Montclair Climate Action Plan

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City of Montclair Climate Action Plan

We must rapidly begin the shift from a 'thing-oriented' society to a 'person-oriented' society.
– Dr. Martin Luther King Jr.

Public Draft
October 2024

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Table of Contents

Climate Resilience

Ability to prepare for, recover from, and adapt to impacts from our changing climate.[1]

Climate Mitigation

Avoiding and reducing emissions of heat-trapping greenhouse gases into the atmosphere to prevent the planet from warming to more extreme temperatures.[2]

Climate Adaptation

Altering our behavior and systems to protect our families, economies, and the environment from the impacts of climate change.[2]

1. https://www.c2es.org/document/what-is-climate-resilience-and-why-does-it-matter/?gclid=CjwKCAiAtouOBhA6EiwA2nLKH1iHNDMdt-S2tqbW0NynC1MUOXsIj7w4M8COvxf00-mJZ8LIgG4qnhoC4mwQAvD_BwE
2. https://www.worldwildlife.org/stories/what-s-the-difference-between-climate-change-mitigation-and-adaptation

Section 1: Introduction

Vision

Montclair is a diverse and forward-thinking community with a young population. Approximately 33.7 percent of the population was born outside of the United States and 63.6 percent of the population speaks a language other than English at home.[3] The community's diversity is highly valued and is part of the foundation that supports the City's first Climate Action Plan (CAP). This CAP presents a pathway for Montclair to reduce greenhouse gas (GHG) emissions, prepare for and mitigate climate risks, and chart the course towards a more sustainable and resilient future. Key components of that future include healthy, accessible, and safe communities that attract and retain jobs, while providing and promoting equitable access to the advancements made through the implementation of the CAP.

Equity in Montclair is defined as a strategic focus of policies, programs, and processes targeted towards communities at greatest risk, and those that require the greatest support.

The goal of this CAP is to interweave equity considerations throughout the Plan because we are committed to working together to reduce our emissions in a fair way and make Montclair, our surrounding communities, and the world a more sustainable, healthier, and resilient place. As such, the role of the CAP is to protect those most vulnerable, including, disadvantaged communities and small businesses, against the impacts of climate change.

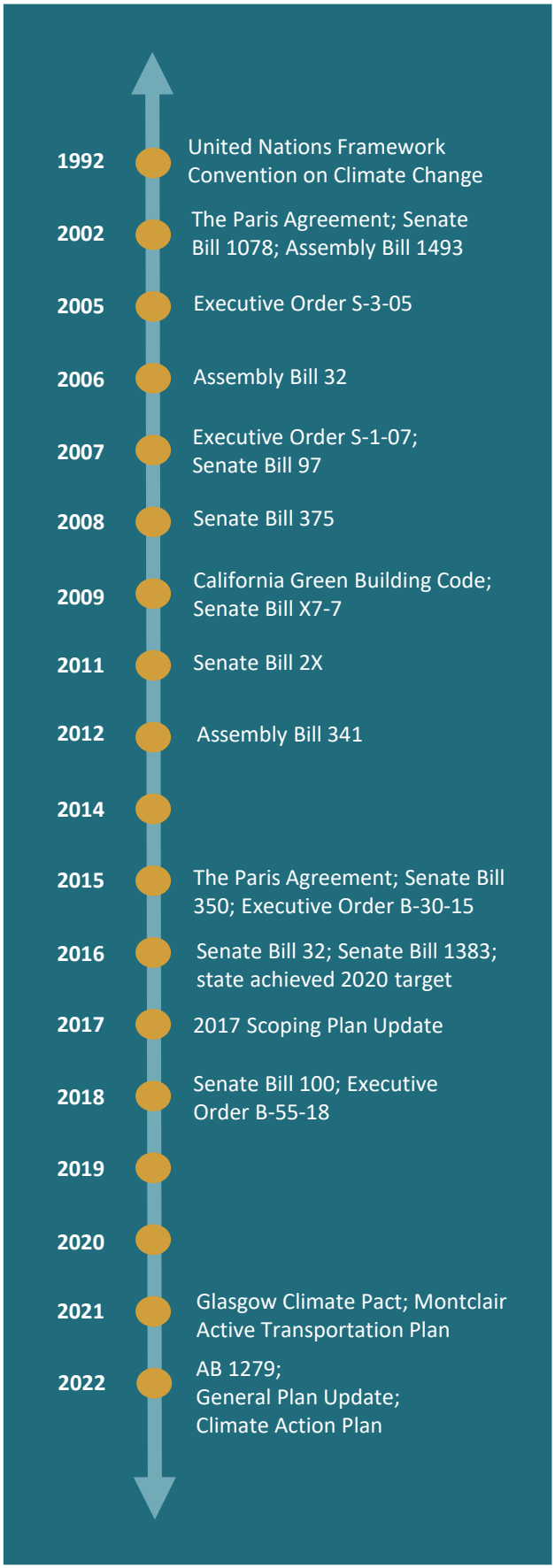
3. https://www.census.gov/quickfacts/montclaircitycalifornia

Background

The effects of climate change are already felt on the local level and are projected to worsen over the next century without a concerted global effort to address the sources of GHG emissions (see *Climate Change in the City of Montclair* for more information on local climate impacts).[4] Therefore, the City of Montclair is looking to the future and preparing for a changing climate and the risks that come with it by adopting our first community CAP. The CAP is a long-range planning document that guides the City towards GHG emissions reductions in accordance with State of California's climate goals and the fair share reductions necessary to limit global warming to 1.5°C compared to pre-industrial levels. The 1.5°C goal was set by the Paris Agreement (2015), which is a legally binding international treaty on climate change, that aims to limit global warming to well below 2°C, preferably to 1.5°C. These goals were reiterated in the Glasgow Climate Pact (2021). See Appendix A for more information on the Paris Agreement and the Glasgow Climate Pact, as well as information on other relevant climate regulations. Figure 1 also includes a timeline of relevant regulations.

4. https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/

Figure 1 Climate Action Timeline



The CAP analyzes GHG emission sources within the City, forecasts future emissions, and establishes emission reduction targets (See Section 2 and Appendix C). This CAP builds upon the San Bernardino County Regional Greenhouse Gas Reduction Plans (GGRP)[5] that were completed in 2014 and 2021, setting a pathway for the City to reduce GHG emissions to 40 percent below 1990 levels by 2030, as outlined in Senate Bill (SB) 32. This CAP also was developed to make substantial progress towards reducing emissions in line with Assembly Bill (AB) 1279, which aims for carbon neutrality by 2045, with 15 percent of the reductions achieved through carbon capture and sequestration solutions. The CAP also provides a framework for implementation and monitoring reduction activities, and further promotes adaptation and preparedness actions. The Plan is intended to be a qualified GHG Reduction Plan and meets the requirements of the California Environmental Quality Act (CEQA) 15183.5(b), see *Purpose* for more information.

COVID-19 and Climate Action

The COVID-19 pandemic disrupted daily life and strained both local and national economies, highlighting the intersection of climate change and community health. It also exposed how vulnerable communities are disproportionately impacted. Frontline communities, already facing higher exposure to toxic air pollution and respiratory illnesses, were hit hardest by the pandemic and continue to experience disproportionate impacts. Likewise, while the economic shutdown affected everyone, small business owners and income-insecure workers were among the least equipped to endure the crisis and await recovery. However, the global response to the pandemic demonstrated that swift, large-scale action in the face of disasters is both possible and essential. Together, we can make a difference.

5. The Regional GGRP provides the information for partner jurisdictions to use, if they so choose. The City of Montclair can choose whether to adopt the Regional GGRP's established strategies or make their own. The Regional GGRP shows what reductions are possible if every jurisdiction were to adopt the proposed strategies. Source: https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/
6. https://www.worldbank.org/en/news/press-release/2021/11/03/covid-19-responses-could-help-fight-climate-change

Although GHG emissions in the United States dropped by about 12 percent and global GHG emissions dropped by about 7 percent between 2019 and 2020 due to the restrictions from COVID-19,[7] global GHG emissions rebounded in 2021,[8] which puts an emphasis on how important it is to act now. This CAP has been developed with a goal of reducing GHG emissions consistent with state goals while also addressing environmental justice and climate equity for our frontline communities. This CAP outlines how Montclair can work towards a safe and equitable future.

Purpose

This CAP will guide the City of Montclair towards reducing GHG emissions consistent with the targets set out by SB 32 and AB 1279, as well as fulfill the requirements of the CEQA Guidelines Section 15183.5(b). CEQA Guidelines Section 15183.5(b) includes the following required criteria for a qualified CAP:

A. Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area (See Section 2)

B. Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable (See Section 2)

C. Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area (See Section 2)

D. Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level (See Section 3)

E. Establish a mechanism to monitor the Plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels (See Section 5)

F. Be adopted in a public process following environmental review (See Appendix E)

If projects are consistent with the CAP, CEQA analysis can be streamlined by presuming that the project is consistent with the measures included in the CAP and the project's GHG emissions are not significant.[10]

Greenhouse Gas Emissions Background

Most of the energy that affects Earth's climate comes from the sun. When solar radiation reaches the Earth's atmosphere, some of it is reflected back into space and a small portion is absorbed by Earth's surface. As Earth absorbs the solar radiation, its surface gains heat and then re-radiates it back into the atmosphere. Some of this heat gets trapped by gases in the atmosphere, causing Earth to stay warm enough to sustain life. This is known as the *greenhouse effect* and the gases trapping the heat are known as *greenhouse gases*.[11] See the infographic depicting the *greenhouse effect and impacts* on the following page.

The greenhouse effect is integral to sustaining life on Earth. However, human activities emit GHGs in excess of natural ambient concentrations, thereby contributing to the enhancement of the natural greenhouse effect. This enhanced greenhouse effect contributes to global warming, an accelerated rate of warming of Earth's average surface temperature. More specifically, by burning fossil fuels to power homes, businesses, and automobiles, we increase the amount of GHGs emitted into the atmosphere,[12] which, in turn, leads to increased absorption of infrared radiation by the Earth's atmosphere and increasing temperatures near the surface.

7. https://earth.stanford.edu/news/covid-lockdown-causes-record-drop-carbon-emissions-2020#gs.iu69fg
8. https://www.globalcarbonproject.org/carbonbudget/21/files/Norway_CICERO_GCB2021.pdf
9. Please Appendix A for a full summary on the regulatory background that drives the climate action planning process.
10. https://opr.ca.gov/docs/OPR_C8_final.pdf
11. https://scied.ucar.edu/learning-zone/how-climate-works/greenhouse-effect
12. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

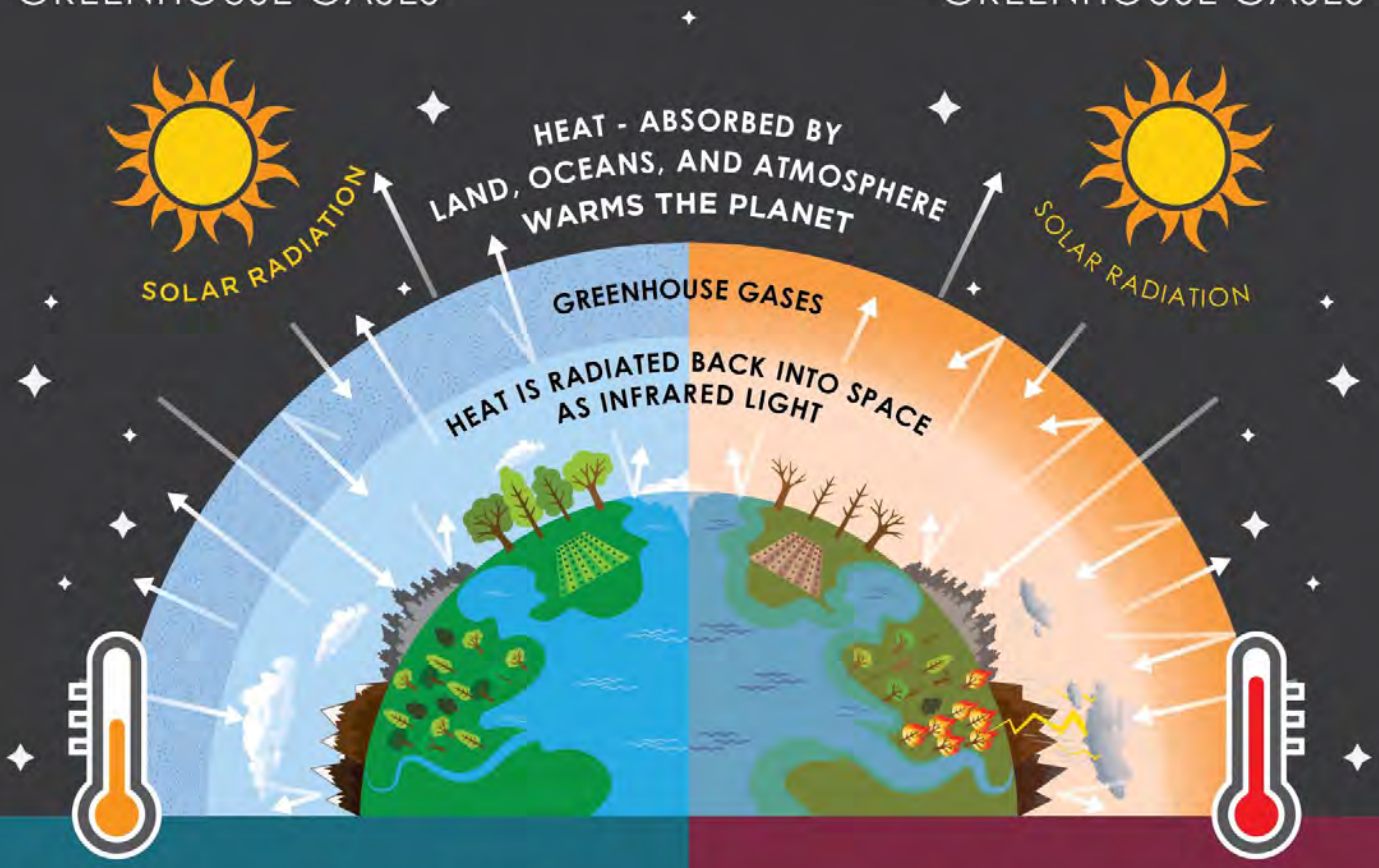
GREENHOUSE EFFECT

In the last century, human activities such as burning fossil fuels and deforestation have caused a jump in the concentration of greenhouse gases in the atmosphere.

THE RESULT: Extra trapped heat and higher global temperatures.

WITH NORMAL GREENHOUSE GASES

WITH INCREASED GREENHOUSE GASES



Some heat continues into space while the rest, trapped by greenhouse gases, help maintain the planet's relatively comfortable temperatures.

LESS GAS =
LESS HEAT TRAPPED IN THE ATMOSPHERE

Retaining more reliable:

- **Weather**
- **Temperature**
- **Rainfall**
- **Sea Level**

Increased greenhouse gases means less heat escapes to space. Between preindustrial times and now, the earth's average temperature has risen by 1.8°F (1.0°C).

MORE GAS =
MORE HEAT TRAPPED IN THE ATMOSPHERE

More intense:

- **Storms**
- **Heat**
- **Drought**
- **Sea Level Rise**

Types of Greenhouse Gases

Greenhouse gases listed by the United Nations Intergovernmental Panel on Climate Change (IPCC) include: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), as well as chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which are collectively called fluorinated gases.[13] In the United States, 97 percent of the annual GHG emissions generated consist of CO_2, CH_4, and N_2O collectively,[14] while fluorinated gases[15] result in the remaining three percent of emissions. Because CO_2, CH_4, and N_2O comprise a large majority of GHG emissions at the community level, these are the gases considered in this analysis.

Each of these gases has its own global warming potential (GWP), or extent to which it traps energy in the atmosphere, ranging from a decade to several thousand years. Often, CO_2 is used as the reference point to compare the potential impact of different GHGs; therefore, CO_2 has a GWP of 1. The GWPs for the emissions included in this analysis are summarized below.

GHG	GWP
CO_2	1
CH_4	25
N_2O	298

When all GHG's are normalized based on their GWP's they are referred to as carbon dioxide equivalents or CO_2e. It is important to also note that there are a variety of GWPs, based on different timeframes and the lifespan of the GHG; however, to be consistent with California's state-wide inventory we have relied upon those included in the Fourth IPCC Assessment Report (2007).[16]

Sources of Greenhouse Gas Emissions

The combustion of fossil fuels (such as natural gas and gasoline), the decomposition of waste, and industrial processes are the primary sources of GHG emissions. With the accelerated increase in fossil fuel combustion and deforestation since the Industrial Revolution of the 19th century, concentrations of GHG emissions in the atmosphere have increased exponentially. The

13. https://www.c2es.org/content/main-greenhouse-gases/
14. https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors
15. Fluorinated gases, which includes four main types: hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6) and nitrogen trifluoride (NF_3), are man-made gases that can stay in the atmosphere for centuries and contribute to the GHG effect.
16. https://www.ipcc.ch/assessment-report/ar4/

California Air Resources Board (CARB) tracks the statewide emissions and publishes an annual report: *California Greenhouse Gas Emissions for 2000 to 2019 Trends of Emissions and Other Indicators.*[17]

According to CARB, in 2019 statewide emissions were 418.2 million metric tons of carbon dioxide equivalent (MMT CO_2e), 7.2 MMT CO_2e lower than 2018 levels and almost 13 MMT CO_2e below the 2020 GHG limit of 431 MMT CO_2e. Between 2018 and 2019, emissions from transportation and electric power decreased due to a significant increase in renewable diesel (up 61 percent from 2018), making diesel fuel bio-components (biodiesel and renewable diesel) 27 percent of total on-road diesel sold in California. Additionally, there was a continued increase in renewable energy generation, including a 46 percent increase in available in-state hydropower in 2019. General trends in CARB's inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product (GDP) is declining.

Emissions in Montclair

As part of the development of this CAP, the City of Montclair developed a 2017 GHG Inventory for its community and municipal emissions sources. A GHG inventory provides information about a community's GHG emissions profile and break that down into individual sectors looking at specific emissions by source. Montclair's inventory is broken down into four sectors: transportation, energy, water, and solid waste for both municipal and community GHG emissions profiles. See Section 2 for more information on the inventory, as well as the forecast and targets established as part of this climate action planning process.

Climate Impacts

Anthropogenic (human) caused climate change is well-understood and widely accepted by the scientific community, with over 97 percent of climate scientists agreeing that the planet is warming and human activities are the root cause.[18] Essentially, climate change is the addition of excess GHGs to the atmosphere which traps energy (heat) and causes changes to temperature, wind patterns, and precipitation. Because of human activities, these GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 400 parts per million in the last 150 years.[19] Although many changes to climate are governed by natural processes, human activities have contributed an increasing amount of GHGs to the atmosphere at a rate that is unprecedented in Earth's history. The Paris Agreement establishes a roadmap to keep the world under 2° C of warming with a goal of limiting an increase of temperature to 1.5° C. As mentioned above, the CAP guides the City towards GHG emissions reductions in accordance with these climate goals and establishes a path that allows the City to achieve the fair share reductions necessary to limit global warming to 1.5°C compared to pre-industrial levels.

Effects of Climate Change

Globally, climate change is already linked to several changes which will impact the earth and its population. Scientists have measured shrinking ice sheets, warming oceans, increasing global temperatures, less snow cover, sea level rise, and species extinction. Consequently, global climate change has the potential to result in reduction of fresh-water supply (due to rainfall and snowfall changes), adverse changes to biological resources and public health (due to increased temperature, less-productive habitats, and expansion of disease vectors), as well as many other adverse environmental consequences.[20]

Globally, a warming trend is abundantly clear, with both the years 2016 and 2020 being the hottest years on record.[21] Additionally, the 20 hottest years on record have all occurred since 1998.[22] Climate change is a global phenomenon that has the potential to impact local health, natural resources, infrastructure, emergency response, and many other facets of society. The direct impacts projected for the City of Montclair include increased temperatures and potential changes in precipitation patterns.

17. https://ww2.arb.ca.gov/sites/default/files/classic/cc/ghg_inventory_trends_00-19.pdf
18. https://climate.nasa.gov/scientific-consensus/
19. https://climate.nasa.gov/evidence/
20. https://www.ipcc.ch/sr15/chapter/chapter-3/
21. https://climate.nasa.gov/evidence/
22. https://www.ncdc.noaa.gov/cag/

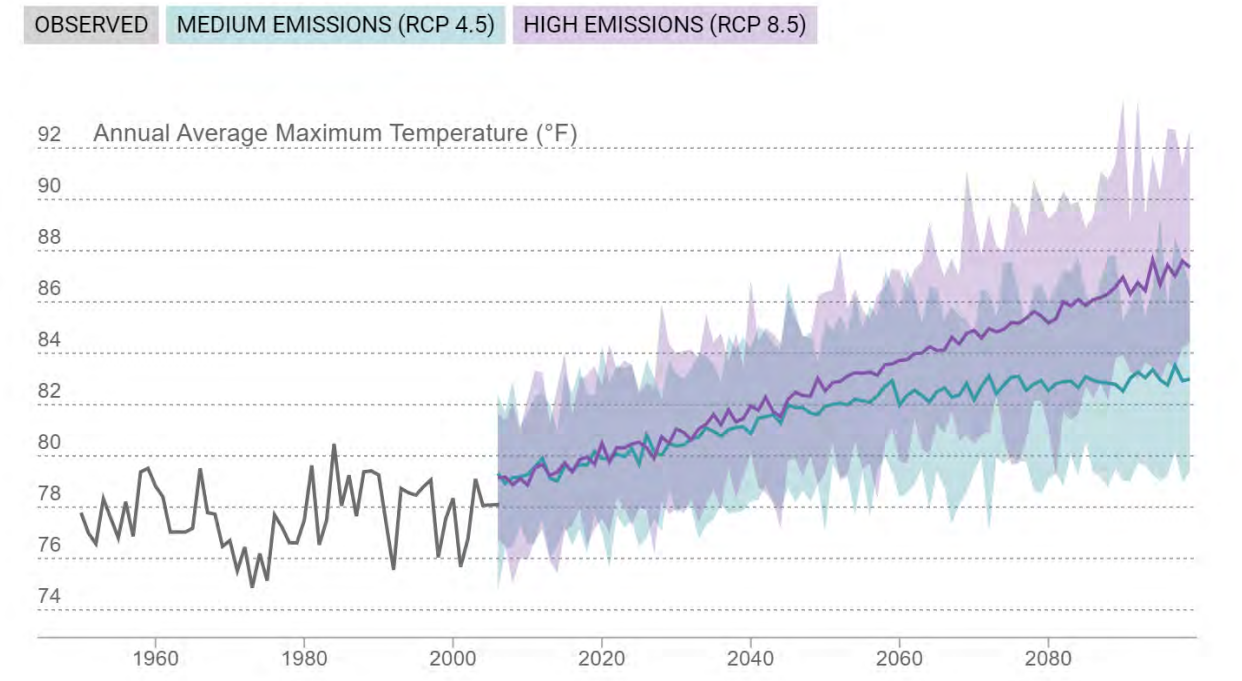
Climate Change in the City of Montclair

In the City of Montclair, the most pronounced effects of climate change will be increased average temperature, more days of extreme heat, and elevated drought risk. The projections used in this analysis were taken from Cal-Adapt, an interactive platform that allows users to explore how climate change might affect California at the local level under different emissions scenarios and climate models, which was developed by the Geospatial Innovation Facility (GIF), University of California, Berkeley with funding and advisory oversight by the California Energy Commission. The conservative emissions scenario used in this analysis is Representative Concentration Pathway (RCP) 8.5, also known as the high emissions scenario, which is intended to project a business-as-usual continuation of current emissions. A range of climate models exist to cover the variability of physical processes, leading to warm/dry simulations and cool/wet simulations. Best practices for conservative planning indicates that an average of all models gives the most representative value. See Appendix B for further information on RCPs and climate models used.

As shown in Figure 2, The projected maximum temperatures in the City of Montclair are expected to rise between 4.4°F and 5.3°F by the end of the century depending on the emissions scenario.[23] Montclair is also projected to experience more extreme heat conditions (Figure 3). The annual number of heat waves, defined as the number of days in a year when the daily maximum temperature is above a threshold temperature of 101.4°F, is projected to increase from 12 to 16 days depending on the scenario by the end of the century. In Southern California, the top five warmest years in terms of annual average temperature have all occurred since 2012:[24] 2014 was the warmest, followed by 2015, 2017, 2016, and 2012. A trend is forming and has been observed. This shows that climate change is already impacting the City of Montclair in the form of hotter annual temperatures and longer and more potent extreme heat days.

The Cal-Adapt projections shows some change in the variability in total annual precipitation in Montclair with increased precipitation in years with high precipitation and a slight decrease in precipitation in low precipitation years, as illustrated in Figure 4. Even small changes in the variability of precipitation can lead to significant

Figure 2 Historical and Projected Maximum Temperatures for the City of Montclair



23. https://cal-adapt.org/tools/local-climate-change-snapshot/
24. https://www.energy.ca.gov/sites/default/files/2019-11/Reg%20Report-%20SUM-CCCA4-2018-007%20LosAngeles_ADA.pdf

Figure 3 Number of Extreme Heat Days for the City of Montclair

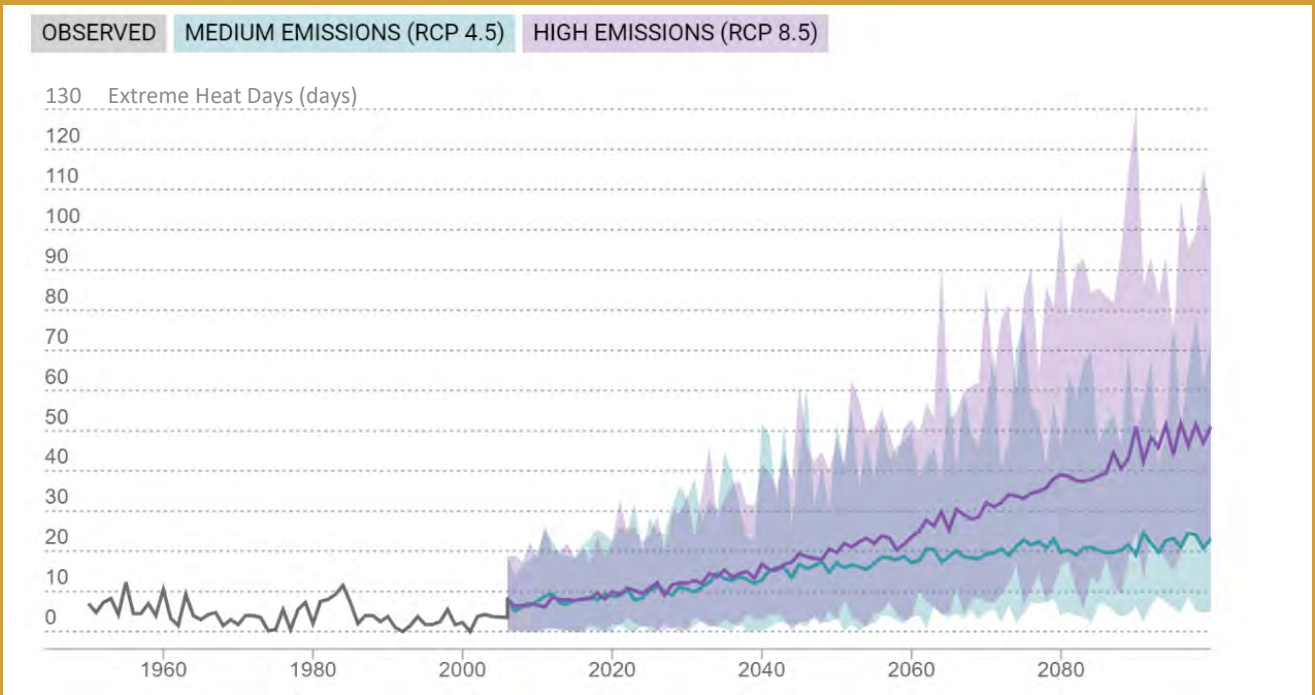
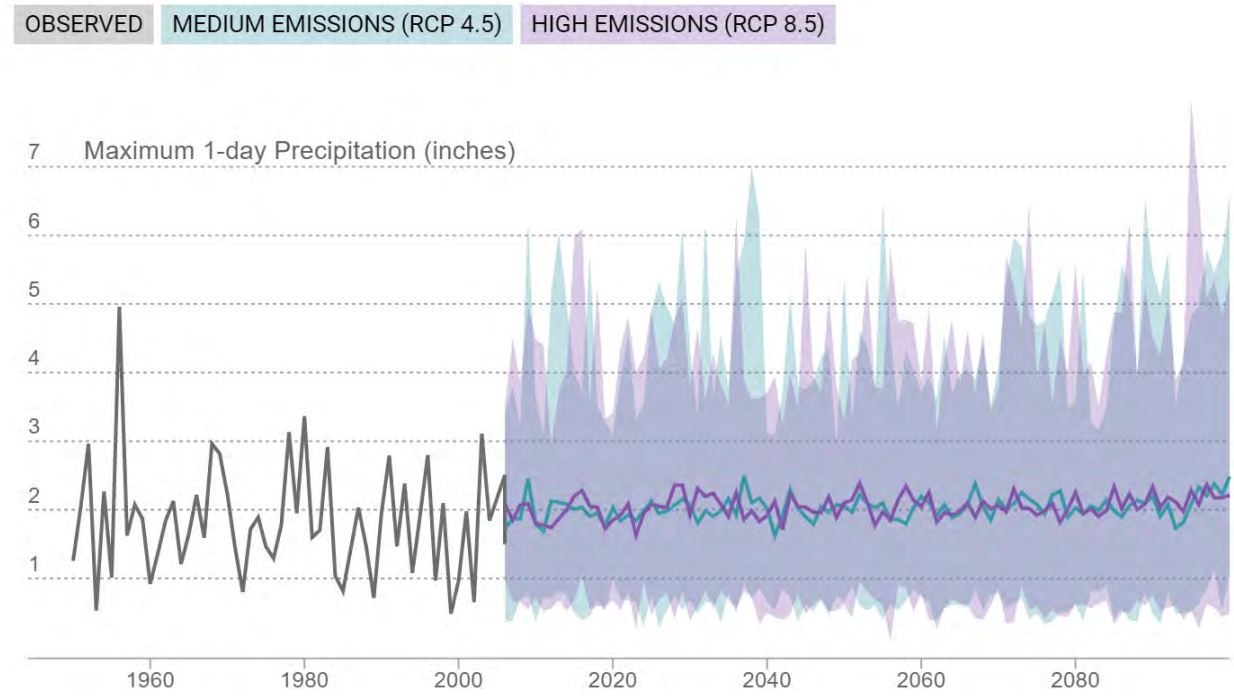
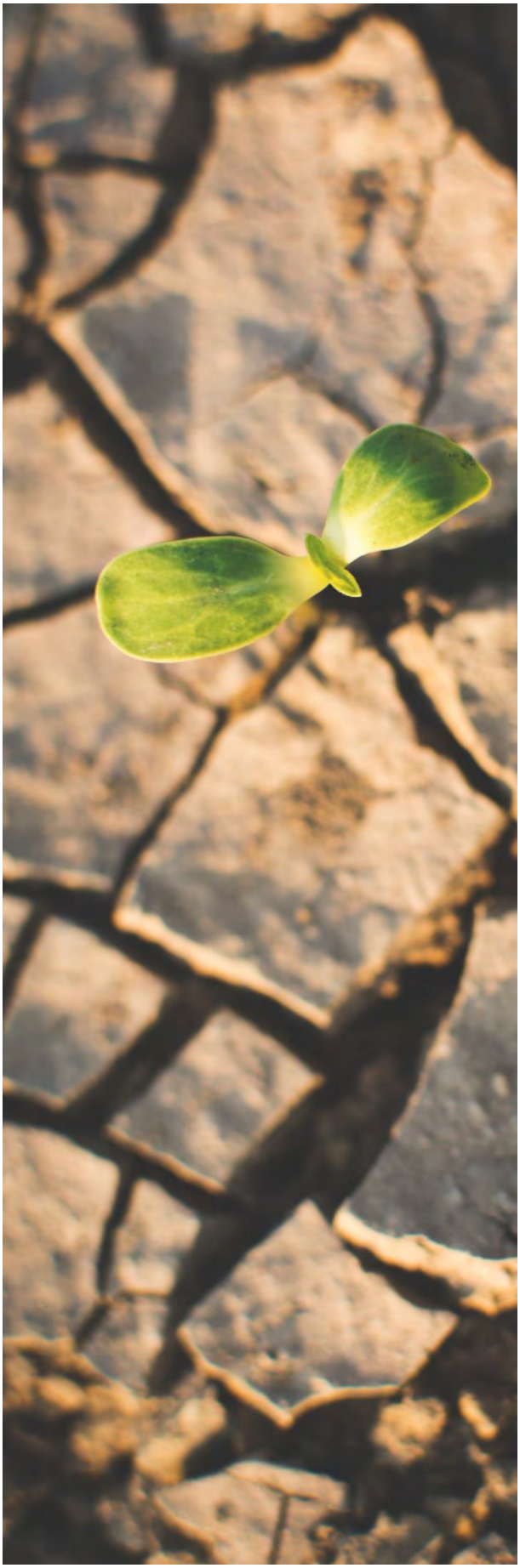


Figure 4 Annual Average Precipitation





impacts such as altered water availability throughout the year, decreased agricultural output in the region, and altered seasonal patterns which could cause increased droughts and/or flooding.

The western section of San Bernardino County, like the adjacent Los Angeles (LA) region, experiences small changes in average precipitation, dry and wet extremes, and both are expected to increase in the future. By the late-21st century, the wettest day of the year is expected to increase across most of the LA region, with some locations experiencing 25-30 percent increases under RCP 8.5. These wet day events may come in the form of an atmospheric river. Atmospheric rivers are regions of high-water vapor transport from the tropics to the Pacific Coast of the U.S. that can produce intense topographic-induced precipitation along Southern California mountain ranges.[25]

The frequency of atmospheric river events may increase in the future, and the storms themselves will be associated with higher water vapor transport rates compared to historical conditions. It is projected that we will experience a nearly 40 percent increase in precipitation during atmospheric river events over Southern California by the late-21st century under RCP 8.5. The number of atmospheric river events is also projected to increase in the future, possibly around a doubling of days by the end of the century. Moreover, the peak season of atmospheric rivers may also lengthen, which could extend the flood-hazard season in California.[26]

Extremely dry years are also projected to increase over Southern California, potentially a doubling or more in frequency by the late-21st century. Regional mountains could lose up to half their snowpack above 6,500 feet by mid-century without the implementation of climate mitigation strategies. Increases in temperature could also worsen local heat island effects in Montclair and the surrounding area, meaning that urban areas could experience a compounded level of heating due to built environments absorbing more heat than rural communities.[27] Children, the elderly, asthmatics, and others susceptible to harm from air pollution exposure, are at the greatest risk of the negative impacts associated with climate change.[28]

25. https://www.usgs.gov/news/featured-story/rivers-sky-6-facts-you-should-know-about-atmospheric-rivers
26. https://www.usgs.gov/news/featured-story/rivers-sky-6-facts-you-should-know-about-atmospheric-rivers
27. https://www.epa.gov/heatislands/learn-about-heat-islands
28. https://ww2.arb.ca.gov/capp-resource-center/community-assessment/sensitive-receptor-assessment

Social Vulnerability

Those that are most vulnerable will bear the greatest burden associated with the potential impacts of a changing climate. Race, ethnicity, gender identity, sexual orientation, age, social class, physical ability, religious or ethical value systems, national origin, immigration status, linguistic ability, and zip code do not make an individual inherently vulnerable. Instead, vulnerabilities relate to deficiencies in the system rather than a judgement of any particular community member or neighborhood. This document aims to provide a foundation to ultimately reduce potential burdens of climate change on vulnerable populations.

According to the California Healthy Places Index (HPI), Montclair is in the 3.3 percentile for a clean environment in California. Meaning, that the City has a cleaner environment than just 3.3 percent of other California census tracts. This includes air quality Ozone, $PM_{2.5}$, and Diesel PM as well as access to safe drinking water. Overall, the City of Montclair is in the 38.6 percentile, which means it is a healthier community than 38.6 percent of other California census tracts.[29] The HPI identifies challenges that could be exacerbated as climate changes impacts unfold.

Potential Impacts to the Community

The City of Montclair may experience a variety of impacts due to climate change including an increase in average temperature and changes in precipitation, as outlined above under *Climate Change in the City of Montclair*. Increased temperatures have the potential to affect public health as a result of changing environmental conditions including extreme weather events, changes in temperature and rainfall, worsening air quality, and increases in allergens and disease vectors.[30] This could lead to hazardous conditions such as heat stroke and respiratory ailments for community members. Potential impacts to public health include cardiovascular disease, exacerbation of asthma, increased risk of skin cancer and cataracts, and heat-related illnesses such as heat stroke, heat exhaustion, and kidney stones.[25] Those in the community without health insurance (about 12.9

29. https://map.healthyplacesindex.org/

30. A disease vector is a living organism that transmits an infectious agent from an infected animal to a human or another animal. Source: https://www.who.int/news-room/fact-sheets/detail/vector-borne-diseases

31. https://resources.ca.gov/CNRALegacyFiles/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf

percent of the population under 65) and those living under the poverty line (approximately 14.6 percent of the population) are particularly vulnerable.[32]

With anticipated increases in temperature, those without health insurance and/or those that are economically disadvantaged may find it more difficult to afford the additional costs of cooling their homes. Consequently, many low-income households, especially those of seniors and disabled individuals may become physically vulnerable to the effects of extreme heat events. It is imperative that the City of Montclair take action now to mitigate and prepare for these climate threats and hazards.

32. https://www.census.gov/quickfacts/montclaircitycalifornia

Section 2: Inventory, Forecast, and Targets

Emissions Inventory

A GHG emissions inventory identifies the major sources and quantities of GHG emissions produced by City government (municipal) operations and community-wide activities within a jurisdiction's boundaries for a given year. Estimating GHG emissions enables local governments to establish an emissions baseline, track emissions trends, identify the greatest sources of GHG emissions within their jurisdiction, and set targets for future reductions.

This CAP includes a 2017 baseline inventory of GHG emissions from municipal operations and community-wide activities within the City, as well as a 2030, 2040, and 2045 "business-as-usual" forecast of how emissions in Montclair would change if consumption trends and behavior continue as they did in 2017, absent any new federal, State, regional, or local policies or action that would reduce those emissions. It is important to note that the municipal operations inventory is a subset of the community inventory, meaning that the municipal emissions are included within the community-wide inventory.

The inventories are divided into four sectors, or sources of emissions: energy (electricity and natural gas), transportation, solid waste, and water consumption. Like all GHG emissions inventories, this document must rely on the best available data and calculation methodologies. Emissions estimates are subject to change as better data and calculation methodologies become available in the future. Nevertheless, the findings of this analysis provide a solid basis upon which Montclair can begin planning and acting to reduce its GHG emissions.

Municipal Emissions

In 2017, the City of Montclair's municipal GHG emissions totaled 2,594 metric tons of carbon dioxide equivalents (MT CO_2e).[33] As shown in Table 1 and Figure 5, the most emissions were generated

Table 1 2017 Municipal Emissions Summary by Sector

Sector	GHG Emissions (MT CO_2e)	Percentage of Total Emissions
Energy	**1,129**	**44%**
Electricity	1,008	39%
Natural Gas	121	5%
Transportation	**1,270**	**49%**
Vehicle Fleet	736	28%
Employee Commute	534	21%
Water and Wastewater	**138**	**5%**
Solid Waste	**56**	**2%**
Total	**2,594**	**100%**

Notes: MT CO_2e: Metric tons of carbon dioxide equivalent
1. Emissions have been rounded and therefore sums may not match.
Source: Emissions were calculated following ICLEI LGOP (May 2010) and using data provided and approved by the City. See Appendix C.

33. According to the United States Environmental Protection Agency (USEPA), "the unit "CO_2e" represents an amount of a GHG whose atmospheric impact has been standardized to that of one-unit mass of carbon dioxide (CO_2), based on the global warming potential (GWP) of the gas." USEPA. October 2014. Pollution Prevention Greenhouse Gas (GHG) Calculator Guidance. https://www.epa.gov/sites/production/files/2014-12/documents/ghgcalculatorhelp.pdf

Figure 5 2017 Municipal Emissions Summary by Sector

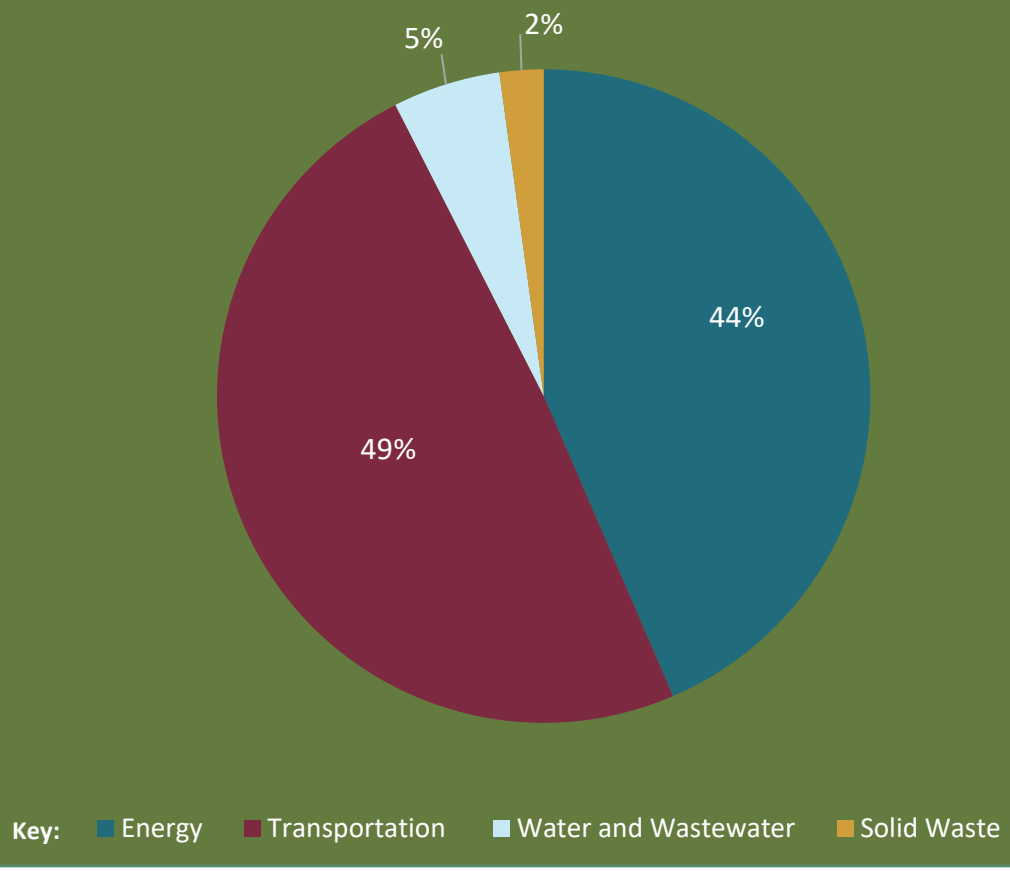
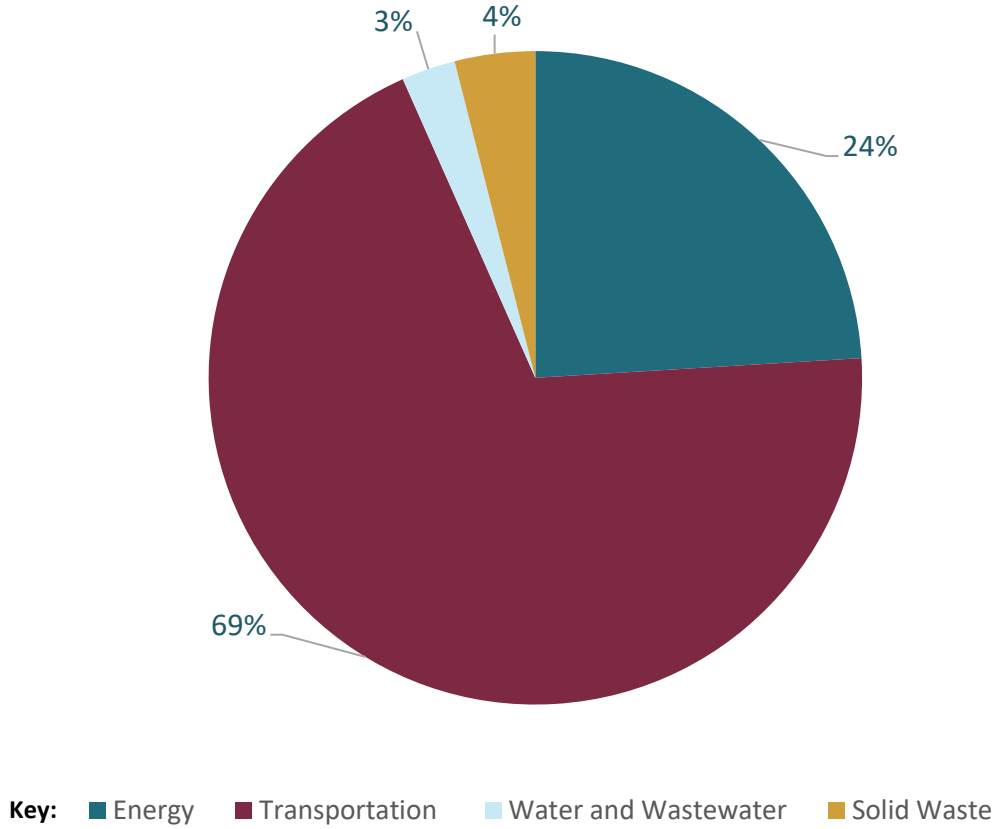


Figure 6 2017 Community Emissions Summary by Sector



by the transportation sector (1,270 MT CO_2e, or 49 percent). The second largest source of emissions (1,129 MT CO_2e, or 44 percent) were from energy (e.g., electricity and natural gas consumed in the City's buildings and facilities.

Community Emissions

In 2017, the Montclair community emitted approximately 283,074 MT CO_2e. As shown in Figure 6 on the previous page and Table 2 below, the transportation sector was the largest source of emissions, generating approximately 196,213 MT CO_2e, or 69 percent of total emissions in 2017. Electricity and natural gas consumption (energy) within the residential, commercial, and industrial sectors was the second largest source of 2017 emissions, generating 68,047 MT CO_2e, or 24 percent of the total. Waste generation, including processing and excluding collection and transportation resulted in four percent of the City's emissions, while water use (one percent) and wastewater generation (two percent) resulted in the remaining three percent.

Emissions Forecast

Emissions forecasts (what we predict GHG emissions to be in the future) are generated from the 2017 baseline inventory to help identify actions that must be taken now in order to meet future

Table 2 2017 Community-wide Emissions Summary by Sector

Sector	GHG Emissions (MT CO_2e)	Percentage of Total Emissions
Energy	**68,047**	**24%**
Electricity	43,306	15%
Natural Gas	24,741	9%
Transportation	**196,213**	**69%**
On-road Transportation	183,577	65%
Off-road Equipment	8,802	3%
Transit	3,834	1%
Water and Wastewater	**7,557**	**3%**
Water transport, distribution and treatment	3,342	1%
Wastewater collection and treatment	4,215	2%
Solid Waste	**11,258**	**4%**
Waste Sent to Landfills	10,879	4%
Process Emissions	355	<1%
Transportation & Collection Emissions[2]	*831*	*<1%*
Combustion Emissions	24	<1%
Total[2]	**283,074**	**100%**

Notes: MT CO_2e: Metric tons of carbon dioxide equivalent
1. Emissions have been rounded and therefore sums may not match.
2. Waste transportation and collection emissions are accounted for in the on-road transportation sector of the inventory and are included here only for informational purposes.
Source: Emissions were calculated following ICLEI Community Protocol and using data provided and approved by the City. See Appendix C.

targets. This CAP identifies GHG emissions reduction targets for the years 2030 (SB 32 target year), 2040 (City of Montclair's General Plan horizon year), and 2045 (AB 1279).[34]

A business-as-usual scenario (BAU) provides a forecast of how GHG emissions would change in the years 2030, 2040, and 2045 if consumption trends continue as they did in 2017 and growth were to occur as projected in the City's General Plan. Montclair's BAU emissions were projected to increase to 330,412 MT CO_2e in 2030, 354,216 MT CO_2e in 2040, and 366,102 MT CO_2e in 2045 (see row one of Table 3).

However, since 2017, several State regulations (i.e., SB 1, SB 100, AB 1493) have been enacted that will reduce future local emissions. These regulations have been incorporated into an *adjusted forecast*, which is more representative of future emissions growth and the emission reduction the City and community will be responsible for after State regulations have been implemented (see row three of Table 3).

Emissions Targets

After analyzing the City's baseline inventory and forecast scenarios, emission targets were set to create quantitative goals that will further the City's ability to measure emission reduction progress from the baseline scenario. Consistent with State guidance, the 2017 inventory results were used to back-cast GHG emissions to 1990 levels to ensure consistency with state goals.

34. Because the state achieved the 2020 target in 2016, it is assumed that the City similarly achieved the 2020 target. Therefore, a 2020 target and forecast is not included in this CAP.

In line with the California Air Resources Board (CARB) 2017 Scoping Plan methodology and the statewide goal established by SB 32, GHG targets can be set using an efficiency pathway. This approach sets GHG targets on a per capita basis and is recommended by the 2017 Scoping Plan for cities anticipating significant growth. Regardless of growth projections, AB 1279 mandates the State reach carbon neutrality by 2045. For Montclair, the efficiency target was set based on 1990 per capita emission levels of 8.2 MT CO_2e.

The City of Montclair established GHG reduction targets consistent with the State's SB 32 goal of reducing emissions 40% below 1990 levels by 2030, and aligned with the trajectory to achieve carbon neutrality by 2045 consistent with AB 1279 and CARB's 2022 Scoping Plan:

- **SB 32 target-** Reduce GHG emissions to 4.9 MT CO_2e per capita by 2030
- **AB 1279 target-** Reduce GHG emissions to 0.0 MT CO_2e per capita by 2045

Table 4 and Figure 7 illustrate the per capita reductions needed to meet the goals (MT CO_2e per capita) after accounting for reductions from State regulations. Table 4 translates efficiency metrics into mass emission reductions for Montclair, which corresponds to a reduction of 18,583 MT CO_2e by 2030 and 225,157 MT CO_2e by 2045 to meet the State goals.

These reductions will be achieved through local measures and actions drawn from best practices in similar jurisdictions and recommendations from State organizations. Vetted by City staff and the community, these measures are quantified to show their contribution to meeting the City's 2030 and 2045 GHG reduction targets. For more details on the forecast and targets, see Appendix C.

Table 3 Business-as-Usual and Adjusted Forecast for City of Montclair

Emission Forecast	2030 (MT CO_2e)	2040 (MT CO_2e)	2045 (MT CO_2e)
Business-as-Usual Forecast	330,412	354,216	366,102
Emission Reductions from State Measures	68,247	120,019	140,944
Adjusted Forecast	**262,166**	**234,197**	**225,157**

Notes: BAU forecast: Forecast of how GHG emissions would change if consumption trends continue as they did in 2017 and growth were to occur as projected in the City's General Plan. See Appendix C for more information on the forecast and targets. MT CO_2e = metric tons of carbon dioxide equivalent

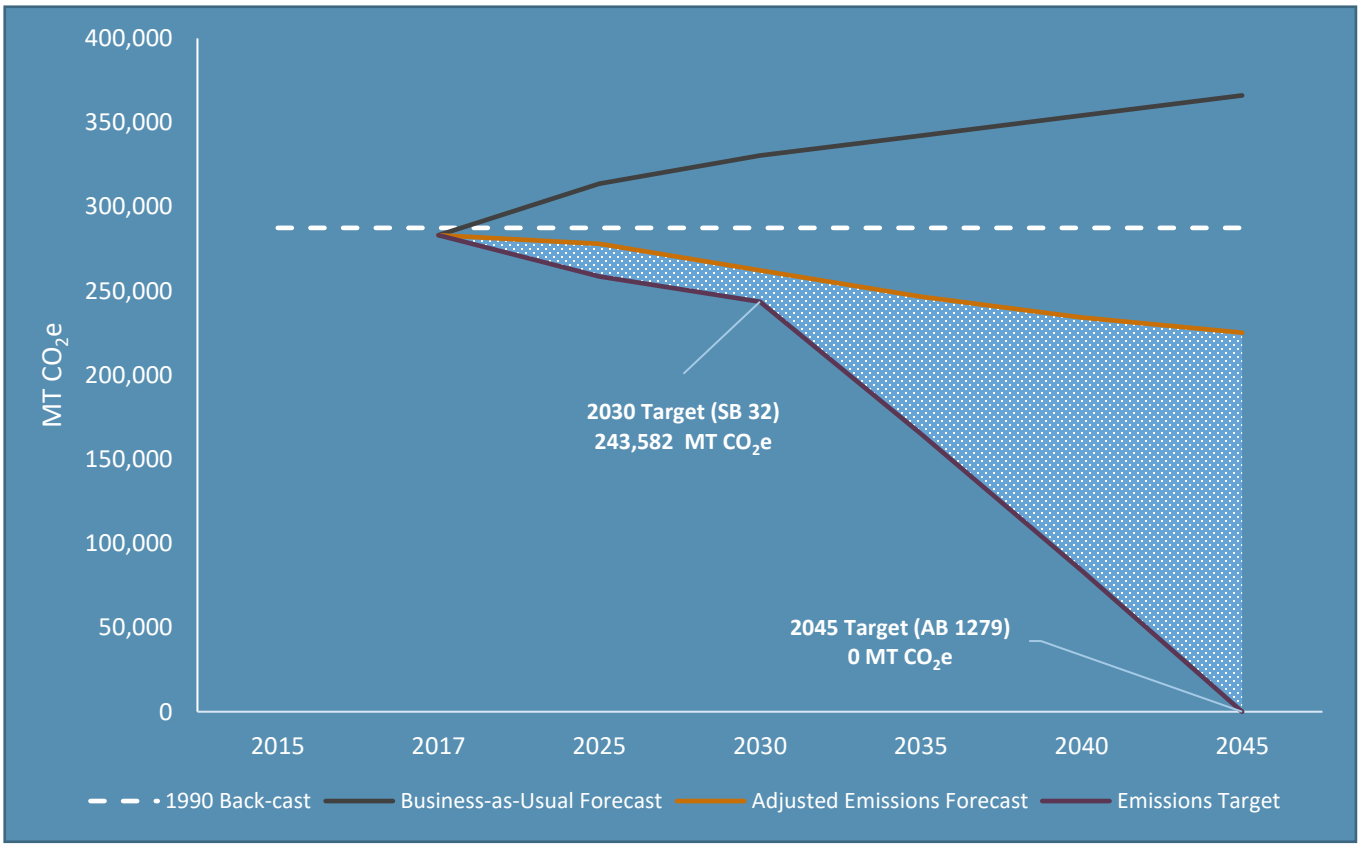
Table 4 Community Emissions, Targets, and Reductions Needed to Meet Targets

Emission Forecast	2030 (MT CO_2e)	2040 (MT CO_2e)	2045 (MT CO_2e)
Population[1,2]	49,672	51,414	52,285
Adjusted Forecast	262,166	234,197	225,157
Per Capita Adjusted Forecast (MT CO_2e per capita)	5.3	4.6	4.3
Per Capita Targets (MT CO_2e per capita)	4.9	1.6	0.0
Remaining Per Capita Reductions Needed to Meet Target (MT CO_2e per capita)	0.4	2.9	4.3
Estimated Absolute Emission Reductions Needed to Meet Target (MT CO_2e)[3]	*18,583*	*150,156*	*225,157*

1. Population from SCAG 2020 RTP/SCS Demographic and Growth Forecast. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_demographics-and-growth-forecast.pdf?1606001579
2. Population values were adjusted to account for RHNA allocation of housing needs for Montclair during the 2021-2029 cycle. https://scag.ca.gov/sites/main/files/file-attachments/6th_cycle_final_rhna_allocation_plan_070121.pdf?1646938785
3. Efficiency emission reductions needed have been translated to mass emissions by multiplying the per capita reductions by the population.

Note: BAU forecast: Forecast of how GHG emissions would change if consumption trends continue as they did in 2017 and growth were to occur as projected in the City's General Plan. Adjusted forecast: Forecast of future emissions including state regulations (i.e., SB 1, SB 100, AB 1493) that have been enacted to reduce the impacts of climate change. See Appendix C for more information on the emissions forecast calculations. MT CO_2e = metric tons of carbon dioxide equivalent

Figure 7 Community Emissions, Targets, and Reductions Needed to Meet Targets



** The shaded area on graph represents the gap remaining between the emissions reduction forecasts and emissions reduction targets.*

Section 3: Emissions Reduction Measures

Reduction Strategy

Montclair's GHG emissions reduction strategy, which is outlined in this section, includes measures and supporting actions that will set the City on a path to reduce emissions and meet the adopted target detailed in Section 2 for 2030, while also putting the City on the trajectory to meet the longer-term target established for 2045. We recognize that achieving the targets will require collective participation from the entire community. Therefore, it was essential that voices from the community were heard, and feedback was incorporated, as applicable, throughout the design of the measures and actions included in this CAP. This ensured a collaborative platform which allowed the strategy to be developed and refined by a team of City Staff, key stakeholders, and community members. We appreciate your time and support and look forward to continue working together to make Montclair, and the world, a better place – *thank you!*

Measures and Actions in Montclair

In the energy sector, electrification will shift energy use from natural gas to electricity, maximizing GHG reductions from increasingly clean electricity, while also being cost-effective and improving indoor air quality. Emission reductions from the transportation sector will come from increasing the adoption of electric vehicles (EV), as well as achieving a shift towards more use of and opportunities for alternative transportation in the community, such as public transit, biking, and walking. Waste sector strategies focus on implementing the requirements of SB 1383, which will decrease the amount of organic waste (e.g., food scraps) that is landfilled, whereas measures in the water sector aim to reduce water consumption and thereby reduce the energy associated with treatment, transport, and disposal of that finite resource. Finally, the carbon sequestration sector will help reduce Montclair's net emissions through better management practices on natural lands. Other GHG reduction measures focus on municipal facilities and operations. With full implementation of measures and actions, the City is expected to meet its 2030 emissions reduction target. Table 5 summarizes the measures and expected GHG reductions in 2030 and 2045.

Table 5 Greenhouse Gas Emissions Reduction Measure Potential

Measure		GHG Emissions Reduction Potential
Building Energy		
BE.1	Join the Clean Power Alliance at the 100% Green Power rate and strive for a less than 4% opt-out rate for residential and commercial customers by 2030 and maintain through 2045.	2030: 29,500 MT CO_2e 2045: 0 MT CO_2e
BE.2	Electrify 100% of newly constructed buildings by 2030.	2030: 2,180 MT CO_2e 2045: 3,615 MT CO_2e
BE.3	Improve energy efficiency by 17% in existing residential buildings and 15% in existing commercial buildings by 2030, and 52% in existing residential and 41% in existing commercial buildings by 2045.	2030: 4,579 MT CO_2e 2045: 13,741 MT CO_2e
Transportation		
TR.1	Develop and implement an Active Transportation Plan to shift 6% of passenger car vehicle miles traveled to active transportation, and 12% by 2045.	2030: 569 MT CO_2e 2045: 1,321 MT CO_2e
TR.2	Implement a public and shared transit programs to achieve 10% of public transit mode share by 2030 and 30% by 2045.	2030: 5,205 MT CO_2e 2045: 19,121 MT CO_2e
TR.3	Increase electric/alternative fuel vehicle adoption to 20% for passenger and 10% for commercial vehicles by 2030, and 65% passenger and 50% commercial by 2045.	2030: 17,904 MT CO_2e 2045: 70,317 MT CO_2e
TR.4	Equitably increase use of electric vehicles, promote active transportation and public transit use by disadvantaged communities.	2030: Supportive 2045: Supportive
Water		
W.1	Reduce per capita water consumption by 10% compared with 2017 levels by 2030 and 25% by 2045.	2030: 252 MT CO_2e 2045: 0 MT CO_2e
Solid Waste		
SW.1	Implement SB 1383 requirements and reduce community-wide landfilled organics by 75% by 2025 and inorganic waste by 35% by 2030 and reduce all landfilled waste by 100% by 2045.	2030: 2,553 MT CO_2e 2045: 3,571 MT CO_2e
Carbon Sequestration		
CS.1	Increase carbon sequestration and green space by planting 500 new trees through the community by 2030, and 1,000 by 2045.	2030: 18 MT CO_2e 2045: 35 MT CO_2e
CS.2	Achieve and maintain compost procurement requirements of SB 1383 by 2030.	2030: 914 MT CO_2e 2045: 962 MT CO_2e
Total		**2030: 63,675 MT CO_2e** **2045: 112,683 MT CO_2e**

Climate Action Co-benefits

Measures and actions that aim to reduce the impacts of climate change often have co-benefits associated with them, which are considered positive factors that are additional to the primary emission reductions achieved. For example, actions that increase electrification in homes have the co-benefit of reducing indoor air pollutants, and, therefore, improve air quality and public health. The specific co-benefits that are considered in this CAP include clean air, cost savings, public health, resource efficiency, and opportunity to develop partnerships, and are each defined below.

- **Air Quality** – reducing GHG emissions improves air quality[35] and can prevent illness and/or premature deaths
- **Jobs/Economic Gain** – new infrastructure and systems will require a skilled workforce to install, implement, and maintain it;[36] additionally, thoughtful climate action improves competitiveness and future-proofs the economy; this co-benefit could also be attributed to measures and actions that aim to reduce the financial burden on low-income households or disadvantaged communities
- **Public Health** – increased physical activity from active transportation improves health;[37] additionally, improving air quality through reduced GHG emissions increases public health
- **Resource Efficiency**[38] – many resources that we rely on are finite and shifting what and how we use them will allow us to develop a sustainable long-term strategy for emissions reductions that establishes a safe and reliable space for future generations
- **Increased Biodiversity** – healthy, diverse ecosystems are essential for regulating climate and absorbing or storing carbon;[39] damaged and fragmented ecosystems impact nature's ability to regulate GHG emissions and protect against extreme weather

Each of the actions in Table 6 includes a summary of the associated co-benefits in order to provide a holistic understanding of climate action.

35. https://www.epa.gov/air-research/air-quality-and-climate-change-research
36. https://www.wri.org/insights/10-charts-show-economic-benefits-us-climate-action
37. https://www.cdc.gov/climateandhealth/effects/default.htm
38. https://www.unep.org/resources/report/resource-efficiency-and-climate-change-material-efficiency-strategies-low-carbon
39. https://ec.europa.eu/environment/nature/climatechange/index_en.htm

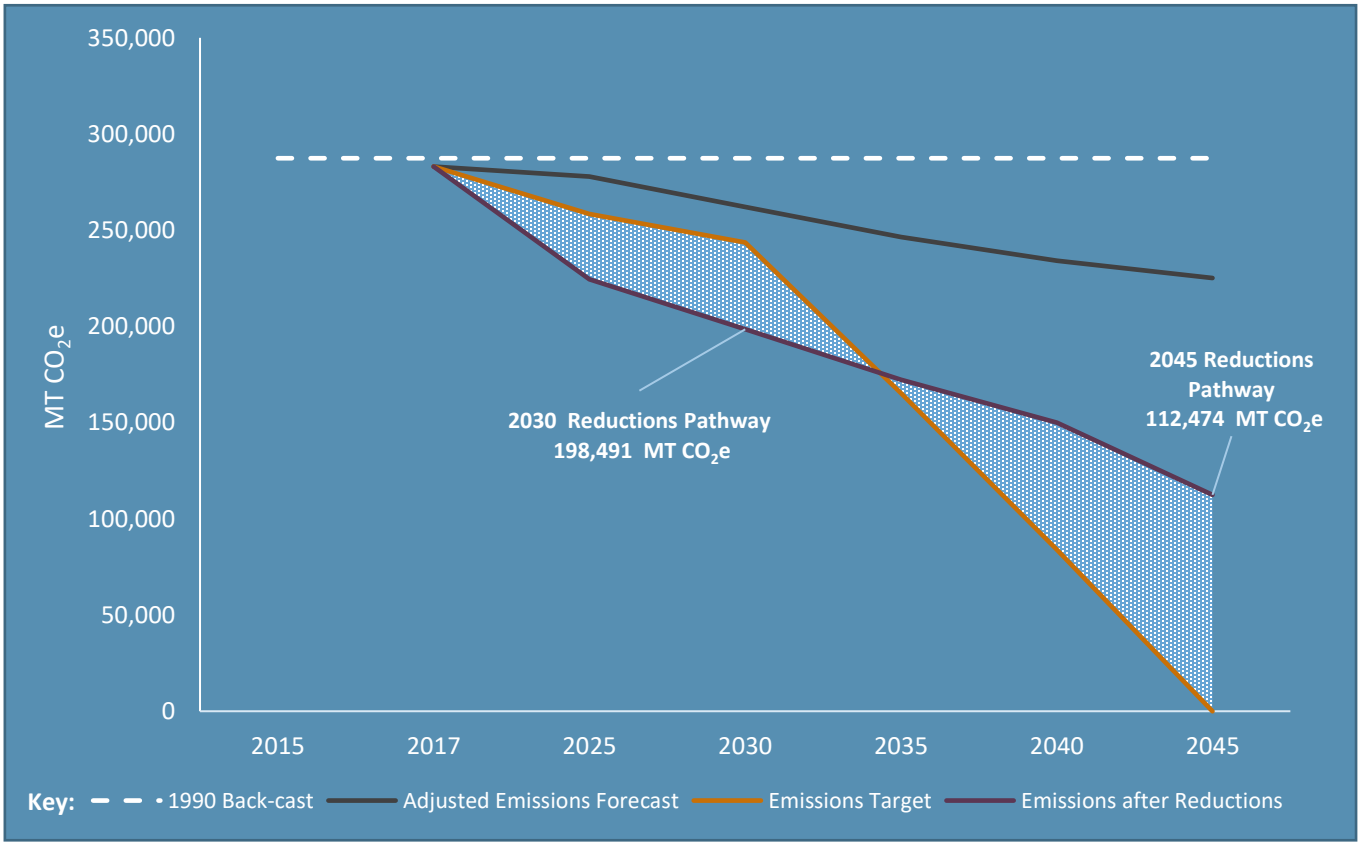
Meeting the State's Goals

The measures and supporting actions outlined in this section were established and refined to meet the City's GHG emissions reduction target for 2030 and provide substantial progress towards meeting the longer-term target of carbon neutrality by 2045. The 2030 and 2045 targets represent the City's fair share reductions towards achieving the State's overall climate goals (see Appendix D for more information on the emission reductions anticipated to be achieved from each measure).

As shown in Figure 8, the measures and actions established in this CAP help the City meet the 2030 target and put the City on the trajectory towards meeting the 2045 target. The 2030 efficiency target allows flexibility as the City grows, accommodating new technologies, legislation, and projects as they come online. However, while these measures are effective for meeting the 2030 goals, much steeper reductions will be required post-2030 to achieve the 2045 carbon neutrality target. Future iterations of the CAP will outline additional strategies to meet the longer-term 2045 emissions reduction target as new technologies and solutions become available.

90% of natural disasters are considered **weather/climate-related**, costing the world economy **$520 billion each year**, with **26 million people forced into poverty**
- United Nations[40]

Figure 8 Emissions Over Time with and without Emissions Reduction Measures



40. https://www.un.org/en/un75/climate-crisis-race-we-can-win

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Table 6 Montclair Emissions Reductions Measures and Actions

ID #	Action	Phase	Co-benefits
Building Energy			
Measure BE.1: Join the CPA at the 100% Green Power rate and strive for a less than 4% opt-out rate for residential and commercial customers by 2030 and maintain through 2045.			
1	Conduct a feasibility study comparing enrollment in the Clean Power Alliance at the different rates versus rates through SCE, including the SCE Green Rate Program.	Phase 1	
2	Join the CPA at the 100% Green Power rate and strive for a less than 4% opt-out rate by 2025.	Phase 1	
3	Perform public outreach and education campaigns highlighting the benefits of using renewable energy and the CPA, including: ▪ Monitoring opt-out rates ▪ Tabling at community events ▪ Establishing an informational resource page on the City website ▪ Regular social media posts ▪ Energy bill inserts	Phase 1	
4	Develop a benchmarking system to track annual opt-out rates and ensure opt-out rate remains low.	Phase 2	
5	Coordinate with CPA to identify rebates or cost incentives for low-income and disadvantaged families.	Phase 2	
Measure BE.2: Electrify 100% of newly constructed buildings by 2030.			
1	In alignment with the California Energy Commission's efforts to advance clean energy in buildings, adopt a Local Building Energy Standard Ordinance that requires new construction to be more energy efficient than all-electric unless cost prohibitive. Implement through the building permit process which limits expansion of natural gas infrastructure and promotes HVAC systems, hot water heaters, and other	Phase 1	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits: Clean Air, Jobs/Economic Gain, Public Health, Resource Efficiency, Biodiversity

ID #	Action	Phase	Co-benefits
Building Energy			
1 cont.	appliances to be all-electric at time of installation, or in major renovations after 2025. The following steps will be used to develop the reach code: ▪ Develop idea for the ordinance. ▪ Work with stakeholders. ▪ Obtain a cost-effectiveness study. ▪ Develop and draft an ordinance. ▪ Public process and revisions. ▪ Formal adoption process.		
2	Engage with an organization such as Building Decarbonization Coalition to work with local building industry stakeholders in development of the electrification ordinance.	Phase 1	
3	Enforce ordinance compliance through a comprehensive permitting compliance program which includes routine training of staff, dedicating staff time to building inspections, charging fees for noncompliance, providing easy to understand compliance checklists online and with permit applications, and facilitating permitting online.	Phase 2	 
4	Develop a webpage and materials at City Hall containing benefits of electrification and resources that can assist in the process. Consider working with regional partners to maintain a database of qualified contractors and consultants for electrification retrofits.	Phase 2	
5	Host outreach events to educate the community on use, versatility and benefits on all-electric appliances.	Phase 2	
Measure BE.3: Improve energy efficiency by 17% in existing residential buildings and 15% in existing commercial buildings by 2030, and 52% in existing residential and 41% in existing commercial buildings by 2045.			
1	In alignment with the California Energy Commission's efforts to advance clean energy in buildings, adopt a Local Building Energy Standard Ordinance by 2025 that requires retrofits or renovations in existing buildings that include natural gas to be more energy efficient than all-electric buildings. The ordinance may include the following type of	Phase 1	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air 
Jobs/Economic Gain 
Public Health 
Resource Efficiency 
Biodiversity 

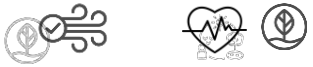
ID #	Action	Phase	Co-benefits
Energy			
1 cont.	amendments: a) Requires mixed-fuel single family and duplex residential buildings to exceed the 2019 Energy Code by 15 percent; b) Requires mixed-fuel office buildings to exceed the 2019 Energy Code by 10 percent; c) Requires prewiring for possible future electric appliances in mixed-fuel buildings; d) For new mixed-fuel construction, require CalGreen Tier 1 for residential buildings, require 5 percent reduced energy budget for hotel/motel and high-rise residential, require 10 percent reduced energy budget for non-residential.		
2	Adopt and implement local amendments to the 2019 California Energy Code incentivizing all electric development (Clean Energy Choice Program).	Phase 1	
3	Work with SoCal Gas to provide opportunities for funding energy efficiency projects and improved natural gas infrastructure to increase energy efficiency in existing buildings.	Phase 1	
4	Create a rebate and incentive programs for appliance replacement, ENERGY STAR appliance program, and Energy Conservation Programs, with public outreach. Work with SCE and/or Clean Power Alliance to provide rebates for residential replacement of old appliances with electric-powered or more energy efficient appliances.	Phase 1	
5	Provide information to staff and community regarding annual energy savings from energy conservation programs for CAP implementation tracking.	Phase 1	
6	Work with and educate businesses on partnerships designed to maximize the use of renewable energy including solar/ storage, appropriate tariff changes and microgrid opportunities.	Phase 2	
7	Identify funding for upgrading ventilation systems and natural gas appliances in disadvantaged community homes to improve air quality and increase energy efficiency.	Phase 2	
8	Seek out funding partnerships with local financiers and work with partners such as local turnkey retrofit program that leverages existing funding, which offers low-cost financing of electrification and energy efficiency retrofits for residents and local businesses.	Phase 3	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air | Jobs/Economic Gain | Public Health | Resource Efficiency | Biodiversity

ID #	Action	Phase	Co-benefits
Transportation			
Measure TR.1: Develop and implement an Active Transportation Plan to shift 6% of passenger car vehicle miles traveled to active transportation, and 12% by 2045.			
1	Develop and adopt an Active Transportation Plan consistent with the City General Plan Policies that will identify funding strategies and policies for development of pedestrian, bicycle, and other alternative modes of transportation projects. Establish Citywide events, outreach, educational programs, or platforms to promote active transportation in the community.	Phase 1	
2	Conduct a Complete Street Feasibility Study on street improvement options to identify streets and intersections that can be improved for pedestrians and bicyclists through traffic calming measures and/or where multi-use pathway opportunities exist to increase active transportation.	Phase 1	
3	Obtain funding and implement "mobility hub" projects consistent with City General Plan. Work to identify grant funding opportunities to implement Complete Our Streets projects included in the Complete Our Streets Plan.	Phase 2	
4	Install and upgrade end-of-trip facilities (lockers, bike racks, etc.) at transit center to encourage active transportation as part of commute for community members using public transit. Improve and ensure there are safe bicycle and pedestrian infrastructure to access transit center.	Phase 2	
5	Engage the Bicycle Pedestrian Commission, Safe Routes to School network, and community groups to identify additional short-term and long-term bikeway and pedestrian infrastructure improvement projects to implement.	Phase 2	
6	Ensure there is equitable access to safe bicycle and pedestrian infrastructure in all areas of the city. Facilitate transportation equity through targeted provision of programs that encourage minority, low-income, and senior populations to take transit, walk, bike, use rideshare or car share.	Phase 3	
7	Evaluate and update the City's Zoning Code, Transportation Demand Management Ordinance, and California Green Building Code to ensure the City requires installation	Phase 3	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air | Jobs/Economic Gain | Public Health | Resource Efficiency | Biodiversity

ID #	Action	Phase	Co-benefits
Transportation			
7 cont.	of accessible, shaded, and secure bicycle parking for new commercial development and retrofits and requires installation of bicycle parking areas in instances where off-street parking is required.		
Measure TR.2: Implement a public and shared transit programs to achieve 10% of public transit mode share by 2030 and 30% by 2045.			
1	Conduct local transportation surveys to better understand the community's needs and motivation for traveling by car versus other alternatives such as bus or Metro Gold Line light rail. Use survey results to inform transit expansion and improvement projects.	Phase 1	
2	Adopt policy to encourage new development of public space to be transit accessible and multi-functional by co-locating public facilities.	Phase 1	
3	Adopt a Transportation Demand Management (TDM) Plan for the City that includes a transit system focus. Provide incentives for implementation of TDM measures at local businesses and for new developments. Incentives and incentives to encourage use of transit instead of driving alone may include: ▪ Offer monetary incentives for employees to use car share, carpool, take the bus, bike, or walk. ▪ Require large employers (more than 25 employees) to offer subsidies to employees for the transit system ▪ Offer car/vanpool matching ▪ Offer emergency ride homes for employees utilizing transit ▪ Market-rate parking fee charged directly to employees or patrons at businesses or new developments ▪ Offer priority/discounted HOV parking at businesses or new developments ▪ Daily parking charge available for occasional drivers instead of monthly parking pass	Phase 1	
4	Continue to work with federal legislative advocate and congress member to secure funds for Metro's Gold Line plan and supporting infrastructure.	Phase 2	
5	Obtain funding and grants to upgrade City-owned or operated facilities and infrastructure, such as parking, transit stops, and community hubs (e.g., the library,	Phase 2	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air | Jobs/Economic Gain | Public Health | Resource Efficiency | Biodiversity

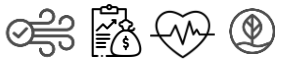
ID #	Action	Phase	Co-benefits
Transportation			
5 cont.	City recreational center), that promote use of public transit.	Phase 2	
Measure TR.3: Increase electric/alternative fuel vehicle adoption to 20% for passenger and 10% for commercial vehicles by 2030, and 65% passenger and 50% commercial by 2045.			
1	Adopt an EV Readiness Reach Code by 2026 requiring new commercial and multifamily construction to install the minimum number of EV chargers based on Tier 2 CalGreen requirements (20% of total).	Phase 1	
2	Adopt an EV Charging Retrofits in existing Commercial and Multifamily Buildings Reach Code by 2026 requiring major retrofits, with either a building permit with square footage larger than 10,000 square feet or including modification of electric service panels, to meet CalGreen requirements for “EV Ready” charging spaces and infrastructure.	Phase 1	
3	Conduct a survey of existing publicly accessible electric vehicle chargers and their locations and identify a prioritized list of locations for new electric vehicle charging stations with particular consideration for equitable distribution of chargers to residents of multi-family homes, low-income people, people on a fixed income, and communities of color.	Phase 2	
4	Add 240 new publicly accessible Level 2 and 3 electric vehicle charging stations to the City by 2030.	Phase 2 – 3	
5	Promote public and private conversion to zero-emission vehicles; including use of City events, social media, and the City website to educate on benefits of zero-emission vehicles and available incentives.	Phase 2 – 3	
6	Investigate commercial vehicle fleets in Montclair and identify businesses/employers to target for accelerating zero emission vehicle (ZEV) adoption. Identify and implement incentives for commercial fleet electrification, such as tax breaks or use of Low Carbon Fuel Standard credits.	Phase 2 – 3	
7	Collaborate with local businesses/employers to develop and implement a plan for City-supported accelerated fleet electrification. As part of the plan, identify opportunities	Phase 2 – 3	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air | Jobs/Economic Gain | Public Health | Resource Efficiency | Biodiversity

ID #	Action	Phase	Co-benefits
Transportation			
7 cont.	for accelerated fleet electrification and promote ZEV adoption within major private and employee fleets in the city.		
8	Work with SCE to incentivize electric vehicle charger installations through on-bill financing.	Phase 2 – 3	
Measure TR.4: Equitably increase use of electric vehicles, promote active transportation and public transit use by disadvantaged communities.			
1	Conduct a feasibility study identifying barriers for disadvantaged and low-income families related to mobility for active transportation, use of public transit, and access identified barriers.	Phase 1	
2	As part of Complete Streets Feasibility Study, evaluate streets within disadvantage communities and identify streets for improvements that would increase mobility within the neighborhood.	Phase 1	
3	Pilot a transit shuttle program for disadvantaged communities to increase access to the transit center.	Phase 2	
4	Investigate and pursue funding opportunities for EV car share for low-income neighborhoods, such as the Zero Emissions Mobility and Community pilot Project Fund. Partner with local community group to identify funding opportunities for purchasing EVs or other pilot projects for deployment in disadvantaged communities.	Phase 2	
5	Work with Metro and Foothill Transit to expand use of LIFE low-income EZ Pass transit subsidy by Montclair low-income households who ride Metro and Foothill Transit buses and commuter inter-city rails.	Phase 3	
Water and Wastewater			
Measure W.1: Reduce per capita water consumption by 10% compared with 2017 levels by 2030 and 25% by 2045.			
1	Adopt ordinance by 2026 requiring non-residential buildings over 20,000 square feet (including municipal buildings over 7,500 square feet) to disclosure water use annually for benchmarking purposes and then take action to reduce their consumption.	Phase 1	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air | Jobs/Economic Gain | Public Health | Resource Efficiency | Biodiversity

ID #	Action	Phase	Co-benefits
Water and Wastewater			
Measure W.1: Reduce per capita water consumption by 10% compared with 2017 levels by 2030 and 25% by 2045.			
2	Adopt a cool pavement ordinance by 2026 to reduce heat island effect improving water quality.	Phase 1	
3	Continue to enforce Model Water Efficient Landscapes Ordinance.	Phase 1 – 3	
4	Adopt an ordinance by 2026 restricting the use of potable water for non-potable uses and requiring greywater capture for land uses that are excess water users (e.g., car washes, large fields, etc.).	Phase 1	
5	Develop a Recycled Water Use and Implementation Strategy that identifies new and existing access to recycled water and quantity of recycled water available to the City for use from MVWD's. The strategy shall identify land use types (i.e., landscaping and golf courses) and specific projects that will switch from potable to recycled water use allowing for a goal of 20% of City's potable water use to be replaced with recycled water provided by MVWD by 2030.	Phase 2	
6	Conduct a citywide study identifying impermeable surfaces that can be targeted for a transition to increase infiltration.	Phase 2	
7	Promote alternative driveways/sidewalk materials and greenscaping through educational pamphlets and programs; incentivize residents to transition from impervious to pervious hardscapes.	Phase 2	
8	Provide rebates or other funding to low- and medium-incomes homes for installing greywater, rainwater catchment system, EnergyStar appliances, and low-flow fixtures and fittings (e.g., faucets, sprinklers).	Phase 2	
9	Work with schools to educate youth about water conversation.	Phase 2	
10	Establish a system to track implementation progress of low-flow devices and to track use of rebates offered through the City.	Phase 2	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air | Jobs/Economic Gain | Public Health | Resource Efficiency | Biodiversity

ID #	Action	Phase	Co-benefits
Solid Waste			
Measure SW.1: Implement SB 1383 requirements and reduce community-wide landfilled organics 75% and inorganic waste by 35% by 2030 and reduce all waste by 100% by 2045.			
1	Enforce adopted ordinance 22-1001 requiring compliance with SB 1383. Ensure ordinances established are consistent with SB 1383 requirements; revise if necessary.	Phase 1	
2	Engage with waste hauler operating within the City to discuss SB 1383 requirements for waste haulers (i.e., organics receptacles and labeling requirements).	Phase 1	
3	Adopt procurement policies to comply with SB 1383 requirements for jurisdictions to purchase recovered organic waste products.	Phase 1	
4	Adopt an Edible Food Recovery Ordinance for edible food generators, food recovery services, or organization that are required to comply with SB 1383.	Phase 1	
5	Partner with City waste hauler, to provide organic waste collection and recycling services to all commercial and residential generators of organic waste.	Phase 1	
6	Enforce ordinance 22-1001 requiring all residential and commercial customers to subscribe to an organic waste collection program and/or report self-hauling or backhauling of organics.	Phase 1	
7	Conduct a Feasibility Study and prepare an action plan to ensure edible food reuse infrastructure is sufficient to accept capacity needed to recover 20% of edible food disposed or identify proposed new or expanded food recovery capacity.	Phase 1	
8	Establish an education and outreach program for school children and adults around food waste prevention, nutrition education, and the importance of edible food recovery.	Phase 1	
9	Establish an edible food recovery program to minimize food waste. Leverage CalRecycle support for projects that prevent food waste or rescue edible food.	Phase 1 – 2	
10	Adopt an ordinance or enforceable mechanism to regulate haulers collecting organic waste, including collection program requirements and identification of organic waste receiving facilities.	Phase 1 – 2	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits: Clean Air, Jobs/Economic Gain, Public Health, Resource Efficiency, Biodiversity

ID #	Action	Phase	Co-benefits
Solid Waste			
11	Partner with waste hauler within the City to: ▪ Ensure organic waste collection from mixed waste containers are transported to a high diversion organic waste processing facility. ▪ Provide quarterly route reviews to identify prohibited contaminants potentially found in containers that are collected along route.	Phase 2	
Carbon Sequestration			
Measure CS.1: Increase carbon sequestration and green space by planting 500 new trees through the community by 2030, and 1,000 by 2045.			
1	Adopt Greenscaping Ordinance that has a street tree requirement for all zoning districts, has a shade tree requirement for new development, requires greening of parking lots, and increases permeable surfaces in new development.	Phase 1	 
2	Adopt a standard policy in alignment with City's General Plan and set of practices for expanding urban tree canopy and placing vegetative barriers between busy roadways and developments to reduce exposure to air pollutants from traffic.	Phase 1	  
3	Prepare and adopt an Urban Forest Management Plan for the City that includes an inventory of existing trees, identifies future tree planting opportunities and a climate-ready tree palette, as well as ongoing operations and maintenance needs.	Phase 2	 
4	Identify and participate in partnership opportunities necessary to plant and maintain an increase in the City's tree inventory by 15% by 2030 and convert priority public space into green space.	Phase 2 – 3	  
5	Promote incentives to property owners and developers for greenspace inclusion through educational pamphlets, programs, and webpages and track the use of incentives.	Phase 2 – 3	  
Measure CS.2: Achieve and maintain compost procurement requirements of SB 1383 by 2030.			
1	Implement all required activities under SB 1383 including achieving compost procurement requirements effective. Effective January 2022, CalRecycle's regulations	Phase 1	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air 
Jobs/Economic Gain 
Public Health 
Resource Efficiency 
Biodiversity 

ID #	Action	Phase	Co-benefits
Carbon Sequestration			
1 cont.	require cities to purchase a minimum of 0.08 tons per resident of recovered organic composts.		
Municipal Operations			
Measure M.1: Electrify the municipal vehicle fleet and mobile equipment by 50% by 2030 and 100% by 2045.			
1	Develop and adopt a policy to apply lifecycle assessment to all new vehicle and equipment purchases.	Phase 1	
2	Implement the City Fleet Alternative Fuel Conversion Policy such that as municipal vehicles turn over, they are replaced with alternative-fuel vehicles in alignment with the state's Advanced Clean Fleet Rule.	Phase 1	
3	Install EV charging stations at municipal buildings.	Phase 1 – 2	
Measure M.2: Reduce carbon intensity of City operations.			
1	Adopt retrofitting policy for City owned buildings such that energy efficient and electrification retrofits are incorporated into City buildings as they become available.	Phase 1	
2	Complete energy audits for all City facilities and implement all feasible recommendations for fuel switching and efficiency upgrades.	Phase 1 – 2	
3	Establish a replacement plan for replacing natural gas fueled equipment with electric where practical and technologically feasible in City-buildings.	Phase 1 – 2	
4	Switch City electricity accounts to SCE 100% Green Rate until joining CPA at 100% Green Power rate by 2025.	Phase 1	
5	Investigate funding and grant opportunities and partnerships to install photovoltaic systems at all City buildings as feasible.	Phase 1 – 2	

Timeframe:

Phase 1	Phase 2	Phase 3
1 - 2 Years	3 - 4 Years	5+ Years

Co-benefits:

Clean Air | Jobs/Economic Gain | Public Health | Resource Efficiency | Biodiversity

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Section 4: Adaptation

Adaptation and Resilience in the City of Montclair

As mentioned in the *Introduction*, the City of Montclair is likely to experience more extreme heat events, increases in droughts due to reductions in fresh-water supply, and increased average temperatures.[41] These impacts will have varying effects on the City's residents, business owners, and visitors; infrastructure; environment; and economy; therefore, steps to increase the community's adaptive capacity[42] must be taken to prepare for the future and increase the City's resilience. This section connects the measures and actions presented in this CAP and the City's General Plan to opportunities to further adapt and increase the City's resilience to climate change.

Increased Average Temperatures and Extreme Heat Events

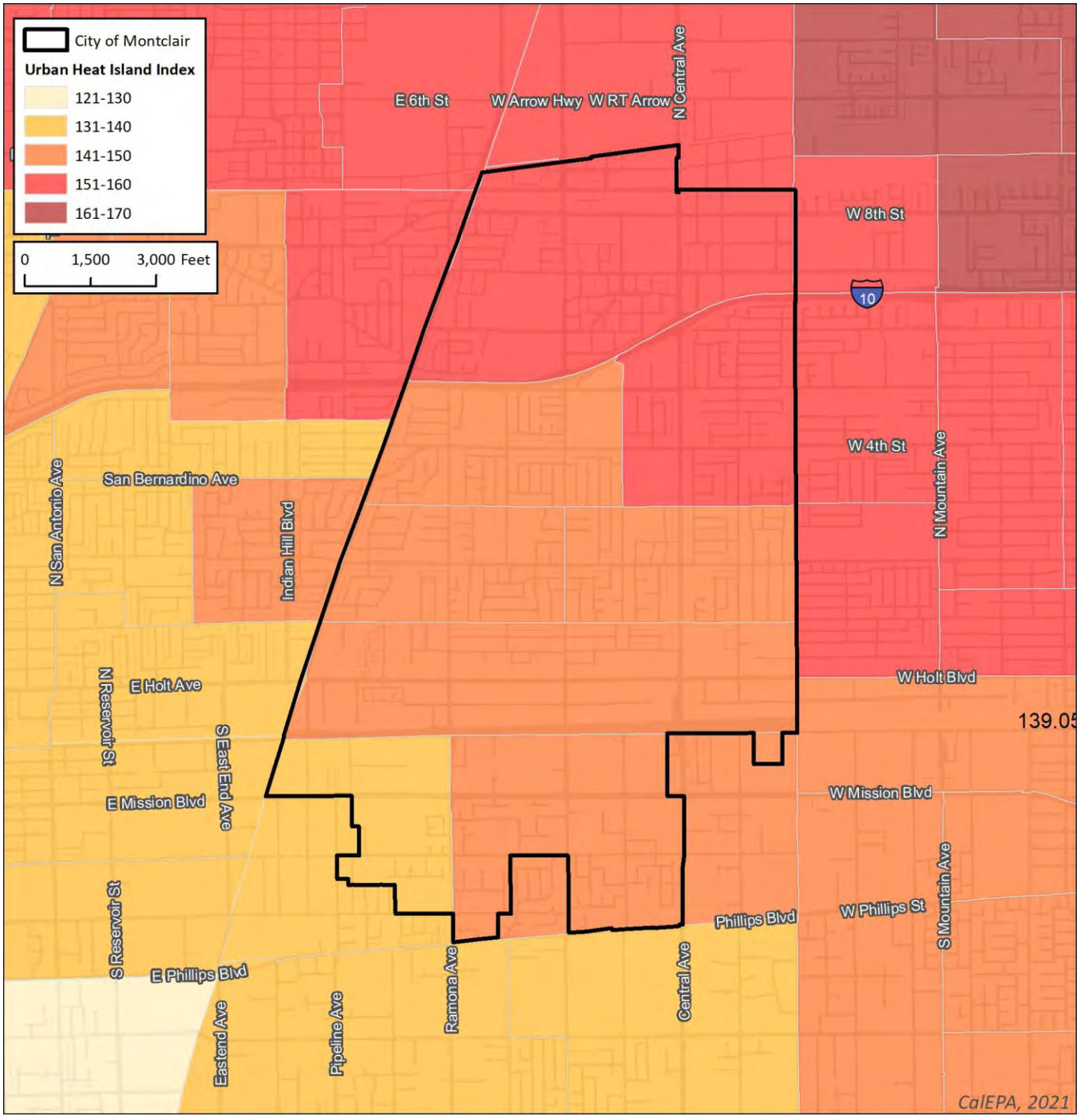
An increase in extreme heat days coupled with more heat waves will result in longer heat waves.[43] Extreme heat events will have greater effects on frontline communities and populations such as the homeless, aging adults, outdoor workers, people with chronic illnesses, and pregnant women. According to The California Healthy Places Index, the City of Montclair has less tree coverage compared with other parts of the State, which may leave vulnerable populations at increased risk of heat related illnesses.[44] To help increase the City's resilience to these events there are long-term preventative strategies such as strategic planting of trees and vegetation cover and improvements in the built environment, which are included in the various measures and actions of the CAP and General Plan because trees provide shade and reduce temperatures through evapotranspiration.

41. https://www.ipcc.ch/sr15/chapter/chapter-3/
42. Adaptive capacity is the potential or ability of a system, region, or community to adapt to the effects or impacts of climate change.
43. https://cal-adapt.org/tools/annual-averages/
44. https://map.healthyplacesindex.org/

For example, Measure CS-1 includes Action 4, which aims to identify and participate in partnership opportunities necessary to plant and maintain an increase in the City's tree inventory by 15 percent by 2030, as well as Action 5, which promotes incentives to property owners and developers for greenspace inclusion. Additionally, each of the energy measures aims to improve the built environment. Measure BE-2 relates to new buildings, while Measures BE-3 is designed for existing buildings already within the City. Likewise, the General Plan includes projects that promote cooling strategies, which include planting shade trees, and installing cool paving as well as shade structures.

Benefits from strategically planted trees and vegetation can help reduce peak summer

Figure 8 City of Montclair Urban Heat Island Effect Map



temperatures by 2-9°F, depending on the species and planting location.[45] Increased tree cover and vegetation will help mitigate the effects of urban heat islands. Urban heat islands are defined as urban areas, where these structures are highly concentrated and greenery is limited, and they become "islands" of higher temperatures relative to outlying areas. According to the California Environmental Protection Agency (CalEPA) Urban Heat Island Interactive Maps, which show urban heat islands in California as measured by the Urban Heat Island Index, the City of Montclair already experiences significant impacts related to the urban heat island effect.[46] See Figure 8.

Reductions in Fresh Water

As weather patterns continue to change, more precipitation is likely to occur as rain which will affect regional snowpack, and therefore, Montclair's imported water resources. Although a majority of Montclair's water supply comes from the Chino Groundwater Basin, the remaining comes from snow melt in the Sierra's.[47] The concern regarding shifts in imported water availability is echoed by the Department of Water Resources (DWR), which announced its initial State Water Project (SWP) allocation for 2022 along with several steps to manage the State's water supply in anticipation of a third dry year with reservoirs at or near historic lows in December 2021. DWR has advised these water agencies to expect an initial allocation that prioritizes health and safety water needs and that the SWP will not be planning water deliveries through its typical allocation process until the State has a clearer picture of the hydrologic and reservoir conditions going into the spring.[48] This shift in water resource availability will likely be ongoing into the future and will require us to adapt.

Further, as mentioned in the *Introduction*, Montclair itself will likely experience changes in precipitation, in addition to changes in available water resources from the SWP. Changes in precipitation coupled with increased temperatures can cause periods of abnormally dry weather, further affecting water-supply and groundwater recharge. While many of these issues occur at a greater regional and even global scale, the City and community can take steps to conserve water at a local level. Planting drought-tolerant landscaping can lessen the demand for irrigation and help decrease stormwater runoff. At home, residents can install high-efficiency toilets and showerheads, only run full loads of laundry and dishes, and take shorter showers; these small changes can collectively save hundreds of gallons of water a month.[49]

This CAP includes a measure that specifically aims to reduce per capita water consumption with specific goals for 2030 and 2045. The anticipated reduction in per capita water consumption would be achieved by adopting an ordinance that requires non-residential water use disclosure; adopting a cool pavement ordinance to reduce the urban heat island effect and improve water quality; adopting an ordinance that restricts the use of potable water for non-potable uses and requires grey water capture for excessive water using land uses; and developing a Recycled Water Master Plan that identifies access to recycled water and the quantity available to the City, as well as additional supportive actions. Further, Measure W.1 includes Action 6, which aims to convert impermeable surface and increase infiltration. Additionally, the General Plan includes actions to promote the use of captured rainwater, grey water, or recycled water (A.1.1d) and Policy P1.7, which states that Montclair will protect, conserve, and replenish existing and future water resources.

Air Pollution

The combustion of fossil fuels, especially within the transportation sector, leads to decreased local air quality and health consequences for local communities. If temperatures continue to rise as predicted in the Cal-Adapt scenarios, there will be more days with weather conducive to ozone formation, leading to reduced air quality and increased health problems. To help improve local air quality, community members can opt to bike, take public transit, or carpool instead of taking their personal vehicle.[50]

45. https://www.i4es.org/benefits-of-urban-forestry/
46. https://calepa.ca.gov/climate/urban-heat-island-index-for-california/urban-heat-island-interactive-maps/
47. https://www.mvwd.org/175/Groundwater
48. https://water.ca.gov/News/News-Releases/2021/Dec-21/SWP-December-Allocation
49. https://water.ca.gov/Water-Basics/Conservation-Tips
50. https://ww2.arb.ca.gov/our-work/topics/simple-solutions-improve-air-quality

Section 5: Implementation

There is Hope – Shifting the Narrative

Despite the very real impacts of climate change that we currently face and will continue to experience, there is hope and we can work collectively to reduce the burdens from climate change in order to establish a more resilient and sustainable future. The actions that we take in our home, at work, and in the community shape our world. As a team, we must act swiftly, yet strategically to support a cause bigger than ourselves. That being said – it's not too late.

This section details the implementation timeframes, responsible parties for implementation, and performance metrics necessary to help monitor and track the success of CAP implementation.

Moving the Dial

This CAP represents the City's first climate planning document and it aims to set the City on a course to reduce GHG emissions consistent with the State's goals in order to build a safer, healthier, and more sustainable future for everyone in Montclair. Achieving the emission reduction targets included in this CAP and meeting the State goals outlined in SB 32 and AB 1279 will require considerable changes and participation from the entire community, including residents, businesses, and the City.

The measures and actions outlined in Section 3, *Emission Reduction Strategies,* provide the first steps towards reducing our impact and will be reevaluated and reestablished as time goes on and progress is made. Additional work will need to be done and updates to the CAP will be required in the future as new technologies and solutions become available. It is anticipated that the success of the existing measures will be reviewed in 2026 and again in 2028 to ensure that the measures are implemented as currently proposed and the emissions reductions attributable to the measures are anticipated to meet the established targets. The CAP update schedule is summarized below under, *Going Forward.*

Climate Action Funding/Financing

This section provides a discussion of some of the funding and financing options available to the City of Montclair in order to implement measures and actions.

Funding

One of the greatest obstacles associated with climate action planning is finding and securing funding to implement various projects and initiatives. Therefore, when considering fostering sustainability in Montclair, one of the most important aspects was how the community could cost-effectively implement GHG reduction strategies in both the present and future. As such, the implementation schedule was developed based on the measures and actions that had either no or low-costs for the community.

Full implementation of the City's CAP will require investments on the part of the City, local households and property owners, and commercial businesses. In most cases, the expenditures will not only help to reduce GHG emissions but will also bring other valuable co-benefits as described in the measures and actions. The CAP will be implemented over time. Funding sources for some actions can be identified at the outset, while the best means to fund other actions will be determined at the time the City is ready to implement them, depending on the resources available. In general, three main principles should guide how future climate action initiatives should be funded, which include equity, cost-effectiveness, and leveraging local resources, as shown in Figure 9.

Financing

One of the major financial tools available to make large investments into infrastructure, vehicles, or buildings is financing. Financing allows us to leverage the time value of money and put future expected money flows to use today. Further, understanding the ranges of cost savings and revenue streams, and how those costs and revenues accrue over time into a payback or return on investment calculation, are prudent factors to structuring partnerships, engaging stakeholders, and making optimal financial decisions. For example, energy efficiency retrofits can generate cost savings of more than 30% for 15 to 20 years. If external partners are involved, such as with an energy savings performance contract, cities may not need to provide any upfront capital, but the project's cost savings would accrue with a private

Figure 9 Funding Strategy Principals

Equity
Limit the imposition of new costs on the segments of the community that have the least ability to shoulder increased cost; target assistance to low- and moderate-income households

Cost-Effectiveness
Prioritize the use of available local resources to implement the measures and actions that have the highest GHG reduction potential; when possible, the measures and actions in the CAP will generate long-term cost savings that will repay and even generate a return on investment.

Leveraging Local Resources
Leverage General Fund resources and in-kind staff time to aggressively seek grants, matching funds, in-kind contributions, and other resources from State, federal, and philanthropic sources to help pay for actions and limit the cost to the City, local residents, and businesses

third-party and be lost by the City. An anaerobic digester may need $5M to $10M in upfront capital but could also generate $1 to $2M annually in natural gas delivery revenue. Over 20 years, that can be an attractive financial investment for a City. Cities must consider the estimated return on investment, how project costs and revenues balance out over the useful life of the project, and whether they are willing to forego long-term cost savings or revenue generation capacity by partnering with a private third-party.

Cost of Doing Nothing

The alternative to implementing climate action measures is not zero. One immediate example is the cost to install conduit and panel capacity for EV chargers for all new construction. While this action increases upfront construction costs by a few hundred dollars, doing that same work after the building is completed can be an order of magnitude higher (~$3,000). Given the move towards electric vehicles, the cost of not installing electric vehicles infrastructure today could cost the community significantly more in the future. In a similar vein, adaptation measures will cost the City and the community today. Planting trees, installing microgrids, and setting up cooling centers all have upfront costs. However, it's imperative that we weigh these costs against the costs of a future without these adaptive measures given what we know about the climate.

The Red Cross and Red Crescent Societies estimate that the number of ***people in need of humanitarian aid each year could double to 200 million annually by 2050*** *due to climate change* ***costing $20 billion per year.*** [51]

Research published in the journal, Nature, predicts the cost of not decreasing emissions to carbon neutrality by mid-century could range between $149.78 to $791.98 trillion by the end of the century.[52] That same study found that if we mitigate climate change and achieve carbon neutrality by mid-century the world could see a $127 to $616 trillion economic benefit after considering the cost of mitigation. The humanitarian impact is also significant. Furthermore, the World Resources Institute has found that investing in adaptation and resilience provides a benefit-cost ratio ranging from 2:1 to 10:1, meaning that for every dollar invested in resilience and adaptation we stand to see $2 to $10 dollars' worth of benefits.

51. https://www.ifrc.org/press-release/200-million-people-need-us20billion-respond-new-report-estimates-escalating-humanitarian-cost
52. https://www.nature.com/articles/s41467-020-15453-z

Going Forward – Monitoring Success and Correcting Course

If substantial progress has not been made towards reaching the GHG emissions reduction targets by the second review (2028), a CAP update may be required to establish new or more robust emissions reduction measures and actions to increase emission reductions and maintain status as a CEQA-qualified GHG emissions reduction plan. The CAP update could require additional implementation of the existing actions and/or additional actions such as shifting incentive and educational programs to mandatory requirements. A complete CAP update for post-2030 emissions reductions targets will also be required, and City Staff should begin this effort by 2031, during the second review.

Who's Responsible?

Climate action starts with us and achieving long-term emission reduction goals will require participation from everyone. Without concentrated, collective action, achieving our long-term goals will be nearly impossible and under that scenario, the impacts of climate change are only anticipated to intensify. The City can update building codes, provide electric vehicle charging infrastructure and designate bike lanes, but it is up to the broader community to embrace these new services and technologies and gain the benefits outlined in this Plan.

Making meaningful progress towards reducing our GHG emissions starts with City leadership, through policies, education, ordinances, and investments that act as catalysts for change throughout the wider community. Community partners then support these

policies with incentives and programs. Businesses can then leverage these policies to provide new services and adopt more sustainable practices. Finally, residents and visitors that have been provided with the incentives and education, can actively work together to reduce our impacts and decrease GHG emissions. As policies and programs are developed and infrastructure is constructed, City Staff will continue to engage the community, provide informative progress updates, and create ongoing opportunities to solicit community feedback. We look forward to working together to reduce our long-term impact from GHG emissions.

Looking Ahead

New iterations of the CAP will be required as time goes on and new technology and information become available. It is anticipated that the inventory will be updated and the measures will be reviewed every three years, as shown in Figure 10. Successful implementation of a long-range planning document requires detailed tracking that will be done by City Staff in all departments. This approach is essential to successful implementation because it gives everyone a seat at the table and demonstrates that climate action requires collective participation to result in real change. Table 7 shows each of the measures with supporting actions and includes the lead or responsible department that is in charge of overseeing and implementing each item. The notes column is provided for tracking and monitoring initiatives over time.

Figure 10 Implementation Monitoring Schedule

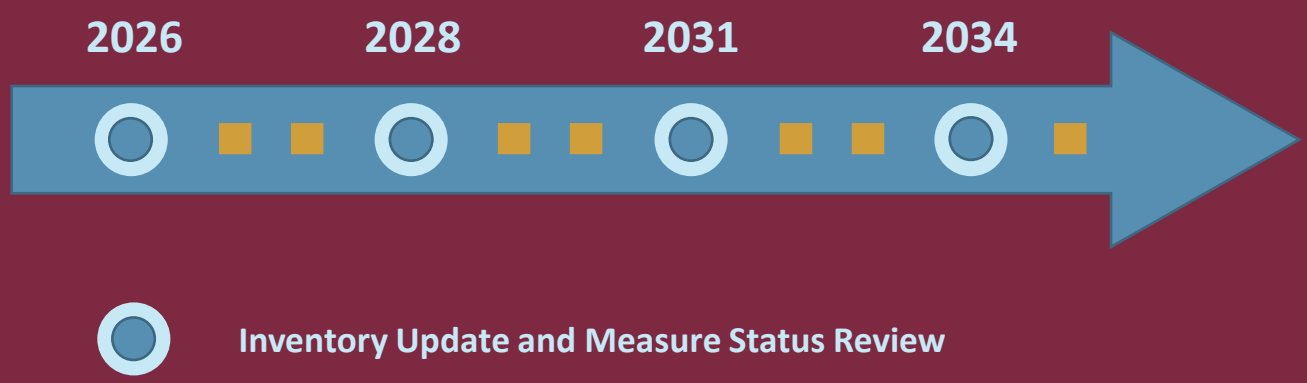


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Table 7 Montclair Implementation Plan

ID #	Action	Lead Department	Notes
Building Energy			
Measure BE.1: Join the Clean Power Alliance at the 100% Green Power rate and strive for a less than 4% opt-out rate for residential and commercial customers by 2030 and maintain through 2045.			**Performance Metric:** Track Opt-out Rate
1	Conduct a feasibility study comparing enrollment in the Clean Power Alliance at the different rates versus rates through SCE, including the SCE Green Rate Program.	Community Development	
2	Join the CPA at the 100% Green Power rate and strive for a less than 4% opt-out rate by 2025.	Community Development	
3	Perform public outreach and education campaigns highlighting the benefits of using renewable energy and the CPA, including: ▪ Monitoring opt-out rates ▪ Tabling at community events ▪ Establishing an informational resource page on the City website ▪ Regular social media posts ▪ Energy bill inserts	Community Development	
4	Develop a benchmarking system to track annual opt-out rates and ensure opt-out rate remains low.	Community Development	
5	Coordinate with CPA to identify rebates or cost incentives for low-income and disadvantaged families.	Community Development	
Measure BE.2: Electrify 100% of newly constructed buildings by 2030.			**Performance Metric:** Track natural gas and electricity use of buildings constructed post-2025
1	In alignment with the California Energy Commission's efforts to advance clean energy in buildings, adopt a Local Building Energy Standard Ordinance that requires new construction to be more energy efficient than all-electric unless cost prohibitive. Implement through the building permit process which limits expansion of natural gas infrastructure and promotes HVAC systems, hot water heaters, and other appliances to be all-electric at time of installation, or in major renovations after 2025. The following steps will be used to develop the reach code: ▪ Develop idea for a reach code ordinance. ▪ Work with stakeholders.	Community Development	

ID #	Action	Lead Department	Notes
Building Energy			
1 cont.	▪ Obtain a cost-effectiveness study. ▪ Develop and draft an ordinance. ▪ Public process and revisions. ▪ Formal adoption process.		
2	Engage with an organization such as Building Decarbonization Coalition to work with local building industry stakeholders in development of the electrification reach code.	Community Development	
3	Enforce ordinance compliance through a comprehensive permitting compliance program which includes routine training of staff, dedicating staff time to building inspections, charging fees for noncompliance, providing easy to understand compliance checklists online and with permit applications, and facilitating permitting online.	Community Development	
4	Develop a webpage and materials at City Hall containing benefits of electrification and resources that can assist in the process. Consider working with regional partners to maintain a database of qualified contractors and consultants for electrification retrofits.	Community Development	
5	Host outreach events to educate the community on use, versatility and benefits on all-electric appliances.	Community Development	
Measure BE.3: Improve energy efficiency by 17% in existing residential buildings and 15% in existing commercial buildings by 2030, and 52% in existing residential and 41% in existing commercial buildings by 2045.			**Performance Metric:** **Track natural gas and electricity use of buildings constructed post-2025**
1	In alignment with the California Energy Commission's efforts to advance clean energy in buildings, adopt a Local Building Energy Standard Ordinance by 2025 that requires retrofits or renovations in existing buildings that include natural gas to be more energy efficient than all-electric buildings. The ordinance may include the following type of amendments: a) Requires mixed-fuel single family and duplex residential buildings to exceed the 2019 Energy Code by 15 percent; b) Requires mixed-fuel office buildings to exceed the 2019 Energy Code by 10 percent; c) Requires prewiring for possible future electric appliances in mixed-fuel;	Community Development	

ID #	Action	Lead Department	Notes
Building Energy			
1 cont.	d) For new mixed-fuel construction, require CalGreen Tier 1 for residential buildings, require 5 percent reduced energy budget for hotel/motel and high-rise residential, require 10 percent reduced energy budget for non-residential.		
2	Adopt and implement local amendments to the 2019 California Energy Code incentivizing all electric development (Clean Energy Choice Program).	Community Development	
3	Work with SoCal Gas to provide opportunities for funding energy efficiency projects and improved natural gas infrastructure to increase energy efficiency in existing building.	Community Development	
4	Create a rebate and incentive programs for appliance replacement, ENERGY STAR appliance program, and Energy Conservation Programs, with public outreach. Work with SCE and/or Clean Power Alliance to provide rebates for residential replacement of old appliances with electric-powered or more energy efficient appliances.	Community Development	
5	Provide information to staff and community regarding annual energy savings from energy conservation programs for CAP implementation tracking.	Community Development	
6	Work with and educate businesses on partnerships designed to maximize the use of renewable energy including solar/ storage, appropriate tariff changes and microgrid opportunities.	Community Development	
7	Identify funding for upgrading ventilation systems and natural gas appliances in disadvantaged community homes to improve air quality and increase energy efficiency.	Community Development	
8	Seek out funding partnerships with local financiers and work with partners such as local turnkey retrofit program that leverages existing funding, which offers low-cost financing of electrification and energy efficiency retrofits for residents and local businesses.	Community Development	

ID #	Action	Lead Department	Notes
Transportation			
Measure TR.1: Develop and implement an Active Transportation Plan to shift 6% of passenger car vehicle miles traveled to active transportation, and 12% by 2045.			**Performance Metric:** Develop an Active Transportation Plan and track mode shift
1	Develop and adopt an Active Transportation Plan consistent with the City General Plan Policies that will identify funding strategies and policies for development of pedestrian, bicycle, and other alternative modes of transportation projects. Establish Citywide events, outreach, educational programs, or platforms to promote active transportation in the community.	Public Works	
2	Conduct a Complete Street Feasibility Study on street improvement options to identify streets and intersections that can be improved for pedestrians and bicyclists through traffic calming measures and/or where multi-use pathway opportunities exist to increase active transportation.	Public Works	
3	Obtain funding and implement "mobility hub" projects consistent with City General Plan. Work to identify grant funding opportunities to implement Complete Our Streets projects included in the Complete Our Streets Plan.	Public Works/Community Development	
4	Install and upgrade end-of-trip facilities (lockers, bike racks, etc.) at transit center to encourage active transportation as part of commute for community members using public transit. Improve and ensure there are safe bicycle and pedestrian infrastructure to access transit center.	Public Works	
5	Engage the Bicycle Pedestrian Commission, Safe Routes to School network, and community groups to identify additional short-term and long-term bikeway and pedestrian infrastructure improvement projects to implement.	Public Works/Community Development	
6	Ensure there is equitable access to safe bicycle and pedestrian infrastructure in all areas of the city. Facilitate transportation equity through targeted provision of programs that encourage minority, low-income, and senior populations to take transit, walk, bike, use rideshare or car share.	Public Works	

ID #	Action	Lead Department	Notes
Transportation			
7	Evaluate and update the City's Zoning Code, Transportation Demand Management Ordinance, and California Green Building Code to ensure the City requires installation of accessible, shaded, and secure bicycle parking for new commercial development and retrofits and requires installation of bicycle parking areas in instances where off-street parking is required.	Community Development/Public Works	
Measure TR.2: Implement a public and shared transit programs to achieve 10% of public transit mode share by 2030 and 30% by 2045.			**Performance Metric:** **Implement a Public and Shared Transit Program and track mode shift to transit**
1	Conduct local transportation surveys to better understand the community's needs and motivation for traveling by car versus other alternatives such as bus or Metro Gold Line light rail. Use survey results to inform transit expansion and improvement projects.	Community Development/Public Works	
2	Adopt policy to encourage new development of public space to be transit accessible and multi-functional by co-locating public facilities.	Community Development	
3	Adopt a Transportation Demand Management (TDM) Plan for the City that includes a transit system focus. Provide incentives for implementation of TDM measures at local businesses and for new developments. Incentives and incentives to encourage use of transit instead of driving alone may include: ▪ Offer monetary incentives for employees to use car share, carpool, take the bus, bike, or walk. ▪ Require large employers (more than 25 employees) to offer subsidies to employees for the transit system ▪ Offer car/vanpool matching ▪ Offer emergency ride homes for employees utilizing transit ▪ Market-rate parking fee charged directly to employees or patrons at businesses or new developments	Community Development/Public Works	

ID #	Action	Lead Department	Notes
Transportation			
3 cont.	▪ Offer priority/discounted HOV parking at businesses or new developments ▪ Daily parking charge available for occasional drivers instead of monthly parking pass	Community Development/Public Works	
4	Continue to work with federal legislative advocate and congress member to secure funds for Metro's Gold Line plan and supporting infrastructure.	Community Development/Public Works	
5	Obtain funding and grants to upgrade City-owned or operated facilities and infrastructure, such as parking, transit stops, and community hubs (e.g., the library, City recreational center), that promote use of public transit.	Community Development/Public Works	
Measure TR.3: Increase electric/alternative fuel vehicle adoption to 20% for passenger and 10% for commercial vehicles by 2030, and 65% passenger and 50% commercial by 2045.			**Performance Metric:** **Install 200 EV chargers and track EV registration**
1	Adopt an EV Readiness Reach Code by 2026 requiring new commercial and multifamily construction to install the minimum number of EV chargers based on Tier 2 CalGreen requirements (20% of total).	Community Development	
2	Adopt an EV Charging Retrofits in existing Commercial and Multifamily Buildings Reach Code by 2026 requiring major retrofits, with either a building permit with square footage larger than 10,000 square feet or including modification of electric service panels, to meet CalGreen requirements for "EV Ready" charging spaces and infrastructure.	Community Development	
3	Conduct a survey of existing publicly accessible electric vehicle chargers and their locations and identify a prioritized list of locations for new electric vehicle charging stations with particular consideration for equitable distribution of chargers to residents of multi-family homes, low-income people, people on a fixed income, and communities of color.	Public Works/Community Development	
4	Add 240 new publicly accessible Level 2 and 3 electric vehicle charging stations to the City by 2030.	Public Works	

ID #	Action	Lead Department	Notes
Transportation			
5	Promote public and private conversion to zero-emission vehicles; including use of City events, social media, and the City website to educate on benefits of zero-emission vehicles and available incentives.	Public Works/Community Development	
6	Investigate commercial vehicle fleets in Montclair and identify businesses/employers to target for accelerating zero emission vehicle (ZEV) adoption. Identify and implement incentives for commercial fleet electrification, such as tax breaks or use of Low Carbon Fuel Standard credits.	Community Development	
7	Collaborate with local businesses/employers to develop and implement a plan for City-supported accelerated fleet electrification. As part of the plan, identify opportunities for accelerated fleet electrification and promote zero-emission vehicle (ZEV) adoption within major private and employee fleets in the city.	Public Works/Community Development	
8	Work with SCE to incentivize electric vehicle charger installations through on-bill financing.	Public Works/Community Development	
Measure TR.4: Equitably increase use of electric vehicles, promote active transportation and public transit use by disadvantaged communities.			**Performance Metric: Conduct feasibility study**
1	Conduct a feasibility study identifying barriers for disadvantaged and low-income families related to mobility for active transportation, use of public transit, and access identified barriers.	Public Works/Community Development	
2	As part of Complete Streets Feasibility Study, evaluate streets within disadvantage communities and identify streets for improvements that would increase mobility within the neighborhood.	Public Works/Community Development	
3	Pilot a transit shuttle program for disadvantaged communities to increase access to the transit center.	Public Works	
4	Investigate and pursue funding opportunities for EV car share for low-income neighborhoods, such as the Zero Emissions Mobility and Community pilot Project Fund. Partner with local community group to identify funding opportunities for purchasing EVs or other pilot projects for deployment in disadvantaged communities.	Public Works/Community Development	

ID #	Action	Lead Department	Notes
Transportation			
5	Work with Metro and Foothill Transit to expand use of LIFE low-income EZ Pass transit subsidy by Montclair low-income households who ride Metro and Foothill Transit buses and commuter inter-city rails.	Public Works/Community Development	
Waste and Wastewater			
Measure W.1: Reduce per capita water consumption by 10% compared with 2017 levels by 2030 and 25% by 2045.			**Performance Metric:** Track community water use
1	Adopt ordinance by 2026 requiring non-residential buildings over 20,000 square feet (including municipal buildings over 7,500 square feet) to disclosure water use annually for benchmarking purposes and then take action to reduce their consumption.	Community Development	
2	Adopt a cool pavement ordinance by 2026 to reduce heat island effect improving water quality.	Community Development	
3	Continue to enforce Model Water Efficient Landscapes Ordinance.	Community Development	
4	Adopt an ordinance by 2026 restricting the use of potable water for non-potable uses and requiring greywater capture for land uses that are excess water users (e.g., car washes, large fields, etc.).	Community Development	
5	Develop a Recycled Water Use and Implementation Strategy that identifies new and existing access to recycled water and quantity of recycled water available to the City for use from MVWD's. The strategy shall identify land use types (i.e., landscaping and golf courses) and specific projects that will switch from potable to recycled water use allowing for a goal of 20% of City's potable water use to be replaced with recycled water provided by MVWD by 2030.	Public Works/Community Development	
6	Conduct a citywide study identifying impermeable surfaces that can be targeted for a transition to increase infiltration.	Community Development	
7	Promote alternative driveways/sidewalk materials and greenscaping through educational pamphlets and programs; incentivize residents to transition from impervious to pervious hardscapes.	Community Development	

ID #	Action	Lead Department	Notes
Waste and Wastewater			
8	Provide rebates or other funding to low- and medium-incomes homes for installing greywater, rainwater catchment system, EnergyStar appliances, and low-flow fixtures and fittings (e.g., faucets, sprinklers).	Community Development	
9	Work with schools to educate youth about water conversation.	Community Development	
10	Establish a system to track implementation progress of low-flow devices and to track use of rebates offered through the City.	Community Development	
Solid Waste			
Measure SW.1: Implement SB 1383 requirements and reduce community-wide landfilled organics by 75% by 2025 and inorganic waste by 35% by 2030 and reduce all landfilled waste by 100% by 2045.			**Performance Metric:** **Meet SB 1383 Requirements**
1	Enforce adopted ordinance 22-1001 requiring compliance with SB 1383. Ensure ordinances established are consistent with SB 1383 requirements; revise if necessary.	Community Development	
2	Engage with waste hauler operating within the City to discuss SB 1383 requirements for waste haulers (i.e., organics receptacles and labeling requirements).	Community Development	
3	Adopt procurement policies to comply with SB 1383 requirements for jurisdictions to purchase recovered organic waste products.	Community Development	
4	Adopt an Edible Food Recovery Ordinance for edible food generators, food recovery services, or organization that are required to comply with SB 1383.	Community Development	
5	Partner with all City waste hauler, to provide organic waste collection and recycling services to all commercial and residential generators of organic waste.	Community Development	
6	Enforce ordinance 22-1001 requiring all residential and commercial customers to subscribe to an organic waste collection program and/or report self-hauling or backhauling of organics.	Community Development	
7	Conduct a Feasibility Study and prepare an action plan to ensure edible food reuse infrastructure is sufficient to accept capacity needed to recover 20% of edible food disposed or identify proposed new or expanded food recovery capacity.	Community Development	

ID #	Action	Lead Department	Notes
Solid Waste			
8	Establish an education and outreach program for school children and adults around food waste prevention, nutrition education, and the importance of edible food recovery.	Community Development	
9	Establish an edible food recovery program to minimize food waste. Leverage CalRecycle support for projects that prevent food waste or rescue edible food.	Community Development	
10	Adopt an ordinance or enforceable mechanism to regulate haulers collecting organic waste, including collection program requirements and identification of organic waste receiving facilities.	Community Development	
11	Partner with waste hauler within the City to: ▪ Ensure organic waste collection from mixed waste containers are transported to a high diversion organic waste processing facility. ▪ Provide quarterly route reviews to identify prohibited contaminants potentially found in containers that are collected along route	Community Development	
Carbon Sequestration			
Measure CS.1: Increase carbon sequestration and green space by planting 500 new trees through the community by 2030, and 1,000 by 2045.			**Performance Metric:** **Plant 500 trees by 2030**
1	Adopt Greenscaping Ordinance that has a street tree requirement for all zoning districts, has a shade tree requirement for new development, requires greening of parking lots, and increases permeable surfaces in new development.	Community Development	
2	Adopt a standard policy in alignment with City's General Plan and set of practices for expanding urban tree canopy and placing vegetative barriers between busy roadways and developments to reduce exposure to air pollutants from traffic.	Community Development	

ID #	Action	Lead Department	Notes
Carbon Sequestration			
3	Prepare and adopt an Urban Forest Management Plan for the City that includes an inventory of existing trees, identifies future tree planting opportunities and a climate-ready tree palette, as well as ongoing operations and maintenance needs.		
4	Identify and participate in partnership opportunities necessary to plant and maintain an increase in the City's tree inventory by 15% by 2030 and convert priority public space into green space.	Community Development	
5	Promote incentives to property owners and developers for greenspace inclusion through educational pamphlets, programs, and webpages and track the use of incentives.	Community Development	
Measure CS.2: Achieve and maintain compost procurement requirements of SB 1383 by 2030.			**Performance Metric:** **Achieve Compost Procurement Requirements of SB 1383**
1	Implement all required activities under SB 1383 including achieving compost procurement requirements effective. Effective January 2022, CalRecycle's regulations require cities to purchase a minimum of 0.08 tons per resident of recovered organic composts.	Community Development	
Municipal Operations			
Measure M.1: Electrify the municipal vehicle fleet and mobile equipment by 50% by 2030 and 100% by 2045.			**Performance Metric:** **Implement a City fleet Fuel Conversion Policy**
1	Develop and adopt a policy to apply lifecycle assessment to all new vehicle and equipment purchases.	Community Development	
2	Implement the City Fleet Alternative Fuel Conversion Policy such that as municipal vehicles turn over, they are replaced with alternative-fuel vehicles in alignment with the state's Advanced Clean Fleet Rule.	Public Works	
3	Install EV charging stations at municipal buildings.	Public Works	

ID #	Action	Lead Department	Notes
Municipal Operations			
Measure M.2: Reduce carbon intensity of City operations.			**Performance Metric:** **Switch 100% of City accounts to 100% Green Power Electricity**
1	Adopt retrofitting policy for City owned buildings such that energy efficient and electrification retrofits are incorporated into City buildings as they become available.	Community Development/Public Works	
2	Complete energy audits for all City facilities and implement all feasible recommendations for fuel switching and efficiency upgrades.	Public Works	
3	Establish a replacement plan for replacing natural gas fueled equipment with electric where practical and technologically feasible in City-buildings.	Public Works	
4	Switch City electricity accounts to SCE 100% Green Rate until joining CPA at 100% Green Power rate by 2025.	Community Development/Finance	
5	Investigate funding and grant opportunities and partnerships to install photovoltaic systems at all City buildings as feasible.	Community Development	

Appendix A: Regulatory Context

Regulatory Context

As the impacts of climate change are being recognized, many strategies that address climate change have emerged at all levels of government. This section provides an overview of the regulatory context at the international, state, and local levels relative to the City of Montclair's actions toward reducing greenhouse gas (GHG) emissions.

International Climate Action Guidance

1992 United Nations Framework Convention on Climate Change

The primary international regulatory framework for GHG reduction is the United Nations Framework Convention on Climate Change Paris Agreement (UNFCCC). The UNFCCC is an international treaty adopted in 1992 with the objective of stabilizing atmospheric GHG concentrations to prevent disruptive anthropogenic climate change. The framework established non-binding limits on global GHG emissions and specified a process for negotiating future international climate-related agreements.[1]

1997 Kyoto Protocol

The Kyoto Protocol is an international treaty that was adopted in 1997 to extend and operationalize the UNFCCC. The protocol commits industrialized nations to reduce GHG emissions per county-specific targets, recognizing that they hold responsibility for existing atmospheric GHG levels. The Kyoto Protocol involves two commitment periods during which emissions reductions are to occur, the first of which took place between 2008-2012 and the second of which has not entered into force. [2]

2015 The Paris Agreement

The Paris Agreement is the first-ever universal, legally binding global climate agreement that was adopted in 2015 and has been ratified by 189 countries worldwide.[3] The Paris Agreement establishes a roadmap to keep the world under 2° C of warming with a goal of limiting an increase of temperature to 1.5°C. The agreement does not dictate one specific reduction target, instead relying on individual countries to set nationally determined contributions (NDCs) or reductions based on GDP and other factors. According to the International Panel on Climate Change (IPCC) limiting global warming to 1.5° C will require global emissions to reduce through 2030 and hit carbon neutrality by mid-century.[4]

1 United Nations Framework Convention on Climate Change (UNFCCC). United Nations Framework Convention on Climate Change. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
2 UNFCCC. What is the Kyoto Protocol? https://unfccc.int/kyoto_protocol
3 UNFCCC. Paris Agreement - Status of Ratification. https://unfccc.int/process/the-paris-agreement/status-of-ratification
4 IPCC. Global Warming of 1.5 C. https://www.ipcc.ch/sr15/

2021 Glasgow Climate Pact

The Glasgow Climate Pact[5] (Pact) was adopted by nearly 200 nations in 2021 and builds on the 2015 Paris Agreement. The Pact includes an agreement to revisit the remissions reduction plans to keep the 1.5°C target achievable and is the first global climate agreement that aims commits to phasing down the use of unabated coal. Further, the Pact includes a commitment to provide climate finance to developing countries.

California Regulations and State GHG Targets

California remains a global leader in the effort to reduce GHG emissions and combat climate change through its mitigation and adaptation strategies. With the passage of Assembly Bill (AB) 32 in 2006, California became the first state in the United States to mandate GHG emission reductions across its entire economy. To support AB 32, California has enacted legislation, regulations, and executive orders (EO) that put the state on course to achieve robust emission reductions and address the impacts of a changing climate. The following is a summary of executive and legislative actions most relevant to the CAP.

2002 Senate Bill 1078

In 2002, SB 1078, established the California Renewables Portfolio Standards (RPS) Program and was accelerated in 2006 by SB 107, requiring that 20 percent of retail electricity sales be composed of renewable energy sources by 2010. EO S-14-08 was signed in 2008 to further streamline California's renewable energy project approval process and increase the state's RPS to the most aggressive in the nation at 33 percent renewable power by 2020.

2002 Assembly Bill 1493

In 2002, AB 1493, also known as the Pavley Regulations, directed the California Air Resources Board (CARB) to establish regulations to reduce GHG emissions from passenger vehicles to the maximum and most cost-effective extent feasible. CARB approved the first set of regulations to reduce GHG emissions from passenger vehicles in 2004, with the regulations initially taking effect with the 2009 model year.

2005 Executive Order S-3-05

Executive Order (EO) S-3-05 was signed in 2005, establishing statewide GHG emissions reduction targets for the years 2020 and 2050. The EO calls for the reduction of GHG emissions in California to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The 2050 emission reductions target would put the state's emissions in line with the worldwide reductions needed to reach long-term climate stabilization as concluded by the IPCC *2007 Fourth Assessment Report*.

2006 Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," which was signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan

5 https://unfccc.int/documents/310475

that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions.

Based on this guidance, CARB approved a 1990 statewide GHG baseline and 2020 emissions limit of 427 million metric tons of CO_2 equivalent (MMT CO_2e). The Scoping Plan was approved by CARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards,[6] and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2014 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer-term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014). The state met its goal of reducing GHG emissions to 1990 levels in 2016, achieving the 2020 goal four years ahead of schedule.

2007 Executive Order S-1-07

Also known as the Low Carbon Fuel Standard, EO S-1-07, issued in 2007, established a statewide goal that requires transportation fuel providers to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. EO S-1-07 was readopted and amended in 2015 to require a 20 percent reduction in carbon intensity by 2030, the most stringent requirement in the nation. The new requirement aligns with California's overall 2030 target of reducing climate changing emissions 40 percent below 1990 levels by 2030, which was set by Senate Bill 32 and signed by the governor in 2016.

2007 Senate Bill 97

Signed in August 2007, SB 97 acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Natural Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

2008 Senate Bill 375

SB 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPOs), including the San Bernardino Council of Governments (SBCOG), of which

6 On September 19, 2019 the National Highway Traffic Safety Agency (NHTSA) and the US Environmental Protection Agency (EPA) issued a final action entitled the One National Program on Federal Preemption of State Fuel Economy Standards Rule. This action finalizes Part I of the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule. This rule states that federal law preempts State and local tailpipe greenhouse gas (GHG) emissions standards as well as zero emission vehicle (ZEV) mandates. The SAFE Rule withdraws the Clean Air Act waiver it granted to California in January 2013 as it relates to California's GHG and zero emission vehicle programs.

Montclair is a member of, to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the MPO's Regional Transportation Plan (RTP).

2009 California Green Building Code

The California Green Building Standards Code (CALGreen) is Part 11 of the California Building Standards Code or Title 24 and is the first statewide "green" building code in the nation. The purpose of CALGreen is to improve public health, safety, and general welfare by enhancing the design and construction of buildings. Enhancements include reduced negative impact designs, positive environmental impact designs, and encouragement of sustainable construction practices. The first CALGreen Code was adopted in 2009 and has been updated in 2013, 2016, and 2019. The CALGreen Code will have subsequent, and continually more stringent, updates every three years.

2009 Senate Bill X7-7

In 2009, SB X7-7, also known as the Water Conservation Act, was signed, requiring all water suppliers to increase water use efficiency. This legislation sets an overall goal of reducing per capita urban water use by 20 percent by2020.

2011 Senate Bill 2X

In 2011, SB 2X was signed, requiring California energy providers to buy (or generate) 33 percent of their electricity from renewable energy sources by 2020.

2012 Assembly Bill 341

AB 341 directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling. As of July 2012, businesses are required to recycle, and jurisdictions must implement a program that includes education, outreach, and monitoring. AB 341 also set a statewide goal of 75 percent waste diversion by the year 2020.

2014 Assembly Bill 32 Scoping Plan Update

In 2014, CARB approved the first update to the Scoping Plan. This update defines CARB's climate change priorities and sets the groundwork to reach the post-2020 targets set forth in EO S-3-05. The update highlights California's progress toward meeting the near-term 2020 GHG emissions reduction target, defined in the original Scoping Plan. It also evaluates how to align California's longer-term GHG reduction strategies with other statewide policy priorities, such as water, waste, natural resources, clean energy, transportation, and land use.

2014 Assembly Bill 1826

AB 1826 was signed in 2014 to increase the recycling of organic material. GHG emissions produced by the decomposition of these materials in landfills were identified as a significant source of emissions contributing to climate change. Therefore, reducing organic waste and increasing composting and mulching are goals set out by the AB 32 Scoping Plan. AB 1826 specifically requires jurisdictions to establish organic waste recycling programs by 2016, and phases in mandatory commercial organic waste recycling over time.

2015 Senate Bill 379

SB 379 requires cities and counties within California to integrate climate adaptation and resilience into their general plans by January 1, 2017, or January 1, 2022, depending on whether that city or county has adopted a Local Hazard Mitigation Plan. The bill requires that the climate adaptation update include a set of goals, policies, and objectives for the community based on the vulnerability assessment, as well as implementation measures, including the conservation and implementation of natural infrastructure that may be used in adaptation projects. Specifically, the bill requires that upon the next revision of a general plan or local hazard mitigation plan, the safety element is to be updated as necessary to address climate adaptation and resiliency strategies applicable to the city or county. The City is currently in the process of updating their General Plan.

2015 Senate Bill 350

SB 350, the Clean Energy and Pollution Reduction Act of 2015, has two objectives: to increase the procurement of electricity from renewable sources from 33 percent to 50 percent by 2030 and to double the energy efficiency of electricity and natural gas end users through energy efficiency and conservation.

2015 Executive Order B-30-15

In 2015, EO B-30-15 was signed, establishing an interim GHG emissions reduction target to reduce emissions to 40 percent below 1990 levels by 2030. The EO also calls for another update to the CARB Scoping Plan.

2016 Senate Bill 32

On September 8, 2016, the governor signed SB 32 into law, extending AB 32 by requiring the state to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). The bill charges CARB to adopt the regulation so that the maximum technologically feasible emissions reductions are achieved in the most cost-effective way.

2016 Senate Bill 1383

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires the CalRecycle, in consultation with the CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills. The bill further requires 20% of edible food disposed of at the time to be recovered by 2025.

2017 Scoping Plan Update

On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 goal set by SB 32. The 2017 Scoping Plan relies on the continuation and

expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted policies, such as SB 350 and SB 1383 .

The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2014 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of six metric tons (MT) CO_2e by 2030 and two MT CO_2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the state (CARB 2017).

2018 Senate Bill 100

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the State's Renewables Portfolio Standard Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

2018 Executive Order B-55-18

Also, on September 10, 2018, the governor issued EO B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

2020 Executive Order N-79-20

On September 23, 2020, the governor issued EO N-79-20, which sets a new statewide goals for phasing out gasoline-powered cars and trucks in California, which is applicable to state agencies. The EO requires 100% of in-state sales of new passenger cars and trucks to be zero-emission by 2035; 100% of in-state sales of medium- and heavy-duty trucks and busses to be zero-emission by 2045, where feasible; and 100% of off-road vehicles and equipment sales to be zero-emission by 2035, where feasible.

2020 Advanced Clean Trucks Regulation

The Advanced Clean Trucks Regulation was approved on June 25, 2020. The regulation establishes a zero-emissions vehicle sales requirement for trucks or on-road vehicles over 8,500 lbs gross vehicle weight and set a one-time reporting requirement for large entities and fleets. Under the regulation, manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines are required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales. Additionally, the regulation established a one-time reporting requirement for large entities and fleets where fleet owners, with 50 or more trucks, are required to report about their existing fleet operations by March 15, 2021.

2021 Senate Bill 27

Adopted on September 23, 2021, SB 27 requires the state Natural Resources Agency to establish carbon sequestration goals for natural and working lands by July 2023. SB 27 also requires the Natural Resources Agency to create a registry of projects for public and private investment and track the carbon benefits of each project. The projects that would be part of this program may not generate compliance offsets under California's Cap-and-Trade program. Additionally, as part of the next Scoping Plan Update, CARB is required to establish specific CO2 removal targets starting in 2030.

2022 Scoping Plan Update

In November 2022, CARB adopted the 2022 Scoping Plan, which provides a framework for achieving the 2045 carbon neutrality goal set forth by AB 1279. The 2022 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently approved legislation, such as AB 1279. The 2022 Scoping Plan includes discussion of the Natural and Working Lands sector as both an emissions source and carbon sink. The Plan centers equity in terms of State climate investments and climate mitigation strategies.

2022 Senate Bill 1020

Adopted in September 2022, SB 1020 advances the State's trajectory to 100 percent clean energy procurement by 2045 by creating clean energy targets of 90 percent by 2035 and 95 percent by 2040. SB 1020 builds upon SB 100, which accelerated the State's RPS and requires electricity providers to increase procurement from eligible renewable energy resources to 60 percent by 2030 and 100 percent by 2045.

2022 Assembly Bill 1279

Known as the California Climate Crisis Act and signed by the governor in 2022, AB 1279 codifies the GHG emissions reduction goals of achieving carbon neutrality by 2045 and expands upon this goal to define carbon neutrality as reducing direct emissions 85 percent below 1990 levels and removing the remaining 15 percent of emissions via other technologies and practices, like carbon sequestration. The 2022 Scoping Plan provides the pathway for reaching the State's AB 1279 goal.

2022 Advanced Clean Cars II

The Advanced Clean Cars II regulation was adopted in August 2022. The regulation amends the Zero-emission Vehicle Regulation to require an increasing number of zero-emission vehicles, and relies on advanced vehicle technologies, including battery electric, hydrogen fuel cell electric and plug-in hybrid electric-vehicles, to meet air quality, climate change emissions standards, and Executive Order N-79-20, which requires that all new passenger vehicles sold in California be zero emissions by 2035. The regulation also amends standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions.

2023 Advanced Clean Fleet

Approved by CARB on April 28, 2023, the Advanced Clean Fleets Regulation requires fleets, businesses, and public entities that own or direct the operation of medium- and heavy-duty vehicles in California to transition to 100 percent zero-emission capable utility fleets by 2045. Under the regulation, fleet operators may choose to purchase only ZEVs beginning in 2024 and remove

internal combustion engine vehicles at the end of their useful life or fleet operators may elect to meet the State's ZEV milestone targets as a percentage of the total fleet starting with vehicle types that are most suitable for electrification.

City of Montclair Plans

The City of Montclair has developed plans and policies that promote sustainability and reduce the City's GHG emissions. Specifically, Montclair adopted an Active Transportation Plan (2020) that includes actions related to increasing walkability and bicycle access across the City to help improve community health, air quality, and equity. The City also adopted a Safe Routes to School Plan in 2020 and most recently updated the General Plan and developed their first Climate Action Plan.

2020 Montclair Active Transportation Plan

The 2020 Active Transportation Plan was updated in November 2020 and has policies aimed at increasing bicycle access and connectivity. The primary goal of this Plan is to help redesign the city to include healthier and more equitable access to safer and more connected roadways through safe and accessible active transportation options. As a co-benefit, the Plan will also improve the community's air quality by encouraging more people to actively commute. The Plan notes that the City's existing pedestrian and bicycle infrastructure is adequate. However, much more can be done. Approximately 72 percent of the City's area is connected by corridors with low Bicycle Level of Traffic Stress - a measure of the comfort of roadways for bicyclists. Furthermore, findings from the Pedestrian Level of Comfort analysis showed that almost the entire city is connected by roadways that are comfortable for pedestrians.[7]

2020 Montclair Safe Routes to School Plan

The Montclair Safe Routes to School Plan is a comprehensive framework for the City of Montclair to improve the health, safety, and equity of students, parents, and the Montclair community in the surrounding areas for the seven elementary schools, one middle school, and one high school in Montclair. The Plan builds upon the international Safe Routes to School movement. The movement strives to make communities safer and more convenient for children and their families to walk and bike to school. It is supported by six key components, often known as the six E's of Safe Routes to School, which are: engagement, equity, education, encouragement, engineering, and evaluation.[8]

2022 General Plan Update

The City's General Plan update was drafted in 2021 and is anticipated for adoption in 2024. The General Plan is an integrated plan which includes a community driven vision, direction, and policy guidance on the physical structure of the City: the places we preserve, the things we build, and how and where we build them. The General Plan also lays out how the City should harness the tools at its disposal to achieve this vision. According to the General Plan, it establishes the City's long-range vision and serves the following purposes:

- Recasts the 1999 General Plan to incrementally generate a place that fulfills the City's vision by 2040

7 https://storage.googleapis.com/proudcity/montclairca/uploads/2021/03/Montclair-Active-Transportation-Plan.pdf

8 https://storage.googleapis.com/proudcity/montclairca/uploads/2021/03/Safe-Routes-to-School.pdf

- Sets forth the principles, goals, policies, and actions to help achieve the community vision, establishing the basis for evaluating choices and making near- and long-term decisions
- Sets forth the principles, goals, policies, and actions to help achieve the community vision, establishing the basis for evaluating choices and making near- and long-term decisions
- Prioritizes actions to advance on-going implementation

Appendix B: Cal-Adapt Analysis

Cal-Adapt Resource Guide

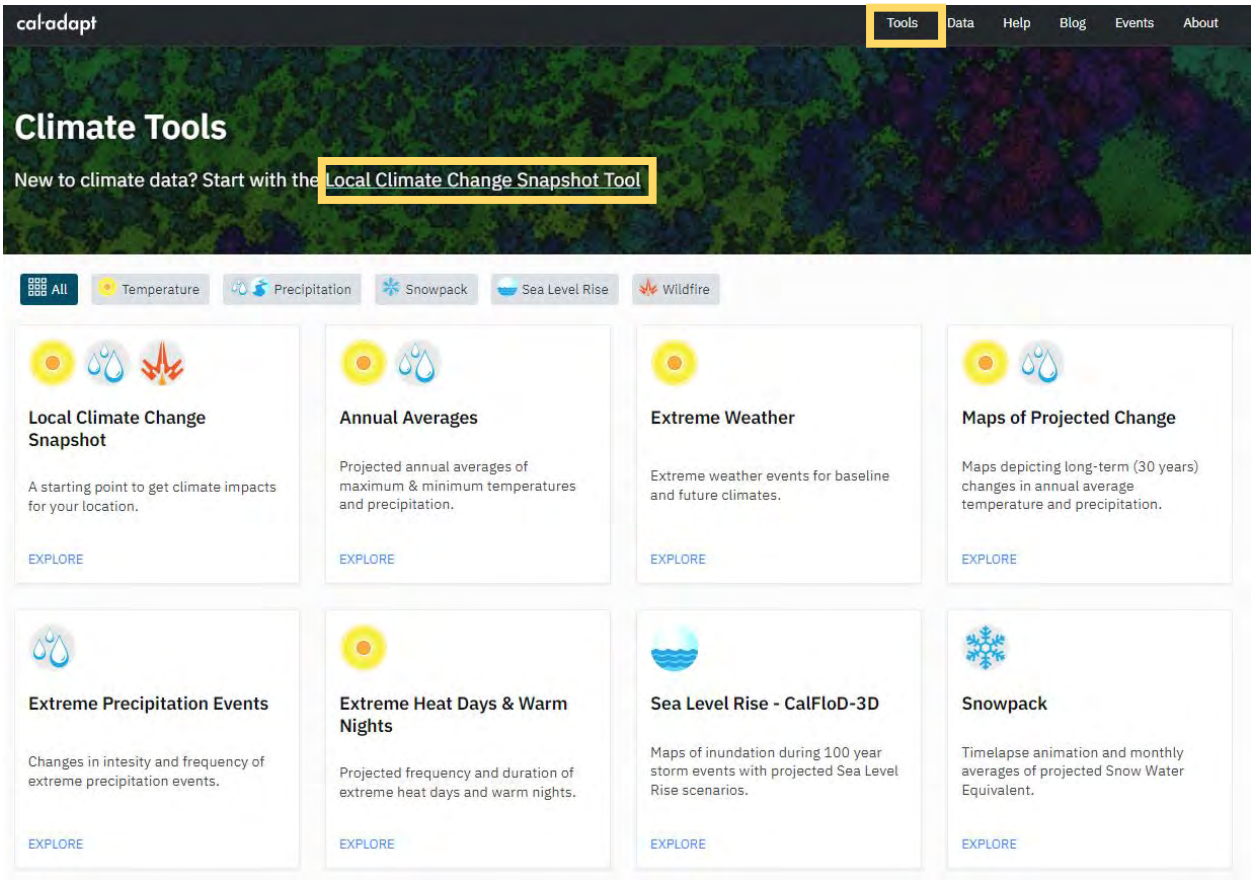
Cal-Adapt[1] is an interactive platform that allows users to explore how climate change might affect California at the local level. The site was developed by the University of California, Berkeley's Geospatial Innovation Facility (GIF) with funding and advisory oversight by the California Energy Commission's Public Interest Energy Research (PIER) Program. The data used within the Cal-Adapt visualization tools have been gathered from California's scientific community, and represent peer-reviewed, high-quality scientific information.[2]

The site includes the following climate change projections:

- Annual Averages (temperature and precipitation)
- Extreme Precipitation Events
- Extreme Heat Days and Warm Nights
- Cooling Degree Days and Heating Degree Days
- Snowpack
- Sea Level Rise
- Wildfire
- Streamflow
- Extended Drought

These localized climate change projections are available on the Cal-Adapt landing page or via the *Tools* tab. The *Tools* tab includes a link to the Local Climate Change Snapshot, which provides interactive visualizations of climate change projections for a location of the user's choice. Another way to download data is through the *Data* tab. The *Data* tab allows you to download spatial and non-spatial data from individual publishers. This technical appendix describes the process of downloading data from the Local Climate Change Snapshot on the *Tools* tab, as it allows the user to select a jurisdictional boundary and is more interactive and provides visualizations of the data, which are included in the Climate Action Plan (CAP).

[1] Cal-Adapt https://cal-adapt.org/
[2] Cal-Adapt https://cal-adapt.org/about/



Best Practices

The following section details the best practices related to choosing a location, selecting which scenario is most appropriate, establishing a baseline and future timeframes, and choosing climate models.

Location

When choosing a location from the Local Climate Change Snapshot page, Cal-Adapt will prompt the user to select an option from a range of spatial boundaries, including: address, county, city, census tract, and HUC10 watershed. When the county, city, census tract, or watershed is selected, the data is spatially averaged over that geographic area. For example, Montclair is in Bernardino County, and if Bernardino County is selected, then the data for the entire area would be averaged. However, to provide a more accurate and refined understanding of the specific data in Montclair, the user would create a snapshot and view the data at the City level. Therefore, for the purposes of this analysis, the City of Montclair was selected.

Representative Concentration Pathways (RCP)

The Representative Concentration Pathways (RCP) are scenarios adopted by the Intergovernmental Panel on Climate Change (IPCC) that describe possible greenhouse gas (GHG) concentration trajectories. Each RCP provides only one of many possible scenarios that would lead to the specific radiative forcing, which is the difference between sunlight absorbed by the Earth and energy radiated back to space.

The California Adaptation Planning Guide[3] recommends always using the high emissions scenario (RCP 8.5).[4] The stabilizing scenario (RCP 4.5)[5] may also be used to provide a wider range of possible futures.

Past and Future Year Horizons

To gain an understanding of how climate change may impact a location, it is essential to know the historical and projected conditions. Below are the past and future 30-year time periods[6] used for the *Climate Change in the City of Montclair* subsection of the Montclair CAP.

- Historical: 1961-1990
- Mid-Century: 2035-2064
- End-Century: 2070-2099

It is important to consider a long-term benchmark year when working with climate change projections to understand the potential impacts over a specific period of time.

Climate Models

Cal-Adapt allows the user to choose whether to use the minimum, average, or maximum estimates (shown below). These are calculated over all models shown in the chart provided by Cal-Adapt. For a representative value of all models combined, rather than selecting the lowest or highest predicting model, it's best to use the average value. The four models used to generate the average projections in this assessment are:

- HadGEM2-ES: a warm/drier simulation
- CNRM-CM5: a cooler/wetter simulation
- CanESM2: an average simulation
- MIROC5: a complement simulation (most unlike the other three models)

These models were selected by California's Climate Action Team Research Working Group as the priority models for research contributing to California's Fourth Climate Change Assessment. To determine projected timing of extreme heat days, Rincon used the range all four priority models. This allows for conservative planning, recommended by the California Adaptation Planning Guide.

[3] https://resources.ca.gov/CNRALegacyFiles/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf
[4] Under the high emissions scenario, emissions continue to rise through the end of the century before leveling off.
[5] Under the stabilizing scenario, emissions rise through 2050 before leveling off.
[6] 30 years is the traditional length of record used in climatological studies and is known as climatological normal. 30 years is considered the minimum number of years needed to characterize a regional climate.

Resources

Cal-Adapt https://cal-adapt.org/

California Adaptation Planning Guide
https://resources.ca.gov/CNRALegacyFiles/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf

Appendix C: Inventory, Forecast, and Targets

City of Montclair Climate Action Plan

GHG Emissions: Municipal Inventory, Community Inventory, Forecast and Target Setting Methodology

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Table of Contents

Tables

Figures

1 Introduction

California considers greenhouse gas (GHG) emissions and the impacts of climate change to be a serious threat to the public health, environment, economic well-being, and natural resources of the state, and has taken an aggressive stance to mitigate the impact on climate change at the state-level through the adoption of legislation and policies. Many cities have developed local climate action plans and established GHG reduction targets to correspond with state emissions reduction goals. The two major state GHG-related goals are established by Assembly Bill (AB) 32 and Senate Bill (SB) 32. AB 32 required state agencies reduce state GHG emissions to 1990 levels by 2020, whereas SB 32 requires a 40 percent reduction below 1990 levels by 2030. The goals set by AB 32 were achieved by the state in 2016[1] and many jurisdictions completed GHG inventories to quantify progress toward reaching their own 2020 targets, and inform the development of updated targets to align with the requisite GHG reduction goals. A long-term goal of carbon neutrality by 2045 for the state was established through AB 1279, which was codified in 2022 by the State.

This technical appendix provides the detailed methodology used for the City of Montclair 2017 Municipal and Community GHG inventory, Community GHG Emissions Forecast, and the setting of emission reduction targets. Emissions are forecasted for the years 2030, 2040 (the General Plan horizon year), and 2045 to align with state targets.

Estimating GHG emissions enables local governments to establish an emissions baseline, track emissions trends, identify the greatest sources of GHG emissions within their jurisdictions, and set targets for future reductions. This inventory is intended to inform completion of a qualified GHG reduction plan for the City of Montclair and is compliant with the Local Governments for Sustainability (ICLEI) *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*[2] (*Community Protocol*) as well as California Environmental Quality Act (CEQA) Guidelines Section 15183.5(b) for the requirements of a 'qualified' GHG emissions reduction plan. Methodology for some sections has been updated slightly to conform with the industry standard for California cities as recommended in the Association for Environmental Professionals (AEP) *California Supplement to the United States Community-Wide GHG Emissions Protocol* (California Supplement). GHG emission inventories are an iterative process, and each year must be viewed in the context of other inventories and relative trends of each GHG emissions sector to maintain consistency with the emissions inventory methods and factors.

GHG emissions contained within this inventory include activities under the jurisdictional control or significant influence of the City of Montclair, as recommended by AEP in preparing Community Protocol and CEQA-compliant inventories.[3] The municipal operations inventory included herein is a subset of the community-wide inventory, meaning the municipal emissions are included within the community-wide inventory.

[1] California Air Resources Board. California Greenhouse Gas Emissions Inventory. Accessed at: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2019/ghg_inventory_trends_00-19.pdf. Accessed on: October 2021.

[2] ICLEI. 2013. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.1

[3] Association of Environmental Professionals. 2013. The California Supplement to the United States Community-Wide Greenhouse Gas (GHG) Protocol.

1.1 Greenhouse Gases

The 2017 City of Montclair Community Inventory was developed using the Community Protocol[4] and California Supplement.[5] Emissions from nitrous oxide (N_2O), methane (CH_4), and carbon dioxide (CO_2) are included in this assessment. Each GHG has a different capability of trapping heat in the atmosphere, known as its global warming potential (GWP), which is normalized relative to CO_2 and expressed as carbon dioxide equivalent, or CO_2e. The CO_2e values for these gases are derived from the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) GWP values for consistency with the yearly California Air Resources Board (CARB) GHG inventory, as shown in Table 1.[6] These global warming potentials are the best available and most recent scientific evidence for carbon dioxide and nitrous oxide.

Table 1 Global Warming Potentials of Greenhouse Gases

Greenhouse Gas	Molecular Formula	Global Warming Potential (CO_2e)
Carbon Dioxide	CO_2	1
Methane	CH_4	25
Nitrous Oxide	N_2O	298

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

1.2 Excluded GHG Emissions and Emission Sources

The following GHG emissions and emission sources are excluded from the 2017 inventory and emissions forecast.

Consumption-Based GHG Emissions

GHG emissions from consumption of goods and services (such as food, clothing, electronic equipment, etc.) by residents of a city are excluded from the inventory and forecast of City of Montclair emissions. Currently there exists no widely accepted standard methodology for reporting consumption-based inventories.

Natural and Working Lands

GHG emissions from carbon sinks and sources in natural and working lands are not included in this inventory and forecast due to the lack of granular data and standardized methodology. Natural and working lands are comprised of the forests, woodlands, rangelands, coastal areas, farmlands, and urban green spaces of California. GHG emissions from these lands result from the loss of carbon sequestration through land use change and fires. CARB has included a state-level inventory of

[4] ICLEI. 2012. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions.

[5] Association of Environmental Professionals. 2013. The California Supplement to the United States Community-Wide Greenhouse Gas (GHG) Protocol. Accessed at: https://califaep.org/docs/California_Supplement_to_the_National_Protocol.pdf. Accessed on: March 15, 2021.

[6] Intergovernmental Panel on Climate Change. 2007. Fourth Assessment Report: Climate Change. Direct Global Warming Potentials.

natural and working lands in the 2017 Scoping Plan[7] and 2022 Scoping Plan Update[8] greenhouse gas inventory; however, at the time of this City of Montclair community-wide inventory, sufficient data and tools were not available to conduct a jurisdiction-specific working lands inventory. The Nature Conservancy and California Department of Conservation[9] are exploring options for a tool which may be able to perform these inventories at a more specific geographic level.

Agricultural Emissions

Emissions from agricultural activities are not included in this inventory as the Community Protocol and California Supplement[10] both note agricultural activity is not a required component of Community Protocol inventories and should be included only if relevant to the community conducting the inventory. Regulations exist to encourage urban agriculture within the City boundaries. Many of the emissions from these activities (e.g. energy) are covered under other sectors included in this inventory and no major commercial-scale livestock activity is noted within the city boundaries. Based on the land use map in the Montclair General Plan, zero percent of the City is utilized for agriculture.[11]

High GWP

High GWP emissions, including chlorofluorocarbons (CFCs) and hydrofluorocarbons (HFCs) used as substitutes for ozone-depleting substances are not included in this inventory as it is not a required component of the Community Protocol, and the California Supplement notes these emissions are not generally included in California inventories.

1.3 Calculating GHG Emissions

GHG emissions are estimated using calculation-based methodologies to derive emissions using activity data and emissions factors. To estimate emissions, the basic equation below is used:

Activity Data x Emission Factor = Emissions

Activity data refer to the relevant measurement of energy use or other GHG-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. Emission factors are used to convert energy usage or other activity data into associated emissions quantities. They are usually expressed in terms of emissions per unit of activity data, such as pounds of carbon dioxide per kilowatt-hour (lbs CO_2/kWh).

As mentioned in the *Introduction*, GHG emissions calculation methodologies follow the guidance of the ICLEI Community Protocol for the Community Inventory, and the ICLEI *Local Government Operations Protocols (LGOP)* for the Municipal Inventory.

[7] California Air Resources Board. 2017. California's Climate Change Scoping Plan.

[8] California Air Resources Board. 2022. California's Climate Change Scoping Plan. Available at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

[9] California Department of Conservation. TerraCount Scenario Planning Tool. Accessed at: https://maps.conservation.ca.gov/terracount/. Accessed on: May 15, 2019

[10] Association of Environmental Professionals. 2013. *The California Supplement to the United States Community-Wide Greenhouse Gas (GHG) Emissions Protocol.* https://califaep.org/docs/California_Supplement_to_the_National_Protocol.pdf

[11] The City of Montclair. 2020. Montclair General Plan

1.4 Reporting GHG Emissions

The following section discusses reporting of GHG emissions by scope and sector.

1.4.1 GHG Emissions by Scope

For municipal and community-wide inventories, emissions sources can be categorized by "scope" according to the entity's degree of control over the emissions source and the location of the source. Emissions sources are categorized as direct (scope 1) or indirect (scope 2 or scope 3), in accordance with the World Resources Institute and the World Business Council for Sustainable Development's *Global protocol for Community-Scale Emissions* and the ICLEI *LGOP*.

MUNICIPAL SCOPE DEFINITIONS

- **Scope 1:** Direct GHG emissions from sources within a local government's operations that it owns and/or controls. This includes stationary combustion to produce electricity, steam, heat, and power equipment; mobile combustion of fuels; process emissions from physical or chemical processing; fugitive emissions that result from production, processing, transmission, storage and use of fuels; and other sources.
- **Scope 2:** Indirect GHG emissions associated with the consumption of electricity, steam, heating, or cooling that are purchased from a utility provider that also provides energy to other jurisdictions and/or is located outside City boundaries.
- **Scope 3:** All other indirect GHG emissions not covered in scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the City (e.g., employee commuting and business travel, outsourced activities, waste disposal, etc.).

COMMUNITY-WIDE SCOPE DEFINITIONS

- **Scope 1:** Direct GHG emissions from sources located within the jurisdictional boundaries of the community, including direct emissions from natural gas combustion in homes and businesses within the community.
- **Scope 2:** Indirect GHG emissions associated with the consumption of electricity within the community.
- **Scope 3:** All other indirect or embodied GHG emissions not covered in scope 2, which occur because of activity within the jurisdictional boundaries (e.g., methane emitted at landfills outside the community resulting from solid waste generated within the community).

1.4.2 Emissions by Sector

In addition to categorizing emissions by scope, ICLEI recommends that local governments examine their emissions in the context of the sector that is responsible for those emissions. Many local governments will find a sector-based analysis more directly relevant to policy making and project management, as it assists in formulating sector-specific reduction measures and Climate Action Plan components.

The municipal and community inventories report emissions by the following sectors:

- Energy

- Transportation
- Water consumption and wastewater treatment
- Solid waste

Table 2 summarizes the interaction of emissions scope and sector in the municipal and community-wide inventories.

Table 2 Emissions by Sector and Scope

Sector	Scope 1	Scope 2	Scope 3
Municipal Inventory			
Energy	Natural Gas	Electricity	NA
Vehicle Fleet	Gasoline, Diesel, CNG	NA	Employee Commute
Water and Wastewater	NA	NA	Electricity (associated with water conveyance and treatment, and wastewater treatment);
Solid Waste	NA	NA	Methane from decomposition of waste at landfill and process emission
Community-wide Inventory			
Energy	Natural Gas	Electricity	NA
Transportation	On-road transportation, Off-road equipment	NA	Transit (i.e. public transit, freight rail)
Water Consumption	NA	NA	Electricity (associated with water conveyance)
Wastewater	NA	NA	Electricity (associated with wastewater treatment)
Solid Waste	NA	NA	Methane from decomposition of community waste in landfill and process emissions

Notes: CNG: Compressed natural gas; NA: Not applicable

1.5 GHG Emissions Forecast Target Years

The GHG emissions forecast is based on the latest available data from City GHG inventories, in this case the 2017 inventory completed as part of this Climate Action Plan. This forecast uses benchmark years of 2030, 2040, and 2045, consistent with currently codified state GHG reduction goals set by legislation and executive orders, and the City's General Plan horizon year, as summarized below:

- 2030 (SB 32)
- 2040 (General Plan horizon year)
- 2045 (AB 1279)

The 2030 and 2040 targets are required for consistency with SB 32 and the City of 2040 General Plan respectively, while the remainder of the targets identify a clear path and milestones of progress toward the long-term state reduction goals.

2 2017 Municipal GHG Inventory

The Municipal GHG Inventory quantifies the GHG emissions generated by local government operations for the City of Montclair. By better understanding the relative scale of emissions from each sector, the City can more effectively focus strategies to achieve the greatest emissions reductions.

Reporting emissions by sector provides a useful way to understand the sources of the City's emissions. The ICLEI *LGOP* further categorizes sectors by the following sub-sectors for local government operations: 1) buildings and other facilities, 2) streetlights and traffic signals, 3) water delivery facilities, 4) port facilities, 5) airport facilities, 6) vehicle fleet, 7) transit fleet, 8) power generation facilities, 9) solid waste facilities, 10) wastewater facilities, and 11) all processes and fugitive emissions. The City of Montclair does not have operational control of a port or airport, or does it manage solid waste facilities; therefore, these emission sub-sectors are excluded. Local government operations are discussed only in terms of sectors and sub-sectors the City has operational control over. Accordingly, the GHG emission sectors reported are provided in Table 3, with the associated GHG emissions sources.

Table 3 Municipal GHG Emissions Sectors and Sources

Sector	Emissions Source
Energy	Natural Gas (buildings & facilities)
	Electricity (buildings & facilities)
	Electricity (traffic signals and streetlights)
	Electricity (water delivery facilities)
Transportation	Vehicle Fleet
	Employee Commute
Water and Wastewater	Water Consumption
	Wastewater Generation
Waste	Solid Waste Generation

2.1 Municipal GHG Inventory Methodology

The Municipal GHG Inventory uses activity data obtained from the City of Montclair to calculate the GHG emissions associated with the local government operations based on the ICLEI *LGOP*, developed in partnership with CARB, California Climate Action Registry, and the Climate Registry.[12] Activity data was obtained from the City of Montclair, primarily through communication with City

[12] CARB, et al. 2010. Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories. https://www.theclimateregistry.org/tools-resources/reporting-protocols/local-goverment-operations-protocol/

staff. The following is a description of the methodology and data used to calculate emissions for each of the municipal GHG emission sectors.

Municipal Energy

Energy emissions consist of natural gas burned in City facilities and buildings for water and space heating (scope 1), and electricity consumed in buildings and facilities, lighting, traffic signals, and water delivery facilities (scope 2). Emissions associated with natural gas and electricity consumption were calculated using ICLEI *LGOP* Method 6.1.1 and 6.2.1, respectively. Table 4 provides the activity data and emission factors used for emission calculations, as well as the GHG emission results.

Table 4 Energy Sector Municipal GHG Emissions

Sector/Emission Source	Activity	Emission Factor	Total Emissions (MT CO_2e)
Natural Gas[1]			**121**
Buildings and Facilities	22,789 therms	0.00531 MT CO_2e/Therm[2]	121
Electricity[3]			**1008**
Traffic and Street Lighting	1,909,462 kWh	0.000249 MT CO_2e/kWh[4]	475
Building & Other Facility Use	2,138,281 kWh		532
Energy Sector Total			**1,129**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = Metric Tons of Carbon Dioxide Equivalent; kWh = kilowatt-hour
1. Natural Gas activity data was provided by the City of Montclair in the form of "SCG - Customer Gas Usage and Total Billed Summary for 2017" on July 5th 2019 for all municipal natural gas accounts.
2. Emission factors obtained from United States Environmental Protection Agency Emission Factors for Greenhouse Gas Inventories, Table 1. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf
3. SCE provided electricity usage summary data for the City of Montclair.
4. Delivered electricity emission factors as CO2e used (lbs/ MWh) and converted to MT CO_2e / kWh.[13]

Municipal Transportation

Municipal GHG emissions from the transportation sector are categorized into two primary sources, employee commute and municipal fleet, for which the activity data and emission calculations are described in the following section.

Employee Commute

Employee commute emissions are a scope 3 emissions source and largely out of the direct control of the City; however, the City can provide incentive for employees to utilize less carbon intensive means of commuting, such as cycling/walking/scooting, ridesharing, or public transit. In 2017, the City of Montclair had a total of 154 full-time City employees and 129 part-time employees.[14] Employee commute vehicle miles traveled (VMT) was calculated using the results of an employee commute survey, from one-way mileage measured from the employee's home zip code to the city center of Montclair. Annual VMT was estimated by multiplying the total miles traveled per day for all employees by the number of workdays per year. The employee commuter survey indicated that a

[13] Edison International 2017 Sustainability Report (p. 10), June 2018. https://www.edison.com/content/dam/eix/documents/sustainability/eix-2017-sustainability-report.pdf
[14] City of Montclair provided employee data via Payroll list.

majority (90%) of employees used a passenger vehicle which was applied as mode of transportation. It was estimated that full-time employees work an average of 240 days per year, and part-time employees an average of 120 days per year; assuming all employees did not work on federal holidays and those full-time employees would take two weeks of vacation, with part-time employees assumed to work half the time of full-time employees. Assumptions above are considered to give a conservative estimate of employee commute patterns. CARB's Emission Factors (EMFAC) model EMFAC2021[15] emission factors for the San Bernardino County region in 2017 were used to determine employee commute emissions. The activity data, emission factors, and resulting emissions are provided in Table 5.

Table 5 Employee Commute Municipal GHG Emissions

Sector/Emission Source	Activity[1,2]	Emission Factor	Total Emissions (MT CO_2e)
Combustion Vehicles	1,401,571 VMT/year	0.0003805 MT CO_2e/mile[3]	533
Electric Vehicles	8,189 VMT/year	0.000249 MT CO_2e/kWh[4]	0.7
Employee Commute Total	**NA**	**NA**	**534**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
VMT = Vehicle Miles Traveled; EV = Electric Vehicle; MT CO2e = Metric Tons of CO_2e
1. Round trip miles traveled were estimated using google maps where one-way mileage was measured from center of employee's home zip code to city center of Montclair. Estimated VMT is the sum of all round-trip mileage for all employees. VMT is broken out as combustion vehicle VMT vs. electric vehicle VMT based on EV-penetration rates reported on a County basis by EMFAC2021.
2. Annual VMT was estimated by multiplying miles traveled per day by workdays. VMT was not further adjusted as employee commute survey indicated that a majority (90%) of employees used an auto to travel to work.
3. Emission factors were obtained from EMFAC2021 where model years and speed were aggregated over vehicle categories and fuels using a VMT-weighted average. Emission factor for combustion vehicles account for distribution of vehicles using different fossil fuel types.
4. EMFAC2021 provides energy data on electric vehicles electricity use, in annual kilowatt-hours. Based on energy consumption by mileage it was determined that 0.338 kWh of electricity was consumed per mile; EV VMT was converted to annual kwh consumed. Emission factor for EV electricity use based on utility provider (i.e. SCE) electricity in 2017.

Municipal Fleet

Municipal fleet vehicles and equipment combust gasoline, diesel, compressed natural gas (CNG), and liquid propane gas (LPG) generating scope 1 GHG emissions. The City owns and operates a number of on-road vehicles, including passenger vehicles, light-duty trucks, and light- and medium-heavy duty trucks, as well as off-road equipment. GHG emissions are calculated using ICLEI *LGOP* Methods 7.1.1 and 7.1.3.2.1, emissions from the City's fleet were calculated by multiplying the activity data from City provided fuel usage reports (gallons of diesel, gasoline, LPG and scf of CNG) by the emission factor for each fuel type. The emission factors for diesel, gasoline, CNG, and LPG were obtained from the United States Environmental Protection Agency's (USEPA) *Emission Factors for Greenhouse Gas Inventories.*[16] This database provides mobile emission factors for fuel in kilograms per gallon (or scf for CNG) for CO_2 but grams per mile for CH_4 and N_2O. Therefore, mileage by vehicle class and fuel type was estimated based on each vehicle's model year and the average fuel economy (in MPG) for each vehicle class obtained from the U.S. Department of Energy's

[15] CARB. (2021) Emissions Inventory, EMFAC 2021 model v1.01.1. Accessed October 2021 from: https://arb.ca.gov/emfac/emissions-inventory/43c4fb407b5290c4aa6bc403e03c79c39ed6224a

[16] USEPA. 2021. Emission Factors for Greenhouse Gas Inventories. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

Alternative Fuels Data Center.[17] EPA's GHG CH_4 and N_2O mobile emissions factors for each vehicle class and fuel type was applied to the estimated mileage by vehicle class to determine emissions . For off-road equipment the emission factors for general construction equipment by fuel type were applied to the activity data, gallons of fuel consumed. Table 6 provides the fuel consumption associated with the municipal fleet, weighted emission factors by fuel type, and calculated total emissions.

Table 6 Municipal Fleet GHG Emissions

Sector/Emission Source	Activity[1]	Emission Factor[2,3,4]	Total Emissions (MT CO_2e)
Fleet Vehicles and Equipment Fuel Consumption			
Diesel	16,187 gal	0.01035 CO_2e/gal	167
Unleaded Gasoline	59,305 gal	0.00882 CO_2e/gal	523
Compressed Natural Gas (CNG)	2,780 scf	0.00703 MT CO_2e/scf	20
Liquid Propane Gas (LPG)	4,558 gal	0.00583 MT CO_2e/gal	27
Municipal Fleet Total			**736**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
gal=gallons; ; MT CO2e = Metric Tons of CO_2e; scf = standard cubic foot
1. City provided bulk fuel purchases and a fleet list including model years and vin numbers.
2. Emission factors obtained from EPA emission actor database for mobile vehicles. Emission factors for CO_2 were provided by fuel type for mobile vehicles.
3. Emission factors for CH4 and N2O were provided as grams/mile by fuel type and based on vehicle class. Therefore, fuel economy in miles per gallon was averaged for each vehicle class and fuel type. Fuel economy by vehicle class was used to estimate mileage from fuel quantity to apply mobile CH_4 and N_2O emission factors in g/mile.
4. Presented emission factor is the weighted average by fuel type, including all vehicle classes using consuming that fuel based on provided fleet list.

Municipal Water and Wastewater

Municipal GHG emissions from water and wastewater were calculated based on the total water consumption of municipal operations. It was conservatively estimated that wastewater generation was equivalent to water consumption. In 2017, the City of Montclair used approximately 87 million gallons (MG) of potable water for facilities operations and irrigation of public parks maintained by the City.[18] Emissions generated from water usage and wastewater generation is due to the indirect electricity used to distribute water and collect and treat wastewater. The energy intensity for water use in the City of Montclair was not available. Based on the characteristics of Montclair's water purveyor, Monte Vista Water District (MVWD), ICLEI Community Protocol default values were applied. Based on groundwater well depth the high value default energy intensity factor for groundwater extraction was used. The median value for local water conveyance and distribution was applied, while the low default value for water treatment was applied based on treatment

[17] U.S. Department of Energy, Alternative Fuels Data Center. (2020). *Average Fuel Economy by Major Vehicle Category*. Accessed December 2021 from: https://afdc.energy.gov/data/10310

[18] Montclair water comes from Monte Vista Water District (MVWD) where 75% is ground water (primarily Chino Basin with some from adjacent Basins) and 25% is imported surface water from the State Water Project (SWP) (MVWD 2015 UWMP).

method and capacity indicated by MVWD. Activity data, energy intensity factors, emission factors , and GHG emission totals are provided in Table 7.

Table 7 Water and Wastewater Sector Municipal GHG Emissions

Emission Source	Activity	Energy Intensity	Emission Factor	Total Emissions (MT CO_2e)
Water Consumption[1]	87.3 MG	5,193 kWh/MG[2]	0.000249 MT CO_2e/kWh[3]	109
Wastewater Generation		1,341.3 kWh/MG[3]		29
Water and Wastewater Sector Total				**138**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = Metric Tons of Carbon Dioxide Equivalent; MWh = Megawatt-hour; MG = Million Gallons
1. Montclair water comes from Monte Vista Water District (MVWD) where 75% is ground water (primarily Chino Basin with some from adjacent Basins) and 25% is imported surface water from the State Water Project (SWP) (MVWD 2015 UWMP)
2. Energy intensity factor is combined energy intensity of each part of the water cycle including local ground water and imported SWP water. The following characteristics were used to determine the default ICELI CP energy intensities to apply for local groundwater: 1) Water supply: MVWD groundwater wells are in an area where the average depth to groundwater is 515 feet (http://www.cbwm.org/docs/engdocs/maps/Figure%2037%20Depth%20to%20GW%202016.pdf), therefore the high default value for groundwater extraction was used; 2) Water conveyance: Montclair is within the Chino Basin boundaries and is serviced through a pipeline network (MVWD 2015 UWMP), therefore median value for "local water" conveyance was applied; 3) Water treatment: groundwater water is treated with chlorine at the production wells with a 1- 3 mgd capacity prior to distribution (MVWD 2015 UWMP), therefore default low value for water treatments with a 1-5 MGD capacity was used; 4) Water distribution: MVWD is split into 4 pressure zones where approximately half of the city of Montclair falls into MVWD pressure zone 2, a third in pressure zone 1, and 1/6 in pressure zone 3. Water is distributed from wells and a hydrogenator in the area (zone 1), gravity fed reservoirs, booster pumps and pressure reducing valves, therefore the default median water distribution value was used.
3. Energy intensity factor is combined energy intensity factor for water collection and treatment using agency specific energy intensity factors obtained from the IEUA 2015 UWMP Chapter 8: Voluntary Reporting of Energy Intensity.
4. SCE is electricity provider for City of Montclair, therefore SCE emission factors in 2017 used

Municipal Waste

Many local government facilities and operations generate solid waste, much of which is eventually sent to a landfill. Typical sources of solid waste from local government operations include paper and food waste from offices and facilities, construction waste from public works, and plant debris from parks departments. Organic materials generate methane as they decay in the anaerobic environment of a landfill. The waste generation for the City was calculated using total employees multiplied by the CalRecycle waste generation rate of 0.59 tons per employee per year and ICLEI default emission factors for landfilled waste.[19] GHG emissions were calculated using ICLEI Community Protocol Method SW.4, where the landfill gas capture rate for the facilities for which the community's waste is sent to was estimated at 75 percent efficiency, and the default emission factor of 0.06 short tons of CH_4 per short ton of waste. The methodology is further detailed in Section 3.5. Solid waste activity data generated by City operations, emission factors, and total emissions are provided in Table 8.

[19] CalRecycle. Estimate Solid Waste Generation Rates. https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates

Table 8 Waste Sector Municipal GHG Emissions

Emission Source	Activity	LFG capture rate	Emission Factor	Total Emissions (MT CO_2e)
Solid Waste Landfilled	167 tons[1]	0.75 [2]	0.06 MT CH_4/short ton[2]	56
Waste Sector Total				**56**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = Metric Tons of Carbon Dioxide Equivalent; MT CH_4 = Metric Tons of Methane; LFG = Landfill Gas Capture
1. In 2017, Montclair had a total of 283 employees on payroll. Tons of waste was estimated by multiplying employees by CalRecycle waste generation rate of 0.59 tons per employee.
2. Calculations and default emission factors from ICELI Community Protocol are used (method SW.4)

2.2 Municipal GHG Inventory Results

Municipal operations of the City of Montclair generated a total of 2,594 MT CO_2e in 2017. As shown in Table 9 and Figure 1, transportation use resulted in the greatest quantity of emissions, resulting in 1,270 MT CO_2e (49% of total municipal emissions), where 736 MT CO_2e (28% of total municipal emissions) was due to vehicle fleet and 534 MT CO_2e (21% of total municipal emissions) was due to employee commute. The second greatest quantity of emissions was energy, resulting in 1,129 MT CO_2e (44% of total emissions), where natural gas use generated 121 MT CO_2e (5% of total emissions), building electricity use generated 532 MT CO_2e (21% of total municipal emissions), and the City's streetlights and traffic signals produced 475 MT CO_2e (18% of total municipal emissions). The City's water consumption and wastewater generation were the third largest source of emissions in 2017 with 138 MT CO_2e (5% of total municipal emissions), where water use accounted for 109 MT CO_2e (4% of total municipal emissions), and wastewater generation accounted for 29 MT CO_2e (1% of total municipal emissions). The generation of solid waste was the smallest source of emissions, generating 56 MT CO_2e (2% of total municipal emissions).

Figure 1 Municipal GHG Emissions by Sector

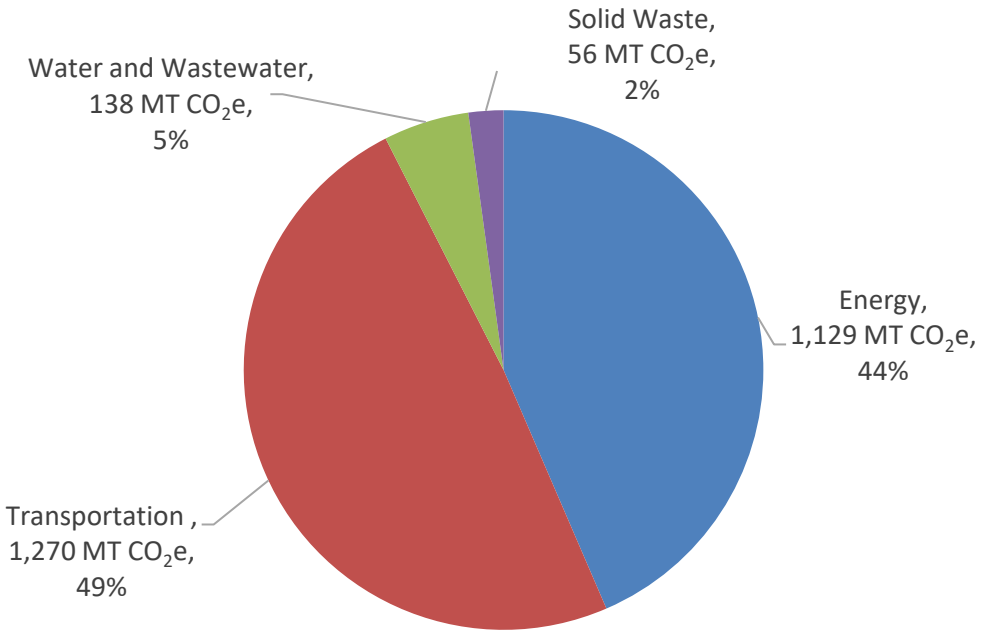


Table 9 Baseline Municipal GHG Emissions Summary by Sector

Sector	GHG Emissions (MT CO_2e)	Percent of Total Emissions
Energy	**1,129**	**44%**
Natural Gas (buildings & facilities)	121	5%
Electricity (buildings & facilities)	532	21%
Electricity (traffic signals and streetlights)	475	18%
Transportation	**1,270**	**49%**
Vehicle Fleet	736	28%
Employee Commute	534	21%
Water and Wastewater	**138**	**5%**
Water Consumption	109	4%
Wastewater Generation	29	1%
Solid Waste	**56**	**2%**
Total Emissions	**2,594**	**100%**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = Metric Tons of Carbon Dioxide Equivalent

3 2017 Community GHG Inventory

The 2017 Community GHG Inventory provides a baseline for forecasting of future GHG emissions and setting of GHG reduction targets, to be included as part of the Climate Action Plan (CAP). GHG emissions were calculated and reported based on the guidance of the ICLEI Community Protocol. Methodologies, data sources, calculations, and results of the 2017 Community GHG Inventory are included in this section.

3.1 2017 Community GHG Inventory Data Sources

The data used to complete the 2017 Community GHG Inventory came from multiple sources, including utility providers, traffic consultants and the City of Montclair. The data sources for the 2017 Community GHG Inventory are summarized in Table 10.

Table 10 Community GHG Inventory Data Sources

Sector	Activity Data	Unit	Source
Energy	Electricity consumption	kWh	SCE
	Natural gas consumption	therms	SCG
Transportation	Vehicle miles traveled	VMT	Fehr & Peers
Water	Water consumption	MG	Monte Vista Water District
Wastewater	Wastewater generation	EDUs	Inland Empire Utilities Agency
Solid Waste	Landfilled solid waste	Tons	CalRecycle Jurisdiction Disposal Summary Report

Notes: kWh = kilowatt hours; SCE = Southern California Electricity; SCG = Southern California Gas Company; VMT = vehicle miles traveled; gpcd = gallons per capita per day; MG = Million Gallons EDU= Equivalent Dwelling Unit
1. 1 EDU=200 gallons

3.2 Community Energy

The community energy sector includes GHG emissions resulting from the consumption of electricity and natural gas. Total consumption for electricity is provided from SCE and natural gas data is provided by SCG. These are the two energy sources used in residential, commercial, and industrial buildings and for other power needs throughout the City of Montclair. A summary of the community energy sector GHG emissions is provided in Table 11, with the methodology of emission calculations detailed in the following section.

Table 11 Community Energy GHG Emissions Summary

Emission Source	Activity Data[1]	Emissions (MT CO_2e)
Natural Gas	NA	24,741
Electricity	NA	41,540
Transmission and Distribution Losses	NA	1,765
Total	**NA**	**68,047**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent; NA = Not Applicable
1. Due to California Public Utilities customer privacy rules, natural gas and electricity consumption data requested through the Energy Data Request Program cannot be published.

Natural Gas

GHG emissions from community natural gas consumption were calculated using the ICLEI Community Protocol Method BE.1.1. The total natural gas consumed was provided by Southern California Gas (SCG) in therms and converted to MMBtu.[20] The natural gas value was then multiplied by the USEPA recommended natural gas emission factors of 53.06 kg CO_2/MMBtu, 0.001. kg CH_4/MMBtu and 0.0001 kg N_2O/MMBtu; equating to 0.00531 MT CO_2e/therm.[21] The CPUC prohibits the public disclosure of natural gas consumption data that has been provided through the Energy Data Request Program (EDRP). Therefore, only emission totals for the entire community are provided, which aggregates the residential and non-residential customer classes. Accordingly, Montclair community natural gas consumption in 2017 resulted in GHG emissions equivalent to 24,741 MT CO_2e.

Electricity

GHG emissions from community electricity consumption were calculated using the ICLEI Community Protocol Method BE.2 by multiplying annual electricity consumption in the City of Montclair by an electricity emission factor representing the average emissions associated with generation of one kilowatt hour (kWh) of electricity. In 2017, electricity was supplied to Montclair by SCE. To calculate emissions from electricity, the total electricity use reported by SCE was multiplied by the carbon intensity factor of 549 pounds CO_2e per MWh, which was converted to 0.000249 MT CO_2e per kWh.[22] The community energy consumption was obtained from SCE through the EDRP. Similar to natural gas activity data, the CPUC prohibits the public disclosure of electricity consumption data that has been provided through the EDRP. Therefore, only emission totals for the entire community are provided, which aggregates the residential and non-residential customer classes. Industrial sector consumption is not included in the electricity consumption data. In 2017, a total 41,540 MT CO_2e was generated within the community due to electricity use.

[20] 1 MMBtu = 10.0024 therms; 1 kg Co_2e = 1 kg CO_2 + 1/(25 kg CH_4) + 1/(298 kg N_2O)

[21] USEPA. 2021. Emission Factors for Greenhouse Gas Inventories. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

[22] Edison International. 2018. Edison International 2017 Sustainability Report. pp. 10 https://www.edison.com/content/dam/eix/documents/sustainability/eix-2017-sustainability-report.pdf.

Community Transmission and Distribution Losses

In addition to energy consumption, the amount of GHG emissions generated due to electricity transmission and distribution (T&D) losses were determined, as recommended by the ICLEI Community Protocol. T&D losses occur as electricity is transported from its generation source to its final end use destination. Transmission losses occur in the form of heat as electricity meets the small resistance in wires, and distribution losses occur when electricity is transformed from higher to lower voltage wires. Although emissions generated due to electricity T&D losses are outside of the City's operational control, emissions related to T&D losses are directly related to electricity use within the community and should be included in the community emissions.[23] GHG emissions from community T&D losses were calculated using the ICLEI Community Protocol Method BE.4. T&D loss associated emissions were determined by multiplying the total community electricity consumption in 2017 by 4.23%, the grid loss factor for the California sub-region (CAMX) determined by the USEPA in the 2018 *Emissions and Generating Resource Integrated Databases (eGRID)*.[24] Due to the CPUC data privacy restrictions of the EDRP, the total community electricity consumption cannot be published. Emissions associated with community electricity T&D losses were 1,765 MT of CO_2e in 2017.

3.3 Community Transportation

The transportation sector for the 2017 Community GHG Inventory consists of GHG emissions from on-road commercial and passenger vehicle travel, public transit buses and rail, and off-road equipment. A summary of the community transportation sector GHG emissions is provided in Table 12, with the methodology of emission calculations detailed in the following section.

Table 12 Community Transportation GHG Emissions Summary

Emission Source	Activity Data	Emissions (MT CO_2e)
Passenger On-Road Transportation	402,568,507 VMT	152,492
Commercial On-Road Transportation	23,008,631 VMT	31,086
Public Transit – Bus	465,510 VRM within jurisdiction	951
Public Transit- Intercity Rail	1,434 gallons diesel within jurisdiction	15
Rail Freight	278,209 gallons of diesel	2,867
Off-road Equipment - Diesel	706,725	7,2766
Off-road Equipment - Gasoline	115,576	1,046
Off-road Equipment – Natural Gas[1]	82,468	479
Total	**NA**	**196,213**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
VMT = Vehicle Miles Traveled; VRM = Vehicle Revenue Miles; MT CO_2e = metric tons of carbon dioxide equivalent; NA = Not Applicable

[23] ICLEI 2019. U.S. Community Protocol for Account and Reporting Greenhouse Gas Emissions. Pg. 36.

[24] USEPA's 2017 eGRID database, February 2018. https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid

Community On-Road Transportation

Community on-road transportation GHG emissions were calculated for passenger and commercial vehicles based on VMT. Accordingly, ICLEI Community Protocol Methods TR.1.B and TR.2.C were used to estimate GHG emissions for 2017. Activity data was obtained through transportation modeling for VMT attributed to the City of Montclair, completed by Fehr & Peers, a traffic consultant. The San Bernardino County Regional Travel model (SBTAM), consistent with the SCAG 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), was used to model traffic volumes, and quantify VMT attributed to Montclair. The VMT modeling results allocate VMT to the City of Montclair using the Origin-Destination (O-D) method. The O-D VMT method is the preferred method recommended by the *Community Protocol* in on-road methodology TR.1 and TR.2 to estimate VMT based on trip start and end locations. Under these recommendations, all VMT associated with trips that start and end entirely within the City (Internal-Internal or I-I) are attributed fully to the City. Additionally, one half of the VMT associated with trips that start internally and end externally and vice versa (Internal-External or I-X and External Internal or X-I) are attributed to the City. The remainder of the trips are considered pass-through trips, which are not attributed to the City, but instead attributed to the Cities in which the trips originate or end.

The GHG emissions associated with on-road transportation were calculated by multiplying the estimated VMT by vehicle class (i.e., passenger vs commercial) by a VMT weighted emission factor calculated using CARB's EMFAC2021 modeling for vehicles within the region. EMFAC2021 provides detailed data on a county-wide basis that includes annual electricity use by electric vehicles (EV) in kilowatt-hours (kWh), VMT associated with electricity powered vehicles, VMT associated with internal combustion engine vehicles (ICE), total VMT, and annual emissions. The data was aggregated into passenger and commercial vehicle categories. EMFAC2021 data was used to determine the percent of EV penetration in 2017 by dividing electric VMT by total VMT and to determine the energy efficiency for passenger and commercial electric vehicles by dividing total energy consumption in kWh by electric VMT for each vehicle category. Annual electric VMT in the City of Montclair in 2017 was estimated by multiplying the total annual City-wide VMT by vehicle category by the corresponding EV penetration rate for that vehicle category. Annual electricity usage by vehicle category was determined by multiplying the calculated electric VMT by the energy efficiency (kWh/mile). The 2017 SCE electricity emission factor was applied to the annual electricity usage for EVs to quantify emissions associated with EVs in Montclair in 2017. To avoid double counting with the energy sector, the electricity usage and associated emissions with EVs was backed out of the SCE reported electricity usage for the community.

Annual ICE VMT was calculated by subtracting the estimated annual electric VMT from the total City VMT for each vehicle category. Emissions due to passenger vehicle operation are calculated using the recommended Community Protocol Method TR.1.A. Because emissions data were not provided, only VMT, ICLEI Methods TR.1.B.2 and TR.1.B.3 are used to convert provided VMT data into emissions data and calculate regional emission factors from CARB's EMFAC2021 model for ICE passenger vehicles by dividing annual CO_2, CH_4 and N_2O emissions by the ICE VMT. Based on EMFAC2021 data, a weighted emission factor is calculated using the mix of vehicle class specific to the county. EMFAC2021 characterizes the vehicle class mix for each county based on the most recent Department of Motor Vehicle (DMV) registration data as well as several other sources for the heavy-duty vehicle population such as International Registration Plan (IRP) Clearinghouse data, vehicle data from California Highway Patrol (CHP), and the National Transit Database (NTD). Emissions from freight and service trucks (i.e., medium, and heavy-duty trucks) are calculated using Community Protocol Method TR.2.C, which is similar to calculating passenger emissions. The

weighted ICE emission factor by vehicle category was applied to the ICE VMT by vehicle category to determined GHG emissions from ICE vehicles.

The activity data, emission factors and total GHG emissions from on-road transportation are provided in Table 13. Activity data is provided in O-D format, with VMT categorized based on whether the associated trips originate and end within the City (I-I), begin outside of the City and end within (X-I), or vice versa (I-X).

Table 13 Community On-road Transportation GHG Emissions

Data	2017
Passenger Vehicle	
Total Annual Passenger VMT[1,2]	402,568,507
Percent of Passenger EV Penetration (%)[3]	0.6%
Passenger ICE Vehicle VMT[3]	400,230,079
ICE Emission Factor (MT CO_2e/mile)[4]	0.000381
Passenger ICE Vehicle Emissions (MT CO_2e)	152,295
Passenger EV VMT[3]	2,338,428
Passenger Energy Efficiency (kWh/mile)[5]	0.34
Passenger EV Vehicles kWh	791,096
Emission Factor (MT CO_2e/kWh)[6]	0.000249
Passenger EV Vehicle Emissions (MT CO_2e)	197
Total Passenger Vehicle Emissions (MT CO_2e)	***152,492***
Commercial Vehicle	
Total Commercial VMT[1,2]	23,008,631
Percent of Commercial EV Penetration (%)[3]	0.0%
Commercial ICE Vehicle VMT[3]	23,008,631
ICE Emission Factor (MT CO_2e/mile)[4]	0.00135
Commercial ICE Vehicle Emissions (MT CO_2e)	31,086
Total Commercial Vehicle Emissions (MT CO_2e)	***31,086***
Total On-road Emissions (MT CO_2e)	**183,577**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled; EVs = electric vehicles; ICE = internal combustion engine
1. O-D trip type represent the origin destination pair designation of each vehicle trip contributing to community VMT. This is based on whether the associated trips originate and end within the City (Internal-Internal or I-I), begin outside of the City and end within (External- Internal or X-I), or vice versa (Internal-External or I-X)
2. Weekday to annual conversion of 347 is used per CARB guidance on VMT modeling.
3. EMFAC2021 EV penetration rate for San Bernardino County by vehicle class applied to VMT to determine ICE vs EV VMT by vehicle class. In 2017, EV penetration for commercial vehicles was 0% so no commercial VMT was allocated as EVs.
4. ICE emission factors are weighted by vehicle type and fuel type within each vehicle class. Determined by dividing ICE emissions by emissions by vehicle class.
5. Energy efficiency of EVs determined by diving energy consumption by EV VMT by vehicle class.
In 2017, EV penetration for commercial vehicles was 0% so no commercial VMT was allocated as EVs.
6. EV emission factor based on electricity utility provide, SCE, 2017 emission factor.

Community Public Transit

Transit that operates within Montclair were determined based on the Montclair Transcenter website.[25] GHG emissions from public transit are attributed to Montclair based on the miles of public bus routes and commuter rail within the City and the light rail ridership from stops within the City. Operational information for each agency was obtained from the transit agency profiles and annual fuel and energy data were obtained from the National Transit Database (NTD).[26,27] Transit emissions were first calculated for each agency operating in Montclair using ICELI methods TR.4.A and TR.4.B, where NTD reported fuel consumption data was multiplied by the fuels emission factor for buses. ICLEI method TR.4.D was used to determine attribution of emissions to the community based on the amount of total vehicle revenue miles for the agency that were traveled within Montclair's city boundaries. Activity data and emissions attributed to the City from public transit are provided in Table 14.

[25] Foothill Transit. Montclair Transit Center. http://foothilltransit.org/lines-and-schedules/transit-centers/montclair-transcenter/

[26] https://www.transit.dot.gov/ntd/transit-agency-profiles

[27] https://www.transit.dot.gov/ntd/data-product/2015-fuel-and-energy

Table 14 VMT and GHG Emissions for Bus Services within the City of Montclair

Route[1]	Annual VRM by Agency[2]	Annual VRM within City[3]	City VRM Attribution[4]	Agency Annual Emissions (MT CO2e)[5]	City Emissions Attribution (MT CO2e)
Foothill Transit - Silver Streak	12,435,234	95,014	0.76%	37,154	284
Foothill Transit - 188		34,882	0.28%		104
Foothill Transit - 197		12,299	0.10%		37
Foothill Transit - 480		52,586	0.42%		157
Foothill Transit - 492		45,802	0.37%		137
Foothill Transit - 690		1,829	0.01%		5
Foothill Transit - 699		29,134	0.23%		87
Omnitrans-66	8,833,288	34,988	0.40%	528	2
Omnitrans-85		70,154	0.79%		4
Omnitrans-88		43,157	0.49%		3
Omnitrans-290		19,943	0.23%		1
Riverside Transit-204	1,358,195	9,410	0.69%	3,156	22
Metrolink-San Bernardino Line	13,133,012	9,580	0.07%	87,162	64
Metrolink-Riverside Line		6,732	0.05%		45
Total					**951**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent; VRM = vehicle revenue miles; NTD = National Transit Database
1. Transit (buses, commuter trains) that operates within Montclair were determined via the Montclair Transcenter website (http://foothilltransit.org/lines-and-schedules/transit-centers/montclair-transcenter/).
2. Operation information, including annual VRMs by agency by mode, are based on Agency profiles (https://www.transit.dot.gov/ntd/transit-agency-profiles)
3. Annual VRMs traveled within the jurisdiction boundaries were estimated by multiplying the miles of a given route within City boundaries by the number of daily route trips by the number of days the route operated. This accounted for weekday, weekend, and holiday schedules in 2017.
4. The attribution of the City to the routes VRMs was calculated by dividing annual City VRMs by annual Agency VRMs. The City attribution was multiplied by the Agency's annual emissions to estimate the amount of transit emissions attributed to Montclair.
5. Agency annual emissions were calculated based on NTD reported fuel consumption and the climate registry emission factors for fuel type.

Emissions from freight rail that use the tracks that run through Montclair and the one switch station located in Montclair were calculated using ICLEI method TR.3. Information related to rail regith movement thorugh Montclair was obtained via Waybill Sample 2010 data[28], while track mileage through Montclair was measured via google maps from where the tracks entered and exited the city boundaries. ICLEI default fuel efficiency for line-haul freight rail and average annual traffic density (millions of gross ton-miles per track mile) was used to estimate fuel consumption on the Union Pacific tracks using data from the Class I Railroad Annual Report (2017) of Union Pacific Railroad

[28] https://www.fra.dot.gov/Page/P0362

Company to the Surface Transportation Board.[29] Fuel consumed at the switchyard in Montclair was estimated using ICLEI default hours of operation and fuel consumption rate. USEPA emission factors for diesel fuel for locomotives was applied to total fuel consumed to calcualte GHG emissions from freight rail attributed to Montclair. Activity data and emissions are summarized in Table 15 below.

Table 15 Freight Rail GHG Emissions Calculations

Rail Line	Total Fuel Consumed[1]	Emission Factor[2]	Total Emissions
Union Pacific	278,209 gallons of diesel	0.0103 gal/MT CO_2e	2,868 MT CO_2e

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent
1. Total fuel consumed for freight rail includes line-haul freight rail fuel consumption associated with freight trains using the tracks through Montclair and one switchyard located in Montclair.
2. USEPA. 2021. Emission Factors for Greenhouse Gas Inventories. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

GHG emissions were calculated for inter-city rail using ICLEI method TR.5. The annual passenger train miles attributed to Montcliar were calculated based on the Amtrak schedule and length of track within Montclair city boundaries. Amtrak operational data including total train passenger miles and energy use in British thermal units (BTU) obtained from the Transportation Energy Databook published by Oak Ridge National Laboratory, was used to develop a energy intensity factor (BTU/train-mile).[30] The energy intensity factor was multiplied by annual passenger train miles attributed to Montclair to estimate annual energy consumption in BTU. This was converted to gallons of diesel based on the energy content of diesel fuel (138,000 BTU/gallon diesel). Emissions were calculated by applying USEPA emission facotrs for diesel fuel in locomotives to the calculated annual fuel consumed by Amtrak passenger trains as attrbiuted to Montclair. The activity data, emission factors, and resulting GHG emission for public transit are provided in Table 16.

Table 16 Inter-City Passenger Rail GHG Emissions Calculations

Emission Source	Activity Data[1]	Energy Intensity[2]	Fuel Consumption[3]	Emission Factor[4]	Emissions (MT CO_2e)
Amtrak-Sunset Limited/Texas Eagle	686.4 passenger miles	288,375 BTU/passenger mile	1,434 gallons of diesel	0.0103 MT CO_2e/gal diesel	15

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
BTU = British Thermal Units; MT CO_2e = metric tons of carbon dioxide equivalent
1. Estimated based on length of track within city boundaries and Amtrak schedule. Based on the Amtrak schedule, six Amtrak passenger trains used the tracks through Montclair weekly. There was approximately 2.2 miles of track within Montclair city boundaries. (6 trains/week*52 weeks/year *2.2 miles = 686.4 miles attributed to Montclair)
2. An energy intensity factor for Amtrak trains calculated using Amtrak operational data obtained from the Transportation Energy Databook published by Oak Ridge National Laboratory (https://cta.ornl.gov/data/index.shtml).
3. Annual energy consumed was calculated as activity data multiplied by the energy intensity factor and converted to gallons based on diesel energy content of 138,000 BTU/gallon.
4. USEPA. 2021. Emission Factors for Greenhouse Gas Inventories. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

[29] https://www.stb.gov/econdata.nsf/f039526076cc0f8e8525660b006870c9?OpenView&Start=1&Count=300&Expand=3#3

[30] https://cta.ornl.gov/data/index.shtml

Community Off-Road Transportation

GHG emissions from off-road transportation were estimated using ICLEI Community Protocol Method TR. 8, based on the CARB's OFFROAD2021 model. The model provides annual GHG emissions and fuel consumption from various types of off-road equipment operating in San Bernardino County. Equipment categories that were not under the jurisdictional control of the City of Montclair were excluded from the inventory including agricultural, airport ground support, commercial harbor craft, forestry, military tactical support, ocean going vessels, oil drilling, and outboard marine tanks. Emissions from locomotives were excluded from this sector as emissions associated with locomotives used in Montclair were already accounted for under the transportation sector. The OFFROAD results were allocated Montclair using population, jobs, and service population as detailed Table 17.

Table 17 2018 Community Off-Road Transportation Data

Equipment	Attribution (% of unincorporated County/entire County)[1]	Attribution Metric
Cargo Handling Equipment	2%	Jobs
Construction and Mining Equipment	2%	Jobs
Gas Can	2%	Population
Industrial Equipment	2%	Jobs
Lawn and Garden Equipment	2%	Service Population
Light Commercial Equipment	2%	Jobs
Pleasure Craft	2%	Population
Portable Equipment	2%	Service Population
Recreational Equipment	2%	Population
Transport Refrigeration Units	2%	Jobs

1. Equipment was attributed to the City based on the percent of the attribution metric associated with the City compared with the entire county.

Annual fuel consumption was multiplied by the emission factor for the corresponding off-road equipment for each fuel type using EPA's emission factors for non-road vehicles.[31] Table 18 summarizes the total annual fuel consumption and GHG emissions by fuel type. Off-road equipment powered by electricity is not included in this estimate to avoid double-counting with the electricity sector.

[31] Emissions Factors for Greenhouse Gas Inventories. U.S. Environmental Protection Agency. April 2021. Accessed September 2021 via online: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

Table 18 GHG Emissions from Off-road Equipment

Data	2017
Diesel	
Activity Data (gallons)[1]	706,725
Emission Factor (MT CO_2e/gallon)[2]	0.01030
Diesel Emissions (MT CO_2e)[1]	7,276
Gasoline	
Activity Data (gallons)[1]	115,576
Emission Factor (MT CO_2e/gallon)[2]	0.00905
Gasoline Emissions (MT CO_2e)[1]	1,046
LPG[3]	
Activity Data (gallons)[1]	82,468
Emission Factor (MT CO_2e/gallon)[2]	0.00581
LPG Emissions (MT CO_2e)	479
Total Emissions (MT CO_2e)	**8,802**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent
1. Activity data is the sum of annual fuel consumption by equipment type by fuel type.
2. Emission factor is weighted based on fuel consumption by equipment type.
3. Natural Gas is not typically used in off-road equipment; LPG is used instead.

3.4 Community Water and Wastewater

Water and wastewater sector GHG emissions include those generated from indirect electricity use for water conveyance and distribution as well as wastewater collection and treatment. GHG emissions were calculated using ICELI Community Protocol methodologies. A summary of the water and wastewater GHG emissions is provided in Table 19, with the methodology of emission calculations detailed in the following section.

Table 19 Community Water and Wastewater GHG Emissions Summary

Emission Source	Activity Data	Emissions (MT CO_2e)
Water Supply	2,676 MG	3,342
Wastewater Treatment and Collection Emissions	12,850 MG	4,215
Total		**7,675**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MG = Million Gallons; MT CO_2e = metric tons of carbon dioxide equivalent

Community Water Supply

Water supplied to the community generates GHG emissions indirectly through the use of energy to extract, convey, treat, and deliver water. The amount of energy required for community water usage was calculated following ICLEI method WW.14, where energy required for each segment of the water cycle was estimated using energy intensities specific to the water segment. Water supplied to Montclair is from Monte Vista Water District (MVWD) where 75% is ground water and

25% is imported surface water from the State Water Project (SWP). ICELI default energy intensity facotrs were used for each segment of the water cycle for local groundwater based on the characteristics indicated in MVWD's 2015 Urban Water Management Plan (UWMP).[32] Details on characteristics and default ICELI values included in Table 20. For imported surface water, energy intensity proxies in typical urban water systems in Southern California were used where energy intensities include a system loss of 5% for conveyance and treatment, and 6% for distribution. Imported water energy intensity values developed for the State Water Project were obtained from California Energy Commission (CEC)'s report.[33] A default high value for groundwater extraction was used from the ICELI Community Protocol due to the location and depth of groundwater at 515 feet. The default median value for conveyance and distribution from ICELI was applied given Montclair's juridsiction and service though a pipeline network as well as MVWD's distribution system through four pressures zones, pumps and well. The ICELI Community Protocol default low value for water treatment was applied based on the assumption that groundwater is treated with chlorine at the production wells. The total water volume undergoing each process (conveyance, treatment, and pumping) was multiplied by the energy intensity of each process to obtain a total energy consumption, which was then multiplied by the SCE electricity emission factor to obtain total GHG emissions. The activity data, energy intensity, and resulting emissions are provided in Table 20.

[32] Monte Vista Water District. 2016. 2015 Urban Water Management Plan.

[33] CEC. 2006. Refining Estimates of Water-Related Energy Use in California. https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Final-EIR-Files/references/rtcref/ch3.1.3/2014-12-19_CEC2006.pdf

Table 20 Community Water Consumption GHG Emissions

Water Source[1]	Water Cycle Segment	Activity Data	Energy Intensity (kWh/MG)	Emission Factor (MT CO_2e/kWh)[7,8]	Emissions (MT CO_2e)
Groundwater	Supply[2]	2,007 MG	2,270	0.000249	1,134
	Conveyance[3]		110		55
	Treatment[4]		300		150
	Distribution[5]		540		270
SWP	Supply[6]	669 MG	0	0.000233	0
	Conveyance[6]		9,727		1,518
	Treatment[6]		111		17
	Distribution[6]		1,272		198
Total					**3,342**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
SWP = State Water Project; MG = million gallons; kWh = kilowatt hours; MT CO_2e = metric tons of carbon dioxide equivalent
1. 75% of total water received by Monte Vista Water District (MVWD) is local ground water and 25% from SWP based on MVWD's 2015 UWMP.
2.Default high value for groundwater extraction was used from ICELI CP given following assumption: MVWD groundwater wells are in an area where the average depth to groundwater is 515 feet (http://www.cbwm.org/docs/engdocs/maps/Figure%203-7%20Depth%20to%20GW%202016.pdf)
3.Default median value for "local water" conveyance from ICELI CP was applied given following assumption: Montclair is within the Chino Basin boundaries and is serviced through a pipeline network. (MVWD UWMP 2015)
4.Default low value for water treatments with a 1-5 MGD capacity was used from ICELI CP given following assumption: groundwater water is treated with chlorine at the production wells with a 1- 3 mgd capacity prior to distribution (MVWD 2015 UWMP).
5.Default median water distribution value was used from ICLEI Community Protocol given following assumption: MVWD is split into 4 pressure zones where approximately half of the city of Montclair falls into MVWD pressure zone 2, a third in pressure zone 1, and 1/6 in pressure zone. Water is distributed from wells and a hydrogenerator in the area (zone 1), gravity fed reservoirs, booster pumps and pressure reducing valves. (MWVD UWMP 2015)
6. SWP energy intensities obtained from California Energy Commission's report, Refining Estimates of Water-Related Energy Use in California (https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Final-EIR-Files/references/rtcref/ch3.1.3/2014-12-19_CEC2006.pdf)
7. SCE is electricity provider for City of Montclair, therefore SCE emission factor used for local ground water.
8. Statewide emission factor was used for imported water obtained from USEPA's eGRID database for CAMX region.

Community Wastewater

Wastewater generated in the City of Montclair is managed by Inland Empire Utility Agency (IEUA). Each of IEUA's wastewater treatment plants produce recycled water that is then sold for direct use or used to recharge the ground water. Community-wide generated wastewater is accounted for based on the fiscal year data provided by IEUA in equivalent dwelling unit (EDU) and produced recycled water direct use and recharge data was used from IEUA's. Billing information from IEUA was provided, as well as the number of EDUs that generate wastewater. Billing for recycled water was converted to acre feet using IEUA's fee schedule for recycled water direct use and recharge, associated with the billing year. Each member agency is charged for groundwater recharge based on the number of EDUs reported. Based on the number of EDUs sold to Montclair, which was provided by the IEUA, it was estimated that 12,591 million gallons of wastewater per year was generated. Each EDU was equivalent to 200 gallons of water. Recycled water direct use for 2017 was approximately 94 million gallons per year and recycled water recharge was approximately 165 million gallons per year. The City of Montclair does not operate a wastewater facility nor is there

one within the City boundaries. Therefore, the data from IEUA was used to calculate emissions associated with indirect electricity use for wastewater collection and treatment. Fugitive and process emissions associated with wastewater were not included.

ICLEI method WW.15 was used to attribute energy-related emissions from wastewater collection and treatment to the community. SCE is the electricity provider for the City; therefore the SCE emission factors were used to calculate GHG emissions from electricity. Activity data and wastewater emissions attributed to Montclair are provided in Table 21.

Table 21 Community Wastewater Treatment and Collection GHG Emissions

Process	Activity Data[1,2]	Energy Intensity (kWh/MG)[3]	Annual Energy Consumption (kWh)	Emission Factor(MT CO_2e/kWh)[4]	Emissions (MT CO_2e)
Wastewater Collection	12,591 (MG/year)	22.7	285,817	0.000249	71
Wastewater Treatment		1,318.6	16,602,551		4,134
Recycled Water Direct Use	94 (MG/year)	301.6	28,403		7
Recycled Water Recharge	165 (MG/year)	49.7	8,208		2
Total					**4,215**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
kWh = kilowatt hours; MT CO_2e = metric tons of carbon dioxide equivalent; MG = Million Gallons; EDU = equivalent dwelling units
Totals may not add due to rounding
1. Fiscal year data was provided by IEUA where fiscal year ends June 30th, therefore data was calculated as a weighted average of FY 2017 and FY 2018 data.
2. Activity data, in million gallons per year, was calculated from IEUA provided EDU wastewater generation data where 1 EDU = 240 gallons per day, and recycled water acre feet data where 1 million gallons = 3.068-acre feet
3. Agency specific energy intensity factors were obtained from the IEUA 2015 UWMP Chapter 8: Voluntary Reporting of Energy Intensity.
4. SCE is electricity provider for City of Montclair, therefore SCE emission factors used. Edison International 2017 Sustainability Report (p. 10), June 2018. https://www.edison.com/content/dam/eix/documents/sustainability/eix-2017-sustainability-report.pdf

3.5 Solid Waste

GHG emissions result from solid waste management and decay of organic material in solid waste. ICLEI Community Protocol provides multiple accounting methods to address both emissions arising from solid waste generated by a community (regardless of where it is disposed of) as well as emissions arising from solid waste disposed of inside a community's boundaries (regardless of where it was generated). GHG emissions from the decomposition of organic material in this sector are broken down into two parts:

- Methane emissions from solid waste generated by the community in the year of the inventory, using ICLEI *U.S. Community Protocol* Method SW.4.
- Methane emissions from existing solid waste-in-place at landfills located within the community limits (waste-in-place), using ICLEI *U.S. Community Protocol* Method SW.1.

No landfills exist within the Montclair 's jurisdictional boundary; therefore, solid waste decay methane emissions were estimated using only ICLEI method SW.4 to calculate the methane

commitment of solid waste generated by Montclair in 2017. While these methane emissions are attributed to a single inventory year, the actual emissions will occur over time as waste decays in the landfill.

In addition to the GHG emissions resulting from the decomposition of solid waste in landfills, the collection, transportation, and processing of solid waste produces GHG emissions. Specifically, for the City of Montclair, a portion of the waste stream is sent to combustion facilities, which produces additional GHG emissions. The emissions from the collection of solid waste are included in the solid waste sector total emissions. The following ICLEI methodologies are used to quantify solid waste process emissions:

- Process emissions, generated at landfills, associated with landfilling of community-generated waste, using ICLEI *Community Protocol* Method SW.5
- Methane emissions from solid waste by collection and transportation, using ICLEI *Community Protocol* Method SW.6.
- Combustion emissions associated with community-generated waste sent to combustion facilities, using ICLEI *Community Protocol* Method SW.7

A summary of the community waste sector GHG emissions is provided in Table 22, with the methodology of emission calculations detailed in the following section.

Table 22 Community Waste GHG Emissions Summary

Emission Source	Activity Data	Emissions (MT CO_2e)
Landfill Methane Emissions	32,235 tons	10,879
Landfilling Process Emissions	32,235 tons	355
Waste Sent to Combustion Facilities	32 tons	24
Total		**11,258**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
kWh = kilowatt-hour; MT CO_2e = metric tons of carbon dioxide equivalent; NA = Not Applicable

Community Generated Waste

In 2017, Montclair produced 40,528 tons of waste, of which 32,235 tons was disposed of in landfills.[34] ICLEI method SW.4.1 was used to calculate methane emissions based on the mass of waste landfilled, organic content of waste, and the landfill gas (LFG) capture rate of the facilities to which waste was sent. Waste generated in Montclair was sent to numerous landfills; therefore, the LFG capture rate used for waste generated in Montclair was derived from CalRecycle and EPA LMOP database it was determined that all landfills that community waste was disposed at had an LFG collection system in place; a default 75% LFG capture efficiency rate was used. The activity data, calculation details, emission factors, and GHG emissions are provided in Table 23.

[34] Waste disposed of by landfill from Montclair was obtained via CalRecycle 2017 Disposal Reports by Jurisdiction. https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility

Table 23 Community Waste Landfill Methane Emissions

Source[1]	Activity Data	Emission Factor (MT CH_4/ton of waste)[2]	Oxidation Rate[3]	LFG Capture Rate[4]	Emissions (MT CO_2e)[5]
Landfilled Solid Waste	32,235 tons	0.06	0.01	0.75	10,879

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
LFG = Landfill Gas ; MT CO_2e = metric tons of carbon dioxide equivalent; MT CH_4 = metric tons of methane
1. Emissions calculated using ICELI method SW.4.1.
2. ICELI default parameters and emission factors used for calculations.
3. Oxidation rate represents the remaining fraction of waste mass that is not converted to methane.
4. LFG capture rate derived from CalRecycle and EPA LMOP database default of 75%.

Landfilling Process Emissions

Landfilling process emissions encompass the contribution of the City of Montclair 's waste to the emissions associated with operations at the destination landfill. These emissions were calculated using ICLEI method SW.5. The primary destination landfills for Montclair 's waste are assumed to use natural gas to fuel their equipment.[35] The activity data, calculation details, emission factors, and GHG emissions are provided in Table 24.

Table 24 Community Waste Landfilling Process GHG Emissions

Source[1]	Activity Data	Emission Factor (MT CO_2/ton of waste)[2]	Emissions (MT CO_2e)[5]
Landfill Processing Equipment	32,235 (tons)	0.011	355

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent
1. Emissions calculated using ICELI method SW.5
2. Default emission factor ICELI used for calculations, assuming natural gas fueled equipment.

Waste Sent to Combustion Facilities

A small portion of the waste generated in the City of Montclair is sent to waste combustion facilities and ICLEI method SW.7 was used to calculate these emissions. In 2017, the City of Montclair sent 32 tons of waste-to-waste combustion facilities.[36] Emission from the waste-to-energy facilities were attributed to Montclair based on the attribution factor of the proportion of waste sent to the facilities to the total annual waste processed by the facility. The activity data, calculation details, emission factors and GHG emissions associated with Montclair waste sent to combustion facilities is provided in Table 25.

[35] It is assumed that the primary fuel used for processing equipment is natural gas; however, EPA GHG Reports the primary landfills Montclair waste is disposed at use natural gas and propane to power stationary combustion equipment rather than purely natural gas. https://ghgdata.epa.gov/ghgp/main.do.

[36] Total waste sent to destination landfills was obtained from CalRecycle 2017 Disposal Reports by Jurisdiction. https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility.

Table 25 Community Waste Sent to Combustion Facilities GHG Emissions

Facility	Total Facility Waste Processed (Tons)[1]	Waste Sent from Montclair (Tons)[2]	Attribution Factor	Total Facility Emissions (MT CO_2e)[3]	Emissions (MT CO_2e)[5]
Commerce Refuse-To-Energy Facility	67,350	32	0.000475	50,395	24

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent
1. Total waste received by the facility in 2017 obtained from CalRecycle Single-year Countywide Destination Detail for Los Angeles County. https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/CountywideDetail.
2. Total waste sent to destination landfills was obtained from CalRecycle 2017 Disposal Reports by Jurisdiction. https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility.
3. Total facility emissions obtained from the U.S. EPA Facility Level Information on Greenhouse gases Tool (FLIGHT). https://ghgdata.epa.gov/ghgp/main.do.

3.6 Community GHG Inventory Results

In 2017, the Montclair community emitted approximately 283,074 MT CO_2e. As shown in Figure 2 and Table 26, the transportation sector was the largest source of emissions, generating approximately 196,213 MT CO_2e, or 69% of total 2017 GHG emissions. Electricity and natural gas consumption within the residential and non-residential sectors were the second largest source of 2017 emissions, generating 68,047 MT CO_2e, or 24% of the total. Waste generation, including waste decay and processing resulted in 4% of the City's emissions, while water consumption and wastewater generation resulted in the remaining 3%.

Figure 2 2017 Community-wide GHG Emissions by Sector

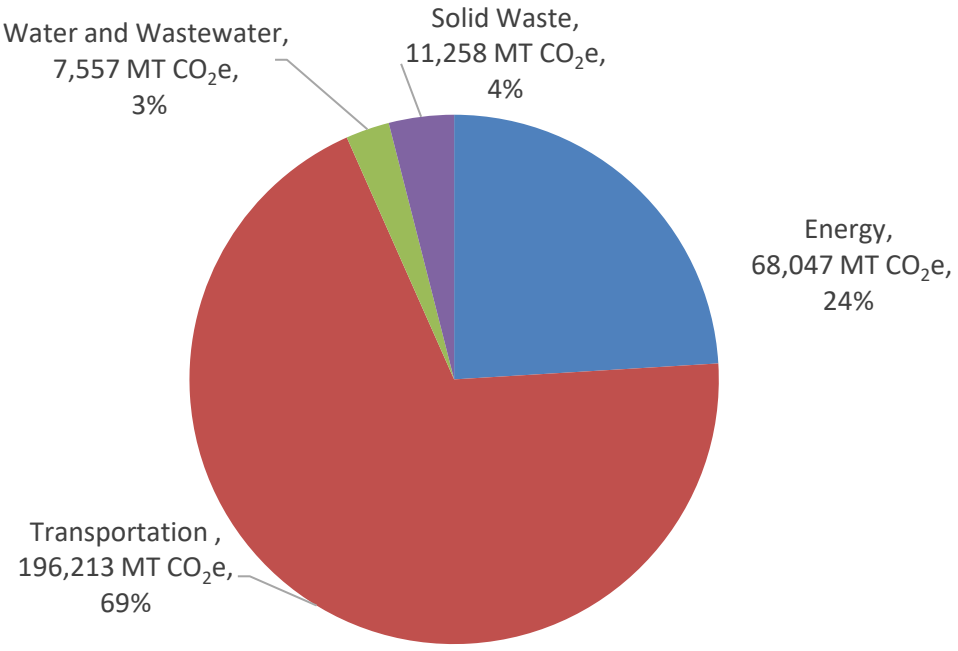


Table 26 Baseline Community-wide GHG Emissions Summary by Sector

Sector	Emissions (MT CO_2e)	Percent of Total Emissions
Energy	**68,047**	**24%**
Electricity	41,540	15%
Natural Gas	24,741	9%
Electricity Transmission and Distribution Losses	1,765	<1%
Transportation	**196,213**	**69%**
On-road Transportation	183,577	65%
Off-road Equipment	8,802	3%
Public Transit	3,834	1%
Water	**7,557**	**3%**
Water Conveyance, Distribution, and Treatment	3,342	1%
Wastewater Collection and Treatment	4,215	2%
Solid Waste	**11,258**	**4%**
Waste Sent to Landfills	10,879	4%
Process Emissions	355	<1%
Waste Sent to Combustion Facilities	24	<1%
Total	**283,074**	**100%**

Notes: Emissions have been rounded and therefore sums may not match
MT CO_2e : Metric tons of Carbon Dioxide Equivalent

3.7 1990 Baseline

The State of California uses 1990 as a reference year to remain consistent with SB 32, which codified the State's 2030 GHG emission targets by directing CARB to reduce statewide emissions 40 percent below 1990 levels by 2030. Determining 1990 GHG emissions levels for a community is an important step in developing climate action targets. CARB has recommended that jurisdictions establish 2030 GHG emissions reduction goals consistent with the State's goal to reduce emissions 40 percent below 1990 levels, established by SB 32. Because Montclair does not have reliable or sufficient activity data to develop an inventory for 1990, the 2017 inventory results were used to back-cast GHG emissions to 1990 for Montclair.[37] Other jurisdictions, such as the City of South Pasadena, have established a relationship between GHG emissions at the state level for their oldest inventory year (in Montclair's case, 2017) and the state's emissions in 1990, as a way to back-case to

[37] Guidance in CARB's 2008 AB 32 Scoping Plan recommends that 1990 GHG emissions are calculated as 15 percent below 2005-2008 GHG emissions levels. However, Montclair does not have a GHG emissions inventory for 2005-2008.

1990 using best available data.[38] This approach assumes that the City's GHG emissions have tracked approximately with the state's GHG emissions, when controlled for community emissions sources. While not a perfect approximation, this approach is defensible and ensures consistency with state goals. The calculation is done by using published state-wide emissions results from CARB, after removing emissions from sectors not included in the City's inventory (i.e., agricultural, industrial, and high GWP sectors).[39] The 1990 back-cast for Montclair is shown in Table 27.

Table 27 1990 GHG Emissions Back-cast

Source	Total
State of CA 1990 Emissions (MMT CO_2e)	306.8
State of CA 2017 Emissions (MMT CO_2e)	302.1
1990 Change Factor (%)	-1.53%
Montclair 2017 Emissions (MT CO_2e)	283,074
Montclair 1990 Emissions (MT CO_2e)	287,411

Notes: Emissions have been rounded and therefore sums may not match
CO_2e : Carbon Dioxide Equivalent; MMT = million metric tons; MT = metric tons
1. Sectors not included in the City's inventory were excluded (i.e., agriculture, High GWP and Industrial except for general fuel usage)

[38] The concept of "best available data" is referenced by the World Resources Institute's 2014 Greenhouse Gas Protocol as a guideline for inventory best practices.

[39] California Air Resources Board (2021). California Greenhouse Gas Emission Inventory - 2021 Edition. Data available at: https://ww3.arb.ca.gov/cc/inventory/data/data.htm

4 GHG Emissions Forecast

A baseline inventory (i.e., the City of Montclair 's 2017 community inventory) sets a reference point for a single year; however, annual emissions change over time due to external factors such as population and job growth. Emissions forecast accounts for projected growth and presents an estimate of GHG emissions in a future year. Calculating the difference between the GHG emissions forecast and the reduction targets set by the City determines the gap to be closed through City Climate Action Plan policies. This section quantifies an estimate of the future GHG emissions in Montclair and the reduction impact state regulations will have on the forecasted GHG emissions for the years 2030, 2040 and 2045.

Several indicator growth rates were developed from demographic growth projections and the results of the 2017 Community GHG Inventory and applied to the various emissions sectors to forecast future GHG emissions. These growth rates were developed from the SCAG 2020 RTP/SCS population and job projections. This forecast based solely on the 2017 GHG inventory and growth projections is considered the *business-as-usual scenario* (*BAU*), where it is assumed that no additional action will occur to reduce future GHG emissions. Once *BAU* forecasted GHG emissions are established, a *legislative adjusted* (*adjusted*) *scenario* of future GHG emissions is developed which considers the GHG reduction impact of state and federal legislation on the *BAU* forecasted GHG emissions. The applicable state and federal regulatory requirements, including Corporate Average Fuel Economy standards, Advanced Clean Car Program, Renewable Portfolio Standard, and Title 24 efficiencies, are then incorporated to accurately reflect expected reductions from state programs. The *adjusted scenario* provides a more accurate picture of future emissions growth and the responsibility of the City and community for GHG reductions to algin with state GHG reduction goals.

4.1 Demographics

The emission forecast is primarily driven by the anticipated population and jobs growth for the City of Montclair. Regardless of the impact of State legislation, changes in population and jobs data are the primary indicator of how activity data for different emissions sources will change. The *Southern California Association of Governments* (SCAG) modeled future population, housing and employment growth for the region including jurisdiction level growth. As part of the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, SCAG provides a forecast for housing, population and employment within the City of Montclair for 2016 and 2045.[40]

The forecast in this document uses the population, employment, and housing forecasted estimates from the 2020 SCAG RTP/SCS as a basis for anticipated growth in the City of Montclair. However, the household based growth factors were adjusted to account for the 6th Cycle Regional Housing Needs Assessment (RHNA) allocation of housing needs for the City of Montclair between 2021 and 2029.[41] As such, the number of households in Montclair is expected to grow by 2,593 between 2021 and

[40] SCAG. 2020. *2020-2045 Regional Transportation Plan/Sustainable Communities Strategy; Demographics and Growth Forecast Technical Report*. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_demographics-and-growth-forecast.pdf?1606001579

[41] SCAG. 2021. SCAG 6th Cycle Final RHNA Allocation Based on Final RHNA Methodology & Final Connect SoCal .https://scag.ca.gov/sites/main/files/file-attachments/6th_cycle_final_rhna_allocation_plan_070121.pdf?1646938785

2029, with steady growth after 2030 at a rate of 45 households per year, consistent with SCAG 2020 RTP/SCS projected growth rates for Montclair.[42] Population growth due to RHNA were accounted for by multiplying the adjusted housing stock by the current average household size (i.e., 3.89 in 2021). Employment projections were not adjusted and remain consistent with SCAG projections. Employment growth after 2045 was calculated assuming a continued growth rate of 55 jobs annually, consistent with SCAG 2020 RTP/SCS projections. The population and housing estimates used in the forecast and in the CAP are different from the population included in the Population and Housing Element Environmental Impact Report (EIR) because the General Plan Update includes estimated growth based on full build out of the Arrow Highway Mixed-Use District (AHMUD) Specific Plan. Additionally, the Department of Housing and Community Development (HCD) recommends that each jurisdiction create a buffer in the housing element inventory of at least 15 to 30 percent more capacity than required to ensure that sufficient capacity exists in the housing element to accommodate the RHNA throughout the planning period.[43] Including the HCD recommended buffer and full build out of the General Plan growth in the CAP could result in an overly conservative emissions reduction forecast and target because these scenarios are in part, calculated based on future population scenarios. Therefore, the forecasts and targets developed for the CAP are based on the SCAG demographic projections with RHNA adjustments.Table 28 presents the demographic projections used to estimate future activity data and GHG emissions for the emissions forecast.

Table 28 Demographic Projections

Sector	2025	2030	2035	2040	2045
Population[1,4]	44,521	49,672	50,543	51,414	52,285
Employment[1]	19,797	20,072	20,348	20,624	20,900
Service Population[2]	64,317	69,745	70,891	72,038	73,185
Household[1,3]	11,459	12,785	13,009	13,233	13,457

Notes:
1. Employment, population and household projections obtained from SCAG 2020 RTP/SCS.
2. Service population is the sum of employment and population in the jurisdiction
3. Households projections from SCAG were adjusted to correspond with the 6th RHNA cycle (i.e., 2,593 additional housing units between 2021 -2029).
4. Population estimates were adjusted to account for growth by multiplying household projections by the current average household size in 2021 of 3.89.

[42] Southern California Association of Governments. May 2020. Connect SoCal. Demographics and Growth Forecast. https://www.connectsocal.org/Documents/Draft/dConnectSoCal_Demographics-And-Growth-Forecast.pdf. Accessed January 22, 2022.

[43] HCD. June 10, 2020. Housing Element Site Inventory Guidebook Government Code Section 65583.2. https://www.hcd.ca.gov/community-development/housing-element/docs/sites_inventory_memo_final06102020.pdf

4.2 Business-as-Usual Scenario GHG Emissions Forecast

The City of Montclair *BAU scenario* forecast provides an estimate of how GHG emissions would change in the forecast years if consumption trends continued as in 2017, absent any new regulations or actions that would reduce local emissions. Several indicator growth rates were developed from the 2017 GHG inventory activity data and applied to the various emissions sectors to project future year activity data. As part of the *BAU scenario,* forecast emission factors are assumed to remain the same as in 2017. Table 29 contains growth and emission factors used to develop the *BAU scenario* forecast. Not included in this table is on-road transportation VMT and off-road equipment. Forecasted emissions from off-road equipment was estimated using the CARB OFFROAD2021 model and the methodology described in the *Community Off-Road Transportation* Section. Forecasted emissions from on-road transportation was estimated using VMT projections provided by Fehr & Peers that correspond with the General Plan Land Use changes and growth projections and emission factors obtained from EMFAC2021.

Table 29 Business-as-Usual Growth Metrics and Emission Factors

Sector	Growth Factor	Emission Factor
Residential Electricity (EV adjusted)	6,542.3 kWh/household	0.000249 MT CO_2e/kWh
Commercial Electricity (EV adjusted)	5,945.8 kWh/job	0.000249 MT CO_2e/kWh
Residential Natural Gas	312.8 therm/household	0.00531 MT CO_2e/therm
Commercial Natural Gas	90.0 therm/job	0.00531 MT CO_2e/therm
Solid Waste	0.57 tons/SP	0.349 MT CO_2e/ton
Water Conveyance, Distribution and Treatment Electricity	0.036 MG Groundwater/SP	0.000249 MT CO_2e/kWh
	0.012 MG Imported Water/SP	0.000233 MT CO_2e/kWh
Wastewater Collection and Treatment Electricity	0.2 MG/SP	0.000249 MT CO_2e/kWh
Public Transit	8.3 VRM/SP	0.00204 MT CO_2e/VRM
Inter-City Rail	0.026-gal diesel/SP	0.01031 MT CO_2e/gal
Rail Freight	4.96-gal diesel/SP	0.01031 MT CO_2e/gal

Notes: Values have been rounded.
kwh = kilowatt-hour; MT CO_2e = Metric Tons of Carbon Dioxide Equivalent; SP = Service Population; VMT = Vehicle Miles Traveled; VRM = vehicle revenue miles

On-Road Activity Data

Activity data for the forecast of on-road transportation was modeled separately from the above growth metrics and growth indicators, using the SBTAM travel demand model. See *Community On-Road Transportation* for the detailed VMT methodology. Daily VMT data was annualized using the annualization factor of 347, described in the EMFAC2021 documentation. EV penetration percent was obtained from EMFAC2021 and applied to the City's total VMT to determine VMT associated with electric versus internal combustion (ICE) vehicles. For the BAU forecast, EV penetration, electricity emission factors and the ICE emission factors remain the same as in 2017. The results for passenger and commercial VMT and electricity usage for EVs are summarized in Table 30.

Table 30 BAU GHG Emissions Forecast On-Road Transportation Data

Growth Metric	2025	2030	2035	2040	2045
Total Passenger VMT	436,096,113	457,050,867	478,005,621	498,960,375	519,915,129
Total Commercial VMT	24,608,741	25,608,810	26,608,878	27,608,947	28,609,015
% Passenger EV Penetration	4.54%	6.79%	8.30%	9.06%	9.37%
% Commercial EV Penetration	0.67%	5.61%	14.08%	20.33%	23.52%
Passenger ICE VMT	416,306,088	426,033,000	438,341,130	453,773,217	471,214,854
Commercial ICE VMT	24,442,967	24,171,858	22,862,331	21,995,482	21,879,501
Passenger EV VMT	19,790,025	31,017,867	39,664,491	45,187,158	48,700,276
Commercial EV VMT	165,774	1,436,952	3,746,548	5,613,465	6,729,514
Passenger Fuel Efficiency (kWh/mile)	0.36	0.37	0.37	0.37	0.37
Commercial Fuel Efficiency (kWh/mile)	1.18	1.15	1.14	1.13	1.13
Passenger kWh	7,216,909	11,370,272	14,582,403	16,633,053	17,934,246
Commercial kWh	195,636	1,659,678	4,270,511	6,326,233	7,610,902
ICE Passenger Emission Factor (MT CO2e/mile)	0.00034	0.00031	0.00030	0.00029	0.00028
ICE Commercial Emission Factor (MT CO2e/mile)	0.00130	0.00123	0.00121	0.00121	0.00123

Notes: VMT = vehicle miles traveled; kWh = kilowatt hour; EV = electric vehicle; ICE = internal combustion engine

Off-Road Activity Data

Activity data for the off-road GHG emissions forecast was modeled separately from the above growth metrics and growth indicators, using the outputs from the CARB OFFROAD2021 model. The OFFROAD2021 model was run for San Bernardino County for the forecast years to obtain fuel consumption for gasoline, diesel, and natural gas. As with the inventory, the following equipment sectors were included:

- Cargo Handling Equipment
- Construction and Mining Equipment
- Gas Can
- Industrial Equipment
- Lawn and Garden Equipment
- Light Commercial Equipment
- Portable Equipment
- Pleasure Craft
- Recreational Equipment
- Transport Refrigeration Units

The results of the OFFROAD2021 model were summarized for the above equipment sectors in San Bernardino County. The City of Montclair was allocated a percentage of total county fuel

consumption for each sector relative to the City's proportion of jobs or population in the county. The results are summarized in

Table 31. Off-road equipment powered by electricity is not included in this estimate to avoid double-counting with the electricity sector.

Table 31 BAU GHG Emissions Forecast Off-Road Fuel Consumption

Off-road Fuel Category	2025	2030	2035	2040	2045
Diesel	876,661	897,262	965,371	1,038,711	1,115,491
Gasoline	124,694	130,710	137,613	144,433	148,022
Natural Gas	93,455	100,800	108,947	117,863	117,863

Notes: All values are of the unit gallons of fuel and have been attributed from County-wide values to unincorporated County using the attribution metric discussed in the inventory

Source: California Air Resources Board. 2021. OFFROAD2021 – ORION

4.2.1 BAU GHG Emissions Forecast Results

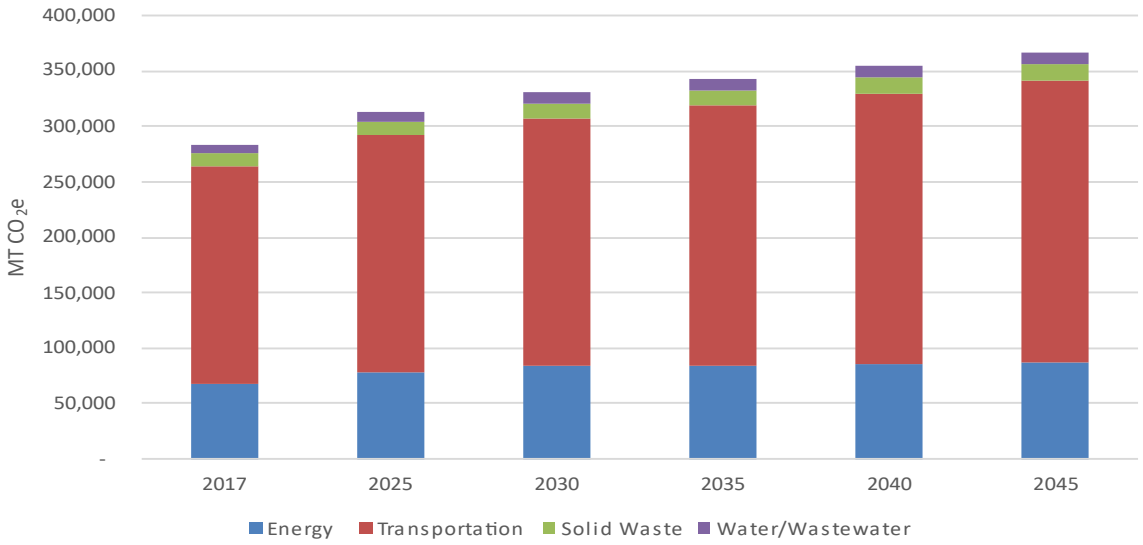
The following provides a summary of the results of the BAU GHG emissions forecast for each source in the City of Montclair. The results have been reported in MT CO_2e. Under the *BAU scenario* forecast, the City of Montclair 's GHG emissions are projected to continue increasing through 2045, as shown in Table 32 and Figure 3. Figure 3 provides a summary of the *BAU scenario* GHG emissions forecast categorized into the four primary emission sectors: energy, transportation, water and waste.

Table 32 Business-as-usual Forecast by Sector

Sector	2025	2030	2035	2040	2045
Residential Electricity	18,669	20,829	21,194	21,559	21,925
Non-residential Electricity	29,312	29,720	30,129	30,537	30,945
Transmission and Distribution Losses	2,039	2,149	2,182	2,215	2,248
Residential Gas	19,035	21,238	21,610	21,983	22,355
Non-Residential Natural Gas	9,461	9,593	9,725	9,857	9,989
Passenger On-road Transportation	165,192	173,129	181,067	189,005	196,942
Commercial On-road Transportation	33,247	34,598	35,950	37,301	38,652
Inter-City Rail	17	18	19	19	19
Public Transit	1,090	1,183	1,202	1,221	1,241
Rail Freight	3,287	3,564	3,622	3,681	3,740
Off-Road Equipment	10,698	11,007	11,818	12,686	13,509
Waste	12,903	13,991	14,221	14,451	14,682
Water	3,831	4,154	4,222	4,291	4,359
Wastewater	4,830	5,238	5,324	5,410	5,496
Total Emissions	**313,611**	**330,412**	**342,286**	**354,216**	**366,102**
Emissions per Capita	***7.0***	***6.7***	***6.8***	***6.9***	***7.0***

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = Metric Tons of Carbon Dioxide Equivalent;

Figure 3 Emissions Forecast - Business-as-usual Scenario (MT CO_2e)



4.3 Legislative Adjusted Scenario GHG Emissions Forecast

The *adjusted scenario* forecast is based on the same base data as the *BAU scenario* but includes an adjustment for the legislative actions and associated GHG emissions reductions occurring at the state and federal levels. The following section described the State legislation and regulations that are expected to reduce City of Montclair's future GHG emissions.

4.3.1 GHG Reduction Legislation Included in Adjusted Forecast

The 2017 Scoping Plan and 2022 Scoping Plant Updates identified several existing state programs and targets, or known commitments required by statute which can be assumed to achieve GHG reductions without City action, such as increased fuel efficiency standards of mobile vehicles. The following State legislation were applied to the *adjusted scenario* based on the unique sectors within the City of Montclair:

- 2019 Title 24 Building Energy Efficiency Standards
- Senate Bill (SB) 100 - California Renewables Portfolio Standard Program
- Assembly Bill 1493 (Pavley Standards) -
- Advanced Clean Cars Program
- Advanced Clean Trucks (ACT) Regulation
- Innovative Clean Transit (ICT)

The impact of these regulations was quantified and incorporated into the *adjusted scenario* to provide a more accurate depiction of future GHG emissions growth in the City.

4.3.1.1 GHG Reduction Legislation Calculations

EMFAC2021 was used to model transportation-related GHG emissions for the City of Montclair forecasts, which considers implementation of state legislation related to transportation such as the fuel efficiency requirements (AB 1493), the Advanced Clean Cars Program, the Advanced Clean Trucks Regulation, Innovative Clean Transit, and anticipated EV penetration based on market trends. In addition, the following methodology was used to calculate energy-related GHG emissions reduction related to Title 24 and SB 100.

- **Title 24:** It is assumed that all growth in the residential sector is from new construction. Accordingly, Title 24 GHG emissions reduction for natural gas and electricity are calculated as a percentage of the projected increase in energy consumption beyond the baseline 2017 GHG emissions inventory, under the BAU forecast. Overall, the energy consumption reduction impact of Title 24 is:
    - 53 percent reduction beyond the 2017 baseline for residential electricity,
    - 30 percent reduction beyond the 2017 baseline for commercial electricity, and
    - 7 percent reduction beyond the 2017 baseline for residential natural gas.[44]

[44] California Energy Commission. 2018. 2019 Building Energy Efficiency Standards Frequently Asked Questions. Available: <https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf>. Accessed June 21, 2021.

- **SB 100:**[45] Southern California Edison (SCE) currently provides electricity to the City of Montclair and is subject to SB 100 requirements. GHG emissions from electricity consumption are largely determined by the emissions factor associated with the supplied electricity. Legislative GHG emissions reductions from SB 100 are calculated as the difference between GHG emissions under the BAU forecast electricity and GHG emissions calculated using a SB 100-adjusted GHG emissions factor for a given forecast year. Adjusted GHG emission factors are calculated by scaling the baseline electricity GHG emissions factor with the RPS percentage for eligible renewable electricity required for compliance with SB 100. Note that while both Title 24 and SB 100 influence GHG emissions reductions in the electricity sector, double counting of these reductions is avoided by accounting for Title 24 reductions first and then accounting for reductions from SB 100. The RPS percentages and associated GHG emissions factors used to determine the *adjusted scenario* electricity emissions are provided in Table 33.

Table 33 Electricity Provider Forecasted RPS and Electricity GHG Emissions Factors

Energy Provider	2025	2030	2035	2040	2045
Southern California Edison (SCE)[1]					
Renewable Portfolio Standard Percentage	50%	60%	73%	87%	100%
Adjusted Electricity Emission Factor (MT CO_2e/kWh)	0.000217	0.000163	0.000108	0.000054	0

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; kWh = kilowatt-hour

1. % RPS and 2020 emission factor obtained from recent power content labels and interpolated to 2030 and 2045 RPS goals.

4.3.2 Adjusted Scenario GHG Emissions Forecast Results

In the *adjusted scenario* emissions forecast, the electricity and water and wastewater sectors all experience a strong downward trend, approaching near-zero in 2045 due to stringent RPS requirements from SB 100. Natural gas emissions are expected to continue an upward trajectory through 2045 due to population and housing growth projections though this trend is partially offset due to the increasingly stringent efficiency requirements for new construction in the upcoming Title 24 code cycles. Transportation emissions are expected to decrease sharply in the next 10 to 15 years due to existing fuel efficiency requirements and the anticipated replacement of internal combustion engine vehicles with zero emission or electric vehicles. As most current regulations expire in 2025 or 2030, emissions standards will experience diminishing returns while VMT continues to increase, leading to lower rates of emissions reduction in the transportation sector. However, the RPS and SB 100 will reduce transportation GHG emissions from electricity used by light rail and the increased EV penetration rate. GHG emission sources that are not impacted by legislation included in the adjusted scenario forecast are waste, off-road equipment, rail freight, and natural gas usage in commercial buildings. These emissions sources are expected to continue to scale upwards with population and employment growth.

A detailed summary of Montclair ’s projected GHG emissions under the *adjusted scenario* forecast by sector and year through 2050 can be found Table 34 and Figure 4. Figure 4 provides a summary

[45] SB 1020 is not included in this analysis as it was codified after the completion of this study. Excluding SB 1020 provides a conservative forecast, as the bill establishes more aggressive RPS targets for California: 90% eligible renewable and carbon-free energy by 2035, 95% by 2040, and 100% by 2045. Including these targets would likely result in lower projected GHG emissions.

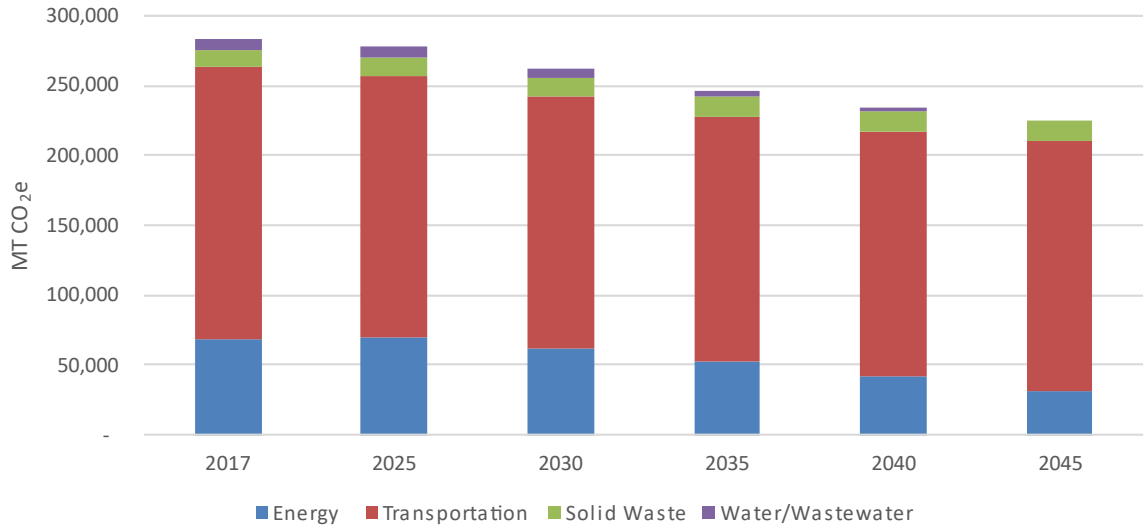
of the *adjusted scenario* GHG emissions forecast categorized into the four primary emission sectors: energy, transportation, water, and waste.

Table 34 Adjusted Scenario Forecast by Sector

Sector	2025	2030	2035	2040	2045
Residential Electricity	15,157	12,031	8,096	4,085	-
Non-residential Electricity	24,488	18,553	12,493	6,309	-
Transmission and Distribution Losses	1,685	1,300	875	442	-
Residential Gas	18,864	20,912	21,258	21,605	21,951
Non-Residential Natural Gas	9,461	9,593	9,725	9,857	9,989
Passenger On-road Transportation	141,277	134,270	131,603	131,575	134,067
Commercial On-road Transportation	31,719	30,039	28,055	26,919	26,828
Inter-City Rail	17	18	19	19	19
Public Transit	1,032	945	701	523	373
Rail Freight	3,287	3,564	3,622	3,681	3,740
Off-Road Equipment	10,698	11,007	11,818	12,686	13,509
Waste	12,903	13,991	14,221	14,451	14,682
Water	3,061	2,518	1,706	867	-
Wastewater	4,209	3,423	2,320	1,179	-
Total Emissions	**277,855**	**262,166**	**246,512**	**234,197**	**225,157**
Emissions per capita	***6.2***	***5.3***	***4.9***	***4.6***	***4.3***

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = Metric Tons of Carbon Dioxide Equivalent;

Figure 4 Emissions Forecast – Adjusted Scenario (MT CO_2e)



4.4 GHG Emissions Forecast Results Summary

The *BAU scenario* and *adjusted scenario* forecasts provide an assessment of how the City of Montclair's future GHG emissions will change based on current conditions (*BAU scenario*) and the impact that state legislation will have on these GHG emissions (*adjusted scenario*). The *adjusted scenario* provides a metric to compare future GHG emissions against state GHG emissions targets. The difference between the adjusted forecast and the state targets, or "the gap", represents the GHG emission reduction that Montclair will be responsible with the policies included in this Climate Action Plan.

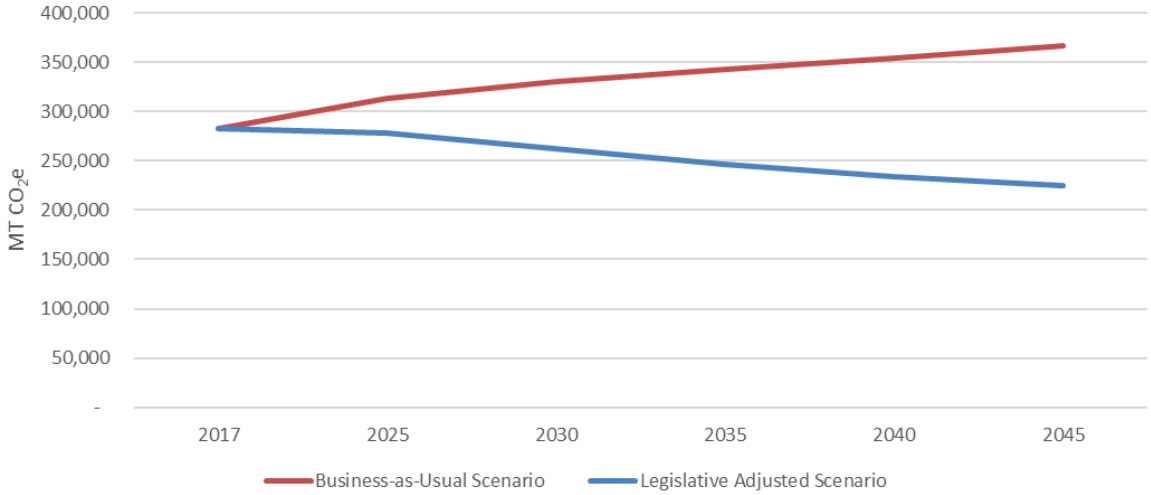
A summary of the GHG reductions resulting from State legislation and programs can be found in Table 35. As shown in Figure 5Figure 5, without legislative reductions at the State level, the City's emissions would increase through 2045, proportionally with population and economic growth.

Table 35 Summary of Legislative Reductions

Legislation	2025	2030	2035	2040	2045
Senate Bill 100 and Renewable Portfolio Standards	-6,095	-18,456	-31,508	-45,557	-60,326
Title 24	-2,763	-4,239	-4,595	-4,950	-5,306
Transportation (Pavley, Advanced Clean Truck, Innovative Clean Transit, etc.)	-26,897	-45,552	-59,671	-69,511	-75,313
Total	**-35,755**	**-68,247**	**-95,773**	**-120,019**	**-140,944**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent

Figure 5 Business-as-usual versus Adjusted Scenarios (MT CO_2e)



5 GHG Emissions Reduction Target Setting

Setting GHG reduction targets for climate action planning that align with the State's goals will allow the City of Montclair to develop its own emission reduction trajectory in a cost-effective manner and on the City's own terms. Target setting is an iterative process that must be informed by the reductions that can realistically be achieved through the development of feasible GHG reduction measures. As such, the targets identified herein should be re-evaluated on a periodic basis (every five years is recommended) and adjusted as more data and information become available to the City.

The State has codified a goal of reducing emissions to 40 percent below 1990 levels by 2030 (SB 32) and developed the 2017 Scoping Plan to demonstrate how the State will achieve the 2030 goal and has tracked progress towards this goal as part of the 2022 Scoping Plan Update. In 2018, a new goal of achieving carbon neutrality by 2045 (EO-B-55-18) was established and codified in 2022 by AB1279. AB 1279 mandates a State goal of carbon neutrality by 2045 through a reduction of anthropogenic GHG emissions by 85%, the pathway to which was developed as part of the 2022 Scoping Plan Update. AB 1279 sets a 15% target for GHG emissions reductions to be achieved through carbon capture and sequestration (CCS) methods, though does not provide a clear pathway as to how CCS technology is to be implemented to achieve said reductions. The purpose of target setting is to develop the trajectory toward achieving the State's 2030 goal (SB 32) and prepare for the deep decarbonization needed by 2045 in a cost-effective manner by setting an incremental path toward achieving AB 1279 targets. CARB guidance is for jurisdictions to first strive to exceed the SB 32 targets of reducing GHG emissions 40% below 1990 levels, while establishing a policy framework to achieve the long-term target of carbon neutrality by 2045.

In accordance with the 2017 Scoping Plan Update, target pathways can be set using either efficiency (MT CO_2e per capita or per service population per year) or absolute (total community-wide MT CO_2e per year) metrics. With CARB's publication in 2017 of the Scoping Plan Update, the state recommended using efficiency metrics for local targets to incentivize growth in a coordinated manner and not penalize cities which are growing at significant rates.[46] With Montclair projected to experience significant population growth in the coming years, an efficiency target was established to establish community GHG reduction goals. Table 36 outlines Monclair's forecasted emissions and the efficiency pathway to achieving the following targets:

- Reduce per capita GHG emissions by 40% below 1990 levels by 2030;
- Reduce per capita GHG emissions to achieve carbon neutrality by 2045.

In addition to the target years that align with the state (i.e., 2030, 2045), the years 2025 and 2035 are presented as interim targets, while the year 2040 corresponds with the City's General Plan Horizon year. Figure 6 shows the forecast and the efficiency target pathway that is used to achieve consistency with SB 32 (2030) and AB 1279 (2045) goals.

[46] California Air Resources Board. 2017. California's Climate Change Scoping Plan, p. 99-102.

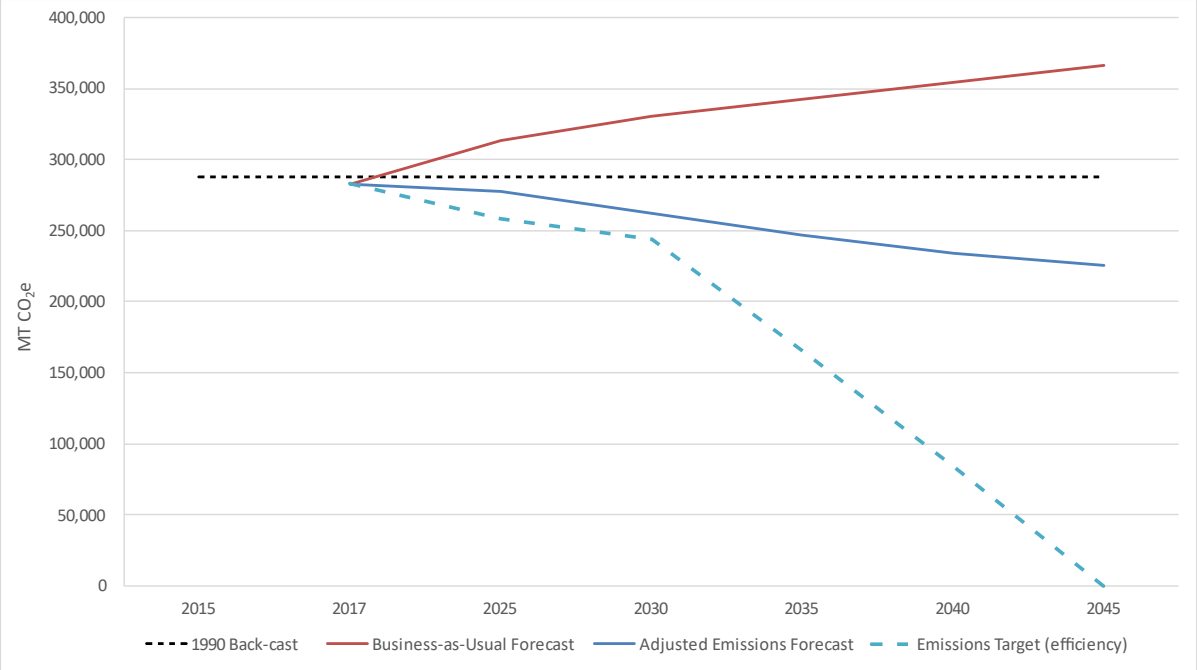
Table 36 Target Pathways[1]

Year	Adjusted GHG forecast ($MT CO_2e$)	Efficiency Pathway ($MT CO_2e$)
2025	277,855 (6.2)	258,487 (5.8)
2030	262,166 (5.3)	243,582 (4.9)
2035	246,512 (4.9)	165,235 (3.3)
2040	234,197(4.6)	84,041 (1.6)
2045	225,157(4.3)	0 (0.0)

Notes: $MT CO_2e$ = metric tons of carbon dioxide equivalent

1. Mass emissions (MT CO2e) with per capita emissions (MT CO2e per person) in parenthesis

Figure 6 Forecast and Target Setting Pathways ($MT CO_2e$)



California achieved its 2020 goal of reaching the 1990 emissions level in 2016[47] and at the time of publication of this inventory, 2020 will be past, therefore the 2020 goal is not referenced. The absolute GHG emission gap in 2030, 2040, and 2045 between each target pathway and the forecast emissions can be found in Table 37. As shown, in Table 37, to achieve the minmum 2030 efficiency target, the City of Montclair will need to reduce emissions through local reduction meausures by 0.4 $MT CO_2e$ per capita or approximately 18,583 $MT CO_2e$.

The emission gap will be bridged by local actions developed in the City of Montclair CAP.

[47] CARB. July 11, 2018. Climate pollutants fall below 1990 levels for the first time. https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time

Table 37 Emission Gap Analysis

Year	Efficiency Pathway ($MT CO_2e$)
2030	-18,583 (-0.4)
2040	- 150,156 (-2.9)
2045	- 225,157 (-4.3)

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

1. Mass emissions (MT CO2e) with per capita emissions (MT CO2e per person) in parenthesis

The 2030, 2040, and 2045 efficiency targets identified above will be achieved through a combination of existing state measures and the implementation of local measures that are identified in the Montclair Climate Action Plan. Local measures were identified through a comprehensive assessment of existing local and regional policies, programs, and actions and by assessing any gaps and identifying additional opportunities. Additional measures were developed from best practices of other similar and neighboring jurisdictions, as well as those recommended by organizations and agencies, such as the California Air Pollution Control Officers Association (CAPCOA), the Office of Planning and Research, CARB's 2017 Scoping Plan, CARB's 2022 Scoping Plan, and Association of Environmental Professionals (AEP). Measures were vetted by City staff and were quantified to identify their overall contribution to meeting the City's 2030, 2040, and 2045 GHG reduction targets in the Climate Action Plan.

Appendix D: Substantial Evidence for Measures and Actions

City of Montclair Climate Action Plan

GHG Emissions Reduction Technical Evidence and Reduction Quantification

prepared for

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Table of Contents

Tables

1 Introduction

This Technical Appendix presents the technical quantification and evidence supporting the greenhouse gas (GHG) emissions reduction potential of the City of Montclair Climate Action Plan (CAP). Section 15183.5(b)(1) of the California Environmental Quality Act (CEQA) guidelines establishes several criteria which a CAP must meet in order to be considered a "qualified GHG reduction plan" and allow for programmatic CEQA streamlining of project GHG emissions. This document provides the evidence substantiating the GHG emissions reductions associated with the CAP measures pursuant to Subsection (D) which states, "measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level." Based on the substantial evidence contained in this Technical Appendix, the GHG emissions reduction associated with the measures in the CAP are sufficient to achieve Montclair's fair share of GHG emissions consistent with the reduction target established by Senate Bill (SB) 32, meet the City's 2030 climate action target, and make substantial progress towards the City's 2045 target, which is in alignment with California's target established by Assembly Bill (AB) 1279.

The quantification in this Technical Appendix is specifically intended to illustrate a viable path to achieving the City of Montclair's 2030 climate action target. As required in CEQA Guidelines Section 15183.5(b)(e), mechanisms to monitor the CAP's progress toward achieving the GHG emissions reduction provided in this Technical Appendix have been established through the CAP development process. If, based on the tracking of community GHG emissions, the City is not on track to reach the 2030 GHG reduction specified here and exceed the target established by SB 32, the CAP as a whole or specific measures and actions will be amended and a CAP update will be prepared that includes altered or additional measures and actions, with evidence that their implementation can achieve the City's climate action targets.

1.1 Measures and Actions Organization

As part of the CAP process, the City of Montclair has developed a comprehensive set of measures reducing community wide GHG emissions in the five primary sectors that must be included in all ICLEI U.S. Community Protocol-compliant inventories to achieve the City's climate action targets. Each measure is supported by a set of actions that provide measurable GHG emissions reduction that is supported by substantial evidence. The City has also developed a set of measures and actions for offsetting GHG emissions through carbon sequestration, which are detailed in a standalone section. Measures and actions are organized according to the following hierarchy:

1. **Sectors** define the GHG emissions category in which the GHG reductions will take place and include the five basic emission generating activities including Building Energy, Transportation, Waste, Water and Wastewater. Additionally, carbon reductions through Carbon Sequestration are included.[1]

[1] Note that the City's municipal measures as established in the CAP Update are not discussed in this document. While the municipal measures are important for reducing the GHG emissions of City operations and establishing the City's operations as demonstrations of

2. **Measures** identify specific GHG reduction goals (i.e., activity data targets by 2030 and 2045) in each sector. A single measure generally addresses a subsector; for example, three measures may be established under the Transportation sector to address active transportation, shared/public transportation, and single-passenger vehicles subsectors.
3. **Actions** identify the programs, policies, funding pathways, and other specific commitments that the City of Montclair will implement. Each measure contains a suite of actions, which together have been designed to accomplish the measure.
    a. **Action Criteria.** The actions supporting each measure have been designed around a set of criteria. The criteria have been identified to play important roles in the implementation of the measures. Because community-focused climate action often requires community-level behavioral changes and buy-in to be implementable and successful, the City has designed a suite of actions associated with each measure that support these changes by emphasizing specific needs of the community. The action criteria are Equity, Funding and Financing, Education and Engagement, and Partnerships.[2] Identification of the action criteria and their inclusion into the CAP helps plan for implementation.

Measures and actions can be either quantitative or supportive, defined as follows:

- **Quantitative** measures and actions result in quantifiable GHG emissions reductions when implemented. GHG emissions reductions from these measures and actions are supported by case studies, scientific articles, calculations, or other third-party substantial evidence. Quantitative measures/actions can be summed to quantify how the City of Montclair will meet its 2030 climate action target and demonstrate progress towards the 2045 target. GHG emissions reductions were calculated using published evidence provided through adequately controlled investigations, studies, and articles carried out by qualified experts that establish the effectiveness for the reduction measures and actions. The estimates and underlying calculations provided in this Technical Appendix include substantial evidence and a transparent approach to achieving the City's GHG emissions reduction targets.
- **Supportive** measures and actions may also be quantifiable and have substantial evidence to support their overall contribution to GHG reduction. However, due to one of several factors – including a low GHG reduction benefit, indirect GHG reduction benefit, or potential for double-counting – they have not been quantified and do not contribute directly to the expected GHG reduction target and consistency with the state goals. Despite not being quantified, supportive measures/actions are nevertheless critical to the overall success of the CAP and provide support so that the quantitative measures and actions will be successfully implemented.

1.2 GHG Emissions Reductions

This Technical Appendix presents an analysis of the GHG reduction pathway to achieve the City's fair share of GHG emissions reductions necessary to support the state's achievement of the SB 32 GHG reduction goal and provide substantial progress to achieve the 2045 goal of carbon neutrality. The

climate action leadership, they contribute only minorly to community-level GHG emissions reductions and are a subset of the community GHG emissions. For this reason, the GHG emissions reductions expected from municipal measures were conservatively excluded from the analysis in this document and were not quantified as part of the CAP Update preparation process.

[2] The exception is for measures and actions in the municipal sector because the City has much more leverage to enact changes at a municipal level and may not need to consider each pillar to ensure success during implementation.

measures and associated actions reflect local policy and document industry best practices for achieving decarbonization. The GHG emissions reduction associated with the City of Montclair CAP's measures and actions have been calculated and presented in this Technical Appendix in terms of mass emissions (in units of MT CO_2e) and are compared to the emissions reduction targets on a per capita basis. A breakdown of the GHG emissions reduction calculated for each measure is included in Table 1.

Table 1 Estimated GHG Emissions Reductions by Measure

Measure #	Measure	Anticipated Reduction/Sequestration (MT CO_2e/person)	
		2030	2045
GHG Emissions Reduction Measures			
BE.1	Join the Clean Power Alliance at the 100% Green Power rate and strive for a less than 4% opt-out rate for residential and commercial customers by 2030 and maintain through 2045.[1]	29,500	0
BE.2	Electrify 100% of newly constructed buildings by 2030.	2,180	3,615
BE.3	Improve energy efficiency by 17% in existing residential buildings and 15% in existing commercial buildings by 2030, and 52% in existing residential and 41% in existing commercial buildings by 2045.	4,579	13,741
TR.1	Develop and implement an Active Transportation Plan to shift 6% of passenger car vehicle miles traveled to active transportation, and 12% by 2045.	569	1,321
TR.2	Implement a public and shared transit programs to achieve 10% of public transit mode share by 2030 and 30% by 2045.	5,205	19,121
TR.3	Increase electric/alternative fuel vehicle adoption to 20% for passenger and 10% for commercial vehicles by 2030, and 65% passenger and 50% commercial by 2045.	17,904	70,317
TR.4	Equitably increase use of electric vehicles, promote active transportation and public transit use by disadvantaged communities.	Supportive	
W.1	Reduce per capita water consumption by 10% compared with 2017 levels by 2030 and 25% by 2045.[1]	252	0
SW.1	Implement SB 1383 requirements and reduce community-wide landfilled organics by 75% by 2025 and inorganic waste by 35% by 2030 and reduce all landfilled waste by 100% by 2045.	2,553	3,571
Carbon Sequestration Measures			
CS.1	Increase carbon sequestration and green space by planting 500 new trees through the community by 2030, and 1,000 by 2045.	18	35
CS.2	Achieve and maintain compost procurement requirements of SB 1383 by 2030.	914	962
Total Reductions from Measure Implementation (MT CO_2e)		***63,675***	***112,683***
Population Projections		***49,672***	***52,285***
Reductions per capita (MT CO_2e per capita)		***1.3***	***2.2***

Measure #	Measure	Anticipated Reduction/Sequestration (MT CO_2e/person)	
		2030	2045

Notes: MT CO_2e = metric tons carbon dioxide equivalents

1. Measure will continue to reduce GHG emissions associated with electricity until 2045 when retail electricity in California will be required to be 100% carbon free per SB 100 requirements.

To assess the magnitude of GHG emissions reduction needed to provide a fair share GHG emissions reduction and contribute to achieving the state's goal for 2030 (40% below 1990 levels) and making substantial progress towards the goal for 2045 (carbon neutrality), the City developed a *business-as-usual scenario* GHG emissions forecast which assessed the impact of growth on the City's GHG emissions. From the *business-as-usual scenario*, a *legislative adjusted scenario* was developed which accounts for the impacts of state and federal policies on GHG emissions. The combined annual reductions from existing state and federal law is expected to result in a reduction of 68,247 metric tons of carbon dioxide equivalent (MT CO_2e) by 2030 and 140,944 MT CO_2e by 2045.[3] The difference between the *legislative adjusted scenario* and the targets, provides the GHG emissions reduction the City would be responsible for to meet its emission reduction targets[4].

As discussed in Appendix C, the 2017 Community GHG Inventory was used to back-cast to 1990 GHG emission levels (i.e., 287,411 MT CO_2e) for Montclair assuming Montclair's GHG emission levels have tracked approximately with the state's GHG emissions. Using Montclair's 1990 population estimate of 35,166, it was estimated that 1990 GHG emissions level was approximately 8.2 MT CO_2e per capita. The 1990 per capita GHG emission level was used to develop the 2030 and 2045 efficiency targets consistent with SB 32 and AB 1279. Accordingly, to be consistent with SB 32, a 40% reduction from 1990 per capita levels equates to a target of 4.9 MT CO_2e per capita by 2030, while achieving carbon neutrality equates to a target of 0.0 MT CO_2e per capita by 2045.

As shown in Table 1, the combined local reductions from the measures and actions, if implemented entirely, could result in a reduction of 63,675 MT CO_2e by 2030 and 112,683 MT CO_2e by 2045. Based on the population projections for Montclair, this correlates with a reduction of approximately 1.3 MT CO_2e per capita by 2030 and 2.2 MT CO_2e per capita by 2045. This results in approximately 4.0 MT CO_2e per capita by 2030 and 2.2 MT CO_2e per capita by 2045 after measure implementation. As such, with full CAP implementation the total GHG emissions reductions have the potential to exceed the state targets established by SB 32, of a 40% reduction in GHG emissions below 1990 per capita GHG emission levels, by 0.9 MT CO_2e per capita. The remaining gap to reach the 2045 target remains at 2.2 MT CO_2e per capita. While the measures and actions identified in this CAP will lead to a significant progress in reducing in GHG emissions and provide a foundation for achieving the 2045 goal; achieving the goal will require significant additional changes to technology and systems currently in place at both the state and local level and will require further policies and programs that

[3] See Appendix C for the methodology and details for establishing the forecast scenarios and the forecast results.

[4] The City has identified targets for 2030 (40% below 1990 levels) and 2045 (carbon neutrality) that are consistent with the state's goals and are intended to establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by this CAP would not be cumulatively considerable

build on this plan. Future CAP updates will outline new measures needed to reach the 2045 target.[5] Table 2 presents Montclair's forecasted emissions, targets, and emissions reduction on a per capita basis as well as the per capita emissions translated to mass emissions.

Table 2 GHG Emissions Forecasts, Reduction Targets and Impact of Measures

GHG Emissions Scenario[1]	2030 (MT CO_2e per capita)	2045 Emission (MT CO_2e per capita)
Population Projection[2]	49,672	52,285
Business-as-Usual Scenario Forecast[3]	6.7 (330,412)	7.0 (366,102)
Legislative Adjusted Scenario Forecast[3]	5.3 (262,166)	4.3 (225,157)
Targets (SB 32 and AB 1279)[1,2]	4.9 (243,582)	0.0 (0)
Reductions from Measures	1.3 (63,675)	2.2 (112,683)
GHG Emissions after Reductions from Measures	4.0 (198,491)	2.2 (112,474)
Remaining Gap to Meet Targets	**-0.9 (-45,092)**	**2.2 (112,474)[4]**
Percent Reduction Below 1990 Levels	**51%**	**74%**
Target Anticipated to be Met?	**Yes**	**No; substantial progress demonstrated[4]**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

1. The efficiency targets and forecasts (i.e., MT CO_2e per capita) were translated into mass emissions by multiplying by population projections and are presented in parenthesis in this table.

2. Population projections obtained from SCAG 2020 RTP/SCS and were adjusted to account for population growth associated with housing projections from the 6th Regional Housing Needs Allocation (RHNA) cycle. See Appendix C for additional details regarding population projections.

3. See Appendix C for the methodology and details for establishing the forecast scenarios and the reduction targets.

4. The emissions reductions required to meet the 2045 goal will be addressed in future iterations of the Climate Action Plan through new and potentially unknown technologies that allow furthering of the following efforts: full electrification of building and transportation systems, an increased shift to shared and active mobility, and increased waste reduction and diversion

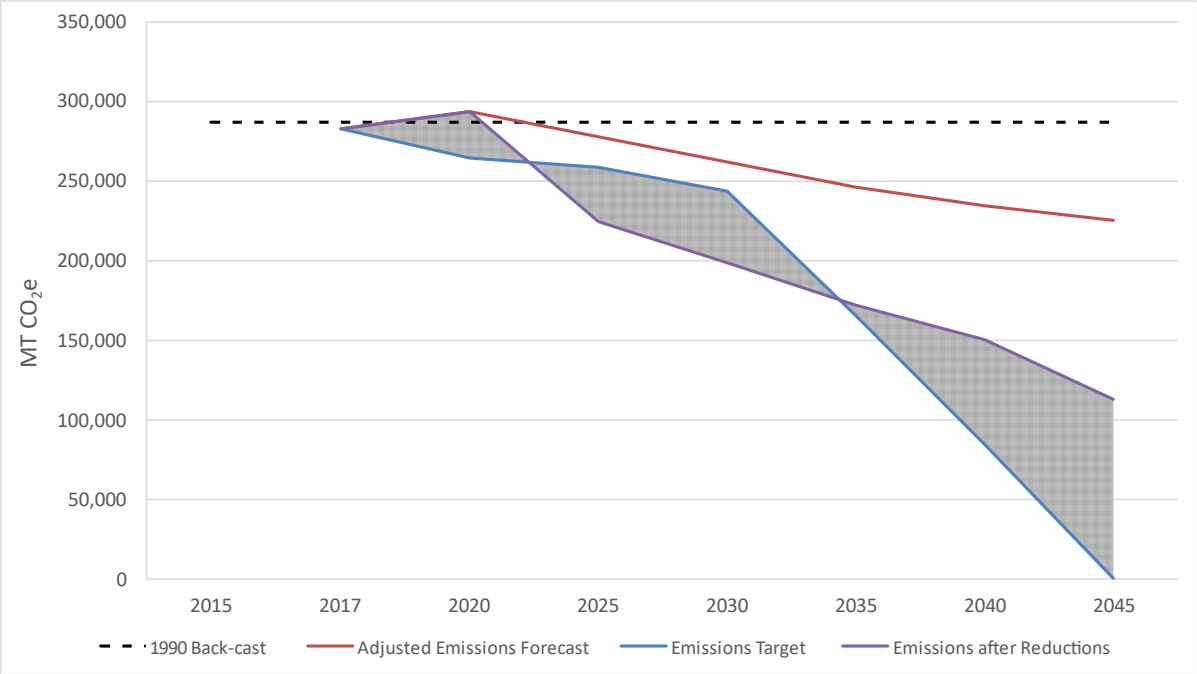
With implementation of the measures and actions in the CAP, the 2030 state goals can be reasonably achieved through local actions and substantial progress towards reaching the 2045 long-term goal can be demonstrated. While the CAP does not provide the GHG emissions reductions to achieve the 2045 goal, it provides evidence-based actions the City can take towards eventually attaining this target. It also illustrates the that reaching carbon neutrality will require significant additional effort and support from the state and federal governments.

Figure 1 shows the climate action targets in relation to the City's GHG emissions after measure implementation. GHG emissions are presented in terms of mass emissions (e.g., per capita emissions times the population projection) for better comparison to the 1990 back-cast, adjusted

[55] Consistent with AEP Climate Change Committee recommendations, SB 32 is considered an interim target toward meeting the 2045 State goal. Consistency with SB 32 is considered to be contributing substantial progress toward meeting the State's long-term 2045 goals. Avoiding interference with, and making substantial progress toward, these long-term State targets is important as these targets have been set at levels that achieve California's fair share of international emissions reduction targets that will stabilize global climate change effects and avoid the adverse environmental consequences described under Section 3.1.3, *Potential Effects of Climate Change* (Executive Order B-55-18).

forecast, and targets. A complete description of each measure and its contributing actions is included in the remainder of the Tehcnical Appendix.

Figure 1 Targets Versus GHG Emissions Reductions



1.3 Greenhouse Gas Emission Reduction Calculation Methodology

The analysis and emission reduction calculations for each of the measures of the CAP outlined in the following pages includes:

- Description of background behind the Measure and the basis for GHG emissions reduction
- Description of the methodology and assumptions for calculating GHG emissions reductions for applicable measures and actions, including reference to data sources.
- A summary of the GHG reduction impact results of GHG emissions reduction calculations.
- Summary table of the impact that the specific Measure has on the overall GHG profile of the City in 2030 and 2045

GHG emissions reduction calculations use conservative values to avoid over-representing the GHG emission reduction potential for any individual measure or action. Special care has been taken to avoid double counting GHG emissions reduction for measures and actions and is detailed in the following sections. Additionally, to eliminate potential for double counting of emissions reduction from the Municipal Sector and the emissions reduction quantified for the community, reduction potential from the municipal measures are not quantified or included in the overall emissions reduction quantified for the CAP. Reduction potential estimated from municipal measures are provided for informational purposes only.

2 Greenhouse Gas Emissions reduction

As mentioned above, the measures and actions are summarized by Sector: energy, transportation, water, waste, carbon sequestration, and municipal operations. This document is summarized similarly, and the following section provides the substantial evidence and calculation details for measures and actions that are quantifiable.

2.1 Assumptions

Achievable GHG emissions reduction were quantified using a number of assumptions and developed emission factors. Emission factors, assumptions, and references used in the quantification of multiple measures are detailed here and referenced in each quantifiable measure as appropriate in the following sections.

2.1.1 Rounding of Values

As part of this document, activity data, emission factors and other calculation factors are shown within tables to provide transparency to the calculations used to quantify GHG reduction potential. Although such values are presented within this document as rounded values, the data is not rounded during the intermediary calculation steps. As such, replication of calculations presented using the rounded values may not exactly match the total GHG reduction potentials reported and some summed values in the tables may not add up exactly.

2.1.2 Electricity Emission Factors

The City of Montclair acquires electricity from Southern California Edison (SCE). SCE offers cleaner energy options, the Green Rate, where a higher percentage of the electricity sourced is renewable or carbon-free than the standard rate option. Additionally, there is the opportunity for Montclair to join the Clean Power Alliance (CPA), a southern California Community Choice Aggregation (CCA), to obtain electricity from more renewable sources. To calculate GHG emissions from electricity consumption, the sum total of kilowatt hours (kWh) derived from a specific source is totaled and multiplied by the corresponding annual GHG emissions factor. The current renewable source making up SCE and CPA electricity by rate product and the current emission factors were obtained from their 2020 power content labels.[6] SCE and CPA emission factors were assumed to achieve the Renewable Portfolio Standards (RPS) targets established by SB 100 such that in 2030, electricity will be at least 60 percent renewable and by 2045 electricity will be 100 percent carbon-free.[7] Table 3 presents the SCE and CPA emission factors and percent of renewable electricity for 2020, 2030 and 2045 that were used to interpolate annual electricity emission factor for the interim years.

[6] https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure/power-content-label

[7] SB 100 established a landmark policy requiring renewable energy and zero-carbon resources supply 100% of electric retail sales to end-use customers by 2045. SB 100 also sets in interim target of 60% renewable or carbon-free electricity by 2030.

Table 3 Electricity Emission Factors

Electricity Source[1]	2030	2045
SCE[2]		
Standard Percent Renewable Sources	60%	100%
Standard Emission Factor (MT CO_2e/kWh)	0.000163	0.0
50% Green Rate Percent Renewable Sources	79.2%	100%
50% Green Rate Emission Factor (MT CO_2e/kWh)	0.000081	0.0
100% Green Rate Percent Renewable Sources	100%	100%
100% Green Rate Emission Factor (MT CO_2e/kWh)	0.0	0.0
CPA		
Lean Power Percent Renewable Sources	64.4%	100%
Lean Power Emission Factor (MT CO_2e/kWh)	0.000245	0.0
Clean Power Renewable Sources	70.1%	100%
Clean Power Emission Factor (MT CO_2e/kWh)	0.000139	0.0
100% Green Power Renewable Sources	100%	100%
100% Green Power Emission Factor (MT CO_2e/kWh)	0.0	0.0

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; MWh =-megawatt-hour; RPS = Renewable Portfolio Standard

1. Renewable sources are considered hydro, biomass, wind, solar and geo-thermal sources. Carbon-neutral includes the listed renewables as well as nuclear sources. Inclusion of carbon-neutral sources in the electricity mix beyond eligible renewable sources can further reduce the emission factor

2. 2020 emission factor for SCE were obtained from the 2020 Power Content label with all following years emission factors assumed to follow a linear decreasing trend to meet SB 100 requirements (i.e. 100% renewable by 2045).

3. 2020 emission factor for CPA were obtained from the 2020 Power Content label with all following years emission factors assumed to follow a linear decreasing trend to meet SB 100 requirements (i.e. 100% renewable by 2045).

For measures or actions that are associated with electrification, the level of GHG emissions savings that is achievable is dependent on the power mix of the provided electricity. Changes in assumptions regarding power mix of purchased electricity, such as upgrading to electricity that is 100 percent carbon-free, will significantly change the electricity emission factor. As such, GHG emissions reduction quantified in the following section are subject to change if the assumptions regarding electricity procurement change.

2.2 Energy Sector

The City of Montclair's building energy measures are primarily focused on increasing the renewable or carbon free electricity supplied to Montclair either through opting into a more renewable or "greener" electricity tier under the current electricity provider, SCE, or by joining the Clean Power Alliance (CPA) at a more renewable electricity tier than currently received. SCE's green rate program offers the 50% Green Rate or 100% Green Rate option. Based on the amount of eligible renewable electricity sources that make up the standard retail electricity versus the Green Rate option, by 2030, the emission factor for the SCE 50% Green Rate electricity is anticipated to be approximately 20 percent lower than SCE standard retail electricity while the 100% Green Rate Option would be made up of 100% renewable sources. However, decisions to opt into other SCE electricity tiers dependent on individual customer decisions and as such are not anticipated to result in a significant shift in the community to SCE Green Rate tiers.

The CPA is a Community Choice Aggregation (CCA). CCAs are public, non-profit agencies that procure electricity for a region or community in place of the incumbent utility provider, in this case

SCE. While the CPA determines how electricity will be procured to meet customer demand, SCE is still responsible for delivering that electricity to SCE customers via the existing electrical grid. The CPA offers two electricity options with lower GHG emissions rates than SCE's baseline rate: Clean Power, made up of 50% renewables, and 100% Green Power, made up of 100% renewable electricity from solar and wind.[8]

Under implementation of Measure BE.1 customers in Montclair would be automatically enrolled in CPA 100% Green Power, but have the option to opt-down to Clean Power, or to opt-out to receive electricity directly from SCE. Enrolling in CPA's 100% Green Energy Tier for residential and commerical customers, will drastically reduce the GHG emissions asscociated with building operations in Montclair. Coupling this with reductions in natural gas and propane to power buildings through energy efficiencies in exisitng buildings and electrifying new buildings will further reduce emissions from building operations. Based on this strategy, the CAP's energy measures consist of the following:

- Measure BE-1: Join the Clean Power Alliance at the 100% Green Power rate and strive for a less than 4% opt-out rate for residential and commercial customers by 2030 and maintain through 2045.
- Measure BE-2: Electrify 100% of newly constructed buildings by 2030.
- Measure BE-3: Improve energy efficiency by 17% in existing residential buildings and 15% in existing commercial buildings by 2030, and 52% in existing residential and 41% in existing commercial buildings by 2045.

Measure BE-1 directs the City to enroll in the 100% Green Power tier of the CPA, which drastically decreases GHG emissions assocaited with builing electricity use in the City. Montclair's building stock currently relies heavily on natural gas. While the City has already adopted a resolution for energy choice between natural gas and electricity, many private developers are moving towards electrification of new buildings due to cost effectiveness. Additionally, GHG emissions from Montclair's existing buildings must also be reduced to achieve the City's climate action targets. Measures BE-2 and BE-3 provide frameworks of updated regulations, programs, funding mechanisms, education, and advocacy to drive electrification of new buildings and increase energy efficiency in exisitng buildings.

[8] https://www.energy.ca.gov/filebrowser/download/3856

Measure BE.1 Join the Clean Power Alliance at the 100% Green Power rate and strive for a less than 4% opt-out rate for residential and commercial customers by 2030 and maintain through 2045.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Conduct a feasibility study comparing enrollment in the Clean Power Alliance at the different rates versus rates through SCE, including the SCE Green Rate Program.	Supportive	
2	Join the CPA at the 100% Green Power rate and strive for a less than 4% opt-out rate by 2025.	29,500	0
3	Perform public outreach and education campaigns highlighting the benefits of using renewable energy and the CPA, including: ▪ Monitoring opt-out rates on an annual basis ▪ Tabling at community events ▪ Establishing an informational resource page on the City website ▪ Regular social media posts ▪ Energy bill inserts"	Supportive	
4	Develop a benchmarking system to track annual opt-out rates and ensure opt-out rate remains low.	Supportive	
5	Coordinate with CPA to identify rebates or cost incentives for low-income and disadvantaged families.	Supportive	

Typically, California CCA opt-out rates are around 3 percent.[9] Because the CPA offers electricity at a competitive price to the utility, opt-out rates are generally low. A recent report found that 96 percent of customers in Los Angeles Counties remaining enrolled in whichever rate product their community was initially enrolled in.[10] Measure BE.1 and its actions include the joining of the CPA, but also aim to keep opt-out rates below 4% by 2030. The City will use a feasibility study and additional education and promotion of the CPA programs and benefits to discourage opting out. While the impacts associated with promotional and educational outreach around CCAs have not been well documented, some research has been conducted on the effects of promotion and education on energy. One study in New York showed that out of the 8,991 people who participated in informational programs, 69% implemented the recommended practices.[11] Another research meta-analysis reviewed dozens of papers covering various energy efficiency, water efficiency, and waste outreach and found that education-only campaigns could produce between 10-12% energy

[9] Julia Sweitzer. 2020. Georgetown Law. Power to the People: Community Choice Aggregation in California. Accessed at https://www.law.georgetown.edu/environmental-law-review/blog/power-to-the-people-community-choice-aggregation-in-california/

[10] Richard Haskell and Sorrel Stielstra. 2022. Claremont Courier. Demystifying Sustainability: Greening Claremont's electricity. Accessed at https://claremont-courier.com/opinion/demystifying-sustainability-greening-claremonts-electricity-from-50-to-100-renewable-56891/

[11] Joseph Laquatra. Journal of Extension. December 2009. The Consumer Education Program for Residential Energy Efficiency. Accessed at: https://archives.joe.org/joe/2009december/a6.php

savings.[12] The methods and assumptions used to calculate the GHG emissions reductions associated with these actions are shown in the Table 4 below.

Table 4 Measure BE.1 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Forecasted SCE Power Purchased (kWh)[1]	188,815,071	194,352,198
Average SCE GHG Emission Factor (MT CO_2e/kWh)[2]	0.000163	0.0
GHG Emissions Generated using SCE Electricity (MT CO_2e)	30,729	0.0
Target Opt-out Power Purchased (kWh)[3]	7,552,603	7,774,088
GHG Emissions Generated from Opt-out Electricity (MT CO_2e)[4]	1,229	0.0
Avoided GHG Emissions (MT CO_2e)[5]	**29,500**	**0.0**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide equivalent; kWh =-kilowatt-hour; MWh = megawatt-hour; 1,000 kWh = 1 MWh

1. The amount of electricity consumed in 2030 and 2045 was forecasted based on the amount of electricity purchased in 2017 and forecasted based on increase in residential electricity usage based on household growth and increase in commercial electricity usage based on employment growth.

2. Due to RPS, retail electricity emission factors (i.e. SCE), will reduce over time. Per SB 100, retail electricity providers would be required to obtain 60% of electricity from renewable sources by 2030 and 100% by 2045. See *2.2.1 Electricity Emission Factors* for details on electricity emission calculations.

3. Assumes 4% opt-out rate, based on a recent study found that 96 percent of customers in Los Angeles Counties remaining enrolled in whichever rate product their community was initially enrolled in.

4. Only emissions associated with the electricity purchased from SCE after CPA opt-out are included as the emission actor for those remaining enrolled in the CPA 100% Green Power rate would be zero.

5. GHG emissions reduction are calculated as the difference between the emissions generated using the standard retail power package versus emissions generated from 96% of the community enrolled in the CPA 100% Green Power rate.

[12] John Green and Lisa A. Skumatz. Skumatz Economic Research Associates, Inc. 2000. Evaluating the Impacts of Education/Outreach Programs: Lessons on Impacts, Methods, and Optimal Education. Accessed at: https://aceee.org/files/proceedings/2000/data/papers/SS00_Panel8_Paper10.pdf

Measure BE.2 Electrify 100% of newly constructed buildings by 2030.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	In alignment with the California Energy Commission's efforts to advance clean energy in buildings, adopt an electrification reach code for all new buildings and major retrofits that requires new buildings or major retrofits to be all-electric unless cost prohibitive. Implement through the building permit process which limits expansion of natural gas infrastructure and requires HVAC systems, hot water heaters, and other appliances to be all-electric at time of installation, or in major renovations after 2025. The following steps will be used to develop the reach code: ▪ Develop idea for a reach code ordinance. ▪ Work with stakeholders. ▪ Obtain a cost-effectiveness study. ▪ Develop and draft an ordinance. ▪ Public process and revisions. ▪ Formal adoption process.	2,180	3,615
2	Engage with an organization such as Building Decarbonization Coalition to work with local building industry stakeholders in development of the electrification reach code.	Supportive	
3	Enforce ordinance compliance through a comprehensive permitting compliance program which includes routine training of staff, dedicating staff time to building inspections, charging fees for noncompliance, providing easy to understand compliance checklists online and with permit applications, and facilitating permitting online.	Supportive	
4	Develop a webpage and materials at City Hall containing benefits of electrification and resources that can assist in the process. Consider working with regional partners to maintain a database of qualified contractors and consultants for electrification retrofits.	Supportive	
5	Host outreach events to educate the community on use, versatility, and benefits on all-electric appliances.	Supportive	

To meet the City's 2030 and 2045 goals, the majority of the buildings in the City, including those that have not yet been constructed, will need to be carbon neutral. By ensuring that new buildings are electric rather than natural gas, emissions associated with building energy can be reduced through SB 100 requirements for increased renewable electricity. Further, electrifying new buildings will capitalize on emissions reduction obtained from implementation of Measure BE.1, joining the CPA at 100% Green Power rate, such that new buildings would be carbon neutral. While Montclair has adopted a resolution for energy choice, private developers have moved towards electrifying new developments due to cost-effectiveness. Additionally, this measure would align with the California Energy Commissions (CEC)'s mission to lead the state to a 100 percent clean energy future. The CEC is the state's primary energy policy and planning agency, and is mandated to update and adopt building standards for increase energy efficiency and reduce GHG emissions. The CEC implements this mandate through Part 6 of Title 24, where every three years the Building Energy Efficiency Standards (Energy Code) are updated for new construction and renovation in existing

buildings.[13] Under each cycle the Energy Code increases requirements and standards that effectively are leading to either electrification of buildings or installation of on-site renewable energy in addition to increased energy efficiency requirements to continue to reduce GHG emissions.

The adoption of an electrification reach code limiting the piping of natural gas in new buildings and accessory dwelling units unless cost prohibitive, would result in emissions reduction by transitioning the energy consumption of any new construction to primarily renewable electricity. Most natural gas appliances have an electric alternative available for residential and commercial uses. Since electric appliance alternatives are approximately three times more efficient over similar natural gas burning equipment,[14] the use of electric equipment instead of natural gas would result in improved energy efficiency and a reduction in overall energy consumption for replaced natural gas equipment. Additionally, the benefits in annual utility bill savings and decreased cost associated with piping of natural gas into new construction makes all-electric buildings more cost effective in some California Building Climate Zones; including, Zone 10, where Montclair is located.[15,16] The reach code would limit natural gas line expansion and installation of natural gas heating, ventilation, and air conditioning (HVAC) systems, hot water heaters, and other appliances. HVAC system and hot water heaters are targeted in the reach code due to their large contribution to residential natural gas end-uses and the cost-effectiveness associated with electric alternatives.[17] According to the U.S. Energy Information Administration (EIA) *2020 Annual Energy Outlook,* electric heat pumps for commercial space heating and cooling are two to five times more efficient than natural gas fueled equipment.[18] Residential electric heat pumps for space heating and cooling are six to 20 times more efficient than natural gas equipment.[19] All other actions included would incrementally support and promote electrification of new buildings such as outreach and educational materials to educate the community on the benefits of electrification.

Emission reduction calculations assume the ordinance will be adopted by 2025; therefore, forecasted increased natural gas consumption from population and employment growth beyond 2025 would be replaced by electricity consumption. The electricity consumption would generate GHG emissions that would offset the reduction in natural gas emissions from electrification; however, these emissions would be negligible assuming full implementation of Measure E.1. The methods and assumptions used to calculate the GHG emissions reductions associated with these actions are shown in the Table 5 below. Footnotes in the table detail the methodology and application of assumptions.

[13] California Energy Commission. August 2021. 2022 Building Energy Efficiency Standards Summary. Accessed at: https://www.energy.ca.gov/sites/default/files/2021-08/CEC_2022_EnergyCodeUpdateSummary_ADA.pdf
14 Dennis, Keith. 2015. Environmentally Beneficial Electrification: Electricity as the End-Use Option. The Electricity Journal. 28(9). pp. 100-112. https://doi.org/10.1016/j.tej.2015.09.019

[15] California Energy Codes and Standards. 2019. 2019 Cost Effectiveness Study: Low-Rise Residential New Construction. https://localenergycodes.com/content/2019-local-energy-ordinances/. Accessed May 25th, 2021.

[16] California Energy Codes and Standards. 2019. 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study. https://localenergycodes.com/content/2019-local-energy-ordinances/. Accessed May 25th, 2021.

[17] Energy and Environmental Economics (E3). April 2019. Residential Building Electrification in California: Consumer economics, greenhouse gases and grid impacts. Accessed at: https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf

[18] EIA. 2020. Annual Energy Outlook. Table 22. Commercial Sector Energy Consumption, Floorspace, Equipment Efficiency, and Distributed Generation. https://www.eia.gov/outlooks/aeo/data/browser/#/?id=32-AEO2020&cases=ref2020&sourcekey=0. Accessed May 25th, 2020.

[19] EIA. 2020. Annual Energy Outlook. Table 21. Residential Sector Equipment Stock and Efficiency, and Distributed Generation. https://www.eia.gov/outlooks/aeo/data/browser/#/?id=30-AEO2020&cases=ref2020&sourcekey=0. Accessed May 25th, 2020.

Table 5 Measure BE.2 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Natural Gas Consumption Growth Beyond 2025 (therms)[1]	5,743,290	6,013,335
Natural Gas Consumption in Implementation Year (therms)[2]	5,332,789	5,332,789
Resulting Natural Gas Consumption Avoided from Electrification[3]	410,501	680,545
Natural Gas Emission Factor (MT CO_2e/therm)[4]	0.00531	0.00531
Natural Gas GHG Emissions Avoided (MT CO_2e)	2,180	3,615
Resulting Increase in Electricity Consumption (kWh)[5,6]	21,295	35,304
Electricity Emission Factor Assuming Implementation of BE.1.(MT CO_2e/kWh)[7]	0.0000065	0.0
Additional GHG Emissions from Increased Electricity Consumption (MT CO_2e)	0.14	0.0
Avoided GHG Emissions (MT CO_2e)[7]	**2,180**	**3,615**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide; kWh = kilowatt hour

1. Natural gas consumption beyond 2025 is obtained from the *Legislative Adjusted* Forecast GHG Emissions to account for Title 24 reductions estimates provided in Appendix C.

2. Implementation year assumed to be 2025. Natural gas consumption is obtained from the *Legislative Adjusted* Forecast GHG Emissions provided in Appendix C.

3. Avoided natural gas consumption calculated as difference between forecasted natural gas consumption and natural gas consumption in the implementation year (2025).

4. Emission factors obtained from United States Environmental Protection Agency Emission Factors for Greenhouse Gas Inventories, Table 1. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

5. The resulting increase in electricity consumption estimates three times increase in efficiency due to the improved efficiency of electric heat pumps and other electrical equipment of natural gas. Dennis, Keith. 2015. Environmentally Beneficial Electrification: Electricity as the End-Use Option. The Electricity Journal. 28(9). pp. 100-112. https://doi.org/10.1016/j.tej.2015.09.019

6. Natural gas consumption converted to electricity using the conversion: 1 Therm = 29.3 kWh. https://dothemath.ucsd.edu/useful-energy-relations/

7. Electricity emission factor assumes implementation of BE.1, enrollment in CPA's 100% Green Power rate, with a 4% opt-out rate

8. Total GHG Emissions Reductions are calculated by subtracting the Additional GHG Emissions from Increased Electricity Consumption from the Natural Gas GHG Emissions Avoided.

Measure BE.3 Improve energy efficiency by 17% in existing residential buildings and 15% in existing commercial buildings by 2030, and 52% in existing residential and 41% in existing commercial buildings by 2045.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	In alignment with the California Energy Commission's efforts to advance clean energy in buildings, adopt a Local Building Energy Standard Ordinance by 2025 that requires retrofits or renovations in existing buildings that include natural gas to be more energy efficient than all-electric buildings. The ordinance may include the following type of amendments: a) Requires mixed-fuel single family and duplex residential buildings to exceed the 2019 Energy Code by 15 percent; b) Requires mixed-fuel office buildings to exceed the 2019 Energy Code by 10 percent; c) Requires prewiring for possible future electric appliances in mixed-fuel buildings; d) For new mixed-fuel construction, require CalGreen Tier 1 for residential buildings, require 5 percent reduced energy budget for hotel/motel and high-rise residential, require 10 percent reduced energy budget for non-residential.	4,579	13,741
2	Adopt and implement local amendments to the 2019 California Energy Code incentivizing all electric development (Clean Energy Choice Program).	Supportive	
3	Work with SoCal Gas to provide opportunities for funding energy efficiency projects and improved natural gas infrastructure to increase energy efficiency in existing building.	Supportive	
4	Create a rebate and incentive programs for appliance replacement, ENERGY STAR appliance program, and Energy Conservation Programs, with public outreach. Work with SCE and/or Clean Power Alliance to provide rebates for residential replacement of old appliances with electric-powered or more energy efficient appliances.	Supportive	
5	Provide information to staff and community regarding annual energy savings from energy conservation programs for CAP implementation tracking.	Supportive	
6	Work with and educate businesses on partnerships designed to maximize the use of renewable energy including solar/ storage, appropriate tariff changes and microgrid opportunities.	Supportive	
7	Identify funding for upgrading ventilation systems and natural gas appliances in disadvantaged community homes to improve air quality and increase energy efficiency.	Supportive	
8	Seek out funding partnerships with local financiers and work with partners such as the CPA to fund a program specifically for decarbonization retrofits, such as a local turnkey retrofit program that leverages existing funding, which offers low-cost financing of electrification and energy efficiency retrofits for residents and local businesses.	Supportive	

With the full implementation of Measure BE.1, nearly all emissions associated with electricity usage in Montclair would be carbon neutral. As such, emissions associated with existing buildings would be associated with natural gas combustion. Natural gas combustion for heating and cooking in

commercial and residential buildings currently[20] contributes nearly 9% of Montclair's total GHG emissions. Through increased energy efficiency and transition buildings from consumption of natural gas to electricity as equipment reaches end of life, emissions from this source can be reduced. Given that electric appliances are approximately three times more efficient over similar natural gas burning equipment and appliances[21] and the numerous incentives, rebates, and programs available for replacing old appliances with energy efficient electric alternatives, [22] it is anticipated that even with Montclair's resolution for energy choice, equipment upgrades, and replacements of natural gas equipment will primarily be an electric alternative. The adoption of a Local Building Energy Standard Ordinance that requires retrofits or renovations in existing buildings that include natural gas to be more energy efficient than all-electric buildings, will further ensure that upgrades and equipment replacement are as energy efficient as possible.

With implementation of Measures BE.1 at 100% Green Power, electric energy efficiency upgrades would have negligible impact on GHG emissions. Therefore, energy efficiency upgrades for this analysis focused on the upgrading natural gas equipment with the assumption that the majority of natural gas fueled equipment would be replaced with electric equipment at its operational end-of-life as electric alternatives are becoming more cost effective and are more energy-efficient than natural gas technology. The anticipated percent of existing residential and commercial buildings needing to replace the varying types of equipment by 2030 and 2045 are presented in the tables below. The calculations for replacement are based on the equipment's lifespan and the assumption that approximately 63% of appliances would be replaced at burnout with an energy efficient electric alternative.[23] The reduction in natural gas consumption was calculated based on the percentage of natural gas attributed to water heaters, HVAC systems, and stoves in residential and commercial buildings multiplied by the calculated percent of anticipated replacement of that type of equipment. The methods and assumptions used to calculate the GHG emissions reductions associated with these actions are shown in Table 6 and Table 7 below. Footnotes in the table detail the methodology and application of assumptions.

[20] Based on 2017 Community GHG Inventory. See Appendix C.

21 Dennis, Keith. 2015. Environmentally Beneficial Electrification: Electricity as the End-Use Option. The Electricity Journal. 28(9). pp. 100-112. https://doi.org/10.1016/j.tej.2015.09.019

[22] In regions where natural gas and electric utilities are separate entities, electrification incentives are strongest. Deason, Jeff. et al. 2018. Electrification of buildings and Industry in the United States. pp. 39. https://pdfs.semanticscholar.org/27f0/d125d5316ee10565560545c0fc17d6c447a8.pdf?_ga=2.3238896.1101123906.1590438648-1004765093.1590438648

[23] Based on studies by the CPUC, permitted and non-permitted HVAC unit installations were 100% compliant with the mandatory minimum requirements and on average exceeded energy efficiency requirements ~63% of the time. CPUC. 2017. Final Report: 2014-2016 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report. Page 4-5. (http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf)

Table 6 Measure BE.3 GHG Emission Reduction Calculations: Residential Buildings

Calculation Factor	2030	2045
Average Percent of Installation Exceeding Energy Efficiency Requirements[1]	63%	63%
Average Residential Natural Gas Usage from Water Heating[2]	38%	38%
Average Residential Natural Gas Usage from Space Heating[2]	39%	39%
Average Residential Natural Gas Usage from Cooking[2]	9%	9%
Average Life-span of Residential Gas-fired Water Heater (years)[3]	13	13
Average Life-span of Residential Gas-fired HVAC (years)[3]	21.5	21.5
Average Life-span of Residential Gas-fired Stove top (years)[3]	12	12
Residential Buildings		
Existing Natural Gas Usage after Implementation of Measure BE.2[4]	3,551,484	3,551,484
Percentage of Hot Water Heaters Replaced with Higher Efficiency Device[5]	24%	63%
Percent Natural Gas Reduction from Water Heater Replacement[6]	9%	24%
Percentage of HVAC Replaced with Higher Efficiency Device[5]	15%	59%
Percent Natural Gas Reduction from HVAC Replacement[6]	6%	23%
Percentage of Stovetops Replaced with Higher Efficiency Device[5]	26%	63%
Percent Natural Gas Reduction from Stovetops Replacement[6]	2%	6%
Total Percent Reduction of Natural Gas[7]	17%	52%
Reduction of Natural Gas (Therms)	613,496	1,864,461
Natural Gas Emission Factor (MT CO_2e/therm)[8]	0.00531	0.00531
Natural Gas GHG Emissions Avoided (MT CO2e)	3,259	9,903
Resulting Increase in Electricity Consumption (kWh)[9,10]	5,991,833	18,209,628
Electricity Emission Factor Assuming Implementation of BE.1.(MT CO_2e/kWh)[11]	0.0000065	0.0
Additional GHG Emissions from Increased Electricity Consumption (MT CO2e)	39	0.0
Avoided GHG Emissions (MT CO_2e)[12]	**3,220**	**9,903**

Calculation Factor	2030	2045

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.

MT CO_2e = metric tons of carbon dioxide; kWh = kilowatt hour

1. Based on studies by the CPUC, permitted and non-permitted HVAC unit installations were 100% compliant with the mandatory minimum requirements and on average exceeded energy efficiency requirements ~63% of the time. CPUC. 2017. Final Report: 2014-2016 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report. Page 4-5. (http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf)

2. Natural gas usage in residential and commercial buildings obtained from California Air Resources Board 2018 GHG Inventory; U.S. Energy Information Administration, 2009 Residential Energy Consumption Survey and 2012 Commercial Buildings Energy Consumption Survey

3. Residential gas fired furnaces, water heaters, and stoves/cook tops have an average lifespan of 21.5, 13, and 12 years, respectively; while commercial natural gas fired furnaces and water heaters have an average lifespan of 23 and 10 years, respectively. EIA. 2018. Updated Buildings Sector Appliance and Equipment Cost and Efficiencies. Appendix C. pp. 9, 51, 75, 90, 98, 120 https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf. Accessed May 25, 2020.

4. To avoid double counting only natural gas consumption beyond 2025 obtained from the *Legislative Adjusted* Forecast GHG Emissions are evaluated. See Appendix C for forecast details.

5. Equipment estimated life-span were used to estimate the percent of equipment that would need replacing at each target year assuming implementation of Local Energy building Ordinance by 2025. Percent of assumed replacement was multiplied by the average percent of equipment found to be installed exceeding energy efficiency requirements, source in Note 1.

6. Natural gas replacement calculated as the percentage of device replace with a higher efficiency device multiplied by the percent that usage makes up of the overall natural gas usage in the building. (e.g., percent of replaced natural gas water heaters multiplied by percent of natural gas used for hot water heating in residential buildings).

7. Sum of total reductions anticipated from device replacement with energy efficient electric alternative.

8. Emission factors obtained from United States Environmental Protection Agency Emission Factors for Greenhouse Gas Inventories, Table 1. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

9. The resulting increase in electricity consumption estimates three times increase in efficiency due to the improved efficiency of electric heat pumps and other electrical equipment of natural gas. Dennis, Keith. 2015. Environmentally Beneficial Electrification: Electricity as the End-Use Option. The Electricity Journal. 28(9). pp. 100-112. https://doi.org/10.1016/j.tej.2015.09.019

10. Natural gas consumption converted to electricity using the conversion: 1 Therm = 29.3 kWh. https://dothemath.ucsd.edu/useful-energy-relations/

11. Electricity emission factor assumes implementation of BE.1, enrollment in CPA's 100% Green Power rate, with a 4% opt-out rate

12. Total GHG Emissions Reductions are calculated by subtracting the Additional GHG Emissions from Increased Electricity Consumption from the Natural Gas GHG Emissions Avoided.

Table 7 Measure BE.3 GHG Emission Reduction Calculations: Commercial Buildings

Calculation Factor	2030	2045
Average Percent of Installation Exceeding Energy Efficiency Requirements[1]	63%	63%
Average Commercial Natural Gas Usage from Water Heating[2]	28%	28%
Average Commercial Natural Gas Usage from Space Heating[2]	42%	42%
Average Life-span of Commercial Gas-fired Water Heater (years)[3]	10	10
Average Life-span of Commercial Gas-fired HVAC (years)[3]	23	23
Commercial Buildings		
Existing Natural Gas Usage after Implementation of Measure BE.2[4]	1,781,306	1,781,306
Percentage of Hot Water Heaters Replaced with Higher Efficiency Device[5]	32%	63%
Percent Natural Gas Reduction from Water Heater Replacement[6]	9%	18%
Percentage of HVAC Replaced with Higher Efficiency Device[5]	14%	55%
Percent Natural Gas Reduction from HVAC Replacement[6]	6%	23%
Total Percent Reduction of Natural Gas[7]	15%	41%
Reduction of Natural Gas (Therms)	259,048	722,607
Natural Gas Emission Factor (MT CO_2e/therm)[8]	0.00531	0.00531
Natural Gas GHG Emissions Avoided (MT CO2e)	1,376	3,838
Resulting Increase in Electricity Consumption (kWh)[9,10]	2,530,041	7,057,483.03
Electricity Emission Factor Assuming Implementation of BE.1.(MT CO_2e/kWh)[11]	0.0000065	0.0
Additional GHG Emissions from Increased Electricity Consumption (MT CO_2e)	16	0.0
Avoided GHG Emissions (MT CO_2e)[12]	**1,359**	**3,838**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide; kWh = kilowatt hour

1. Based on studies by the CPUC, permitted and non-permitted HVAC unit installations were 100% compliant with the mandatory minimum requirements and on average exceeded energy efficiency requirements ~63% of the time. CPUC. 2017. Final Report: 2014-2016 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report. Page 4-5. (http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf)
2. Natural gas usage in residential and commercial buildings obtained from California Air Resources Board 2018 GHG Inventory; U.S. Energy Information Administration, 2009 Residential Energy Consumption Survey and 2012 Commercial Buildings Energy Consumption Survey
3. Residential gas fired furnaces, water heaters, and stoves/cook tops have an average lifespan of 21.5, 13, and 12 years, respectively; while commercial natural gas fired furnaces and water heaters have an average lifespan of 23 and 10 years, respectively. EIA. 2018. Updated Buildings Sector Appliance and Equipment Cost and Efficiencies. Appendix C. pp. 9, 51, 75, 90, 98, 120 https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf. Accessed May 25, 2020.
4. To avoid double counting only natural gas consumption beyond 2025 obtained from the *Legislative Adjusted* Forecast GHG Emissions are evaluated. See Appendix C for forecast details.
5. Equipment estimated life-span were used to estimate the percent of equipment that would need replacing at each target year assuming implementation of Local Energy building Ordinance by 2025. Percent of assumed replacement was multiplied by the average percent of equipment found to be installed exceeding energy efficiency requirements, source in Note 1.
6. Natural gas replacement calculated as the percentage of device replace with a higher efficiency device multiplied by the percent that usage makes up of the overall natural gas usage in the building. (e.g., percent of replaced natural gas water heaters multiplied by percent of natural gas used for hot water heating in commercial buildings).
7. Sum of total reductions anticipated from device replacement with energy efficient electric alternative.
8. Emission factors obtained from United States Environmental Protection Agency Emission Factors for Greenhouse Gas Inventories, Table 1. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf
9. The resulting increase in electricity consumption estimates three times increase in efficiency due to the improved efficiency of electric heat pumps and other electrical equipment of natural gas. Dennis, Keith. 2015. Environmentally Beneficial Electrification: Electricity as the End-Use Option. The Electricity Journal. 28(9). pp. 100-112. https://doi.org/10.1016/j.tej.2015.09.019
10. Natural gas consumption converted to electricity using the conversion: 1 Therm = 29.3 kWh. https://dothemath.ucsd.edu/useful-energy-relations/
11. Electricity emission factor assumes implementation of BE.1, enrollment in CPA's 100% Green Power rate, with a 4% opt-out rate
12. Total GHG Emissions Reductions are calculated by subtracting the Additional GHG Emissions from Increased Electricity Consumption from the Natural Gas GHG Emissions Avoided.

2.3 Transportation Sector

Reducing transportation emissions means reducing the number of miles driven by fossil fuel-powered vehicles, particularly passenger and commercial vehicles, which account for 65% of GHG emissions in the City of Montclair. The City's transportation strategy consists of a multi-pronged approach for incentivizing alternatives to fossil fuel-powered vehicle trips, including shifting transportation mode share to active transportation and public transit options; electrifying passenger and commercial vehicle trips, and decarbonizing off-road equipment. This CAP prioritizes reducing vehicle miles travelled (VMT) first, by improving active and public transportation mode share, then shifting remaining VMT to electric vehicles. While in theory, 100% electrification of all vehicles in Montclair could achieve zero-emissions in the transportation sector without reducing VMT, the City recognizes that cars and roadways carry huge amounts of embodied emissions[24] not accounted for in the inventory, over which the City has little control.[25] Reducing VMT carries additional benefits outside of GHG emissions reductions as well, including reduced congestion, reduced space needed for roadways and parking, local economic revitalization, and lifestyle improvements.[26] Based on this strategy, the CAP's transportation measures consist of the following:

- Measure TR-1: Develop and implement an Active Transportation Plan to shift 6% of passenger car vehicle miles traveled to active transportation, and 12% by 2045.
- Measure TR-2: Implement a public and shared transit programs to achieve 10% of public transit mode share by 2030 and 30% by 2045.
- Measure TR-3: Increase electric/alternative fuel vehicle adoption to 20% for passenger and 10% for commercial vehicles by 2030, and 65% passenger and 50% commercial by 2045.
- Measures TR-4: Equitably increase use of electric vehicles, promote active transportation and public transit use by disadvantaged communities.

To achieve a greater than 6% mode shift to active transportation (Measure TR-1), the City plans to provide low stress and convenient infrastructure and prioritize mobility via active transportation. Infrastructure needs include bikeways, sidewalk improvements, and expansions of both kinds of infrastructure to all areas of the City. Once the infrastructure is available and stress/comfort is not an issue, comparison with other cities around the world suggest more people will choose active transportation.

To achieve a greater than 10% mode shift to public transit (Measure TR-2), the City plans to improve public and shared transit programs and infrastructure. Further, the Metro Gold Line Foothill Extension project currently underway will extend the existing Metro Gold line from the City of Pasadena to City of Montclair and will include the construction of six new stations including one in Montclair. The project will serve the cities and the communities within the Glendora to Montclair corridor area and will greatly improve City-to-City mobility. It's anticipated that with the extension in the Gold Line and infrastructure to support those services will increase ridership and reduce passenger VMT in the community. Therefore measure prioritizes public transit in the City, makes transit more convenient and accessible, and improves infrastructure to access transit stations –

[24] Embodied emissions are associated with energy used in the extraction, processing, and transportation of materials.

[25] Mark Mills. August 2021. The tough calculus of emissions and the future of EVs. Accessed at: https://techcrunch.com/2021/08/22/the-tough-calculus-of-emissions-and-the-future-of-evs/

[26] Richard Campbell and Margaret Wittgens. March 2004. The Business Case for Active Transportation. Accessed at: http://thirdwavecycling.com/pdfs/at_business_case.pdf

important determining factors for public transit mode share.

While the City cannot require its residents or businesses to buy ZEVs, Measure TR-3 will ensure the infrastructure and incentives are present in the City to begin to remove present barriers to passenger and commercial zero emission vehicle (ZEV) adoption.

Measure TR-4 focuses on providing equitable opportunities for disadvantaged communities in the City to have access to electric vehicle (EV) car shares and transit available.

Measure TR.1 Develop and implement an Active Transportation Plan to shift 6% of passenger car vehicle miles traveled to active transportation, and 12% by 2045.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Develop and adopt an Active Transportation Plan consistent with the City General Plan Policies that will identify funding strategies and policies for development of pedestrian, bicycle, and other alternative modes of transportation projects. Establish Citywide events, outreach, educational programs, or platforms to promote active transportation in the community.	569	1,321
2	Conduct a Complete Street Feasibility Study on street improvement options to identify streets and intersections that can be improved for pedestrians and bicyclists through traffic calming measures and/or where multi-use pathway opportunities exist to increase active transportation.	Supportive	
3	Obtain funding and implement "mobility hub" projects consistent with City General Plan. Work to identify grant funding opportunities to implement Complete Our Streets projects included in the Complete Our Streets Plan.	Supportive	
4	Install and upgrade end-of-trip facilities (lockers, bike racks, etc.) at transit center to encourage active transportation as part of commute for community members using public transit. Improve and ensure there are safe bicycle and pedestrian infrastructure to access transit center.	Supportive	
5	Engage the Bicycle Pedestrian Commission, Safe Routes to School network, and community groups to identify additional short-term and long-term bikeway and pedestrian infrastructure improvement projects to implement.	Supportive	
6	Ensure there is equitable access to safe bicycle and pedestrian infrastructure in all areas of the city. Facilitate transportation equity through targeted provision of programs that encourage minority, low-income, and senior populations to take transit, walk, bike, use rideshare or car share.	Supportive	
7	Evaluate and update the City's Zoning Code, Transportation Demand Management Ordinance, and California Green Building Code to ensure the City requires installation of accessible, shaded, and secure bicycle parking for new commercial development and retrofits and requires installation of bicycle parking areas in instances where off-street parking is required.	Supportive	

Current bicycle and pedestrian mode share in Montclair (as of 2019) is low – 0.5% and 0.7%, respectively.[27] Increasing active transportation is an essential aspect of reducing the amount of VMT in Montclair. Walking, bikes, e-bikes, and other active transportation modes can have a strong impact on cities' GHG emissions, with the potential to cut urban transportation emissions up to 11% in cities that make a strong commitment to promoting bicycle travel.[28] An Active Transportation Plan, which provides an understanding of the current conditions of sidewalks and bike lanes, will provide a framework and timeline for making the most effective infrastructure improvements to increase trips by biking and walking and reduce trips by passenger car. A successful plan also includes identification of funding sources for which Montclair will pursue the establishment of developer fees. The SCAG 2020 RTP/SCS outlined specific measures, actions, and investments that are anticipated to effectively shift 12.5% of trips to active transportation by 2045 forecasted rates assuming business-as usual and current trends.[29] As part of this plan, local governments are expected to develop and implement active transportation plans that include the development of a comprehensive local bikeway and pedestrian network, using Complete Streets principles and investing in Safe Route to School strategies. Accordingly, with development and implementation of an Active Transportation Plan consistent with SCAG's 2020 RTP/SCS, Montclair is expected to attain a 12.5% decrease in passenger vehicle VMT by 2045 and about half that or about 6% by 2030. The calculations and assumptions used to estimate emissions reduction from Measure TR.1 are provided in Table 8. Footnotes in the table detail the methodology and application of assumptions.

[27] https://data.census.gov/cedsci/table?g=1600000US0648788&tid=ACSST5Y2019.S0801

[28] Jacob Mason et al. Institute for Transportation & Development Policy and the University of California, Davis. November 2015. A Global High Shift Cycling Scenario. Accessed at: https://itdpdotorg.wpengine.com/wp-content/uploads/2015/11/A-Global-High-Shift-Cycling-Scenario_Nov-2015.pdf

[29] Southern California Association of Governments (SCAG). 2020 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Active Transportation Appendix. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_active-transportation.pdf?1606001530

Table 8 Measure TR.1 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Bicycle share mode target[1]	2.5%	5.0%
Pedestrian share mode target[2]	3.5%	7.0%
Total Forecasted Passenger ICE VMT (miles)[3]	426,033,000	471,214,854
Passenger trips/mile[4]	0.112	0.1140
Total Forecasted Passenger Trips	47,711,490	53,721,032
Targeted Substitution of Bike Trips for Passenger Vehicle Trips[5]	954,230	2,417,446
Targeted Substitution of Pedestrian Trips for Passenger Vehicle Trips[5]	1,335,922	3,384,425
Passenger VMT Reduced with Bike Trips[6]	1,431,345	3,626,170
Passenger VMT Reduced with Bike Trips[7]	400,777	1,015,328
Total Reduction in Passenger ICE VMT	1,832,121	4,641,497
Passenger Vehicle ICE Emission Factor (MT CO_2e/VMT)[8]	0.000311	0.000285
Avoided GHG Emissions (MT CO_2e)	569	1,321

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide; VMT = vehicle miles traveled; ICE = internal combustion engine
1. Increase by 2% compared with 2019 baseline of 0.5%
(https://data.census.gov/cedsci/table?g=1600000US0648788&tid=ACSST5Y2019.S0801)
2. Increase by 2.8% compared with 2019 baseline of 0.7%
(https://data.census.gov/cedsci/table?g=1600000US0648788&tid=ACSST5Y2019.S0801)
3. Total Forecasted Passenger VMT are projections provided by Fehr & Peers for forecasting GHG emissions, provided in Appendix C. To avoid double counting of reductions associated with electric vehicle VMT, only VMT from combustion vehicles considered here.
4. Passenger trips per mile calculated using EMFAC2021. Calculated for combustion vehicles only
5. Calculated as number of passenger vehicle trips multiplied by the targeted mode share percentage.
6. Calculated by multiplying the estimated new bike trips by the average distanced biked per trip (1.5 miles) as reported by CARB (https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/bicycle_facilities_technical_041519.pdf)
7. Calculated by multiplying the estimated new pedestrian trips by the average distanced walked per trip (0.3 miles) as reported by CARB (https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/pedestrian_facilities_technical_041519.pdf)
8. Forecasted passenger ICE emission factor calculated using EMFAC2021. See Appendix C for details on EMFAC analysis.

Measure TR.2 Implement a public and shared transit programs to achieve 10% of public transit mode share by 2030 and 30% by 2045.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Conduct local transportation surveys to better understand the community's needs and motivation for traveling by car versus other alternatives such as bus or Metro Gold Line light rail. Use survey results to inform transit expansion and improvement projects.	Supportive	
2	Adopt policy to encourage new development of public space to be transit accessible and multi-functional by co-locating public facilities.	Supportive	
3	Adopt a Transportation Demand Management (TDM) Plan for the City that includes a transit system focus. Provide incentives for implementation of TDM measures at local businesses and for new developments. Incentives and incentives to encourage use of transit instead of driving alone may include: ▪ Offer monetary incentives for employees to use car share, carpool, take the bus, bike, or walk ▪ Require large employers (more than 25 employees) to offer subsidies to employees for the transit system ▪ Offer car/vanpool matching ▪ Offer emergency ride homes for employees utilizing transit ▪ Market-rate parking fee charged directly to employees or patrons at businesses or new developments ▪ Offer priority/discounted HOV parking at businesses or new developments ▪ Daily parking charge available for occasional drivers instead of monthly parking pass	5,205	19,121
4	Continue to work with federal legislative advocate and congress member to secure funds for Metro's Gold Line plan and supporting infrastructure.	Supportive	
5	Obtain funding and grants to upgrade City-owned or operated facilities and infrastructure, such as parking, transit stops, and community hubs (e.g., the library, City recreational center), that promote use of public transit.	Supportive	

In general, increases and improvements to public transportation systems reduce a city's dependence on fossil fuels and reduce VMT.[30] The City of Montclair is anticipated to experience an increase in transit ridership in part due to the Metro Gold Line Foothill Extension.[31] According to the SCAG 2020 RTP/SCS, an increased mode shift away from passenger vehicles will require improved operational and accessibility strategies for public transit. [32]The best ways to improve a transit system and reduce driving is to expand its geographical reach and increase the frequency and

[30] California Air Resources Board (CARB). August 2017. Methods to Assess Co-Benefits of California Climate Investments: Vehicle Miles Travelled. Accessed at: http://ww2.arb.ca.gov/sites/default/files/auction-proceeds/carb_vehicle_miles_traveled.pdf

[31] https://foothillgoldline.org/environmental-reviews/

[32] Southern California Association of Governments (SCAG). 2020 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Transit Appendix. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_transit.pdf?1606002122

reliability of transit service. The majority of these improvements will need to come from the transit agencies themselves. However, through understanding the needs of the community, Montclair can increase public transit accessible for all social and demographic needs of their community. Success in other cities suggests that significant investment in public transit can increase public transit mode share on par with those cities. The City of San Francisco leads the state with 26% transit mode share in 2017 (pre-COVID),[33, 34] while the City of Seattle has documented significant increases in public transit mode share to 48% in 2017 (pre-COVID).[35]

Through the proposed strategies for improved operations and accessibility and significant investment in transit and passenger coupled with development of sustainable communities, the travel demand model used for SCAG 2020 RTP/SCS indicates a 144% increase in transit and rail boardings. On a per capita level, this translates to a doubling in transit ridership that will outpace the region's growth in population and employee of approximately 19.5% from 2016 and 2045.[36] Each new mile of transit usage replaces VMT on much more than a 1:1 basis, with approximately 1% increase in transit frequency saving 0.5% in VMT.[37] The Metro Gold Line Foot line Extension will add approximately 12 miles of route and one new station to Montclair to begin operation in 2025. For this analysis it was assumed that with the addition of the Metro Gold Line Extension and implementation of strategies included in the SCAG 2020 RTP/SCS that by 2030 mode shift from passenger VMT to public transit would increase to 10% and to 30% by 2045. This is approximately 8% and 28%, respectively, greater than Montclair's existing transit mode share of 2.2%.[38] With the Innovative Clean Transit regulation requiring the transition of fleet to zero-emission vehicles, emissions associated with mode shift from passenger vehicles to public transit are anticipated to result in further reduction. Foothill Transit has already transitioned a majority of their fleet to electric buses while Metro aims to transition to a 100% electric bus fleet by 2030.[39, 40] As such, it is assumed in this analysis that increased ridership of transit would be on zero-emission vehicles. The calculations and assumptions used to estimate emissions reduction from Measure TR.2 are provided in Table 9. Footnotes in the table detail the methodology and application of assumptions.

[33] San Francisco Municipal Transportation Agency (SFMTA). December 2021. Sustainable Transportation Mode Share. Accessed at: https://www.sfmta.com/reports/sustainable-transportation-mode-share

[34] Pre-COVID numbers are referenced here with the understanding that public transit usage during the COVID pandemic were lower than normal and are likely to increase again assuming a return to pre-COVID conditions.

[35] Commute Seattle. December 2021. 2019 Mode Split Study Report. Accessed at: https://www.commuteseattle.com/resource/2019-mode-split-study/

[36] Southern California Association of Governments (SCAG). 2020 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Transit Appendix. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_transit.pdf?1606002122

[37] Todd Litman. Victoria Transport Policy Institute. August 2021. Evaluating Public Transit Benefits and Costs Best Practices Guidebook. Accessed at: https://www.vtpi.org/tranben.pdf

[38] https://data.census.gov/cedsci/table?g=1600000US0648788&tid=ACSST5Y2017.S0801

[39] http://foothilltransit.org/news/sustainability/

[40] https://www.dropbox.com/s/wdlpmph9x2gbm2h/Moving-Beyond-Sustainability-Strategic-Plan-2020.pdf?dl=0

Table 9 Measure TR.2 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Transit share mode target [1]	10.0%	30.0%
Total Forecasted Passenger ICE VMT (miles)[2]	426,033,000	471,214,854
Passenger trips/mile[3]	0.112	0.114
Total Forecasted Passenger Trips	47,711,490	53,721,032
Targeted Substitution of Transit Trips for Passenger Vehicle Trips[4]	3,721,496	14,934,447
Passenger VMT Reduced with Transit Trips[5]	16,746,733	67,205,011
Passenger Vehicle ICE Emission Factor (MT CO_2e/VMT)[6]	0.000311	0.000285
Avoided GHG Emissions (MT CO_2e)[7]	5,205	19,121

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide; VMT = vehicle miles traveled; ICE = internal combustion engine
1. Increase by 7.8% compared with 2019 baseline of 2.2% (https://data.census.gov/cedsci/table?g=1600000US0648788&tid=ACSST5Y2019.S0801)
2. Total Forecasted Passenger VMT are projections provided by Fehr & Peers for forecasting GHG emissions, provided in Appendix C. To avoid double counting of reductions associated with electric vehicle VMT, only VMT from combustion vehicles considered here.
3. Passenger trips per mile calculated using EMFAC2021. Calculated for combustion vehicles only
4. Calculated as number of passenger vehicle trips multiplied by the targeted mode share percentage.
5. Calculated by multiplying the estimated new transit trips by the average distance traveled per transit trip (4.5 miles) as reported by American Public Transportation Association (APTA). Public transit in Montclair consists primarily of buses and light-rail, therefore the average distance traveled per transit trip is the average distance traveled by bus and light-rail. (https://www.apta.com/wp-content/uploads/Resources/resources/statistics/Documents/FactBook/2018-APTA-Fact-Book.pdf)
6. Forecasted passenger ICE emission factor calculated using EMFAC2021. See Appendix C for details on EMFAC analysis.
7. Avoided emissions is calculated as the reduced passenger ICE VMT multiplied by the passenger ICE emission factor. Based on the transit agencies that operate in Montclair, the current public transit fleets are primarily electric or zero emissions and are continuing to transition to 100% zero emissions. Therefore, it is assumed that mode shift to transit in Montclair would be to zero emission transit fleets and emissions with those fleets are considered carbon neutral.

Measure TR.3 Increase electric/alternative fuel vehicle adoption to 20% for passenger and 10% for commercial vehicles by 2030, and 65% passenger and 50% commercial by 2045 .

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Adopt an EV Readiness Reach Code by 2026 requiring new commercial and multifamily construction to install the minimum number of EV chargers based on Tier 2 CalGreen requirements (20% of total).	17,904	70,317
2	Adopt an EV Charging Retrofits in existing Commercial and Multifamily Buildings Reach Code by 2026 requiring major retrofits, with either a building permit with square footage larger than 10,000 square feet or including modification of electric service panels, to meet CalGreen requirements for "EV Ready" charging spaces and infrastructure.	Supportive	
3	Conduct a survey of existing publicly accessible electric vehicle chargers and their locations and identify a prioritized list of locations for new electric vehicle charging stations with particular consideration for equitable distribution of chargers to residents of multi-family homes, low-income people, people on a fixed income, and communities of color.	Supportive	
4	Add 240 new publicly accessible Level 2 and 3 electric vehicle charging stations to the City by 2030.[41]	Supportive	
5	Promote public and private conversion to zero-emission vehicles; including use of City events, social media, and the City website to educate on benefits of zero-emission vehicles and available incentives.	Supportive	
6	Investigate commercial vehicle fleets in Montclair and identify businesses/employers to target for accelerating zero emission vehicle (ZEV) adoption. Identify and implement incentives for commercial fleet electrification, such as tax breaks or use of Low Carbon Fuel Standard credits.	Supportive	
7	Collaborate with local businesses/employers to develop and implement a plan for City-supported accelerated fleet electrification. As part of the plan, identify opportunities for accelerated fleet electrification and promote zero-emission vehicle (ZEV) adoption within major private and employee fleets in the city.	Supportive	
8	Work with SCE to incentivize electric vehicle charger installations through on-bill financing.	Supportive	

A transition to zero-emission vehicles (ZEV) will play an essential role in the reduction of fossil fuel consumption needed for Montclair, and California as a whole, to reach GHG reduction targets. he state has established a goal of putting 5 million ZEVs on the road by 2030.[42] Additionally, the recent

[41] Goal is based on providing one public electric vehicle charger for every 20 electric vehicles and the goal of EVs to be registered by 2030.

[42] Executive Order B-48-18 provides a target of 5 million ZEVs to be in California's vehicle fleet in 2030. While this target does not provide what amount are to be passenger and light-duty vehicles, as compared to medium- and heavy- duty vehicles, it is assumed that 80% of ZEVs will be light-duty passenger vehicles, which is consistent with the previous target of 1.5 million ZEVs by 2030 (1.2 million of which are expected to be light-duty passenger vehicles, as shown in Figure 15 of the CARB 2016 *Mobile Sources Strategy*). Under these assumptions,

passing of executive order N-79-20 calls for 100% of passenger vehicle sales to be all-electric by 2035.[43] This new executive order puts the total number of ZEVs on the road by 2035 at approximately 15 million. Based on the current number of vehicles registered in California and a 2% growth rate per year, 15 million ZEV's accounts for 35% of total passenger vehicles in 2035. The City has established its own goal in line with this and aims to reach 20% ZEV adoption by 2030 and 65% by 2045 for passenger vehicles. As of 2020, 3% of passenger vehicles in Montclair were ZEVs.[44] While the state and Montclair cannot require the purchase of ZEVs, they can work to provide sufficient electric vehicle (EV) charging infrastructure that would be required to support ZEV adoption and incentivize the behavior change. As market trends continue to shift towards more ZEVs being purchased, Montclair can facilitate this transition by:

- Developing, implementing, and funding a plan for providing, and assessing the challenges associated with, adequate EV infrastructure
- Ensuring adequate charging is available at commercial land uses and workplaces
- Promoting the benefits of ZEVs and available rebates and incentives for ZEVs and fueling infrastructure
- Streamlining the permitting process for ZEV infrastructure

The actual number and ideal locations for these EV charging stations would need to be further investigated through a Feasibility Study. In addition to well-planned public charging stations, workplace and residential EV charging infrastructure would further support ZEV adoption. A 2015 report by Idaho National Laboratory, *Plugged In: How Americans Charge Their Electric Vehicles*, found that nearly 98% of all EV charging events occurred at home or work. In support of these findings, and to address the challenges faced by those who may not be able to install their own home chargers, adoption of an EV Readiness Reach Code would support increased infrastructure at new and existing commercial and multi-family residential developments. Electric vehicle-ready reach codes are one of the most effective and low-cost strategies for states and local governments to encourage consumers to buy or lease electric vehicles and can save consumers thousands of dollars in installation costs.[45]

Commercial electric vehicle adoption is projected to occur at a slower rate than passenger vehicle adoption, with the greatest electrification success projected in light-duty commercial vehicles.[46] However, through identification and engagement with businesses/employers with vehicle fleets Montclair can help to accelerate ZEV adoption of commercial vehicles in the City. CARB is currently developing the Advanced Clean Fleet regulation that with adoption will further accelerate commercial ZEV adoption. The Regulation Commercial ZEV adoption is anticipated to increase with the Advanced Clean Fleet rule would require 50% of public fleets replacement to be ZEV beginning in 2024 and 100% ZEV by 2027. To support this transition there are several funding programs to

of the 30 million expected passenger vehicles in California in 2030 (CARB 2016 *Mobile Sources Strategy*, page 67), 13% would be ZEVs. Assuming the same increase of ZEV adoption between 2030 and 2045, as occurred before 2030, there would be an approximate doubling of ZEVs by 2045.

[43] EO N-79-20 directs CARB to develop regulations to achieve 100% electric vehicle car sales in CA by 2035 & 100% ZEV medium/heavy-duty vehicles by 2045.

[44] https://www.dmv.ca.gov/portal/uploads/2020/09/MotorVehicleFuelTypes_City_01012020.pdf

[45] Southeast Energy Efficiency Project (SWEEP). December 2018. Cracking the Code on EV-Rady Building Codes. Accessed at: https://www.swenergy.org/cracking-the-code-on-ev-ready-building-codes

[46] Erica Schueller. Fleet Owner. July 2021. What it will take to accelerate electric truck adoption. Accessed at: https://www.fleetowner.com/drivers-seat/article/21167635/what-it-will-take-to-accelerate-electric-truck-adoption

advance the adoption of ZEVs by fleets.[47]

GHG emissions reduction from the adoption of ZEVs assumes that the collective impact of each of the actions under Measure TR.3 will incentivize and provide the infrastructure needed for Montclair to meet the ZEV adoption targets that align with state targets. The calculations assume that the adoption rates will result in an equivalent reduction in VMT powered by fossil fuels, and emissions associated with these miles traveled would instead be accounted for in additional electricity use. The GHG emissions reduction of Measure TR.3 are applied after the VMT reductions attained by Measure TR.1 and TR.2 through increased active transportation and public transit. This GHG reduction would be offset by electricity consumption which would generate a small amount of GHG emissions. The calculations and assumptions used to estimate emissions reduction from Measure TR.3 are provided in Table 10. Footnotes in the table detail the methodology and application of assumptions.

[47] CARB. 2022. Advanced Clean Fleets: Accelerating Zero-Emission Truck Markets. Accessed at: https://ww2.arb.ca.gov/sites/default/files/2022-03/ACF%20Fact%20Sheet_ADA.pdf

Table 10 Measure TR.3 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Passenger Vehicles		
Passenger ZEV adoption target[1]	20%	65%
Legislative Adjusted GHG Forecast Projected EV adoption[2]	7%	9%
Effective Increase in EV Adoption Above Legislative Adjusted GHG Forecast[3]	13.2%	55.6%
Forecasted Passenger Vehicle ICE VMT(VMT)[4]	407,454,146	399,368,346
Passenger Vehicle ICE Emission Factor (MT CO_2e/VMT)[5]	0.000311	0.000285
Emissions reduction from EV Adoption Increase (MT CO_2e)[6]	16,734	63,214
EV Electricity Usage (kWh/mile)[5]	0.367	0.368
Electricity Usage Increase from Increased EVs (kWh)	19,735,800	81,819,739
Electricity EF with Implementation of BE.1 (MT CO_2e/kWh)[7]	0.0000065	0.0
Emissions from Electricity Usage for EVs (MT CO_2e)	128	0.0
Avoided Emissions from Passenger EV Adoption (MT CO_2e)	***16,606***	***63,214***
Commercial Vehicles		
Commercial ZEV adoption target[1]	10%	50%
Legislative Adjusted GHG Forecast Projected EV adoption[2]	6%	24%
Effective Increase in EV Adoption Above Legislative Adjusted GHG Forecast[3]	4.4%	26.5%
Forecasted Commercial Vehicle ICE VMT(VMT)[8]	24,171,858	21,879,501
Commercial Vehicle ICE Emission Factor (MT CO_2e/VMT)[5]	0.00123	0.00123
Emissions reduction from EV Adoption Increase (MT CO_2e)[6]	1,307	7,103
EV Electricity Usage (kWh/mile)[5]	1.155	1.131
Electricity Usage Increase from Increased EVs (kWh)	1,225,297	6,551,929
Electricity EF with Implementation of BE.1 (MT CO_2e/kWh)[7]	0.0000065	0.0
Emissions from Electricity Usage for EVs (MT CO_2e)	8	0.0
Avoided Emissions from Commercial EV Adoption (MT CO_2e)	***1,299***	***7,103***
Total Avoided Emissions (MT CO_2e)	**17,904**	**70,317**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.
MT CO_2e = metric tons of carbon dioxide; VMT = vehicle miles traveled; ICE = internal combustion engine; EV = electric vehicle; kWh = kilowatt hour
1. Targets developed in line with state goals based on EO B-48-18 and EO N-79-20.
2. Estimated EV penetration rates obtained from EMFAC2021 for San Bernardino County. EMFAC2021 considers current legislation and market trends determined via vehicle registration obtained from the DMV.
3. The effective increase in EV adoption above *Legislative Adjusted* EV adoption projections represents the gap in EV adoption in the San Bernardino County vehicle fleet that will allow Montclair to reach its EV adoption target. The *Legislative Adjusted* GHG Forecast obtained EV adoption rates from the California Air Resources Board (CARB) EMFAC2021 vehicle emissions model. The model was run for 2030 and 2045 for San Bernardino County.
4. Total Forecasted Passenger VMT are projections provided by Fehr & Peers for forecasting GHG emissions, provided in Appendix C. To avoid double counting of reductions, only VMT from combustion vehicles considered here after the reduction in VMT assumed from implementation of Measure TR.1 and Measure TR.2 due to increased active transportation and public transit use.
5. Forecasted ICE emission factors and electricity usage for passenger and commercial vehicles calculated using EMFAC2021. See Appendix C for details on EMFAC analysis.
6.It is assumed that the percent of EV adoption is equivalent to the percent reduction in ICE VMT. GHG emissions reduction calculated as the forecasted ICE VMT multiplied by the percent of EV adoption to give the estimated replaced VMT, multiplied by the forecast ICE emission factor.
7. Electricity emission factor assumes implementation of BE.1, enrollment in CPA's 100% Green Power rate, with a 4% opt-out rate
8. Total Forecasted Commercial VMT are projections provided by Fehr & Peers for forecasting GHG emissions, provided in Appendix C. To avoid double counting of reductions with already accounted for Legislative Reductions, only VMT from combustion vehicles considered here.

Measure TR.4 Equitably increase use of Electric vehicles, promote active transportation and public transit use by disadvantaged communities in improve.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Conduct a feasibility study identifying barriers for disadvantaged and low-income families related to mobility for active transportation, use of public transit, and access to zero-emissions or EV vehicles. Identify funding or grant opportunities to address identified barriers.	Supportive	
2	As part of Complete Streets Feasibility Study, evaluate streets within disadvantage communities and identify streets for improvements that would increase mobility within the neighborhood.	Supportive	
3	Pilot a transit shuttle program for disadvantaged communities to increase access to the transit center.	Supportive	
4	Investigate and pursue funding opportunities for EV car share for low-income neighborhoods, such as the Zero Emissions Mobility and Community pilot Project Fund. Partner with local community group to identify funding opportunities for purchasing EVs or other pilot projects for deployment in disadvantaged communities.	Supportive	
5	Work with Metro and Foothill Transit to expand use of LIFE low-income EZ Pass transit subsidy by Montclair low-income households who ride Metro and Foothill Transit buses and commuter inter-city rails.	Supportive	

To effectively reduce GHG emissions from the transportation sector, it is important to enact changes and measures equitably. For disadvantages communities, numerous barriers exist such as limited access to funds for EV vehicles or charging stations, unsafe or incomplete streets limiting mobility by active transportation, and limited access to transit stations. However, there are numerous funding and partnership opportunities focused on deploying projects in disadvantages communities to increase access to EVs or improving street safety to encourage active transportation. Targeted feasibility studies and programs can help identify the barriers and funding opportunities to reduce GHG emissions in an equitable way that benefit all community members.

2.4 Water and Wastewater Sector

Water and wastewater generally account only for a small portion of a community's GHG emissions. Water use and wastewater collection and treatment resulted in approximately 3% of total community emissions in the City of Montclair in 2017. Although this is a small amount of overall emissions, a holistic approach to climate change allows for GHG emissions reduction and the co-benefits of protecting one of California's scarcest resources. A majority of emissions associated with water use and wastewater generation is associated with the electricity use for the pumping and treatment of potable water and the collection and conveyance of generated wastewater. Therefore, strategies related to this sector include promoting water conservation by reducing per capita potable water consumption and increasing access to and use of recycled water. To this end, the

CAP' water and wastewater measures consist of the following measures:

- Measure W-1: Reduce per capita water consumption by 10% compared with 2017 levels by 2030 and 25% by 2045.

Measure W.1 Reduce per capita water consumption by 10% compared with 2017 levels by 2030 and 25% by 2045.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Adopt ordinance by 2026 requiring non-residential buildings over 20,000 square feet (including municipal buildings over 7,500 square feet) to disclosure water use annually for benchmarking purposes and then take action to reduce their consumption.	Supportive	
2	Adopt a cool pavement ordinance by 2026 to reduce heat island effect improving water quality.	Supportive	
3	Continue to enforce Model Water Efficient Landscapes Ordinance.	Supportive	
4	Adopt an ordinance by 2026 restricting the use of potable water for non-potable uses and requiring greywater capture for land uses that are excess water users (e.g. car washes, large fields, etc.).	252	0
5	Develop a Recycled Water Use and Implementation Strategy that identifies new and existing access to recycled water and quantity of recycled water available to the City for use from MVWD's. The strategy shall identify land use types (i.e., landscaping and golf courses) and specific projects that will switch from potable to recycled water use allowing for a goal of 20% of City's potable water use to be replaced with recycled water provided by MVWD by 2030.	Supportive	
6	Conduct a citywide study identifying impermeable surfaces that can be targeted for a transition to increase infiltration.	Supportive	
7	Promote alternative driveways/sidewalk materials and greenscaping through educational pamphlets and programs; incentivize residents to transition from impervious to pervious hardscapes.	Supportive	
8	Provide rebates or other funding to low- and medium-incomes homes for installing greywater, rainwater catchment system, EnergyStar appliances, and low-flow fixtures and fittings (e.g., faucets, sprinkler heads).	Supportive	
9	Work with schools to educate youth about water conversation.	Supportive	
10	Establish a system to track implementation progress of low-flow devices and to track use of rebates offered through the City.	Supportive	

A majority of emissions associated with the water sector are associated with energy usage for water pumping, treatment, conveyance, and wastewater collection and treatment. Therefore, emissions reduction achieved through Measure W.1 are based on the energy savings associated with the reduction in water consumption per service population. Montclair does not have operational control of the water purveyor, and therefore electricity usage for water supply, conveyance, and

distribution the water supply and conveyance is not included within Montclair's electricity usage sector. As such, reduction in emissions quantified herein do not pose a risk to double counting within the electricity sector measures.

Because the City of Montclair is primarily made up of low and medium-density residential development, it was assumed that 30-70% of community water use is associated with outdoor usage as found in a 2006 analysis of California water demand trends.[48] As such, a majority of the actions supporting Measure W.1 focus on the regulation of landscaping and the switch from use of potable water to recycled water for purposes such as irrigation that do not require potable water.

The 10% target for reduction in per capita water consumption by 2030 is based on the continued support and implementation water conservation strategies by Montclair's water purveyor and water conservation programs incorporated into the Draft City General Plan. The 2045 target of reduction in per capita water use by 25% assumes the adoption of ordinances restricting the use of potable water for non-potable uses and increased usage of greywater and recycled water over potable water for specific land-uses and support management strategies as it relates to infrastructure needs. These reduction potential assumptions are based on studies that have shown that the use of devices such as smart controllers can reduce residential outdoor water use by approximately 20-30% while transitioning to water-wise landscape options can reduce outdoor water use up to 70%.[49] The calculations and assumptions used to estimate emissions reduction from Measure W.1 are provided in Table 11. Footnotes in the table detail the methodology and application of assumptions.

[48] Hanak, Ellen, and Davis, Matthew. "Lawns and Water Demand in California," *California Economic Policy*, Vol. 2, No 2, July 2006.
[49] ibid

Table 11 Measure W.1 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Forecasted Service Population[1]	69,745	73,185
2017 Baseline per capita water consumption (MG/SP)[2]	0.0477	0.0477
Target Reduction in per capita water consumption from 2017 baseline	10%	25%
Targeted Water Consumption per capita	0.0429	0.0358
Targeted Water Consumption Use (MG)[3]	2,993	2,617
Forecasted Water Consumption (MG)[4]	3,325	3,489
Reduced Water Consumption with Measure W.1 Implementation (MG)	333	872
Legislative Adjusted Forecasted Emissions (MT CO_2e)[5]	2,518	0.0
Legislative Adjusted Emission Factor (MT CO_2e/ MG)[6]	0.76	0.0
Avoided GHG Emissions (MT CO_2e)[7]	**252**	**0.0**

Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly.

MT CO_2e = metric tons of carbon dioxide; MG = million gallons; SP = service population

1. Service population is the population in addition to the employed population. See Appendix C for details on population projections.

2. The 2017 baseline per capita water consumption was calculated as Montclair's water consumption in the 2017 inventory baseline year divided by the 2017 service population. See Appendix C for details on the community inventory.

3. The targeted water consumption was calculated by multiplying the targeted per capita water consumption by the forecasted service population.

4. Forecasted water consumption based on forecasted population and water consumption per service population (i.e., population + employees) determined from the 2017 baseline inventory. See Appendix C for details on forecast calculation.

5. The Legislative Adjusted Forecasted Emissions associated with water consumption were obtained from the forecast in Appendix C to avoid double counting of emissions reduction that are anticipated to be achieved through SB 100.

6. An emission factor that incorporates reductions anticipated from SB 100 was calculated by dividing the Legislative Adjusted Forecasted Emissions by the forecasted water consumption. Due to SB 100, all retail electricity in California will have an emission actor of zero by 2045 and therefore emission factors post 2045 are 0.

7. Avoided emissions are calculated by multiplying the reduced water consumption by the emissions factor.

2.5 Waste Sector

The City of Montclair's waste measures focus on reducing solid waste generation and increasing diversion from the landfill. Particular emphasis is placed on reduction of organic waste sent to landfills, as landfilled organic waste is the major source of waste-related greenhouse gas emissions. This Measure also supports the City working toward zero waste of resources by 2045. The CAP's waste measure consist of the following:

- SW-1: Implement SB 1383 requirements and reduce community-wide landfilled organics 75% by 2025 and inorganic waste by 35% by 2030 and reduce all landfilled waste by 100% by 2045.

Working toward zero waste of resources requires that the city address two factors: 1) waste generation, reducing the amount of waste generated regardless of its destination (e.g., landfilling, recycling, composting); and 2) waste diversion, recycling the waste that is generated through available facilities. Measure SW-1 primarily focuses on waste diversion and reduction of organic waste generation. Actions supporting the implementation of SB 1383 will also support the diversion of inorganic waste though is not as significant for reducing emissions.

Actions for reducing organic waste are underpinned by SB 1383 requirements, which lay out specific

programs, policies, and objectives for the city to support the state's goal of a 75% reduction in organics waste by 2025. While not explicitly modeled, many of these actions support achievement of SB 1383 goals. Actions that address inorganic waste are not quantified in this analysis due to their very minimal impact on communitywide greenhouse gas emission reduction gals.

Measure SW.1 Implement SB 1383 requirements and reduce community-wide landfilled organics 75% by 2025 and inorganic waste by 35% by 2030 and reduce all landfilled waste by 100% by 2045.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Enforce adopted ordinance 22-1001 requiring compliance with SB 1383. Ensure ordinances established are consistent with SB 1383 requirements: revise if necessary.	2,553	3,571
2	Engage with waste hauler operating within the City to discuss SB 1383 requirements for waste haulers (i.e., organics receptacles and labeling requirements).	Supportive	
3	Adopt procurement policies to comply with SB 1383 requirements for jurisdictions to purchase recovered organic waste products.	Supportive	
4	Adopt an Edible Food Recovery Ordinance for edible food generators, food recovery services, or organization that are required to comply with SB 1383.	Supportive	
5	Partner with City waste hauler, to provide organic waste collection and recycling services to all commercial and residential generators of organic waste.	Supportive	
6	Enforce Ordinance 22-1001 requiring all residential and commercial customers to subscribe to an organic waste collection program and/or report self-hauling or backhauling of organics.	Supportive	
7	Conduct a Feasibility Study and prepare an action plan to ensure edible food reuse infrastructure is sufficient to accept capacity needed to recover 20% of edible food disposed or identify proposed new or expanded food recovery capacity.	Supportive	
8	Establish an education and outreach program for school children and adults around food waste prevention, nutrition education, and the importance of edible food recovery.	Supportive	
9	Establish an edible food recovery program to minimize food waste. Leverage CalRecycle support for projects that prevent food waste or rescue edible food.	Supportive	
10	Adopt an ordinance or enforceable mechanism to regulate haulers collecting organic waste, including collection program requirements and identification of organic waste receiving facilities.	Supportive	

Action #	Action	Anticipated Reduction ($MT CO_2e$)	
		2030	2045
11	Partner with waste hauler within the City to: ▪ Ensure organic waste collection from mixed waste containers are transported to a high diversion organic waste processing facility ▪ Provide quarterly route reviews to identify prohibited contaminants potentially found in containers that are collected along route.	Supportive	

The requirements and actions associated with SB 1383 have been developed to produce a 75% reduction in organics by the State of California.[50] The State's efforts towards such goals have been ongoing with previously enacted laws such as AB 341 and AB 1826 establishing commercial recycling requirements. The State recognizes that individual jurisdictions cannot achieve the goals of SB 1383 alone and therefore SB 1383 stipulates how waste generators and local governments must operate to achieve SB 1383 goals. Therefore, by taking the actions required, City of Montclair can expect to achieve an equivalent reduction level. The emissions reductions associated with a 75% reduction in organics was calculated using the 2018 Waste Characterization Study for California pursuant to the SB 1383 guidelines.[51] The City of Montclair did not have City-specific waste characterization data; therefore, it was assumed that 54% of the waste landfilled from the City was proportional to the percentage of organics as reported in the CalRecycle Waste Characterization Study for the state. As of June 2022, the City adopted ordinance 22-1001 that made changes to the Montclair Municipal Code in compliance with SB 1383.[52] This included establishment of a mandatory Organic Waste Disposal Reduction Program, which provides organic waste recycling requirements for single-family generators and commercial businesses, recovery requirements for commercial edible food generators and food recovery organizations, service requirements for waste haulers, waivers for organic waste generators, and authority for inspections, investigations, and enforcement by City officials and the City's franchise waste hauler. A 75% reduction to the City's organic waste stream was applied in 2025 and continued through 2030. Calculations assumed that emissions reduction would come from diverting that waste to compost or hunger relief, decreasing the methane generation potential of this waste to zero. The calculations and assumptions used to estimate emissions reduction from Measure SW.1 are provided in Table 12. Footnotes in the table detail the methodology and application of assumptions.

Table 12 Measure SW.1 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Target Reduction in Landfilled Organics[1]	75%	100%
Forecasted Waste Generation (tons)[2]	40,062	42,038
Forecasted Organic Waste Generation (tons)[3]	21,433	22,490
Diverted Organic Waste (tons)[4]	16,075	22,490
Organics Waste Emission Factor ($MT CO_2e$/ton)[5]	0.159	0.159
Avoided GHG Emissions ($MT CO_2e$)	**2,553**	**3,571**

[50] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383
[51] https://www2.calrecycle.ca.gov/Publications/Download/1458
[52] https://www.cityofmontclair.org/documents/ordinance-no-22-1001

Calculation Factor	2030	2045
Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly MT CO_2e = metric tons of carbon dioxide; kWh =-kilowatt-hour 1. Implementation of the programs and policies as described in SB 1383 are anticipated to result in a 75% reduction in landfilled organics by 2025. 2. Forecasted waste generation is estimated as the forecasted service population multiplied by the per capita waste generation factor obtained from the 2017 inventory (0.574 tons/service population). See Appendix C for inventory details. 3. Data on the composition of the waste stream by waste type was not available for the City of Montclair, therefore the Cal Recycle statewide average composition was used where ~54% of the waste stream is organics. 4. Diverted organics is based on the total forecasted organics generation multiplied by the targeted reduction. 5. The emission factor for organics waste is the weighted average of emission factors for organic materials listed in CARB's *Method for Estimating GHG Emissions reduction from Diversion of Organic Waste from Landfills to Compost Facilities* (https://nrcne.org/wp-content/uploads/2019/12/Method-estimating-GHG-emissions-reductions.pdf) and using the Cal Recycle 2018 Waste Characterization study prepared for California Regions (https://www2.calrecycle.ca.gov/WasteCharacterization/ResidentialStreams?lg=443&cy=19) for tonnage by waste type.		

2.6 Carbon Sequestration Sector

The City of Montclair is generally considered a built-out city where a majority of new development or growth will involve the redevelopment of underutilized parcels or renovation of existing structures. However, to achieve deep decarbonization by 2045, the City will need to include carbon sequestration[53] mechanisms, which take carbon out of the atmosphere, to offset GHG emissions. Although built-out, the City has the opportunity to engage in carbon sequestration activities through enhancing open space, managing greenspace effectively, protecting and increasing the City's urban forest or tree stock, and composting. Over time as emissions are removed from more and more sectors, carbon sequestration will play an increasingly important role in California's ability to achieve carbon neutrality. The CAP's carbon sequestration measures align with these strategies[54] and consist of the following:

- Measure CS.1: Increase carbon sequestration and green space by planting 500 new trees through the community by 2030 and 1,000 new trees by 2045.
- Measure CS.2: Achieve and maintain compost procurement requirements of SB 1383 by 2030.

Measure CS.1 Increase carbon sequestration and green space by planting 500 new trees through the community by 2030, and 1,000 by 2045.

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Adopt Greenscaping Ordinance that has a street tree requirement for all zoning districts, has a shade tree requirement for new development, requires greening of parking lots, and increases permeable surfaces in new development.	18	35
2	Adopt a standard policy in alignment with City's General Plan and set of practices for expanding urban tree canopy and placing vegetative barriers between busy roadways and developments to reduce exposure to air pollutants from traffic.	Supportive	
3	Prepare and adopt an Urban Forest Management Plan for the City that includes an inventory of existing trees, identifies future tree planting opportunities and a climate-ready tree palette, as well as ongoing operations and maintenance needs.	Supportive	
4	Identify and participate in partnership opportunities necessary to plant and maintain an increase in the City's tree inventory by 500 trees by 2030 and convert priority public space into green space.	Supportive	
5	Promote incentives to property owners and developers for greenspace inclusion through educational pamphlets, programs, and webpages and track the use of incentives.	Supportive	

[53] Carbon sequestration refers to the physical removal of CO_2 from the atmosphere, either through natural processes such as photosynthesis and weatherization, or industrial chemical processes that transform atmospheric CO_2 to a solid state.

[54] Note that measures regarding composting are included in the CAP Update's waste measures rather than the carbon sequestration measures.

As stated in the City's General Plan, a majority of the city's land use is occupied by the street network with limited trees or greenery. Montclair recognizes that "greening" of Montclair's streets would enhance the neighborhood character, cool the urban area, and provide incentives for walking or biking. The City is committed to increasing the green infrastructure in the city. The goal of Measure CS.1 is to maintain the amount and health of the current tree stock and then add trees to increase the carbon storage capacity of the urban forest. Assuming that the urban forest is not 100% stocked, which is typical even of communities that have well-managed forests, there is the ability to increase the size of the urban forest by 15% - 25% as summarized by American Forests, the oldest national nonprofit conservation organization in the United States, in a 2017 article titled *Why We No Longer Recommend a 40 Percent Urban Tree Canopy Goal*.[55,56] It is assumed that the City has the capacity to increase the City's tree inventory by 500 trees by 2030 and 1,000 trees by 2045. Annual CO_2e emissions reductions were estimated based on the number of trees to be added to the inventory and the average CO_2e accumulation factor per tree (0.0354 MT CO_2e/tree/year).[57] The calculations and assumptions used to estimate emissions reduction from Measure CS.1 are provided in Table 13. Footnotes in the table detail the methodology and application of assumptions.

Although not quantified herein, urban greening can further reduce building carbon emissions by reducing the heat island effect in cities which reduces the need to rely on air conditioning in homes.[58] Additionally, the application of suitable composted organic material to existing opens spaces can be used to enhance the sequestration of CO_2e. The application of compost allows for carbon to be stored in the soil and, over time, to be captured in the stems, leaves, and roots of grasses, woody plants, and trees. The calculations and assumptions used to estimate emissions reduction from Measure SW.1 are provided in Table 13. Footnotes in the table detail the methodology and application of assumptions.

Table 13 Measure CS.1 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Target Increase in Newly Planted Trees1	500	1,000
Tree Sequestration Factor (MT CO_2e/tree/year)[2]	0.0354	0.0354
Sequestered GHG Emissions (MT CO_2e/year)	**18**	**35**

Notes: Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly

MT CO_2e = metric tons of carbon dioxide

1. Default annual CO_2e sequestration per tree per year with a maximum lifespan of 20 years per tree is 0.0354 MT CO_2e/tree/year was obtained from CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures.

[55] https://www.americanforests.org/blog/no-longer-recommend-40-percent-urban-tree-canopy-goal/

[56] https://sfgov.org/sfplanningarchive/urban-forest-plan

[57] CAPCOA. 2011. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

[58] The Trust for Public Land (TPL). Quantifying the greenhouse gas benefits of urban parks. August 2008.

Measure CS.2 Achieve and maintain compost procurement requirements of SB 1383 by 2030.[59]

Action #	Action	Anticipated Reduction (MT CO_2e)	
		2030	2045
1	Implement all required activities under SB 1383 including achieving compost procurement requirements effective. Effective January 2022, CalRecycle's regulations require cities to purchase a minimum of 0.08 tons per resident of recovered organic composts.	914	962

SB 1383 requires each jurisdiction in California to procure recovered organic waste products to meet organic waste product procurement targets, as notified by CalRecycle by 2022. Through implementation of Measure SW.1 the City commits to implementing all requirements of SB 1383, including organic waste procurement requirements. Procuring and applying compost to meet these requirements will result in carbon sequestration benefits for Montclair. Guidance from CalRecycle has set the procurement target for Montclair in 2022 at 3,168 tons of recovered organic product (i.e., compost, mulch, etc.) based on Montclair's population.[60] Based on this procurement target, Montclair's population, and the carbon sequestration potential per ton of mixed organics compost, the carbon sequestration potential for Montclair's compost procurement through 2045 was calculated. The methods and assumptions used to calculate the GHG emissions reductions associated with carbon sequestration from Measure are shown in the Table 14 below. Footnotes in the table detail the methodology and application of assumptions.

Table 14 Measure CS.2 GHG Emission Reduction Calculations

Calculation Factor	2030	2045
Forecasted population[1]	49,672	52,285
Estimated Procurement Requirements[2]	3,974	4,183
Emission Sequestration Factor (MT CO_2e/ton)[3]	0.23	0.23
Sequestered GHG Emissions (MT CO_2e/year)	**914**	**962**

Notes: Notes: Emissions have been rounded to the nearest whole number and therefore may not add up exactly

MT CO_2e = metric tons of carbon dioxide

1. Forecasted population obtained from forecast analysis detailed in Appendix C.

2. Calculated by multiplying forecasted population by procurement requirement of 0.08 tons per person per 14 CCR Section 18993.1.

3. Default annual CO_2e sequestration per ton of mixed organic compost applied obtained from CARB's *Method for Estimating GHG Emissions reduction from Diversion of Organic Waste from Landfills to Compost Facilities* (https://nrcne.org/wp-content/uploads/2019/12/Method-estimating-GHG-emissions-reductions.pdf).

2.7 Municipal Operations Sector

In the baseline year of 2017, City of Montclair operations generated approximately 2,594 MT CO_2e. Approximately 44% of these emissions were a result of natural gas and electricity consumption, and

[59] Measure SW.1 is associated with more actions than listed in the table. However, only Action 1 is associated with carbon sequestration benefits. For a full list of actions associated with Measure SW.1.

[60] CalRecycle. December 2021. Jurisdiction Procurement Targets Based on January 1, 2021, Population Estimates.

49% of these emissions were a results of vehicle fleet and employee commute. The CAP includes the following municipal measures:

- Measure M.1: Electrify the municipal vehicle fleet and mobile equipment by 50% by 2030 and 100% by 2045.
- Measure M.2: Reduce carbon intensity of City operations.

As GHG emissions associated with municipal operations are fully under Montclair's operational control, it is assumed that full implementation of municipal Measures M.1 and M.2 are achievable. Further, under the state's Advanced Clean Fleet Rule 50% of vehicles added to fleets subject to the regulation (i.e., local government fleets such as the City's) from 2024-2026 must be zero-emission vehicles (ZEVs) with 100% of vehicles added to the fleet 2027 and after must be ZEV. Alternatively, fleets may opt-in to the Milestones Option. If the Milestone Option is selected, fleet owners must continuously meet or exceed the ZEV Fleet Milestone percentage as defined by the regulation. Compliance reporting would be required annually and within 30 days of adding vehicles to the fleet. In 2022, CARB also approved amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation that incorporates new requirements to use renewable diesel. Beginning January 1, 2024, all California fleets subject to this regulation are required to procure and only use R99 or R100 renewable diesel fuel in all vehicles subject to the Off-Road Regulation, with some limited exceptions. This regulation applies to all self-propelled off-road diesel vehicles 25 horsepower or greater used in California and applies to vehicles that are rented or leased. Exceptions to the regulation include locomotives, commercial marine vessels, marine engines, recreational off-highway vehicles, combat and tactical support equipment, stationary equipment, portable engines, equipment used exclusively for agricultural operations, implements husbandry, and off-road diesel vehicles owned and operated by an individual for personal, non-commercial and non-governmental purposes.[61] Emissions associated with municipal operations is a subset of overall community emissions and therefore emissions reduction that could be achieved through Measures M.1 and M.2 are not explicitly quantified herein as that would double count emissions reduction achieved through community GHG reduction measures discussed above. As such, the following tables presents for information purposes only, the potential emissions reduction compared with the baseline that would result from full implementation of Measures M.1 and M.2.[62]

Measure M.1 Electrify the municipal vehicle fleet and mobile equipment by 50% by 2030 and 100% by 2045.

Action #	Action	Reduction Potential (MT CO_2e)	
		2030	2045
1	Develop and adopt a policy to apply lifecycle assessment to all new vehicle and equipment purchases.	Supportive	

[61] California Air Resources Board (CARB). (2022). Final Regulation Order Amendments to Sections 2449, 2449.1, and 2449.2 Title 12, California Code of Regulations. Accessed at: https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/off-roaddiesel/froa-1.pdf

[62] Presented emissions reduction are for information purposes only and assume full implementation of Measures M.1 and M.2 such that 100% reduction of emissions from the indicated source would be achieved by 2045. Emission reduction potential obtained from the municipal inventory results for the specific source provided in Appendix C.

Action #	Action	Reduction Potential (MT CO_2e)	
		2030	2045
2	Implement the City Fleet Alternative Fuel Conversion Policy such that as municipal vehicles turn over, they are replaced with alternative-fuel vehicles in alignment with the state's Advanced Clean Fleet Rule.	368	736
3	Install EV charging stations at municipal buildings.	Supportive	

In 2017, Montclair operated a vehicle fleet that operated primarily on gasoline and compressed natural gas (CNG), with one diesel powered vehicle. Off-road equipment used by the City was powered by diesel and liquid propane gas (LPG). With full implementation of Measure M.1. by 2030, based on the City's vehicle replacement schedule or as needed based on the condition of the vehicles, these vehicles would be transitioned to either alternative fuel or electric vehicles. For this estimation is assumed that vehicles and equipment would be replaced with an electric alternative. Any replacement of fossil-fueled vehicles with electric would also generate no additional emissions with the full implementation of Measure M.2, where all municipal accounts would be enrolled in 100% renewable electricity rate structures.

Measure M.2 Reduce carbon intensity of City operations.

Action #	Action	Reduction Potential (MT CO_2e)	
		2030	2045
1	Adopt retrofitting policy for City owned buildings such that energy efficient and electrification retrofits are incorporated into City buildings as they become available.	Supportive	
2	Complete energy audits for all City facilities and implement all feasible recommendations for fuel switching and efficiency upgrades.	Supportive	
3	Establish a replacement plan for replacing natural gas fueled equipment with electric where practical and technologically feasible in City-buildings.	Supportive	
4	Switch City electricity accounts to SCE 100% Green Rate until joining CPA at 100% Green Power rate by 2025.	1,008	1,008
5	Investigate funding and grant opportunities and partnerships to install photovoltaic systems at all City buildings as feasible.	Supportive	

Enrollment of all municipal electricity accounts in either SCE's 100% Green Rate product or the CPA's 100% Green Power program would immediately eliminate emissions associated with electricity usage for municipal operations. The installation of solar PV and increased efficiency at City facilities would further reduce building emissions as energy purchased by the City would already be 100% renewable. Developing a flexible schedule policy for employees and encouraging the use of zero emission or EV vehicles through installation of EV chargers would further reduce emissions associated with the City's operation.

Actions taken by the City to reduce GHG emissions from municipal operation provide an example to the community and demonstrate the City's commitment to reducing emissions and implementing the measures laid out in the CAP.