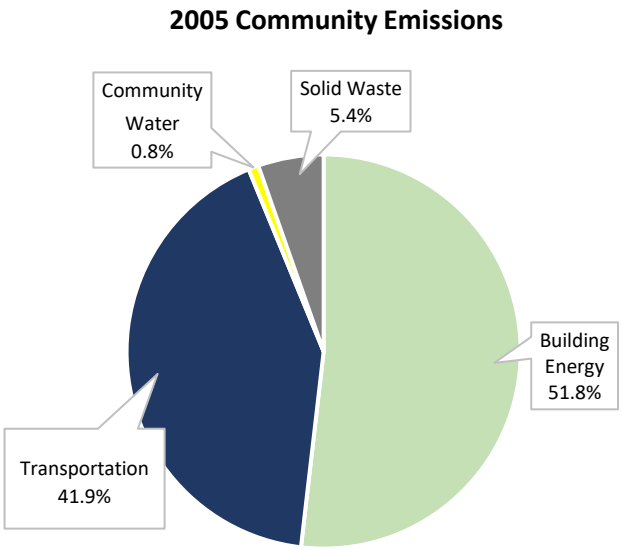


Figure 10

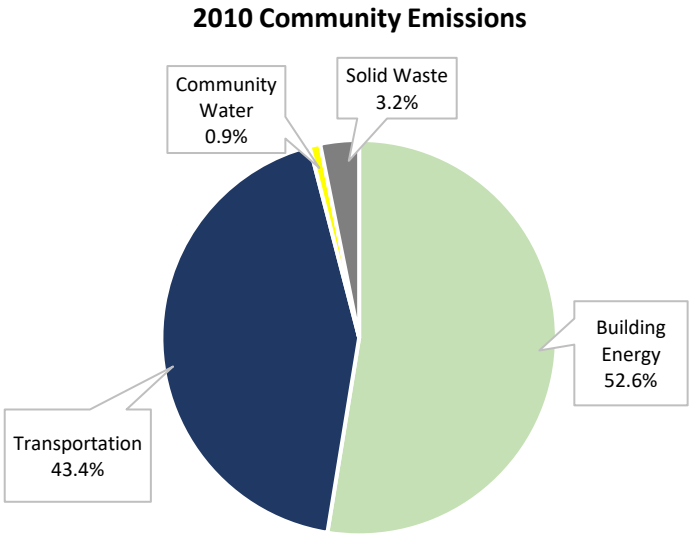


Figure 11

In 2010, a new methodology for creating an inventory for government and community GHG emissions, the U.S. Community Protocols for Accounting and Local Government Operating Protocols, was adopted as the standard across the San Francisco Bay Area. The new methodology was applied to the 2005 inventory and baseline emissions were updated to 48,818 metric tons of CO_2e. Using this calculation method in 2010, analysts found that community activities resulted in in-territory emissions of approximately 46,901 metric tons of CO_2e, a 3.9% reduction in in-territory GHG emissions from 2005 levels. This reduction can largely be attributed to an increase in hydropower in Pacific Gas and Electric Company's (PG&E) energy mix during this "wet" year. As seen in Figure 11, the distribution by sector was similar to 2005 with a slight decrease in waste produced by the community as a result of the 2008 roll-out of new recycling and organic waste programs.

In 2014, Piedmont had in-territory emissions of approximately 39,456 metric tons of CO_2e, a reduction of approximately 19.2% below 2005 levels. This was the first year Piedmont reached its 2020 GHG reduction target outlined in the CAP. In the 2010 Climate Action Plan, targets were set for 2020 and 2050. The decrease in GHG reductions was due in part to ongoing conservation and energy efficiency efforts by Piedmonters and the result of exceptionally warm seasonal temperatures. The City's municipal activities in 2014 resulted in approximately 1,076 metric tons of CO_2e.

In 2015, Piedmont had in-territory emissions of approximately 38,492 metric tons of CO_2e, a reduction of 21.2% below 2005 levels. This indicates that for the second year in a row Piedmont had reached its 2020 GHG reduction target, as seen in Figure 12. Municipal and community in-territory emissions decreased from 2014 to 2015. The reduction in emissions from the 2005 baseline is mostly the result of the continued trend in decreased natural gas usage.

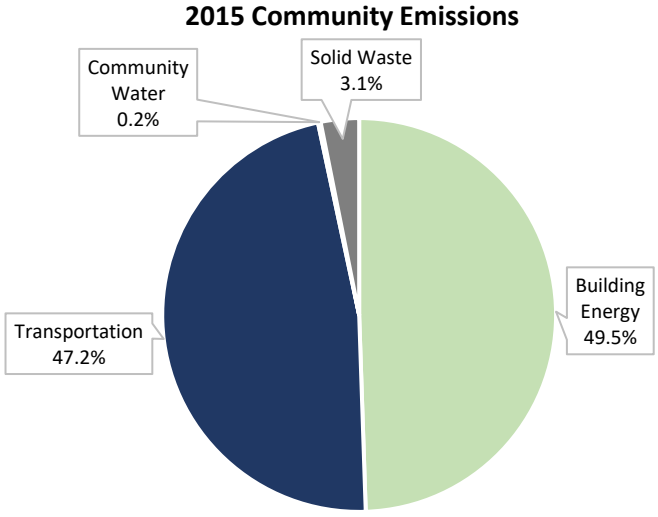


Figure 12

However, it should be noted that Piedmont's total natural gas usage (commercial and residential combined) did increase 5.9% from between 2014 and 2015.

Piedmont completed the 2016 GHG Emissions inventory in the winter of 2017, once again made possible through the City's participation in the CivicSpark program. In 2016, Piedmont had in-territory emissions of approximately 37,025 metric tons of CO_2e, a reduction of 24.2% below 2005 levels. This indicates that for the third year in a row Piedmont had reached its 2020 GHG reduction target. Both total municipal and community emissions decreased from 2015 to 2016. Although natural gas usage in 2016 was still significantly lower than in 2010, it should be noted that emissions from natural gas increased 10% between 2014 and 2016. The reduced in-territory emissions between 2015 and 2016 are largely the result of an increase in hydropower in PG&E's energy mix. As a result, between 2015 and 2016 the emissions associated with residential electricity use decreased by 28%.

In April of 2018, East Bay Energy Watch (EBEW) announced that they had selected a consultant team (Placeworks) to help prepare the 2017 GHG Inventories for all 35 East Bay Communities participating in EBEW. For the 2018-2019 year, Piedmont again secured a CivicSpark Fellow. Through this collaborative effort, Piedmont completed the 2017 Municipal GHG Emissions Inventory in January of 2019. In 2017, Piedmont had in-territory emissions of approximately 38,101 metric tons of CO_2e, of which 879.5 metric tons are attributed to municipal activities. This is a reduction of 22% below 2005 levels, and an increase of 2.9% from 2016 total emissions.

In 2019, EBEW and Placeworks worked with the Piedmont CivicSpark Fellow to complete the 2018 emissions inventory. In 2018, Piedmont had in-territory emissions of approximately 34,340 metric tons of CO_2e, of which 934 metric tons of CO_2e are attributed to municipal activities. This is a reduction of 26.44% below 2005 levels, and a reduction of 9.8% from 2017 in-territory emissions.

In 2020, EBEW permanently closed. Piedmont's 2020-2021 CivicSpark Fellow worked with City staff to complete the 2019 GHG emissions inventory and present it to the City Council.

The results showed that in 2019, Piedmont's in-territory emissions were approximately 34,197 metric tons of CO_2e, of which 1,139 metric tons of CO_2e were attributed to municipal activities. This was a reduction of 30% below 2005 levels, and a reduction of 0.42% from 2018 in-territory emissions. The reductions since 2005 are largely due to decreases in emissions from building appliances, and shift in electricity sources in 2018.

More specifically, the small reduction between 2018 and 2019 was largely due to the November 2018 community shift to renewable power through EBCE electricity. This shift reduced emissions stemming from electricity production substantially. In spite of this change, two of the largest sources of emissions (residential natural gas usage and residential vehicle usage) both increased since 2018, meaning that the overall decrease in emissions was smaller than anticipated. In order to have a larger impact on natural gas emissions, Council passed energy Reach Codes in 2021 designed to reduce residential natural gas usage over time.

2020 Greenhouse Gas Inventory

33,402 Metric Tons of CO_2e
2.3% decrease from 2019
32% decrease from 2005

Piedmont's 2021-2022 CivicSpark Fellow, Annie Wensley, worked with City staff to complete the 2020 GHG emissions inventory and present it to the City Council.

The results showed that in 2020, Piedmont's in-territory emissions were approximately 33,402 metric tons of CO_2e, of which 722 metric tons of CO_2e were attributed to municipal activities, and the remaining 32,680 were attributed to community emissions. This was a reduction of 32% below 2005 levels, and a reduction of 2.3% from 2019 in-territory emissions. The reductions since 2005 are largely due to decreases in emissions from building appliances, and shift in electricity sources in 2018.

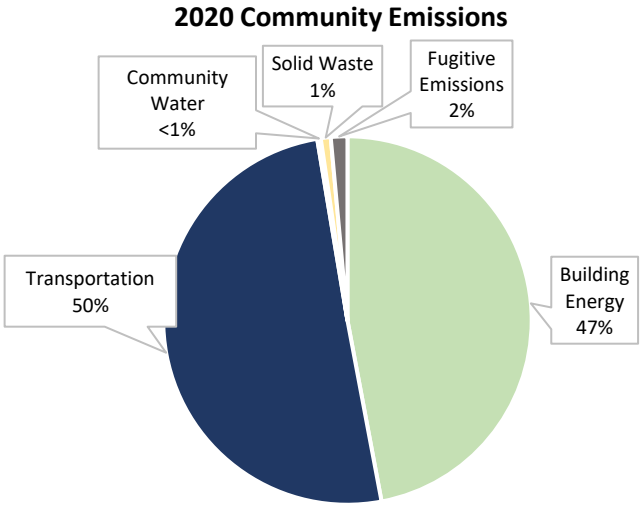


Figure 13

More specifically, these reductions can be partially attributed to the November 2018 community shift to renewable power through East Bay Community Energy (EBCE) electricity. Particularly, City Facilities and many residential energy accounts switched to EBCE's Renewable 100 Plan, which reduces the emission of CO_2e to zero through the use of 100% renewable energy.

Community Emissions

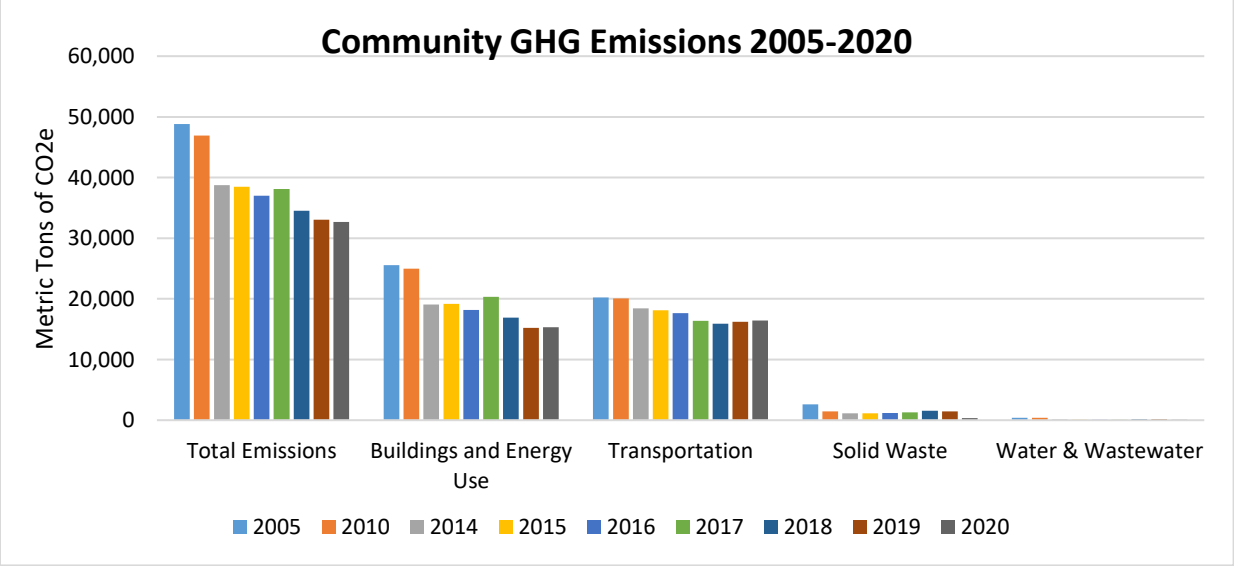


Figure 14

As seen in Figure 14 above, community-wide total emissions decreased, yet sector-specific emissions increased across the transportation and buildings and energy use sectors, and decreased across the solid waste and water and wastewater sectors. The biggest sectors contributing to in-territory emissions were building energy and transportation. Transportation does not include off road emissions, which are emissions from fuel use (gasoline, diesel, and compressed natural gas) from vehicles and equipment that are not used for transportation. Water and solid waste are minor contributors to Piedmont's community greenhouse gas portfolio. Combined, these sources account for less than 10% of total emissions. Solid waste emissions come from the breakdown of organic material in landfills.

Please see below for specific information on each sector:

Transportation

16,407 Metric Tons of CO_2e
50% of 2020 total emissions
1.2% increase from 2019

Transportation sector emissions, modeled by the Metropolitan Transit Commission (MTC), are the result of travel that begins or ends in the City, or is associated with Piedmont residents' activity. This includes personal vehicle travel, commercial transport within the City, and Piedmont residents' use of public transportation, AC Transit and BART. In 2020, transportation sector emissions contributed 50% to the community's total in-territory emissions. This is on the higher end of previous inventories, which found that transportation contributed between 40% and 50% of total in-territory emissions. This is attributed to a gradual reduction in residential energy emissions, which has positioned transportation emissions to become proportionally larger.

In-territory transportation emissions come predominately from personal vehicle use. In 2020, staff used county data to approximate Piedmont residential travel. As with elsewhere in the country, vehicle miles traveled (VMT) increased from 2019 to 2020 in Piedmont. The factors used to calculate vehicle emissions are VMT and on-road emissions factors (grams CO2/mile). The increase in transportation sector emissions from 2019 to 2020 may be explained by an increase in personal vehicle travel and commercial vehicle usage.

Data from the California Air Resources Board indicates that Piedmont residents are driving a greater percentage of electric vehicles in 2020 compared to Alameda County as a whole. In 2020, approximately 6.76% of vehicles registered to census tracts in Piedmont were electric, compared to 2.67% of vehicles registered to census tracts in Alameda County.

Vehicle Type	Piedmont	Alameda County
Gasoline	91.42%	94.21%
Electric	6.76%	2.67%
Diesel	1.77%	2.99%
Natural Gas	0.04%	0.09%
Hydrogen	0.01%	0.04%

Figure 15

Despite increased adoption of Electric Vehicles in Piedmont, Piedmont maintains one of the highest proportions of Community Vehicle Miles Travelled (VMT) to

population in Alameda County. Despite representing less than one percent of the population of Alameda County, Piedmont residents represent over ten percent of VMT throughout Alameda County. As a result, Piedmont residents emit a disproportionate amount of CO_2e from transportation.

The increase in VMT throughout Piedmont from 2019 to 2020 may be attributed, at least in part, to the Coronavirus Pandemic, during which independent vehicle travel increased, while public transportation use and transportation in shared vehicles, such as carpooling, decreased. As a result, the overwhelming majority of community transportation emissions stemmed from personal vehicle travel and commercial vehicle usage, as opposed to public transportation.

It should also be noted that emissions from airplane travel are not included in this inventory. Airplane travel contributes a large portion of many US residents' total greenhouse gas footprint. Were emissions from airplane travel included in this inventory, the inventory would likely find much higher community greenhouse gas emissions from transportation. Although car travel is included in the inventory, it is important to consider the other methods residents use to get around, and how to limit emissions stemming from those methods.

Continuing to encourage EV purchases and usage, as well as promoting public transit use is important. As Piedmont continues to improve streets, sidewalks, and bike infrastructure, deliberate decisions by the Public Works and Planning & Building Departments can help encourage residents to choose more eco-friendly modes of transportation. Additionally, residents may respond to financial incentives. Staff will continue to conduct outreach on rebates and other financial opportunities residents can use. Although community vehicle use is one of the highest causes of emissions in Piedmont, there are ways to decrease these emissions.

Building Energy

15,311 Metric Tons of CO_2e
46% of 2020 total emissions
0.59% increase from 2019

Greenhouse gas emissions associated with building energy come from burning fossil fuels to create electricity that powers electric appliances and from burning natural gas to directly power natural gas appliances. Eliminating both of these causes will have significant positive effects on Piedmont's GHG emission rates.

Between 2005 and 2020, Piedmont's emissions from building electricity has generally decreased, while emissions from natural gas have fluctuated, as seen in Figure 16. Building energy emissions in 2020 was 40% below 2005 emission levels. Much of the decrease in emissions from 2005 to 2020 owes to generally lower electricity and natural gas usage.

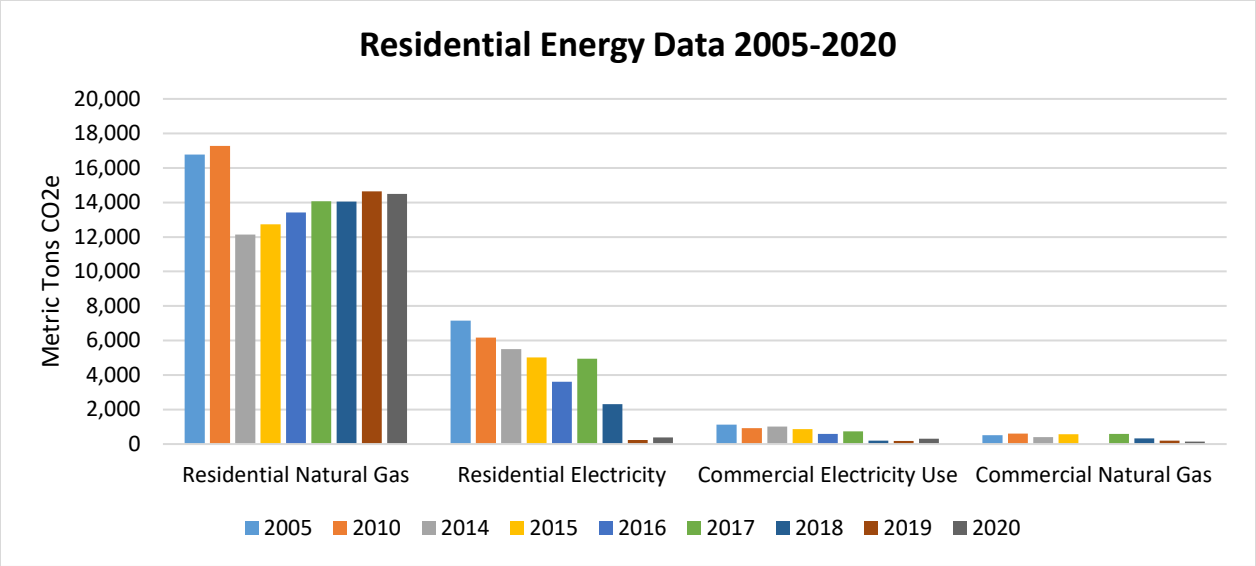


Figure 16

As seen in Figure 17 below, despite decreases in emissions from natural gas usage in both the residential and commercial sectors, emissions from electricity increased in both the residential and commercial sectors. City Staff have determined that this may be, in part, a result of greater electricity usage throughout the COVID-19 pandemic. Another contribution to the increase in emissions from electricity usage could be an increase in CO_2e emissions from Piedmont accounts enrolled in EBCE's Bright Choice electricity plan (~ 5% of accounts in Piedmont are enrolled in this plan). Compared to EBCE's 100% Renewable energy service plan (~88% of customers in Piedmont are enrolled in this plan), the Bright Choice service plan contributes higher greenhouse gas emissions, as the plan is comprised of 40% eligible renewable energy compared to 100%.

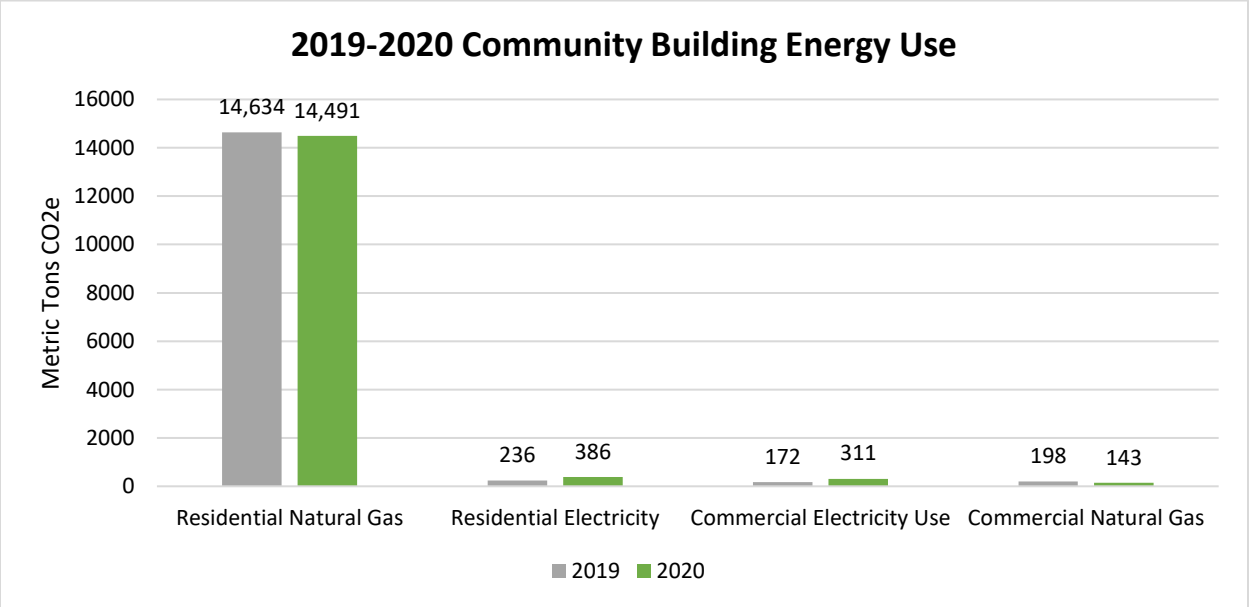


Figure 17

In 2020, residential natural gas appliances alone contributed 95% of total building energy emissions. Natural gas use in Piedmont residential homes has also decreased on average over the past ten years, though gas use fluctuates depending on the year.

It is important to note that emissions from electricity are determined not just by amount of electricity used, but also by calculations for the carbon emissions released to generate electricity. These calculations change over time, both because the methods used to generate electricity change, and because companies revise their estimates of how much carbon was previously released to generate electricity. For instance, PG&E provides municipalities with power transmission emission information, but this information is not always verifiable.

Although emissions from electricity dropped, more needs to be done to decrease emissions stemming from natural gas appliances. In February 2021, Council approved a local ordinance (Ordinance 750 N.S.) that is expected to reduce natural gas emissions stemming from homes over the next two decades. Additionally, staff continues to conduct outreach for electric appliances, and uses opportunities like the new induction cooktop loaning program to improve residents' knowledge of electrification and why it is an important climate action to take in Piedmont.

Solid Waste

368 Metric Tons of CO_2e
1% of 2020 total emissions
68% decrease from 2019

Solid waste generates methane when organic material decomposes in anaerobic landfill settings. According to Republic Services Annual Report, Piedmont produced 2,366 tons of residential waste in 2020. Over the past eight years, Piedmont has consistently diverted a majority (over 70%) of its waste from landfill to recycling and composting facilities.

It is important to note that the tons of waste reported by Republic Services remained consistent with the 2,367 tons of waste in 2019. However, the significant decrease in emissions from Solid Waste can be attributed to Piedmont's waste hauler, Republic Services, decrease in Scope 1 and 2[1] Greenhouse Gas Emissions, as reported in their 2020 Sustainability Report.

Water & Wastewater

Each year between 2005 and 2010, water and wastewater have contributed only a small percentage of total in-territory greenhouse gas emissions: between 0.1-1%. In 2020, this category accounted for 0.3% of in-boundary emissions. Emissions decreased by 37% between 2018 and 2020. Much of this decrease can be attributed to the East Bay Municipal District "EBMUD" wastewater treatment plant, which is a net energy producer, meaning that the plant produces more renewable energy onsite than is needed to run the facility.

[1] According to the United States Environmental Protection Agency (EPA), Scope 1 emissions are direct GHG emissions that occur from sources controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles). Scope 2 emissions are defined as indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling.
Source: https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance#:~:text=Scope%201%20emissions%20are%20direct,boilers%2C%20furnaces%2C%20vehicles).

Process & Fugitive Emissions

A new category for the inventory, Process & Fugitive Emissions contributed 473 metric tons of CO_2e, or 2% of emissions in the 2020 inventory. City Staff chose to begin including these emissions in the inventory beginning with the year 2020 in order to reflect a holistic scope of emissions. According to the U.S. Environmental Protection Agency, Fugitive Emissions account for GHG compounds directly released into the atmosphere as a result of extraction, transport, storage, and processing of fossil fuels such as CH4, methane, or natural gas.

Municipal Emissions

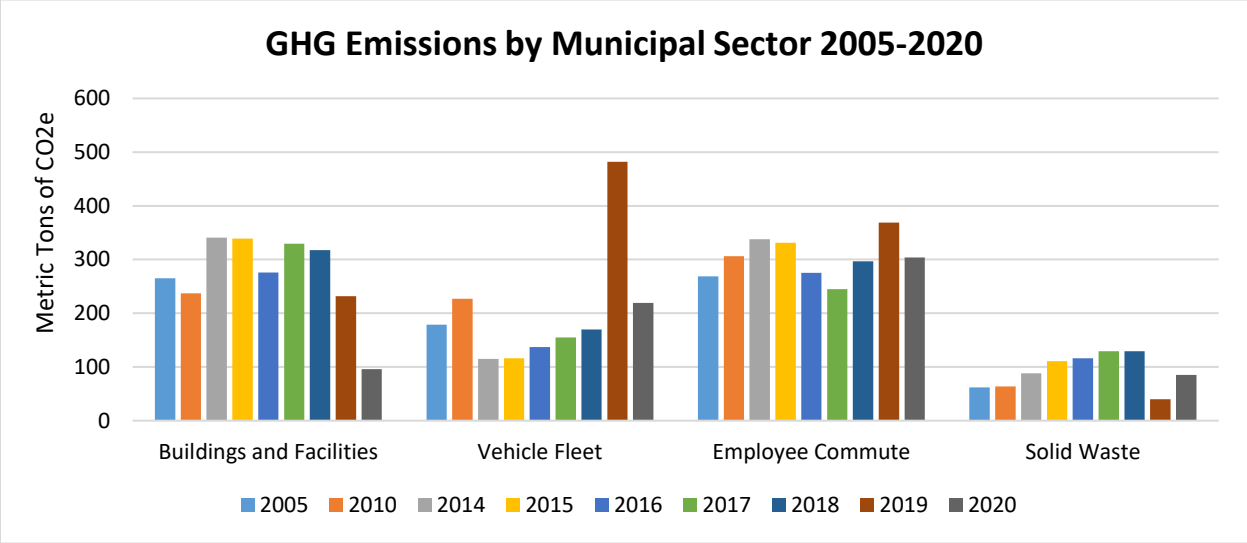


Figure 18

As seen in Figure 18 above, emissions from the vehicle fleet, employee commute, and buildings and facilities decreased in 2020. Municipal activities in 2020 resulted in in-territory emissions of approximately 722 metric tons of CO_2e, or 2.2% of total community in-territory emissions. This is a 36.6% decrease from total in-territory municipal emissions from last year. This decrease can largely be accounted for by a decrease in employees working in City Facilities due to the COVID-19 pandemic.

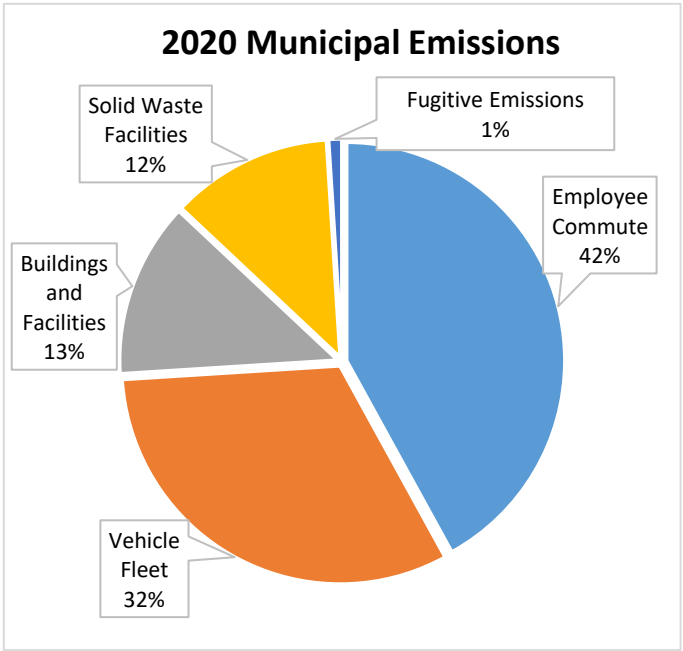


Figure 19

Municipal Energy consumption: Buildings

96 Metric Tons of CO_2e
13% of 2020 municipal emissions

Emissions associated with municipal natural gas use decreased by 49.5% since 2019. This decrease is likely attributed to City Staff working from home as a result of the COVID-19 pandemic.

Emissions associated with municipal electricity use, such as by buildings, streetlights, and sprinkler use have decreased from 42 metric tons of CO_2e in 2019 to 0 metric tons in 2020. This decrease is largely attributed to remaining City accounts switching to EBCE's Renewable 100 service plan.

Municipal Vehicle Fleet

The vehicle fleet consists of vehicles utilized by the police, fire, public works, and recreation departments, and by contractor services for landscaping (Brightview) and solid waste collection (Republic Services). In 2020, vehicles continued to contribute a substantial portion of municipal GHG emissions. In 2020, emissions from transportation account for 32% of total municipal emissions. Emissions estimates for the municipal fleet were calculated using vehicle fuel efficiency, miles driven, and fuel used by each vehicle.

Solid Waste Facilities

Municipal solid waste generated an estimated 85 metric tons of CO_2e in 2020. Despite residential emissions from solid waste decreasing from 2019 to 2020, municipal solid waste increased. However, emissions from solid waste have decreased from 2018 to 2020 by 34%.

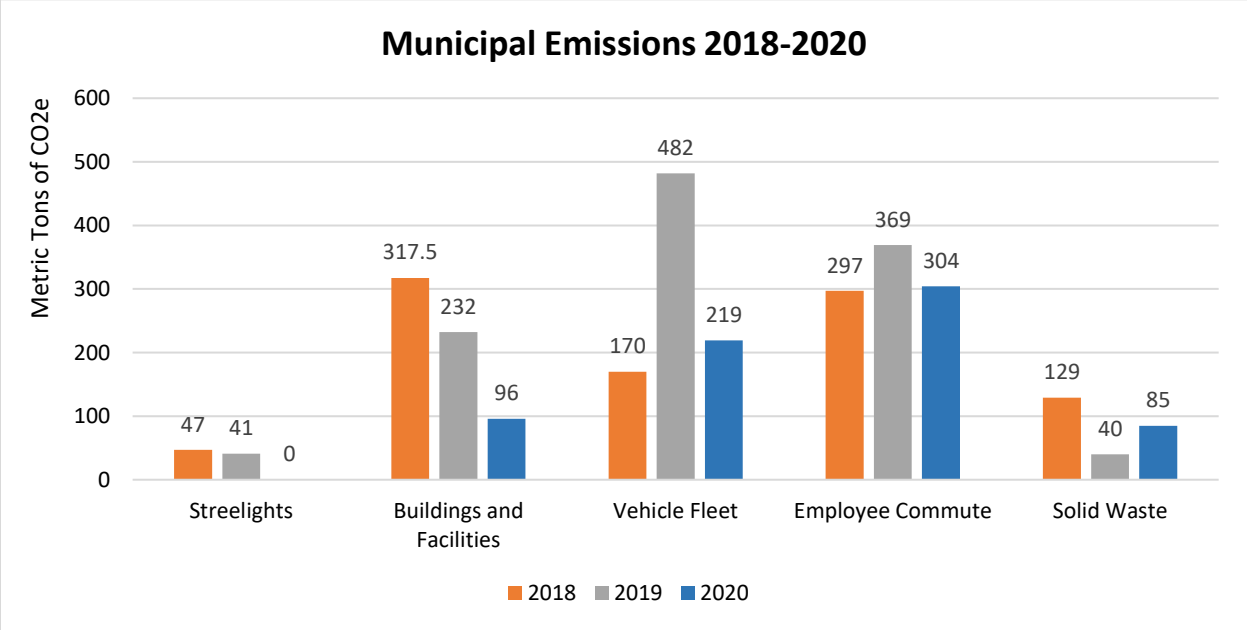
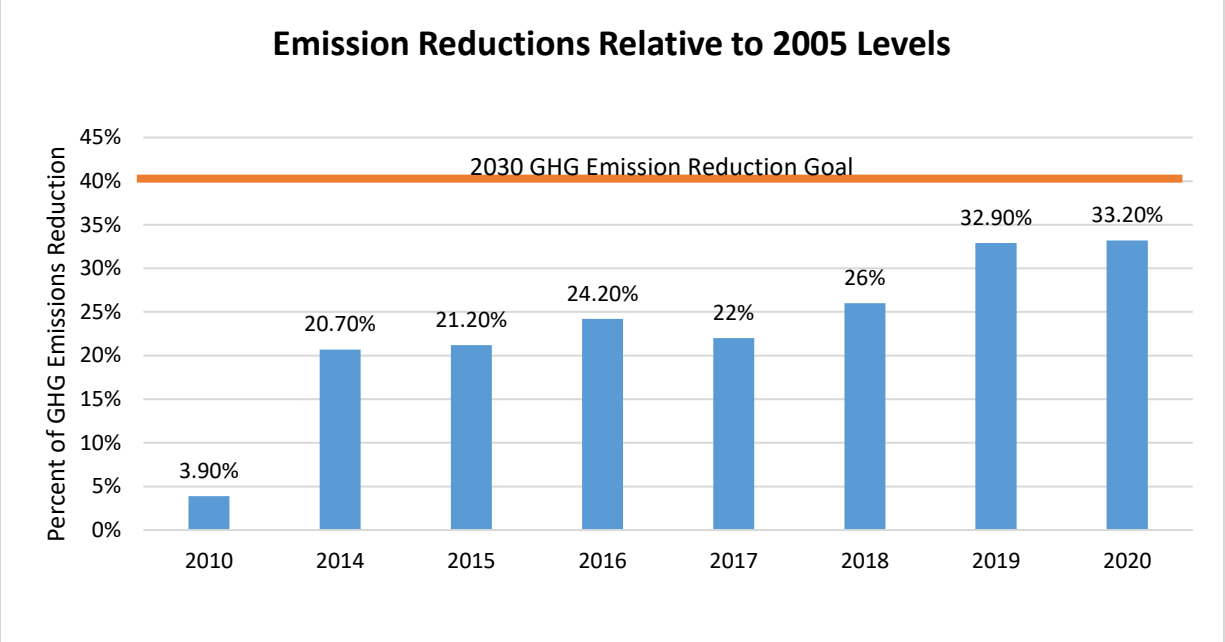


Figure 20

Conclusions

As of 2020, Community emissions continue dwarf municipal emissions, with community emissions comprising 98% of total in-boundary emissions throughout Piedmont. The City's residential and municipal enrollment in EBCE's 100% renewable energy service plan has continued to contribute to the difference in electricity emission reductions towards our 2030 goal. However, more needs to be done on both the municipal and community side, especially to curb natural gas emissions and emissions from transportation, particularly gas-powered vehicle use.



In order to have a larger impact on natural gas emissions, Council passed energy Reach Codes in 2021 designed to reduce residential natural gas usage over time. However, the impacts of the Reach Code Ordinance will be reflected in the 2021 and subsequent inventories.

CAP 2.0 Implementation Progress

The following list provides information on the progress the City has made on certain CAP 2.0 measures. Cost estimates and estimated potential GHG reductions for these measures are also provided to help prioritize actions and provide guidance on which measures are most impactful. The potential GHG reductions are not exact measurements. Instead, they are based on current best estimates and rely on a range of assumptions. The City has also made progress on a number of measures and actions that will support CAP 2.0 implementation. Some of the most recent actions include:

- The City's continued commitment to the Global Covenant of Mayors for Climate & Energy (formerly known as the Compact of Mayors), which involves conducting annual GHG inventories to track the City's progress toward meeting its emissions reduction goals.
- Passing local amendments to the statewide Building Energy Efficiency Standards ("Reach Codes" Ordinance 750 N.S.). These amendments will help residents insulate and electrify buildings and install solar panels while helping residents save energy and money.
- Approving the installation of publicly accessible electric vehicle fast chargers near the Exedra on Magnolia Avenue.
- Replacing all remaining gas water heaters with electric heat pump water heaters at City facilities.
- Continued use of a Piedmont Climate Challenge platform that can help residents track emissions reductions in their daily life and compete to see who can most reduce their emissions the most.

Cost Delineations

The cost brackets for the Planning & Building and Public Works departments were designed to match the brackets of the City's purchasing policy. A few CAP 2.0 measures rely heavily on private funds necessary for changes on private property. Some private costs would be low, like a building energy disclosure ordinance, which would cost $300 or more at the time of home sale. Some CAP measures would require higher private costs up front but should be cost effective in the long run, such as the installation of a heat pump hot water heater. Many CAP 2.0 measures address actions the Piedmont Unified School District (PUSD) can take to contribute to CAP 2.0 implementation, and its cost brackets are delineated the same way as the Planning & Building and Public Works Department's cost brackets.

Cost Categories	Planning	Public Works	Private	PUSD
LOW	<$5,000	<$75,000	<$500	<$5,000
MED	<$75,000	<$300,000	<$5,000	<$75,000
HIGH	>$75,000	>$300,000	>$5,000	>$75,000

Types of Costs

Marketing & Outreach Campaigns typically cost upwards of $75,000, a "HIGH" cost action. However, when bundled together, the costs per action decrease.

Staff Time costs include a staff member dedicated to sustainability. Alone, this is a "HIGH" cost action, but the expenditure contributes to multiple measures, resulting in "LOW" cost estimates per action. As of 2020, the City hired its first Sustainability Program Manager, Alyssa Dykman, who manages and implements the City's climate action goals. The City also has participated in the CivicSpark program, which provides a full-time sustainability AmeriCorps fellow to Piedmont for about $29,500 per year.

Incentive programs targeting building energy efficiency and administered through the Planning & Building Department are highly flexible and can be adjusted depending on funds available. For example, providing a small financial incentive for local businesses or homeowners to improve energy efficiency may require a limited amount in municipal funds in conjunction with a larger amount of private funds. One project that the department is considering is revising the fee schedule.

Infrastructure projects are typically far more expensive than any other kind of CAP 2.0 implementation, with a few exceptions. Partnerships with regional JPAs, or the securing of external grants, may greatly decrease infrastructure project costs to the City. Most infrastructure project costs would likely fall to the Public Works Department, rather than the Planning & Building Department. In contrast to incentive programs, capital improvement project costs vary greatly. Installing bike racks would be "LOW" cost, but large complete street projects could be considered "HIGH" cost. For each measure, there is also a brief description of the kind of cost, such as staff time, incentives, and marketing. Figure 5.2 shows cost breakdowns by responsible party.

Private costs would be incurred by residents or businesses. Only a few CAP 2.0 measures rely on substantial private costs. Private funds that will be necessary to achieve reductions in the two sectors that contribute 91% to Piedmont's in-territory GHG emissions: the residential and commercial building energy sector, and the residential transportation sector. Optimally, the costs associated with reducing the carbon footprint of private property owners and drivers can be expected to be cost effective over the lifespan of the improvement.

	Measures and actions by sector	2030 GHG Reduction Potential (MTCO2e)	Kind of Cost	Lead Actor	Cost	Status/Priority
	Buildings and Energy					
	Objective: Reduce Residential Building Energy Use					
BE-1.1	**Measure: Disclose building energy consumption**	304				
	Develop a single-family and/or multi-family residential unit energy assessment ordinance requiring disclosure at the time of sale, major remodel, rental, or other trigger point		Staff Time, Private	**Planning & Building**	LOW	Completed. In July 2020, City Council adopted an Energy Assessment Policy requiring an energy assessment to be conducted for projects which require design review permits and which may have an energy impact. In February 2021, City Council adopted Ordinance 751 N.S. that requires a home energy assessment disclosure at time of sale. Became effective March 3, 2021. Evaluation of the policy is ongoing.
	Partner with home energy audit providers to develop public outreach and community engagement programs on residential energy assessment opportunities and energy efficiency retrofits, with a focus on post audit follow-through		Marketing & Outreach	**Planning & Building**	LOW	Ongoing. City staff continues to work with StopWaste and BayREN staff to conduct public outreach on energy assessment opportunities. Resources are provided on the Building Electrification and Reach Code webpages on the City's website.
	Increase knowledge of and encourage residents to use PGE's "My Energy" online tool to compare and understand energy and natural gas use		Marketing & Outreach	**Planning & Building**	LOW	Ongoing. A hyperlink to the My Energy online tool is provided on the Building Electrification webpage of the City's website.
BE-1.2	**Measure: Reduce electricity and natural gas consumption**	1602				

	Encourage utilities' to develop and implement demand-side management programs		Staff Time	Planning & Building	LOW	Ongoing. Information on distributed energy resource programs are provided on the Building Electrification and Solar FAQ webpages on the City's website.
	Promote and incentivize residential energy conservation and efficiency retrofits (i.e. insulation, energy-efficient windows, etc.) for existing buildings through competitions, case studies, rebates, and educational/community engagement events on statewide code changes, financing options, and the benefits of GHG reduction methods.		Marketing & Outreach, Incentive	Planning & Building	MED-HIGH	Ongoing. In May 2022, the City's Planning & Building Department launched its first Sustainability Awards as part of its annual Design Awards. City launched an interactive online platform in 2019 to enhance and incentivize local action, which includes residential energy conservation and retrofit opportunities. Marketing of these programs is ongoing.
	At point of replacement, consider requiring the installation of energy conserving appliances and fixtures, such as on-demand tank-less water heaters, Energy Star appliances, and LED lightbulbs		Staff Time, Private	Planning & Building	LOW-HIGH	Completed. In February 2021, City Council adopted Ordinance 750 N.S. that requires certain energy efficiency measures during renovations. Became effective as June 1, 2021. Evaluation of the policy is ongoing.
	Promote Property Assessed Clean Energy (PACE) financing and other energy improvement financing programs		Marketing & Outreach	Planning & Building	LOW	Ongoing. Information on PACE financing and other energy improvement financing programs are listed on the Building Electrification webpage on the City's website.
	Consider following the State's goal of having all new residential construction be Zero Net Energy (ZNE)		Staff Time, Private	Planning & Building	HIGH	Completed. Based on the state's Residential New Construction Zero Net Energy (ZNE) Action Plan, all new residential construction will be ZNE by 2020. The state's definition of a ZNE building is an energy-efficient building where, on a source energy basis, the actual annual consumed energy is less than or equal to the on-site renewable generated energy. As of the 2019 Building Code, solar photovoltaics (PV) are required to offset the remaining energy needed to get to ZNE. The 2022 Building Code expands solar PV systems with onsite battery storage standards.

	Investigate developing an online, GHG reduction tracking platform for Piedmont residents to track their actions that may affect their carbon footprint and to participate in community-wide GHG reduction challenges		Staff Time	Planning & Building	LOW	Completed. In collaboration with Piedmont Connect, the City launched an interactive online platform, the Piedmont Climate Challenge, in fall 2019.
	Provide case studies/awards/highlights for property owners who set good sustainability examples (i.e. solar, LEED, drought-tolerant landscape, etc.)		None	Planning & Building	LOW	Ongoing. In May 2022, the City's Planning & Building Department launched its first Sustainability Awards as part of its annual Design Awards. We also have a page devoted to this on the City's website and work with Piedmont Connect to bring attention to these residents.
BE-1.3	**Measure: Switch from natural gas to electric appliances, paired with renewable energy**	14083				
	Educate residents on the options and incentives for electric appliances, such as furnaces, water heaters, dryers, stoves, and more, as well the importance of pairing electrification with the installation of renewable energy		Marketing & Outreach	Planning & Building	LOW	Ongoing. The Building Electrification page on the City's website contains information about this, as does the Piedmont Climate Challenge Website. Additional information is shared through the City's Climate Action e-newsletter, as well as in local media outlets.
	Consider requiring electric appliances for new construction		Staff Time, Private	Residents & Building	MED	Completed. In February 2021, City Council adopted Ordinance 750 N.S. that requires all-electric appliances for new construction of low-rise residential buildings and detached accessory dwelling units (ADUs).
	Provide incentives to convert existing residences from natural gas to electric appliances		Incentive, Staff Time	Planning & Building	MED	Ongoing. The approved FY 22-23 budget allocates $50,000 for the development of a new electrification rebate program that incentives the replacement of appliances fueled with natural gas with electric appliances. Staff are having ongoing discussions about what such incentives could be and how the City could generate funds for these incentives.

BE-3.3	**Measure: Increase the amount of renewable energy delivered through the grid**	1794				
	Encourage residents to choose East Bay Clean Energy as their electricity provider and support education and community engagement for residents throughout the transition to EBCE		Staff Time, Marketing & Outreach	Planning & Building	LOW	Ongoing. EBCE is currently the default option for Piedmont accounts. 93% of residential electricity accounts are enrolled in EBCE service plans. Staff partners with EBCE to continue to educate residents about electricity options.
	Have 100% renewable be the default option for Piedmont residents through EBCE with an opt-down option		Staff Time, Marketing & Outreach	Planning & Building	LOW	Completed. In May 2018, City Council voted to auto-enroll all residential electricity accounts in EBCE 100% Renewable Energy service plan starting in November 2018. An overwhelming share of Piedmont's electric customers are enrolled in EBCE's 100% Renewable Energy service plan.
BE-5.1	**Measure: Decrease the impact of Piedmont's building stock on pollution and GHG emissions**	1950				
	Prohibit wood-burning fireplaces in new development and encourage retrofitting existing wood-burning fireplaces with natural gas or electric alternatives		Staff Time, Private	Planning & Building	LOW	Ongoing. Ordinance 750 N.S. requires all-electric appliances for new construction of low-rise residential buildings and detached accessory dwelling units (ADUs). In advance of the 2022 Building Code effective date, staff are drafting updated language to specify interior and exterior wood-burning fireplaces in new construction is prohibited.
	Require that new air conditioning and refrigeration units use refrigerants with low global warming potential (e.g. CO2 or ammonia instead of hydrofluorocarbons)		Staff Time	Planning & Building	LOW	Ongoing. In 2020, the California Air Resources Board (CARB) approved first-in-the-nation rules to phase down the use of HFCs, including banning many HFCs in new equipment. Staff will monitor the HFC prohibitions and effective dates.
	Promote and consider requiring the installation of exterior electrical outlets to promote the use of electric maintenance equipment		Staff Time, Private	Planning & Building	LOW	Action needed. In 2021, CA Assembly Bill 1346 was signed into law, effectively banning small off-road engines which are used primarily in lawn and garden equipment. Staff are conducting ongoing outreach on the City's leaf blower regulations and

						determining opportunities to incorporate exterior electrical outlet requirements in the Building Code.
BE-6.1	Measure: Explore deep decarbonization infrastructure changes					
	Assess the potential for district heating in Piedmont, including a density assessment to evaluate potential costs, mapping the City's heating and cooling demand (including building stock and consumption data)		Staff Time, Private	Planning & Building	HIGH	Action needed. Staff have proposed a budget allocation for FY 23-24 to conduct an existing buildings electrification strategy that would provide baseline information in this area.
	Explore micro-grids as a carbon reduction and resiliency strategy		Staff Time, Private	Planning & Building & Public Works	HIGH	Action needed. Staff will continue to explore funding and partnership opportunities for microgrid deployment in Piedmont.
	Reduce the need for new natural gas lines through phasing out natural gas appliances in new construction and existing building replacements		Staff Time, Private	Planning & Building	HIGH	Ongoing. Ordinance 750 N.S. prohibits natural gas infrastructure in new construction of low-rise residential buildings and detached accessory dwelling units (ADUs). While not required, the Ordinance includes provisions for voluntary heating system electrification improvements in existing building renovation projects. Additional policy levers, such as time of replacement and building performance standards, will be necessary to address the phasing out of natural gas in existing buildings.

	Transportation					
	Objective: Increase number of trips made by biking and walking					
T-1.1	**Measure: Encourage walking and biking safety**					
	Install sidewalk railings on the Oakland Avenue bridge*		Infrastructure	Public Works	LOW	Completed. As of summer 2020, safety railings along both sidewalks on the Oakland Avenue bridge were completed.
	Enhance street crossing safety through crosswalks, flashing pedestrian lights, and signage*		Infrastructure	Public Works	MED-HIGH	Ongoing. In December 2021, the Council adopted the Piedmont Safer Streets plan which identifies 21 locations, including a subset of the highest-priority locations, that need enhanced street crossings. High priority sites are located on Moraga, Grand, or Oakland Avenue.
	Provide safety education led by the Police or Public Works Department (traffic safety messages on city buildings and online)		Staff Time	Public Works	LOW	Ongoing. In August of 2018, Public Works, the Police Department, and the City Engineer formed the Traffic Safety Team. It meets once a month to answer residents' inquiries and disseminate traffic safety information.
	Consider transitioning streets to one-way traffic to add bike lanes in residential areas		Infrastructure	Public Works	MED-HIGH	Ongoing. In 2020, the City evaluated a neighborhood request to convert the western loop of Wildwood Gardens to one-way traffic. The recommendation of the study was to keep the loops two-way.
	Implement traffic calming measures*		Infrastructure	Public Works		Ongoing. The City does not have a formal traffic calming program; instead, it considers residents' requests on a case-by-case basis. In 2020, the Council approved a pilot program for the installation of traffic-calming 'speed cushions' on Scenic and Greenbank Avenue. Evaluation of the pilot program is ongoing.
T-1.2	**Measure: Provide access to bicycles and bicycle paths**	1340				

	Pursue the installation of a Bay Area Bike Share station in the Grand Ave commercial district*		Staff Time	Public Works	LOW	Ongoing. Staff is actively searching for grants and other funding opportunities. According to Bay Wheels, the first phase of their expansion in the East Bay is complete in Berkeley, Oakland, and Emeryville and they are currently evaluating the network design.
	Enhance bike infrastructure along bikeway network designated in Piedmont's Pedestrian and Bicycle Master Plan (PBMP)*		Infrastructure	Public Works	HIGH	Completed. Based on the Safer Streets Plan, since 2014, the City completed or is in the process of 8 crossing improvement projects at intersections, 8 bikeways on street segment projects, 9 pedestrian curb ramps at intersections, and 15 street resurfacing projects.
	Install additional bike parking racks at key destinations		Infrastructure	Public Works	LOW	Ongoing. Staff is actively searching for grants and other funding opportunities.
	Implement Highland road diet		Infrastructure	Public Works	LOW	Action needed. The Safer Streets Plan recommends a detailed traffic study of the Highland Avenue corridor, with 3 objectives: road diet, reconfiguration of the "bend", and alleviating school-related congestion.
	Implement Grand Avenue road diet		Infrastructure	Public Works	LOW	Completed. In 2016, the City of Oakland implemented a road diet on Grand Avenue between Elwood Avenue and the Piedmont city limit, near Jean Street/Wildwood Avenue. The project replaced two travel lanes with bike lanes and a center turn lane.
	Coordinate with Oakland on the planning, design, funding and creation of inter-city bikeways, particularly on Grand, Moraga and Wildwood Avenues and on Park Boulevard and the creation of a map that shows these networks*		Staff Time, Infrastructure	Public Works	LOW	Ongoing. In 2015, Moraga Avenue was repaved and a bike lane was added. In 2017, a new bike lane was added to Linda Avenue, between Grand and Rose. These bike lanes add to the regional bikeway network. The City of Piedmont has been communicating with Oakland staff to contribute to the regional bikeway map.
	Introduce traffic signal controls that prioritize bicycles		Infrastructure	Public Works	LOW	Action needed.

	Provide bicycle parking at city sponsored events		Infrastructure	Public Works	LOW	Ongoing. Staff is actively searching for grants and other funding opportunities.
	Implement physical bike protection, separation, or warning infrastructure like Botts' dots, 5 in concrete dome curb extensions, or pop ups		Infrastructure	Public Works	LOW	Ongoing. Based on the Safer Streets Plan, since 2014, the City completed or is in the process of 8 bikeways on street segment projects.
	Facilitate Bike to Work Day and other bike promotion and educational/community engagement events		Staff Time	Public Works	LOW	Ongoing. In 2022, the City promoted Bike to Work Day events through various communication platforms.
	Objective: Support the adoption of ZEVs and the growth of EV charging stations					
T-4.1	**Measure: Support the growth of EV charging infrastructure**	5181				
	Install EV chargers in the Civic Center area, Grand Avenue commercial zone, and other commonly traveled locations in Piedmont		Infrastructure, Staff Time	Public Works	HIGH	Ongoing. City staff is working with East Bay Community Energy to complete the installation of 4 publicly accessible EV fast charging stations (DCFC) on Magnolia Avenue south of the Exedra. The chargers are anticipated to be installed by the end of 2022. Staff is actively searching for grants and other funding opportunities to deploy additional chargers.
	Develop an ordinance to require EV charger pre-wiring in any garage remodel		Staff Time, Private	Planning & Building	HIGH	Completed. Chapter 8 of City Code requires newly constructed one- and two-family dwellings, townhouses, and one- and two-family dwellings with an existing or proposed garage for which a building permit application has been submitted with a project value of $50,000 or greater and that includes an electric service panel upgrade to comply with CalGreen Code.
	Require pre-wiring for EV charging in new construction		Staff Time, Private	Planning & Building	HIGH	Completed. The 2019 CalGreen Code requires new construction to include the installation of an EV capable raceway to accommodate a dedicated 208/240-volt branch circuit.

	Solid Waste					
	Objective: Reduce waste going to the landfill					
SW-1.1	Measure: Establish a waste diversion target for 2030					
	Adopt a resolution to achieve 85% waste reduction and diversion by 2030		Staff Time	Public Works	LOW	Action needed. The City currently has a diversion rate of 75%.
SW-1.2	Measure: Provide education on ways to reduce consumption					
	Encourage composting within the City through education and community engagement about proper green waste sorting, backyard composting, and providing compostable bags and countertop compost bins		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. As of January 1, 2022, all residents in California are required to subscribe to organics collection service per SB 1383 regulations. Information about composting is distributed through Republic's quarterly billing inserts, the City's Climate Action e-newsletter, and articles in local media. Composting information is also located on the Organics and SB 1383 pages of the City's website. Staff regularly give away compostable bags and green kitchen pails to residents at the City's Planning & Building Counter. In 2021, sustainability staff managed a table at the Harvest Festival about composting.
	Promote educational programs and community engagement and outreach on reducing food waste, recycling, and landfill diversion		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. Sustainability staff manage Piedmont Evergreen, the City's outreach and education program for waste reduction, recycling, and composting. In the last year, staff assisted with waste management and diversion efforts at the Harvest Festival and Turkey Trot. The City's website provides information on these topics on various pages housed under Recycling, Organic Waste, & Garbage Collection Services in Piedmont.

	Promote "fix-it" clinics to educate residents on how to repair items instead of throwing them away		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. Staff distribute information about "fix-it" opportunities through local media articles and the City's Climate Action e-newsletter.
	Provide education and community engagement on items accepted in bulk-pick up program to ensure proper disposal of appliances and other bulky refuse		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. Information about bulky-items is distributed through Republic's quarterly billing inserts, the City's Climate Action e-newsletter, and articles in local media. Information can also be found on the City's Bulky Items website page. County-wide information can be found on StopWaste's Re:Source tool.
	Provide education and community engagement on where to drop-off specialized waste, such as paints, fats, grease, oils, and other items that cannot go in curbside or bulk pick-up		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. Information about specialized waste is distributed through Republic's quarterly billing inserts, the City's Climate Action e-newsletter, and articles in local media. Information can also be found on the City's Household Hazardous Waste and E-Waste website pages. County-wide information can be found on StopWaste's Re:Source tool.

	Consumption					
	Objective: Reduce emissions associated with food consumption and food waste					
C-2.1	Measure: Reduce Food Waste					
	Educate residents on how to reduce waste of edible foods through proper food storage, meal planning, and purchasing of 'imperfect food'		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. City staff organized a community event in April 2019 to raise awareness on more sustainable consumption habits, goods, and services. City's Climate Challenge platform and Piedmont Evergreen program also include information about this topic.
C-2.2	Measure: Reduce carbon intensity of food consumption					
	Begin a community campaign to educate the public about food choice as part of a climate-friendly lifestyle		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. City staff organized a community event in April 2019 to raise awareness on more sustainable consumption habits, goods, and services. The City's Climate Challenge platform and the Piedmont Evergreen program also provide information about this topic.
	Educate residents and businesses on low-carbon food options, such as minimally processed foods, fruits, grains and vegetables		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. The City's Climate Challenge platform and the Piedmont Evergreen program provide information about this topic.
	Educate residents on the benefits of collecting and recycling fats, oils, and grease from food products and use		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. The City's Climate Challenge platform and the Piedmont Evergreen program provide information about this topic.
	Objective: Increase awareness of consumption related GHG emissions					
C-3.1	Measure: Provide education on consumption related GHG emissions					

	Increase awareness of consumption-based GHG emissions through the Climate Action Plan		Staff Time, Marketing & Outreach	Planning & Building	LOW	Ongoing. City staff organized a community event in April 2019 to raise awareness on more sustainable consumption habits, goods, and services. The City's Climate Challenge platform and the Piedmont Evergreen program provide information about this topic.
	Promote education on personal and household carbon footprints		Staff Time, Marketing & Outreach	Planning & Building	LOW	Ongoing. City staff organized a community event in April 2019 to raise awareness on more sustainable consumption habits, goods, and services. The City's Climate Challenge platform and the Piedmont Evergreen program provide information about this topic.
	Host a decarbonization workshop to promote awareness of the climate change impacts of consumption		Staff Time, Marketing & Outreach	Planning & Building	LOW	Ongoing. City staff organized a community event in April 2019 to raise awareness on more sustainable consumption habits, goods, and services. The City's Climate Challenge platform and the Piedmont Evergreen program provide information about this topic.

	Water and Wastewater					
	Objective: Reduce water use by 20%					
WW -1.1	**Measure: Encourage residential and commercial users to participate in EBMUD's free water audit program**					
	Partner with EBMUD and StopWaste to provide water conservation outreach and community engagement programs and encourage residential and commercial users to participate in free water efficiency audits		Staff Time, Marketing & Outreach	**Public Works**	**LOW**	**Ongoing. Information on water conservation can be found on the Water Conservation page on the City's website. Staff regularly provide updates on the drought and water conservation at Park Commission meetings. Staff also share updates on water conservation opportunities in the City's Climate Action e-newsletter and local media.**
	Promote rebates for water efficiency projects, including low-flow fixtures		Staff Time, Marketing & Outreach	**Public Works**	**LOW**	**Ongoing. Information on water efficiency be found on the Water Conservation page on the City's website. Staff regularly provide updates on the water efficiency projects at Park Commission meetings. Staff also share updates on water efficiency opportunities in the City's Climate Action e-newsletter and local media posts.**
	Require a water efficiency audit at point of sale		Staff Time, Marketing & Outreach	**Planning & Building**	**LOW**	**Action needed.**
WW -1.2	**Measure: Reduce residential water use**					
	Adopt a residential retrofit program to encourage the installation of water conservation measures		Staff Time, Marketing & Outreach, Private	**Planning & Building**	**LOW**	**Ongoing. Ordinance 750 N.S. includes a water conservation package option for homeowners to select for installation when undergoing a $25,000 or $100,000 renovation project.**
	Consider requiring the installation of water conserving fixtures at the point of sale or rental		Staff Time, Marketing & Outreach	**Planning & Building**	**LOW**	**Action needed.**

	Consider requiring pool covers in order to reduce evaporation		Staff Time, Marketing & Outreach	Planning & Building	LOW	Action needed.
	Investigate developing an online, GHG reduction tracking platform for Piedmont residents to track their actions related to water use that may affect their carbon footprint and to participate in community-wide GHG reduction challenges		Staff Time, Marketing & Outreach	Planning & Building	LOW	Completed. In collaboration with Piedmont Connect, the City launched an interactive online platform, the Piedmont Climate Challenge, in fall 2019. The platform provides information related to water conservation actions that help to reduce GHG emissions.
	Objective: Conserve and Collect water					
WW -2.1	**Measure: Promote infrastructure improvements**					
	Work with EBMUD to repair and maintain existing water lines to prevent leaks		Staff Time	Public Works	MED	Ongoing. Staff are evaluating and monitoring water use reports to determine priority sites for repairs and improvements.
WW -2.2	**Measure: Encourage use of greywater and rainwater collection**					
	Consider requiring greywater or rainwater collection systems in new construction		Staff Time, Private	Planning & Building	LOW	Action needed.
	Create an outreach or community engagement program that encourages business and residents to construct greywater and rainwater collection systems that can be used for irrigation and non-potable uses		Staff Time	Public Works	MED	Action needed.

	Municipal					
	Objective: Reduce City GHG emissions					
M-1.1	Measure: Set a zero-carbon goal for the City government					
	Pass a resolution committing Piedmont's municipal facilities and activities to zero-carbon by 2050 and develop interim milestones		Staff Time	Planning & Building	LOW	Action needed.
	Objective: Reduce emissions from City buildings and energy supply					
M-2.1	Measure: Reduce energy use in city buildings					
	When remodeling or repairing City buildings, include opportunities for energy efficiency retrofits or green building certification		Infrastructure	Public Works	MED	Ongoing. The City has a Civic Green Building Ordinance that resides in Chapter 8 of the Piedmont Municipal Code. Staff is actively searching for grants and other funding opportunities.
	Construct new City buildings to ZNE and green building certification standards		Infrastructure	Public Works	LOW	Ongoing. The City has a Civic Green Building Ordinance that resides in Chapter 8 of the Piedmont Municipal Code. Staff is actively searching for grants and other funding opportunities.
	Increase the energy efficiency of lighting and appliances in City buildings as opportunities arise		Infrastructure	Public Works	LOW	Ongoing. The City has a Civic Green Building Ordinance that resides in Chapter 8 of the Piedmont Municipal Code. This is also standard practice for the Piedmont Building Department. Staff is actively searching for grants and other funding opportunities.
	Switch from natural gas to electric appliances once the electricity supply nears 100% and the technology becomes affordable		Staff Time	Public Works	MED	Ongoing. In May 2022, the City replaced all remaining gas water heaters with electric heat pump water heaters. The City also already converted all cobra head streetlights to LEDs and will be converting the remaining decorative post

						top streetlights to LEDs. Staff is actively searching for grants and other funding opportunities.
	Investigate strategies for reducing energy use at the City aquatic facilities		Staff Time	Public Works	HIGH	Completed. In April 2022, an Energy Use Report developed for the new Aquatic Facility that determined it is feasible to electrify the entire facility with a combination of electric heat pumps, photovoltaic/thermal (PVT) panels, and integration with the clean electrical grid. In April 2022, Council directed staff to proceed with full electrification of the new facility and pursue additional funding and partnership opportunities to offset electrification costs. Staff is actively searching for grants and other funding opportunities.
M-2.2	**Measure: Monitor Building Performance**					
	Consider installing electronic building performance displays in all publicly accessible buildings		Staff Time, Infrastructure	Public Works	LOW	Action needed.
	Conduct energy audits of all buildings every 10 years		Staff Time, Private	Public Works	MED	Ongoing. The approved FY 22-23 budget allocates $150,000 for the completion of an energy audit and analysis of municipal buildings.
M-2.3	**Measure: Increase the amount of renewable energy on-site and through the grid**					
	Evaluate the potential for and install cost-effective renewable energy systems on City Properties		Staff Time	Public Works	MED	Ongoing. The approved FY 22-23 budget allocates $150,000 for the completion of an energy audit and analysis of municipal buildings, which will inform potential future projects.
	Commit to 100% renewable energy through EBCE.		Staff Time	Public Works	LOW	Completed. In May 2018, City Council voted to auto-enroll all municipal electricity accounts in EBCE 100% Renewable Energy service plan starting in November 2018.
	When constructing new buildings or replacing and structurally upgrading		Staff Time	Public Works	MED	Ongoing. The approved FY 22-23 budget allocates $150,000 for the completion of an energy audit

	roofs, build solar ready or include the installation of solar in the bid process					and analysis of municipal buildings, which will inform potential future projects.
M-2.4	**Measure: Reduce emissions from high global warming potential gases**					
	Enforce the ban on petroleum powered leaf blowers and maintenance equipment		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. In 2021, CA Assembly Bill 1346 was signed into law, effectively banning small off-road engines which are used primarily in lawn and garden equipment. Staff are conducting ongoing outreach on the City's leaf blower regulations and determining opportunities to incorporate exterior electrical outlet requirements in the Building Code. City staff are also considering options to more effectively enforce the ban.
	Replace high GWP refrigerant air conditioners and dispose of them properly		Infrastructure	Public Works	LOW	Ongoing. Corp Yard replaced gas furnace and water heater with heat pumps in August 2020. Staff is actively searching for grants and other funding opportunities.
	Continue to maintain Piedmont's urban forest and plant new trees where possible to sequester carbon emissions, improve air quality, and help reduce the heat island effect		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing. As of 2022, staff are working to develop a municipal tree inventory that will provide baseline information and conditions.
	Objective: Reduce Municipal Transportation Emissions					
M-3.1	**Measure: Reduce employee transportation emissions**					
	Promote employee ride-shares, walking, biking, and public transportation as commuting alternatives		Staff Time, Marketing & Outreach	Public Works	LOW	Ongoing.
	Provide a shower and changing area for City employees to facilitate biking to work		Staff Time, Infrastructure	Public Works	LOW	Action needed.

	Install EV chargers accessible to City employees		Staff Time, Infrastructure	Public Works	MED	Action needed.
M-3.2	**Measure: Reduce municipal fleet emissions**					
	Develop a fleet purchasing policy that prioritizes fuel efficiency and ZEVs		Staff Time	Public Works	LOW	Ongoing. In 2022, staff are working with EBCE to conduct a fleet electrification assessment which will help inform future fleet purchasing decisions.
	Objective: Reduce Solid Waste Generated by City Services					
M-4.1	**Measure: Reduce solid waste generated by the city or city-related events**					
	Implement a zero-waste City Events, including compostable dinnerware, water refilling stations, and banning plastic water bottles		Staff Time	Public Works	LOW	Ongoing. Staff follow guidelines and procedures set forth by the Green Event Guide and Sustainable Procurement Policy to achieve maximum waste diversion, including the use of reusable foodware.
	Institute paperless practices for City Council, Commissions, and community meetings		Staff Time	Public Works	LOW	Ongoing. Staff follow guidelines and procedures set forth by the Sustainable Procurement Policy to reduce paper use.
	Enforce and expand the City's environmental purchasing policy		Staff Time	Public Works	LOW	Completed. In December 2021, the Council adopted updates to the City's Sustainable Procurement Policy, which expands on purchasing policies since the first plan was adopted in 2011.
	Conduct a solid waste audit for City facilities		Staff Time	Public Works	LOW	Action needed.
	Consider meat-free options for City events		Staff Time	Public Works	LOW	Ongoing. Staff follow guidelines and procedures set forth by the Sustainable Procurement Policy to minimize emissions from food and food waste.
	Educate City employees and the public on recycling and composting at city events and facilities		Staff Time	Public Works	LOW	Completed. In 2022, Sustainability staff provided trainings to City purchasers on the City's recently updated Sustainable Procurement Policy.

	Replace paper towels with electric hand dryers in City bathrooms		Staff Time	Public Works	LOW	Ongoing. Electric hand dryers have been installed in Community Hall and staff are evaluating sites for additional deployment.
	Objective: Reduce City Water Use					
M-5.1	**Measure: Reduce water use in City buildings**					
	Install water efficient fixtures in City buildings, including motion sensor faucets in bathrooms		Infrastructure, Staff Time	Public Works	LOW	Ongoing. Staff are evaluating sites in City facilities to install water efficient fixtures.
	Install water efficient appliances, such as dishwashers and hot water heaters		Infrastructure, Staff Time	Public Works	LOW	Ongoing. Staff are evaluating sites in City facilities to install water efficient appliances.
M-5.2	**Measure: Reduce and capture water use in City landscapes**					
	Transition current water-intensive landscaping to drought-tolerant landscaping, limiting areas requiring intensive irrigation		Infrastructure, Staff Time	Public Works	LOW	Ongoing. Staff are monitoring and tracking water use in City landscapes and public areas. In FY 2022-23, irrigation upgrades will focus on improvements to turf irrigation in Piedmont parks where lawn is actively used for irrigation.
	Facilitate the installation of weather-based evapotranspiration (ET) controller irrigation systems in City landscapes		Infrastructure, Staff Time	Public Works	LOW	Ongoing. In FY 2022-23, irrigation upgrades will start at existing meters in parks, medians, and civic landscapes. Installed submeters will provide flow information, leak detection and improve water management at each meter by transmitting water use data through a wireless network.
	Implement the City's Green Infrastructure Plan		Infrastructure, Staff Time	Public Works	LOW	Ongoing. Staff are actively assessing opportunities for green infrastructure, including Oakland Avenue, Lower Grand, and the Highland-Guilford Steps. These opportunities are being prioritized to help meet green infrastructure targets by 2027. The City's green infrastructure targets will change in the Municipal Regional Permit (MRP) 3.0 (effective July 1, 2022) and reflect reductions being met regionally and through other actions.

	Objective: Use the City's resources to disseminate and collect information on climate change					
M-6.1	**Measure: Enhance and update the City's climate action program outreach efforts**					
	Develop a user-friendly web page and/or build the City's social media presence to provide information on energy and water efficiency programs, waste reduction best practices, renewable energy, electric vehicles, and other resources. Investigate ways to include the GHG emissions reduction potential of each action		Staff Time	Planning & Building	LOW	Ongoing. The Piedmont Climate Challenge contains numerous actions individuals, households, and businesses can take and their associated GHG emission reductions. In addition, various pages on the City's website (Climate Action Plan, Electric Vehicles, Electrification, Piedmont Evergreen, Reach Code Information, Upcoming Webinars, Water Conservation Resources) include information on sustainability best practices. Staff are actively working to build out Piedmont Evergreen social media accounts.
	Distribute information to residents and commercial business owners on energy and water audit programs, rebates, waste reduction best practices, and environmental stewardship		Staff Time, Marketing & Outreach	Planning & Building	LOW	Ongoing. In April 2022, staff held a Reach Code Community Forum which featured an informational presentation on incentive programs offered by BayREN. Staff also distribute information at the City's Planning & Building counter, as well as to participants of the City's compost giveaway events.
	Host education events on residents reducing GHG emissions		Staff Time	Planning & Building	LOW	Ongoing. In September 2021, staff worked with Piedmont Connect to host a water conservation webinar that showcased how Piedmonters are utilizing sustainable landscaping practices during the drought.
M-6.2	**Measure: Collect information to track progress on the Climate Action Plan**					
	On application forms for building and design review permits include a questionnaire regarding energy efficiency improvements include in the		Staff Time	Planning & Building	LOW	Ongoing. Staff are developing a form to be included when the Department rolls out its online permitting system in the fall of 2022.

	construction, and that heightens awareness of others not considered					
	Objective: Consider adjusting taxes to reflect the social costs of carbon					
M-7.1	**Measure: Reduce the City's carbon footprint through carbon pricing**					
	Consider adjusting the utility tax to act as a revenue neutral carbon tax on natural gas while reallocating money to reduce electricity and/or communication taxes through 2030		Staff Time, Private, Marketing & Outreach	Planning & Building, Public Works, Finance	HIGH	Action needed.
	Through a City vote, establish a carbon tax on natural gas that dedicates its revenue to energy efficiency, renewable energy, and fuel switching incentives for residents		Staff Time, Private, Marketing & Outreach	Planning & Building, Public Works, Finance	HIGH	Action needed.
	Support State and Federal efforts to establish a tax or fee on carbon		Staff Time, Marketing & Outreach	Planning & Building	LOW	Ongoing. In September 2021, Mayor King participated in a panel discussion on carbon pricing at a League of Women Voters event.