

# Morgan Hill 2021

## Climate Action Plan



Goals and actions for greenhouse gas reduction for a resilient and adaptable community and environment

# Acknowledgements

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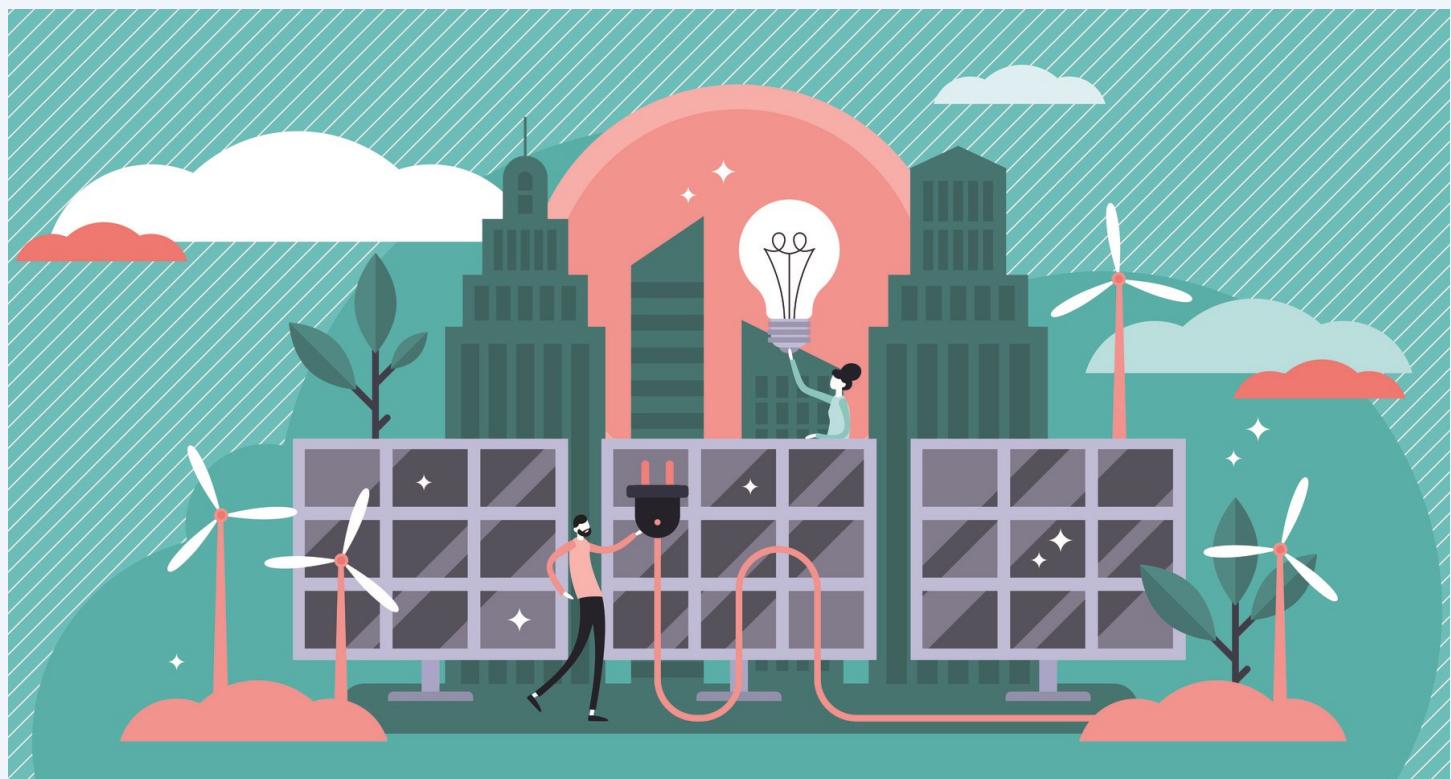


# Chapter 1:

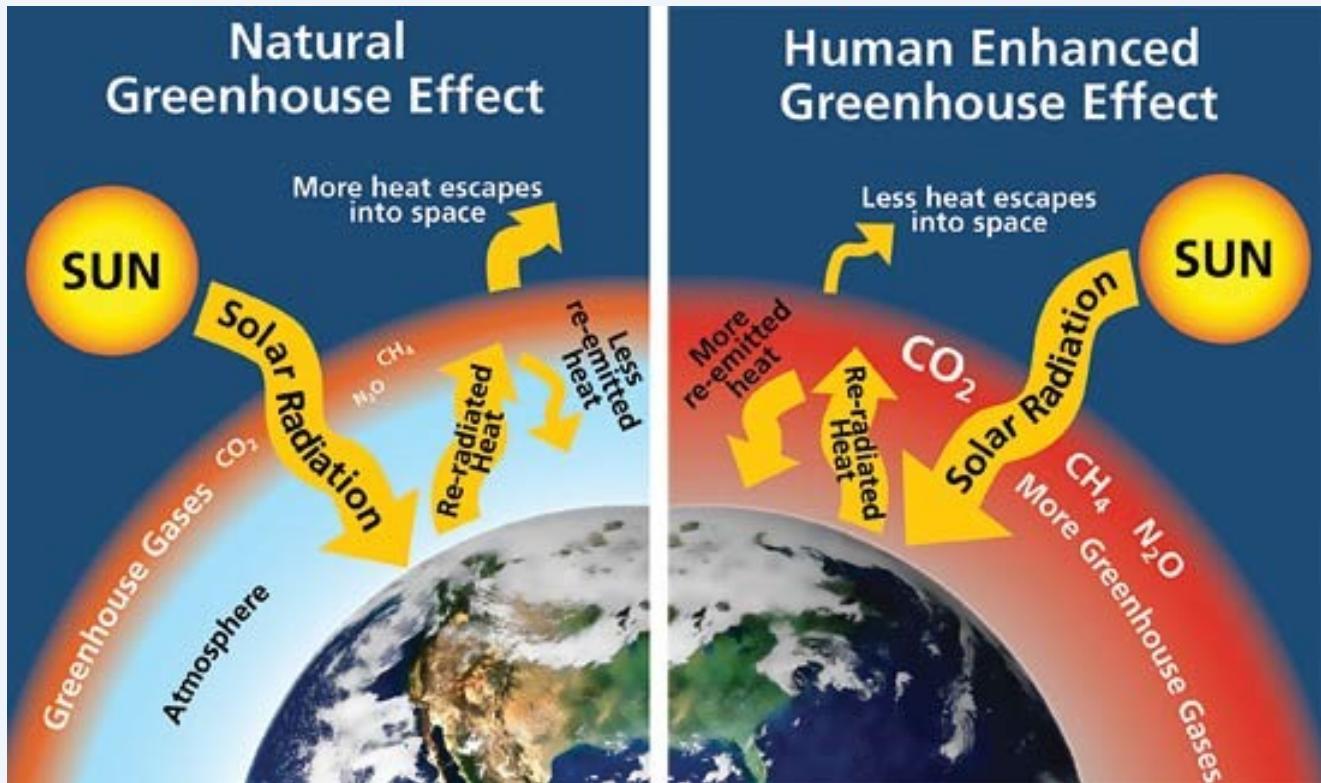
## Introduction

The City of Morgan Hill is invested in preparing a resilient future for our community and the environment overall. This Climate Action Plan (CAP) was developed out of the urgency that the City Council saw to address climate change and focus efforts towards the initiatives that will make the most significant positive impacts in the most timely manner. Thus, it was determined that a limited CAP be developed with a focus on reducing greenhouse gas emissions in the transportation and building sectors.

Through unexpected and catastrophic natural disasters, human health impacts, and overall climate temperature increases, it is clear that addressing the climate crisis is of the utmost importance. This CAP serves as the pathway to reduce Morgan Hill's emissions.



# 1.1 Climate Change and Greenhouse Gas Emissions



Climate change is affecting Morgan Hill and the impact on the community is increasing each year. Climate change is the long-term alteration of the overall temperature, which has been happening over the decades since the industrial revolution. We are just now beginning to see the effects this accumulation of temperature change has on our local area in the forms of extended drought, the largest wildfires in recorded history, and sea level rise.

The main cause of this change in climate is the emission of greenhouse gasses from human activities. As the human population has increased, so has our natural resource consumption, energy usage, and waste production. The main greenhouse gasses emitted from human activity contributing to climate change include carbon dioxide ( $CO_2$ ), methane, and nitrous oxide. Because  $CO_2$  is the largest contributor to global warming and the largest GHG emitted in Morgan Hill, this CAP will focus on reducing  $CO_2$  emissions.

CO<sub>2</sub> is emitted anytime fossil fuels are burned including gasoline, coal, oil, and natural gas. CO<sub>2</sub> and other GHGs are released into the atmosphere and become trapped. In the atmosphere they create a barrier, trapping the sun's rays and ultimately trapping more heat in the atmosphere. The purpose of this CAP is to introduce steps to reduce the amount of CO<sub>2</sub> emitted in Morgan Hill and contribute less of this GHG to the atmosphere.

CO<sub>2</sub> emissions can happen at multiple points in the average person's daily life whether we are aware of it or not. Turning on the hot water, starting the furnace, driving a car, or cooking a meal are all tasks that emit CO<sub>2</sub> if they are powered by fossil fuels.



Pictured Above: Anderson Reservoir in December 2020

The Intergovernmental Panel on Climate Change suggested that the globe is projected to reach or exceed a change of 1.5 degrees Celsius (2.7 degrees F) within the next two decades which will lead to devastating changes and disasters across the earth. Aggressive action must be taken now if we are to address this issue and change the course for the better.

Morgan Hill is joining the efforts of other cities throughout California in establishing a CAP and implementing it to reach the necessary outcomes.

# 1.2 Morgan Hill History

Morgan Hill is located in the southern Santa Clara Valley, approximately 12 miles south of San Jose, 10 miles north of Gilroy, and 15 miles inland from the Pacific Coast. The Valley is approximately 4 miles wide and is surrounded by the Santa Cruz mountain range to the west and the Diablo mountain range to the east.

With a 2021 population of 47,000, Morgan Hill is a growing community. With population growth comes an increase in the usage of resources including water, energy, and fuel. Household natural gas appliances and gasoline-powered vehicles used by the population in Morgan Hill all emit CO<sub>2</sub> leading to an increase of GHGs.

It is a challenge to provide a growing population with the necessities of life in a manner that does not increase harmful emissions — all while maintaining accessibility and equity for all.

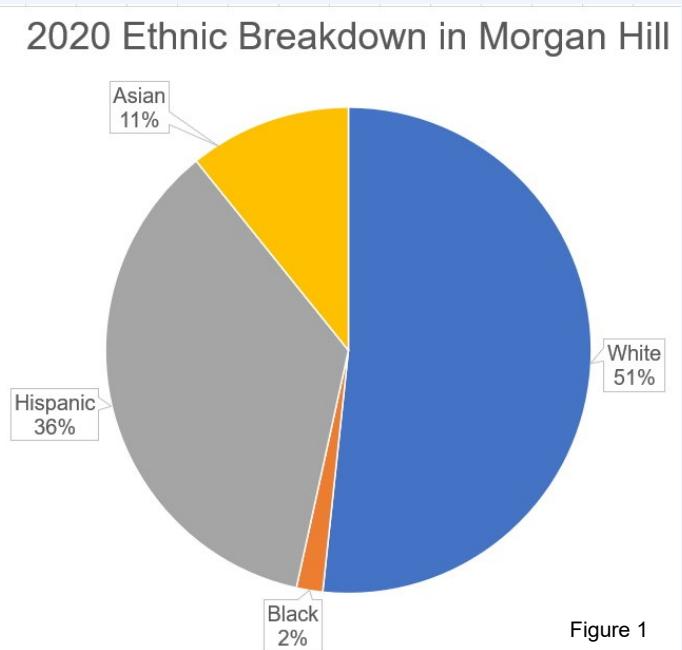
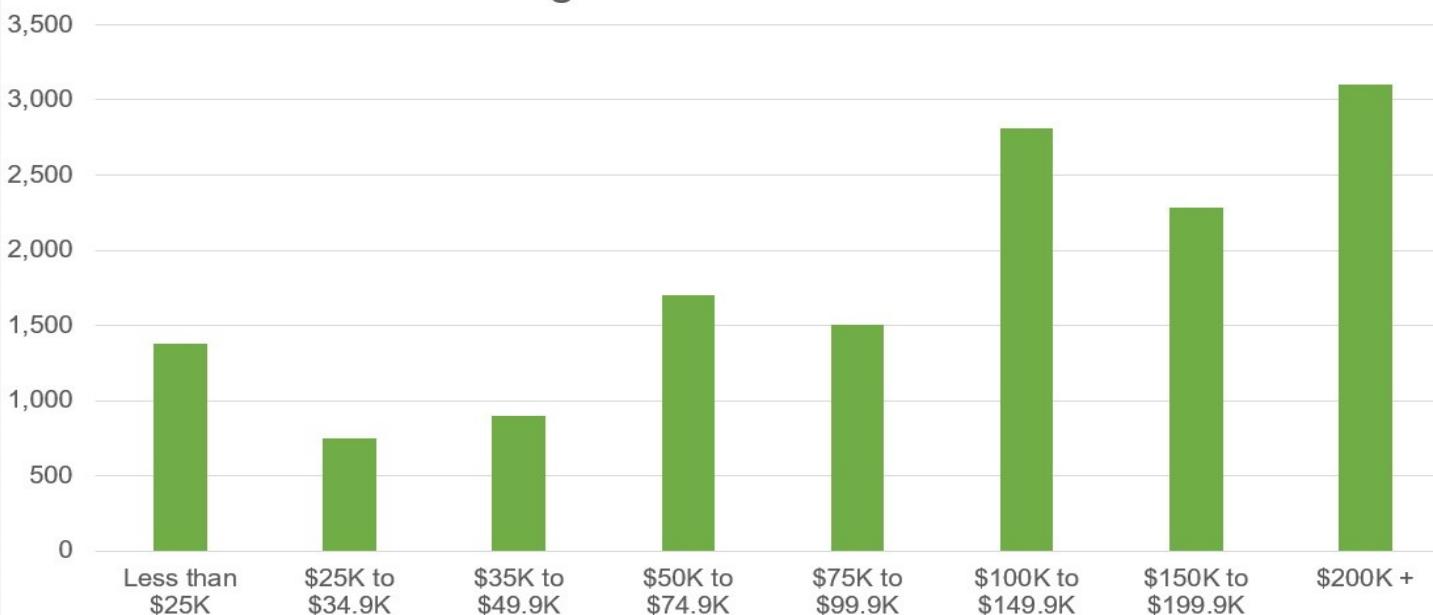


Figure 2

2020 Morgan Hill Household Income



# 1.3 Supporting Laws, Policies and Reports

The following list of laws, policies, and reports are paving the way for Morgan Hill to implement its own CAP as support for reducing GHGs is increasing across the State. The items below support this CAP's focus on vehicle and building emissions.

- [AB 32](#) - required California to reduce its GHG emissions to 1990 levels by 2020 and to make deeper reductions by key milestones.
- [Executive Order N-79-20](#) - requires the state of California to have a goal that 100% of in-state new passenger vehicles be zero-emission by 2035.
- [AB 1346](#) - will ban the sale of small internal combustion engines predominately used in lawn and garden equipment, starting as soon as 2024.
- [Renewable Portfolio Standard](#) (RPS) - established in 2002. Senate Bill 1078 requires electricity providers to increase the portion of energy that comes from eligible renewable sources, including solar, wind, small hydroelectric, geothermal, biomass and biowaste.

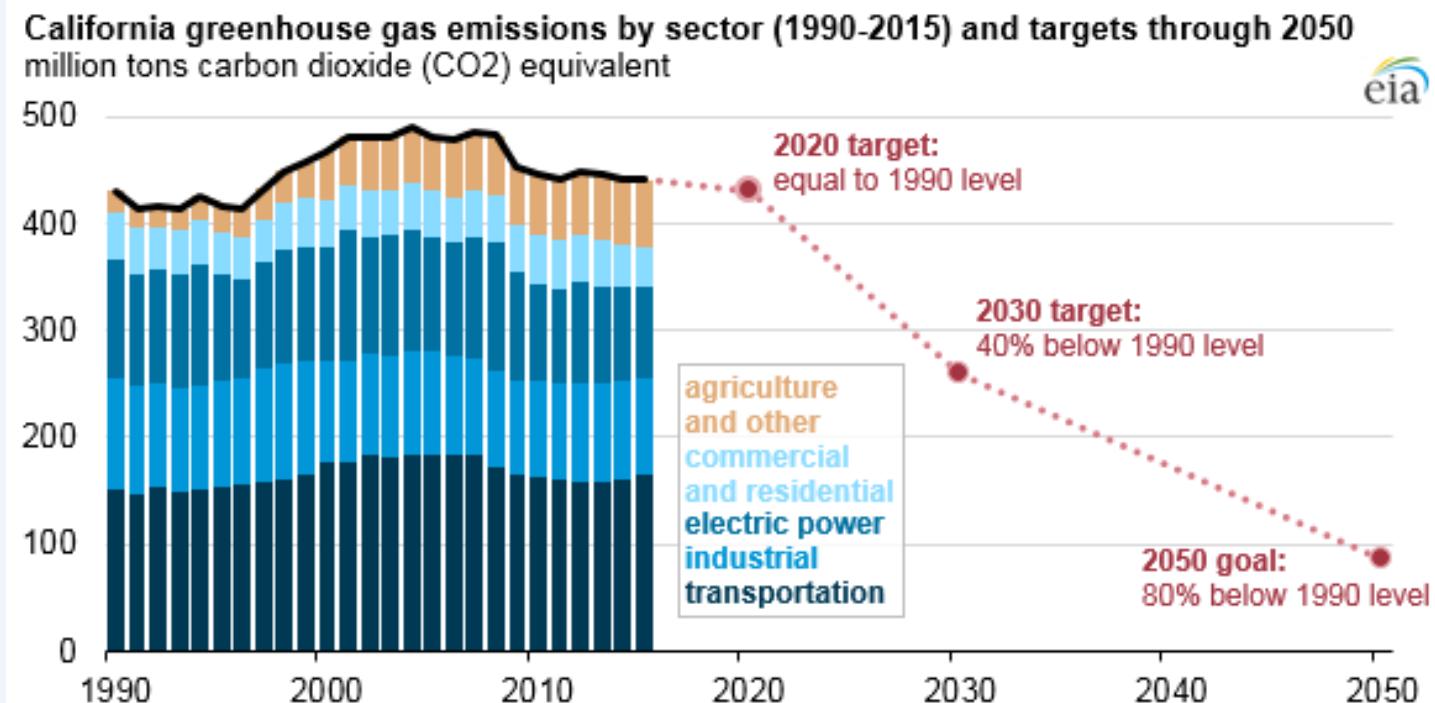
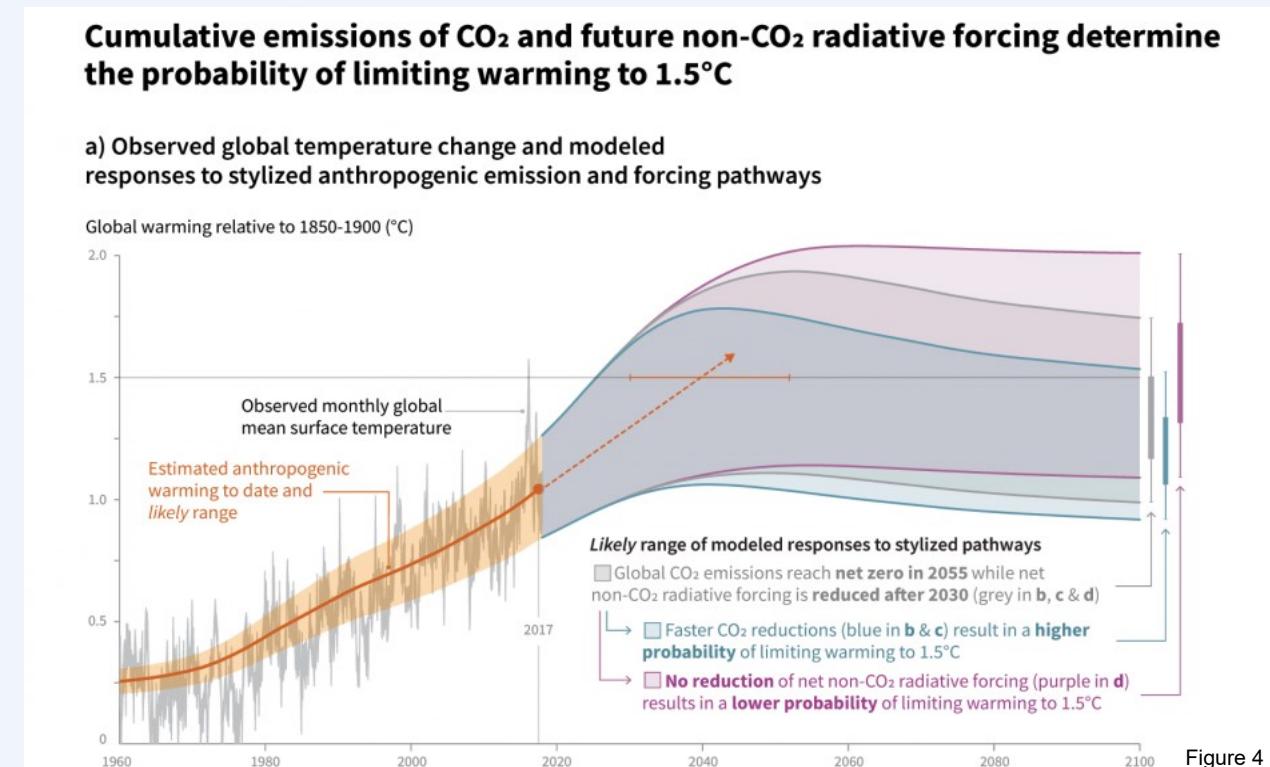


Figure 3: U.S. Energy Information Administration, based on California Air Resources Board data

- [AB 1493](#) (Pavley) - required carmakers to reduce greenhouse gas emissions from new passenger cars and light trucks by increasing fuel efficiency standards.
- [Low Carbon Fuel Standard](#) (LCFS) - was developed by the California Air Resources Board to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020 as called for by Governor Schwarzenegger in Executive Order S-01-07.
- [Title 24](#) of the California Code of Regulations consists of regulations that cover the structural, electrical, mechanical, and plumbing system of every building constructed or altered after 1978.
- [AB 1470](#) - Established a ten-year incentive program that encourages installations of solar water heating systems that offset natural gas and electricity use in homes and businesses throughout the state.
- [Intergovernmental Panel on Climate Change \(IPCC\)](#) - Issued the 2021 Report finding the probability of global warming exceeding 1.5 degrees Celsius in the next two decades has increased and shows that emissions of GHG from human activities are responsible for 1.1 degrees Celsius since 1850-1900.

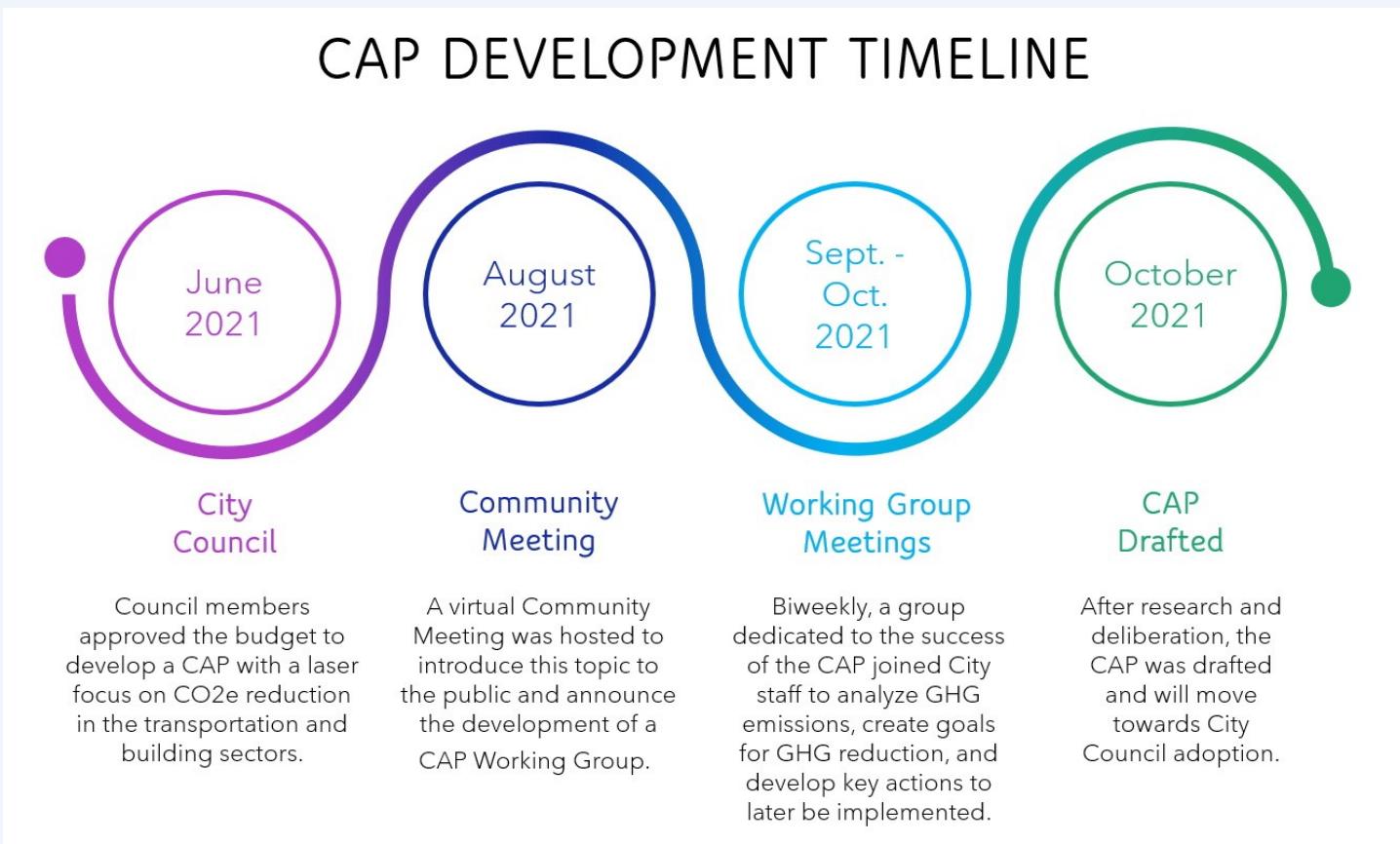


# 1.4 Developing the CAP

The Morgan Hill CAP was developed out of necessity. The need for this community to drastically reduce CO2 emissions is vital for the overall GHG reduction statewide. The City Council unanimously decided that now is the time to address climate change for the health of the local environment and the physical health of the community.

The creation of a CAP was brought to the attention of the public through a virtual community meeting and was widely accepted by those who attended. Since then, City staff met with a dedicated group of community members as a Working Group to delineate the goals, key actions, equitable accessibility, and feasibility of a CAP for Morgan Hill.

Through this CAP, the City of Morgan Hill demonstrates its passion about becoming a leader in the community, showing that through action it is possible to make a change for the better so the environment can continue to sustain all who inhabit it.



# Chapter 2:

## Greenhouse Gas Inventory

The first step in understanding where we need to go is to understand where we are and where we have been. By analyzing the CO2 emissions output in Morgan Hill, we can better predict what the emissions in the future will be. If Morgan Hill were to continue on the “business as usual” track, the emissions output from fossil fuel powered vehicles and new buildings constructed using natural gas, the result could be catastrophic.

Morgan Hill is no stranger to the natural disasters that have been increasingly occurring due to the shift in climate. In a regular season with precipitation, Morgan Hill has seven natural creeks and three reservoirs. Drought has been a semi-constant occurrence since 2014 for Morgan Hill and the extreme drought that Morgan Hill has experienced in the 2020-2021 years has impacted every resident, business owner, and farmer who relies on that water.

As the climate has warmed and dried, the intensity of devastating wildfires seems to grow larger each year and become less predictable. Up and down California, extreme wildfires have required thousands to evacuate and decimated hundreds of thousands of acres. Fires have historically resulted in a rejuvenation of the soil and plant life, but human sprawl has restricted this process. Addressing climate change and reducing GHG emissions are key to reducing these events.



Chesbro Reservoir July 2021



Chesbro Reservoir October 2021



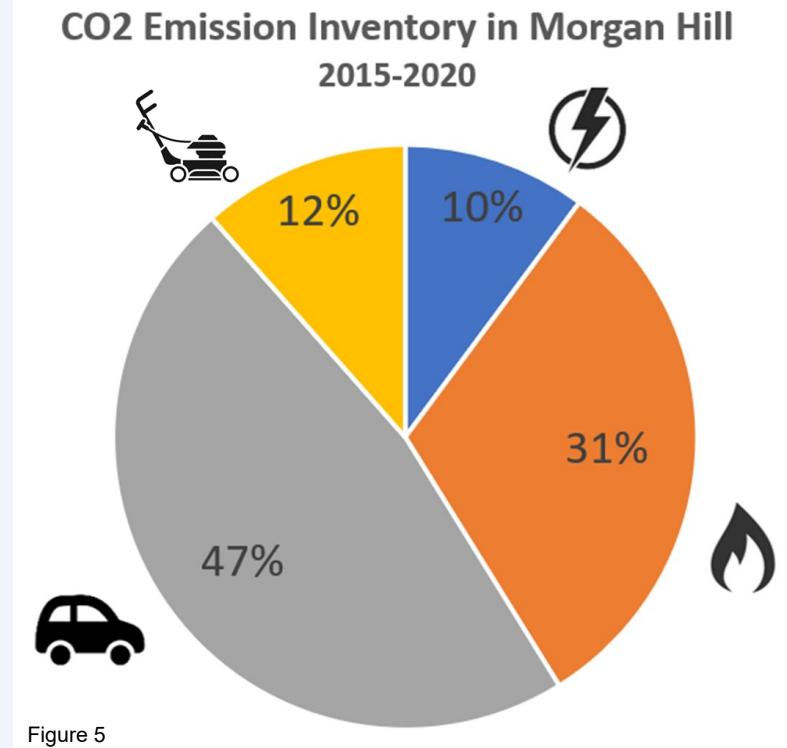
August 2020 fire. Photo courtesy California Conservation Corps

## 2.1 Current GHG Status

Morgan Hill's GHG emission data has been gathered through Silicon Valley Clean Energy for the years 2015, 2017, 2018, 2019, and 2020. This CAP is solely focused on the emissions output from the transportation and building sectors. For those two sectors, the CO2 emissions analyzed are in the four categories below:

1. On-Road Vehicle
2. Off-Road Vehicle
3. Natural Gas from Buildings
4. Electricity from Buildings

Within the five years analyzed, these sources emitted more than 776,000 metric tons (MT) of CO2, contributing to climate change and the devastating effects occurring throughout California and across the globe.



The two categories that generate the most CO2 emissions (shown in Figure 5) are on-road vehicles and natural gas from buildings. Combined these two sources emitted 108,561 metric tons of CO2 in 2020. By specifically focusing the majority of strategies and efforts in this CAP toward the two largest contributors to climate change, the adaptations made will have the largest impacts.

While there is still CO2 emitted from off-road vehicles and electricity from buildings, which is addressed in the action items of this CAP, they comprise a minor portion of the overall emissions and have already decreased dramatically since 2015. With state policies enacted and improved renewable energy sources from electric power, these emissions are predicted to continue to decline.

Figure 6

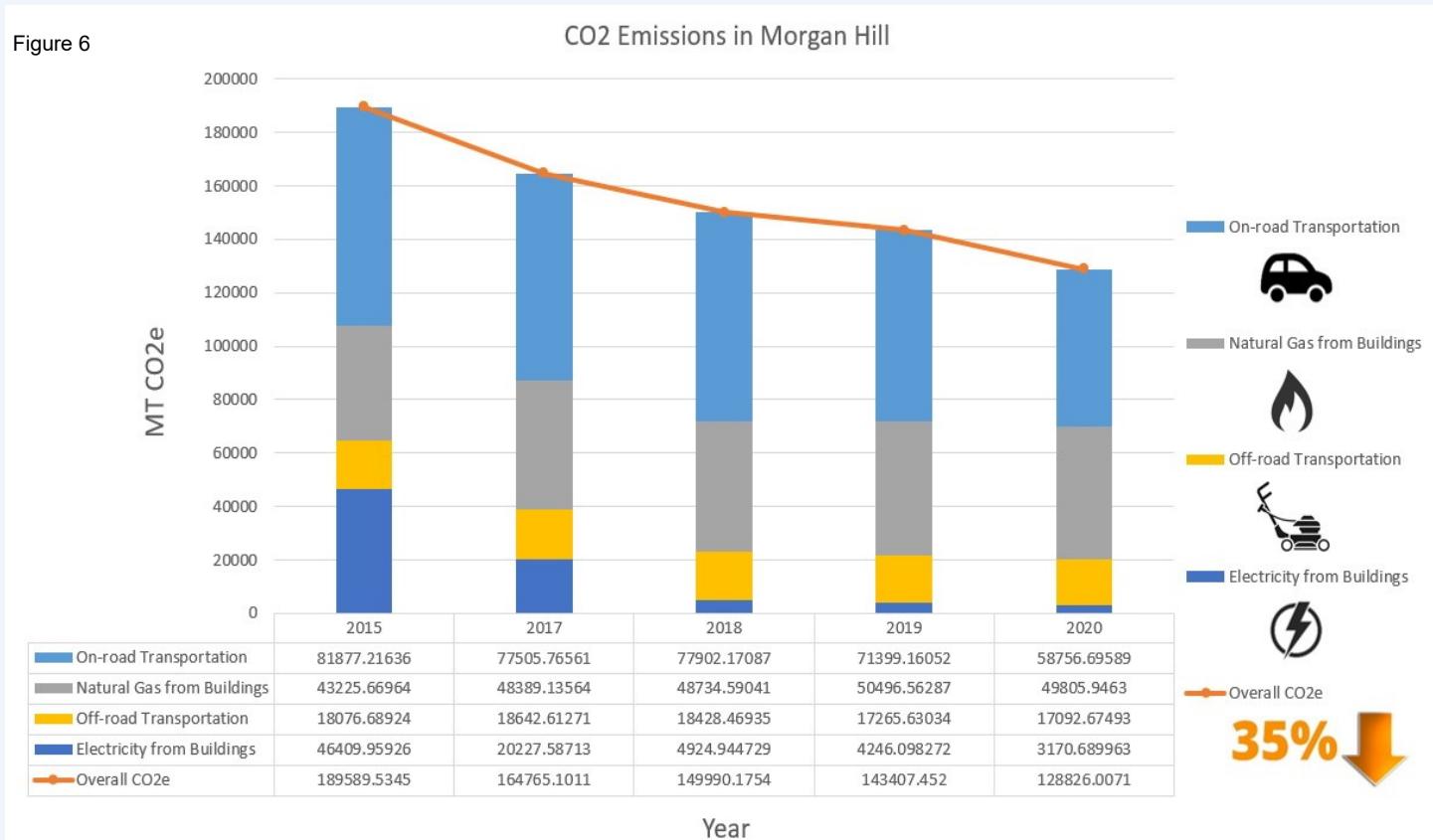


Figure 6 above shows the overall CO<sub>2</sub> emissions attributed to Morgan Hill. The largest CO<sub>2</sub> contributor, on-road vehicles, has declined since 2015, due to the introduction and availability of electric vehicles (EV). As EV production expands and the price of such vehicles becomes more affordable to residents, the goals in this CAP will emphasize reducing CO<sub>2</sub> emissions from on-road vehicles, as decreasing this will make the largest positive impact.

Running almost parallel to this are the CO<sub>2</sub> emissions from natural gas from buildings. Many household appliances used in most existing buildings, both residential and commercial, are powered by natural gas. The hot water heater, heating systems, cooking appliances, and clothes drying appliances in almost all existing buildings emit CO<sub>2</sub> emissions. Switching these household items to ones powered by electricity, instead of natural gas, will greatly reduce these CO<sub>2</sub> emissions.

As the population and development in Morgan Hill has grown, there is a promising downward trend of electricity emissions from buildings drastically decreasing from 23% in 2015 to only 2% in 2020 as a result of the actions taken by Silicon Valley Clean Energy to source carbon-free electricity for the community.

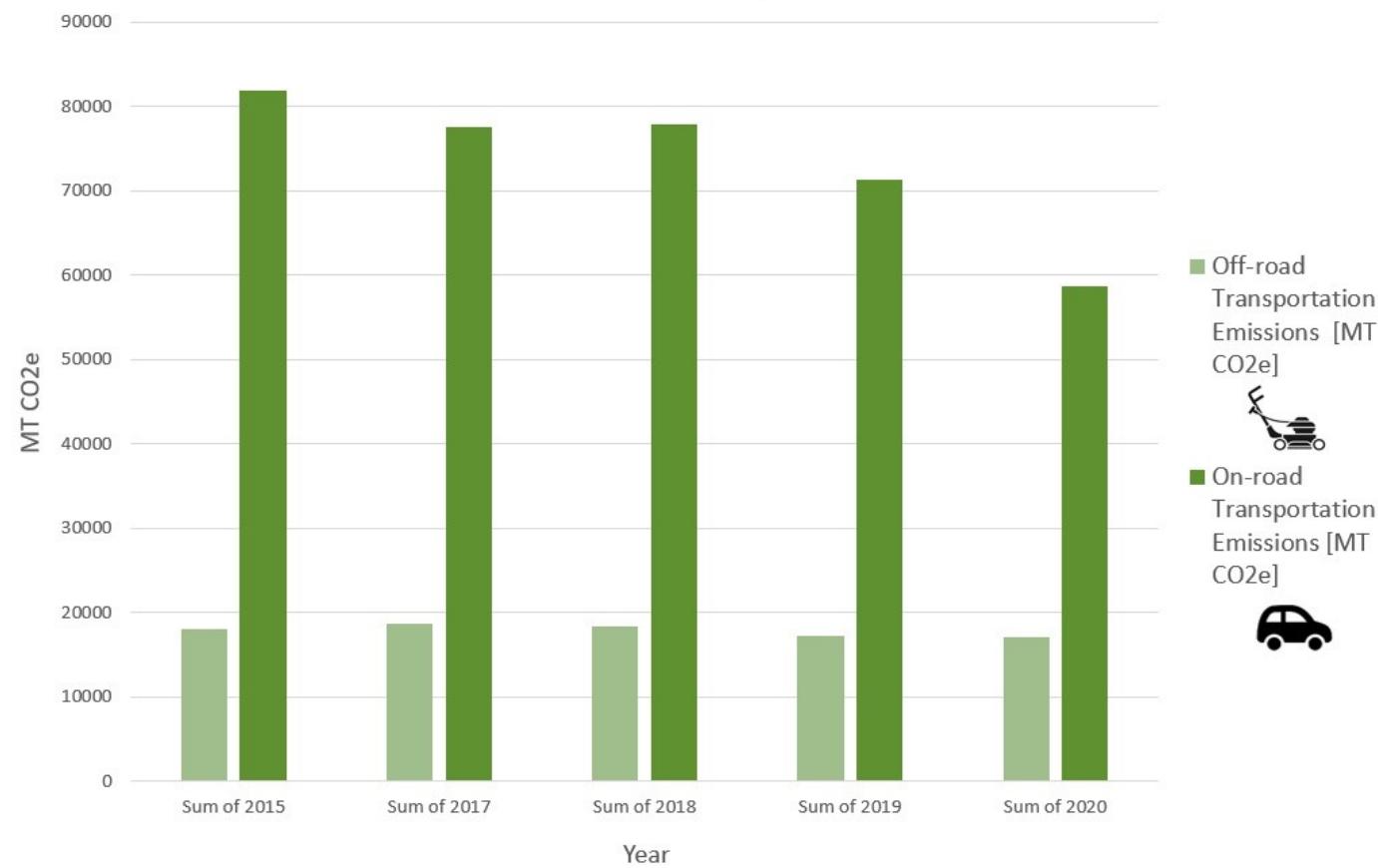
Figure 7 provides a closer view of the emissions released only from the vehicle categories. Both on-road and off-road vehicles are displayed by the graph below. These two categories account for 59% of Morgan Hill's overall emissions from 2015 to 2020.

The off-road vehicle emissions have remained generally steady and have only decreased from 18,077 MT to 17,093 MT over the course of five years. Types of off-road vehicles that output these emissions include, but are not limited to, landscaping and gardening equipment (leaf blowers, lawn mowers, etc.), construction equipment, and recreation vehicles.

As previously stated, by far the largest contributor to CO<sub>2</sub> emissions in Morgan Hill is on-road vehicles. In 2015, 81,877 MT of CO<sub>2</sub> were emitted. We are beginning to see a decrease as electric vehicles (EV) are becoming more accessible and affordable. In 2020, on-road vehicles CO<sub>2</sub> emissions were reduced to 58,767 MT. In addition to the increase in EV use, this decrease reflects the lockdown that occurred due to the COVID-19 global pandemic that began in March of 2020.

Figure 7

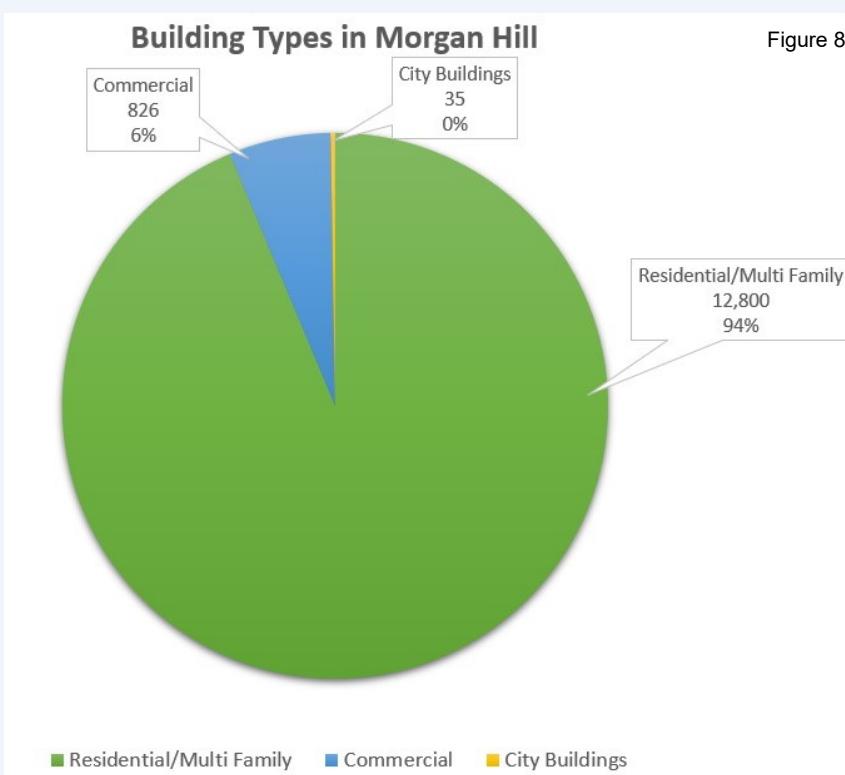
CO<sub>2</sub> Emissions in Morgan Hill from Vehicles



The CO2 emissions from natural gas in buildings (both residential and commercial) will be another focal point within this CAP. While it is currently required that newly constructed buildings as of 2020 are built as all-electric, the vast majority of existing buildings utilize natural gas. As development in Morgan Hill expands, the new builds, both residential and commercial, will be constructed utilizing only electric power with the occasional exception.

This leaves us with the issue of having almost 14,000 existing buildings using natural gas. For decades natural gas has been the source of generating heat, hot water, and cooking in buildings of all types and sizes. The consequences of this practice and the resulting emissions are now being noticed. This CAP will focus on addressing those emissions and providing key actions to reduce them.

The existing building types from 2021 data are shown in Figure 8. Of the roughly 14,000 existing buildings in Morgan Hill, the vast majority (94%) are residential. Commercial buildings make up only 6% and municipal buildings make up less than 0.003% of the buildings in Morgan Hill.



To make a true and meaningful change in the building sector, residential properties need to be converted to all-electric. With the innovative technologies that are now available, buildings now have more electrically-powered alternatives that can supplant natural gas. This retrofitting does come at a cost and will be at the forefront of future

discussions with residential property owners. It is not feasible for every residential property owner to convert all appliances to electric all at once.

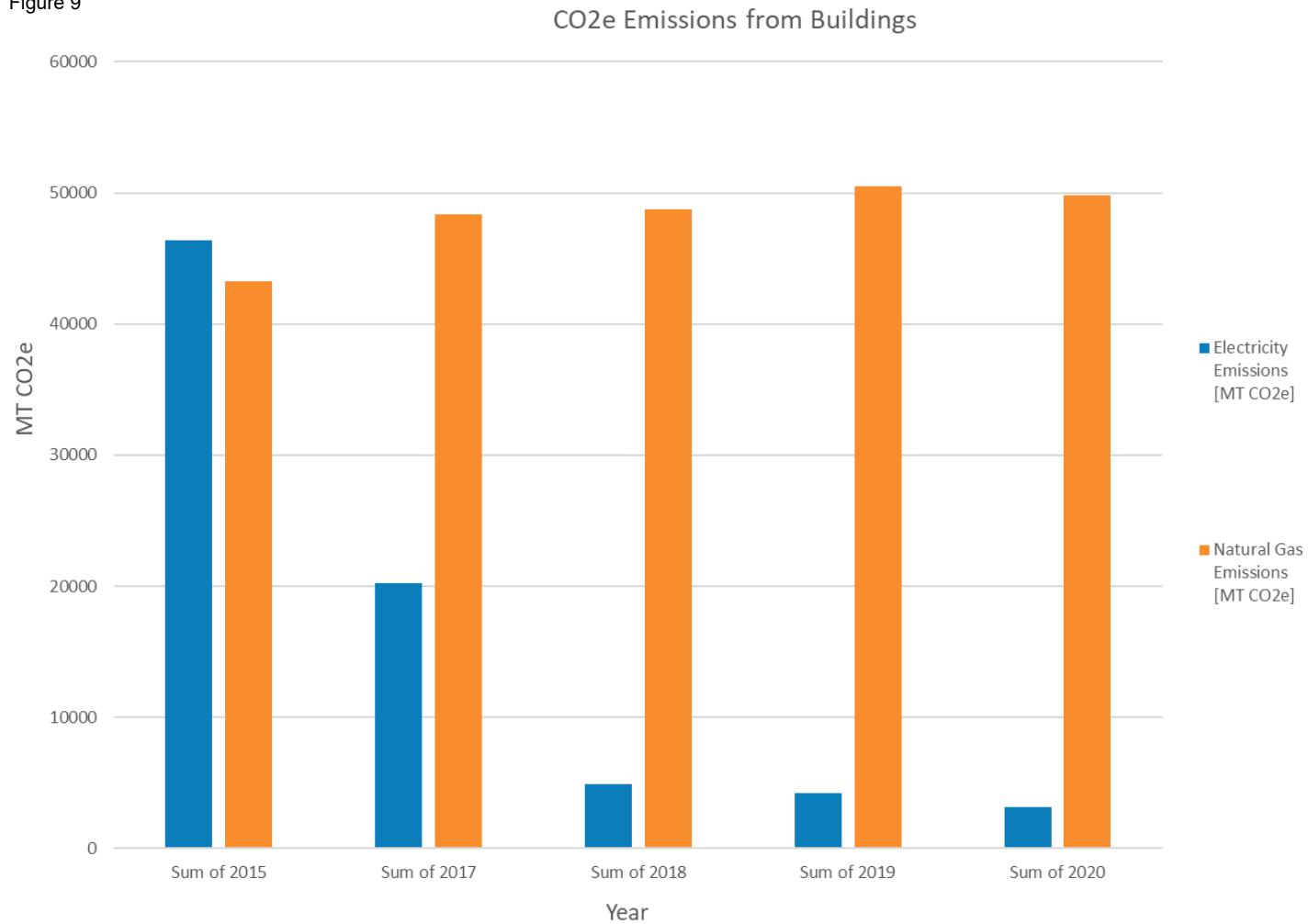
By making the transition one appliance at a time and utilizing the financial assistance programs available by external campaigns, this switch to an all-electric building can be more digestible. While it may take a slow running start for residential buildings to become all-electric, this change is crucially needed in order for Morgan Hill to reduce its contribution to climate change. In 2020, the natural gas from all buildings in Morgan Hill exerted 49,806 metric tons of CO<sub>2</sub> emissions into the atmosphere, which was not far off from the 58,757 from the On-Road Vehicles.

As technology has improved, there are new innovative ways for every property owner to reduce their GHG emissions. The most commonly found appliances in buildings that use natural gas for power, but have electric alternatives readily available include:

- Heating systems
- Water heaters
- Clothes dryers
- Stovetops

The CO<sub>2</sub> emissions in metric tons from both natural gas and electricity from buildings in Morgan Hill over five years is shown in Figure 9 below.

Figure 9



The drastic difference between natural gas and electricity to power the same household appliances makes this urgent need for a change evident. Even with the increase in Morgan Hill's population and more new buildings being constructed, the electricity emissions have continued to decrease. These new buildings that are required to be all-electric show the path that the 13,661 existing buildings in Morgan Hill need to follow to reduce CO2 emissions.

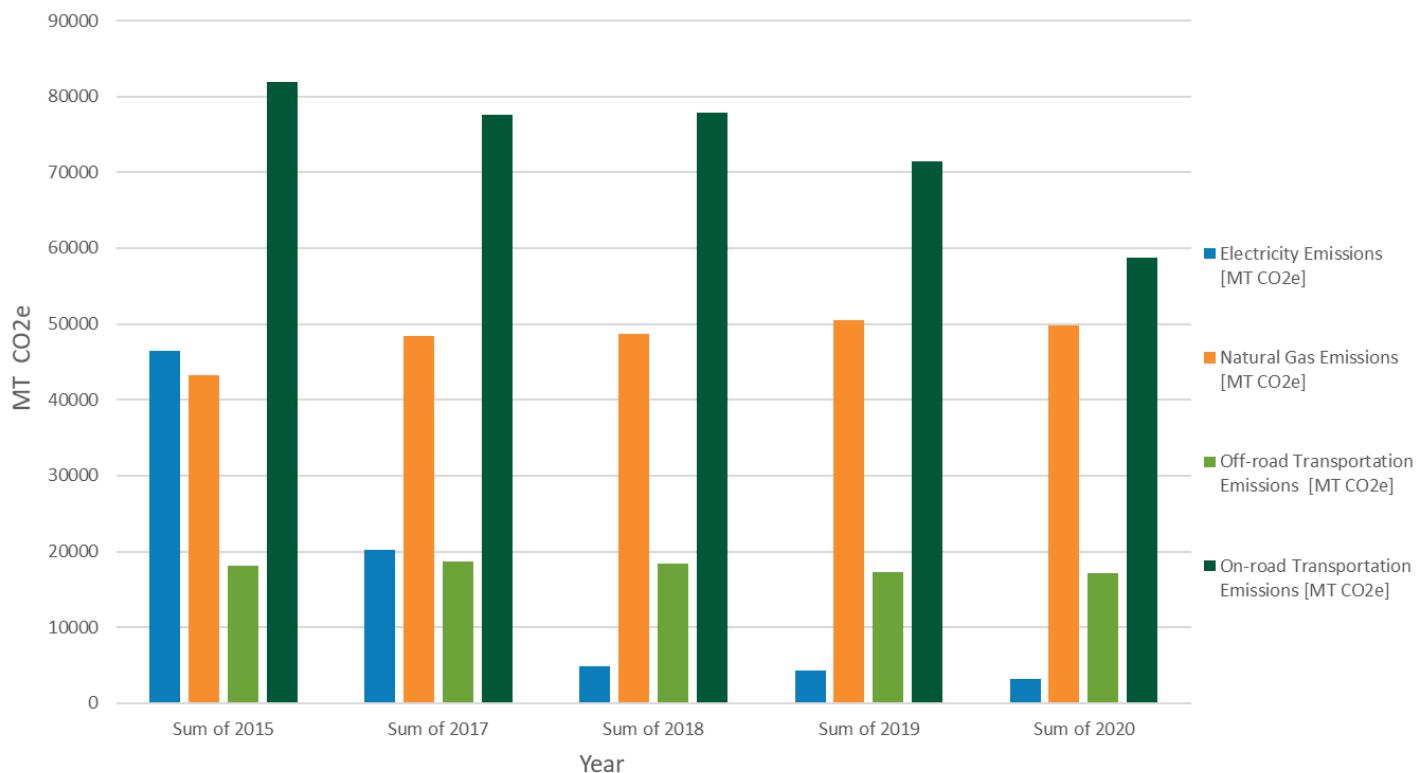
By completing an at-home analysis of current appliances in the building, the options available for retrofitting, and the applicable budget, a building owner can begin the path to all-electric. A major factor with this conversion is knowing the current capacity of the electrical panel in the building. Most older homes contain a 100-amp electrical panel which is suitable for the home's traditional electrical needs. The conversion to a larger 200-amp electrical panel may be necessary to make the switch to all-electric.

Upgrading to a larger panel will ensure capacity for retrofitting all appliances, but in some cases it is not always necessary. By using watt diet tools and having a professional energy audit conducted, there may be ways to make the switch using the building's current panel.

The CO2 emissions data will continue to be collected and analyzed as this CAP is implemented and reduction efforts are made. Figure 10 below reiterates the current CO2 status and the areas that need improvement.

Figure 10

Overall CO2 Emissions in Morgan Hill from Buildings and Vehicles



# Chapter 3:

# CAP Goals and Actions

City staff and members of the CAP Working Group have been dedicated to establishing a roadmap for GHG reduction that can be implemented to secure a resilient future for the City of Morgan Hill. The goals and actions in this Climate Action Plan have been set forth to assure that Morgan Hill is a leader in the community to mitigate climate change.

The strategies in this Chapter focus on areas of decarbonizing buildings and reducing emissions from on-road and off-road vehicles by increasing EVs and electric equipment to reach net zero emissions.



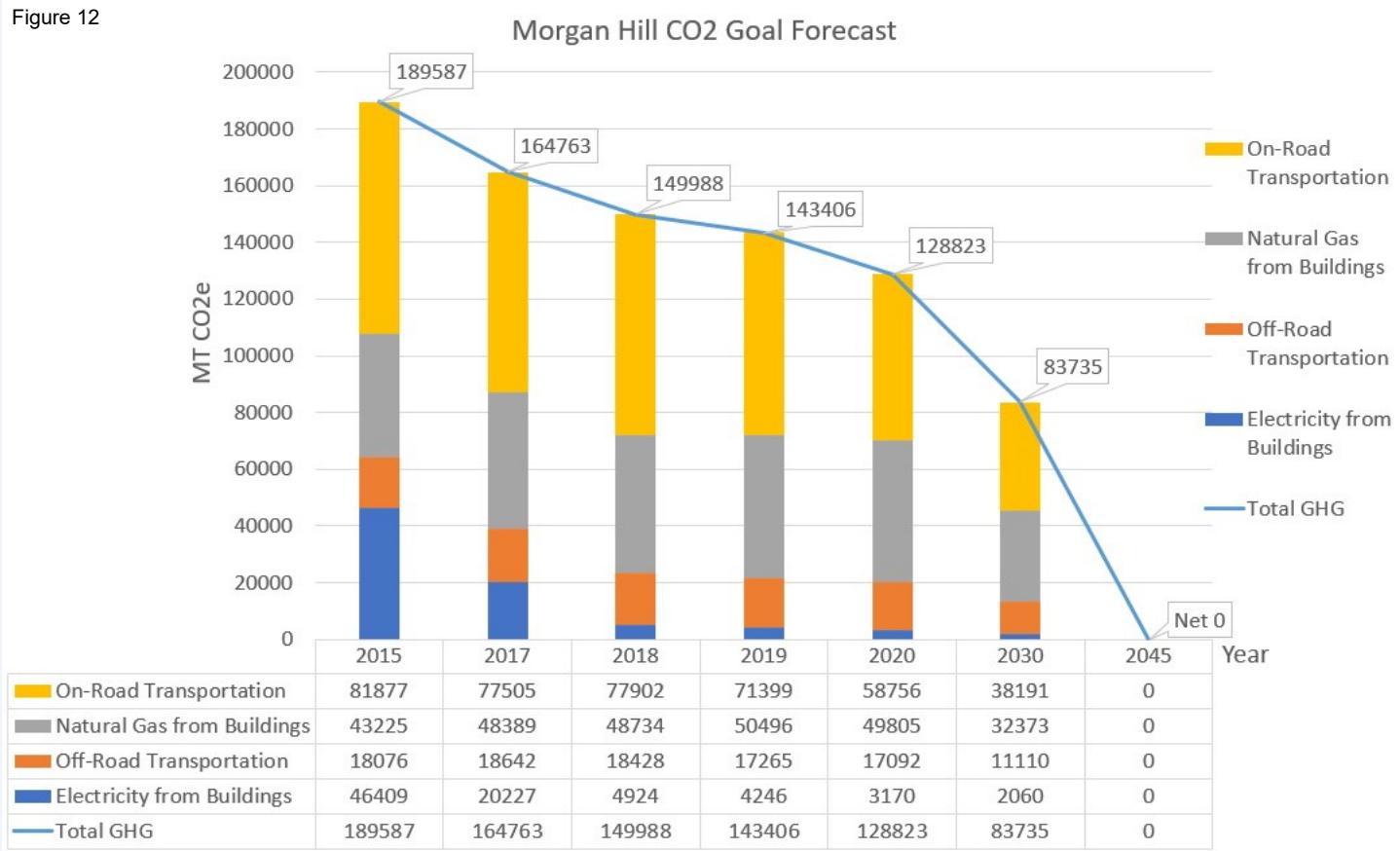
# 3.1 CAP Main Goal



## Main Goal:

Reduce Morgan Hill's net CO2 emissions in the building and transportation sectors 35% below the 2020 baseline level by 2030 and 100% below the 2020 baseline level by 2045.

Figure 12



Utilizing the goals established above for the City of Morgan Hill, Figure 12 displays where the CO2 emissions (in metric tons) will be with the overall target of 35% CO2 reduction by 2030 and 100% CO2 reduction by 2045.

## 3.2 CAP Sub-Goals

### Sub-Goals for Transportation Sector:

Utilizing a baseline of 2020,

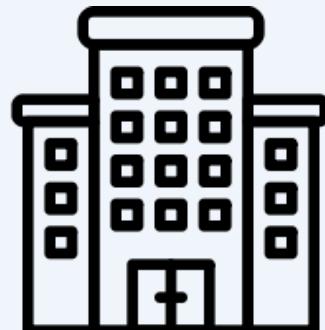


1. Expand electric vehicle charging station access for existing multifamily complexes by 30%, (i.e., the number of chargers in multifamily complexes will be equivalent to at least 30% of the number of units in multifamily complexes) by the year 2025 and 100% by 2035.
2. Transition 50% of the municipal fleet from fossil fuel to electric by 2030 and 100% by 2035.
3. Prohibit the construction of new gas stations in Morgan Hill.
4. Require newly-constructed residential buildings to have the necessary capacity to facilitate EV charging.
5. Install EV charging stations for at least 10% of available parking spaces in new non-residential projects.

### Sub-Goals for Building Sector:

Utilizing a baseline of 2020,

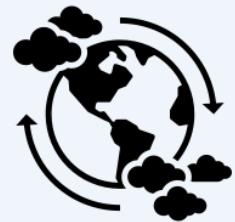
1. Transition 95% of existing buildings (*roughly 14,000*) in Morgan Hill to be all-electric by 2045, with additional targets every five years consisting of:
  - 1% of existing buildings by 2025
  - 10% of existing buildings by 2030
  - 35% of existing buildings by 2035
  - 70% of existing buildings by 2040
2. Convert all municipal buildings to all-electric by 2035.



# 3.3 Actions for Implementation

## Main Goal:

Reduce Morgan Hill's net carbon dioxide emissions in the building and transportation sectors 35% below the 2020 baseline level by 2030 and 100% below the 2020 baseline level by 2045.



## Action Items:

- a.** Continue to collect and analyze GHG data to identify areas of successes and needs for improvement.
- b.** Provide education for the community to increase building decarbonization and electric vehicle use through outreach methods such as community meetings, webinars, providing materials at events, and conducting surveys.
- c.** Partner with existing campaigns to increase community awareness of building decarbonization, neighbor-to-neighbor ambassador programs, and rebate options.
- d.** Support programs outside of this CAP that reduce vehicle miles travelled, which could include topics of nonmotorized transportation improvements, small EVs, carpool or telework programs, improvements of traffic flow, and increase of bus routes.
- e.** Coordinate a City-sponsored Clean Air Week consisting of:
  - EV car showcase
  - Electric landscaping alternative displays and demonstrations
  - Vehicle idling reduction promotion in congested areas
  - Outreach regarding bike lane updates and maps
  - Induction cooking display and demonstration
  - Variety of other outreach methods to encourage building decarbonization and electric vehicles

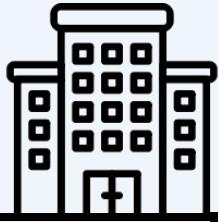
For the Transportation sector, with a baseline year of 2020, the following actions will be implemented to accomplish the sub-goals and overarching main goal.



<u>Sub-Goal:</u>	<u>Action Items:</u>
<p><b>1.</b> Expand electric vehicle charging station access for existing multifamily complexes by 30%, i.e., the number of chargers in multifamily complexes is equivalent to at least 30% of the number of units in multifamily complexes, by the year 2030 and 100% by 2035.</p>	<p><b>1.a.</b> Adopt an ordinance requiring the installation of EV chargers for at least 30% of the parking spaces based on the number of units in existing multifamily complexes by 2030.</p> <p><b>1.b.</b> Adopt an ordinance requiring the installation of EV chargers for at least 30% of the parking spaces based on the number of units in existing multifamily complexes when a complex is sold or an addition or large renovation valued at more than \$1,000,000.</p> <p><b>1.c.</b> Analyze and strategize preferential parking design when EV chargers are to be installed.</p>
<p><b>2.</b> Transition 50% of the municipal fleet from fossil fuel to electric by 2030 and 100% by 2035.</p>	<p><b>2.a.</b> Require every new vehicle purchase of municipal fleet to be electric once appropriate vehicles are available and realistically affordable.</p>
<p><b>3.</b> Prevent new gas stations from being built in Morgan Hill.</p>	<p><b>3.a.</b> Pass an ordinance by December 2022 preventing the installation of new gas stations that are not already in the permit pipeline.</p>

<p><u>Sub-Goal:</u></p> <p><b>4.</b> Require new residential buildings to have the capacity for EV charging, (e.g., install a raceway that can accommodate a 208/240-volt circuit branch).</p>	<p><u>Action Item:</u></p> <p><b>4.a.</b> Require all new construction of single family detached homes, townhouses, and other dwelling units with a garage to install a listed raceway to accommodate a 208/240-volt branch circuit for potential EV charging to be installed in accordance with the California Electrical Code, Article 625.</p> <p><b>4.b.</b> Adopt an ordinance to require new construction of multifamily buildings without garages to install EV chargers in at least 40% of the parking spaces based on the number of units in the building, compared to the CALGreen 2019 which required 10%.</p>
<p><u>Sub-Goal:</u></p> <p><b>5.</b> Install EV charging stations in at least 10% of available parking spaces in new non-residential projects.</p>	<p><u>Action Item:</u></p> <p><b>5.a.</b> Require new construction of nonresidential buildings to comply with section 5.106.5.3 of CALGreen Standards Code, Title 21, Part 11.</p>

For the Building sector, with a baseline year of 2020, the following actions will be implemented to accomplish the accompanying sub-goals and the



Sub-Goal:

**1.** Transition 95% of existing buildings (roughly 14,000) in Morgan Hill to all-electric by 2045, with incremental targets every five years consisting of:

- 1% by 2025
- 10% by 2030
- 35% by 2035
- 70% by 2040

Action Items:

- 1.a.** Initiate a program to assist property owners with the transition to all-electric:
  - research financial assistance programs
  - provide energy audits
  - adopt an ordinance requiring retrofitting appliances at resale
- 1.b.** Provide resources to property owners including a list of contractors, rebate information, and alternative appliance options.
- 1.c.** Coordinate training and education for contractors.
- 1.d.** Adopt an ordinance requiring additions over 1,000 square feet to existing buildings/properties to be all-electric unless the addition is not going to result in the addition or expansion of the existing water or space heating system.
- 1.e.** Launch a loaner induction program with cooking demonstrations.

	<p><b>1.f.</b> Create incentive programs for commercial buildings to convert rooftop HVAC systems to all-electric.</p> <p><b>1.g.</b> Look at opportunities to encourage or mandate direct access customers (those businesses that independently procure electricity) to switch to carbon-free power.</p> <p><b>1.h.</b> Evaluate opportunities to facilitate permit approvals</p>
<p><b>Sub-Goal:</b></p> <p><b>2.</b> Convert all municipal buildings to all-electric by 2035.</p>	<p><b>Action Item:</b></p> <p><b>2.a.</b> Appropriate funding to a conversion budget reserve fund annually.</p>

# Chapter 4:

# Appendix



## Work Cited:

- [Sustainable Morgan Hill](#)
- [California Air Resource Board](#)
- [Senate Bill No. 32](#)
- [Intergovernmental Panel on Climate Change](#)
- [Executive Order N-79-20](#)
- [Assembly Bill No. 1346](#)
- [Renewable Portfolio Standard \(RPS\)](#)
- [Assembly Bill No. 1493](#)
- [Low Carbon Fuel Standard](#)
- [Title 24 of the California Code of Regulations](#)
- [Assembly Bill No. 1470](#)
- [2019 California Green Buildings Standards Code - CALGreen](#)
- [Senate Bill No. 68](#)
- [Silicon Valley Clean Energy](#)
- [California Energy Commission](#)
- [BAYREN](#)
- [Building Decarbonization Coalition](#)
- [Bay Area Energy Atlas](#)
- [Switch Is On](#)
- [Energy.gov](#)