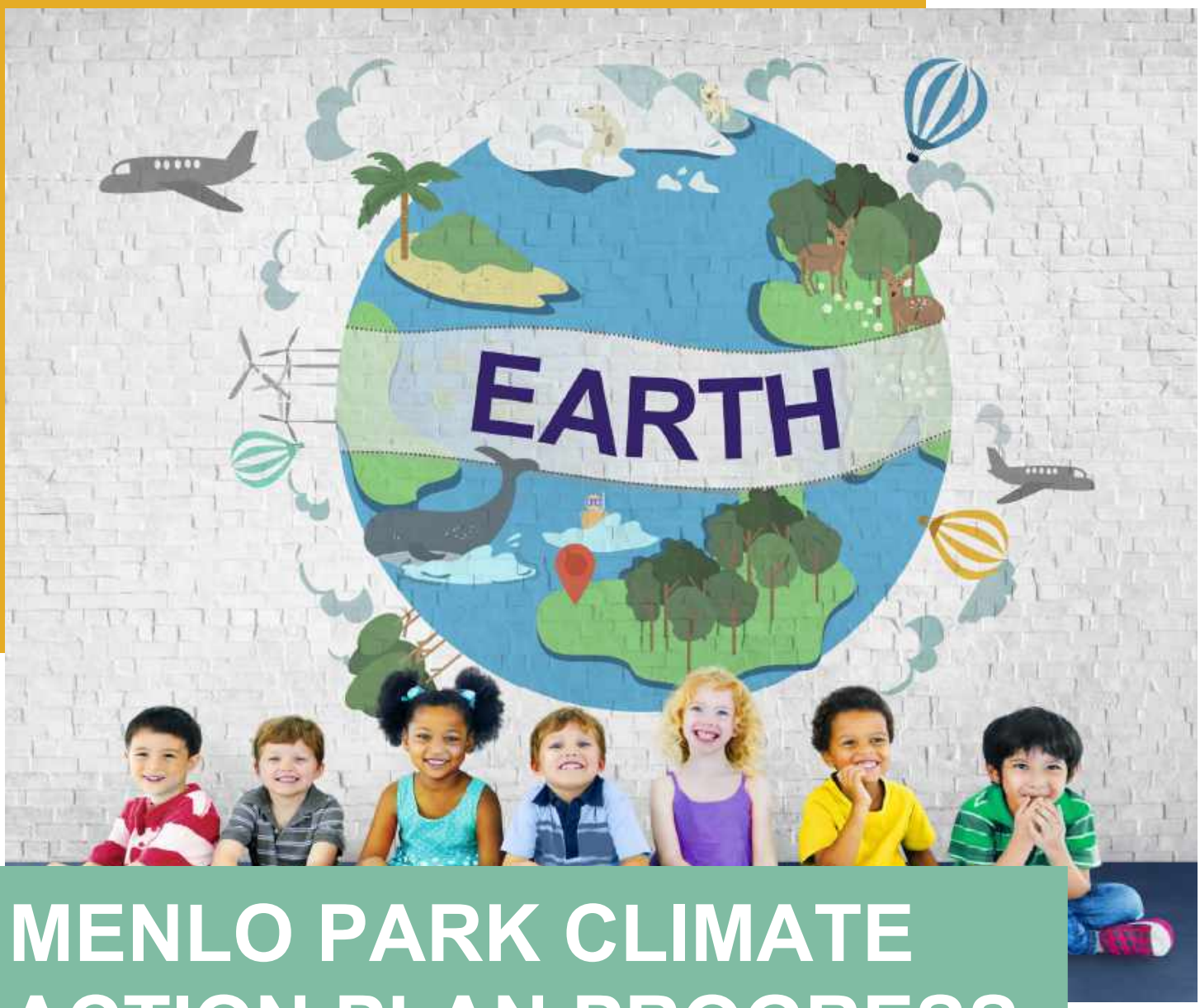


MENLO PARK CLIMATE ACTION PLAN PROGRESS REPORT

Transmitted to City Council on October 12, 2021

Prepared for the City of Menlo Park, Office of Sustainability

Prepared by Municipal Plan Check Services

MUNICIPAL
PLAN CHECK SERVICES

CONTENTS

EXECUTIVE SUMMARY

Climate Action Plan

The City of Menlo Park adopted its first Climate Action Plan in 2009. The goal of this plan was to reduce communitywide greenhouse gas (GHG) emissions 27 percent below 2005 levels by 2020. The most recent data shows the City has reached this goal even with continued development. This can be attributed to reductions from:

- Waste related emissions (-15,723 tons) due to:
  - Installation of gas capture devices at the primary landfill that services Menlo Park, Ox Mountain landfill.
  - Improved sorting and waste diverted from landfill. Note, this is largely due to statewide requirements and regional cooperation.

- Building energy use: electricity related emissions (-64,591 tons) due to:
  - State mandates requiring energy providers, such as Pacific Gas & Electric and Peninsula Clean Energy to obtain power with lower emissions[1] and from renewable sources[2].
  - Menlo Park subscribing all residents and businesses to the community choice aggregate, Peninsula Clean Energy (PCE)[3]. PCE provides Menlo Park with cleaner electricity, from more renewable sources (e.g., solar, wind, and geothermal) to reduce the consumption of fossil fuels (like natural gas). As of 2021, all electricity provided by PCE is 100% carbon-free and is on track to be 100% renewable by 2025. It should be noted this single measure reduced building energy use: electricity related emissions by 24,689 tons in one year (2016-2017).

- Transportation related emissions (-36,657 tons between 2017 and 2019) due to:
  - Increased state mandated fuel efficiency and emission standards.
  - This is also a possible indication of increased zero emission vehicle adoption and/or local trip and vehicle miles traveled reduction measures.

It should be noted, despite recent reduction, the most significant source of emissions continue to be transportation (48.2 percent) and building energy use: natural gas (41.2 percent).For detailed inventory, refer to Communitywide Greenhouse Gas Inventory section.

At the time of adoption, the community, City Council, and staff believed this would be a challenging and costly goal to achieve. Fortunately, due to progressive state policy allowing for the formation of community choice aggregation programs (CCAs), Menlo Park has

---

[1] Assembly Bill 32, the California Global Warming Solutions Act (2006) arb.ca.gov/cc/ab32/ab32.htm
[2] Senate Bill X1-2, Renewables Portfolio Standard (2011) leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_bill_20110412_chaptered.pdf
[3] Peninsula Clean Energy: peninsulacleanenergy.com

achieved the GHG reduction needed to meet this goal. Through CCAs cities and counties can now buy or generate more renewable and/or lower carbon intensive electricity for residents and businesses using Pacific Gas and Electric's transmission and distribution infrastructure. In 2016, Peninsula Clean Energy (PCE) was formed and began delivering carbon-free and renewable energy to San Mateo County and all 20 of its cities and towns, including Menlo Park.

The CCA program, through PCE electricity, is the largest contributing factor in Menlo Park meeting its 2020 GHG emissions reduction goal. Additionally, this measure was and continues to be cost effective for the community and city operations.

This paved the way for, Menlo Park to amend the building codes (known as reach codes) in 2019 to require new buildings to be all-electric. The reach codes allow the community to capitalize on PCE's carbon-free electricity and eliminate the use of natural gas in new buildings, curbing climate change impacts in new construction.

Even though Menlo Park has reached its 2020 GHG reduction goal, the urgency to address climate change remains unchanged. As a result, the community, the Environmental Quality Commission, and the City Council remain committed to addressing climate change. In alignment with the United Nations Intergovernmental Panel on Climate Change's and the City Council declaring a climate emergency in 2019, a new Climate Action Plan was adopted in July 2020. The 2030 Climate Action Plan (CAP) outlines six initial strategies to achieve carbon neutrality by 2030[4]:

1. Explore policy/program options to convert 95% of existing buildings to all-electric by 2030
2. Set citywide goals for increasing electric vehicles to 100% of new vehicles by 2025 and decreasing gasoline sales 10% a year from a 2018 baseline
3. Expand access to electric vehicle (EV) charging for multifamily and commercial properties
4. Reduce vehicle miles traveled (VMT) by 25% or an amount recommended by the Complete Streets Commission
5. Eliminate the use of fossil fuels from municipal operations
6. Develop a climate adaption plan to protect the community from sea level rise and flooding

Results and adopted CAP strategies progress

This is the first progress report for 2030 CAP (2020) since its adoption, and largely reflects data from 2019 under the previous plan. However, it does provide important clues on next steps to achieve carbon neutrality by 2030. In addition, adjustments to reporting methodology and reframing of some CAP goals were identified to increase efficiency, accuracy, and help communicate city level actions from year to year.

[4] Menlo Park Climate Action Plan: menlopark.org/305/Climate-Action-Plan

The following table provides an overview of the formal metrics/methodology and communication of strategy results for future progress reports. This information will be included when the 2030 Climate Action Plan is updated and/or amended. Note, in addition to proposed metrics, reporting for each strategy will include a short narrative describing the status of related projects, initiatives, and/or activities implemented by the city and/or its partners. This reporting will be supplemental to GHG inventories.

2030 CAP strategy progress summary				
CAP strategy	**2021 Scope of work status**	**Metric(s) to measure progress going forward**	**Results**	**On track to achieve carbon neutrality by 2030**
Explore policy/program options to convert 95% of existing buildings to all-electric by 2030	**Completed:** Completed Council directed cost effectiveness and policy options analysis[5] **New work underway**: Implement council direction from August 31 meeting	1. Changes/trends in therms of natural gas consumed (commercial and residential)	From 2017-2019, natural gas consumption has increased an average of 4.61% per year primarily in the commercial sector. However, this was before all-electric reach codes became effective for new construction in 2020. It is anticipated that natural gas emissions will flatten	**No.** There is an upward trend in consumption of natural gas and related emissions, particularly in the commercial sector
Increase *total* EVs in the community and decrease gasoline sales 10% per year from a 2018 baseline *Reframed to reflect overall community transition to EVs rather than new vehicle purchases	**Ongoing, currently underway or being implemented:** Beyond Gas Initiative under Joint Venture Silicon Valley	1. Changes/trends in total full battery EVs registered in Menlo Park 2. Changes/trends in total gallons of fossil fuel (gasoline/diesel) sales	1. Since the DMV began tracking vehicle population (2010), there has been a steady and persistent upward trend EV adoption in Menlo Park. However, EVs make up only 6.71% of total vehicles 2. From 2017-2019[6], fossil fuel (gasoline/diesel) sales have decreased an average of 6.62% per year	**No.** While there is an upward trend in EV adoption and downward trend in gasoline consumption, current rates are not rapid enough to meet the 2030 carbon neutrality goal

[5] Menlo Park City Council staff report 21-170-CC, August 31, 2021: menlopark.org/DocumentCenter/View/29521/F1-20210831-CC-CAP-No-1-SS
[6] Note, while 2020 fossil fuel sale data is available, it will be excluded until the impacts due to COVID-19 pandemic are known.

2030 CAP strategy progress summary				
CAP strategy	**2021 Scope of work status**	**Metric(s) to measure progress going forward**	**Results**	**On track to achieve carbon neutrality by 2030**
Expand access to EV charging for multifamily and commercial properties	**Completed:** EV charging gap analysis[7] (Fall 2020) **Ongoing, currently underway or being implemented:** – Monitor effectiveness of state and regional incentives – Local outreach of the incentives (Fall 2021) – Launch additional incentive for multifamily EV charging (Fall 2021)	1. Changes/trends in multifamily households with access to onsite EV charging 2. Changes/trends in multifamily households with access to public EV charging within 0.25 miles 3. Changes/trends of commercial properties with EV charging	1. Currently 0.97% of multifamily households have EV charging onsite. 2. Currently 2.46% of multifamily households have EV charging within 0.25 miles. 3. To be included in reporting next year	**No.** To achieve necessary EV adoption levels, all multifamily units will need convenient (at minimum within 0.25 miles, onsite preferred) access to readily available and affordable EV charging
Reduce vehicle miles traveled by 25% *by increasing/enhancing multi-modal opportunities and infrastructure to reduce community dependence on personal vehicle travel.* *Reframed with additional context on city ability to influence behavior through infrastructure/program development	**Ongoing, currently underway or being implemented:** – Transportation Master Plan (2020) implementation – Transportation Management Association development – General Plan update (Senate Bill 2 housing grant)	1. Increases in participation in mode share programs and percent change trends in mode sharing behavior (if available) 2. Miles of multi-modal infrastructure installed and/or improved	1. To be included in reporting next year 2. To be included in reporting next year	**Not clear yet.** It is anticipated that as a result of the projects and programs underway or ongoing that there will be an increase in multi-modal participation and opportunities. However, it is unclear if it will be enough to meet the 2030 carbon neutrality goal

[7] Menlo Park City Council staff report 20-239-CC, October 27, 2020: menlopark.org/DocumentCenter/View/26523/G4-20201027-CC-EV-charging

2030 CAP strategy progress summary				
CAP strategy	**2021 Scope of work status**	**Metric(s) to measure progress going forward**	**Results**	**On track to achieve carbon neutrality by 2030**
Eliminate the use of fossil fuels from municipal operations	**Ongoing, currently underway or being implemented:** – Clean energy package for Menlo Park Community Campus. – Long-term planning and strategy development to eliminate fossil fuels at city facilities. – Electric leaf blower pilot	1. Changes/trends in tons of greenhouse gas emissions from municipal operations 2. Changes/trends in gasoline consumption by vehicle type/use 3. Changes/trends in natural gas consumption by building	1. Available inventories from 2016-2019 show an average reduction of 7.45% per year 2. To be included in reporting next year 3. To be included in reporting next year	**No.** Despite downward trends, it is unlikely to be enough to meet the 2030 carbon neutrality goal. Requires longer term resources to address
Increase community resiliency to adapt to climate change *Reframed to expand scope beyond sea level rise impacts and include multiple long term planning efforts underway	**Ongoing, currently underway or being implemented:** – SAFER Bay Project – Partnership with OneShoreline. – Local Hazard Mitigation Plan adoption and implementation. – Safety and Environmental Justice (General Plan) Element adoption and implementation	1. Implementation status of long term planning efforts 2. Miles of shoreline protected against sea level rise	1. There are multiple long term planning efforts and groundbreaking project underway. Further detail is provided in Strategy No. 6 section of this report 2. To be included in reporting next year	**Not applicable**. GHG reductions cannot be measured for climate resiliency and adaptation. However, based on the long-term plans currently underway, it is anticipated that additional resources will be needed to proactively protect the community's quality of life from climate change impacts

For a detailed summary of efforts to date, refer to 2021 scope of work and progress to date section. For Environmental Quality Commissions (EQC) selected metrics including data limitations and considerations, refer to Climate action plan metrics section. However, note that the EQC metrics are best suited for individual policy/program development and will not be used going forward for annual reporting.

While Menlo Park shows encouraging emissions reductions, the adopted strategies and scope of work are not substantial enough to achieve carbon neutral by 2030. Considering the COVID-19 pandemic, the EQC presented an intentionally pared down plan, with the understanding that some action is better than no action. The 2030 CAP acknowledges these six strategies are by no means the best plan, simply the highest impact actions, and should be expanded upon when feasible.

Furthermore, current staffing constraints are such that, city council has only approved city work for strategies no. 1 (existing building electrification), no. 3 (expand access to EV charging), and no. 5 (eliminate fossil fuels from municipal operations). To achieve carbon neutrality in the next 8 years, additional resources are required to not only to successfully implement the six adopted strategies, but also scope and develop long term, aggressive reductions strategies.

CLIMATE ACTION PLAN STRATEGIES

2021 scope of work and progress to date

In April, the City Council approved a 2021 scope of work to implement the adopted six CAP strategies. The following is a summary of progress including related projects, initiatives, and/or activities related to the 2030 Climate Action Plan strategy implementation.

Strategy No. 1: Explore policy/program options to convert 95% of existing buildings to all-electric by 2030

Scope of work: Like the reach codes for new construction, Menlo Park is seeking to capitalize on Peninsula Clean Energy's carbon-free and increasingly renewable electricity by developing and implementing all-electric codes and/or programs for existing buildings.

The project is well underway and is considered a top priority[8] of the City Council's 2021 annual work plan. The following is a summary of project milestones:

- May/June 2021: Complete cost effectiveness analysis on various policy/program pathways toward achieving 95% electrification by 2030
- June/July 2021: Environmental Quality Commission provides advice to City Council on cost effectiveness analysis and potential pathways to achieve electrification goals for existing buildings
- August 2021: City Council reviews policy/program

Progress and next steps

This project is anticipated to meet the milestones listed.

Additionally, in 2019, the City adopted local building codes known as reach codes[9] requiring new buildings to be all-electric with limited exceptions. Considering, all Menlo Park residents and businesses receive carbon-free electricity[10], this measure is expected to maintain current levels or even slightly reduce, natural gas consumption emissions in the community.

As of May 2021, 87 new building permits (84 single family residential and 3 mixed use commercial/multifamily residential) have been subject to the provisions of the reach code.

---

[8] Menlo Park City Council 2021 annual work plan priorities: menlopark.org/DocumentCenter/View/27924/F1-20210420-CC-CC-priorities

[9] Menlo Park reach codes: menlopark.org/1583/Reach-codes

[10] As mandated by the state and through automatic enrollment in Peninsula Clean Energy service.

Strategy No. 2: Set citywide goals for increasing electric vehicles (EVs) to 100% of new vehicles by 2025 and decreasing gasoline sales 10% a year from a 2018 baseline

Scope of work: Implementation deferred to the Beyond Gas Initiative (BGI) under Joint Venture Silicon Valley[11].

Progress and next steps

BGI is currently gathering data on gasoline consumption and electric vehicle adoption at the county, city, and zip code level. BGI also signed a memorandum of understanding with Joint Venture Silicon Valley in September 2020 to promote climate, health & equity by speeding the transition from gasoline to cleaner alternatives in Silicon Valley.

BGI goals:

- Reduce gasoline consumption in Silicon Valley 50% by 2030.
- Shift transportation culture to reject gasoline and embrace cleaner alternatives.

BGI's methods to achieve those goals are:

- Build a coalition of government, business, and organization leaders to advance effective gasoline reduction policies.
- Collect data regarding gasoline use, the adoption of alternative transportation and city and business gasoline reduction policies, and commitments in Silicon Valley in collaboration with Joint Venture's Institute for Regional Studies.
  - Note: city staff has coordinated estimated fossil fuel (e.g., gasoline and diesel) sales and zero-emissions vehicles registration data collection to be shared with local stakeholders, such as Beyond Gas Initiative.
- Partner with cities to adopt gasoline reduction measures such as public fleet electrification, vendor clean delivery requirements, and citywide gasoline sales reduction goals.
  - Note: In addition to the goal outlined in this strategy, in March 2020, Menlo Park adopted the Sustainable Fleet Policy prioritizing the purchase of zero-emission vehicles as a first option and establishing a fossil fuel (e.g., gasoline and diesel) reduction goal of 5 percent annually over 2018 baseline.
- Partner with businesses interested in making gasoline-reduction commitments to take actions such as electrifying corporate fleets, reducing gas-powered deliveries, and enabling employees to avoid using gasoline in connection with work.
- Inspire Silicon Valley elected officials to call publicly for a gasoline-free future; gain news and media coverage of the Beyond Gasoline Initiative; convene performance art and cultural events.
- Publish a gasoline picture book and promote it to elementary school districts and library branches. Launch a Beyond Gasoline website and digital campaign.

[11] Beyond Gasoline Initiative: jointventure.org/initiatives/climate-change/beyond-gasoline

Strategy No. 3: Expand access to electric vehicle (EV) charging for multifamily and commercial properties

Scope of work: To align with Governor Executive Order N-79-20[12] banning the sale of new fossil fuel (e.g., gasoline and diesel) vehicles by 2035 and take advantage of available EV charging incentive programs, the City will:

- Monitor the effectiveness of state and regional charging infrastructure incentives.
- Promote/market the state and regional charging infrastructure incentives to multifamily property owners.
- Offer up to $10,000 in additional incentives to multifamily property owners.

Progress and next steps

In Fall 2020, city staff completed an electric vehicle charging gap analysis to identify barriers to accelerate zero-emission (specifically full battery electric) vehicle adoption[13]. A key finding was adoption rates are closely linked to access to at-home charging. While this is not typically a problem for single-family homes, it is problematic for multifamily properties.

Though there are several public EV charging spaces available in Menlo Park, they are located at a limited number of sites; primarily on the Facebook campus and/or other public locations that are not convenient for overnight charging. This indicates a severe deficiency of on-site EV charging infrastructure at multifamily properties.

The analysis found less than 2.5 percent of existing multifamily properties have EV charging available at or near (within 0.25 miles) their respective locations. Multifamily property residents, roughly 40 percent of Menlo Park's population, do not have ready access to on-site charging. This lack of on-site EV charging infrastructure results in substantial equity and barrier issues for EV ownership and/or use.

The deficiency of on-site charging at multifamily properties will also negatively impact the implementation of CAP strategies No.2 (increase EV purchase/use and decrease gasoline sales) and No. 4 (reduce vehicle miles traveled).

These findings are consistent with analysis[14] performed for East Bay Community Energy, a local community choice energy provider servicing Alameda County and 14 cities (Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Tracy, and Union City).

The next steps include:

---

[12] Executive Order N-79-20: library.ca.gov/Content/pdf/GovernmentPublications/executive-order-proclamation/40-N-79-20.pdf

[13] Menlo Park City Council staff report 20-239-CC, October 27, 2020: menlopark.org/DocumentCenter/View/26523/G4-20201027-CC-EV-charging

[14] Innovations in Electric Vehicle Charging for Multi-unit Dwellings: res.cloudinary.com/diactiwk7/image/upload/v1614128486/FINAL-REPORT_Ecology-Action_Innovation_in_EV_Charging_for_MUDs_kgtbh3.pdf

- Continue to monitor and track incentive penetration for multifamily properties in Menlo Park by tracking:
  - Number of new electric vehicle charging stations installed at multifamily and commercial properties
  - Participation in regional funding programs

To determine the number of new electric vehicle charging stations installed at multifamily and commercial properties, staff evaluated city permit data. Relevant permits were identified as alterations or additions which specified installation of EV charging stations or infrastructure (i.e., electrical upgrades, wiring, etc.).

Data limitation(s) and/or consideration(s): Level 1 charger installation (120v household plug) may not be included if no electrical upgrade (permit) was required.

Table 1 and 2 describes the number of building permits issued to install electric vehicle charging infrastructure in existing multifamily and commercial properties:

Table 1: Electric vehicle charging permits at multifamily properties

Year	Total related permits	Comments
2017	5	4 charging ports installed (dedicated parking spaces). 1 upgrade to electrical service for future EV charging installation.
2018	6	29 charging stations installed (at least 3 in dedicated parking spaces, total port/spaces unknown).
2019	3	2 charging stations installed (total port/spaces unknown). 10 prewired spaces for future EV charging installation.
2020	1	1 charging station installed (total port/spaces unknown).

Table 2: Electric vehicle charging permits at commercial properties

Year	Total related permits	Comments
2017	9	33 charging stations installed (total port/spaces unknown).
2018	13	65 charging stations installed (total port/spaces unknown), and 4 EV chargers relocated. This includes the installation of three 120v household plugs (Level 1) in addition to two Level 2 chargers in one location.
2019	0	None.
2020	3	51 charging stations installed (total port/spaces unknown).

  - Participation in regional funding programs was reported to the City by Peninsula Clean Energy (PCE). Currently, PCE is administrating its EV Ready Program[15] which features $24M in incentives. These incentives are available to all PCE customers. PCE reports five multifamily properties in Menlo Park have applications that are currently under review. The scope of these projects is currently unknown,

[15] Peninsula Clean Energy, EV Ready Program: peninsulacleanenergy.com/ev-ready/

and the properties vary in size from 4 to 41 units. Note, two locations have yet to confirm total units in the building/complex.

- Implement an additional Menlo Park incentive for multifamily properties to install EV charging stations. Work anticipated to begin Fall 2021.
- Market and educate multifamily property owners about EV charging and available incentives. Work anticipated to begin in Fall of 2021.

Strategy No. 4: Reduce vehicle miles traveled (VMT) by 25% or an amount recommended by the Complete Streets Commission

Scope of work: Reduce VMT through the implementation of the Transportation Master Plan, utilization of Senate Bill 2 Housing grant, formation of a Transportation Management Association, and implementation of the VMT guidelines for new development.

Progress and next steps

Transportation Master Plan implementation

In November 2020, the City Council adopted the Transportation Master Plan (TMP)[16]. The 2020-21 Capital Improvement Plan (CIP) has 14 projects in the TMP either underway or programmed. Many of these projects are beneficial to reducing VMT since they will improve bicycle and pedestrian infrastructure by either closing gaps or upgrading existing facilities, encouraging more bicycle and pedestrian usage. One project is also expected improve transit travel times, encouraging more transit use. Table 3 summarizes the status of these projects and describes expected VMT benefit:

[16] Menlo Park Transportation Master Plan: menlopark.org/1147/Transportation-Master-Plan

Table 3: Status of Transportation Master Plan Projects in Capital Improvement Plan			
Project	**TMP Project Number (Priority)**	**VMT Benefit**	**Status**
Active Projects			
Haven Avenue Streetscape	1, 2 (Tier 1)	Close bicycle and pedestrian gap	Construction to start in FY21-22
Middle Avenue Bicycle and Pedestrian Crossing	81 (Tier 1)	Improve bicycle and pedestrian infrastructure	Design phase
Traffic Signal Modifications: Ravenswood/Laurel	74 (Tier 1)	Improve bicycle and pedestrian infrastructure	Construction to start in 2021
Willow Oaks Bike Connector	59 (Tier 1)	Improve bicycle and pedestrian infrastructure	Design phase
Funded/On Hold Projects			
Caltrain Grade Separation	Regional	Provide pedestrian and bicycle infrastructure, Reduce transit travel times	On hold
Future Year Programmed Projects			
El Camino Real Crossings Improvements	85, 91, 92, 95 (Tier 1)	Improve pedestrian and bicycle infrastructure	Not started, programmed for FY 21-22
Middle Avenue Complete Streets	118 (Tier 1)	Provide pedestrian and bicycle infrastructure	Not started, programmed for FY 21-22
Middlefield-Linfield Santa Monica Crosswalk	65 (Tier 1)	Improve pedestrian and bicycle infrastructure	Not started, programmed for FY 21-22
Willow Road and Newbridge Bicycle and Pedestrian Improvements	28, 37 (Tier 2)	Improve pedestrian infrastructure	Not started, programmed for FY 22-23

Note: the named projects may encompass multiple TMP efforts which may result in a single project name having multiple project numbers.

In addition to the 20-21 CIP projects, the following multi-modal transportation projects were funded prior to TMP adoption and are underway or have been completed:

- Chilco Street and Sidewalk Installation
- Oak Grove Safe Routes to School and Green Infrastructure
- Pierce Road sidewalk and San Mateo Drive bike route installation
- Santa Cruz Avenue repaving (including sidewalk and bike lane installation)
- Sharon Road sidewalks
- Sidewalk Repair and Replacement program

Required infrastructure that can also reduce VMT:

- Bayfront Pedestrian and Bicycle Bridge: required condition for the Facebook West Campus project
- Garwood Way bicycle route: required mitigation measure for the 1300 El Camino Real project

Walk audits were added to the TMP as part of the Safe Routes to School program. Due to the most students being remote or partially remote for the 2020 school year, virtual walk audits were performed for most schools in the spring with staff participating in an in-person walk audit for Belle Haven Elementary.

The VMT guidelines in the Transportation Master Plan also call out reducing the VMT per capita and VMT per employee metrics which are aligned with the VMT standards in the City's Transportation Impact Analysis guidelines.

Implementation of vehicle miles traveled (VMT) guidelines for new development:
In June 2020, the City Council adopted new standards and updated the Transportation Impact Analysis[17] (TIA) guidelines[18]. The TIA guidelines have been adopted with the purpose of disclosing potential transportation impacts, such as increased VMT, resultant from new development or capital improvement projects in Menlo Park. TIA guidelines ensure compliance with both state (California Environmental Quality Act) and local (e.g., General Plan, Climate Action Plan, etc.) requirements.

The timing of how often VMT will be measured has not been established. However, development of the methodology, reporting mechanism, and a reduction target are expected to be part of the Complete Streets Commission work plan in 2022-23.

- Note: The VMT standards in TIA guidelines were developed using the City's Travel Demand Model and may have different results than other methodologies (i.e., Google Environmental Insight Explorer, California Department of Transportation Highway Performance Monitoring System, etc.).
- Approved development project subject to new VMT reduction guidelines:
  - 111 Independence Drive[19]
  - Note: project is also subject to the City's Transportation Demand Management Ordinance[20] that requires a 20 percent reduction in trip generation.

Transportation Management Association (TMA)
The goal of a TMA is to coordinate logistics and transportation demand management (TDM) services amongst multiple member businesses. Instead of an individual business providing TDM services (e.g., shuttles, public transportation discount programs, etc.) for their employees, a TMA allows multiple businesses to share resources and creates cost-efficiency, allowing smaller businesses to access services that may otherwise be unaffordable. These services provide customized alternative transportation options to reduce single-vehicle travel amongst commuters.

---

[17] The TIA is a tool used for development or capital projects to ensure that a thorough transportation analysis occurs for all projects that might result in impacts under the California Environmental Quality Act and in conformance with the City's General Plan.
[18] Menlo Park Transportation Impact Analysis: menlopark.org/DocumentCenter/View/302/Transportation-Impact-Analysis-Guidelines
[19] 111 Independence Drive: menlopark.org/1571/111-Independence-Drive
[20] Menlo Park Transportation Demand Management Ordinance (Municipal Code Section 16.45.090): codepublishing.com/CA/MenloPark/#!/MenloPark16/MenloPark1645.html#16.45.090

Since the adoption of this CAP strategy there have many external factors which impact commute patterns and the transportation system. Specifically, the COVID-19 pandemic which shifted attitudes toward public transportation and remote work policies, and the formation of the subregional TMA, Manzanita Works[21]. In responses to these factors, the following three TMA objectives were developed[22]:

- Objective 1: Endorse and support regional and sub-regional TDM efforts
- Objective 2: Ensure TDM is available for all businesses
- Objective 3: City can serve as an example of an employer with a robust and collaborative TDM program

The TMA feasibility study to achieve these objectives is nearing completion. A final report and proposed next steps will be presented to City Council in August 2021.

Senate Bill 2 Housing grant

The City was awarded a grant under Senate Bill 2[23] (SB 2) to accelerate/encourage housing production within Menlo Park. These actions are designed to locate additional units in already urban/built-up areas, such as existing single-family neighborhoods that are potentially walkable/bikeable to transit and jobs, or downtown near local and regional transit lines as well as near the commercial core of Menlo Park. This type of infill development reduces dependence on vehicles for everyday activities/errands and vehicle miles traveled.

The City's housing grant application to accelerate/encourage housing production, specifically in urban/built-up areas will be considered part of the 2023-2031 Housing Element Update[24]. The City is currently updating its required Housing Element and Safety Element, and preparing a new Environmental Justice Element.

Strategy No. 5: Eliminate the use of fossil fuels from municipal operations

Scope of work: The City owns, operates, and manages an array of equipment and facilities to provide the community with specialized services. To reduce related emissions in the provision of these services, the following direction was given by City Council:

- Utilize current resources and available budget toward eliminating fossil fuels in building the new Menlo Park Community Campus.
- Replace fossil fuel appliances/assets at the end of life with non-fossil fuel options unless infeasible.
- Pilot program to transition landscaping equipment from gas to electric.

---

[21] Manzanita Works: manzanita.works
[22] Menlo Park City Council staff report 21-074-CC, April 13, 2021: menlopark.org/DocumentCenter/View/27882/L3-20210413-CC-TMA-update
[23] Senate Bill No. 2 Chapter 364: leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB2
[24] 2023-2031 Housing Element update: menlopark.org/housingelement

Progress and next steps

Menlo Park Community Campus (MPCC)

In collaboration with Facebook, the City is in the process of building a new multigenerational community center and library on the site of the current Onetta Harris Community Center, Menlo Park Senior Center, Belle Haven Youth Center, and Belle Haven Pool (100-110 Terminal Avenue).

To showcase Menlo Park's sustainability leadership, this project aims to achieve:

- LEED Platinum certification
- Full building/facility including pool electrification (no natural gas consumption)
- Installation of a renewable power microgrid system. To support the development of a resilient and cost-effective islandable (off-grid for operation as a Red Cross emergency center), renewable energy project, the system will include:
  - Solar PV (building/facility energy use) and solar water heating (Belle Haven Pool)
  - Battery energy storage systems
  - Microgrid energy management systems (MEMS)
  - Electric vehicle charging stations

A renewable power microgrid feasibility study was completed in 2020 and City Council approved developing a request for proposals to consider the installation of a renewable power microgrid system. Proposals for Solar PV Microgrid and Electric Vehicle Charger Design, Installation, and Operation[25] (renewable power microgrid system) were submitted May 2021 and are currently under review. Contract award will be conducted during a public hearing anticipated in August/September 2021. If approved, this would eliminate the use of fossil fuel consumption at this site (including the Belle Haven Pool which is the largest greenhouse gas contributor).

Electrification of existing city facilities

The City of Menlo Park currently owns and operates the following city facilities and buildings:

- Menlo Park Civic Center Complex:
  - City Hall & Police Department (701 Laurel Street)
  - City Council Chambers (Laurel Street)
  - Library (800 Alma Street)
  - Arrillaga Family Gymnasium & Burgess Pool (600 Alma Street)
  - Arrillaga Family Gymnastics Center (501 Laurel Street)
  - Arrillaga Family Recreation Center (700 Alma Street)
  - Child Care Center (801 Laurel Street)
- Coporation Yard (333 Burgess Drive)
- Menlo Park Community Campus (100-110 Terminal Ave): the following buildings are currently closed due to development of a new multigenerational facility (MPCC):

[25] Solar PV Microgrid and Electric Vehicle Charger Design, Installation and Operation at Menlo Park Community Campus: pbsystem.planetbids.com/portal/46202/bo/bo-detail/82009

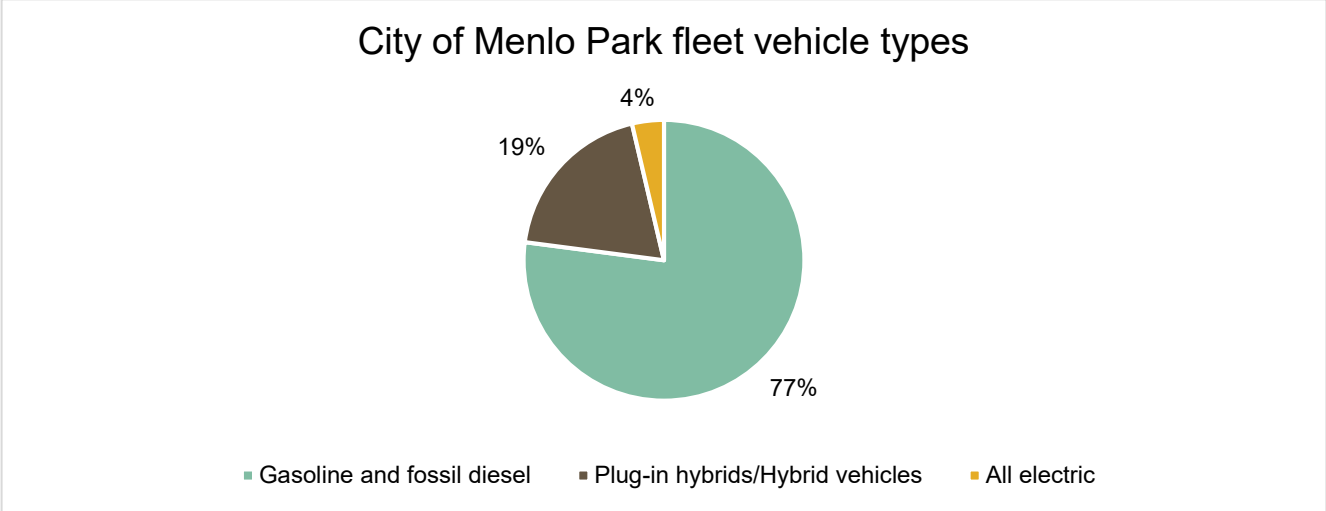
- Onetta Harris Community Center
- Menlo Park Senior Center
- Belle Haven Youth Center
- Belle Haven Pool

In addition to the MPCC project, design projects to replace the HVAC equipment in the Arrillaga Family Recreation Center (700 Alma Street) and Gymnasium (600 Alma Street) buildings are currently underway, and all-electric options are planned. This equipment is likely to be replaced in 2022.

A consultant has also been hired to assist and support Public Works in long-term planning and strategy development to eliminate fossil fuels at city facilities.

Municipal Fleet

Menlo Park's municipal fleet of vehicles and equipment comprise the largest collection of fossil fuel (e.g., gasoline and diesel) assets. The City currently manages 109 fleet vehicles (including light-, medium-, heavy-duty and pursuit-rated vehicles, motorcycles, and parking enforcement). Figure 1 summarizes the characterization by fuel type of the current municipal fleet:



In March 2020, the City Council adopted the Sustainable Fleet Policy to reduce greenhouse gas emissions related to fleet operation[26]. This policy prioritizes the purchase of zero-emission vehicles as a first option. This policy also establishes a purchasing hierarchy to ensure vehicle purchases are the lowest emissions option available and a fossil fuel (e.g., gasoline and diesel) reduction goal of 5 percent annually over 2018 baseline. While the City did achieve a 5.54 percent reduction relative to baseline in 2020, this data is expected to be an outlier due the COVID-19 pandemic and shelter-in-place orders. Staff expects to begin tracking municipal fleet fossil fuel reduction once 2021 data is available.

[26] Menlo Park City Council Sustainable Fleet Policy: menlopark.org/DocumentCenter/View/24571/F3-20200326-CC-Follow-up-grand-jury-response

Given vehicle availability and market trends, city staff estimates approximately 40 percent of the current municipal fleet will have EV options available now or in the next three years. Table 4 summarizes Menlo Park's municipal fleet characterization by vehicle category and EV market availability:

Table 4: Menlo Park fleet vehicle summary

Vehicle category	% of municipal fleet (109 total vehicles)	EV market ready	EV market available in less than three years	EV market available in more than three years
Light-duty passenger vehicles, motorcycle, and parking enforcement	14%	X		
Light-duty trucks and cargo van	26%		X	
Police patrol vehicles	35%			X
Medium and heavy-duty truck	25%			X

It is important to note that much of the City's fleet is specialized, and electrification of specialized fleets are not as readily available as passenger light duty vehicles. For example, there are currently no police pursuit-rated vehicles, and the market lacks medium- and heavy-duty vehicles that are full battery electric. Electric prototypes and vehicle conversion technology exists but using early technologies can run the risk of reduced performance or safety for the community and employees.

Even with this barrier, city staff has continued to seek out GHG reduction strategies for the fleet. For example, the City reserved five full battery electric Ford F-150 light-duty trucks, which are planned to go into production in 2022.

Additionally, in April 2021, the City transitioned to renewable diesel to fuel diesel vehicles and equipment. Unlike conventional fossil fuel diesel, renewable diesel is made from sustainable sources such as animal fats, and plant and cooking oils. Renewable diesel can also be intermixed with conventional fossil fuel diesel; no specialized equipment or infrastructure modifications are required. This means any vehicle or equipment using fossil fuel diesel can begin using renewable diesel immediately. Per the manufacturer, Neste, use of this product can reduce related emissions by up to 80 percent.

Several other County of San Mateo jurisdictions are currently using this fuel including City of San Mateo and Menlo Park Fire Protection District. San Francisco International Airport (SFO) also uses a similar product called sustainable aviation fuel (SAF) to fuel aircraft. SFO is currently working with the California Air Resources board, airlines, and supply chains with a goal of 5 percent SAF by 2025.

Expansion of city-owned electric vehicle (EV) charging infrastructure

The City of Menlo Park currently owns and operates the following electric vehicle charging infrastructure:

- Four public, Level 2 EV charging stations (8 total charging spaces)
  - Two (4 charging spaces) located at City Hall (701 Laurel Street)
  - Two (4 charging spaces) located at Downtown Parking Lot 2 (Crane Street)
- Three Level 2 EV charging stations (6 total space) that are exclusive for municipal fleet charging
  - Two (4 charging spaces) located at City Hall (701 Laurel Street)
  - One (2 charging spaces) located at the Corporation Yard (333 Burgess Drive)
- One Level 1 charging port (120v household plug) is also located at City Hall (701 Laurel Street) for exclusive for parking enforcement vehicle charging

Based on available EV charging infrastructure and best management practices (2:1 vehicle/charging ratio), the City can support 14 electric vehicles (approximately 12 percent of the current municipal fleet). To support the electrification of the municipal fleet for the next 10 years, staff estimates the following infrastructure is needed:

- City Hall (701 Laurel Street):
  - Three modular direct current (DC) fast charging systems
    - One exclusive for police department use
  - Nine Level 2 charging stations for exclusive police department use
- Corporation Yard (333 Burgess Drive)
  - One modular DC fast charging system

In August 2020, an existing System and Load Analysis (load monitoring) of the Civic Center Complex (701 Laurel Street) main switchboard and emergency distribution panel was completed. This analysis found the main switchboard available capacity can accommodate a maximum of four Level 2 EV charging stations (8 charging spaces) and two DC fast charging (2 charging spaces) and the emergency distribution panel available capacity can accommodate a maximum of four Level 2 EV charging stations (8 charging spaces).

Installation of additional EV charging stations at city facilities are currently in the design phase. This includes 12 Level 2 and three DC fast charging stations (27 charging spaces) at MPCC. It is anticipated that additional charging stations will also be added at the civic center where most of the city's vehicle fleet is located.

Electric leaf blower pilot

To maintain all 14 of the City's parks, the Public Works department performs several recurrent tasks each week, including:

- Mowing fields
- Trimming vegetation
- Adjusting and repairing irrigation
- Picking up litter

- Clearing debris (i.e., leaves, small branches, trimmings, etc.) along landscape and hardscape (e.g., walking pathways and parking lots) to ensure public safety

In 2020, the City purchased four full battery electric leaf blowers to pilot their use in the maintenance of city parks. Leaf blowers are used daily to complete approximately 90 percent of the park maintenance tasks throughout all city parks and sports fields. Each city park may require up to eight hours of using the leaf blowers per week during heavy leaf season; this requires up to 40 per week.

Currently the City uses seven gasoline-fueled and four full battery electric leaf blowers. One electric leaf blower (including the equipment, battery fast charger, and battery pack) costs approximately $1,600. On average each battery pack lasts for 1.5 hours and costs $1,100. Typically, two city staff members work together at each park. Therefore, two fully charged electric leaf blower with six extra battery packs would provide the duo team approximately 4.5 hours of leaf blower duties a day: up to 22.5 hours total per week. This is not enough to complete daily responsibilities, especially when considering other recurrent maintenance tasks (mowing, trimming, etc.).

Initial results of the pilot have found that while quieter and less greenhouse gas emitting, the electric leaf blowers are not as powerful as their gas counterparts. They simply cannot move large volumes of debris (i.e., leaves, small branches, trimmings, etc.), especially in the fall when the amount of leaves is greatest.

To fully transition to electric leaf blowers, hand raking and extra work to collect the leaves during the fall season will be required. This will result in a 50 percent increase in work per site/time required to complete daily maintenance duties. If more time is spent collecting debris (i.e., leaves, small branches, etc.), other maintenance tasks/projects may be eliminated or deprioritized. More community engagement would also be required to explain slower response times to maintenance requests, and park and facility beautification efforts.

Also, identification and/or installation of more charging infrastructure (i.e., 120v household plugs, mobile storage solutions, facility upgrades, etc.) to charge the batteries while in the field is needed. City facilities, such as sports field sheds, may require electrical upgrade to meet battery pack charging needs. If charging is limited to facilities with larger capacity (i.e., City Hall, Corporation Yard, etc.), this would increase vehicle miles traveled and related tail pipe emissions until the fleet is transitioned to full battery electric vehicles. Note, a battery pack may take up to two hours to fully charge.

The City will continue to explore the full transition to electric landscaping equipment with a recently hired Public Works consultant working to eliminate city operations' fossil fuel use.

Strategy No. 6: Develop a climate adaption plan to protect the community from sea level rise and flooding:

Scope of work: To mitigate public safety risk associated with sea level rise and flooding, the following direction was provided by the City Council:

- Update the Safety Element in Menlo Park's General Plan to bring it into compliance with recent changes in General Plan law, including Senate Bill 379 (Climate Adaptation and Resiliency)
- Continue progress on the Menlo Park SAFER Bay grant application
- Continue to participate in and monitor OneShoreline
- Hold a City Council study session by July 2021 on the City's local hazard mitigation plan

Progress and Next Steps

SAFER Bay grant application

In early July 2021, the City was notified by the Federal Emergency Management Agency (FEMA) and California Office of Emergency Services (CalOES) that the application submitted to the Building Resilient Infrastructure and Communities (BRIC) program to design and construct portions of the SAFER Bay sea level rise protection project has been selected for further review[27]. Based on FEMA's provided definition, a subapplication that is Selected for Further Review means a *"subapplication is eligible (or potentially eligible pending some additional information) and there is available funding under the applicable subtotals."* In other words, of the $500M allocated for all proposed BRIC projects, $50M has been set aside for the Menlo Park SAFER Bay Project pending further review. This is not a guarantee of receiving the funding, but it is very significant advancement in the process.

City staff will continue to work with FEMA and CalOES to provide requested information for the project, as well as continuing to work on a memorandum of understanding between the funding and project delivery partners, including Facebook, PG&E, and the San Francisquito Creek Joint Powers Authority. A City Council study session on the project is planned for late August 2021, followed by consideration of the memorandum of understanding in fall 2021.

Continue to participate in and monitor OneShoreline

City staff and the City Council liaison frequently attend OneShoreline board meetings, which are held approximately monthly. In addition, Menlo Park is collaborating with Redwood City, Atherton, San Mateo County, and OneShoreline to develop a diversion structure to mitigate flooding impacts from high/rising tides, up to 25-year storm event, the

[27] BRIC 2020, City of Menlo Park, Menlo Park SAFER bay Project: fema.gov/grants/mitigation/building-resilient-infrastructure-communities/fy2020-subapplication-status#2020-chart

Bayfront Canal and Atherton Channel flood protection and ecosystem restoration project[28].

The City has allocated $1.2M as part of the fiscal year 2020-21 capital improvement program budget and committed to construct by December 2021 to preserve $1.135M Department of Water Resources grant funding.

In fall 2020, the City entered a memorandum of understanding (MOU) and drainage easement agreement for the construction and maintenance of the Bayfront Canal and Atherton Channel Flood Protection project[29]. This MOU establishes terms and responsibilities for cost-sharing related to construction, operation and maintenance (O&M), and mitigation monitoring. OneShoreline will serve as contracting and managing agency for all work funded by MOU, except O&M. Note, MOU expires five years after completion of construction.

Construction began in June 2021 and is expected to continue through the end of 2021.

Local Hazard Mitigation Plan

The Local Hazard Mitigation Plan (LHMP) identifies strategies that would reduce risk or eliminate long-term risk to life and property from a hazard event. Mitigation planning is the systematic process of learning about the hazards that could affect the community, including hazards that are a direct result of climate change, such as extreme heat, fires, and sea level rise. The plan aims to set clear goals, identify appropriate actions, and follow through with an effective mitigation strategy. Mitigation could also protect critical community facilities, reduce exposure to liability, and minimize post-disaster community disruption.

Adopting a LHMP allows jurisdictions to be eligible for various types of pre- and post-disaster grants from the Federal Emergency Management Agency (FEMA) and California Governor's Office of Emergency Services (CalOES), such as the $5M Hazard Mitigation Grant program for the Chrysler Pump Station reconstruction and the $50M Building Resilient Infrastructure and Communities (BRIC) grant pending FEMA review for constructing a portion of the SAFER Bay sea level rise protection project (described above).

To comply with the federal mandates in the Disaster Mitigation Act of 2000 (Public Law 106-390) and Menlo Park Municipal Code Section 2.44.050(5), the local hazard mitigation plan typically gets updated every five years. Menlo Park City Council last adopted Resolution No. 6339 on August 30, 2016 to approve an update to the Menlo Park Local

[28] For the past several decades, high tides have kept flows in the Bayfront Canal from draining to the Bay. Even minor rainfall events have resulted in the flooding with nearby properties experiencing flooding 40 times over the past 70 years – most recently in 2017.

[29] City Council staff report, October 27,2020: menlopark.org/DocumentCenter/View/26509/G1-20201027-CC-Bayfront-Canal-and-Atherton-Channel

Hazard Mitigation Plan Annex to the San Mateo County Hazard Mitigation Plan. The 2021 update is currently underway.

Due to changes in the City Council meeting calendar in summer 2021, an update for the City Council is now tentatively planned for late August 2021. The City Council, along with other agencies and the Board of Supervisors for San Mateo County, will need to adopt the LHMP by the end of 2021.

Once adopted, the LHMP will be used to help update the Safety Element, which is part of the City's General Plan. The Safety Element update is anticipated to be adopted by the end of 2022.

Climate action plan metrics

The following metrics were developed by the Environmental Quality Commission as part of the 2030 Climate Action Plan (CAP) to assess progress of local initiatives, policies, and programs. The CAP was adopted in July 2020, so this is the first year these metrics and related data have been aggregated. While compiling, city staff experienced challenges with both internal and external (e.g., third-party) stakeholders to source the necessary data. Data limitations and/or considerations are listed with each metric.

1. Metric no.1: Number of gas hot water heaters citywide that are replaced with electric versions.

   To determine the number of gas hot water heaters replaced with electric versions in existing buildings, staff evaluated city permit data. Relevant permits were identified as alterations or additions which specified replacement, repair, or relocation of water heaters and are not limited to replacement of electric for natural gas units.

   Data limitation(s) and/or consideration(s):

   Municipal software (formerly TideMark and currently Accela) has limitations. Specifically, the type of water heater is not explicitly and/or consistently reported; there is no notation to define water heater fuel type (natural gas or electric).

   Due to lack of notation, staff used technician notes to glean more insight on relevant projects. However, these notes are entered manually and vary widely; they may simply list "water heater" or include additional details like 30-gallon, tankless, etc.

   Additional comments provide more information about permits that specifically identified electric appliances.

Tables 5, 6, and 7 describe the total number permits issued by Menlo Park related to hot water heaters in existing buildings by type:

Table 5: Climate Action Plan Metric No. 1: commercial properties		
Year	Total related permits	Comments
2017	1	None.
2018	3	1 permit describes the replacement of electric water heater; note, this may be a like for like replacement and represent no reduction in natural gas consumption.
2019	2	None.
2020	0	None.

Table 6: Climate Action Plan Metric No. 1: multifamily properties		
Year	Total related permits	Comments
2017	16	None.
2018	12	None.
2019	27	None.
2020	0	None.

Table 7: Climate Action Plan Metric No. 1: single family properties		
Year	Total related permits	Comments
2017	77	None.
2018	54	None.
2019	56	1 permit describes the removal and replacement of electric water heater; note, this may be a like for like replacement and represent no reduction in natural gas consumption.
2020	8	None.

2. Metric no. 2: Number of gas furnaces citywide that are replaced with electric versions.

   To determine the number of gas furnaces replaced with electric versions in existing buildings, staff evaluated city permit data. Relevant permits were identified as alterations or additions which specified replacement, repair, or relocation of furnaces and are not limited to replacement of electric for natural gas units.

   Data limitation(s) and/or consideration(s):

   Municipal software (formerly TideMark and currently Accela) has limitations. Specifically, the type of furnace is not explicitly or consistently reported; there is no notation to define furnace fuel type (natural gas or electric).

   Due to lack of notation, staff used technician notes to glean more insight on relevant projects. However, these notes are entered manually and vary widely; they may simply list “furnace” or include additional details like 70k BTU, 95%/AFUE/60k BTU, etc.

Additional comments provide more information about permits that specifically identified electric appliances.

Tables 8, 9, and 10 describe the total number permits issued by Menlo Park related to furnaces in existing buildings by type:

Table 8: Climate Action Plan Metric No. 2: commercial properties

Year	Total related permits	Comments
2017	0	None.
2018	2	None.
2019	2	1 permit describes the replacement of a furnace with a heat pump.
2020	3	None.

Table 9: Climate Action Plan Metric No. 2: multifamily properties

Year	Total related permits	Comments
2017	18	None.
2018	19	None.
2019	14	1 permit describes the addition of new heat pump system. Note, may be in addition to existing natural gas infrastructure and represent no reduction in natural gas consumption.
2020	8	1 permit describes the installation of new heat pump system. Note, this may be like for like replacement and represent no reduction in natural gas consumption.

Table 10: Climate Action Plan Metric No. 2: single family properties

Year	Total related permits	Comments
2017	55	None.
2018	77	1 permit describes the replacement of a furnace with a heat pump.
2019	66	3 permits describe the replacement of a furnace with a heat pump. 3 permits describe the replacement of heat pumps. Note, this may be like for like replacement and represent no reduction in natural gas consumption.
2020	31	2 permits describe the installation of new heat pump systems. Note, may be in addition to existing natural gas infrastructure and represent no reduction in natural gas consumption.

3. Metric no. 3: Number of utility natural gas accounts terminated.

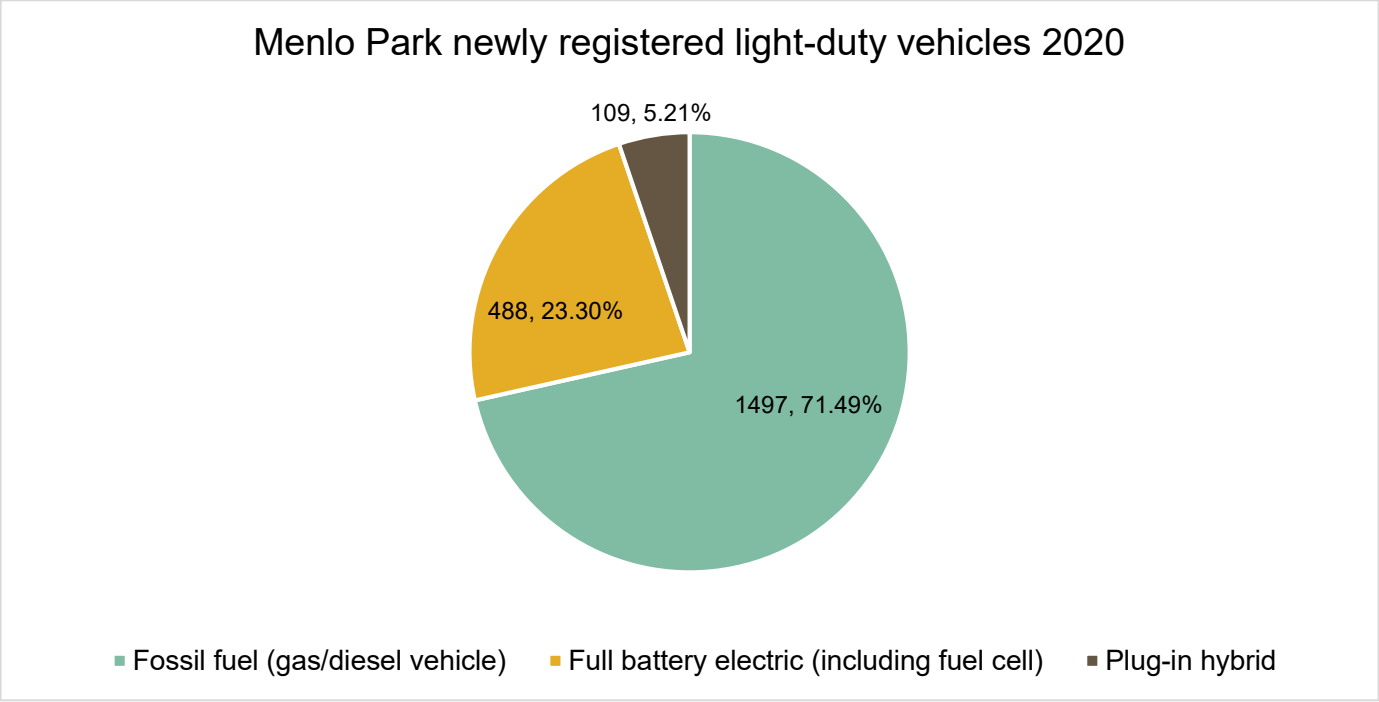
   Data limitation(s) and/or consideration(s): Upon contacting the local natural gas provider, Pacific Gas & Electric, city staff was informed this metric is not currently tracked and is not anticipated to be available to the public in the near future. Therefore, this data is not obtainable.

4. Metric no. 4: Number of light-duty vehicles newly registered that are fossil fuel (e.g., gasoline and diesel) vs. electric.

   Data limitation(s) and/or consideration(s): This is a synthesized data point provided by third party; city staff does not have access to raw or referenced data sets. This number is from a staff member at the California Energy Commission (CEC) using the Department of Motor Vehicles (DMV) Registration Data[30]. CEC staff used the following criteria to determine new registrations:
   - A recent model year (model years 2019+ are be considered "new")
   - The owner took possession of the vehicle within the reporting period
   - A low odometer reading (under 50 miles)
   - No history of prior ownership

   Additionally, while the CEC does provide total new zero emission (including electric) vehicle sales data, it does not provide *total* vehicle sales data. Continued provision of this data point is considered a special (not regularly analyzed/reported) request and is not readily available to the public. For ongoing report of this metric, CEC staff recommends submitting formal requests for information to the DMV. Note, because this is considered a special request, no estimate on availability or timelines for future data requested is currently available.

Figure 2 describes newly registered light-duty vehicles in Menlo Park by fuel type:

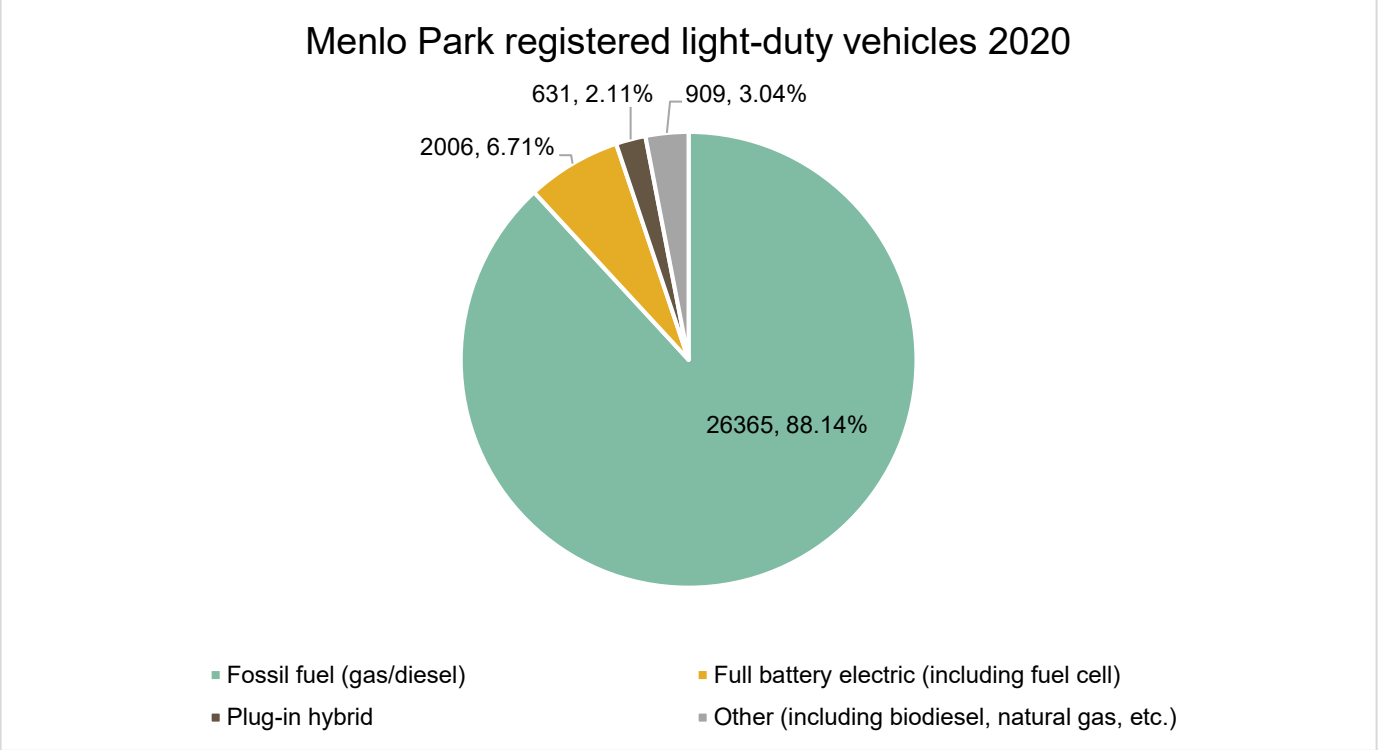


5. Metric no. 5: Number of total light-duty vehicles registered that are fossil fuel (gasoline) vs. electric.

[30] California Energy Commission Staff analysis of DMV Vehicle Registration Data. Provided May 25, 2021, from energy.ca.gov/zevstats

Data limitation(s) and/or consideration(s): Data published and publicly available on California Energy Commission Zero Emission Vehicle and Infrastructure dashboard[31].

Figure 3 describes the vehicle population, including total number of light-duty, fully battery electric vehicles registered in Menlo Park:



6. Metric no. 6: Gallons of gasoline sold in Menlo Park.

Data limitation(s) and/or consideration(s): Per the Climate Action Plan, gallons of fossil fuel (e.g., gasoline and diesel) are estimated using revenue data reported to the California Board of Equalization and average state gas prices.

Table 11 describes the estimated volume of fossil fuel sold in Menlo Park:

Table 11: City estimated fossil fuel sales

Year	Gasoline (g)	Diesel (g)	Total Fuel
2001	16,459,982.14	914,443.45	17,374,425.60
2002	17,328,807.69	962,711.54	18,291,519.23
2003	16,203,111.70	900,172.87	17,103,284.57
2004	14,624,502.30	812,472.35	15,436,974.65

[31] California Energy Commission Zero Emission Vehicle and Infrastructure Statistics. Data last updated April 30, 2021. Retrieved October 1, 2021 from energy.ca.gov/files/zev-and-infrastructure-stats-data

2005	14,239,357.14	791,075.40	15,030,432.54
2006	15,013,421.05	834,078.95	15,847,500.00
2007	14,551,615.38	808,423.08	15,360,038.46
2008	13,837,500.00	768,750.00	14,606,250.00
2009	14,825,472.53	823,637.36	15,649,109.89
2010	15,235,079.62	846,393.31	16,081,472.93
2011	15,437,310.16	857,628.34	16,294,938.50
2012	15,298,218.27	849,901.02	16,148,119.29
2013	15,172,023.26	842,890.18	16,014,913.44
2014	15,491,960.21	860,664.46	16,352,624.67
2015	14,790,242.24	821,680.12	15,611,922.36
2016	16,178,600.72	898,811.15	17,077,411.87
2017	16,730,094.82	929,449.71	17,659,544.53
2018	15,145,466.57	841,414.81	15,986,881.38
2019	13,055,148.55	725,286.03	13,780,434.59
2020	9,584,281.54	532,460.09	10,116,741.62

7. Metric no. 7: Percentage of municipal assets converted from gas or diesel to electric.

   Data limitation(s) and/or consideration(s): To determine percentage, city staff would need to audit all current assets. For the purposes of this metric, staff has defined an asset as city owned property or equipment with a purchase price/value of $5,000 or greater.

   While not represented in a percentage, the following summarizes the addition or replacement of fossil fuel (e.g., gasoline, conventional diesel, and natural gas) assets with electric and lower GHG emitting versions. Note, in July 2021, the City hired a consultant to assist Public Works with a long-term strategy for converting municipal assets from fossil fuel to electric.

   <u>Buildings</u>
   The Menlo Park Community Campus (MPCC) project includes the demolition and replacement of four existing buildings, including the Belle Haven Pool facility (currently the largest greenhouse gas emitter on-site). The new facility will be all-electric (no natural gas consumption), including solar heating for the pool.

   Design projects replace the HVAC equipment in the Arrillaga Family Recreation Center (700 Alma Street) and Gymnasium (600 Alma Street) buildings are also currently underway, and all-electric options are planned. This equipment is likely to be replaced in 2022.

   <u>Fleet</u>

In alignment with the Sustainable Fleet Policy, city staff proposes the following vehicle replacement for fiscal year 2021-22:

- Seven gasoline hybrid police vehicles; six replacing gasoline vehicles and one would replace an existing gasoline hybrid.
- Five heavy-duty trucks; four renewable diesel and one gasoline. The proposed gasoline truck would replace an older diesel truck due to its inefficiencies and high maintenance costs. One of the four renewable diesel heavy-duty trucks includes a hybrid component; the vehicle would run on renewable diesel to travel to/from job sites but use an electric battery in operation at the jobsite.

City staff continue to strive towards the benchmarks outlined in Sustainable Fleet Policy and research electric options for fleet vehicles as the technology becomes more readily available. For example, the City reserved five full battery electric Ford F-150 light-duty trucks, which are planned to go into production in 2022. Light-duty trucks are used for daily operations, such as carrying tools and small equipment.

Additionally, in 2020, the City added four all-electric leaf blowers to existing equipment to pilot their use for daily maintenance duties.

8. Metric no. 8: Vehicle miles traveled, including trips inbound, outbound, and within the City.

   Data limitation(s) and/or consideration(s): Per the 2030 Climate Action Plan, this metric was sourced from Google Environmental Insights Explorer[32]. Google EIE uses proprietary data derived from Google Maps Location History data to estimate trips taken within a city's boundaries. These estimates are multimodal (passenger vehicle, bus, cycling, rail, and walking) and including vehicles traveling into (inbound), leaving (outbound), and within (in-boundary).

   Note: The vehicle miles traveled standards in Transportation Impact Analysis (TIA) guidelines were developed using the City's Travel Demand Model and may have different results than other methodologies (i.e., Google Environmental Insight Explorer, California Department of Transportation Highway Performance Monitoring System).

Table 12 describes the total vehicle kilometers (approximate miles) traveled:

Table 12: Climate Action Plan Metric No. 8

Year	Total vehicle km (mi) traveled	% change (year to year)
2018	1,140,000,000 km (~708,363,156 mi)	
2019	1,160,000,000 km (~720,790,580 mi)	1.75%

[32] Google Environmental Insights Explorer: insights.sustainability.google

2020	610,000,000 km (~379,036,425 mi)	-47.41%[33]

9. Metric no. 9: number of other cities that query and/or copy Menlo Park's climate policies and programs

   Data limitation(s) and/or consideration(s): There is currently no tracking system in place to record these queries and/or incidents, especially if policies and/or programs are templated from publish reports which are readily available to the public.

[33] Note: In March 2020, in response to the COVID-19 pandemic the state of California issued a shelter-in-place order.

COMMUNITYWIDE GREENHOUSE GAS INVENTORY

Overview

To track progress of Climate Action Plan strategies and programs, the City calculates and tracks its greenhouse gas (GHG) emissions. The City Council had a GHG reduction goal of 27 percent below 2005 levels by 2020. In 2005, the community generated 349,284 tons of GHG emissions in four categories: transportation, solid waste, building energy use: natural gas consumption, and building energy use: electricity. This means Menlo Park's 2020 GHG emission target is 254,977 tons or a 94,307 ton reduction.

The most recent data shows the City has achieved notable emission reductions in the face of continued development and has successfully achieved its target. Between 2005 and 2019, communitywide greenhouse gas emissions have decreased to 253,371 tons. This reflects a 27.5 percent decrease relative to the 2005 baseline. This can be attributed to reductions from:

- Waste related emissions (-15,723 tons) due to:
  - Installation of gas capture devices at the primary landfill that services Menlo Park, Ox Mountain landfill.
  - Improved sorting and waste diverted from landfill. Note, this is due to statewide requirements and regional cooperation.

- Building energy use: electricity (-64,591 tons) due to:
  - State mandates requiring energy providers, such as Pacific Gas & Electric to obtain power with lower emissions and from renewable sources.
  - Menlo Park subscribing all residents and businesses to the community choice aggregate organization, Peninsula Clean Energy (PCE). PCE provides Menlo Park with cleaner electricity, from more renewable sources (e.g., solar, wind, and geothermal) to reduce the consumption of fossil fuels (like natural gas). As of 2021, all electricity provided by PCE is 100% carbon-free and is on track to be 100% renewable by 2025. It should be noted this single measure reduced electricity related emissions by 24,689 tons in one year (2016-2017).

- Transportation related emissions (-36,657 tons between 2017 and 2019) due to:
  - Increased state mandated fuel efficiency and emission standards.
  - This is also a possible indication of increased zero emission vehicle adoption and/or local trip and vehicle miles traveled reduction measures.

Community greenhouse gas emissions results

A communitywide greenhouse gas emissions inventory involves measuring the energy and fuel consumed, and solid waste generated in the community to calculate the resultant greenhouse gases. The City completed an inventory of its 2005 communitywide greenhouse gas emissions, which serves as its baseline. The initial 2005 inventory was conducted in conjunction with ICLEI-Local Governments for Sustainability, an organization that specializes in climate change and greenhouse gas inventories for cities and counties. To maintain consistency, staff has continued to use the ICLEI methodology. Greenhouse gas emissions in Menlo Park were measured from:

- Estimated fossil fuel (gasoline and diesel) consumption
- Estimated vehicle miles traveled
- Reported solid waste sent to the landfill
- Building energy usage (natural gas and electricity consumption) by account type

Figure 4 describes annual communitywide emissions with percentage by category. Figure 5 summarizes communitywide emissions for the most recent inventory year (2019). As shown in Figures 4 and 5, the most significant source of emissions is transportation (48.2 percent), followed by natural gas consumption (41.2 percent). For comprehensive data summary, refer to Appendix A.

Figure 4-Community greenhouse gas emission 2005-2019 by category

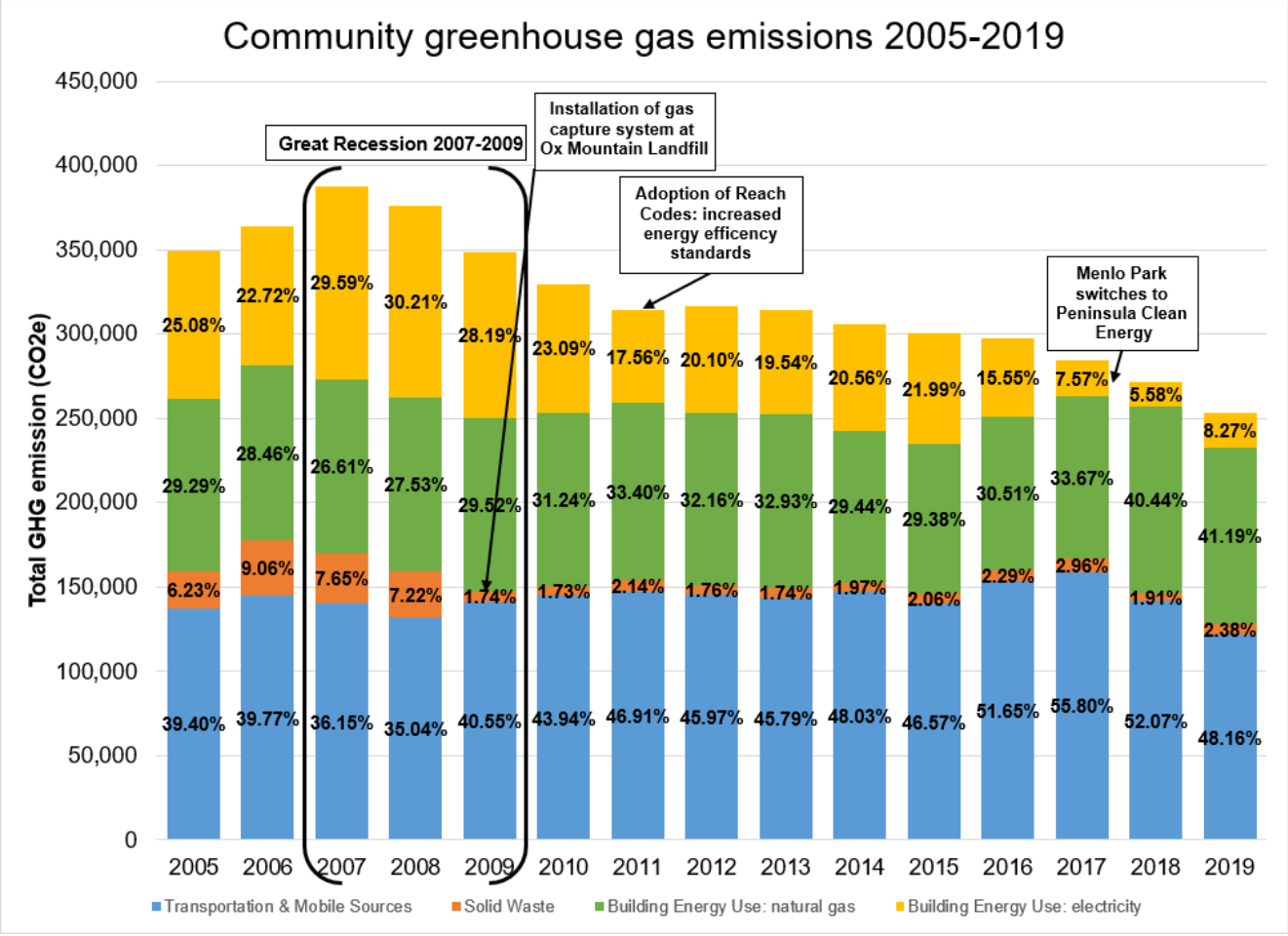


Figure 5-City of Menlo Park communitywide greenhouse gas emissions 2019

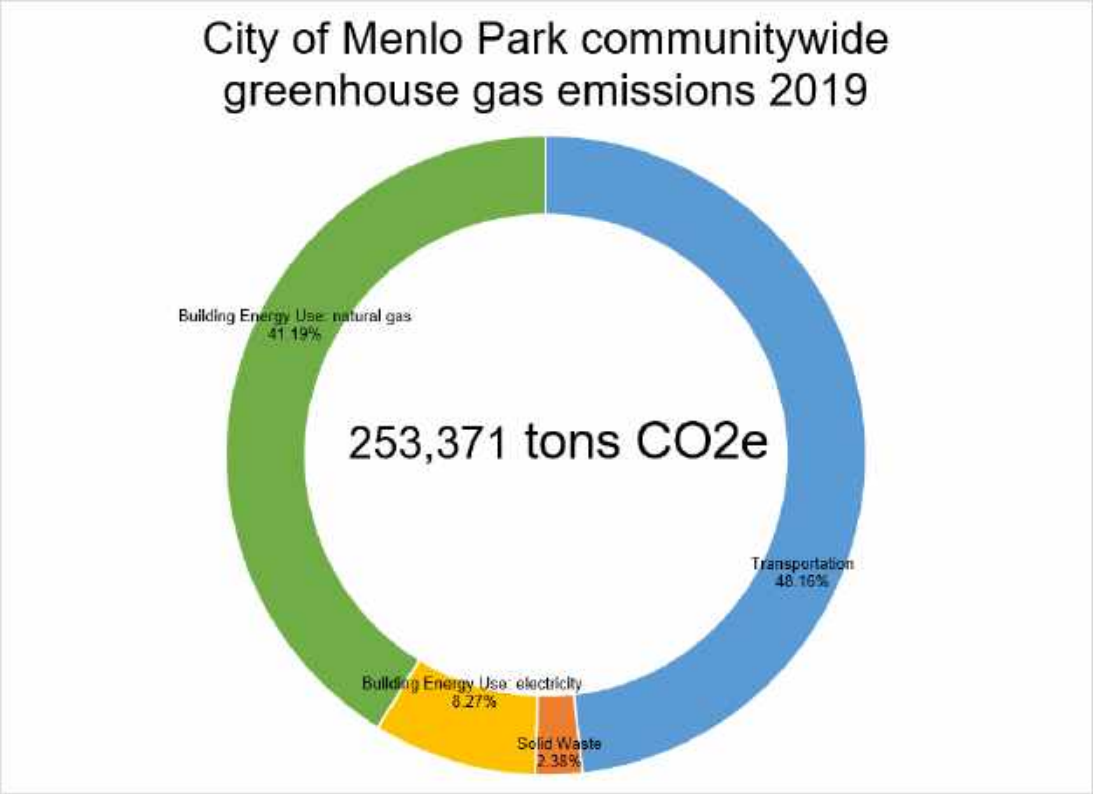
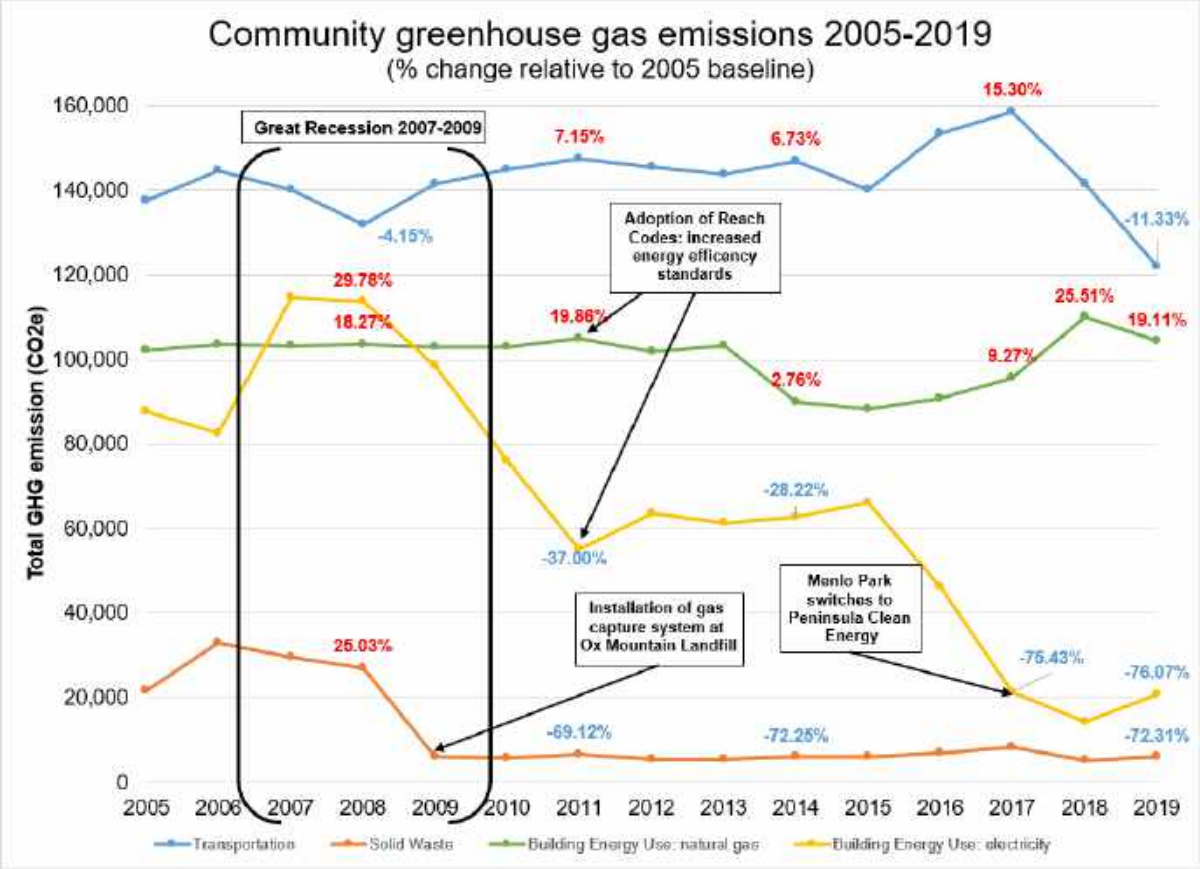


Figure 6 highlights changes in community greenhouse gas emissions by category:



Economic/development events are also noted, such as the Great Recession, installation of gas capture devices at Ox Mountain Landfill (primary landfill that services Menlo Park), and city implemented reduction strategies (adoption of local ordinance, automatic enrollment in Peninsula Clean Energy). These noteworthy events show while local strategies can affect communitywide greenhouse gas emissions, they can also be influenced by factors outside the City's purview (e.g., economic event, state, or regional efforts, etc.).

Methodology/measurement notes and considerations

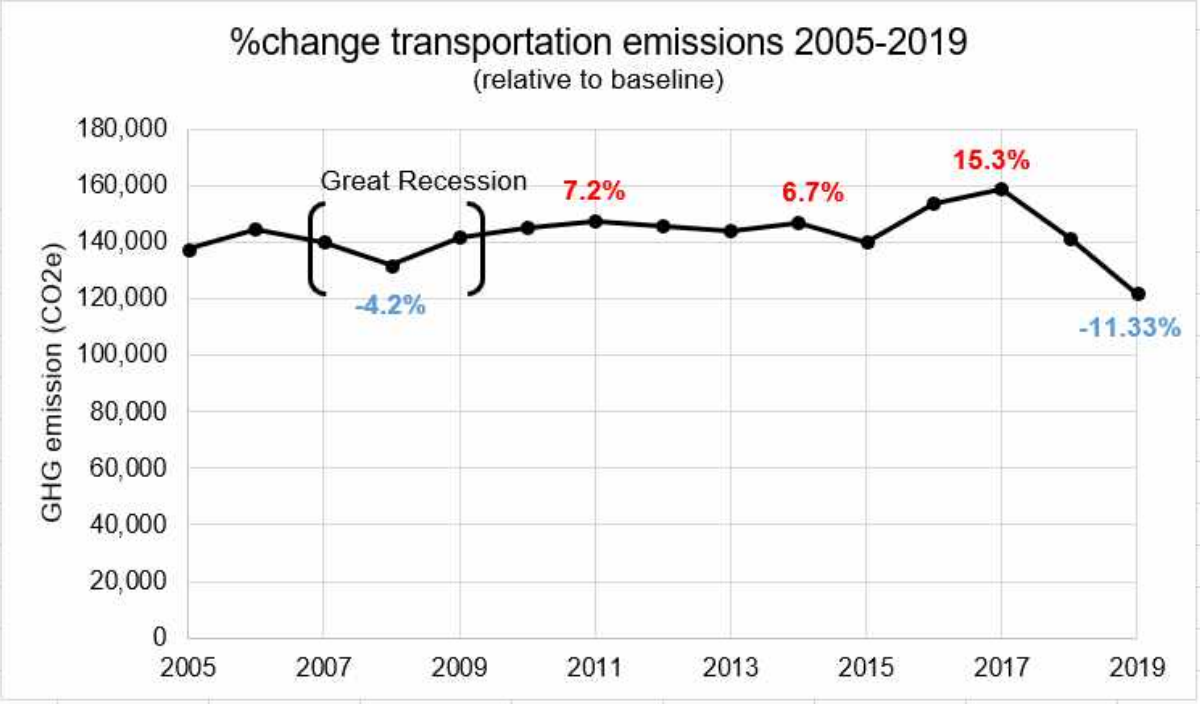
It is important to note that any greenhouse gas emissions inventory represents an estimate using the best available data and calculation methodologies at the time it was conducted. These estimates are subject to change as better data and calculation methodologies become available.

Current data and calculation methodologies also have limitations, for example solid waste emissions include only the direct emissions due to waste breakdown and do not represent emissions associated with the sourcing, production, or transportation of goods (cradle-to-grave emissions). Limitations such as these may underrepresent related emissions.

Inventory data for 2020 will not be available until Fall 2021.

Transportation

Despite recent overall reductions (11.3 percent relative to 2005 baseline), fossil fuel (gasoline and diesel) vehicle travel continues to be the largest source of greenhouse gas emissions in Menlo Park. In 2019, transportation related emissions were 122,029 tons (48.2 percent of the communitywide total). For comprehensive summary of data, refer to Appendix A. Figure 7 describes the change in transportation related emissions relative to the 2005 baseline:



The transportation category includes emissions related to passenger vehicle travel within (in-boundary) Menlo Park. Emissions are estimated using both vehicle miles travel (VMT) estimates from the California Department of Transportation (Caltrans) Highway Performance Monitoring System data and estimated fuel usage derived from fuel vehicle sales tax reported to State of California Board of Equalization and average gas prices. These data sets (VMT and fuel usage) are used to estimate different transportation related greenhouse gases:

- Estimated vehicle miles traveled are used to calculate methane (CH4) and nitrous oxide (N2O) emissions
- Estimated fuel usage is used to calculate carbon dioxide (CO2) emissions

It should be noted, VMT or fuel usage have been used in past inventories to approximate total transportation related emissions independently to prevent double counting. However, this calculation method allows for the use of both since they calculate different GHG emissions.

Also note, Caltrans Highway Performance Monitoring System vehicle miles travel estimate methodology may differ from City VMT standards for specific development and city capital projects. Thus, estimates may differ.

The Bay Area has experienced a period of increased development. In addition to development completed in 2018 and 2019, the City expects the replacement and rebuild of 100 new homes and the addition of 21 new buildings that include high-rise residential, retail, office, and hotels over the next three years (2020 to 2023). The estimated daytime (resident and employee) population is estimated to be 64,152 by the end of this code cycle (2023).

It is important to note, that while the State has had established vehicle emissions reduction requirements since 2002[34] and in 2012 the California Air Resources Board (CARB) adopted mandates for emissions standards[35], these programs affect new vehicles only. As of 2020, the average age of cars on the road in California is estimated to be 11.9 years[36]. Average car age in the United States has increased since this metric started being tracked and is predicted to increase especially in regions, like the Bay Area, where the cost of living is higher than average.

Furthermore, in September 2020, Governor Gavin Newsom signed Executive Order N-79-20[37], setting a target for all new passenger cars and light truck sales to be zero-emission (ZEV) by 2035. While this may increase the adoption of new ZEVs (i.e., electric vehicles), considering this order relates to new vehicles sales only, it may further increase the average age of cars on the road in Menlo Park.

---

[34]California Assembly Bill 1493 Vehicular emissions: greenhouse gas emissions (also known as the Pavely legislation) establishing emissions standards for new passenger vehicles manufactured in 2009-2016

[35]Advanced Clean Car Programs a set of regulations to control emissions from passenger vehicles arb.ca.gov/our-work/programs/advanced-clean-cars-program/about

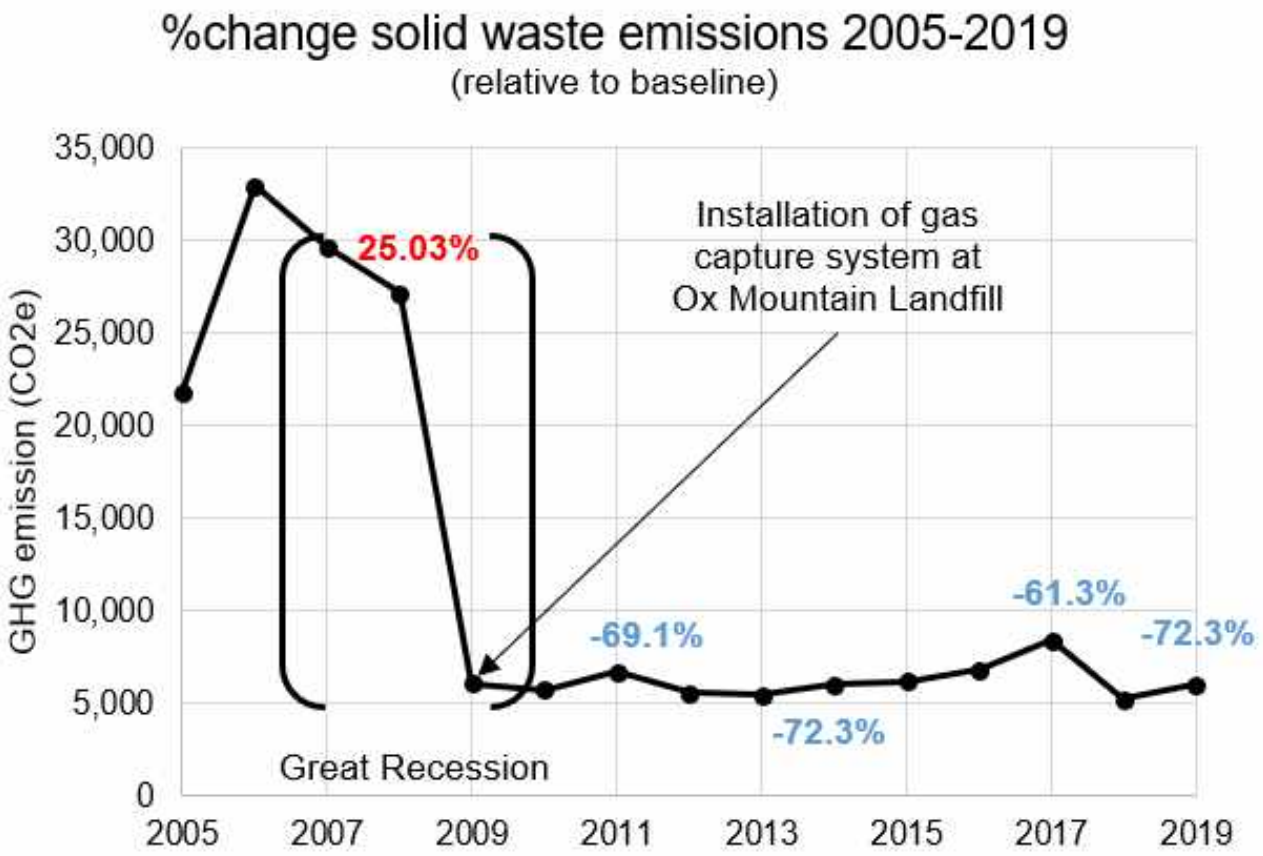
[36]Bureau of Transportation Statistics: bts.gov/content/average-age-automobiles-and-trucks-operation-united-states

[37] Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20): arb.ca.gov/resources/fact-sheets/governor-newsoms-zero-emission-2035-executive-order-n-79-20

Solid Waste

The current greenhouse emission calculation methodology shows direct emissions from solid waste to be the smallest source of emissions in Menlo Park. However, solid waste emissions include only the direct emissions due to waste breakdown and do not represent emissions associated with the sourcing, production, or transportation of goods (cradle-to-grave emissions). If the cradle-to-grave emissions were accounted for, the emissions associated with waste would be significantly higher.

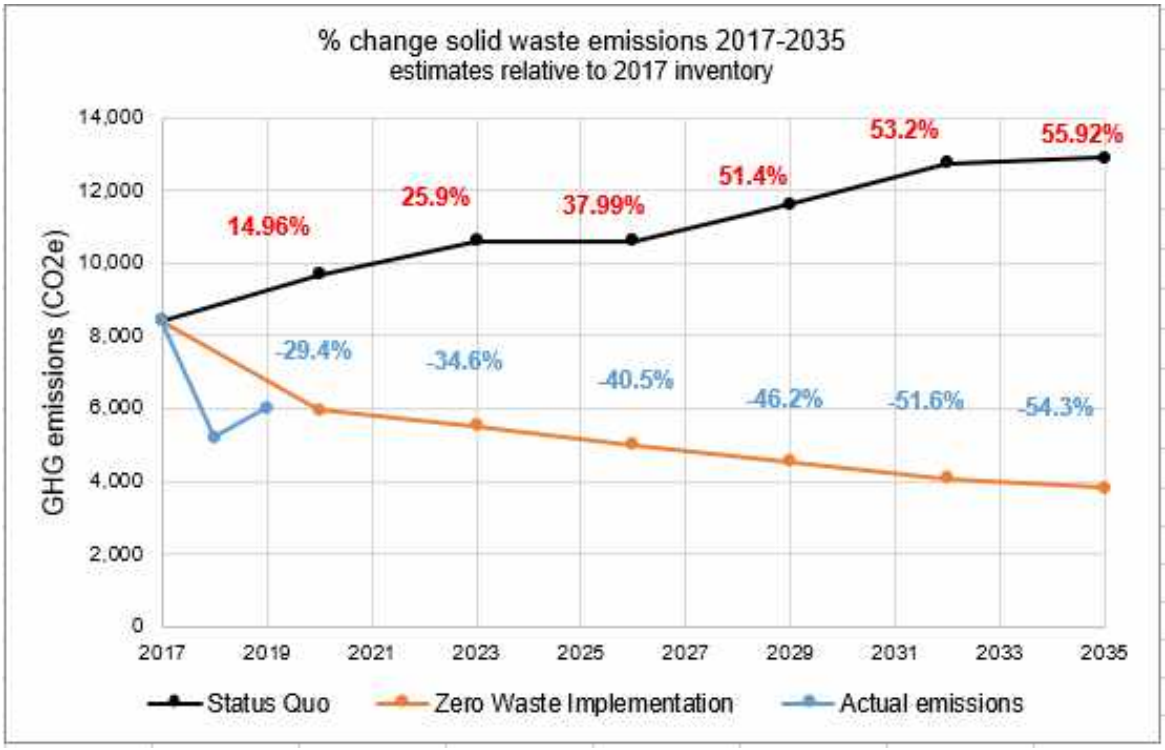
The solid waste category reflects emissions related to total community waste sent to landfill reported to California Department of Resources Recycling and Recovery (CalRecycle). In 2019, solid waste related emissions were 6,022 tons (2.38 percent of the communitywide total). For comprehensive summary of data, refer to Appendix A. Figure 8 describes the change in solid waste related emissions relative to the 2005 baseline:



In 2017, City Council adopted the Community Zero Waste Plan. This plan could reduce waste related emissions by over 50 percent over 2017 levels. The following figure shows emissions forecasts for both status quo (no new measures undertaken) and fully implementation of the Community Zero Waste Plan (reduction of waste per capita from 5.0 to 3.1 pounds per person per day).

As of 2019, solid waste emissions are on trend with zero waste implementation estimates. Reductions in this category may be attributed to improved sorting and waste diverted from landfill. Note, this is due to statewide requirements and regional cooperation

Figure 9-Estimated solid waste related emissions 2017-2035



Building Energy Use: natural gas and electricity

In 2016, all electricity customers in the City of Menlo Park began being automatically enrolled in Peninsula Clean Energy service. This action alone reduced greenhouse gas emissions related to electricity 24,689 tons in a single year (2016-2017).

Due to significant reductions in electricity related emissions, staff has separated building energy use into two distinct categories, building energy use: natural gas and building energy use: electricity. Analysis at this level provides more granular data to support 2030 Climate Action Plan strategies such as existing building electrification (No. 1).

In 2019, building energy use: natural gas was the second largest contributor communitywide emissions, 104,358 tons (41.2 percent of the communitywide total). For comprehensive summary of data, refer to Appendix A.

Figure 10 describes overall building energy use emissions by type (natural gas versus electricity):

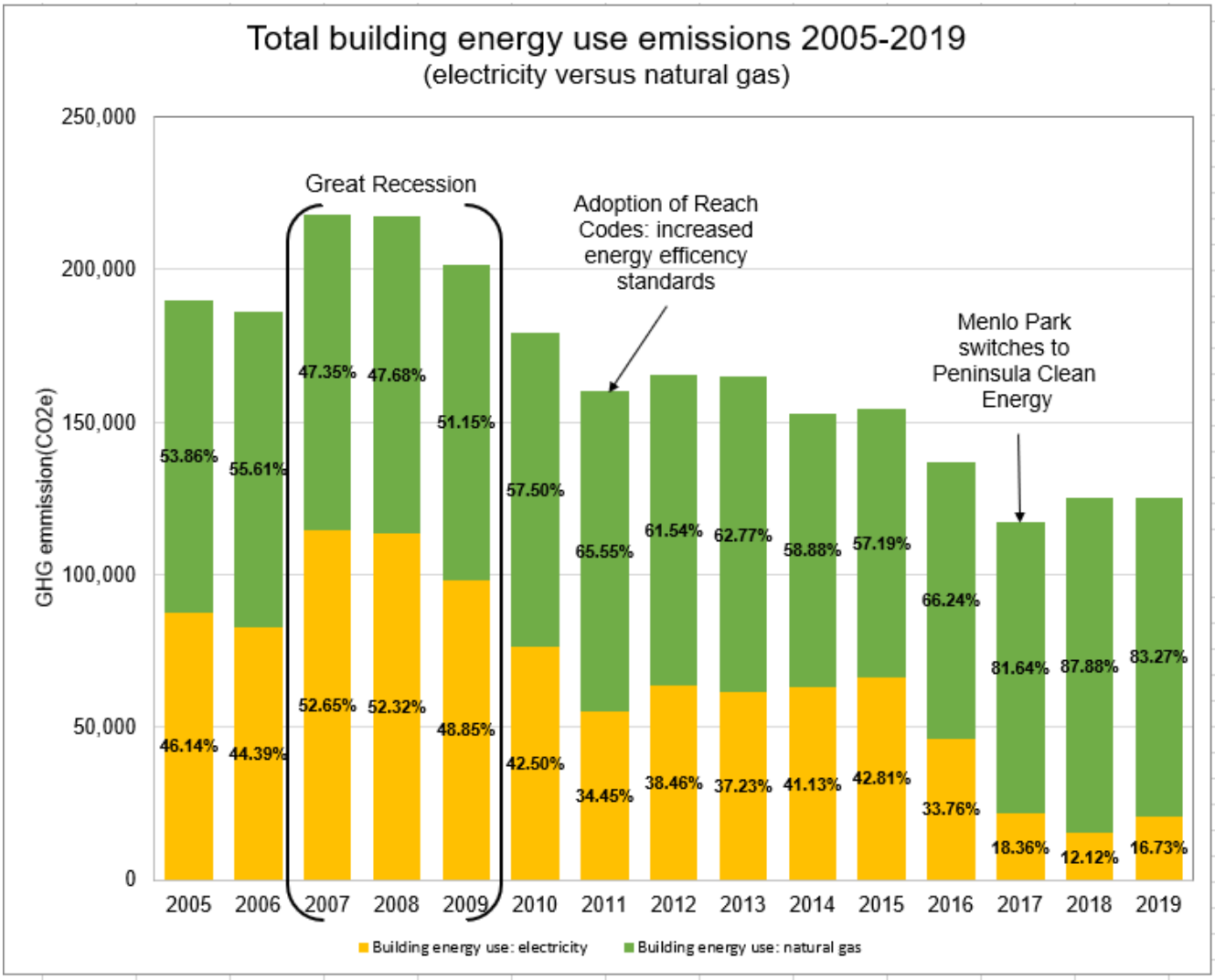
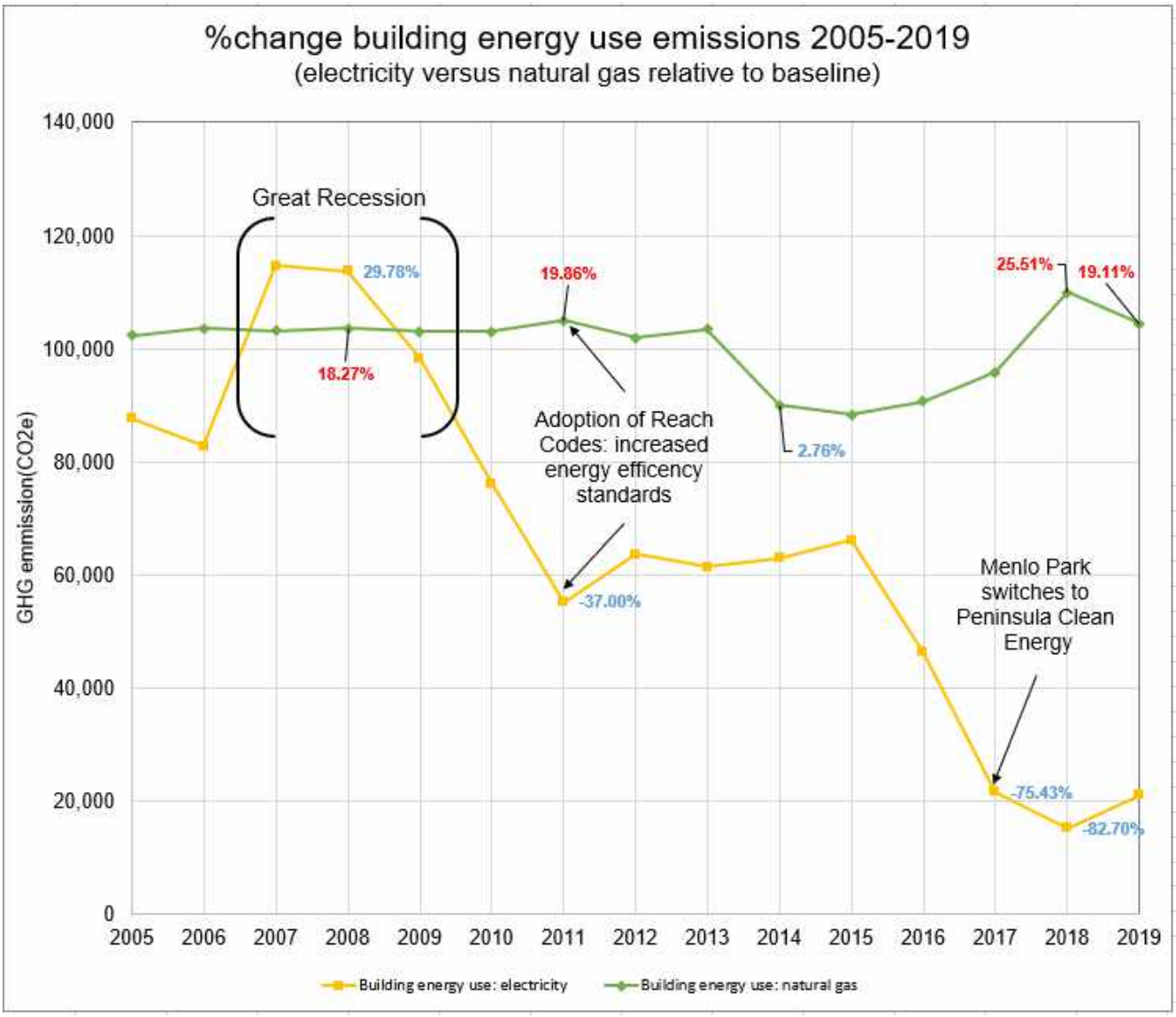


Figure 11 highlights changes in building energy use relative to the 2005 baseline by type (natural gas versus electricity):



The building energy use category includes both natural gas consumption and electricity use reported by Pacific Gas & Electric (PG&E) and Peninsula Clean Energy (PCE). In April 2017, all San Mateo County electricity customers (including Menlo Park) were fully transitioned to PCE service, therefore PCE data is available for 2017 to 2019 inventories only.

Automatic enrollment in PCE service comes with the ability to opt-out (retain PG&E service) if desired. As of May 2021, Peninsula Clean Energy services 98.6 percent of all electricity customers in Menlo Park.

Since launching in 2016, PCE has provided cleaner energy every year; though significantly lower than PG&E, the PCE provided electricity did have associated carbon emissions with the goal of being carbon-free. Emissions related to electricity use are expected to decrease further in 2020 as energy sources increasingly become carbon neutral or free.

In March 2021, Peninsula Clean Energy accomplished its carbon-free goal and reported all electricity provided is 100 percent carbon-free, at least 50 percent renewable, and non-

nuclear. Nominal emission related to electricity consumption are expected after 2021 for customers who have opted out of PCE service.

While emissions related building energy use: electricity have and are expected to decreased to near minimal levels, the emissions related to natural gas are likely to remain unchanged or increase until natural gas-powered appliances in existing building stock are replaced.

It should be noted, in Fall 2019, the City adopted building codes eliminating the installation of natural gas infrastructure in new commercial and residential buildings. These codes were implemented in 2020. Building code updates related to existing buildings are currently being explored.

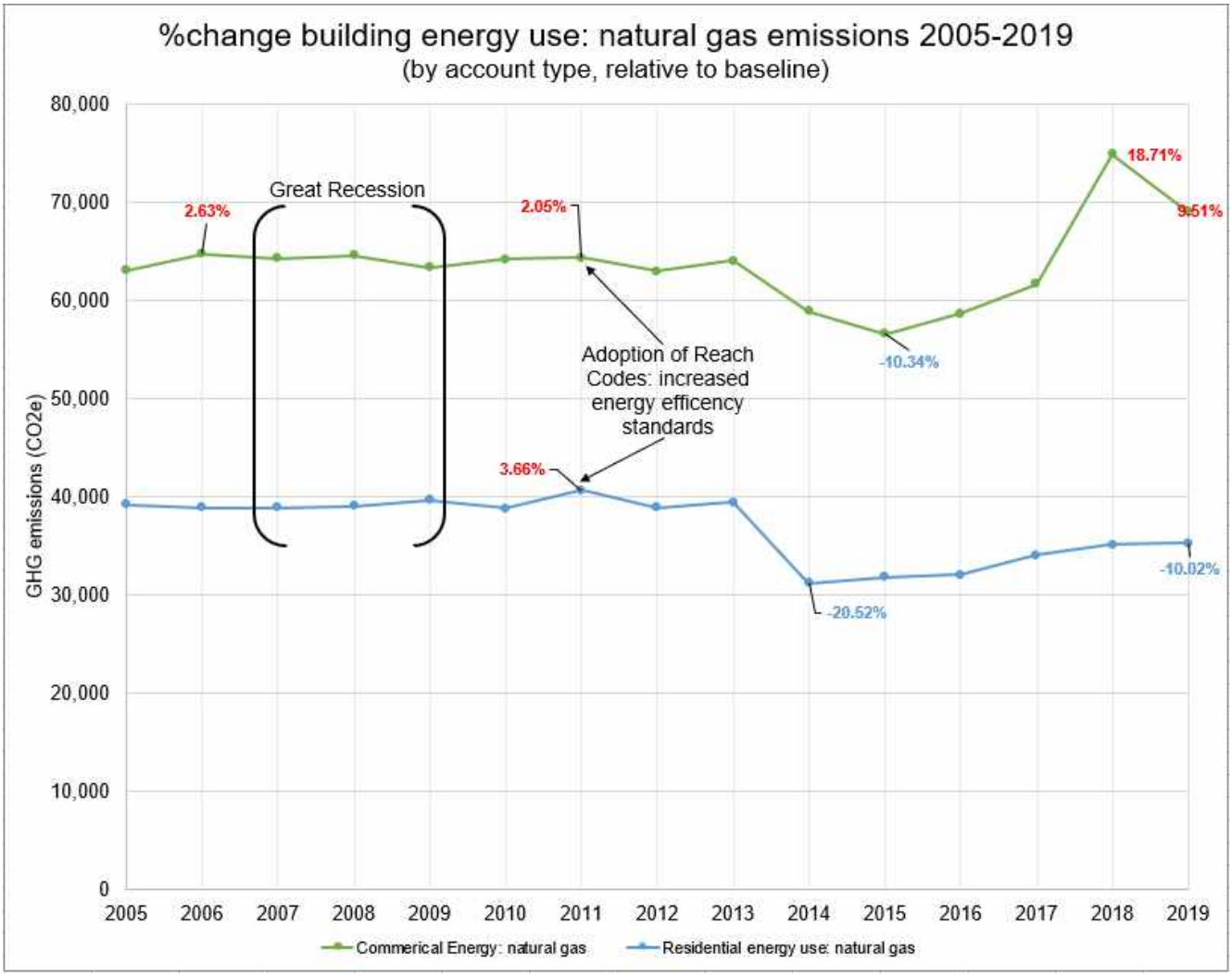
Building energy use by account type

Natural gas is the second largest contributor to communitywide GHG emissions, evaluating natural gas separately by account type can provide insights for future policy and programs around building electrification.

Commercial accounts are the largest GHG contributor in the building natural gas use. In 2019, building natural gas emissions from commercial accounts were 69,049 tons from or approximately 55.1 percent total building natural gas consumption. In 2019, building natural gas use emissions from residential accounts were 35,309 tons or approximately 28.2 percent of natural gas emissions for buildings. For comprehensive summary of data, refer to Appendix A.

The emissions related to natural gas are likely to remain unchanged or increase until natural gas-powered appliances in existing building stock are replaced. Note, all new construction projects are subject to 2020 reach codes prohibiting the installation of natural gas infrastructure (all-electric) with limited exception.

Figure 12 highlights changes in building energy use: natural gas emissions relative to baseline (2005) by account type (commercial and residential):



As of May 2021, Peninsula Clean Energy services 1,727 commercial customers, 1 industrial customer (included in commercial energy category), and 13,766 residential customers. This data also includes usage from customers who opt out (decline) PCE service.

Note, direct access accounts have emissions related to electricity use only. For building energy use related to direct access accounts, refer to Appendix B.

MUNICIPAL GREENHOUSE GAS INVENTORY

Overview

To track progress of Climate Action Plan strategies and programs, the City calculates and tracks its greenhouse gas emissions. In 2016, municipal operations generated 2,812 tons of GHG emissions in six categories: natural gas consumption, electricity use, vehicle fleet, employee commute, waste generation, and emissions from decommissioned Bedwell Bayfront landfill.

The City Council has adopted communitywide GHG reduction goals of 27 percent below 2005 levels by 2020 and zero net emissions by 2030 but does not currently have a specific target for municipal operations. Though there is no specific target, the most recent data shows the City has successfully reduced emissions to 2,178 (22.6 percent relative to 2016 levels) in 2019. This can be attributed to reductions from:

- Building/facility energy use related emissions (-540 tons) due to:
  - Menlo Park city buildings and facilities subscribing to the community choice aggregate, Peninsula Clean Energy (PCE). In 2017, Menlo Park took formal action to enroll all municipal accounts in ECO100 which provides 100% renewable electricity to subscribers. This means, all electricity provided to the City by PCE is Green-e certified; 100% from renewable sources (i.e., solar and wind) and carbon-free.

- Solid was related emissions (-120 tons) due to:
  - Incremental reduction at Bedwell Bayfront Landfill. Note, this landfill has been decommissioned (no new material is being disposed) so emissions will continue to decrease with no intervention.
  - Improved sorting and waste diverted from landfills. Note, this is due to statewide requirements and regional cooperation.

Municipal greenhouse gas emissions inventory results

The City completed an inventory of its municipal greenhouse gas emissions from 2016-2019. The aim is to update the municipal inventories every five years to use resources efficiently. The inventory was conducted in conjunction with ICLEI-Local Governments for Sustainability, an organization that specializes in climate change and greenhouse gas inventories for cities and counties.

Greenhouse gas emissions in Menlo Park were measured from:

- Reported vehicle fleet fuel consumption, vehicles miles traveled, and equipment run time
- Estimated solid waste sent to the landfill (both municipal solid waste/trash and organics)
- Reported gas captured at Bedwell Bayfront Landfill
- Reported energy usage by type (natural gas and electricity)
- Reported commuter program participation with transportation method and vehicle miles traveled estimates

Note, the 2009 inventory included emissions related to water/sewage and excluded emissions related to employee commute and the Bedwell Bayfront Landfill. Also, emissions related to buildings and streetlights are included as separate categories. However, due to the formal action taken in 2017 to enroll all municipal accounts in ECO100, staff now calculates emissions related to natural gas consumption and electricity use separately (regardless of location, i.e., building/facility or streetlight). For previous inventory, refer to Appendix B.

Figure 13 describes annual municipal emissions with percentage by category. Figure 14 is a summary of total municipal emissions from 2019. As shown in Figure 13 and 14, the most significant source of emissions is natural gas consumption (35.35 percent), followed by vehicle fleet (23.46 percent).

Figure 13-Municipal greenhouse gas emission 2016-2019 by category

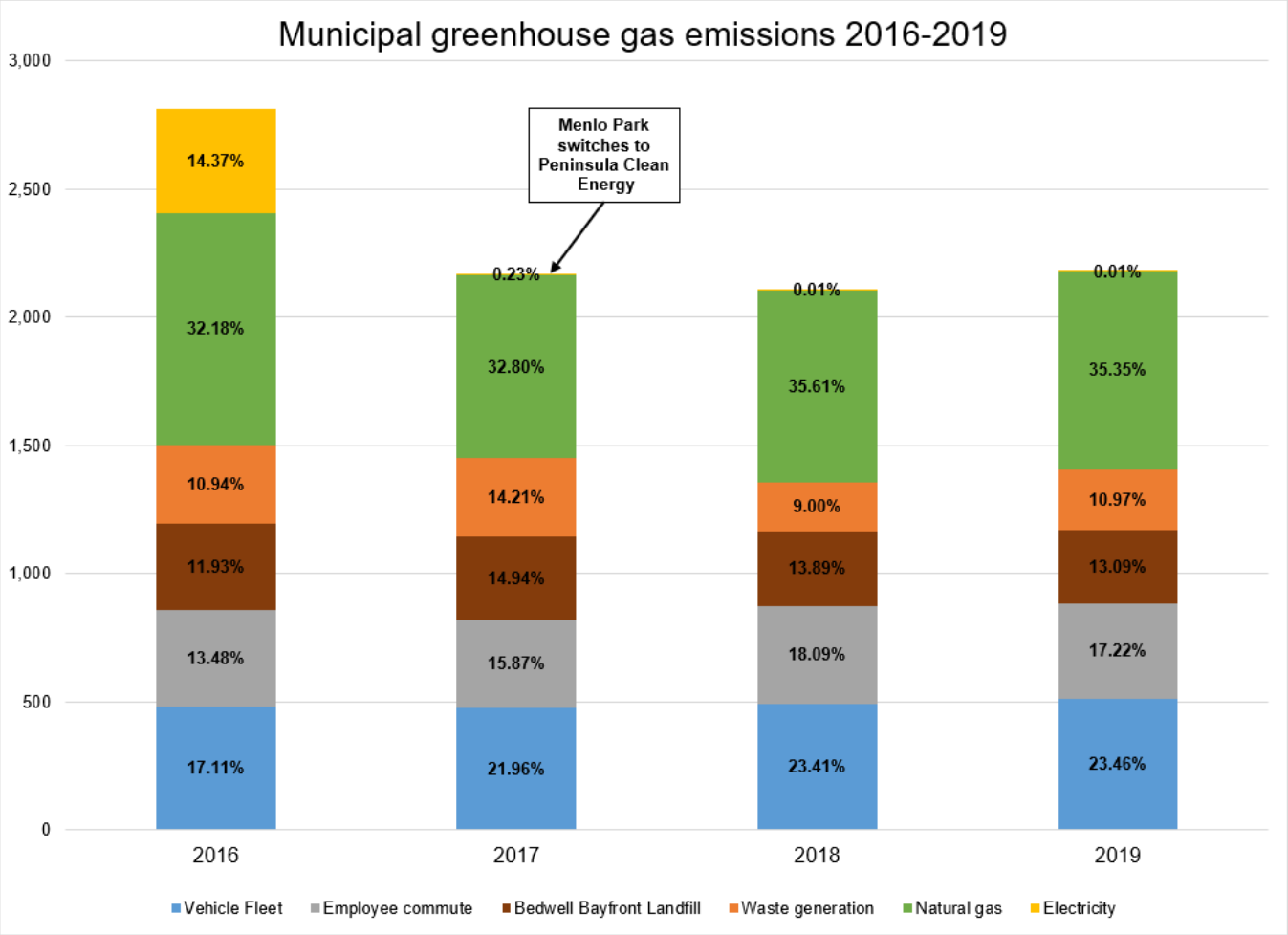


Figure 14-City of Menlo Park municipal greenhouse gas emissions 2019

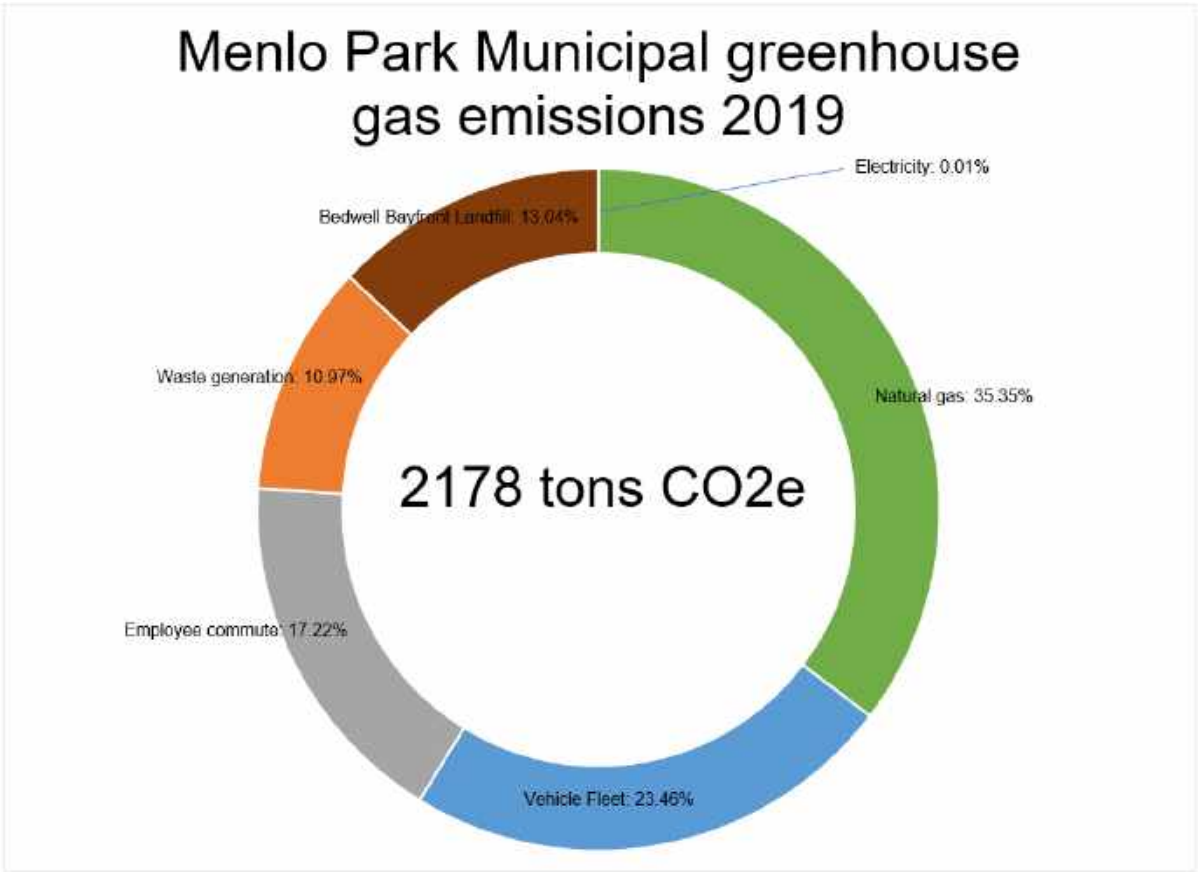
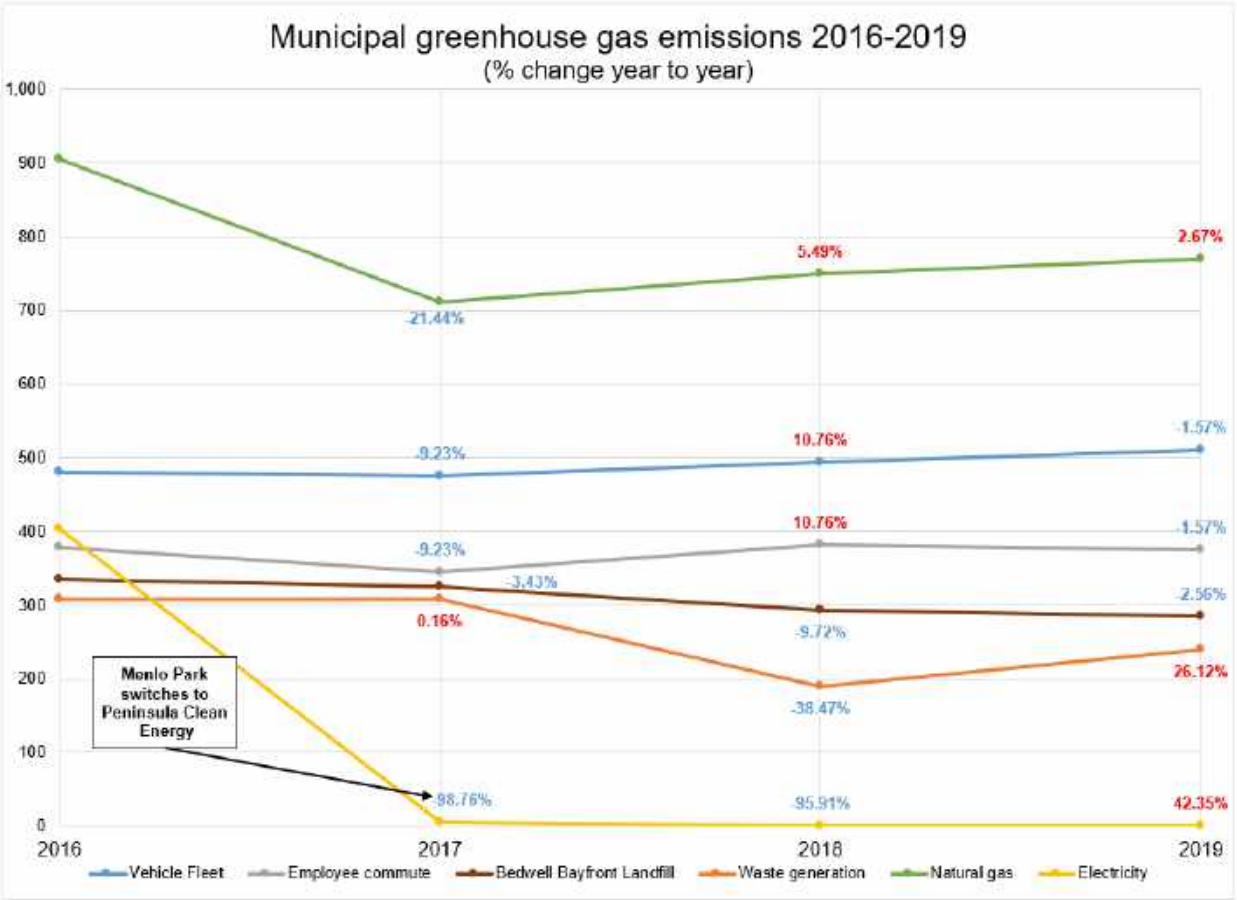


Figure 15 highlights changes in municipal greenhouse gas emission by category:



Methodology and measurement notes

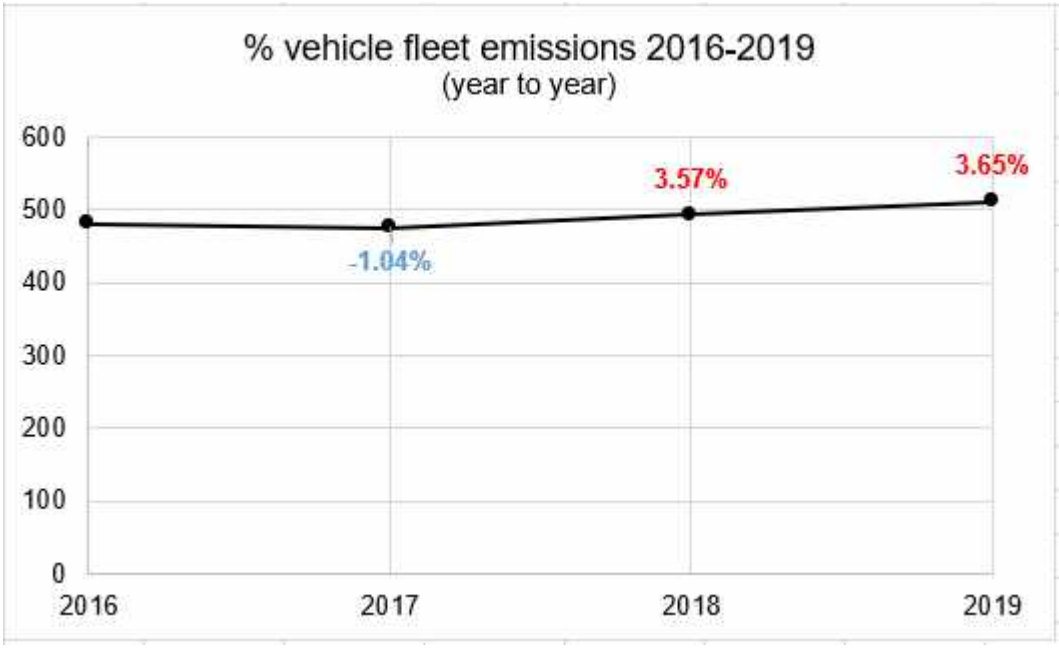
The City can calculate emissions generated by municipal operations related to water and wastewater emissions, fugitive point sources, and more. However, the city has elected to calculate greenhouse gas emissions in six categories (natural gas consumption, electricity use, vehicle fleet, employee commute, waste generation, and emissions from decommissioned Bedwell Bayfront landfill) to provide the most accurate measure of progress in the sectors under the City's purview which will receive the greatest impact from local action.

It is also important to note that any greenhouse gas emissions inventory represents an estimate using the best available data and calculation methodologies at the time it was conducted. These estimates are subject to change as better data and calculation methodologies become available.

Inventory data for 2020 will not be available until Fall 2021.

Vehicle Fleet

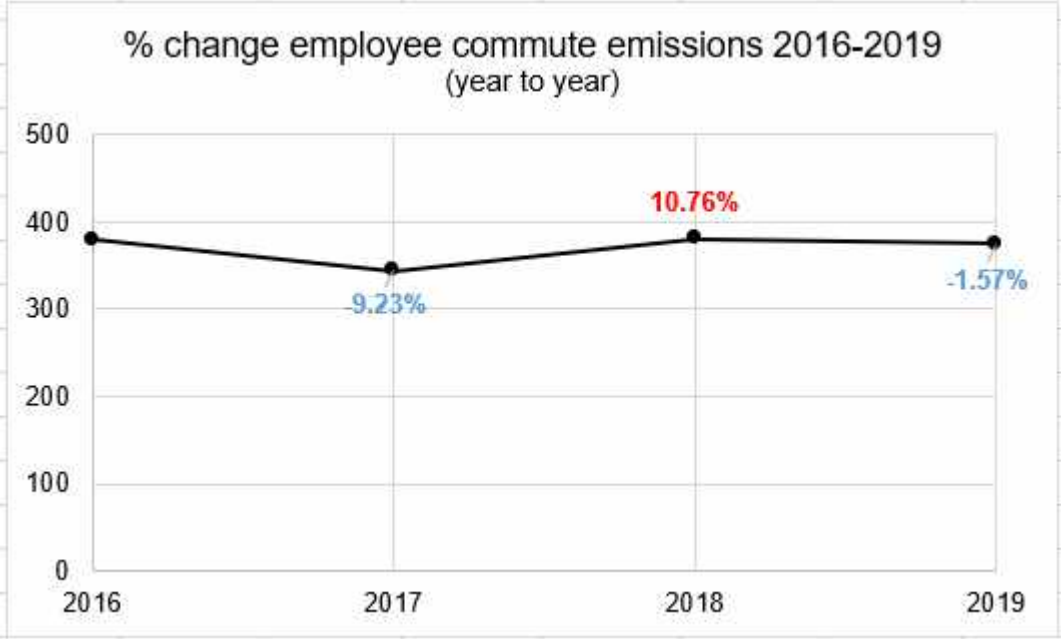
The transportation category includes emissions related to vehicle fleet fuel consumption, vehicles miles traveled, and equipment run time recorded and reported by Menlo Park Public Works, Maintenance Division. As of 2019, vehicle fleet emissions are the second largest contributor to municipal greenhouse gas emissions; 511 tons (23.46 percent of total). Figure 16 highlights the change in emission from 2016 to 2019:



Vehicle fleet related emissions are expected to reduce due to the Sustainable Fleet Policy which prioritizes the purchase of zero-emission vehicles as a first option and establishes a fossil fuel (e.g., gasoline and diesel) reduction goal of 5 percent annually over 2018 baseline.

Employee commute

The employee commute category includes emissions related to commuter program participation reported by Menlo Park Public Works, Transportation Division, and transportation method[38] and vehicle miles traveled[39] estimates derived from regional data reported by the Metropolitan Transportation Commission. As of 2019, vehicle fleet emissions are 375 tons (17.22 percent of total). Figure 17 highlights the change in emission from 2016 to 2019:



Employee commute related emissions are expected to reduce in the near term due to a significant increase in telecommuting/working remote because of the COVID-19 pandemic. At date of publication, though the prevalence of telecommuting/working remote remains, it is unclear if will persist as state, regional, and city restrictions lift.

Considering the previous need for social distancing requirements (COVID-19 prevention measure), if employees do return to office, significant outreach and education must be done to reengage those who previously utilized public transportation and successfully transition more employees away from single vehicle travel.

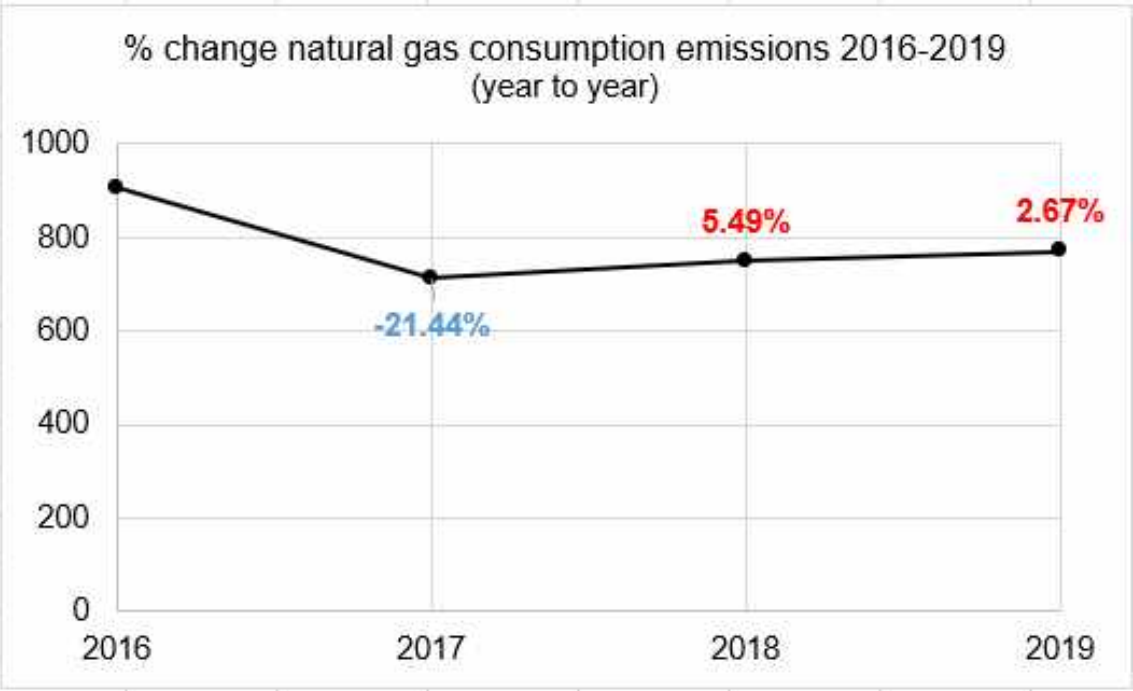
Natural gas consumption

The natural gas consumption category includes emissions related to natural gas usage reported by Pacific, Gas & Electric. As of 2019, natural gas consumption emissions are the largest contributor to municipal greenhouse gas emissions; 770 tons (35.35 percent of total). Figure 18 highlights the change in emission from 2016 to 2019:

---

[38] Metropolitan Transportation Commission, Vital Signs: Commute Mode Choice: vitalsigns.mtc.ca.gov/commute-mode-choice

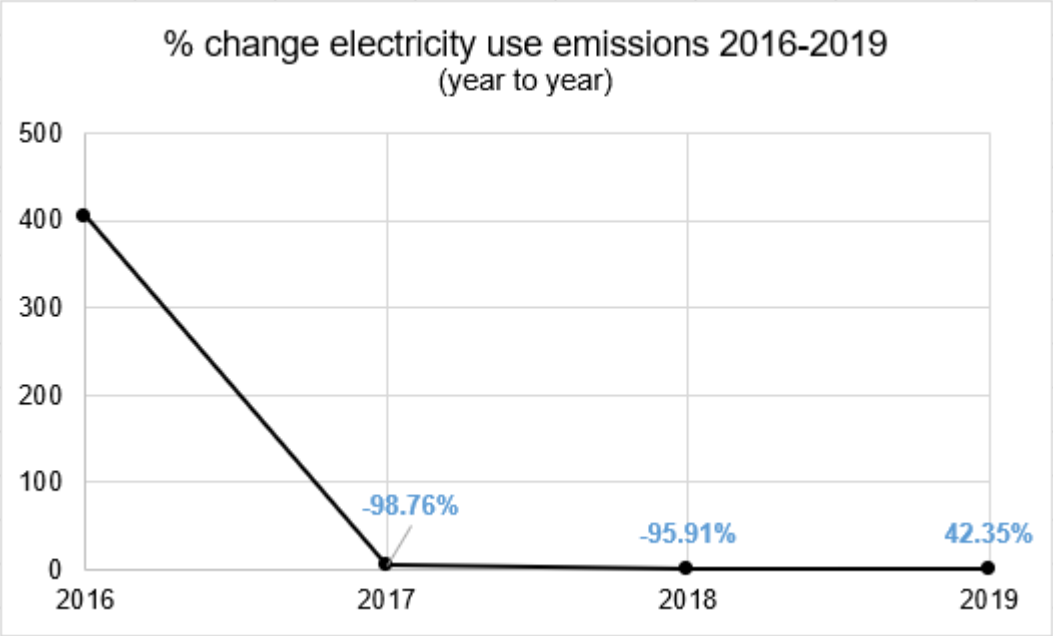
[39] Metropolitan Transportation Commission, Vital Signs: Daily Vehicle Miles Traveled: vitalsigns.mtc.ca.gov/daily-miles-traveled



Natural gas consumption emissions are expected to remain constant or decrease as more municipal assets and facilities are electrified. For example, the City is currently evaluating proposals to install an all-electric, fully islandable (operation off-grid through the use of on-site solar and battery arrays) microgrid system at the new Menlo Park Community Center (100-110 Terminal Avenue). All-electric options for HVAC equipment replacements in the Arrillaga Family Recreation Center (700 Alma Street) and Gymnasium (600 Alma Street) buildings are also planned.

Electricity use

The electricity use category includes emissions related to electricity usage reported by Pacific, Gas & Electric (2016 to current) and Peninsula Clean Energy (2017 to current). As of 2019, electricity use emissions are an insignificant contributor to municipal greenhouse gas emissions; 0.2909 tons (0.01 percent of total). Figure 19 highlights the change in emission from 2016 to 2019:



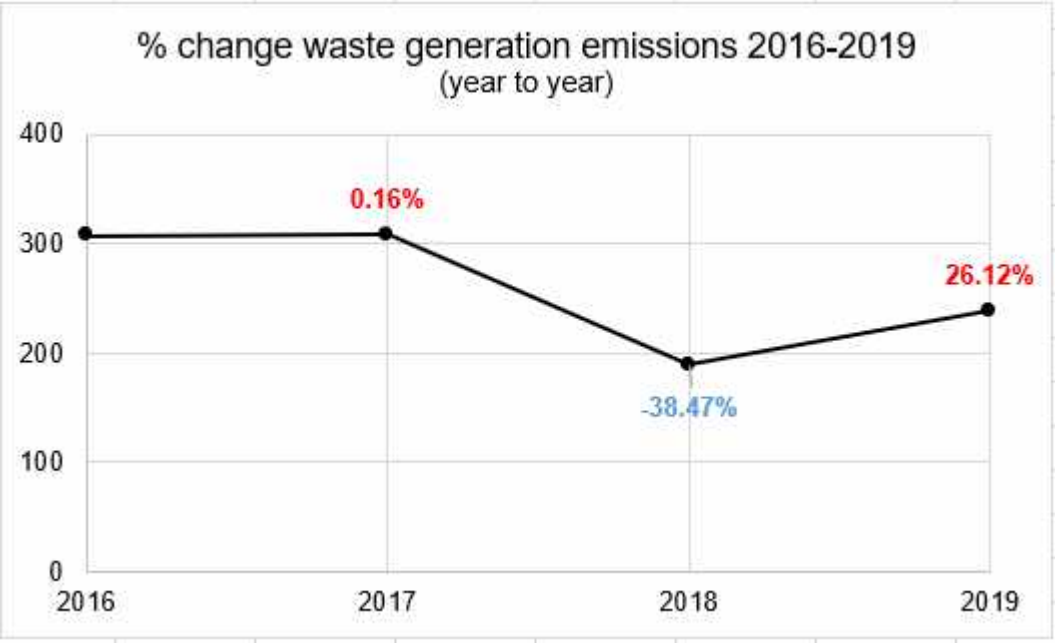
Electricity use emissions were expected to be zero due to the 2017 formal action taken to enroll all municipal accounts in ECO100 (electricity is Green-e certified; 100% from renewable sources (i.e., solar and wind) and carbon-free). However, while staff was performing the municipal inventory, it was discovered that a small amount of electricity from PG&E is still provided to municipal accounts. While it is a very small amount (2706 kWh in 2019) resulting in negligible emissions (0.2909 tons), more investigation is necessary to determine the reason for this discrepancy.

Waste generation

The waste category includes direct emissions related to the breakdown of estimated solid waste (municipal solid/trash waste and organics) sent to the landfill. Estimates were derived service levels for all municipal accounts described in the City's franchise agreement with Recology[40]. Note, any emissions related to the collection and processing of recyclable material or the sourcing, production, or transportations of goods (cradle-to-grave emissions) are not included.

As of 2019, waste generation emissions are 239 tons (10.97 percent of total). Figure 20 highlights the change in emission from 2016 to 2019:

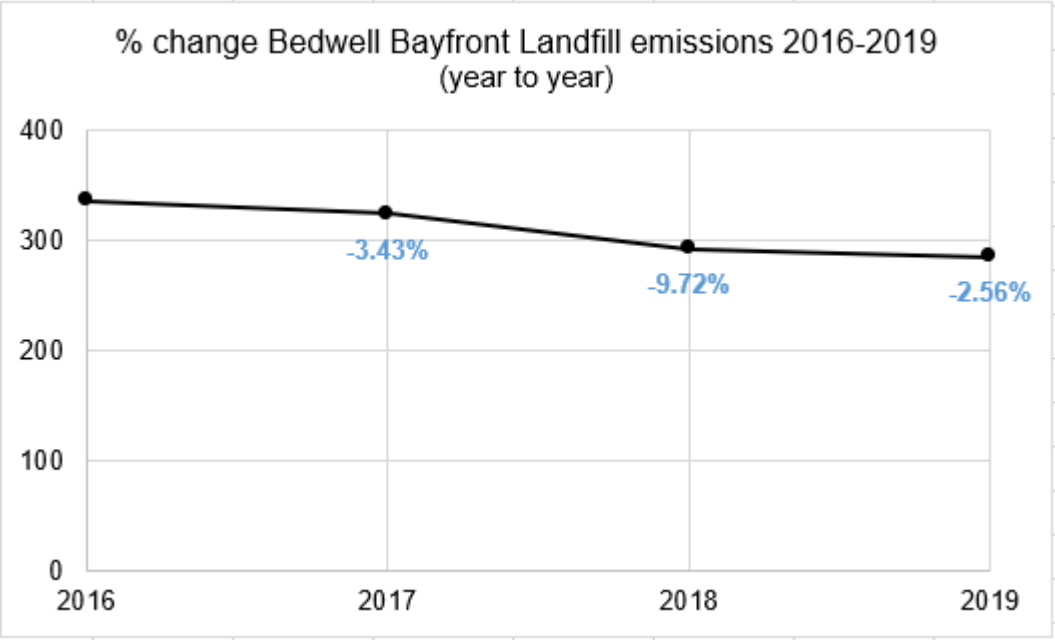
[40] Menlo Park City Council staff report, April 24, 2018: menlopark.org/DocumentCenter/View/17285/I1---Recology-Agreement



If calculation methodology remains the same, waste generation emissions are expected to decrease due improved sorting and waste diverted from landfills. Note, this is due to statewide requirements and regional cooperation. Emissions could be further reduced through the implementation of the Community Zero Waste Plan (2017)[41].

Bedwell Bayfront Landfill

The Bedwell Bayfront Landfill category includes emissions related to captured gas reported by Menlo Park Public Works, Engineering Division. As of 2019, Bedwell Bayfront Landfill emissions are 285 tons (13.09 percent of total). Figure 21 highlights the change in emission from 2016 to 2019:



[41] Menlo Park Community Zero Waste Plan: menlopark.org/1132/Community-Zero-Waste-Plan

Bedwell Bayfront Landfill emissions are expected to continue decreasing because it has been decommissioned (no new material is being introduced).

APPENDIX A: GREENHOUSE GAS EMISSIONS DATA TABLES

The following table summarizes calculated communitywide greenhouse gas emissions from 2005 to 2019.

Table 13-Communitywide greenhouse gas emissions 2005-2019

Table 13: Communitywide greenhouse gas emissions			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	349,284		
2006	364,090	4.24%	4.24%
2007	387,731	6.49%	11.01%
2008	376,435	-2.91%	7.77%
2009	348,934	-7.31%	-0.10%
2010	329,777	-5.49%	-5.58%
2011	314,412	-4.66%	-9.98%
2012	316,761	0.75%	-9.31%
2013	313,981	-0.88%	-10.11%
2014	305,845	-2.59%	-12.44%
2015	300,834	-1.64%	-13.87%
2016	297,239	-1.20%	-14.90%
2017	284,378	-4.33%	-18.58%
2018	271,903	-4.39%	-22.42%
2019	253,371	-6.50%	-27.46%

The following tables summarizes calculated greenhouse gas emissions from 2005 to 2019 by category (transportation, solid waste, build energy use: natural gas, and building energy use: electricity).

Table 14-Transportation related emissions 2005-2019

Table 14: Transportation			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	137,628		
2006	144,795	5.21%	5.21%
2007	140,176	-3.19%	1.85%
2008	131,917	-5.89%	-4.15%
2009	141,478	7.25%	2.80%
2010	144,892	2.41%	5.28%
2011	147,475	1.78%	7.15%
2012	145,627	-1.25%	5.81%
2013	143,757	-1.28%	4.45%
2014	146,885	2.18%	6.73%
2015	140,111	-4.61%	1.80%
2016	153,518	9.57%	11.55%
2017	158,686	3.37%	15.30%
2018	141,568	-10.79%	2.86%
2019	122,029	-13.80%	-11.33%

Table 15- Building energy use related emissions by type (natural gas and electricity) 2005-2019.

Table 15: Total building energy use: natural gas			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	102,295		
2006	103,611	1.29%	1.29%
2007	103,165	-0.43%	0.85%
2008	103,621	0.44%	1.30%
2009	103,012	-0.59%	0.70%
2010	103,027	0.01%	0.72%
2011	105,021	1.94%	2.66%
2012	101,885	-2.99%	-0.40%
2013	103,406	1.49%	1.09%
2014	90,036	-12.93%	-11.98%
2015	88,375	-1.84%	-13.61%
2016	90,689	2.62%	-11.35%
2017	95,742	5.57%	-6.41%
2018	109,971	14.86%	7.50%
2019	104,358	-5.10%	2.02%

Table 15: Total building energy use: electricity			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	87,617		
2006	82,715	-5.59%	-5.59%
2007	114,718	38.69%	30.93%
2008	113,712	-0.88%	29.78%
2009	98,368	-13.49%	12.27%
2010	76,142	-22.59%	-13.10%
2011	55,203	-27.50%	-37.00%
2012	63,677	15.35%	-27.32%
2013	61,342	-3.67%	-29.99%
2014	62,891	2.53%	-28.22%
2015	66,150	5.18%	-24.50%
2016	46,217	-30.13%	-47.25%
2017	21,528	-53.42%	-75.43%
2018	15,161	-29.57%	-82.70%
2019	20,963	47.26%	-76.07%

The following tables summarizes calculated greenhouse gas emissions related to building energy use (natural gas and electricity) from 2005 to 2019 by account type (commercial,

residential, and direct access). Note, direct access accounts have only electricity related emissions.

Table 16-Commercial energy related emissions 2005-2019

Table 16: Commercial energy use: natural gas			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	63,053		
2006	64,709	2.63%	2.63%
2007	64,238	-0.73%	1.88%
2008	64,535	0.46%	2.35%
2009	63,358	-1.82%	0.48%
2010	64,188	1.31%	1.80%
2011	64,344	0.24%	2.05%
2012	62,956	-2.16%	-0.15%
2013	64,000	1.66%	1.50%
2014	58,847	-8.05%	-6.67%
2015	56,533	-3.93%	-10.34%
2016	58,638	3.72%	-7.00%
2017	61,656	5.15%	-2.22%
2018	74,849	21.40%	18.71%
2019	69,049	-7.75%	9.51%

Table 16: Commercial energy use: electricity			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	57,508		
2006	54,035	-6.04%	-6.04%
2007	76,323	41.25%	32.72%
2008	76,486	0.21%	33.00%
2009	66,151	-13.51%	15.03%
2010	50,710	-23.34%	-11.82%
2011	34,020	-32.91%	-40.84%
2012	39,856	17.15%	-30.69%
2013	38,765	-2.74%	-32.59%
2014	40,191	3.68%	-30.11%
2015	42,913	6.77%	-25.38%
2016	26,205	-38.93%	-54.43%
2017	13,206	-49.61%	-77.04%
2018	10,297	-22.03%	-82.09%
2019	7,610	-26.09%	-86.77%

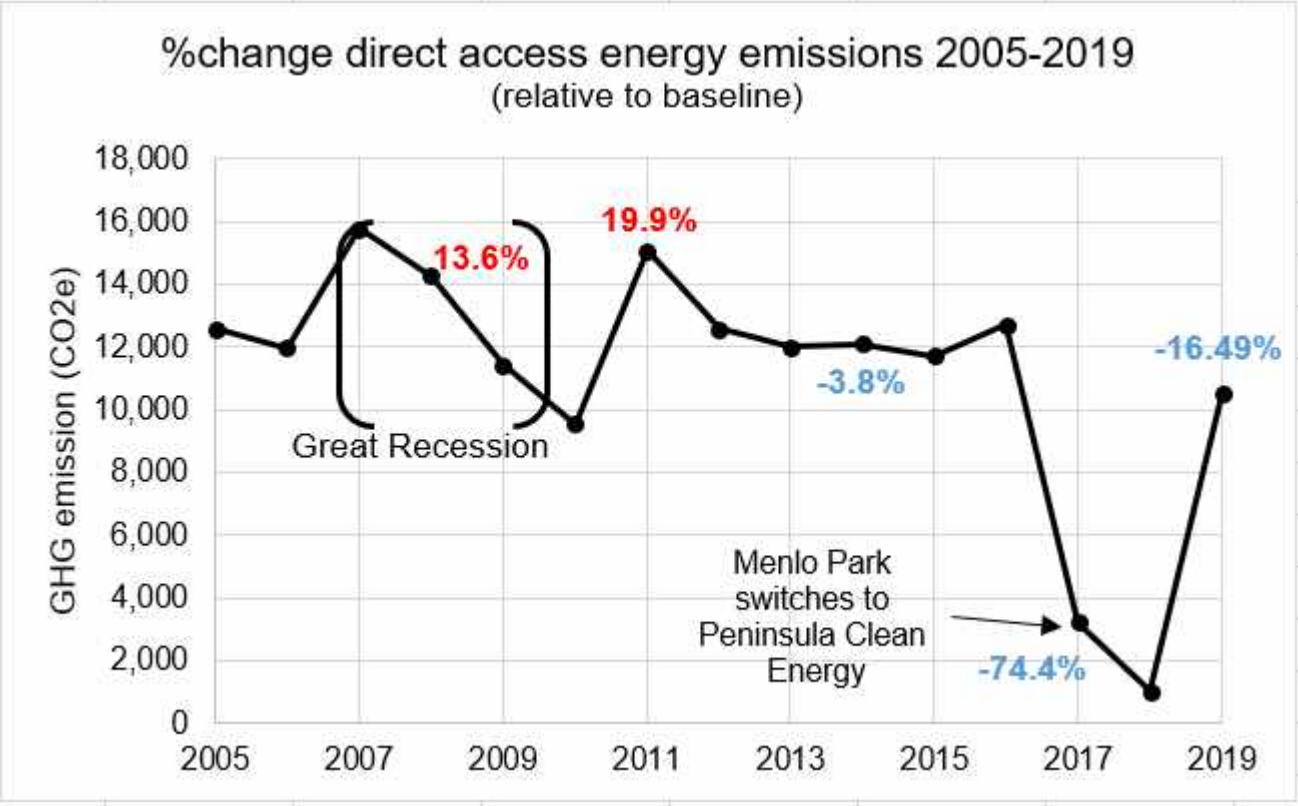
Table 17-Residential energy related emissions 2005-2019

Table 17: Residential energy use: natural gas			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	39,242		
2006	38,902	-0.87%	-0.87%
2007	38,927	0.06%	-0.80%
2008	39,086	0.41%	-0.40%
2009	39,654	1.45%	1.05%
2010	38,839	-2.06%	-1.03%
2011	40,677	4.73%	3.66%
2012	38,929	-4.30%	-0.80%
2013	39,406	1.23%	0.42%
2014	31,189	-20.85%	-20.52%
2015	31,842	2.09%	-18.86%
2016	32,051	0.66%	-18.32%
2017	34,086	6.35%	-13.14%
2018	35,122	3.04%	-10.50%
2019	35,309	0.53%	-10.02%

Table 17: Residential energy use: electricity			
Year	GHG emissions (tons)	%change (year to year)	%change (relative to baseline)
2005	17,534		
2006	16,709	-4.71%	-4.71%
2007	22,626	35.41%	29.04%
2008	22,943	1.40%	30.85%
2009	20,789	-9.39%	18.56%
2010	15,895	-23.54%	-9.35%
2011	13,967	-12.13%	-20.34%
2012	15,690	12.34%	-10.52%
2013	14,875	-5.19%	-15.16%
2014	14,636	-1.61%	-16.53%
2015	14,817	1.24%	-15.50%
2016	14,434	-2.58%	-17.68%
2017	5,104	-64.64%	-70.89%
2018	3,837	-24.83%	-78.12%
2019	2,852	-25.67%	-83.74%

APPENDIX B: BUILDING ENERGY USE: DIRECT ACCESS

The current greenhouse emission calculation methodology shows direct access accounts to be the smallest contributor the building energy use category. In 2019, building energy use related emissions from direct access accounts was 10,501 tons (4.14 percent of the communitywide total). Figure 22 highlights changes direct access building energy use related emission 2005-2019:



Note, all PCE provided electricity (irrespective of account type) is tracked by PG&E as direct access energy. To avoid double counting, total electricity use reported by PCE is subtracted from PG&E direct access energy category. This process likely resulted in the abnormal (91.8 percent relative to baseline) emissions reduction in 2018.

The direct access energy category reflects electricity consumption reported by Pacific Gas & Electric (from 2005 inventory to current) and Peninsula Clean Energy (from 2017 inventory to current). As of 2019 emissions related to direct access energy use represent approximately 8.4 percent of building energy use related emissions.

Emissions related to electricity use are expected to continue decreasing as energy sources increasingly become carbon neutral or free.

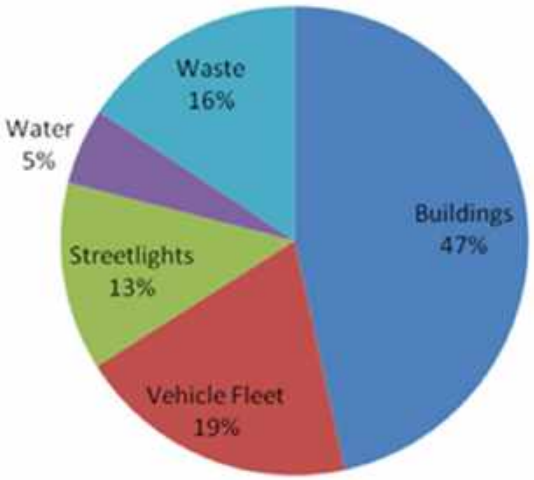
Table 18-Direct access energy related emissions 2005-2019. Note, all PCE provided electricity (irrespective of account type) is tracked by PG&E as direct access energy. To avoid double counting, total electricity use reported by PCE is subtracted from PG&E direct access energy category.

Table 18: Direct Access Energy			
Year	GHG emissions (tons)	% change (year to year)	%change (relative to baseline)
2005	12,575		
2006	11,971	-4.80%	-4.80%
2007	15,769	31.73%	25.40%
2008	14,283	-9.42%	13.58%
2009	11,428	-19.99%	-9.12%
2010	9,537	-16.55%	-24.16%
2011	15,073	58.05%	19.86%
2012	12,580	-16.54%	0.04%
2013	12,020	-4.45%	-4.41%
2014	12,092	0.60%	-3.84%
2015	11,716	-3.11%	-6.83%
2016	12,696	8.36%	0.96%
2017	3,218	-74.65%	-74.41%
2018	1,028	-68.05%	-91.83%
2019	10,501	10195.10%	-16.49%

APPENDIX C: PREVIOUS MUNICIPAL GREENHOUSE GAS INVENTORY

The following is the last published Municipal Greenhouse Gas Inventory (included as part of the 2015 Climate Action Plan update[42].

Municipal Operations Greenhouse Gas Emissions Inventory 2009 By Source (2,889 tons CO_2e)



Emissions from the City are embedded within the community-wide totals. Government operations are therefore a subset of total community emissions. In the year 2009, the City of Menlo Park's municipal operations generated 2,889 tons of CO_2e, which constitutes 0.004% of the community's total greenhouse gas emissions. This is a 25% increase compared to 2005 total emissions (2,305 tons).

Electricity and natural gas use in the City's buildings contributed to 47%, the vehicle fleet contributed 19% of this total, and the remainder of CO_2e came from streetlights, waste, and the electricity for pumping water and storm water.

Municipal Buildings - Electricity and natural gas use in the City's buildings contributed to 47% of CO2e from municipal operations. This is up 14% compared to City buildings contributing 33% of CO2e toward municipal operations in 2005. This increase can be attributed to a couple reasons; PG&E's greenhouse gas CO2 emission rates for electricity increased from KWh x (0.489 lbs/kWh / 2,204.6 lbs/metric ton) in 2005 to KWh x (0.641 lbs/kWh / 2,204.6 lbs/metric ton) in 2009. The increase in emissions rates means that each kWh consumed in 2009 contributed approximately 31.1% more CO2 than in 2005. Another reason for the increase in fuel and electricity consumption from municipal buildings is the construction of new buildings from 2005-2009.

---

[42] Menlo Park Environmental Quality Commission staff report, August 26, 2015: menlopark.org/DocumentCenter/View/7879/B5---CAP?bidId=

Vehicle Fleet - In 2009, Menlo Park's municipal vehicle fleet is responsible for the second largest share of overall municipal emissions at 19%. Compared to 2005's 28.4%, this is a 9.4% reduction. Menlo Park's vehicle fleet consists of analyzing the fuel consumed by City vehicles and equipment, such as police vehicles, and the tractors used for landscaping

Streetlights - The energy consumed by the City's street lights accounted for 13% of municipal operations greenhouse gas emissions in 2009. This analysis included the energy consumed by streetlights, traffic signals, park lighting, decorative lights, and parking lot lights. Compared to 2005's 11.9%, this is a 1.1% increase. This increase can be attributed to the addition of more streetlights, including signal cameras added throughout the city in 2008.

Water/Sewage - The emissions resulting from the energy used to pump water and waste water remained the same at 5% in 2005 and 2009. This analysis excludes pumping and treatment of wastewater that is carried out by the West Bay Sanitary District (WBSD), East Palo Alto Sanitary District (EPASD), and the South Bayside System Authority (SBSA).

Waste - In 2009, the relative contribution of landfilled waste from municipal operations to greenhouse gas emissions is 16%. Compared to landfilled waste contributing 20.8% to municipal operations in 2005, there is a 4.8% decrease. This decrease can be attributed to the reduction of solid waste sent to the landfill from year to year.