Environmental Quality Commission

SPECIAL MEETING AGENDA
Date: 9/22/2021
Time: 6:00 p.m.
Special Meeting Location: Zoom.us/join – ID# 890 8487 9938

NOVEL CORONAVIRUS, COVID-19, EMERGENCY ADVISORY NOTICE
On March 19, 2020, the Governor ordered a statewide stay-at-home order calling on all individuals living in the State of California to stay at home or at their place of residence to slow the spread of the COVID-19 virus. Additionally, the Governor has temporarily suspended certain requirements of the Brown Act. For the duration of the shelter in place order, the following public meeting protocols will apply.

Teleconference meeting: All members of the Environmental Quality Commission, city staff, applicants, and members of the public will be participating by teleconference. To promote social distancing while allowing essential governmental functions to continue, the Governor has temporarily waived portions of the open meetings act and rules pertaining to teleconference meetings. This meeting is conducted in compliance with the Governor Executive Order N-25-20 issued March 12, 2020, and supplemental Executive Order N-29-20 issued March 17, 2020.

- How to participate in the meeting
  - Access the special meeting real-time online at:
    Zoom.us/join – Special Meeting ID 890 8487 9938
  - Access the meeting real-time via telephone at:
    (669) 900-6833
    Meeting ID 890 8487 9938
    Press *9 to raise hand to speak

Subject to Change: Given the current public health emergency and the rapidly evolving federal, state, county and local orders, the format of this meeting may be altered or the meeting may be canceled. You may check on the status of the meeting by visiting the City's website www.menlopark.org. The instructions for logging on to the Zoom webinar and/or the access code is subject to change. If you have difficulty accessing the Zoom webinar, please check the latest online edition of the posted agenda for updated information (menlopark.org/agenda).

Special Session (Zoom.us/join – ID# 890 8487 9938)

A. Call To Order

B. Roll Call – Elkins, Evans, Gaillard, Kabat, London, Payne, Price

C. Regular Business

C1. Approve August 18, 2021 minutes (Attachment)

C2. Review and discuss Commissioner Elkins recommendation to City Council on gas powered leaf blower ban (Attachment)

C3 Informational presentation on modification of the 2030 Climate Action Plan progress reporting methodology and clarification of the goals (Attachment)

C4. Review and discuss Commissioner Gaillard, Kabat, and Chair Payne recommendations on Climate Action Plan tracking metrics (Attachment)

C5 Review and discuss Commissioner Gaillard, Kabat, and Chair Payne recommendations on post-crisis implementation of the 2020 Climate Action Plan (Attachment)

D. Reports and Announcements

D1. Reports and Announcements from staff and commissioners

E. Adjournment

At every Regular Meeting of the Commission, in addition to the Public Comment period where the public shall have the right to address the Commission on any matters of public interest not listed on the agenda, members of the public have the right to directly address the Commission on any item listed on the agenda at a time designated by the Chair, either before or during the Commission's consideration of the item.

At every Special Meeting of the Commission, members of the public have the right to directly address the Commission on any item listed on the agenda at a time designated by the Chair, either before or during consideration of the item.

For appeal hearings, appellant and applicant shall each have 10 minutes for presentations.

If you challenge any of the items listed on this agenda in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Menlo Park at, or prior to, the public hearing.

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REGULAR MEETING MINUTES – DRAFT
Date: 8/18/2021
Time: 6:00 p.m.
Regular Meeting Location: Zoom.us/join – **ID# 915 4675 0502**

A. Call To Order

Chair Payne called the meeting to order at 6:06 p.m.

B. Roll Call

Present: Elkins, Evans (Vice Chair), Gaillard, Kabat, London, and Payne
Absent: Price
Staff: Rebecca Lucky- Sustainability Manager

C. Public Comment

None.

D. Regular Business

D1. Approve July 21 2021 minutes (Attachment)

Chair Payne introduced item.

- Peter Edmonds identified a mistake with the May 19, 2021 meeting minutes.

ACTION: Motion and second (Gaillard/ Elkins) to approve the July 21, 2021 meeting minutes with the modification on Page D1.1, to include correction of "coloration," passed 6-0 (Price absent).

D2. Review and discuss cost effectiveness and policy options report to electrify existing buildings (climate action plan No. 1 strategy) (Staff Report #21-006-EQC)

Sustainability Manager introduced the item.

TRC and DNV consultants made a presentation (Attachment).

The Environmental Quality Commission's (EQC) Building Decarbonization Subcommittee made a presentation (Attachment).

- Peter Edmonds spoke about the contractor's role in disposal of natural gas appliances, the environmental cost of removing the appliance, appliance recycling industry, and secondary market which could lessen the cost of removal/replacement which may encourage the transition to electric appliances and reduce demand for natural gas appliances.
- James Pistorino spoke in opposition of the accuracy of cost estimates in the draft report.
- Diane Bailey spoke in support for the subcommittee's recommendation.
- Karen Grove spoke in support for measures to reduce displacement of renters and implementation of climate action plan strategy no. 1.

- Rich Wipfler spoke in opposition of the infrastructure and space needed for heat pump water heaters.

ACTION: Motion and second (Elkins/ Evans) to recommend to the City Council the actions identified in the "Final Recommendation" section of EQC building decarbonization committee's memorandum on Page 4 and development of a long-term plan for the decarbonization of existing buildings to reach climate goals, passed 6-0 (Price absent).

ACTION: Motion and second (Gaillard/ Elkins) to forward the EQC's building decarbonization subcommittee memorandum to the City Council with edits to reflect the new August 18, 2021 draft TRC report addressing concerns as stated in the subcommittee memorandum, passed 6-0 (Price absent).

D3. Discuss annual Chair report and work plan presentation to City Council

Chair Payne announced Chair report to be heard at the August 31, 2021 City Council meeting.

The Commission provided the Chair with general guidance on reporting the EQC work plan and progress to the City Council.

E. Reports and Announcements

E1. Reports and Announcements from staff and commissioners

Sustainability Manager provided updates for upcoming September 15, 2021 Commission meeting topics:

- Climate action plan strategy no. 1 potential policy pathways (as identified by City Council at the August 31, 2021 meeting)
- Climate action plan strategy metrics
- Gas-powered leaf blowers, including Commissioner Elkins report

F. Adjournment

Chair Payne adjourned the meeting at 8:33 p.m.

Sustainability Contractor Candise Almendral

D2-STAFF PRESENTATION

REVIEW AND DISCUSS COST EFFECTIVENESS AND POLICY OPTIONS REPORT TO ELECTRIFY EXISTING BUILDINGS

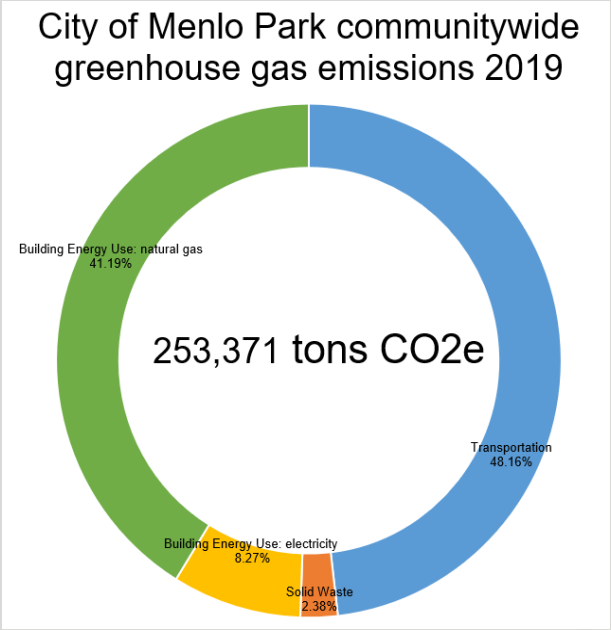
Rebecca Lucky, Sustainability Manager

AGENDA

- Process and Next Steps (Staff)
- Overview of the cost effectiveness analysis (TRC)
- Overview of potential policy and program pathways (Staff)
- Meeting the goal to convert 95% of existing buildings to electric by 2030 (DNV)

CLIMATE ACTION PLAN GOAL NO. 1

- Convert 95% of existing buildings (residential and commercial) to electric by 2030
- Helps city meet its carbon neutral goal by capitalizing on clean and fossil fuel free energy from Peninsula Clean Energy
- Menlo Park adopted electric requirements for new construction in 2020



CITY COUNCIL DIRECTION

- Prepare a cost effectiveness analysis and policy options to present to the City Council
- Requested feedback from the Environmental Quality Commission
- Working draft was provided to the EQC last month and reviewed concurrently with city staff
- Deferred further review of the analysis and policy options to the commission's building decarbonizaiton subcommittee

TIMELINE

- No final decision is being made regarding any policy or program at this meeting for the community
- **August 31**: City Council study session to present cost effectiveness analysis and receive direction on preparing a possible roadmap and timeline
- **September 15:** EQC meeting to finalize feedback/advice on policy roadmap and timeline
- **October 12:** City Council study session to review roadmap and timeline and provide further direction

THANK YOU

D2- CONSULTANT PRESENTATION

Existing Building Electrification Policy Options: Draft Analysis and Discussion

August 18, 2021

Prepared by Farhad Farahmand (TRC), Mayra Vega (TRC), and Blake Herrschaft (DNV), Douglas Kot (DNV) in partnership with City Staff and Peninsula Clean Energy

INTEGRATED
[RESILIENT]
SUSTAINABLE

Summary of Updates

- Updated cost-effectiveness for proposed measures as a result of updated utiltiy escalation rates
- Included a single family cost-savings graphic for all measures
- Included a burn-out ordinance
- Coming soon: incorporating the cost of climate change to a greater degree

Market Readiness

End Use	Technology Available?	Contractor Familiarity?	More Challenging Building Types
Space Heating	Yes, since 1950s	All	Labs, hospitals, Variable air volume (VAV) reheat systems in commercial office (typically >50 ft2 or more)
Water Heating	Yes, since 2010	Some	Labs, hospitals, hotels, large multi-family
Cooking	Yes, since 1950s, more so since 2010	All for residential, Some for commercial	Restaurants with limited site electrical capacity
Clothes Drying	Yes, since 1940s	All for most buildings, some for laundromats, etc.	Laundromats, hotels, hospitals
Pools	Yes, since 1990s	Some	Large commercial pools

BayREN contractor list available here
Clean Energy Connection list available here

Berkeley, Half Moon Bay, Palo Alto, San Francisco, and New York City are all working towards existing building electrification mandates

Local Jurisdiction Roles in Incentives and Financing

Lead Roles

- Developing incentive programs for constituents
  - Can fund via local taxes and fees (e.g., Utility User's Tax)
  - Can partner with other agencies (e.g., Bay Area Air Quality Management District).
- Municipal financing – electrifying public buildings through green bonds or local taxes

Advocacy Roles

- On-bill financing (utility customer loan) or *tariffed* on-bill financing (utility investment tied to utility meter)
- Sharing of resources enabling electrification
  - Partner incentives (Utilities, BayREN, PCE)
  - Electrification-as-a-service partnerships
  - Tax credits, deductions and rebates
  - Loan programs (i.e., California Hub for Energy Efficiency Financing)

Statewide Utility Cost Effectiveness: Methodology

- Lifecycle periods of 15 years (nonresidential) and 30 years (residential)
- Benefit metrics
  - On-bill – Peninsula Clean Energy utility rate schedules
  - Time Dependent Valuation - 'societal value or cost'
- Cost effectiveness measured in Benefit/Cost ratio and Net Present Value
- Three vintages: 80's, 90's, and 2000's

Sector	Prototypes
Residential	Single-family (2,700 ft2), Low-rise multifamily (8 DUs)
Nonresidential	Office (53,000 ft2), Retail (25,000 ft2), Warehouse (18,000 ft2), Quick Restaurant (2,500 ft2), Full Restaurant (5,000 ft2), High-Rise Multifamily (117 DUs), Small Hotel (41,000 ft2)

Can be used for Energy Commission approval of local energy conservation standards (PRC 25402.1(h)2), but the cost-effectiveness criteria is up to jurisdiction. This analysis largely follows the Statewide Utility Codes & Standards Program methodology.

Cost Effectiveness: Residential Results (Water Heating)

- The upfront cost to replace natural gas equipment with an electric heat pump water heater (HPWH) is higher
- HPWH increases utility bills nominally in the 1st year but saves an average of $6-$8/month over the life of the equipment compared to a gas water heater

	Monthly Bill Savings		30-Year On-Bill Savings (NPV)
	Year 1	30-Year Average	
HPWH	($1)	$6	($387) $1,859 with incentive

Cost Effectiveness: Residential Results (Space Heating)

- Standard efficiency HPSH increases utility bills by $22 - $31/month in the first year and $6/month over the life of the equipment
- High efficiency HPSH increases utility bills by $3 - $6/ month in the 1st year but saves an average of $7 -$18/month over the life of the equipment

	Monthly Bill Savings		30-Year On Bill Savings (NPV)
	Year 1	30-Year Average	
Standard efficiency HPSH	($26)	($6)	($2,555)
High efficiency HPSH	($5)	$11	($106) $1,016 with incentive

Cost Effectiveness: Residential Results (Cooking and Clothes Drying)

- Electric cooking ranges and electric clothes dryers are not cost-effective

	Monthly Bill Savings		30-Year On Bill Savings (NPV)
	Year 1	30-Year Average	
Electric Range/Oven	($5)	($3)	($1746)
Electric Dryer	($15)	($10)	($4058)

Cost Effectiveness: Nonresidential Results

Prototype	All-Electric (Code Minimum)	All-Electric + Efficiency	All-Electric + Solar PV
Retail	Not cost effective yet	On-Bill and TDV	On-Bill and TDV
Office	Not cost effective yet	Not cost effective yet	Not cost effective (maybe TDV with efficiency measures, not analyzed)
Quick-Service Restaurant	Not cost effective	Not cost effective yet	Not cost effective yet (includes battery)
Full-Service Restaurant	Not cost effective yet	Not cost effective	Not cost effective yet (includes battery)
Warehouse	Not cost effective yet	Not cost effective yet	On-bill
High-rise Multifamily	Not cost effective yet	Not analyzed	TDV
Small Hotel	On-Bill and TDV	Not analyzed	On-bill and TDV

Electrification For All

- Menlo Park contains 1,500 housing units with occupants that are below 30 percent of the area median income (AMI).
  - Mostly renters
  - 7-11% of income is spent on energy
- Equitable policy characteristics
  - Ensure access to incentives
  - Ensure bill reductions
  - Avoid increasing debt
  - Avoids "renovictions" that evict tenants when making building upgrades, or rent increases
- Partnering with local community-based organizations is critical to honest discussion and long-term commitment

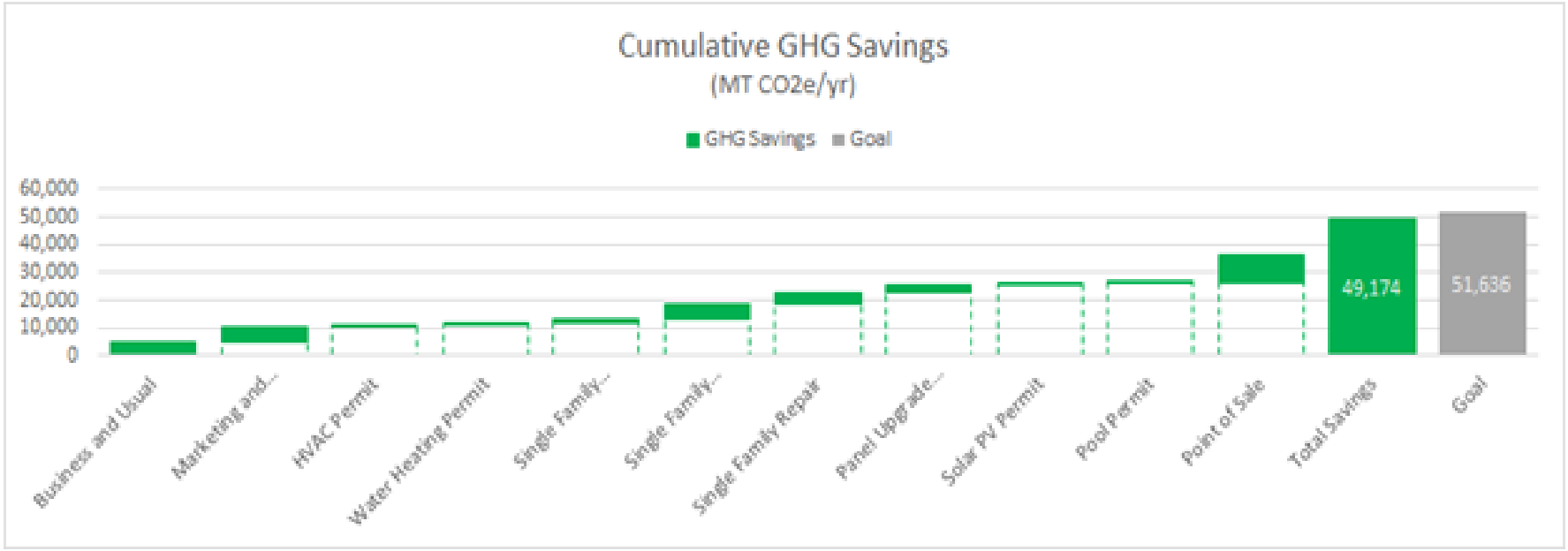
Rental Housing Performance Standards (RHPS), coupled with rental housing policies, could:
- reduce the energy cost burden on tenants,
- eliminate the split incentive, and
- support cities in meeting climate goals.

26 cities in CA have rental housing inspection policies

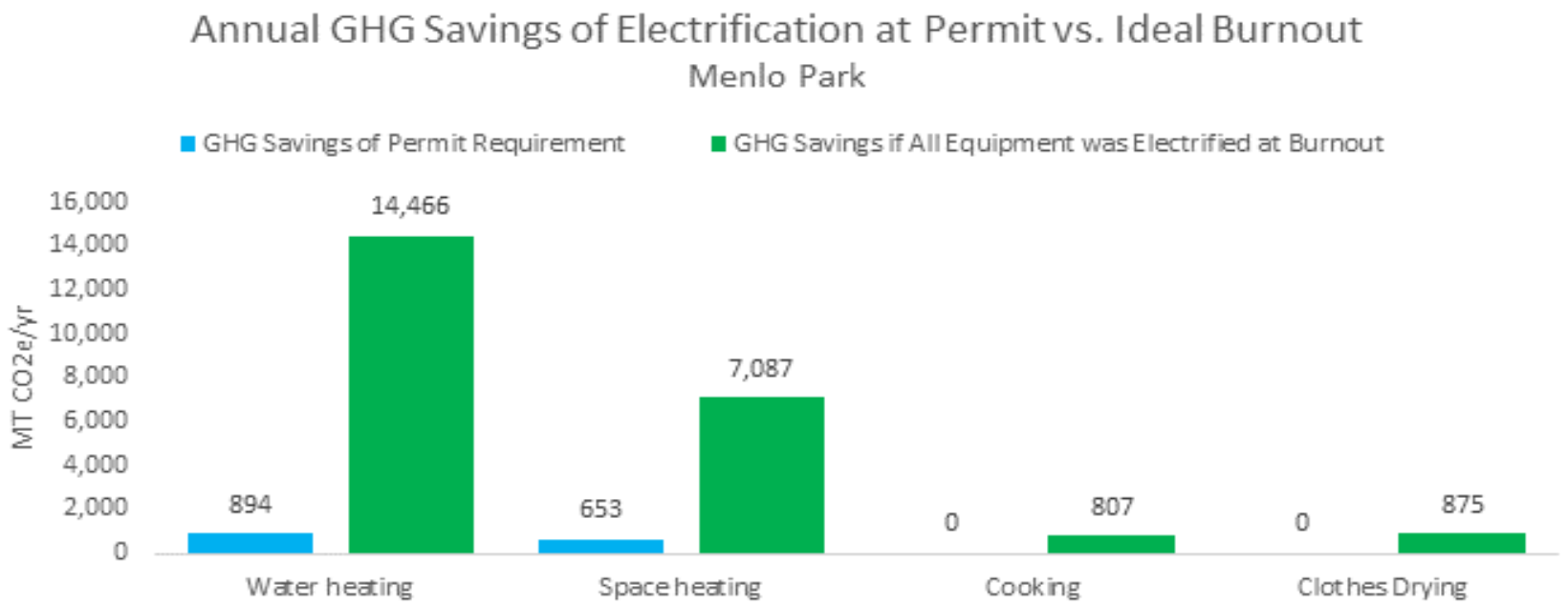
At least **6 cities outside CA** have RHPS with energy efficiency requirements.

Sources: LEAD Tool, StopWaste, Urban Sustainability Director's Network

Emissions Impacts



Emissions Impacts – Limitations of Eqpt Permits



Grid Reliability

FAQs

1. Can the grid handle the load increases?
2. Will it take longer to get utility service?
3. Will electrification reduce resilience?
4. What is going on with these fires?
5. If the grid isn't green, what's the point?

Can the Grid Handle Load Increases?

New Construction only accounts for *1% of building stock*. Yes, the grid can handle a 1% year-over-year increase

Service obligation – grid operators in CA are mandated to deliver the power you want.

Grid over-capacity is often over-stated. There are less than 13 calls in a given year to reduce load, typically closer to 1 than 13.

"PG&E fully expects to meet the needs that all-electric buildings will require"
-Robert S. Kenney, Vice President, PG&E

"Electrification is lower-cost, lower-risk mitigation strategy" - CEC

Will Electrification Reduce Resilience?

Space Heating

Gas furnaces require electric fans, but fireplaces still work.

Water Heating

Gas water heaters require electronic ignition or pumps

Cooking

Will work without electricity

Clothes Drying

Electric motor runs tumbler

Policy Options Overview

#1: Public Engagement and Education

- Concierge assistance for residents toward financing, permit education
- Piloting projects in low-or-moderate income (LMI) communities
- Outreach and forums for residents and businesses

#2: Generate Funds for Financing

- Fees for building projects that generate greenhouse gases (GHGs)
- City reserves, American Rescue Plan funds, Utility User's Tax
- Partner with local lenders to provide streamlined financing options

#3 Time Certain Building Performance Standards

- Set a deadline for electrification (e.g., 2030)
- Require reporting and/or inspections

Policy Options Overview

#4: Permitting

- A: Heat pumps when installing air-conditioning
- B: Electric-ready at panel upgrade or solar PV install
- C: Heat pumps installed at voluntary heating, ventilation and air-conditioning (HVAC)/Domestic hot water (DHW) replacements
- D: Heat pumps installed in Additions to single family homes
- E: Heat pump pool heating for new pools
- F: Electric appliances in Alterations including HVAC/DHW
- G: Replace at End of Life

Policy Options Overview

#5: Time of Sale

- *Encourage* electrification at time of real estate sale or transfer through reduced taxes or rebates
- *Require* upgrades at time of sale, similar to Davis or San Francisco

Key Takeaways

There may be key steps before implementing a policy that include addressing equity, greater financial incentives, reducing life and safety risks of permit avoidance, and rental protections

The analysis reviews only heat pump technology which is the most efficient

There is long term cost effectiveness (TDV) for high efficiency heat pump space and water heating

Installing solar can protect against any increases in utility costs

A short, medium, and long term timeline and roadmap is likely needed

Building a Potential Roadmap

Each policy/program option could be evaluated with a set of criteria.

Ease of Implementation/ Process	Convenience	Equitable	Cost Effectiveness	Effectiveness
➉There is a low level of engagement necessary during the adoption process ➉Does not require long term-staff resources ➉Does not require coordination with other agencies.	➉Does not increase scope beyond the original plan ➉Does not increase project timeline or cause a physical impact to the property ➉Skilled workforce for the required upgrade is available.	➉Tenant protections exist ➉There are income-qualified exemptions, incentives, and financing available ➉There is community engagement on policy design and workforce development and training.	➉Demonstrates on-bill savings ➉Does not increase upfront costs ➉Incentive programs are available or forth-coming.	➉Is an enforceable mandate, ➉Transforms the market ➉Is scalable

Discussion

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BACKUP SLIDES

Cost Effectiveness: Residential Results

- Heat pumps are TDV cost effective using 2022 TDV
- Heat pumps are on-bill cost effective when paired with on-site solar photovoltaics (PV)

Measure	Vintage	Gross Measure Cost	PCE/ BayREN Incentive	Net Measure Cost	Year 1 Utility Cost Savings	No Incentive		With Incentive	
						On-Bill B/C Ratio	On-Bill NPV	On-Bill B/C Ratio	On-Bill NPV
SEER 21 Heat Pump at HVAC Replacement	Pre-1978	$3,749	$1,000	$2,749	-$30	0.19	-$3,290	0.26	-$2,168
	1978-1991				-$66	0	-$4,637	0	-$3,514
	1992-2010				-$67	0	-$4,820	0	-$3,697
NEEA Tier 3 HPWH at Replacement	Pre-1978	$2,775	$2,000	$775	$5	0.21	-$2,434	0.78	-$188
	1978-1991				-$6	0.13	-$2,702	0.46	-$456
	1992-2010				-$9	0.10	-$2,788	0.36	-$542

Policy Option Evaluation: Preliminary Results

					LEGEND		
					0	1-2	3
Policy Option and Requirement		Ease of Implementation	Convenience	Equitable	Cost Effective	Effective	Total Score
Option 1: Public Engagement and Education		1-2	3	0	0	1-2	6
Option 2: Generate funds to Develop Additional Incentive and Financing Program Offerings		3	3	1-2	1-2	1-2	10
Option 3: Time Certain Building Performance Standards		0	1-2	1-2	1-2	1-2	5
Option 4: Permit Desk	Option 4A: Heat Pump at A/C Installation	3	1-2	0	1-2	3	9
	Option 4B: Electric Ready Due to PV Installation or Panel Upgrade	1-2	1-2	0	1-2	3	6
	Option 4C: Heat Pump Installed Upon Voluntary Replacement	1-2	0	0	1-2	1-2	4
	Option 4D: Heat Pump Installed During Additions to SF Buildings	1-2	0	0	1-2	1-2	4
	Option 4E: Heat Pump Pool Heater Installed for New Equipment	1-2	1-2	0	1-2	1-2	6
	Option 4F: Electric Appliances and EV Charging in Alterations to Residential Buildings	1-2	1-2	0	1-2	3	6
	Option 4G: Replacement at End of Life	0	1-2	0	1-2	1-2	4
Option 5: Electrification Ready at Time of Sale		0	1-2	0	1-2	3	6

Policy Option Evaluation: Key Takeaways

Highest ranking options

- **Option 2 Generate Funds**
  - Most convenient policy because it doesn't directly impact project work
  - Incentives available
  - Can be designed to generate and redistribute funds equitably
  - May be implemented by city staff relatively easily, or in partnership with utility
- **Option 4A Heat Pump at A/C installation**
  - Minimally intrusive
  - Does not add cost to a project where air-conditioning equipment is already being replaced

Lowest ranking options

- **Option 4C Heat Pump Installed Upon Voluntary Replacement**
- **Option 4D Heat Pump Installed During Additions to SF Buildings**
- **Option 4G Replace at End of Life**
- All of these options require
  - High level of engagement, and either new staff resources or coordination with outside agencies
  - They can all increase a project's scope of work, budget, and timeline
  - Incentives for panel upgrades, heat pump water heaters and heat pump space heaters are available but may not cover full upfront cost
- All are susceptible to permit dodging

Option 1: Marketing and Education

Trigger	Requirement	Logistical challenges
Council Action	Fund staff to develop and share educational materials and interactive tools covering ➢ Heat pump installation and design ➢ Incentive programs	➢ Staff resources ➢ Requires regular updating and coordination with other agencies

Option 2: Generate Funds

Trigger	Requirement	Logistical Challenges
Ballot Measure	Generate funds to: ➢ Incentivize the replacement of existing fossil gas equipment ➢ Support income-qualified projects Funds can be raised using: ➢ Utility User Tax increase similar to proposals by the City of Albany, CA and City of Berkeley. ➢ Carbon fee created and applied to building permits that include gas usage, similar to San Luis Obispo (proposed)	Requires voter approval

Option 3: Time Certain Building Performance Standards

Trigger	Requirement	Logistical Challenges
Council Action	Adopt policy requiring all appliances in all buildings (with some exceptions) to be all-electric by December 31, 2030. Couple with a Disclosure Program assessing the emissions intensity or presence of gas-fired appliances in all building types. Precedence from several cities relies on existing Rental Inspection policies for residential buildings, and Business license policies for commercial buildings.	No precedence in Menlo Park for rental inspections. No precedence for owner-occupied residences.

Option 4A – Heat Pump at A/C Installation

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual residential building stock impacts	Exceptions/Notes
Air-conditioning upgrade	Heat pump installed	➢ $0 typically ➢ $2,000 - $5,000 if original scope was only relocation.		1.4 percent	

Option 4B: Electric at PV Installation or Panel Upgrade

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual residential building stock impacts	Exceptions/Notes
Panel upgrade Solar PV upgrade	➢ Panel and breaker space for all-electric appliances and 240V electric vehicle (EV) charger ➢ 30A HPWH branch circuit	➢ $500 - $1,000 for panel ➢ $500 - $2,000 for circuit ➢ $1,000 - $3,000 total	➢ Physical space accommodation ➢ Adherence to zoning code (setbacks, noise)		➢ Exempt - Multifamily HW systems located in individual dwellings ➢ Included - Multifamily distribution panels

Option 4C: Heat Pump Installed Under Voluntary Replacement

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual building stock impacts	Exceptions/Notes
Voluntary replacement, or relocation of gas-fired appliances.	All-electric equipment installed (heat pumps for space- and water-heating)	➢ HVAC: $0 if replacing air-conditioning, $10,000 - $20,000 if no existing air-conditioning ➢ Water Heating: $4,000 - $6,000 if relocating before burnout ➢ $500 - $2,000 – for branch circuits to each appliance ➢ $2,000 - $4,000 for panel upgrade if necessary	➢ Addition of condensate drain for heat pumps ➢ Additional verification required for existing equipment type ➢ Need to avoid delays during emergency replacements	➢ 1.6 percent per year	Emergency repairs allow work to be completed prior to permit. May cause re-doing the work if not done to code.

Option 4D: Heat Pump Installed During Additions to SF Buildings

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual building stock impacts	Exceptions/Notes
Added conditioned space	Panel and breaker space for all-electric appliances and 240V EV charger	➢ $500 if panel upgrade is already in scope ➢ $3,000 - $5,000 if panel upgrade was not in scope		0.7 percent of existing single-family buildings	
	Replace existing space heating with heat pump	➢ $0 if replacing air-conditioning, ➢ $10,000 - $20,000 if no existing air-conditioning	➢ Physical space accommodation ➢ Adherence to zoning code (setbacks, noise)		➢ Exempt – no alterations to the existing heating system ➢ Multifamily buildings
	Replace existing water heater with heat pump	➢ $2,500 if replace on burnout ➢ $4,000 - $6,000 if relocating before burnout			➢ Exempt – no alterations to the existing water heater. A 240V, 30-amp circuit required instead. ➢ Multifamily buildings

Option 4E: Heat Pump Pool Heater for New Equipment

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual building stock impacts	Exceptions/Notes
New pool construction on a property with an existing building	Heat pump pool heater installed	➢ $500 if panel upgrade is already in scope ➢ $3,000 - $5,000 if panel upgrade was not in scope ➢ Heat pump: $1,000 - $1,500 more than a gas pool heater	Permit dodging	0.24% for single family	

Option 4F: Electric Appliances and EV Charging in Alterations to Residential Buildings

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual building stock impacts	Exceptions/Notes
Interior alterations	Panel and breaker space for all-electric appliances and EV charger (240V for single family, 120V for multifamily*)	➢ $500 if panel upgrade is already in scope ➢ $3,000 - $5,000 if panel upgrade was not in scope		➢ 2.5 percent of single-family homes ➢ 1.7 percent of multifamily dwellings	
	Replace existing space heating with heat pump	➢ $0 if replacing air-conditioning, ➢ $10,000 - $20,000 if no existing air-conditioning	➢ Physical space accommodation ➢ Adherence to zoning code (setbacks, noise) ➢ Permit dodging or avoided projects		➢ Exempt – no alterations to the existing heating system ➢ Exempt – Multifamily alterations to <50 percent of dwellings with central system
	Replace existing water heater with heat pump	➢ $2,500 if replace on burnout. ➢ $4,000 - $6,000 if relocating before burnout			➢ Exempt – no alterations to the existing water heater. A 240V, 30-amp circuit required instead. ➢ Exempt – Multifamily alterations to <50 percent of dwellings with central system

Option 4G: Replace at End of Life

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual building stock impacts	Exceptions/Notes
Equipment burnout	Replace existing space heating with heat pump	➢ $0 if replacing air-conditioning, ➢ $10,000 - $20,000 if no existing air-conditioning			Emergency replacements
	Replace existing water heater with heat pump	$2,500	➢ Physical space accommodation ➢ Adherence to zoning code (setbacks, noise) ➢ Permit dodging or avoided projects		

Option 5: Electrification Ready at Time of Sale

Trigger	Requirement	Upfront Incremental Costs (single family, no incentives)	Logistical challenges	Annual building stock impacts	Exceptions/Notes
Property Transfer	Upgrade branch circuits to cooking and laundry	➢ $500 - $2,000 per circuit	➢ Physical space accommodation ➢ Adherence to zoning code (setbacks, noise) ➢ May add significant electrical work - circuit reconfiguration or panel upgrade ($3,000 - $5,000)	4.3 percent	➢ Should be combined with time certain policy and incentives
	Replace existing space heating with heat pump	➢ $0 if replacing air-conditioning, ➢ $10,000 - $20,000 if no existing air-conditioning			
	Replace existing water heater with heat pump	➢ $4,000 - $6,000 if replacing before burnout			

Questions?

Analysis and Recommendations: Building Electrification in Menlo Park

EQC Building Decarbonization Subcommittee

August 18, 2021

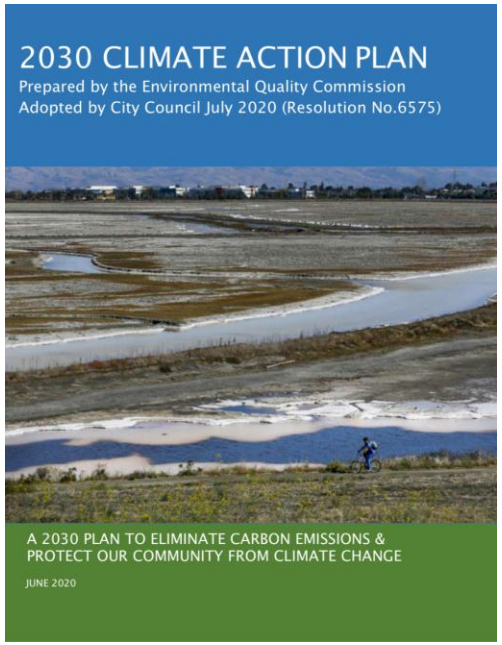
IPCC 6th Assessment

"Climate change widespread, rapid, and intensifying"

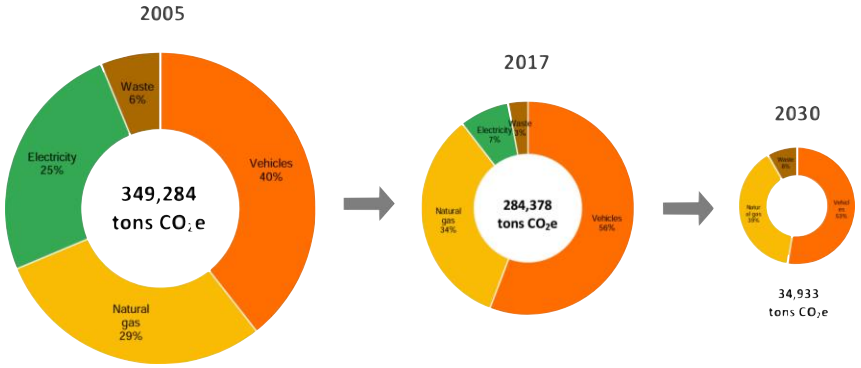
"…human actions still have the potential to determine the future course of climate"

"Stabilizing the climate will require strong, rapid, and sustained reductions in greenhouse gas emissions, and reaching net zero CO2 emissions. Limiting other greenhouse gases and air pollutants, **especially methane,** could have benefits both for health and the climate." — Panmao Zhai, IPCC Working Group I Co-Chair, August 9, 2021

Climate Action Plan



- Adopted by Menlo Park City Council in July 2020
- Sets a goal of 90% reduction in GHG by 2030 and elimination of the remaining 10% through direct carbon removal
- **Plan paired down due to pandemic budget cuts**



Menlo Park CAP 2020-21

#	Action	2030 GHG Reduction (tons/yr)
1	Explore policy/program options to convert 95% of existing buildings to all-electric by 2030	1) 86,465 OR 2) 51,636
2	Set citywide goals for increasing EVs and decreasing gasoline sales	7,120
3	Expand access to EV charging	7,370
4	Reduce vehicle miles traveled (VMT) by 25% or an amount recommended by the Complete Streets Commission	31,743
5	Eliminate the use of fossil fuels from municipal operations	879
6	Develop a climate adaptation plan to protect the community from sea level rise and flooding	0
		98,748

Not on track to meet goals

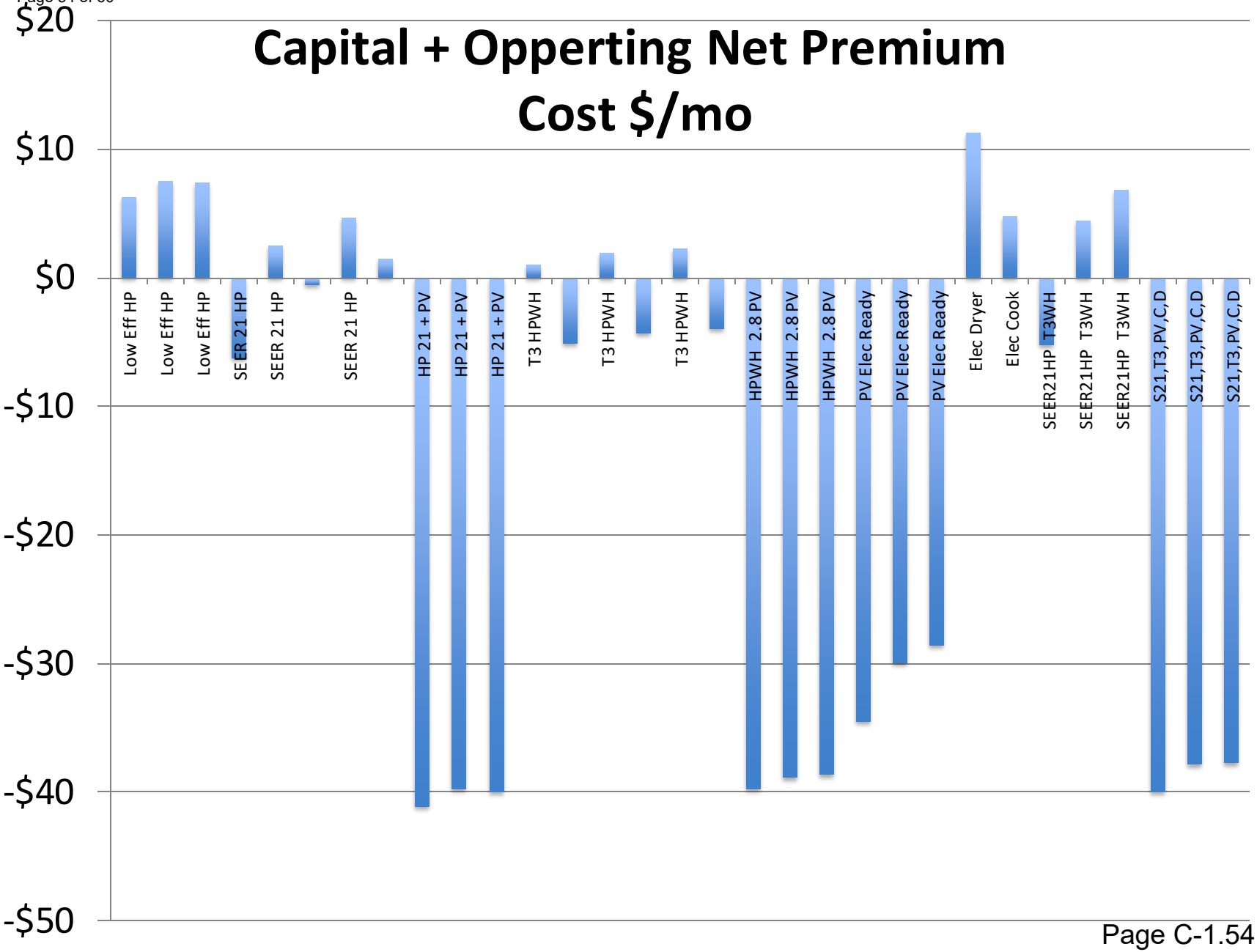
- Menlo Park is not currently on track to meet adopted climate goals
- Not on track for GHG cuts required for 1.5°C
- Not on track for GHG cuts required for 2.0°C
- Not on track to meet Paris Climate Agreement goals

Focus Tonight: CAP #1

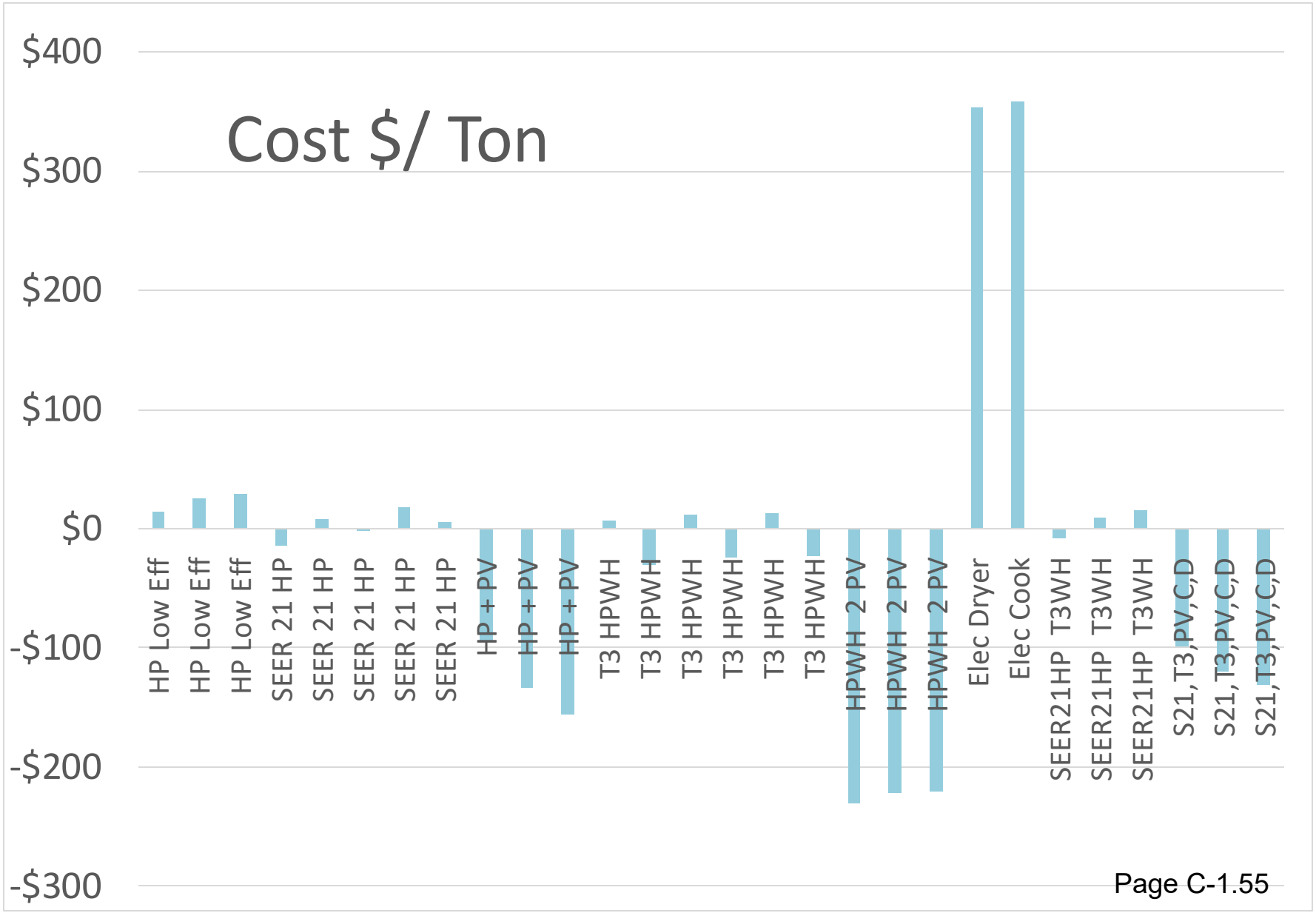
- CAP goals: reduce greenhouse gas emissions 90% by 2030
- CAP #1: Explore policy and program options to convert 95% of existing buildings to all-electric by 2030
- 41% of city emissions come from buildings

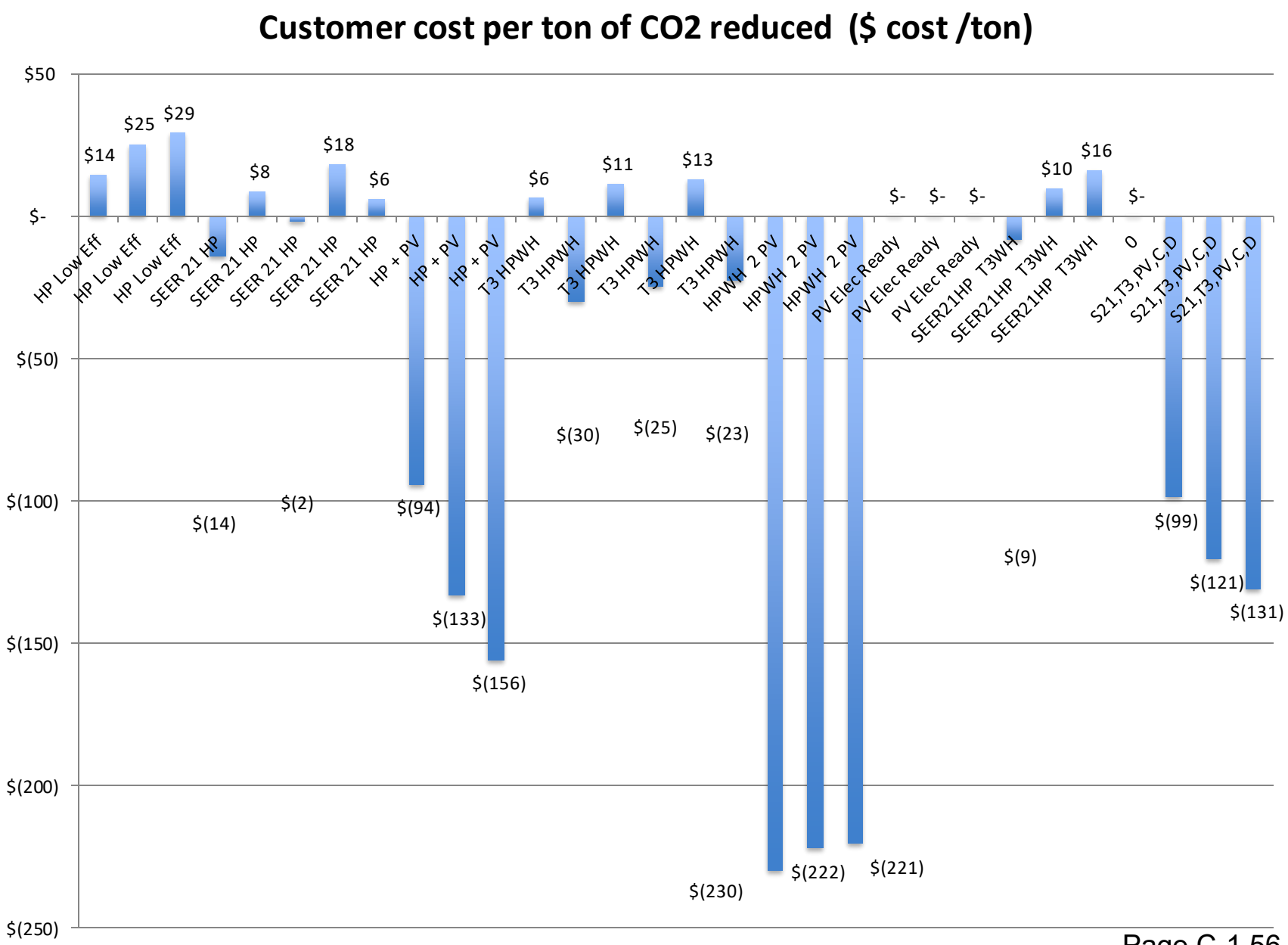
TRC's report is a work in progress

- Context
  - Americans are only slowly coming to grips with the need to fight climate change
  - Letting climate change happen will be very costly
  - Initial leadership is needed to start progress
  - The study shows that fighting climate change is affordable (about 1 latte per month)
  - The study shows a variety of approaches to electrifying buildings for climate progress


Capital + Opperting Net Premium
Cost $/mo
$20
$10
$0
-$10
-$20
-$30
-$40
-$50
Low Eff HP
Low Eff HP
Low Eff HP
SEER 21 HP
SEER 21 HP
SEER 21 HP
HP 21 + PV
HP 21 + PV
HP 21 + PV
T3 HPWH
T3 HPWH
T3 HPWH
HPWH 2.8 PV
HPWH 2.8 PV
HPWH 2.8 PV
PV Elec Ready
PV Elec Ready
PV Elec Ready
Elec Dryer
Elec Cook
SEER21HP T3WH
SEER21HP T3WH
SEER21HP T3WH
S21,T3,PV,C,D
S21,T3,PV,C,D
S21,T3,PV,C,D

Consumer Cost per ton of CO2e




Customer cost per ton of CO2 reduced ($ cost /ton)
$50
$-
$(50)
$(100)
$(150)
$(200)
$(250)
$14
$25
$29
$8
$18
$6
$6
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HP Low Eff
HP Low Eff
HP Low Eff
SEER 21 HP
SEER 21 HP
SEER 21 HP
SEER 21 HP
SEER 21 HP
HP + PV
HP + PV
HP + PV
T3 HPWH
T3 HPWH
T3 HPWH
T3 HPWH
T3 HPWH
T3 HPWH
HPWH 2 PV
HPWH 2 PV
HPWH 2 PV
PV Elec Ready
PV Elec Ready
PV Elec Ready
SEER21HP T3WH
SEER21HP T3WH
SEER21HP T3WH
0
S21,T3,PV,C,D
S21,T3,PV,C,D
S21,T3,PV,C,D

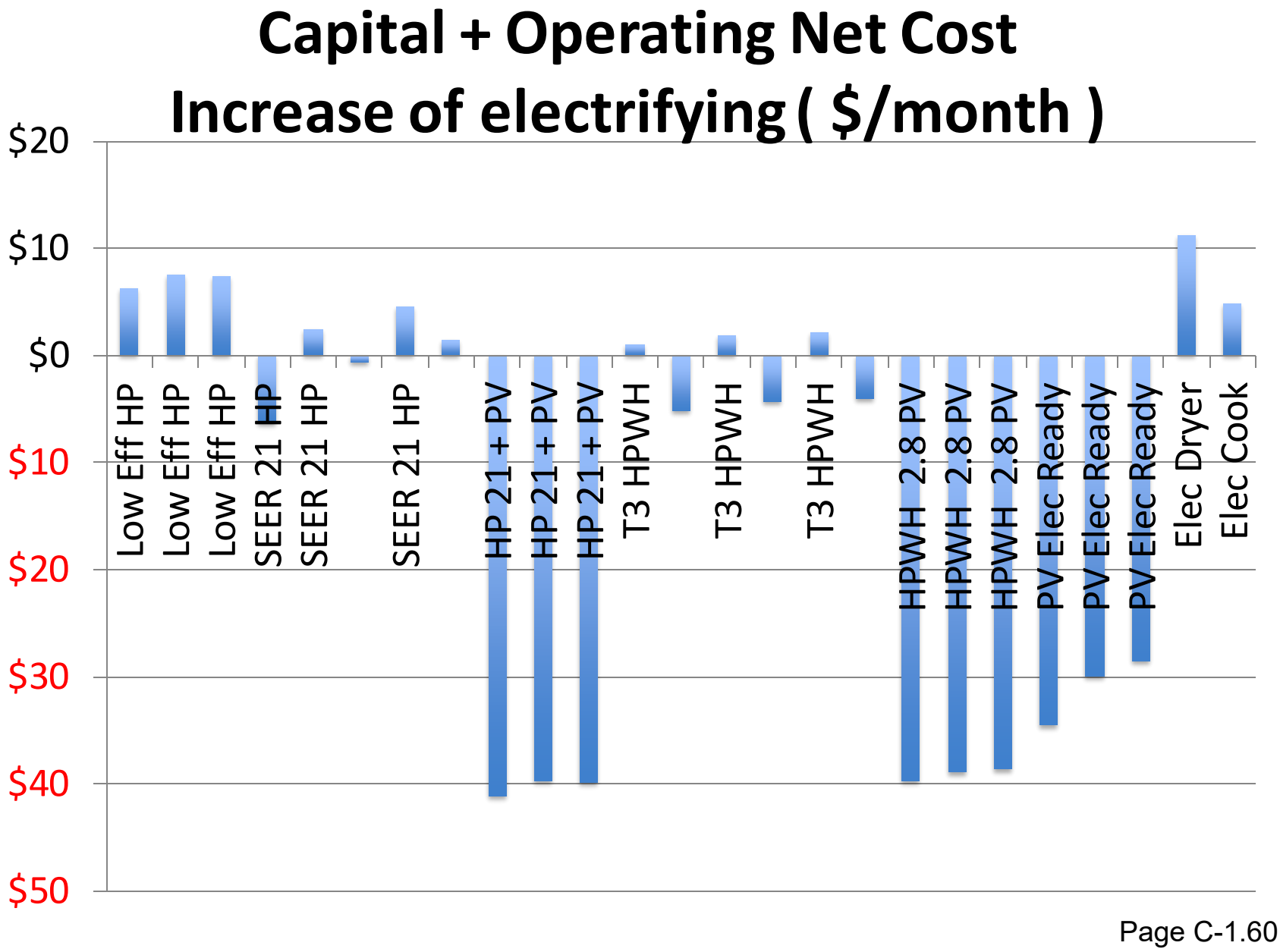
Possible Recommendations to Council

- Direct staff to draft a simple policy that prohibits the installation of new gas devices
- Provide a program to protect low-income households
- Provide technical support for those making the transition

Possible Recommendations to Council

- Remember it is a Climate Emergency
- Make the bold progress start now
- Pursue a decisive path toward climate safety
- Recruit added help as needed
- Have staff develop the plans and policy proposals to start the transition
- Streamline processes to accommodate emergency speed

- Backup slides


Capital + Operating Net Cost
Increase of electrifying ($/month)
$20
$10
$0
$10
$20
$30
$40
$50
Low Eff HP
Low Eff HP
Low Eff HP
SEER 21 HP
SEER 21 HP
SEER 21 HP
HP 21 + PV
HP 21 + PV
HP 21 + PV
T3 HPWH
T3 HPWH
T3 HPWH
HPWH 2.8 PV
HPWH 2.8 PV
HPWH 2.8 PV
PV Elec Ready
PV Elec Ready
PV Elec Ready
Elec Dryer
Elec Cook

To: Environmental Quality Commission
From: Commissioner Elkins on Gas Powered Leaf Blowers
Date: Sept. 22, 2021

Recommendation

Recommend to the City Council that it direct city staff to prepare a report regarding a ban on gas powered leaf blowers.

Special note: City council requested this topic be reviewed by the Environmental Quality Commission as a result of public feedback received during the city council's annual work plan process earlier this year. Staff resources have not been appropriated to review/analyze this topic at this time. The city council would review the Environmental Quality Commission's recommendations and provide further direction on next steps to city staff.

Background

Menlo Park residents have increasingly complained to the City Council about the harmful impacts caused by the operation of gasoline-fueled leaf blowers (GLBs) operating in the city. The City Council has directed the Environmental Quality Commission (EQC) to prepare a report and recommendation regarding the continuing operation of GLBs in Menlo Park.

The three concerns repeatedly cited by local residents are (1) noise pollution, (2) air pollution and (3) the effects of each on human health. Our state government has notably committed to address the global climate change crisis by mandating that California reduce its Greenhouse Gas Emissions (GHG) emissions to 40% below 1990 levels by 2030. https://www.ca.gov/archive/gov39/2015/04/29/news18938/index.html.

Governor Newsom's Executive Order No. N-79-20 of September 23, 2020, has further directed that the California Air Resources Board (CARB) implement strategies to achieve 100% zero emissions from small off-road equipment by 2035, where feasible and cost-effective. Menlo Park itself has set an even bolder goal of becoming carbon neutral (zero emissions) by the year 2030.

This study examines the three concerns above and the extent to which they are addressed - or not addressed - by Menlo Park's existing regulation of GLB use in Menlo Park Municipal Code Chapter 8.07. The study also examines other public health issues related to GLB operation and use. As discussed below, all of the available evidence strongly indicates that public health in Menlo Park would be best served by phasing out GLBs in favor of battery-powered alternatives. The study concludes by examining methods for how to do so in as equitable a manner as possible.

Noise Pollution and Health

High Decibel Noise

Menlo Park has committed to minimize noise levels within the city "to protect the peace, health and safety of its citizens from unreasonable noises from all sources including, but not limited to, those specified in this chapter." Menlo Park Municipal Code Chapter 8.07.

In Chapter 8.07, entitled "Leaf Blowers," the city acknowledges that "[i]t has been found that internal fuel combustion engine leaf blowers cause considerable noise and air pollution and have been the source of numerous complaints by persons working and residing in the city. This chapter is intended to regulate the use of internal fuel combustion engine leaf blowers to minimize noise and air pollution in the city." To that end, only "certified leaf blowers" may be operated during the permitted hours of 8 am to 5 pm, Monday through Friday. Residents only may operate them on Saturdays from 11 am until 3 pm. Chapter 8.07.020, Section 2 states, "'**Certified leaf**

blower'" means only those leaf blowers measured at sixty-five (65) dB(a) or less at a distance of fifty feet (50') by an independent laboratory per American National Standards Institute ('ANSI') standard B175.2-1996, as certified by the manufacturer."

Noise ratings of gas-powered backpack leaf blowers available from typical suppliers indicate that most operate at the ANSI standard. S*ee* Leaf Blower Ratings, Consumer Reports Buying Guide (Oct 2019) https://www.consumerreports.org/products/leaf-blower/ratings-overview/. The reality of urban environments like Menlo Park, where smaller lots are common, is that an operating GLB will frequently be within fifty feet of adjacent residents. When an operating GLB is fewer than fifty feet away, hearing protection is recommended. *Id.* Expecting residents to purchase and don ear protection whenever a GLB is operating nearby is neither reasonable nor practicable, particularly for infants and children.

The existing ordinance consequently does not actually address the noise concerns of city residents. Moreover, enforcing the ordinance is difficult as a practical matter because complaint calls are given low priority by the Police Department, which has many competing public safety concerns. By the time a complaint is made and an officer arrives at the scene, the GLB is usually no longer being used. The ordinance's intent of protecting the peace and health of Menlo Park residents from GLB noise has not been achieved by the attempt to regulate these blowers.

Low Frequency Noise

The existing ordinance also does not take into account the low frequency nature of GLB noise. A study by the Harvard University School of Public Health shows that low frequency sound travels farther and penetrates walls and buildings more effectively than higher pitched sound. Jamie L Banks, Erica Walker, *Characteristics of Lawn and Garden Equipment Sound: A Community Pilot Study*, Harvard T.H. Chan School of Public Health, https://sciforschenonline.org/journals/environmental-toxicological-studies/JETS-1-106.php. The study concluded that a single GLB could

negatively impact up to ninety surrounding homes in typical urban densities versus six homes for a powerful electric blower. Electric engines operate at higher frequencies, explaining why they are significantly less "noisy" than GLBs. This part of the problem is not addressed by an attempt to regulate decibel levels.

Health Impacts of Excessive Noise

The noise that GLBs generate poses a health risk. Prolonged or repeated exposure to sound levels above 85dB (common with backpack style leaf blowers at close proximity) can cause permanent hearing loss. Center for Disease Control and Prevention, ”*Too Loud! For Too Long! Loud noises damage hearing*” https://www.cdc.gov/vitalsigns/hearingloss/index.html. Multiple studies have found a correlation between exposure to ambient noise over 55dB and a higher incidence of arterial hypertension and cardiovascular diseases due to increased mental stress. Munzel, Gori, Babisch, Basner, *Cardiovascular effects of environmental noise exposure*, European Heart Journal (Apr. 2014) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3971384/.

Another study found that people living in areas with more traffic noise were 25% more likely to exhibit symptoms of depression than those living in quieter neighborhoods. Researchers suspect that greater noise aggravates existing health conditions by inducing higher levels of stress. https://www.brainfacts.org/thinking-sensing-and-behaving/diet-and-lifestyle/2018/noise-pollution-isnt-just-annoying-its-bad-for-your-health-062718; see also https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4873188/ (depression and anxiety increased with the degree of overall noise annoyance).

Studies have also indicated that noise induced stress can cause the release of cortisol, a hormone that helps to restore homeostasis in the body after a bad experience, and a decrease in dopamine, which controls the flow of information from other parts of the body. “Excess cortisol impairs

function in the prefrontal cortex—an emotional learning center that helps to regulate 'executive' functions such as planning, reasoning and impulse control. . . Changes to this region, therefore, may disrupt a person's capacity to think clearly and to retain information. . . [and] decrease higher brain function, impairing learning and memory." https://www.scientificamerican.com/article/ask-the-brains-background-noise/. Excessive noise has specifically been shown to negatively impact cognitive development in children. https://www.frontiersin.org/articles/10.3389/fpsyg.2013.00578/full. Aside from issues of physical or mental health, GLB noise can disrupt children's ability to learn, as well as adults' ability to work from home.

Air Pollution and Health

What Type of Pollution is Caused by GLBs?

Compared to the transportation and electricity production sectors, GLBs represent a minor source of overall greenhouse gases. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions. GLBs are, however, a significant contributor to air pollution.

According to the Environmental Protection Agency, air pollution is any visible or invisible particle or gas found in the air that is not part of the natural composition of air. Ozone (also known as ground-level ozone or O_3), a gas, is a major component of smog and is one of the most common air pollutants. Air pollution may also contain particulate matter (PM), carbon monoxide (CO), and unburned fuel in the form of benzene, formaldehyde, and acetaldehyde.

In addition to pollution from toxic exhaust fumes, gas leaf blowers kick up several particulate matter types in the form of "fugitive dust," including mold, pollen, animal and bird feces, pesticides, and fertilizers. CARB has stated that leaf blowers are a principal generator of fugitive dust in urban areas.

http://media.metro.net/projects_studies/sustainability/images/3_Fugitive_Dust_Handbook_from_CARB.pdf. [1]

The majority of gas-powered leaf blowers in the US use small two-stroke engines (sometimes referred to as small off-road engines, or “SOREs”) that lack an independent lubrication system. The fuel is thus mixed with oil. Approximately 30% of the fuel does not fully combust, resulting in significant emission of toxic pollutants - including carbon monoxide, nitrous oxides, and non-methane hydrocarbons (which together cause smog and acid rain by reacting with sunlight.) https://www.sustainability.wustl.edu/rethinking-lawn-equipment-2/.

A widely cited study conducted at the American Automobile Association's Automotive Research Center and commissioned by Edmunds InsideLine.com, found that a typical two-stroke GLB emits hundreds of times more hydrocarbons than the Ford F-150 Raptor Pickup truck used as a control. "The hydrocarbon emissions from a half-hour of yard work with the two-stroke leaf blower are about the same as a 3,900-mile drive from Texas to Alaska in a Raptor." https://www.edmunds.com/about/press/leaf-blowers-emissions-dirtier-than-high-performance-pick-up-trucks-says-edmunds-insidelinecom.html. The EPA has also stated that gas-powered lawn and garden equipment is a prevalent source of high levels of air pollution. https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf.

While manufacturers have made steady reductions in two-stroke engine emissions, they are still one of the largest sources of air pollutants in this country, exceeding even the emissions of large automobiles, which are

[1] Because electric blowers create these same fugitive dust problems (as well as degradation of top soil and harm to beneficial insect habitats), I chose not to get into this factor too extensively. However, there is an argument to be made that all blowers should be restricted in favor of rakes and brooms or, at the very least, that blower use be limited to hardscape only. This is the course taken in Portola Valley. https://library.municode.com/ca/portola_valley/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.32LEBLUSCHSHGOINEFJA232021#:~:text=It%20is%20unlawful%20to%20use,or%20other%20non%2Dhardscape%20surfaces.&text=%C2%A7%201%2C%202019)-,8.32.,blowers%20over%20sixty%2Dfive%20decibels.

regulated to reduce and capture air pollutants via the use of catalytic converters. https://sustainability.wustl.edu/rethinking-lawn-equipment-2/. CARB has projected that due to increased adoption of electric vehicle technology and stricter emissions standards for automobiles, along with the increasing numbers of lawn and garden equipment powered by small gasoline engines, total smog forming pollution emissions from small engines will exceed those from passenger cars by 2020. *Small Engine Fact Sheet, California Air Resources Board, July 2018*, https://ww3.arb.ca.gov/msprog/offroad/sm_en_fs.pdf?_ga=2.57772970.1807115685.1562651154%20-1700486834.1557971923. By 2031, CARB states, small engine emissions will be more than twice those from passenger cars. *Ibid*. CARB has recommended a major shift toward electric equipment in order to hit state emissions reduction targets.

Therefore, small actions such as banning the use of GLBs can make a significant difference in improving regional air quality.

Health Impacts of Poor Quality Air

As seen, air pollution like CO, nitrogen dioxide, and hydrocarbons, as well as harmful chemicals, are released when fossil fuels are incompletely burned and enter the atmosphere. Inhaling such pollutants can cause damage that lasts for years, if not for life, and may even lead to death. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7044178/pdf/fpubh-08-00014.pdf. Those most vulnerable to illness and premature death related to air pollution include children, pregnant women, the elderly, and those with pre-existing heart or lung disease. https://www.lung.org/clean-air/outdoors/who-is-at-risk and https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.120.050252. In studying the health effects of leaf blower created pollution, CARB found that “with exposure to CO, subtle health effects can begin to occur, and exposure to very high levels can result in death.” https://ww2.arb.ca.gov/sites/default/files/2018-11/Health%20and%20Environmental%20Impacts%20of%20Leaf%20Blowers.pdf. Symptoms of acute CO poisoning cover a wide range depending on

severity of exposure, from headache, dizziness, weakness, and nausea, to vomiting, disorientation, confusion, collapse, coma, and at very high concentrations, death. At lower doses, central nervous system effects, such as decreases in hand-eye coordination and attention in healthy individuals, have been noted. https://www.cdc.gov/disasters/co_guidance.html. These neurological and cardiovascular effects can be especially serious in children. https://www.lung.org/clean-air/outdoors/who-is-at-risk/children-and-air-pollution. Older people are more likely to suffer a heart attack, stroke, atrial fibrillation, and pneumonia because of air pollution. https://www.nrc.gov/docs/ML1006/ML100601201.pdf at pg. 97.

Benzene, a component of gasoline, depresses the central nervous system and causes cancer. Acetaldehyde is classified as a Group B2 probable human carcinogen; acute exposure to which causes irritation of the eyes, skin, and respiratory tract. Formaldehyde is highly irritating to eye and respiratory tract tissues, triggering or exacerbating asthma. https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf Studies have confirmed these chemicals' connection to increased cancer risk in gasoline station employees. https://www.hoajonline.com/jeees/2050-1323/1/1. All three are listed as Group 1 known human carcinogens by the American Cancer Society. https://www.cancer.org/cancer/cancer-causes/general-info/known-and-probable-human-carcinogens.html.

It has been firmly established that breathing ozone results in short-term decreases in lung function and damages the cells lining the lungs. It also increases the incidence of asthma-related hospital visits and premature deaths. Confalonieri, U., B. Menne, R. Akhtar, K.L. Ebi, M. Hauengue, R.S. Kovats, B. Revich, and A. Woodward, 2007: Human health. In: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, UK, and New York, pp. 391-431.

“Adverse health effects from the [GLB] emissions are well known. Benzene, 1,3 butadiene, and formaldehyde are listed among the four top ranking cancer-causing compounds. They cause lymphomas, leukemias, and other types of cancer. Ground level ozone and fine PM cause or contribute to early death, heart attack, stroke, congestive heart failure, asthma, chronic obstructive pulmonary disease, and cancer. Growing evidence suggests these pollutants also contribute to developmental and neurological disorders, including autism. The mounting evidence on the dangers of short term exposure is especially concerning.” See https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf and citations therein.

As for fugitive dust pollution, the epidemiological literature demonstrates statistically significant associations between ambient PM levels and negative human health outcomes, including mortality, hospital admissions, respiratory symptoms, and illness. http://media.metro.net/projects_studies/sustainability/images/3_Fugitive_Dust_Handbook_from_CARB.pdf. Asthma sufferers are particularly sensitive to pollens and other allergens aerosolized by blowers. https://www.aafa.org/air-pollution-smog-asthma/.

Two new studies just presented at the Alzheimer's Association International Conference 2021 found that reducing air pollution can reduce the risk of cognitive ailments such as dementia and Alzheimer’s. See https://www.newsweek.com/reducing-air-pollution-could-lower-risk-dementia-alzheimers-1613671?amp=1. “Breathing in pollutants, especially those that result from the burning of fuel and those so small they are invisible to the naked eye, has been associated with increased risk for a diverse cross-section of diseases, disorders, and other conditions, including but not limited to: mouth cancer, poor bone health and mental illnesses such as bipolar disorder and major depression.” *Ibid*.

As stated by Dr. Mahdieh Danesh Yazdi of the Harvard School of Public Health, “[e]ven if air pollution can’t be fully mitigated, we should strive to do better. Levels of pollutants now considered safe can still have harmful effects and result in bad outcomes.” https://www.nytimes.com/2021/06/28/well/live/air-pollution-health.html?referringSource=articleShare.

Operator Impacts

The health risks associated with lawn and garden equipment are highest for those who operate this equipment continuously. https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf at pg 12. A study published in *Nature* in 2006 found that emissions from small gas engines “may lead to elevated air pollution exposures for a number of gaseous and particulate compounds, especially for individuals whose occupations require the use of these engines daily, such as landscapers.” https://www.nature.com/articles/7500471. And while workers are exposed to very high levels of pollutants for many hours each day, they are also exposed to very high noise levels that can, as seen, induce permanent hearing loss if proper ear protection is not worn at all times.

Workers are also required to routinely handle gasoline, engine oil, and maintenance chemicals, most often under unsafe conditions. https://www.greenindustrypros.com/mowing-maintenance/engines-parts-shop-equipment/article/12228422/gas-can-safety-for-landscapers-and-lawn-care-contractors Exposure to gasoline fumes is a health hazard as is skin contact. https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=465&toxid=8.

GLBs, particularly those carried on the operator’s back, also cause vibration impacts to the body and hands. Prolonged exposure to vibration can cause injuries known as Hand-Arm Vibration Syndrome. https://www.researchgate.net/publication/334361296_Vibration_Transmitte

d_to_the_Hand_by_Backpack_Blowers. This condition causes changes in the sensation of the fingers which can lead to permanent numbness of fingers, muscle weakness and, eventually, wasting which can leave a sufferer unable to continue working with power tools. https://patient.info/bones-joints-muscles/hand-arm-vibration-syndrome-leaflet.

Dan Mabe of American Green Zone Alliance (AGZA) has worked with many landscape maintenance professionals while transitioning them to electric tools. He states that workers “love the smoothness of the electric tools – less vibration, they feel less fatigued. And they love the fact they don’t have to work with any gas or oil or solvents. They can go home and not feel like a gas can walking into the house.” https://cleantechnica.com/2021/06/19/the-fully-electric-future-of-landscape-maintenance/.

These operators are typically low wage workers, and often do not have a say in which equipment they use. The continued use of GLBs thus puts additional disproportionately high health risks upon a population who are some of the least able to avoid those risks.

Environmental Damage

Even putting aside issues of the localized poisoning of communities, residents, and workers, GLBs are harming our global environment at a rate that should not be dismissed out of hand simply because other sources are larger culprits. “According to the US Department of Energy, 1.2 billion gallons of gasoline are consumed annually in the US for lawn and garden maintenance, and a significant portion of that is spilled while filling gas tanks. Roughly 25 pounds of CO2 are emitted per gallon of gasoline burned, which means nearly 15 million tons of CO2 are emitted per year for lawn maintenance.” https://afdc.energy.gov/files/u/publication/lawn_equip_2014.pdf.

But even beyond this, the daily use of GLBs produces thousands of pounds of solid toxic and plastics waste yearly in the form of contaminated air and fuel filters, spark plugs, gaskets, and plastic two cycle oil containers that are sent to landfills. Filling gas tanks and mixing two cycle oil often results in spillage of toxic liquids and residual oil from used containers can find its way into water systems and harm local ecosystems. Common fluids used for engine maintenance – such as carburetor cleaners and engine degreasers - are highly toxic fluids themselves which require care in use and special disposal procedures. www.agza.net

Alternatives to Gas

Fortunately, a clean technology exists that can largely replace GLBs and perform most tasks effectively and efficiently. Consumer Reports says that, for ordinary yards, electric leaf blowers perform comparably to gas-powered models. The New York Times consumer product team also found many electric blowers to be as effective as gas powered models, although corded versions still tend to outperform battery versions. https://www.nytimes.com/wirecutter/reviews/best-leafblowers/. The electric Toro F700, for example, “is light, with an easy one-handed speed control, and it moves leaves with a fury . . . at less than $60.” *Ibid* “The Ego LB5604 doesn’t have the raw leaf-blasting power of the corded models, but in our tests its more focused airstream was better at getting under a dense mat of wet leaves, and its turbo button can produce an extra burst of power.” *Id*.

According to *Chainsaw Journal*, “cordless [electric] leaf blowers offer all the benefits of gas without any of the weakness. No fumes, no mixing gas and oil, easy to start, and highly maneuverable . . . You can even find professional-grade cordless backpack leaf blowers, such as the DeWalt DCBL590X1, which is powered by a 40V 7.5Ah lithium ion battery pack for increased power and runtime. . . . Some of the backpack cordless models accept dual batteries so they can deliver more blowing power and extended runtime for professional landscaping jobs. The Greenworks cordless 80V

backpack leaf blower is on the higher end of the power spectrum with 580CFM and 145MPH." https://www.chainsawjournal.com/electric-vs-gas-leaf-blower/.

While commercial grade electric blowers may cost more upfront than gas fuel models, manufacturers and green organizations make the case that they more than pay for themselves in gas savings and maintenance cost. In one study by the University of Arkansas, comparing the gas blower then currently in use to maintain the campus to two electric models, they found the electric blower to represent an overall savings - "If you look at the amount of gasoline
it takes to fuel the leaf blower over a five-year period . . . you see how quickly the cost of refueling these [gas machines] can be. https://sustainability.uark.edu/_resources/publication-series/project-reports/reports-electric_power_tools_ua-2017-ofs.pdf.

An analysis by California State Senator Josh Becker's office shows that the cost of a commercial grade electric blower is surpassed by the cost of fueling a comparable gas blower after less than 1000 hours of use. https://docs.google.com/spreadsheets/d/1JNGM0eW3VsOgFSnPJ5NgiOJHSeXNDsvDsM8Wywzz5us/edit#gid=0. Assuming a blower is used only 2 hours a day for 50 weeks a year, the electric version has paid for itself in 2 years.

AGZA also states that the savings in switching to electric begins at year two. (AGZA.net Service Pro Workshop)

Moreover, electric tools have a much simpler design, with fewer moving parts and do not need to be cleaned and serviced routinely like a gas machine, representing additional cost savings.

Although the Menlo Park Public Works Department currently believes that electric blowers are not up to the task of maintaining city properties, AGZA has shown that, with proper training and education on best practices, even very large areas can be maintained. In AGZAs model, grounds crews are

encouraged to use gas tools only for jobs that absolutely cannot be handled without the extra power of gas. In such cases it recommends the use of 4-stroke equipment only which is substantially cleaner than 2-stroke. See www.AGZA.net.

Jose Diaz, a landscaping coordinator in Los Angeles who has given testimony against proposed local gas-powered SORE limitation laws, has even acknowledged that electric "leaf blowers work just fine." https://californiaglobe.com/section-2/bill-that-would-ban-sales-of-new-small-gas-powered-engine-machines-introduced-in-assembly/.

Our city's parks, playgrounds, and public areas, including schools, are some of the places we most want clean air and a quiet background. Our city government should take steps to make this possible even if it involves rethinking the current approach to keeping these areas free of leaves, hazardous materials and debris.

Organizations, Municipalities and Industry are going Electric

At least ninety California municipalities have enacted restrictions on leaf blowers, as outlined in the table below. Most of these towns and cities restrict leaf blower usage by ordinance to certain times of the day, or through their noise regulations. Approximately thirty of these cities have explicit bans on gas-powered leaf blowers, while at least two cities have banned all motorized blowers outright.

California Cities Banning Gas Leaf Blowers (GLB)	Effective date of gas leaf blower ban
Belvedere	1987
Berkeley	1991
Beverly Hills	1976
Carmel	1975
Claremont	1991
Del Mar	Mid 1980s
Encinitas	2019
Hermosa Beach	Early 1990s
Indian Wells	1990
Laguna Beach	1993
Larkspur-Corte Madera	2020

Lawndale	2018 or earlier
Lomita	1986
Los Altos	1991
Los Gatos	2014
Malibu	2019
Manhattan Beach	1998
Mill Valley	1993
Monterey City	2021
Oakland	2021
Ojai (Public Works maintenance zero emissions)	2017
Pacific Grove	2021
Palm Springs	2019
Palo Alto	2005
Piedmont	1990
Portola Valley	2021
Rancho Palos Verdes	2020
Redondo Beach	2018
San Clemente	2021
San Francisco (Recreation and Parks Dept)	Jan. 2023
Santa Barbara City	1997
Santa Monica	2018
Sonoma	2016
South Pasadena (All municipal properties zero emissions, maintained by AGZA)	2016
South Pasadena*	Oct. 2022
West Hollywood	1986

* As reiterated at July 7, 2021 City Council meeting (meeting video available on city website).

Other institutions and organizations that have adopted electric garden equipment include high schools, golf courses, sports complexes, and universities. https://www.brightview.com/resources/press-release/penn-switches-all-electric-landscaping-equipment-help-brightview; https://www.washingtonpost.com/climate-solutions/2021/06/30/electric-lawn-care/. Yerba Buena High School in San Jose was the nation's first AGZA Green Zone high school and its grounds department performs all routine landscaping maintenance on over 30 acres of serviceable area with all-electric equipment. https://agza.net/agza-gz-ybhs-press-release/ Pennsylvania State University, with a campus of nearly 8000 acres, has also recently recognized the benefits of switching from gas to electric landscaping equipment and has found that electric equipment performs as well as gas. https://www.collegian.psu.edu/news/campus/penn-state-s-

office-of-physical-plant-seeks-to-prevent-pollution-through-electric-landscaping-equipment/article_4112fcaa-0f80-11ec-812d-67faa2311a21.html?fbclid=IwAR0CVKY8qHkp29oiCzu6GSGeIlWW3uWSxN6kvPG6MYRXlOgqX9AzPlfzJPs.[2]

CARB last submitted a report on GLBs to the California Legislature in February, 2000. At that time, CARB did not recommend a ban on GLBs due to the landscaper's "need" for such equipment despite its detriments to air quality and public health and because of the lack of acceptable alternative tools. https://ww2.arb.ca.gov/sites/default/files/2018-11/Health%20and%20Environmental%20Impacts%20of%20Leaf%20Blowers.pdf at p. 56. At that time electric leaf blowers were limited either to corded models or largely underpowered battery models. But at this point, according to CARB's current website, "[l]eaf blowers have . . . been deemed an ideal candidate for electrification in both the residential and commercial market. *Ibid* "Furthermore, in an effort to reduce the amount of PM that is stirred up by the leaf blowers, alternatives such as leaf vacuums can and should be considered by both the commercial and residential sector." *Id.*
Thus, it is only a matter of time before GLBs are banned statewide and Menlo Park should take the lead by demonstrating a commitment to electrification in all ways large and small.[3]

State Action will not Adequately Address Citizen Concerns

California State Assemblymember Marc Berman, D-Menlo Park, in response to CARBs statements (above), submitted legislation (AB 1346)

[2] The landscaping crews at Penn State still use GLBs in the fall months when electric blowers are not powerful enough for specific tasks.
[3] It might behoove the city to think ahead to the time when GLBs will simply be unavailable and only electric blowers will be used – are we going to be satisfied to have them operated such that they continue to harm habitat for beneficial insects, destroy topsoil, and create fugitive dust and associated PM? If we are going to legislate now, perhaps we should consider an ordinance that restricts blower use to hardscape, and directs that dust and other debris shall not be deposited onto a neighboring property or into a street, gutter, or storm drain, (while, of course, continuing to restrict hours of use and db levels). For an example of such an ordinance see https://encinitas.granicus.com/MetaViewer.php?view_id=7&clip_id=1968&meta_id=101104.

that would require new sales of SOREs to be zero-emission by 2024 or whenever CARB determines is feasible, whichever is later. The bill also requires CARB to make funding available for commercial rebates to support the transition to zero-emission SORE. https://a24.asmdc.org/press-releases/20210329-berman-and-gonzalez-bill-will-phase-out-gas-powered-small-engines. This bill has now passed both houses of the California Legislature and currently awaits Governor Newsom's signature. https://www.sacbee.com/news/politics-government/capitol-alert/article254086403.htmlhttps://www.sacbee.com/news/politics-government/capitol-alert/article254086403.html

While this law will finally begin to address the dangers and nuisance of gas-powered leaf blowers, the fact is that it's impact will not actually be felt for many years. It only bans the sale of GLBs within California and does nothing to prevent the operation of equipment purchased before December 31, 2023, nor any equipment bought out of state. This could potentially leave GLBs operating within the state for years to come.[4] If the City Council wants to address the concerns of Menlo Park residents over the noise and pollution effects of GLBs in our neighborhoods well past 2030, they need to take steps now to educate residents and workers of the dangers associated with operating and living near GLBs.

On the positive side, the law will provide $30 million in funding to provide incentives to persuade users to switch from gas equipment to zero emission electric equipment. While it is yet to be decided if these funds will be directed towards local municipalities or whether a statewide program will be created, there will be money available to gardeners who go electric.

Implementing a Ban Equitably

[4] As noted by landscaper Jose Diaz, "you can buy a gas-powered version in Mexico or Arizona or some place out of state and it's not illegal to bring it in. If you can do that, or with the way we're moving to online shopping, just order a gas-powered lawnmower [or blower] from out of state without consequence, what is the point of this?" https://californiaglobe.com/section-2/bill-that-would-ban-sales-of-new-small-gas-powered-engine-machines-introduced-in-assembly/.

Electric is actually cheaper than gas in the long run. Thus the only financial hardship to professional users would be the upfront cost. If AB1346 is signed by the governor, it will require CARB to make funding available for commercial rebates to support the transition to zero-emission SORE. https://a24.asmdc.org/press-releases/20210329-berman-and-gonzalez-bill-will-phase-out-gas-powered-small-engines.

In Encinitas, $10,000 was set aside to provide incentives to local professionals to turn in their gas machines. The city staff estimated this could provide up to 50 rebates. https://encinitas.granicus.com/MetaViewer.php?view_id=7&clip_id=1968&meta_id=101104. Portola Valley was also able to fund a buyback program, allotting $6000. https://www.almanacnews.com/news/2019/11/26/portola-valley-town-to-buy-back-leaf-blowers-add-church-to-housing-program. If Menlo Park is committed to clean and healthy air and the protection of low income workers, it could similarly fund such a program if regional or statewide incentive programs cannot be found.

A phase-in period can also alleviate financial burdens by allowing owners of non-compliant equipment the time to prepare for a switch to clean technology. The California Landscape Contractors Association agrees “that efforts to prohibit outmoded equipment should be accompanied by buy-back programs that permanently remove the equipment from service. At a minimum, bans on outmoded equipment should go into effect at least one year after a decision is made. This would give users crucial lead time to phase out their non-compliant equipment.” https://www.clca.org/advocacy-2/current-issues/leaf-blowers/.

A robust campaign that would educate property owners and commercial users about all the issues involved, from human health, to noise pollution, to habitat preservation, and including information about the costs and savings related to an upgrade to electric, could encourage those who employ landscape crews to pay a little extra to make up for increased costs and any lost productivity that is attributed to battery life. Time currently spent blasting leaves out of planting beds and borders could be saved if

property owners can be persuaded that a garden provides beneficial habitats for bugs, birds and other life and does not need to look like a golf course. Homeowners can ask their gardening crews to use blowers only on hardscape. The city could also suggest that property owners themselves could invest in an inexpensive electric blower to be kept available for the workers' use. Portola Valley Councilman John Richards noted that he knew "of several people in town who have stepped up to purchase electric blowers for their gardeners, or have helped finance them," after his city's ban went into effect. https://www.almanacnews.com/news/2021/08/03/portola-valley-quieter-after-gas-powered-leaf-blower-ban?utm_source=express-2021-08-03&utm_medium=email&utm_campaign=express.

South Pasadena is one of the California cities that has most recently approved a ban. They will phase in the law over a one-year period, using that one year to educate residents and landscapers about the dangers of gas blowers. https://southpasadenan.com/leaf-blower-ban-as-ordinance-takes-effect-city-seeks-to-educate/ The city plans to hold demonstrations of the power and efficiency of electric equipment, partner with AGZA in it's outreach campaign, create a webpage dedicated to the ban, distribute information via a city e-newsletter and flyers handed out at farmers markets, city offices and libraries, and publish ads in local newspapers, among other efforts. *Ibid*.

Because workers are the ones most vulnerable to the health impacts of GLBs, helping low income operators to acquire and use cleaner technology should be a goal of this council. The City of San Mateo recently announced a rebate program which provides residents up to $100 towards the purchase of an electric blower while professional landscapers can receive a rebate of up $500. https://climaterwc.com/2021/08/11/san-mateo-launches-electric-leaf-blower-rebate-program-to-reduce-noise-pollution/.

Finally, enforcement issues are less important if education is prioritized. Any fines should be preceded by effective education and multiple

documented warnings and the option to fine the employer rather than the worker can be written into any ordinance.

Conclusion

Citizens have made it known that the noise impacts alone are sufficient reason to ban GLBs but the vast evidence shows that routine use of this tool in the vicinity of residential neighborhoods, schools, parks, and other public spaces is exposing the public as well as landscape workers to unnecessary and preventable health risks. Recent racial and socio-economic reckoning makes the need to protect the operators of GLBs more apparent and imperative.

As stated by 350 Bay Area, a local non-profit working to address climate change, "[r]eining in these engines is a climate, health, and environmental justice issue." https://350bayareaaction.org/support-ab-1346-and-electrify-landscaping-equipment-for-climate-health-justice/. And Asm. Berman has stated in connection with AB1346: "[w]e must look beyond transportation if we are to achieve the emissions reductions needed to fight climate change and improve air quality and health in our communities." https://a24.asmdc.org/press-releases/20210329-berman-and-gonzalez-bill-will-phase-out-gas-powered-small-engines.

A recent article in the Almanac on the local efforts to ameliorate the harmful effects of GLBs elicited the following comment from Menlo Oaks resident "Ms Walker:"

"I despair of we [sic] as a society ever doing anything about the climate crisis if we can't even ban the use of a "gardening" tool that the California Air Resources Board has determined is a major source of air pollution and that has an electric alternative tool already available to use. If we can't even take this simple step (which would have a beneficial effect on our health), what does it say about our ability to take bold action?"

https://www.almanacnews.com/news/2021/08/03/portola-valley-quieter-after-gas-powered-leaf-blower-ban?utm_source=express-2021-08-03&utm_medium=email&utm_campaign=express.

Equitable solutions can be found to help landscape professionals transition from gas to electric with minimal financial impact. The benefits to the workers themselves, the public at large and the very planet are well worth the resources the city will need to expend to implement a ban.

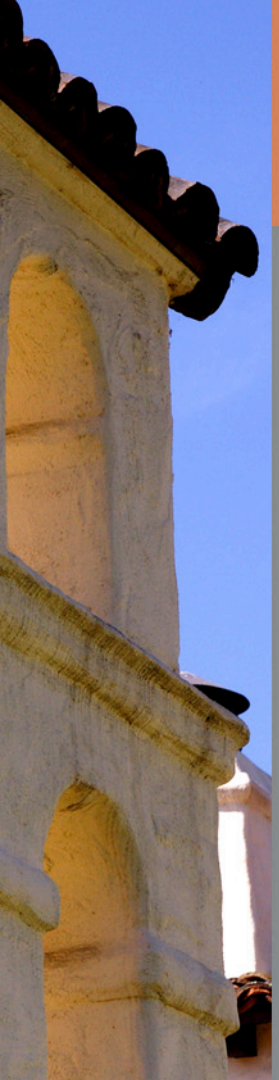
Recommendation

Environmental Quality Commission recommend that the City Council direct city staff to prepare a report regarding the implementation of a ban on gas-powered leaf blowers in Menlo Park.

MODIFICATION OF 2030 CAP PROGRESS REPORTING METHODOLOGY AND CLARIFICATION OF GOALS

Rebecca Lucky, Sustainability Manager

Candise Almendral, MuniPC Sustainability



BACKGROUND

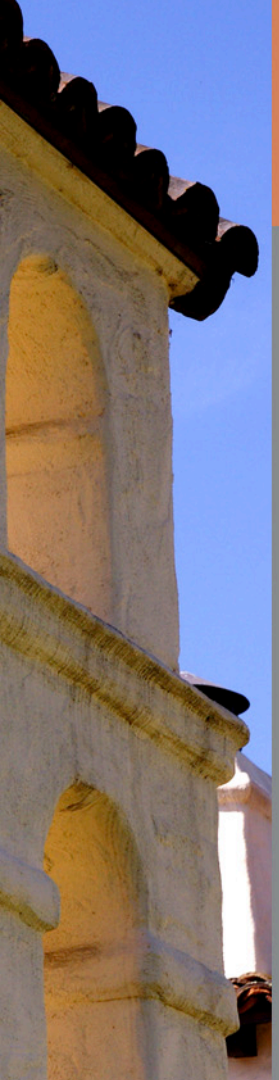
- Environmental Quality Commission reviewed draft progress report in July
- Staff proposed to return with recommendations on improving reporting methodology for future reports based on first year reporting experience
- EQC deferred to the climate action plan subcommittee consisting of Commissioner Gaillard, Kabat, and Chair Payne to provide feedback

CHALLENGES AND OPPORTUNITIES IDENTIFIED

- Some metrics identified in the CAP were challenging to obtain or not well suited for annual reporting at this time
- Challenges in aligning metrics with progress on the six adopted CAP goals
- Need for clarity on the goals as it relates to current and future work
- Better alignment with showing progress at a local/city level for the six adopted CAP goals
- Helped to understand opportunities and constraints through department/division narratives
- Helped to identify potential areas where additional resources and support is needed (e.g., CAP No.5 and No.6)

CRITERIA FOR PROGRESS REPORTING

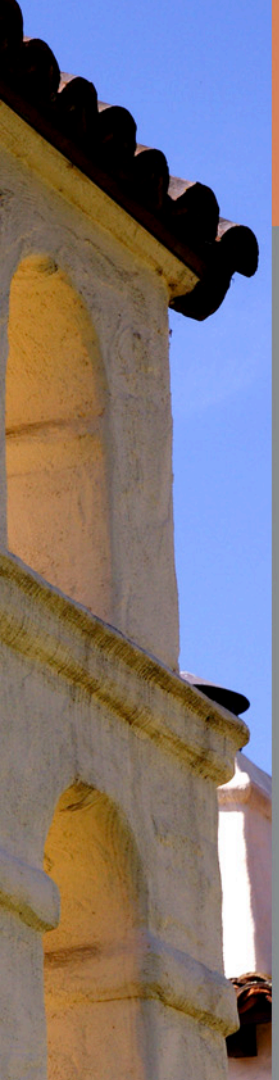
- Capture progress in the form of emissions reduced/increased as it relates to achieving carbon neutrality goal
- Accurate, easy to obtain, publically available, and can be done on an annual basis
- Ability to communicate at a high level the current state at the local level while also providing context on progress constraints or opportunities
- Incorporation of 2030 Climate Action Plan metrics to the greatest extent possible



MODIFICATIONS AND CLARIFICATIONS

- Strategy no. 1 (existing buildings electrification):
  - Total therms of natural gas consumed in Menlo Park
  - Report out on any special programs or polices implemented by the city and/or its partners (education and outreach, permit streamlining, etc.)

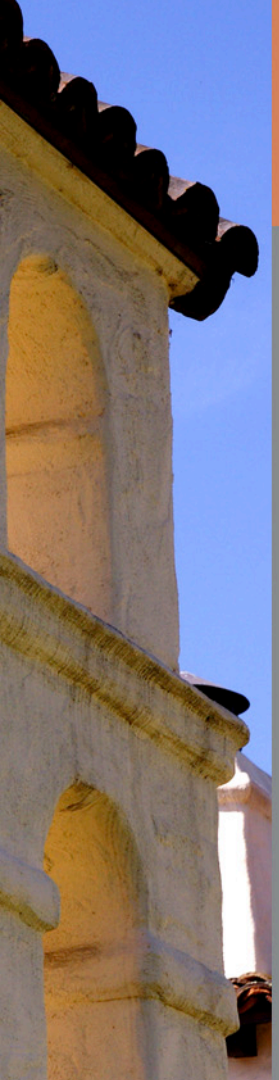
- Strategy no. 2 (increase electric vehicles and decrease gasoline sales)
  - Reframe goal with the intent to drive/capture increases in the total community fleet
  - Total light-duty vehicles registered that are fossil fuel (gasoline/diesel) vs. electric
  - Gallons of fossil fuel (gasoline/diesel) sold in Menlo Park
  - Report out on any related programs and policies implemented by the city and/or its partners such as the Beyond Gas Initiative



MODIFICATIONS AND CLARIFICATIONS CONT.

- Strategy no. 3 (expand access to electric vehicle (EV) charging):
  - Total available electric vehicle charging stations/spaces accessible to multifamily and commercial properties
  - Report out on any related programs and policies implemented by the city and/or its partners such as Peninsula Clean Energy incentive programs

- Strategy no. 4 (reduce vehicle miles traveled):
  - Reframe the goal with the intent to expand and enhance multimodal opportunities and infrastructure to reduce community dependence/reliance on personal vehicle travel
  - Mode share (methods of travel used by community)
  - Miles of multimodal infrastructure improved and/or installed
  - Report out on any related programs and policies implemented by the city and/or its partners



MODIFICATIONS AND CLARIFICATIONS CONT.

- Strategy no. 5 (eliminate the use of fossil fuels from municipal operations):
  - GHG inventory
    - Total therms of natural gas consumed to be reported by municipal building/facility
    - Report out on any related programs and policies implemented by the city

- Strategy no. 6 (climate adaption):
  - Reframe the goal with the intent to address climate resiliency beyond sea level rise
  - Report out on any related programs and policies implemented by the city and/or its partners, such as:
    - Adoption and implementation of Local Hazard Mitigation Plan (LHMP)
    - Adoption and implementation of Safety and Environmental Justice (General Plan) Element
    - SAFER Bay construction implementation progress/status
    - Partnerships with other agencies to complete flood protection and ecosystem restoration projects along the bay shoreline to comply with new construction building reach codes.

GREENHOUSE GAS INVENTORY

- Both the communitywide and municipal greenhouse gas inventories to be updated annually

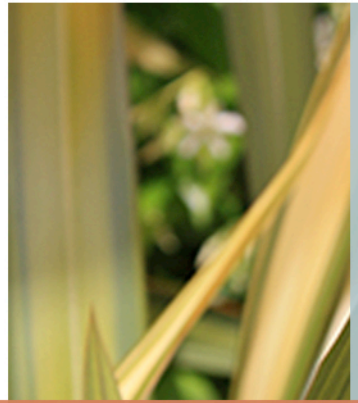
- Municipal inventory provides holistic review of all operations related emissions
  - Can capture all department/division programs to reduce emissions (waste reduction, employee commuter programs, remote work policy, etc.) that may not be captured in fossil fuel consumption

- Due to the impact of external factors to tracking communitywide GHG emissions year-to-year, emissions will be considered on a rolling average (e.g., the most recent three reporting years)

NEXT STEPS

- Informational item to City Council to present final progress report and inform the city council on reporting methodology and goal clarification going forward

- These modifications and clarifications would be incorporated when the City Council directs a formal review/update or amendment to the CAP goals or annual scope of work



THANK YOU

MENLO PARK CLIMATE ACTION PLAN PROGRESS REPORT

July 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 (CAP) in 2009. The goal of this plan was to reduce communitywide greenhouse gas (GHG) emissions 27 percent below 2005 levels by 2020. 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), the Menlo Park has 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 measure emphasizes that while the community, City Council, and staff continue to take great efforts to plan and strategize toward meeting local GHG reduction goals, many reductions also come from regional or state efforts that compliment strategies in the CAP. It also highlights the need for the ability to quickly adapt to new external policies, programs, or technologies that have the potential for greater and/or more cost-effective impact than may have been previously realized in a local climate action plan.

A great example of Menlo Park's nimble adaptability includes amending the building codes (known as reach codes) in 2020 to require new buildings to be all-electric. This allowed the community to capitalize on PCE's carbon-free electricity and eliminate the use of natural gas in new buildings to curb climate change 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 (IPCC) 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 strategies to achieve carbon neutrality by 2030[1].

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

Current Climate Action Plan Strategies

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

Current climate action plan metrics

To track the progress of the six adopted strategies and the achievement of carbon neutrality by 2030, the following metrics were selected by the Environmental Quality Commission:

1. Number of gas hot water heaters citywide that are replaced with electric versions
2. Number of gas furnaces citywide that are replaced with electric versions
3. Number of utility natural gas accounts terminated
4. Number of new light-duty vehicles registered that are fossil fuel (gasoline) vs. electric
5. Number of total light-duty vehicles registered that are fossil fuel (gasoline) vs. electric
6. Gallons of gasoline sold in Menlo Park
7. Percentage of municipal assets converted from gas or diesel to electric
8. Vehicle miles traveled, including trips inbound, outbound, and within the City
9. Number of other cities that query and/or copy Menlo Park's climate policies and programs

Community greenhouse gas inventory

Before the climate action plan metrics were selected by the Environmental Quality Commission, the City has historically tracked CAP progress through GHG emissions reductions relative to the 2005 baseline. The inventory does provide value in understanding GHG trends, external influences, and the sectors that contribute most to climate change. Some areas of the inventory are more precise at measuring GHG emissions, such as building emissions, while others may not be accurate or representative of the full GHG impact.

In 2005, the community generated 349,284 tons of GHG emissions [2] in four categories: transportation, solid waste, building energy use: natural gas, and building energy use: electricity. In 2013, the City Council established a GHG reduction goal of 27 percent below 2005 levels by 2020.

The most recent data shows the City has reached this goal even with continued development. 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:

[2] The industry standard unit for GHG emissions is metric tons carbon dioxide equivalent (MT CO2e). These terms can be used interchangeably.

- 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[3] and from renewable sources[4].
  - Menlo Park subscribing all residents and businesses to the community choice aggregate, Peninsula Clean Energy (PCE)[5]. 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 continues to be transportation (48.2 percent), followed by building energy use: natural gas (41.2 percent).

Municipal greenhouse gas inventory

In 2016, municipal operations generated 2,812 tons of GHG emissions in six categories[6]: natural gas consumption, electricity use, vehicle fleet, employee commute, waste generation, and emissions from decommissioned Bedwell Bayfront landfill.

The most recent data shows the City has successfully reduced its municipal operations related emissions to 2,178 (22.6 percent) in 2019. This can be attributed to reductions from:

- Building/facility electricity use related emissions (-540 tons) due to:
  - Menlo Park city buildings and facilities being subscribed to the community choice aggregate, PCE. In 2017, Menlo Park took formal action to enroll all municipal

[3] Assembly Bill 32, the California Global Warming Solutions Act (2006) arb.ca.gov/cc/ab32/ab32.htm
[4] 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
[5] Peninsula Clean Energy: peninsulacleanenergy.com
[6] Previous municipal inventories calculated emissions in five categories: buildings, vehicle fleet, streetlights, water/storm water, and solid waste.

accounts in ECO100[7] 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 waste related emissions (-120 tons) due to:
  - Incremental reduction at Bedwell Bayfront Landfill. Note, this landfill has been decommissioned so emissions will continue to decrease with no intervention.
  - Improved sorting and waste diverted from landfill. Note, this is largely due to statewide requirements and regional cooperation.

[7] Peninsula Clean Energy, ECO100: peninsulacleanenergy.com/opt-up

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.

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[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

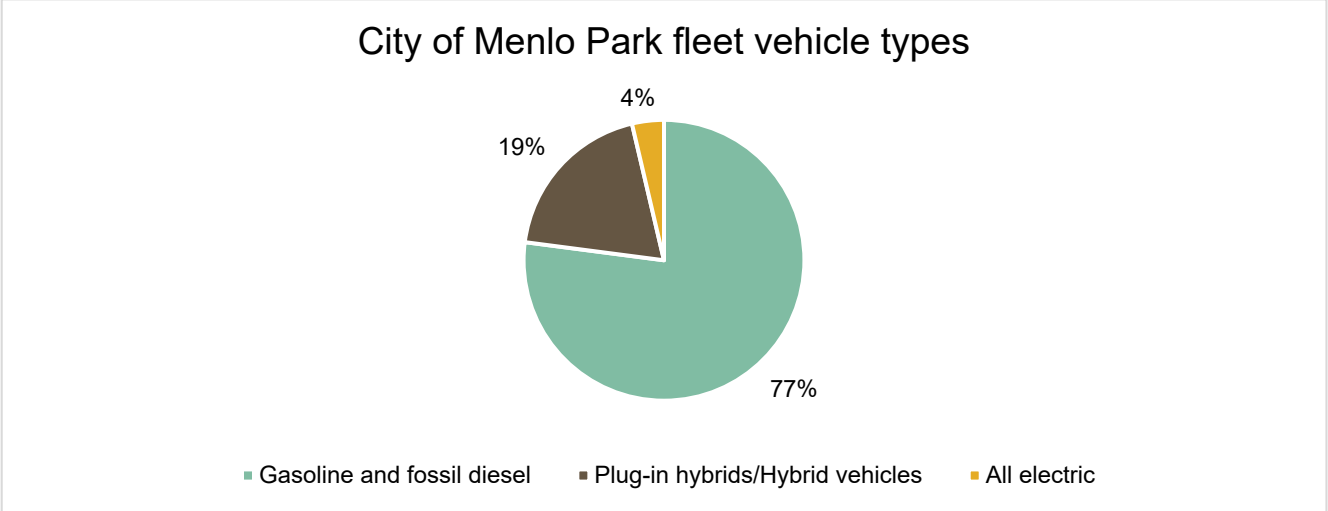
- Onetta Harris Community Center
- Menlo Park Senior Center
- Belle Haven Youth Center
- Belle Haven Pool

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.

   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.

   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.

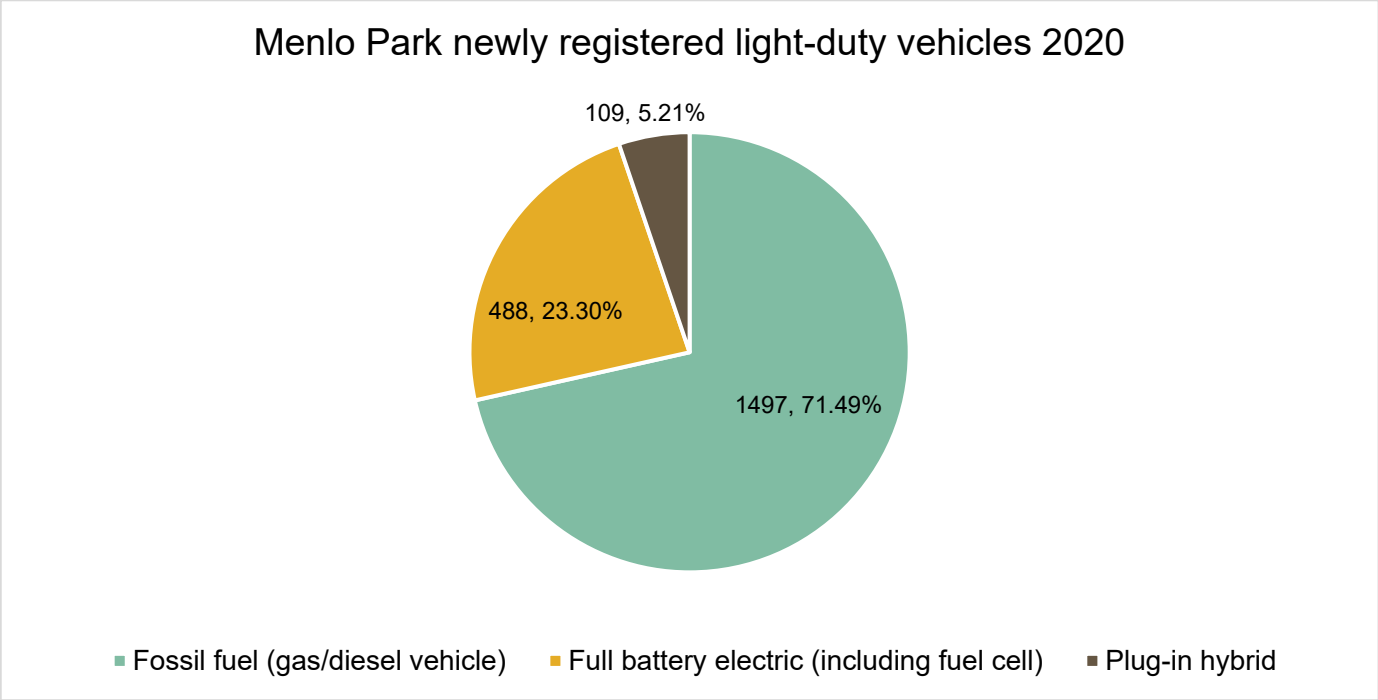
   Data limitation(s) and/or consideration(s): Upon contacting the local natural gas provider, Pacific Gas & Electric, city staff was informed this metric is not currently tracked and is not anticipated to be available to the public in the near future. Therefore, this data is not obtainable.

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, provision of this data point is considered a special (not regularly analyzed/reported) request and is not readily available to the public. CEC staff does not currently and has no immediate plans to include city level data (i.e., newly registered light-duty vehicles in Menlo Park) in its regular reporting. 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:

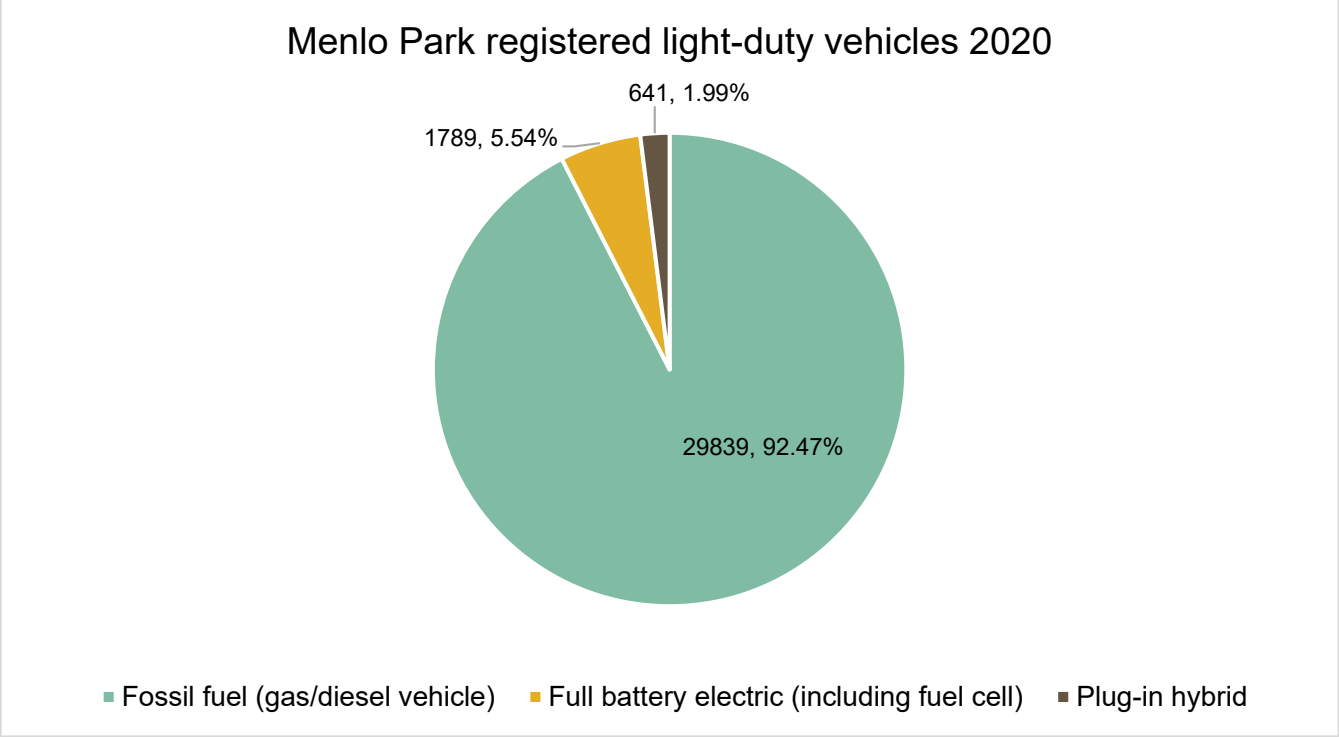


5. Metric no. 5: Number of total light-duty vehicles registered that are fossil fuel (gasoline) vs. electric.

[30] California Energy Commission, Zero Emission Vehicle and Infrastructure Statistics: energy.ca.gov/data-reports/energy-insights/zero-emission-vehicle-and-charger-statistics

Data limitation(s) and/or consideration(s): The Department of Motor Vehicles (DMV) currently reports vehicle counts by zip code, model year, fuel type, make, and duty (light/heavy) of registered vehicles at irregular intervals[31]. This report was last updated on December 14, 2020, but the DMV has provided no estimate on availability or future report updates. Lack of regular reporting intervals may impact future reporting of this metric. City staff has submitted a request to the DMV encouraging regular provision of this report.

Figure 3 describes the 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:

[31] California Department of Motor Vehicles, Vehicle Fuel Type Count by Zip Code: data.ca.gov/dataset/vehicle-fuel-type-count-by-zip-code

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
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.

   Buildings

   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.

Fleet

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:

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

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%
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

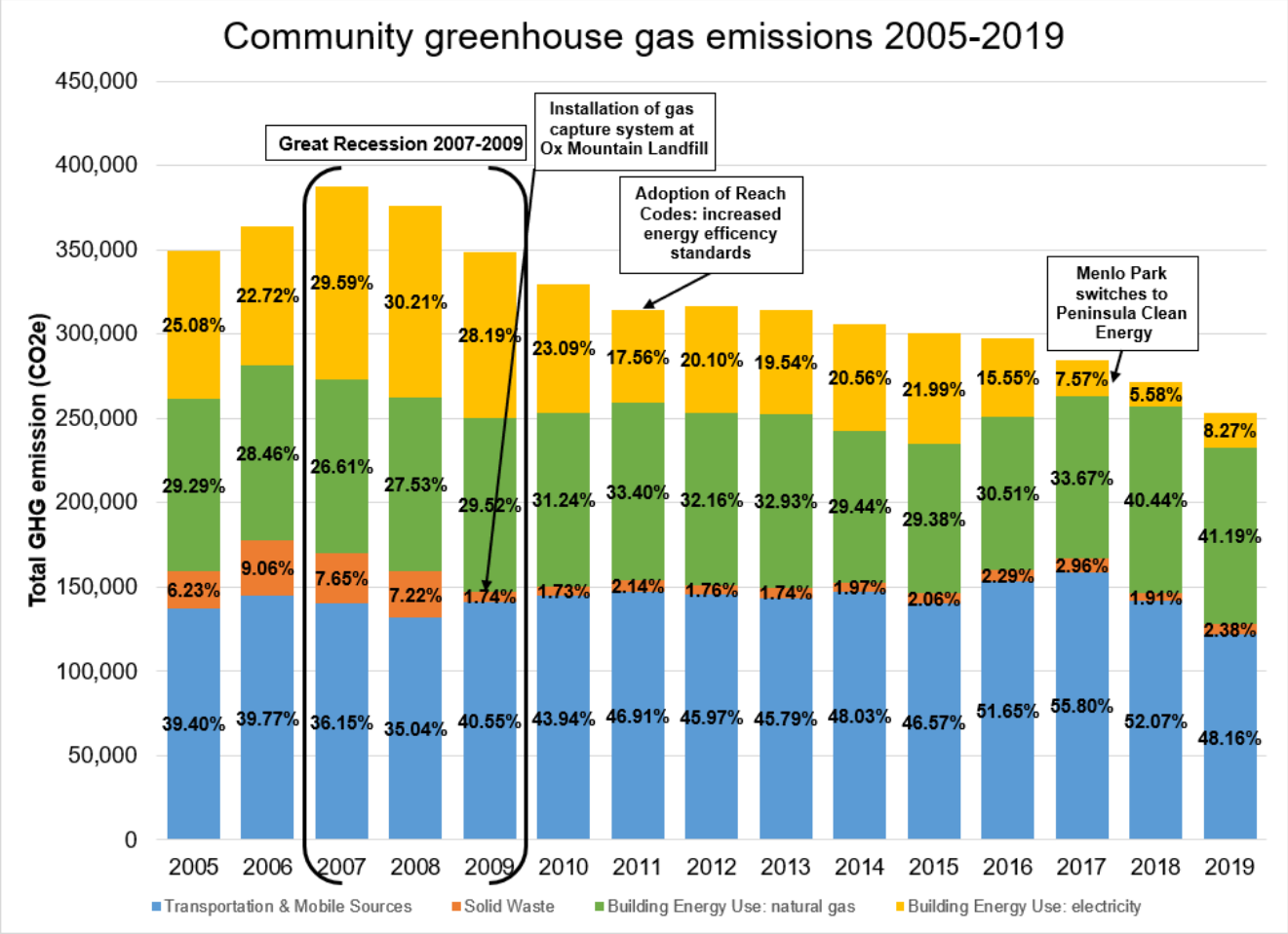


Figure 5-City of Menlo Park communitywide greenhouse gas emissions 2019

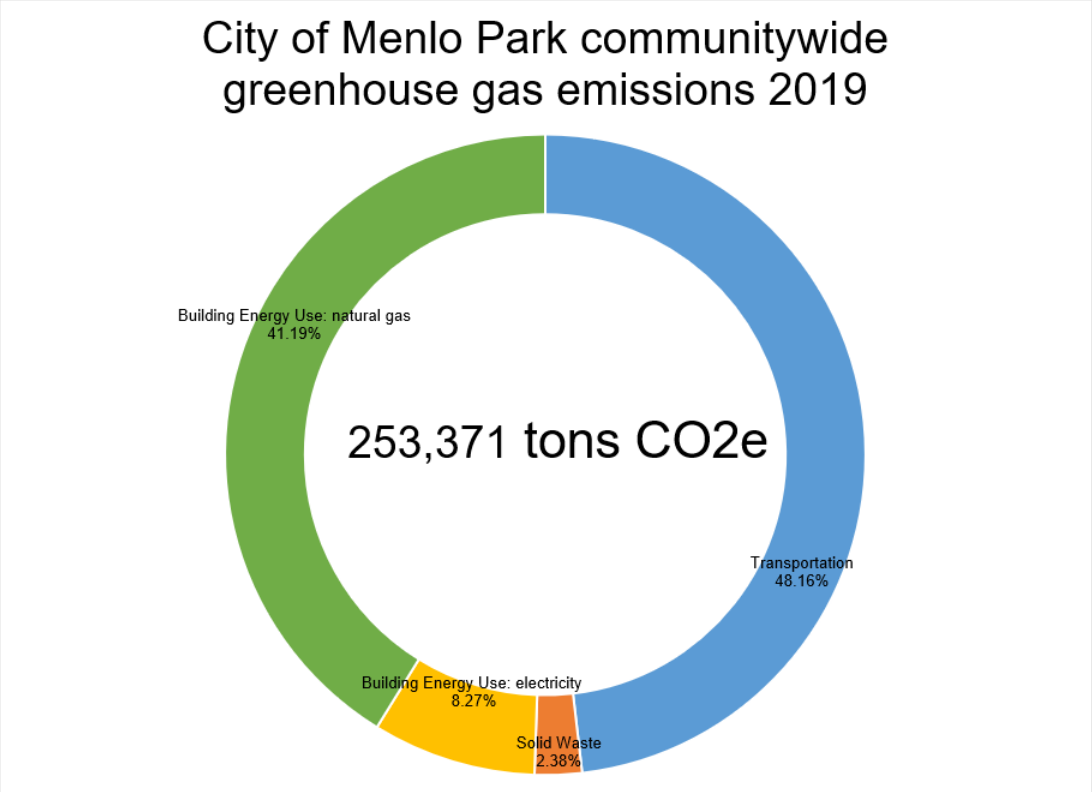
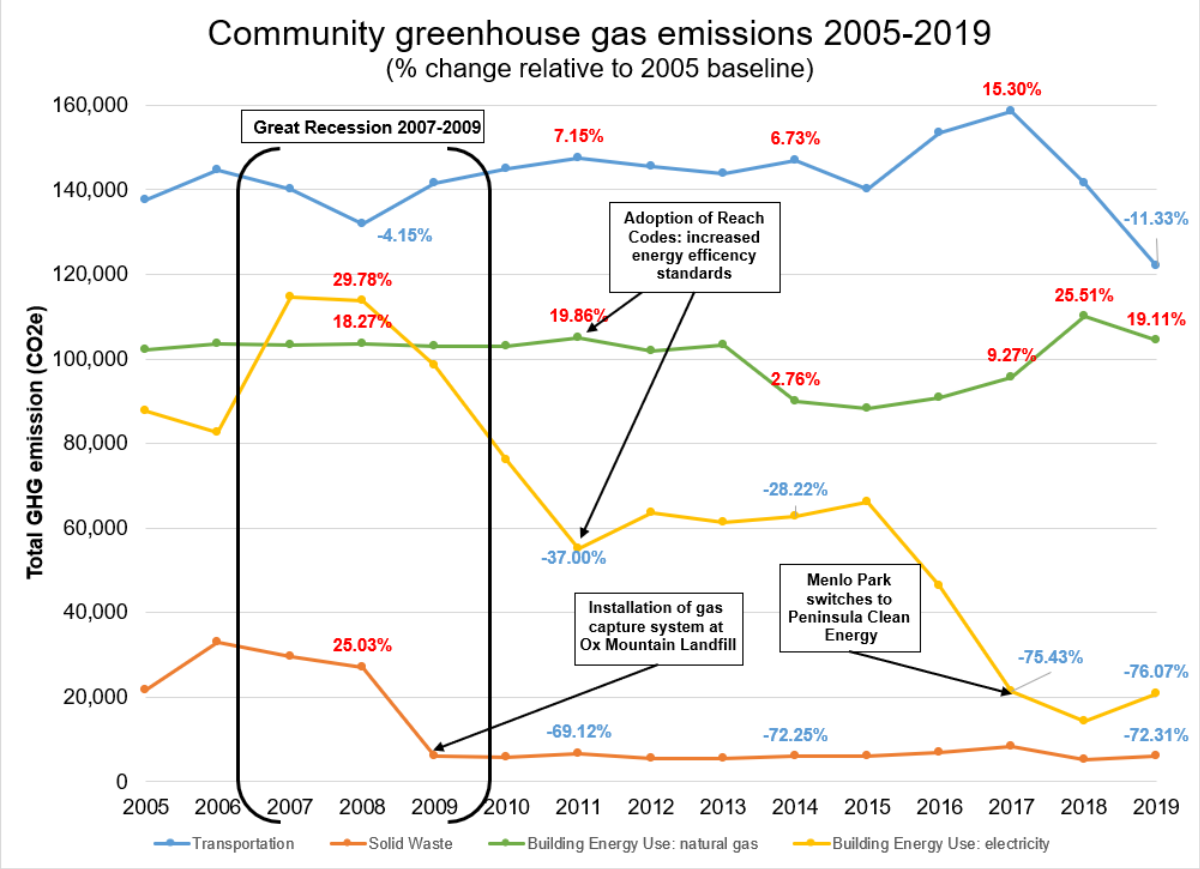


Figure 6 highlights changes in community greenhouse gas emissions by category:



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

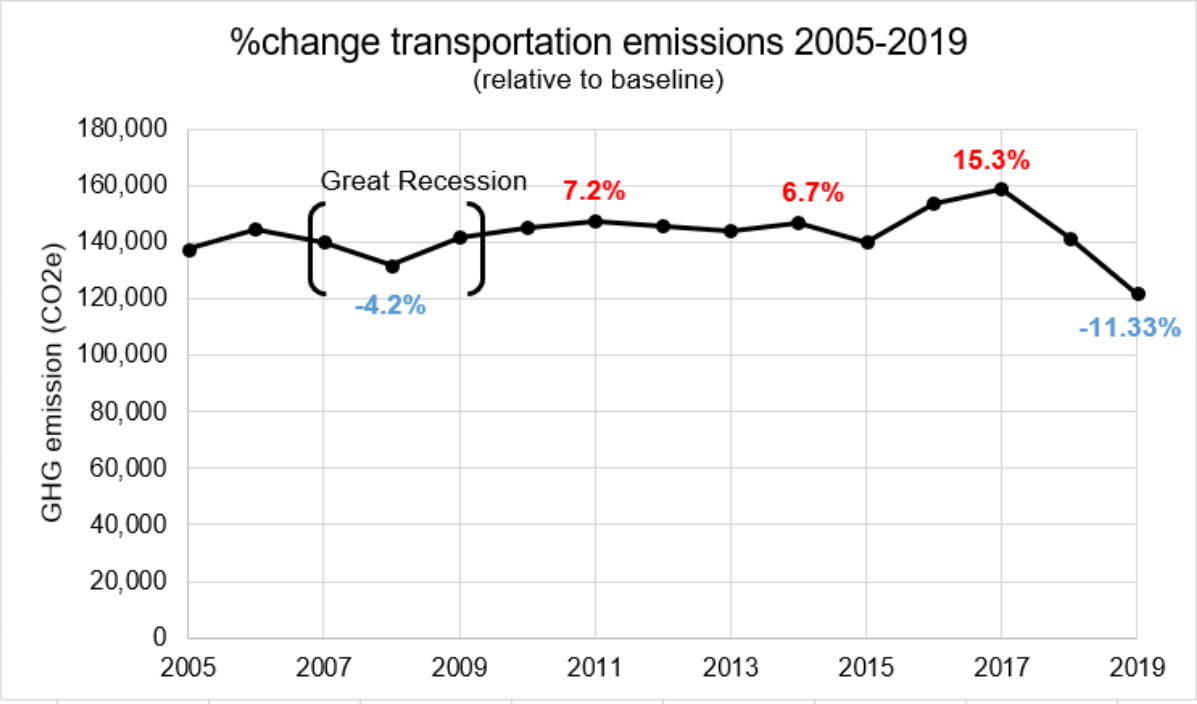
It is important to note that any greenhouse gas emissions inventory represents an estimate using the best available data and calculation methodologies at the time it was conducted. These estimates are subject to change as better data and calculation methodologies become available.

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.

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[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

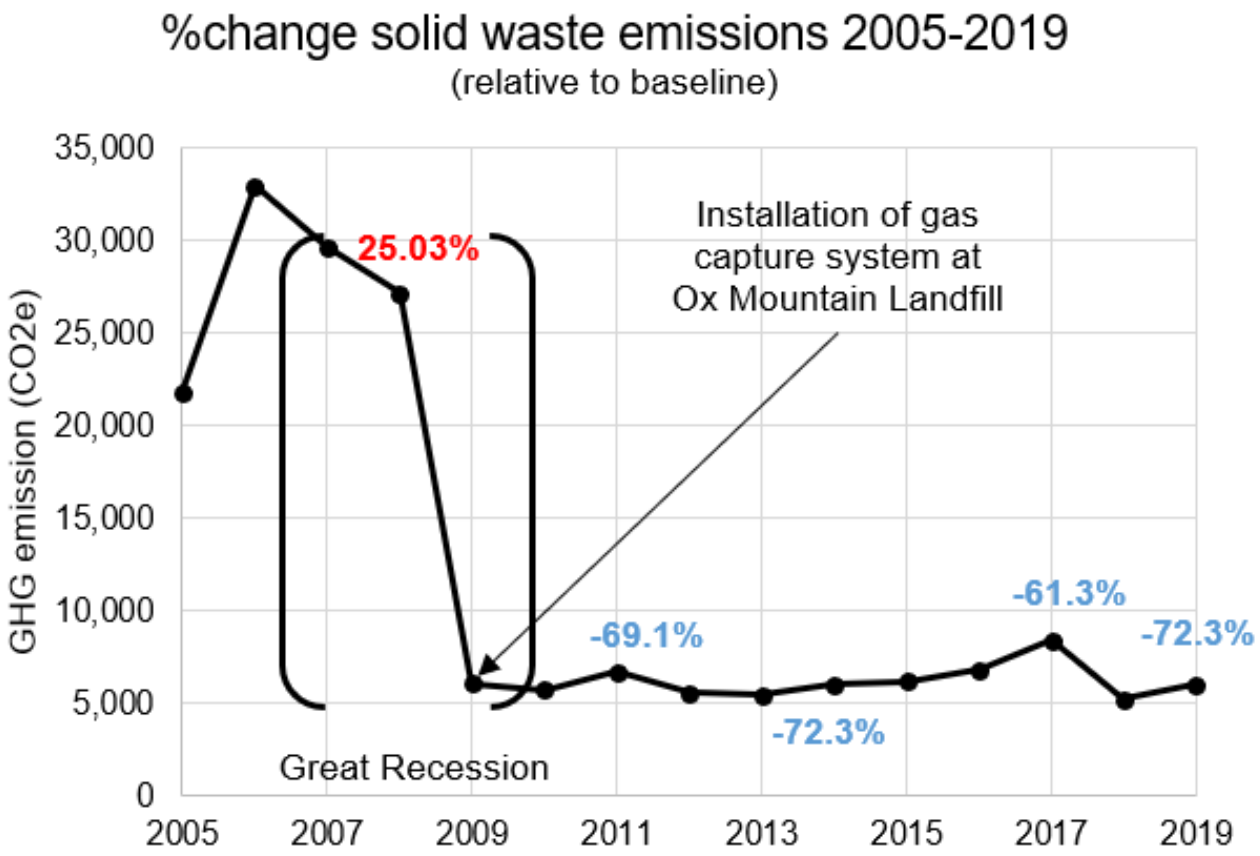
[36]Bureau of Transportation Statistics: bts.gov/content/average-age-automobiles-and-trucks-operation-united-states

[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.

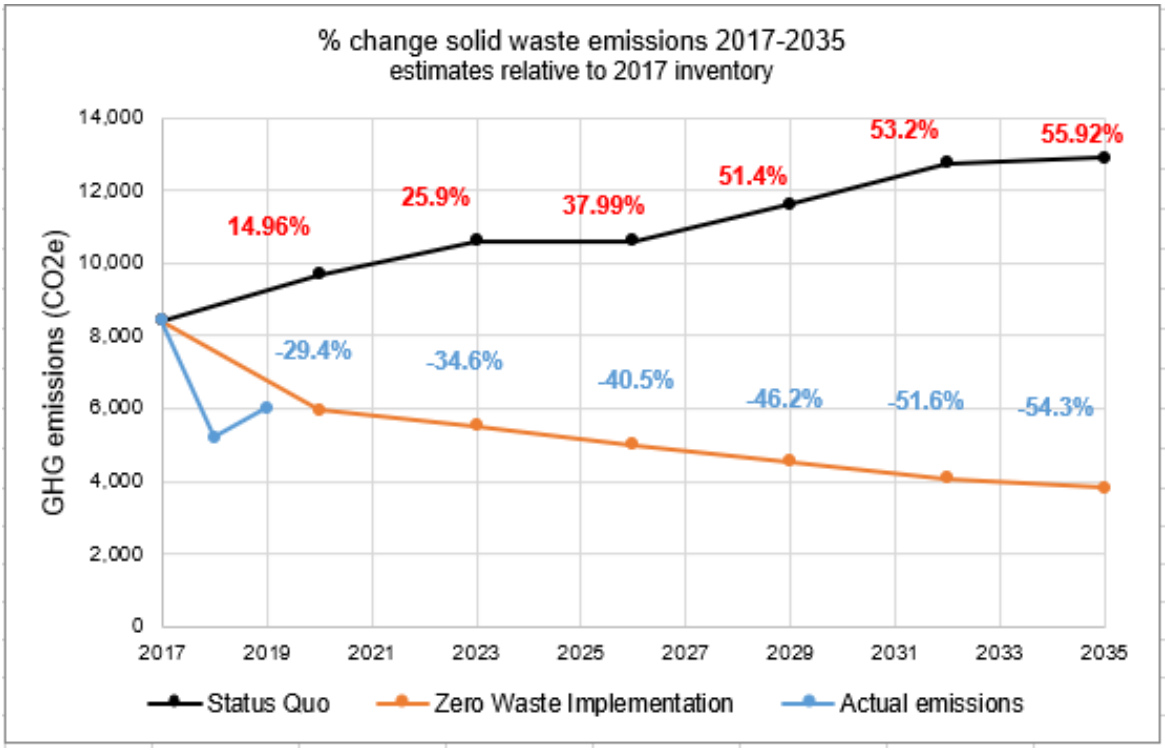
The solid waste category reflects emissions related to total community waste sent to landfill reported to California Department of Resources Recycling and Recovery (CalRecycle). In 2019, solid waste related emissions were 6,022 tons (2.38 percent of the communitywide total). For comprehensive summary 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):

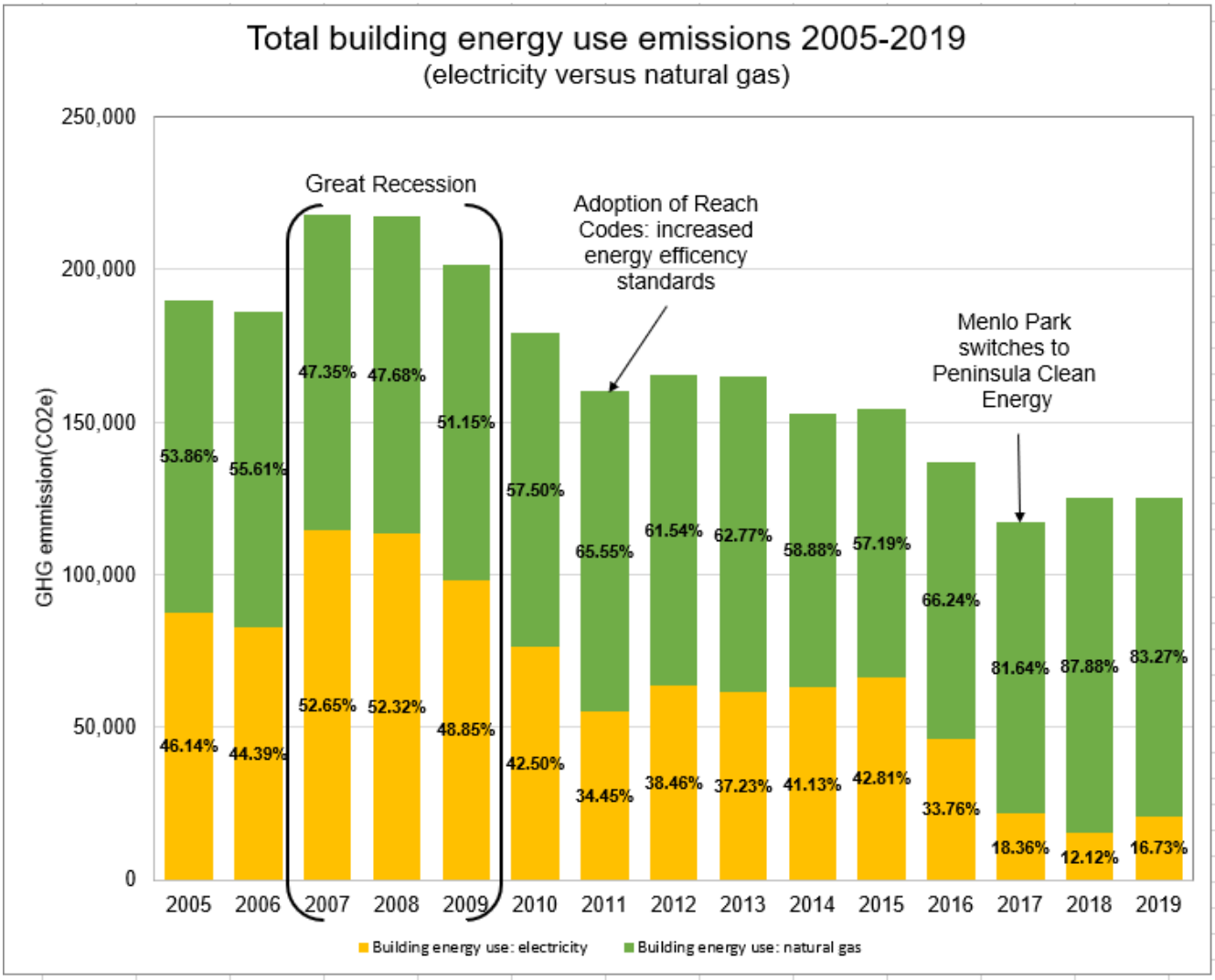
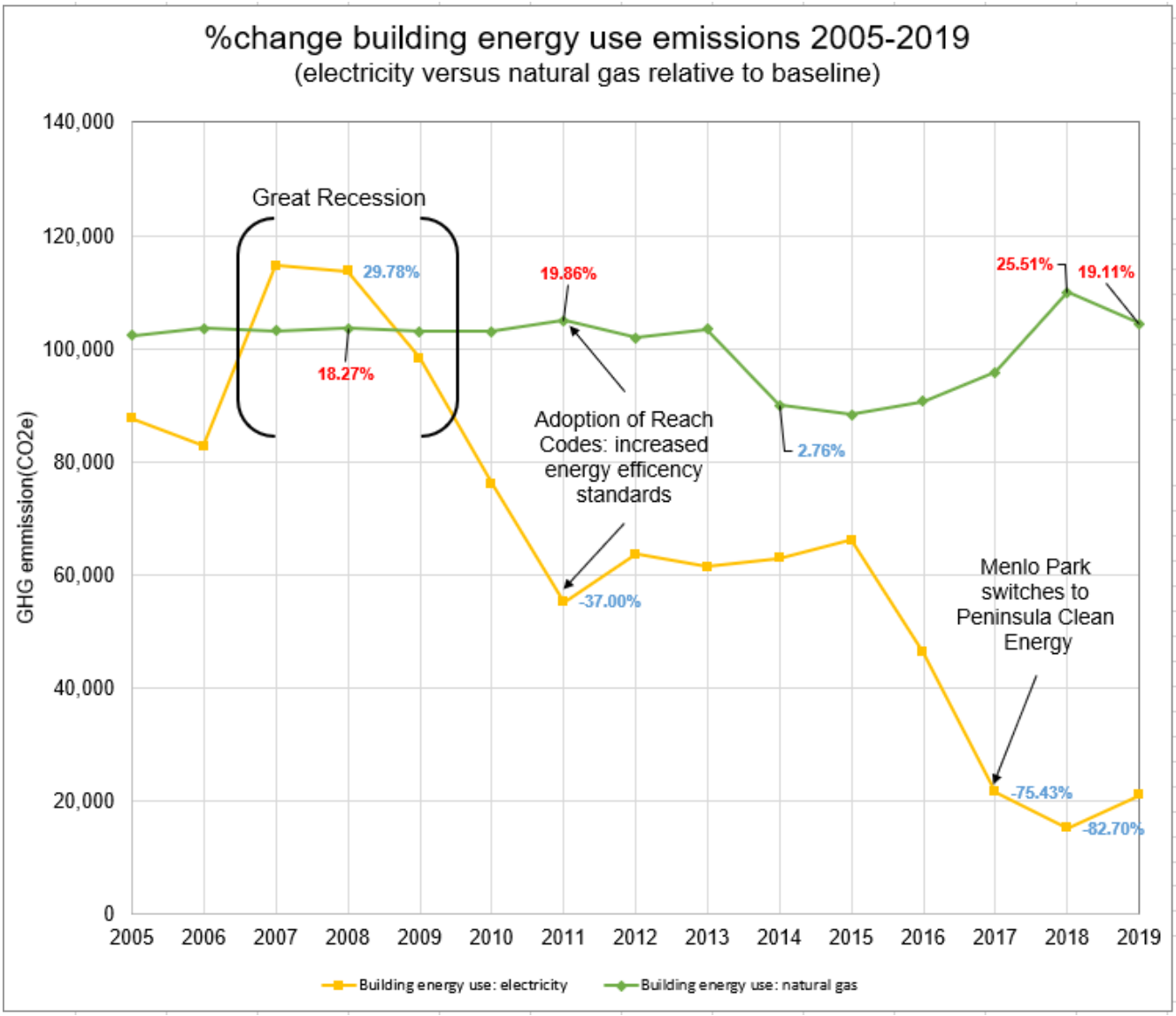


Figure 11 highlights changes in building energy use relative to the 2005 baseline by type (natural gas versus electricity):



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.

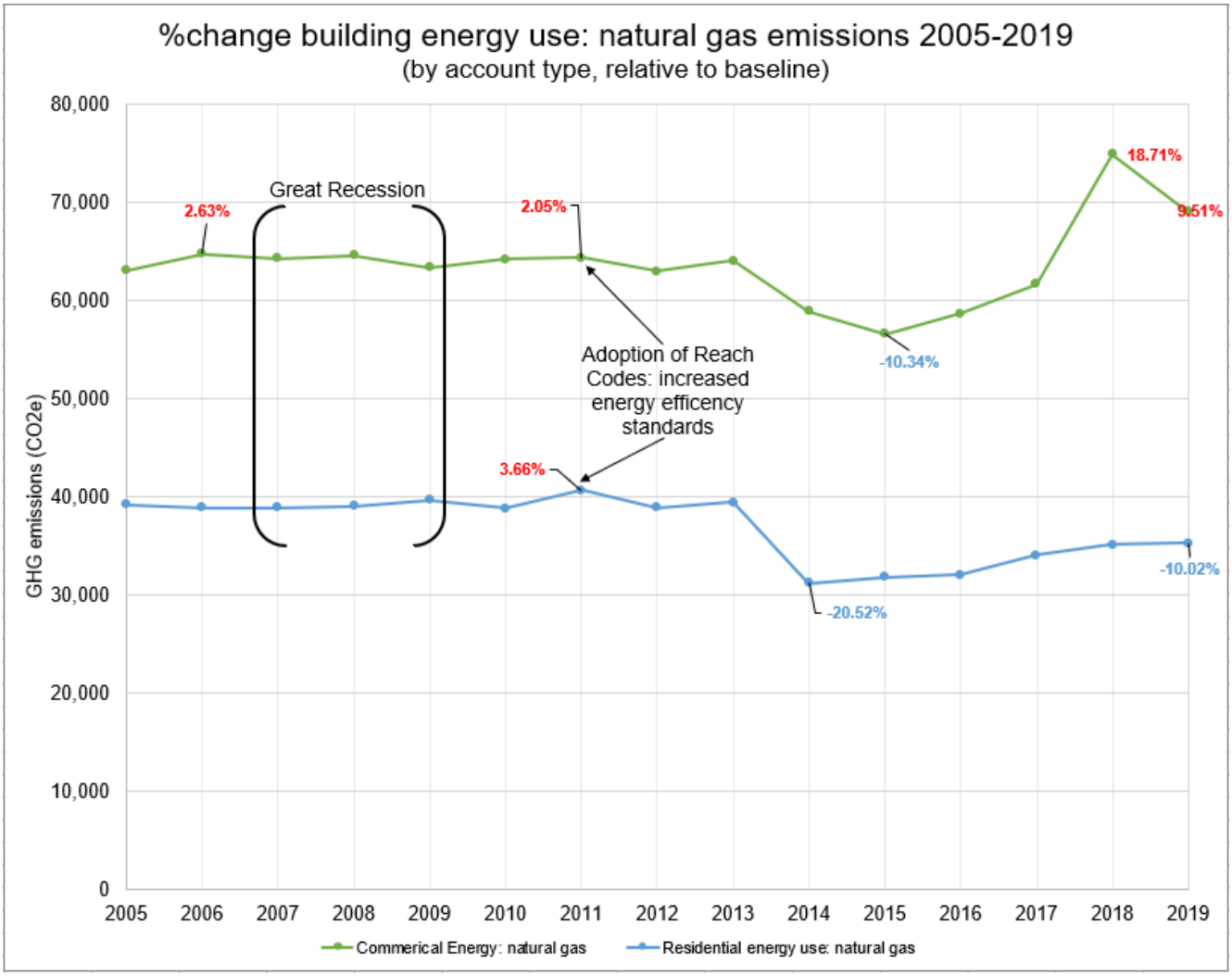
Building energy use by account type

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

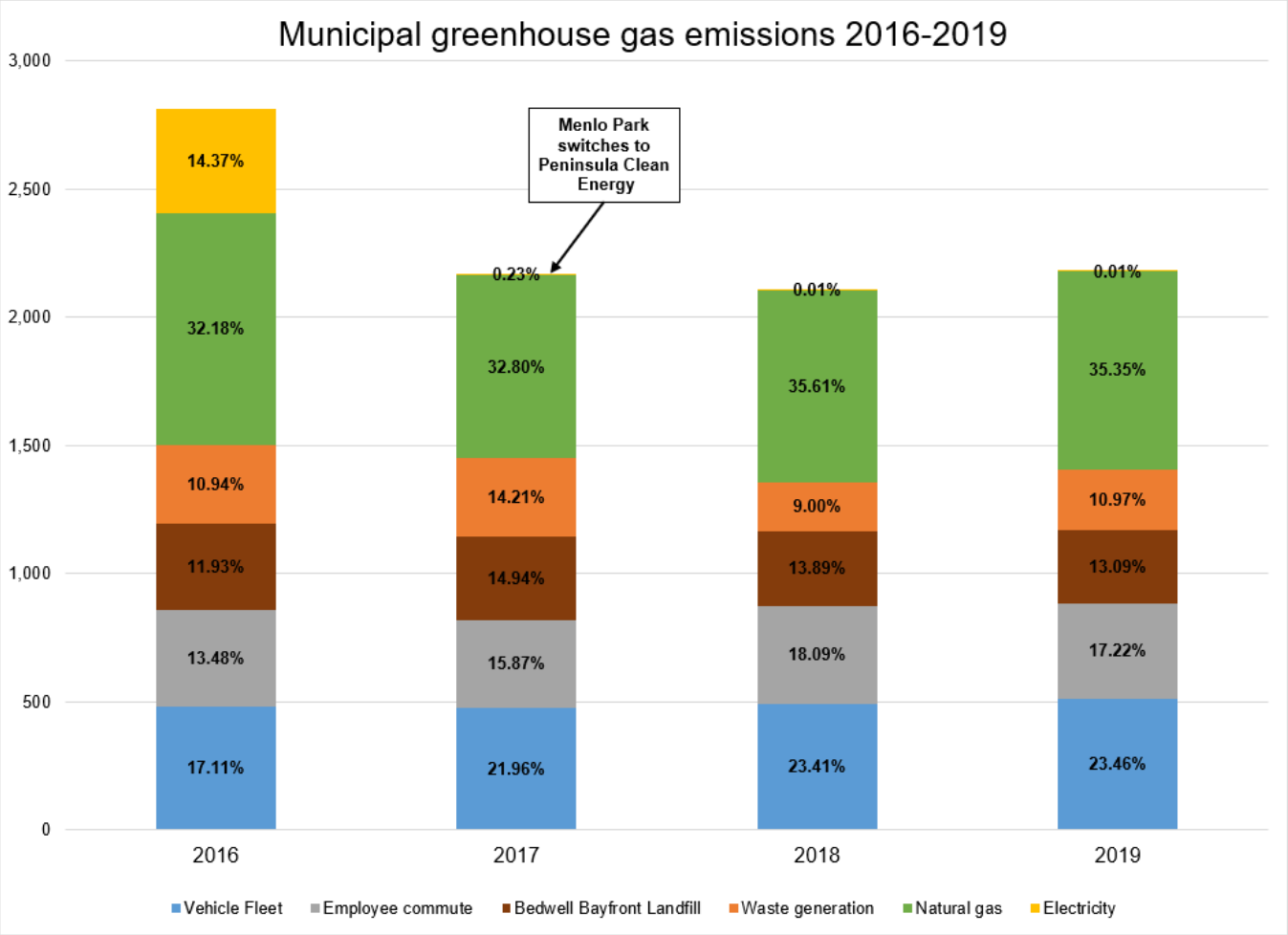


Figure 14-City of Menlo Park municipal greenhouse gas emissions 2019

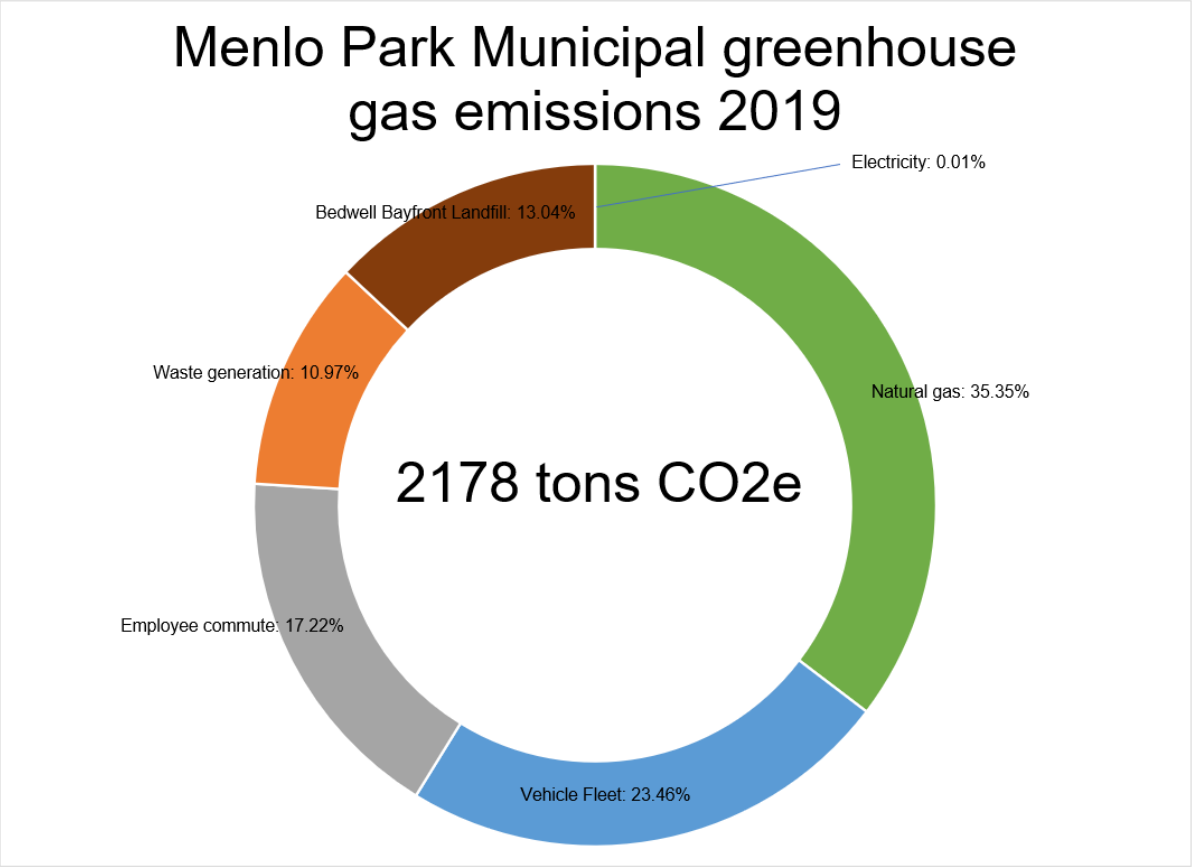
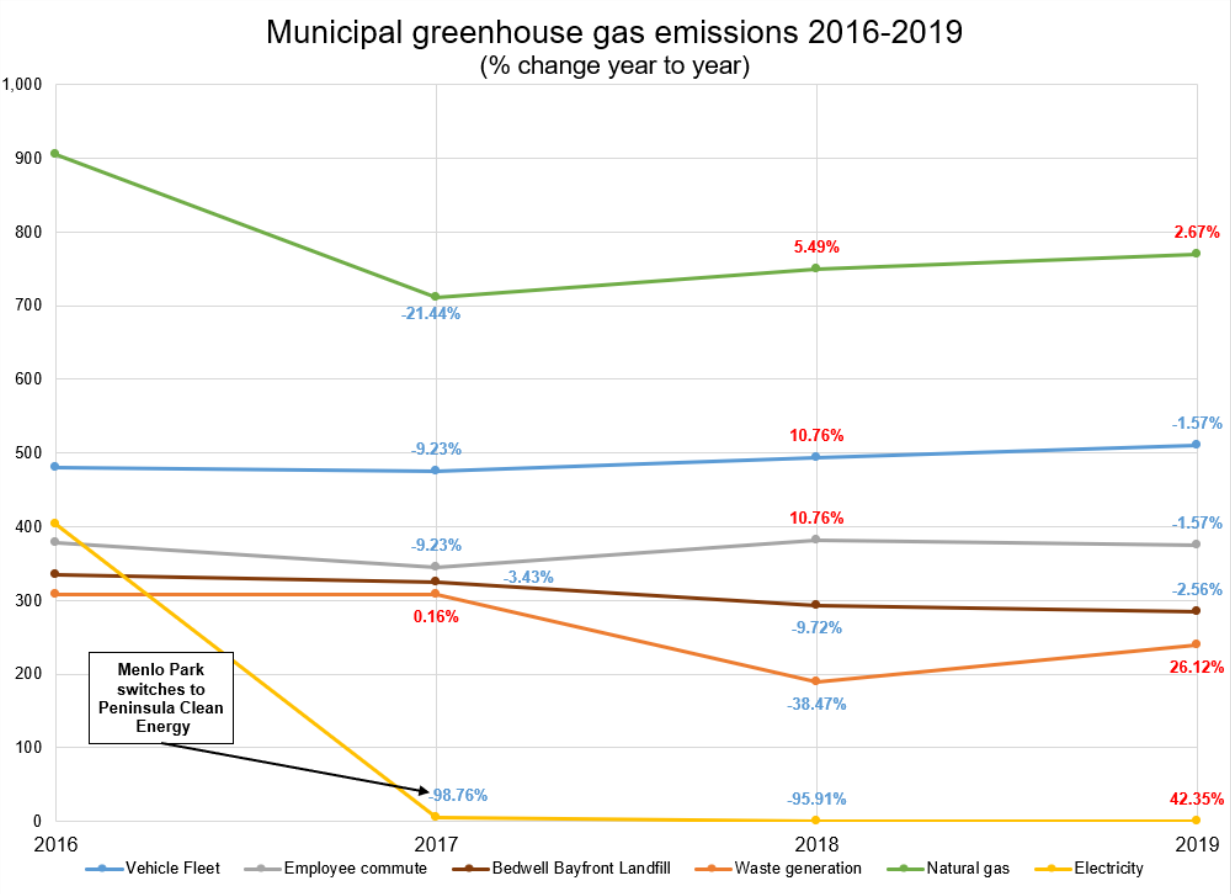


Figure 15 highlights changes in municipal greenhouse gas emission by category:



Methodology and measurement notes

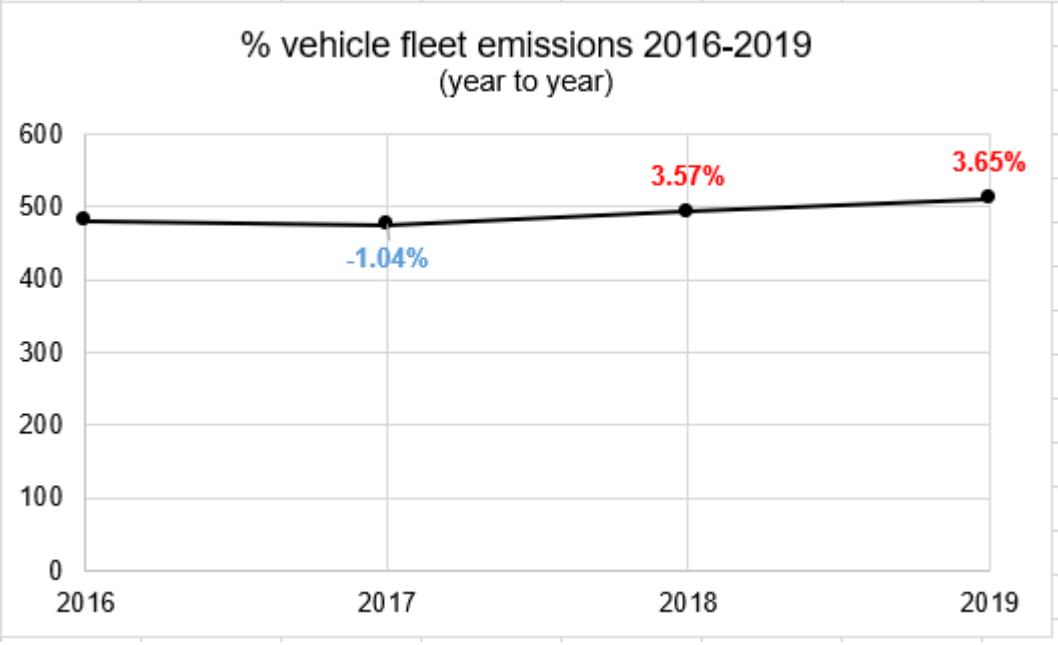
The City can calculate emissions generated by municipal operations related to water and wastewater emissions, fugitive point sources, and more. However, the city has elected to calculate greenhouse gas emissions in six categories (natural gas consumption, electricity use, vehicle fleet, employee commute, 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

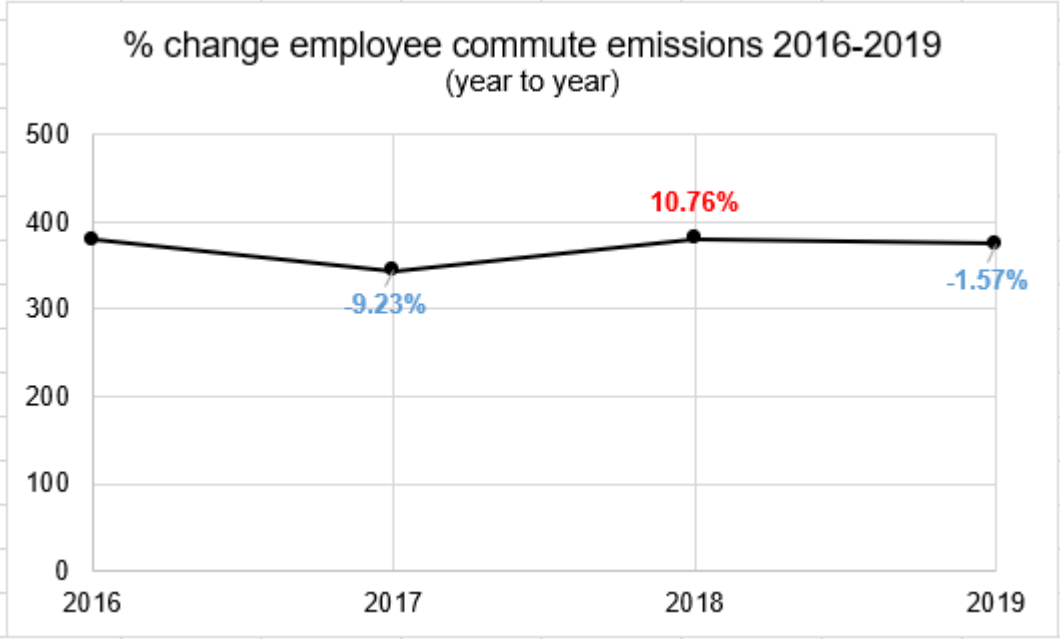
The transportation category includes emissions related to vehicle fleet fuel consumption, vehicles miles traveled, and equipment run time recorded and reported by Menlo Park Public Works, Maintenance Division. As of 2019, vehicle fleet emissions are the second largest contributor to municipal greenhouse 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:

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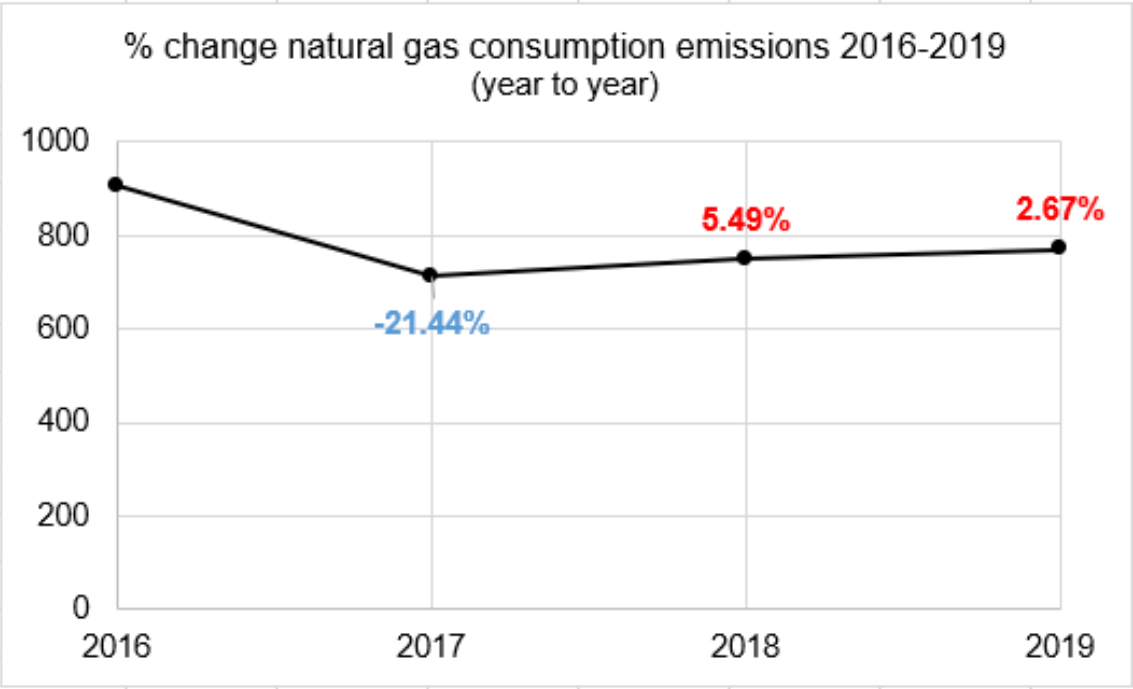
[38] Metropolitan Transportation Commission, Vital Signs: Commute Mode Choice: vitalsigns.mtc.ca.gov/commute-mode-choice

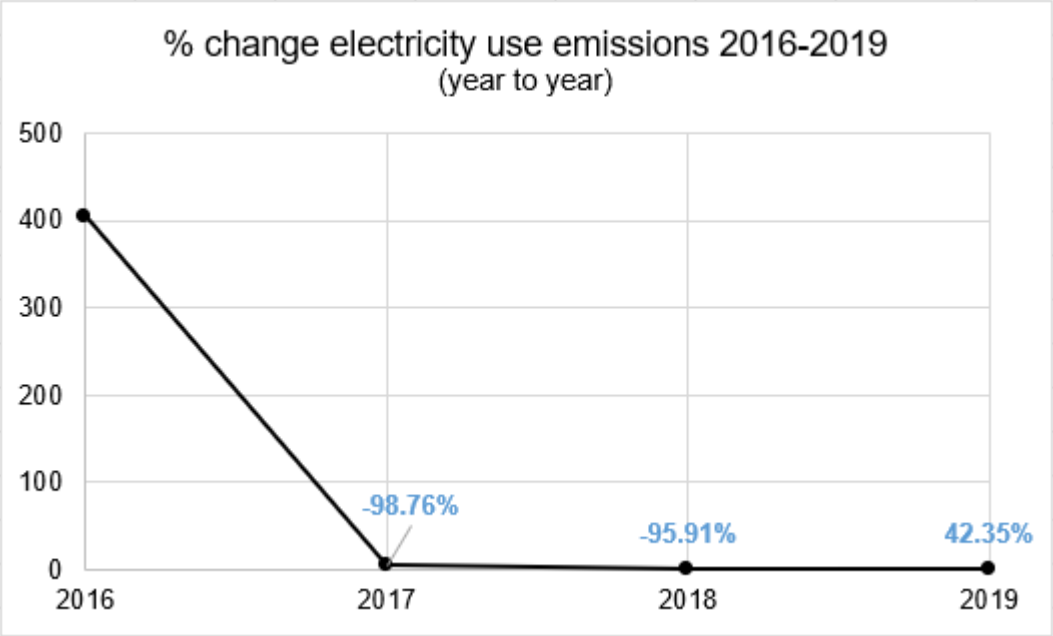
[39] Metropolitan Transportation Commission, Vital Signs: Daily Vehicle Miles Traveled: vitalsigns.mtc.ca.gov/daily-miles-traveled



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:



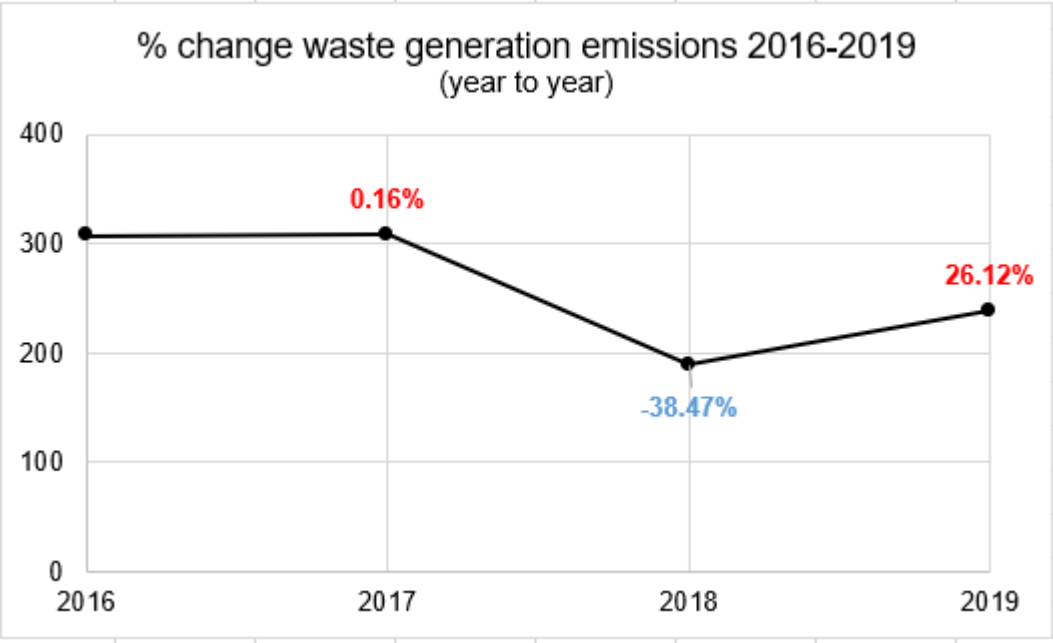
Electricity use emissions were expected to be zero due to the 2017 formal action taken to enroll all municipal accounts in ECO100 (electricity is Green-e certified; 100% from renewable sources (i.e., solar and wind) and carbon-free). However, while staff was performing the municipal inventory, it was 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:

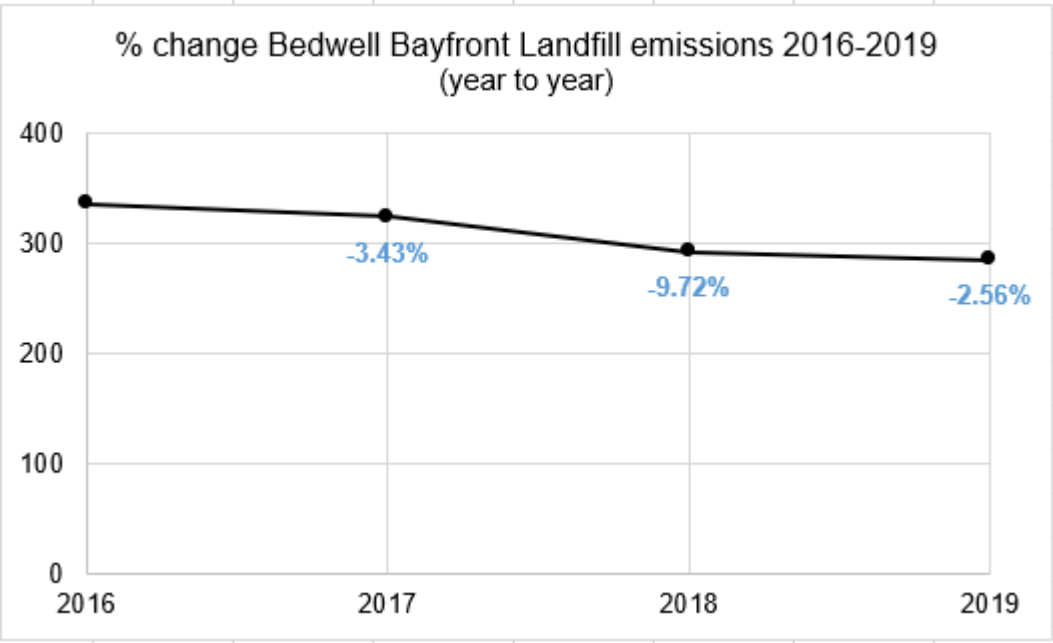
[40] Menlo Park City Council staff report, April 24, 2018: menlopark.org/DocumentCenter/View/17285/I1---Recology-Agreement



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%

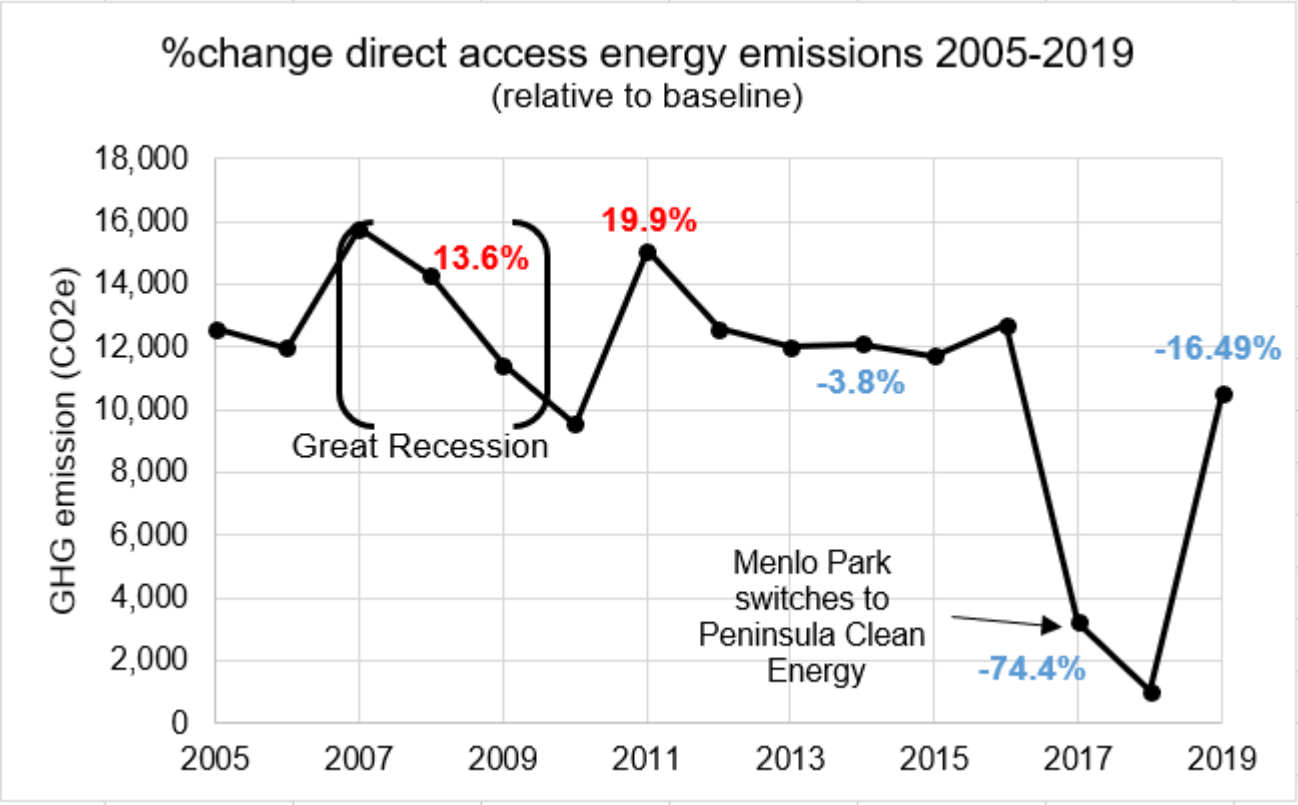
Table 17-Residential energy related emissions 2005-2019

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.

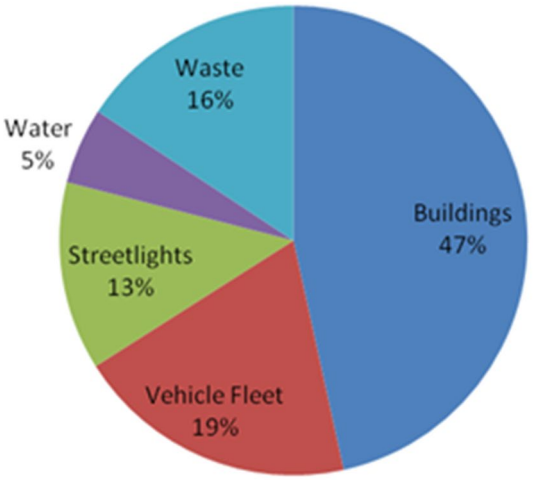
Table 18-Direct access energy related emissions 2005-2019. Note, all PCE provided electricity (irrespective of account type) is tracked by PG&E as direct access energy. To avoid double counting, total electricity use reported by PCE is subtracted from PG&E direct access energy category.

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.

Memo

Date: August 18, 2021
To: Environmental Quality Commission
From: EQC Climate Action Plan Subcommittee
(Commissioner Gaillard, Kabat, and Chair Payne)
Subject: Recommendation on CAP tracking metrics

The CAP sub committee discussed the merits of different tracking systems for helping staff, council and community see if we are rising quickly enough to meet the climate emergency in line with the aggressive goals of the city's adopted CAP.

Recommendations

The subcommittee recommends the commission vote to advise council on these items:

1) Ensure processes are in place to support frequent and automated reporting of all CAP metrics related to vehicle and infrastructure appliance commitments. (vehicle registrations and building permits)
2) In light of the council declared Climate Emergency, suggest frequent updates from staff and discussions with staff to enable new and streamlined methods to bring policies to council for addressing the need to get in front of the climate problem.

Special note: City staff resources have not been appropriated to review/analyze the proposed recommendations at this time. The city council would review the Environmental Quality Commission's recommendations and provide further direction on next steps to city staff.

Background and rationale

The subcommittee recommends freeing up time and effort by decreasing the frequency of reporting of slow moving non-actionable metrics like calculated community wide emissions (tons of CO2e) to a cycle of approximately every three or four years. Alternatively, the city may farm it out to RICAPS (Regional Integrated Climate Action Planning Suite) to have a single entity easily assemble the utility and gasoline and regional miles data for several cities at once if more frequent reporting is needed.

The subcommittee recommends that the city put automated systems in place to collect more actionable data that reveals two types of things:

1) What fossil-fueled or electric devices are residential and non-residential buildings installing? What vehicle types are they registering? This addresses how quickly and in what sectors our community is installing the electric solutions vs. continuing to install the fossil fired problems.
2) How quickly and effectively are city processes working to take actions to respond to the council declared Climate Emergency? This addresses how quickly and effectively are we developing and implementing policy and programs to achieve installation of the solutions such as building electrification and vehicle electrification.

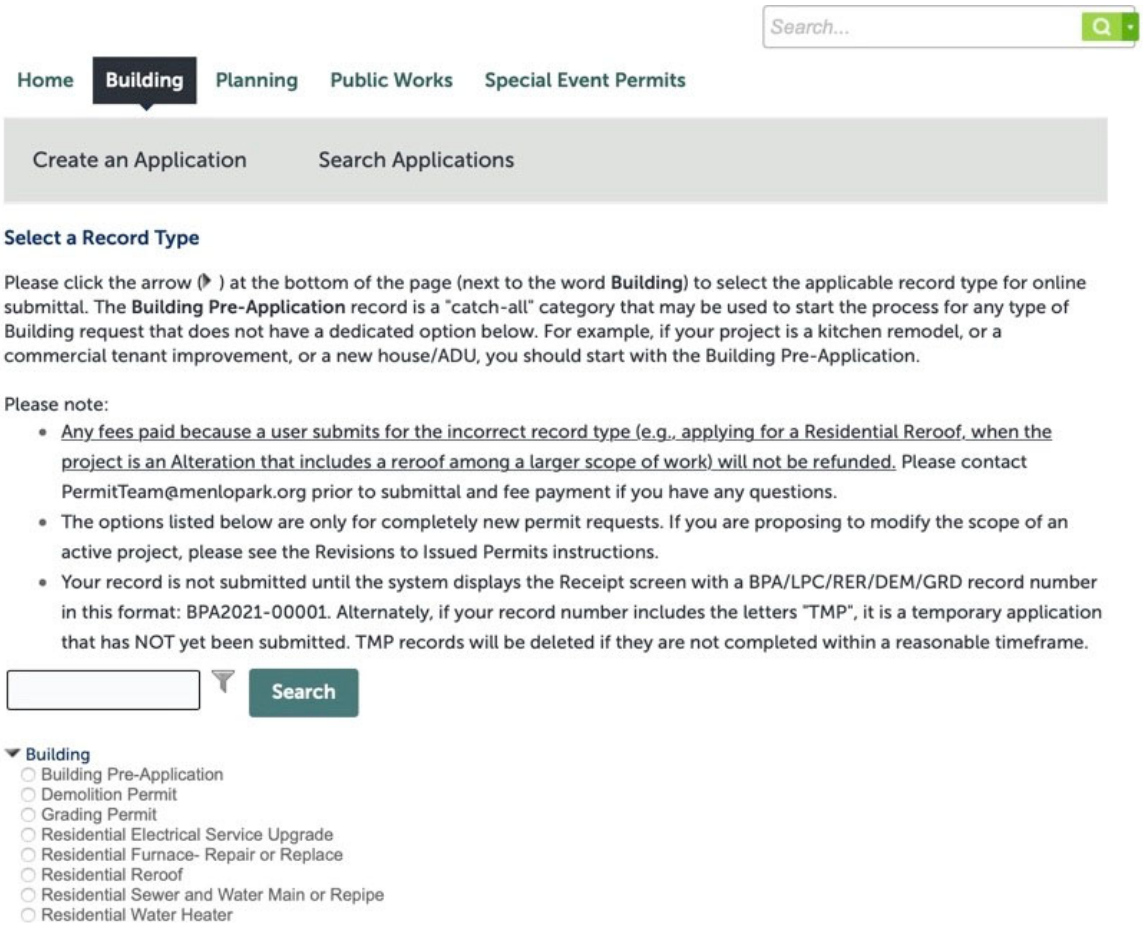
The EQC may also want to recommend that staff report on the calendar time and work hours spent on implementing policy changes so management and council can discuss if there is a need to find faster methods to make progress during the growing climate emergency.

Requested Changes to tracking forms

With regards to tracking the permitted installation of new and replacement equipment that directly reflects progress on the CAP, the

subcommittee recommends staff modify the following forms to collect and report the data needed.

Below are example screenshots from the current Menlo Park online building permit application forms and suggested changes to them to gather and report pertinent information about community uptake of electrification devices or continued installation of gas fired devices.



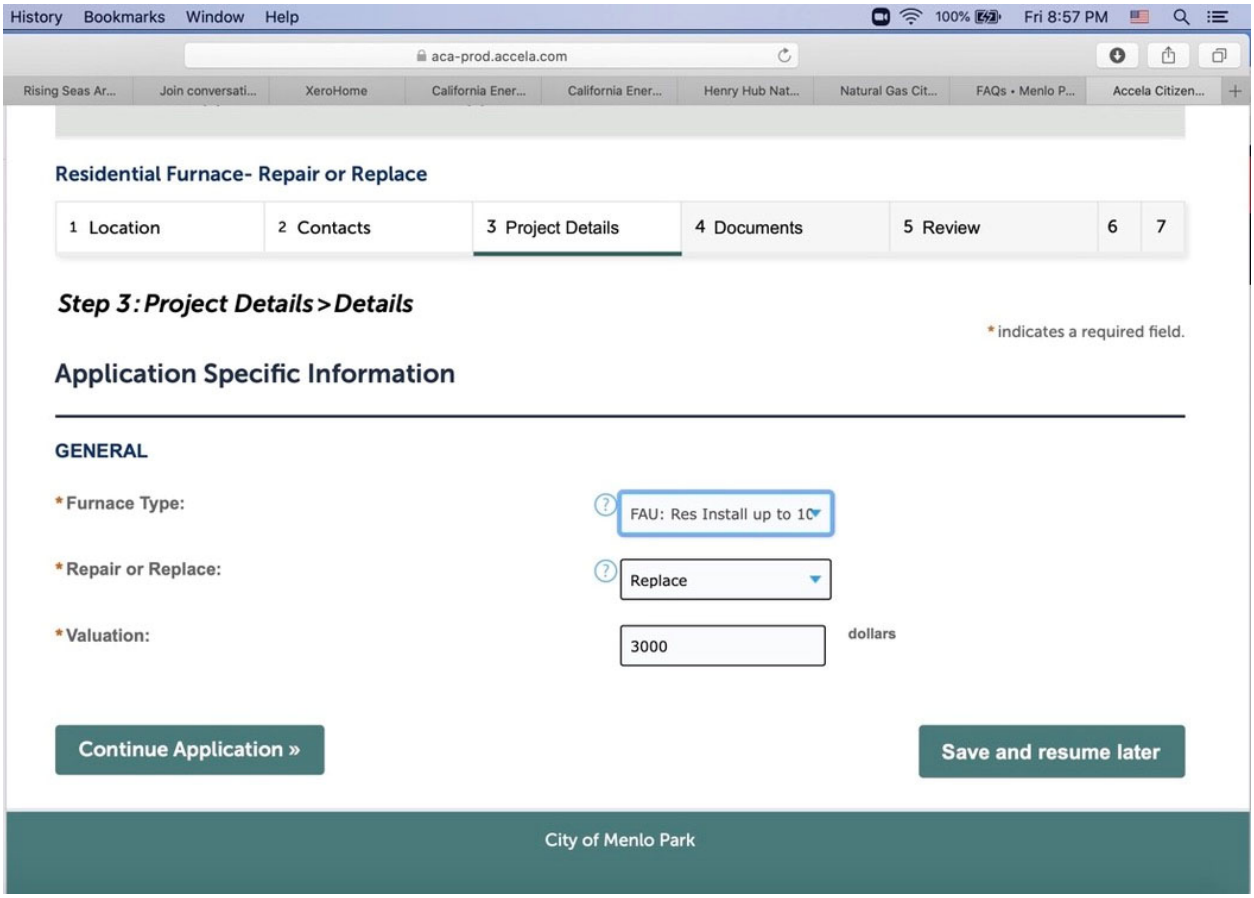
To this form we recommend adding a wiring permit type:

- Residential Wiring for Electrification

(discussed in more detail on page 5)

The “Furnace Repair or Replace” item can be replaced by a more general item addressing cooling as well since we recommend moving from furnaces to two-way heat pumps that both heat and cool.

- Residential Space Heating and/or Cooling



In place of asking about Furnaces (since we no longer encourage them) it can lead to a page that says:

“The city encourages the use of efficient two-way heat pumps instead of separate machines for heating and cooling.

- Heating Type.

--Select—
- Heat Pump (electric) (preferred alternative)
- Electric resistance
- Gas fired furnace Central Forced Air
- Gas fired furnace Wall type or floor type

- Cooling type.

--Select—
- Heat Pump (electric) (preferred alternative)
- Mini split heat pump (preferred alternative)
- Packaged Heat Pump through the wall
- Packaged cooling through the wall
- One way A/C coil on central gas furnace

The button (from the first form) that asked if they were seeking a permit for:

- Residential Wiring for Electrification

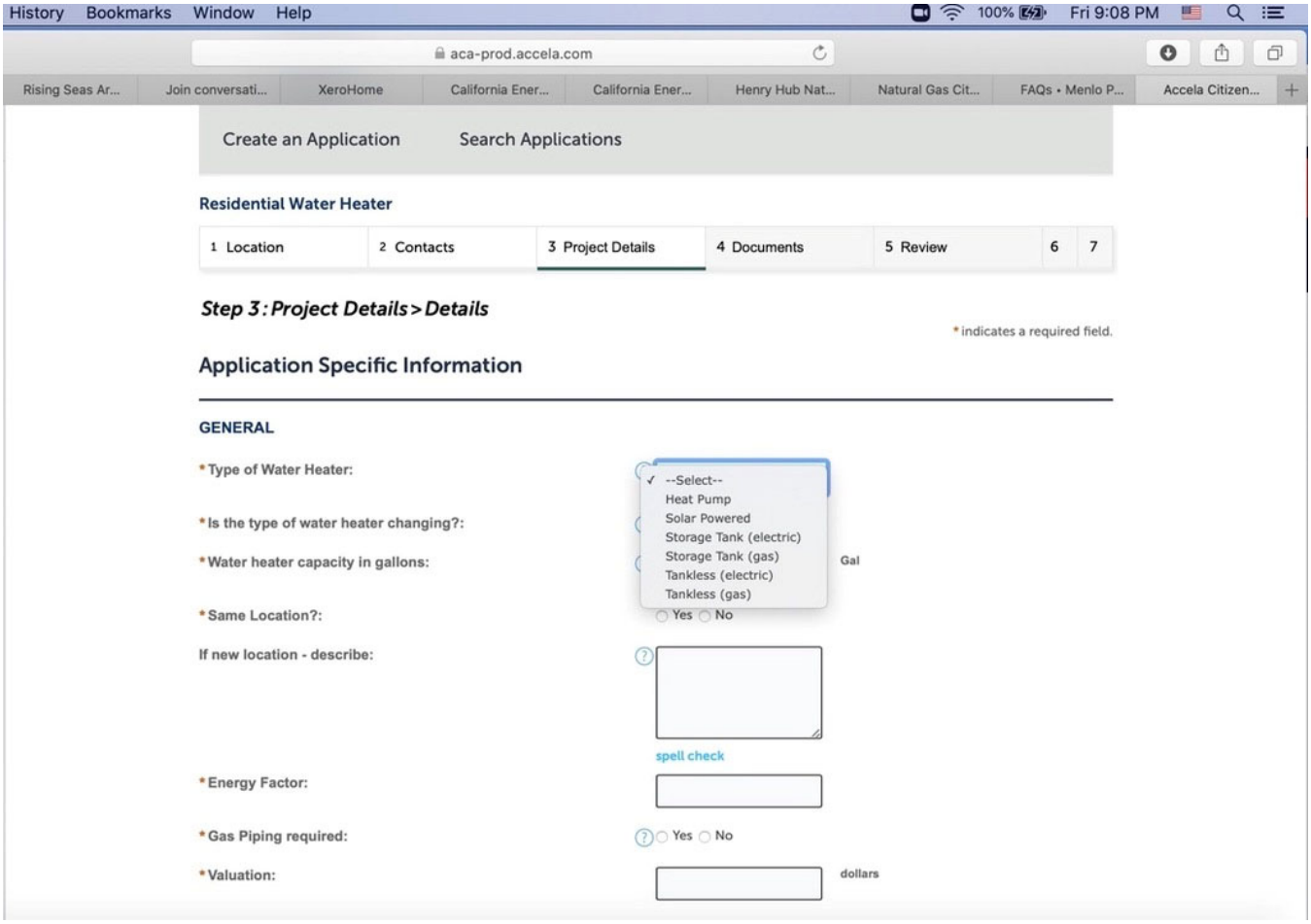
Could lead to a page with these choices:

- Are you prewiring now to make it easy for other electric devices to be included in future projects?

--Select all that apply—
- Pre-wiring now (preferred alternative)
- For Future Heat Pump Water Heater
- For Future Induction cooking

- For future electric clothes drying
- For Future Heat Pump heat and cooling
- For Future EV charging

The water heating page could be changed as follows:



The “Select” box in the center could be revamped to show this….

--Select—
Heat Pump (electric) (preferred alternative)
Solar Thermal Preheat
Storage Tank (electric resistance)
Tankless (electric resistance)
Storage Tank (gas fired)
Tankless (gas fired) (hardest to decarbonize)

Water heater storage capacity in gallons stored

Other climate impacting projects applicants may be pursuing can be recorded by a box like this one:

--Select—
- Cooking (electric) (preferred alternative)
- Cooking (gas)
- Clothes Dryer (electric) (preferred)
- Clothes Dryer (gas)
- Fireplace (electric) (preferred alternative)
- Fireplace (gas)
- Pool Heating (elec. heat pump) (preferred)
- Pool Heating (solar) (preferred)
- Pool Heating (gas)

Many of the projects on these pages are applicable to non-residential projects also.

Perhaps it makes sense to remove the word "Residential" from the items and have the items occur on both **residential page**s and **non-residential pages.**

EV Charging Questions

The subcommittee recommends adding "EV Chargers installed" to the list of CAP metrics tracked and present the figure to EQC quarterly broken out by building type (which is already captured in Accela):

- - Single-family
- - Multi-family
- - Commercial public charger or employee charger
- - Retail public charger or employee charger
- - Municipal public charger or employee charger
- - Other public charger or employee charger

The term "EV Chargers" may need to be clarified as EV Charger connector ports (or connection cords to vehicles) as some modern EV charging equipment can serve multiple EVs from multiple connection cords coming from a single "charger".

The subcommittee recommends that the full commission be provided with the automated reports from this tracking system on a monthly basis and that a regular agenda item be sharing the results with the commission.

Reporting on Vehicle Types Registered in Menlo Park

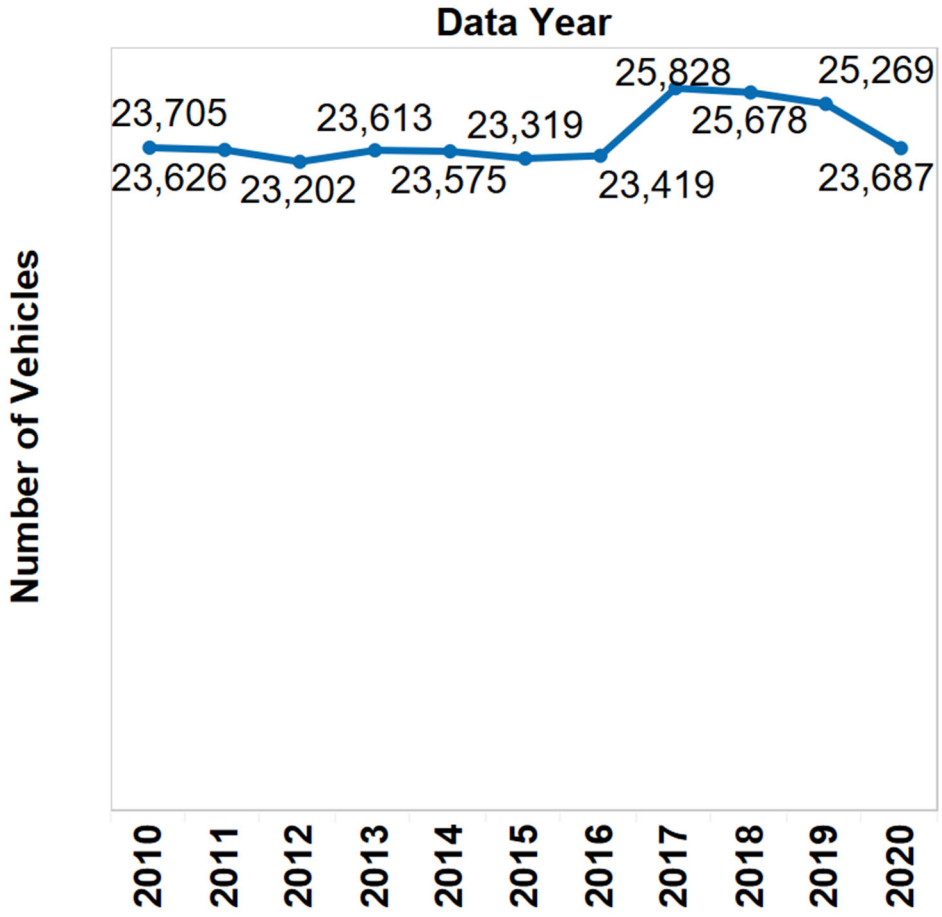
In addition to the stationary equipment data, the subcommittee suggests that staff use this CEC data presented here for tracking the total

number of vehicle registrations in Menlo Park for gasoline cars, hybrid cars, battery electric cars etc. : https://www.energy.ca.gov/data-reports/energy-insights/zero-emission-vehicle-and-charger-statistics This state provided detailed report makes it easily track new registrations of EVs and the percentage of total registered vehicle fleet that is EV. This report can be generated in a few minutes for the 94025 zip code and it is updated frequently with the recent update being April 30 2021.

For instance, it shows that gasoline-fueled car registrations are starting to decline in Menlo Park.

Gasoline make up **79.192%** of the total ZEV and Non-ZEV count

23,687 gasoline vehicles are on the road as of the end of **2020**



Below is an alternative showing a one-page version of a tracking form that collects information and shows builders what types of equipment is in line with the direction of Menlo Park's Climate Action Plan.

Menlo Park… Building with Climate in Mind

"Menlo Park has committed to eliminating its carbon emissions to avert climate change and the disastrous impacts climate change will have on our city. This goal is only possible if we eliminate the use of fossil fuels, including natural gas for appliances, all of which can be replaced with high-efficiency electric alternatives. Since the city gets 100% of its electricity from renewable sources, this eliminates carbon emissions from these appliances. Does your proposed project involve the addition or replacement of any of the following appliances, and if so, will the new appliances be electric or gas?"

Regarding your project applying for these permit(s), please circle the applicable answers in the *Existing Equipment column* and one of the *shaded columns*:

Energy Type used for each category in permit project	**Existing Equipment** *Circle* what's been in place	**Climate Prefers Electric!** *Circle* if you're installing Electric Device	*Circle* if **you're *retaining* unsustainable** old equipment	*Circle* if **you're *installing* unsustainable** new equipment
Heating	Elec Gas None	Heat Pump	Gas	Gas
Air Conditioning (A/C)	Heat Pump A/C None	2-way Heat Pump	One-way A/C	One-way A/C
Water Heating	Elec Gas None	Heat Pump	Gas	Gas
Cooking	Elec Gas None	Electric	Gas	Gas
Clothes drying	Elec Gas None	Electric	Gas	Gas

Pool heating or spa heating	Elec Gas None Elec Gas None	Electric or solar Electric or solar	Gas Gas	Gas Gas
Fireplace	Elec Gas Wood None	Electric	Gas	Gas
Electric Car Charging	110V 220V None	110V 220V		

Note: Installing gas-fired equipment (even installing one way air conditioners instead of heat pumps for cooling) may be uneconomic due to the possible limited future of methane in our area. New gas fired equipment may need to be removed before the end of its planned life. Retrofitting is proving to be more costly than going electric from the start with a planned project.

UPDATED MEMORANDUM

Date: 5/11/2021
Revised 9/15/2021
From: EQC CAP Subcommittee
(Commissioner Gaillard, Kabat, and Chair Payne)
To: EQC
Re: Post-Crisis Implementation of the 2020 Climate Action Plan

Attached please find the EQC CAP Subcommittee's recommendations for implementation of the city's 2020 Climate Action Plan, following resolution of the city's COVID-related budget crisis. This memo has been revised to provide better context for our recommendations and updated to reflect current events.

Special note: City staff resources have not been appropriated to review/analyze the proposed recommendations at this time. The city council would review the Environmental Quality Commission's recommendations and provide further direction on next steps to city staff.

Implementing the 2020 Climate Action Plan

Introduction

In July of last year, Menlo Park set a net-zero carbon emissions target of 2030 and initiated a few unique initiatives to inspire action among other cites in an effort to magnify our climate preservation efforts. Those initiatives were presented as part of Menlo Park's Climate Action Plan (CAP), and outlined the first six core actions the city would take on the road to reaching its net-zero carbon emissions target. **These actions were never intended to encompass all activity on the CAP, but were merely the first in a yearly set of actions intended to be taken up by the city in order to achieve the goals approved in the CAP.** In fact, the CAP authors acknowledged that the first six actions proposed would only achieve 40% of the required emissions reductions:

"In fact, the plan only addresses 40% of the sought-after reductions. This simplified 6-action plan is significantly scaled back from the more comprehensive plans envisioned before COVID-19 struck, a compromise the CAP subcommittee felt was warranted, given the City's projected budget short-falls" (Menlo Park Climate Action Plan Adopted by City Council July 2020, p. 7).

When the CAP was approved in July 2020, the City Council authorized budget and resources to work on three of the six CAP goals above. This included CAP #1 (existing building electrification), CAP #3 (electric vehicle charging infrastructure), and CAP #5 (eliminating fossil fuel use from city operations). On April 6 2021, the City Council further refined the scope of work for implementation in 2021. It is important to note that CAP implementation for 2022 and beyond will be discussed during the annual CAP updates provided to the City Council every summer. Progress on each CAP goal should be discussed during the annual CAP update and additionally through quarterly reports regarding the City Council's work plan. The current slate of CAP Measures for 2021 Includes the following:

1. Explore policy/program options to convert 95% of existing buildings to all-electric by 2030
2. Set citywide goal for increasing EVs and decreasing gasoline sales
3. Expand access to 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 adaptation plan to protect the community from sea level rise and flooding

If fully implemented, the six core measures above would collectively reduce almost 100,000 tons of GHG per year, equal to roughly 40% of the carbon reductions needed to meet. **However, there is much work to do to complete these measures, as well as defining the next slate of measures to address the remaining 60% of reductions necessary and agreed to.**

Because of the COVID-19 crisis, fast developing at that time, these first six actions were limited by uncertainty surrounding city resources. Now, one year later, we are thankful to be on our way out of, rather than into, the COVID-19 crisis and recommend that the city organize its CAP activities and resources in such a way to more fully address the entirely of the CAP None of this should come as a surprise as it was clearly laid out in the approved CAP. The first six actions were intended to be begun and completed within the first year and to be followed by another fuller set of recommendations in July 2021 as described here:

"The Environmental Quality Commission expects the significantly truncated six-action plan presented above to be completed within one year and strongly advises City Council to revisit the original, more comprehensive plan in July 2021, so that as the economy improves, those actions can be reincorporated into the plan" (Menlo Park Climate Action Plan Adopted by City Council July 2020, p. 7).

The full set of actions considered by the CAP Subcommittee prior to COVID were listed in Appendix B of the Council -approved 2020 CAP and are attached to the end of this memo for reference. This memo recommends 6 high-level strategic goals for organizing resources effectively to implement the full 2020 CAP and includes our view of staffing requirements critical to successful execution of the CAP. Unfortunately, while COVID raged across the globe and our attention was focused there, the problem of climate change has continued its steady march of increasing destruction, marked by ever greater wildfires, devastating drought, deadly hurricanes, polar vortex events and the documented acceleration in melting of earth's ice caps. The US recently reaffirmed its commitment to the Paris Climate Agreement, which sets a goal of keeping global temperatures under 2°C, preferably 1.5°C; **however, Menlo Park is currently not on track to lower emissions to hit either goal**. According to a study published in the respected scientific journal Nature, **we must retire all existing fossil fuel equipment at the end of its life in order to stay under 2°C**. If we wish to stay under the much preferred 1.5°C, **we must retire all existing fossil fuel equipment early, starting immediately.**[1]

In August, the Intergovernmental Panel on Climate Change (IPCC) issued a stunning report that is directly relevant to Menlo Park's CAP. It is the IPCC's 6th Assessment on climate change and is described by United Nations Secretary-General Antonio Guterres in the following way:

"Today's IPCC ... report is a code red for humanity. The alarm bells are deafening, and the evidence is irrefutable: greenhouse gas emissions from fossil fuel burning and deforestation are choking our planet and putting billions of people at immediate risk. Global heating is affecting every region on Earth, with many of the changes becoming irreversible."

Thankfully, responding appropriately to the climate crisis will not upend our lives like the COVID-19 crisis did, if we listen now to the clear messages our scientists are giving us about what is required. However, we can not afford to delay. Every moment of delay exponentially increases the sacrifices or acceleration that will have to be made tomorrow. Had decisive action on climate been taken in the 1990s, when the United Nations Framework Convention on Climate Change and the Kyoto Protocol were first established, even less disruption to our lives would have been required now. If we wait another decade to take decisive action, a far greater disruption to our lives will be required and far more climate damage and suffering will be locked in for our offspring, who are now too young to make the needed policy moves we adults face.

We have examined the landscape that Menlo Park finds itself in today, on its way out of the COVID-19 crisis, and attempted to determine the most impactful actions our city can take in 2021 to begin to confront the climate crisis. Our city faces unique threats from climate change – many of our residents and businesses are located mere feet above sea level – but also possesses unique strengths that will serve us well in this fight. The major challenge we face involves our energy sources, pivoting from dirty fossil fuels to clean electric devices that provide the same or better services. Thankfully, our electricity from Peninsula Clean Energy is now 100% carbon free, making our path forward clear: by electrifying our infrastructure currently powered by fossil fuels, we will be powering it with 100% clean energy. The bold leadership that Menlo Park showed on building electrification with the passage of the Reach Codes in 2019 has already rippled to dozens of additional cities and has even influenced the State of California to

[1] "Committed Emissions from Existing Energy Infrastructure Jeopardize 1.5°C Climate Target," Nature, July 2019, https://www.nature.com/articles/s41586-019-1364-3.

slightly accelerate the normalization of all-electric construction in the 2022 energy code. The sooner we act, the more impactful our leadership will be.

Menlo Park stands to benefit in significantly from early action to reduce fossil fuel use and address the climate crisis, not just setting a great example for our neighbors but directly prospering from the actions. The U.S. EPA asserts that **near-term action to mitigate GHG emissions can significantly reduce and avoid impacts** such as extreme weather, heat, wildfires, and draught. Reducing our use of fossil fuels will dramatically improve our air quality. For example, transitioning from gas use to all-electric homes and buildings in California is estimated to reduce unhealthy smog and soot pollution, preventing 1,500 premature deaths and saving $17 billion, according to a recent Harvard School of Public study.

Addressing Some Recent Misunderstandings about the CAP

Now that the city's target of net zero carbon by 2030 has been official for nearly a year, we have heard overwhelming support from community members, and polling data shows that the vast majority of Americans want to see more local climate action. However, several concerns have emerged from a few community members about the actions that will be required to meet this goal and these are important to address. Before describing the actions we propose for 2021, we will briefly respond to some of the concerns raised.

1. Is this too expensive?

The truth is that the cost of inaction on climate change is far higher than the cost of acting. Building a seawall 10 feet high to protect Menlo Park from just three feet of sea level rise is estimated to cost $100 million[2], and since a seawall two times higher requires four times as much material, twice as much land and extends much further up our once shallow creeks, the costs of a seawall to protect Menlo Park from the, at minimum, 20 feet of sea level rise it will experience at our current level of action will be far, far higher. Sea walls built this high also raise the risk of quake breach and catastrophe.

Next, we must compare the cost of combatting climate change to the costs we already face today combatting public health problems brought on by fossil fuel use. A recent study estimated that outdoor air pollution from natural gas appliances costs California $3.5 billion a year[3] (to say nothing of indoor air pollution, or outdoor pollution from gasoline-powered vehicles), while another study determined that use of a gas stove in a house is as detrimental to a child's health as secondhand tobacco smoke[4].

The best way to keep climate-related costs down isn't inaction, or delayed action, but rapid action. Every furnace installed this year leads to enormous costs borne by all of us today and in the future: higher seas and the higher seawalls we will be forced to build; more asthma in our children; more COPD and bronchitis in our citizens. Ultimately a gas furnace will also cost the owner dearly, when the device must be torn out early due to the accelerating climate crisis and the increasingly drastic actions society will take in response. By installing a heat pump today instead of a furnace, or a heat pump water heater instead of a gas water heater, an induction

[2] Public Draft Feasibility Report, SAFER Bay Project, Strategy to Advance Flood protection, Ecosystems and Recreation along San Francisco Bay, East Palo Alto and Menlo Park, October 2016, p. 37.

[3] UCLA Fielding School of Public Health, "Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California," April 2020, https://coeh.ph.ucla.edu/effects-residential-gas-appliances-indoor-and-outdoor-air-quality-and-public-health-california

[4] Kicking the Gas Habit: How Gas is Harming Our Health, https://www.climatecouncil.org.au/wp-content/uploads/2021/05/Kicking-the-Gas-Habit-How-Gas-is-Harming-our-Health.pdf.

stovetop instead of a gas range, an EV (or a bike) instead of a gasoline-powered car, we are paying a small premium today that will pay for itself many times over in avoided climate damage. Even oil companies tell us we should plan to spend $200 per ton to remove the carbon we emit using their products today, making that gas furnace look more like a frivolous and deadly extravagance than like a prudent choice, when all costs are considered. The upfront cost to replace natural gas equipment with electric heat pump equipment is higher. However, incentives can greatly reduce the cost making it cost effective when using high efficiency equipment. Incentives are currently offered in Menlo Park for high efficiency heat pumps for residential space and water heating.

The bill impact for heat pump water heating is nominal with monthly bill increases in the first year ($1) or in some cases no increases depending on a building's age. On average, there will monthly savings between $6 and $8 over the life of heat pump water heaters due to changes in future energy prices. The bill impact for space heating is mixed depending on type of equipment used and age of the building. For high efficiency space heating equipment there are nominal bill increases in the first year between $3 and $6 per month, but over the life of the equipment there will be monthly bill savings between $7 and $18.

For space and water heating, using heat pumps are cost effective when considering time of use energy pricing and the societal costs of climate change for all types of buildings and heat pump equipment regardless of energy efficiency rating.

When heat pumps are combined with solar on buildings, it can yield even greater savings and protect against bill cost increases.

2. Can't we just use "carrots" (incentives) instead of "sticks" (ordinances)?

Three major electric providers around us (Peninsula Clean Energy, Silicon Valley Clean Energy and Palo Alto Utilities have been offering large incentives for heat pump water heaters for about 6, 24 and 48 months respectively. They marketed incentives of $1,500 to $2,500 for heat pump water heater replacements of gas water heaters. They were able to attract voluntary participation equaling on average only 1% of the targeted water heaters, as estimated by the number of water heaters burning out during their program offering periods.

While it may feel tempting for Menlo Park leaders to follow in the footsteps of these energy providers, using all "carrots" and no "sticks", the collective experience of these neighboring agencies calls into question whether incentives are a significant motivator (compared to inertia) for those in our relatively affluent communities. It is possible that we simply cannot provide big enough carrots to motivate the changes we need to make on the timescale that is required. Ordinances prohibiting new fossil fuel devices are necessary if we want to meet the Paris Agreement commitments. While a voluntary incentive program might slowly transform the market over a 15-20 year timeframe, the climate crisis requires that we make this transition in a much shorter timeframe to keep global temperatures below 2°C (Paris limit, with a goal of 1.5°C). Incentives may play a role in some programs, but we urge decision-makers to focus our limited resources on aiding disadvantaged groups to help them transition to clean, safe appliances, and not squander precious resources on those who can already afford it.

3. Is the public ready?

The Paris Climate Agreement is supported by nearly 70% of American voters, and likely an even higher percentage of Menlo Park residents. The policies we are suggesting are merely

those necessary to fulfill the Paris Climate Agreement's goal of limiting global warming to 2°C.[5] It is true that many residents may not realize the scale of action needed to meet that goal. The job of leaders is to lead the public, explaining clearly what is required and removing as many barriers as possible. As was done with COVID, leaders must listen to scientists and technical experts and translate that advice into policy, even when the public is not yet fully aware or informed of what policies are needed to avert disaster.

4. Should the city government stick to repairing potholes?

While several levels of government are involved in making sure that appliances are safe and efficient, the only entity that directly controls, through permits, what type of heating appliances are installed in your house is the city – not the county, not the state, not the federal government. The city has the means and the responsibility to only allow appliances in buildings that are safe, not only for the occupants, but for members of the community at large, and for the community's continued survival.

5. Can low-income families afford this?

Mirroring our response to "it's too expensive" above, the members of our community who struggle the most economically can even less afford inaction on climate change. Low-income residents disproportionately and unjustly suffer the greatest costs from climate change – both to their health and from climate disasters such as sea level rise – and they have the fewest resources to handle these crises. Recognizing that these residents also have the fewest resources to spend updating their appliances, we must design our policies with this in mind, making the best use of limited city resources to assist those most in need with making these transitions necessary for the survival of our city.

While it is true that some members of our community have raised concerns about climate action, we also see that there is broad agreement on several core issues:

- the need to take action on climate change
- the need to listen to scientists
- support for the goals of the Paris Climate Agreement
- and the responsibility of the city to protect its most vulnerable and disadvantaged residents.

After studying the science, assessing the economic feasibility of various options and weighing community readiness, we present what we believe is the most effective way for Menlo Park to meet the goals set forth in the Paris Climate Agreement, aimed at keeping global warming under 2°C, and in so doing, protecting our most vulnerable and disadvantaged residents.

This way forward started years ago, with the establishment of Peninsula Clean Energy (PCE) and the passage of the Reach Codes being two major milestones, and the city's 2020 Climate Action Plan building on those with its goal of achieving zero carbon by 2030. We now turn to the actions we believe would be most effective at propelling the city forward to a cleaner, safer future for all residents.

[5] "Committed Emissions from Existing Energy Infrastructure Jeopardize 1.5°C Climate Target," Nature, July 2019, https://www.nature.com/articles/s41586-019-1364-3.

High-Level CAP Goals & Proposed 2021 Priorities

Following are six high-level CAP goals that, if all accomplished, would achieve Menlo Park's established 2030 target of **a 90% reduction in greenhouse gas (GHG) emissions and sequestration of the remaining 10%**, thus resulting in net-zero emissions by 2030. It is important to note that ***the initial six core measures*** of the CAP lay a strong foundation for achieving the CAP target, but much more needs to be done, not just in implementing the six core measures – a significant undertaking – but also in evaluating additional measures to continue progress.

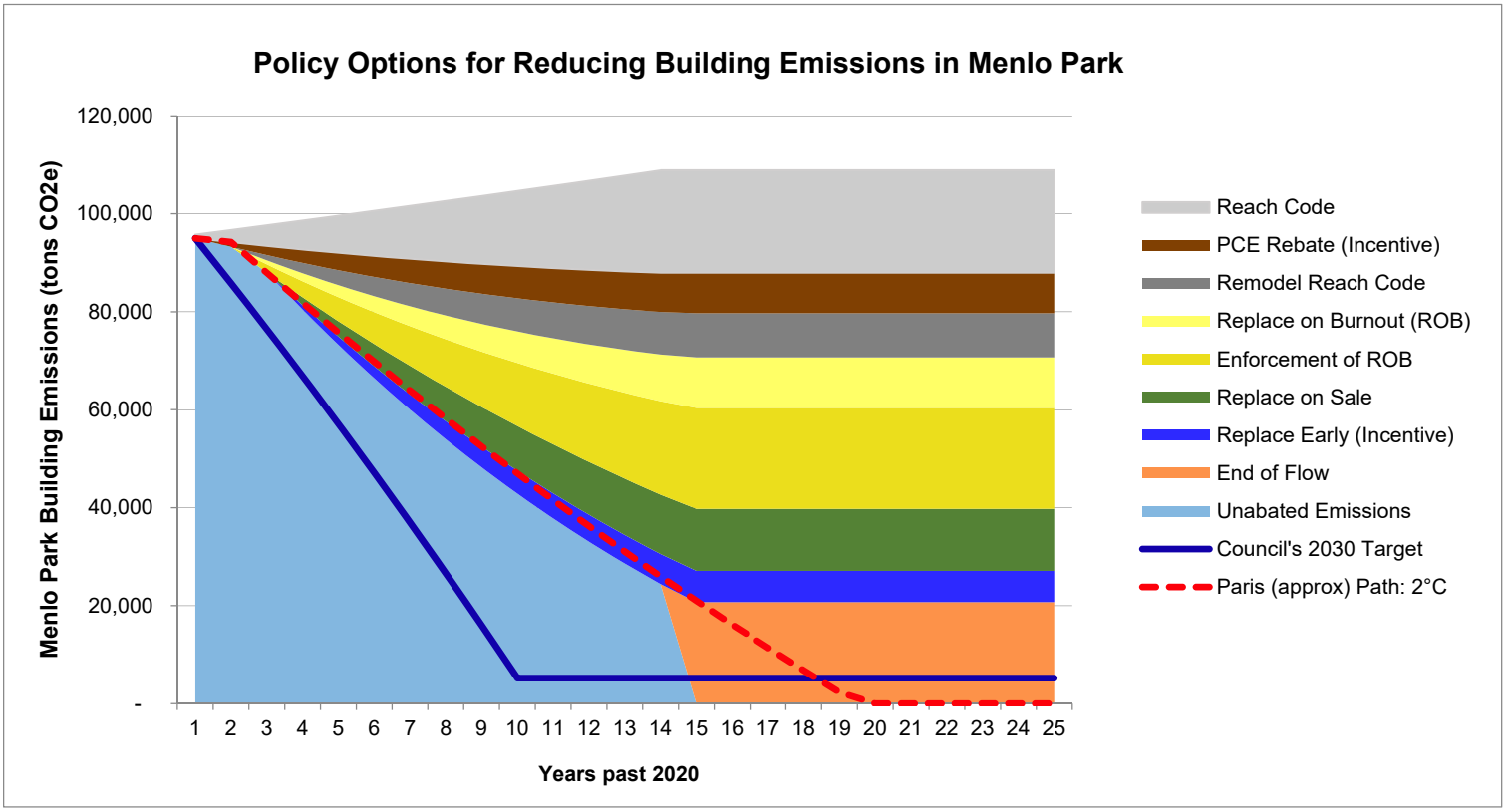
In order to accomplish an overall 90% reduction, we could achieve a 90% reduction in each of the sectors of emissions the city produces – the goals have been written in that format. Conversely, if a heavier lift is accomplished in one sector, a proportionately smaller lift is needed in others. Included underneath each goal are the proposed priorities for 2021 that would work toward that goal, along with graphs showing the potential impact of various policy options for the two biggest emissions categories: buildings and vehicles.

Goal #1: Reduce emissions from buildings by 90% by 2030

Note: this goal has overlap with two existing 2020 CAP goals – "Explore policy/program options to convert 95% of existing buildings to all-electric by 2030" and "Eliminate the use of fossil fuels from municipal operations", as well as the Reach Codes passed in 2020. We recommend continuing with these core measures, "CAP #1" and "CAP #5", as well as continuing implementation of the Reach Code. We recommend enhancing these current commitments, through the following improvements that will lead to greater efficacy and success of the measures.

Proposed 2021 Priorities:

- Conduct community outreach for CAP #1 policies
- Draft policies, i.e. Burnout Ordinance, and related code language
- Develop plan for enforcing CAP #1 policies
- Simplify permit application and process for electrification
- Create and begin implementing electrification plan for all municipal buildings



The EQC's CAP subcommittee quantified the impact of various policy and program options in the graph. The graph shows that a combination of decisive policies will be required to meet the CAP and Paris targets. The chart also shows how a few years of delayed action can make the current targets exceedingly difficult to achieve.

Goal #2: Reduce emissions from vehicles by 90% by 2030

Note: this goal has overlap with four existing 2020 CAP goals – "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", "Expand access to electric vehicle (EV) charging for multifamily and commercial properties", "Reduce vehicle miles traveled (VMT) by 25% or an amount recommended by the Complete Streets Commission", and "Eliminate the use of fossil fuels from municipal operations". The city has two main levers for achieving this goal: electrifying transportation and reducing miles traveled, with the second lever including many possible options: bicycle/pedestrian infrastructure, public transportation, increasing housing near public transit and amenities, increasing amenities near housing, etc. We considered splitting this goal into separate goals, electrification and VMT reduction, but having them unified in a single goal provides opportunities to see how these strategies interact with one another.

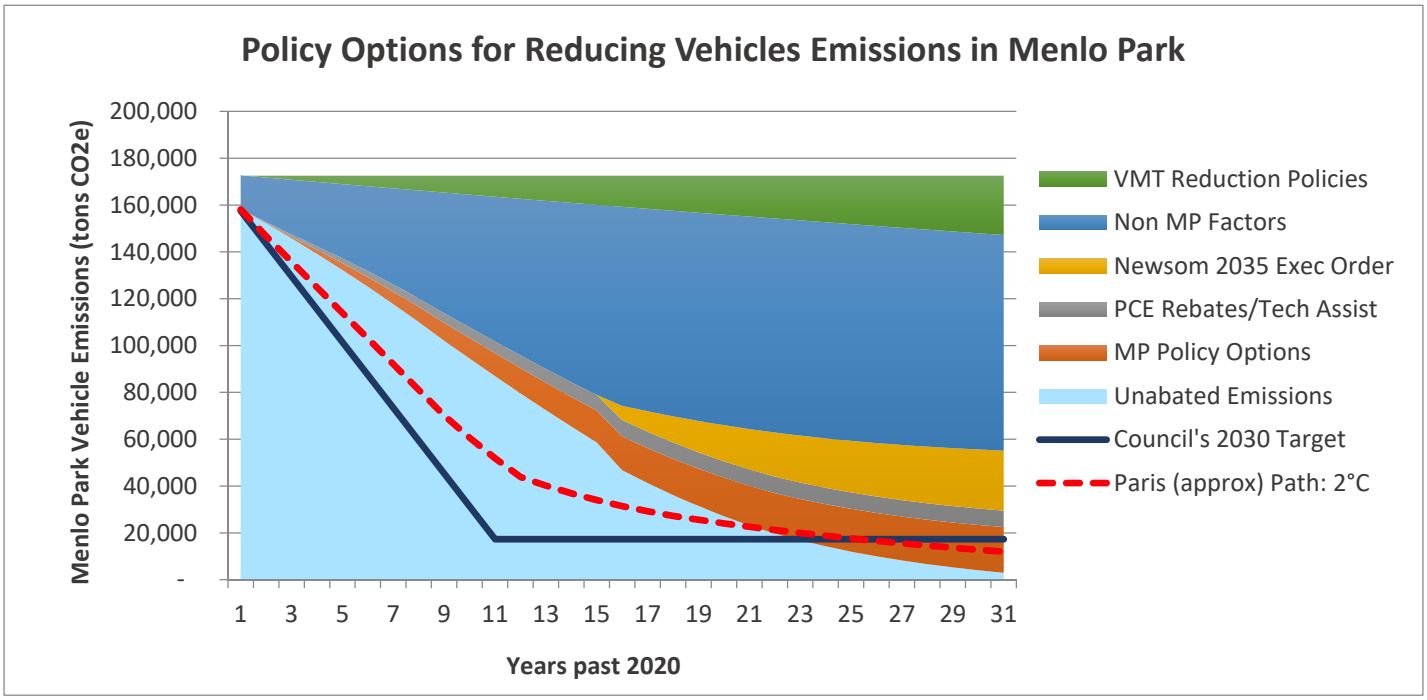
We recommend continuing with these core measures, "CAP #2," "CAP #3" and "CAP #4", and enhancing them through the following improvements that will lead to greater efficacy and success of the measures.

Proposed 2021 Priorities:

- Explore and implement policies/programs to increase employer-based EV charging
- Explore and implement policies/programs to increase EV charging at multi-family buildings

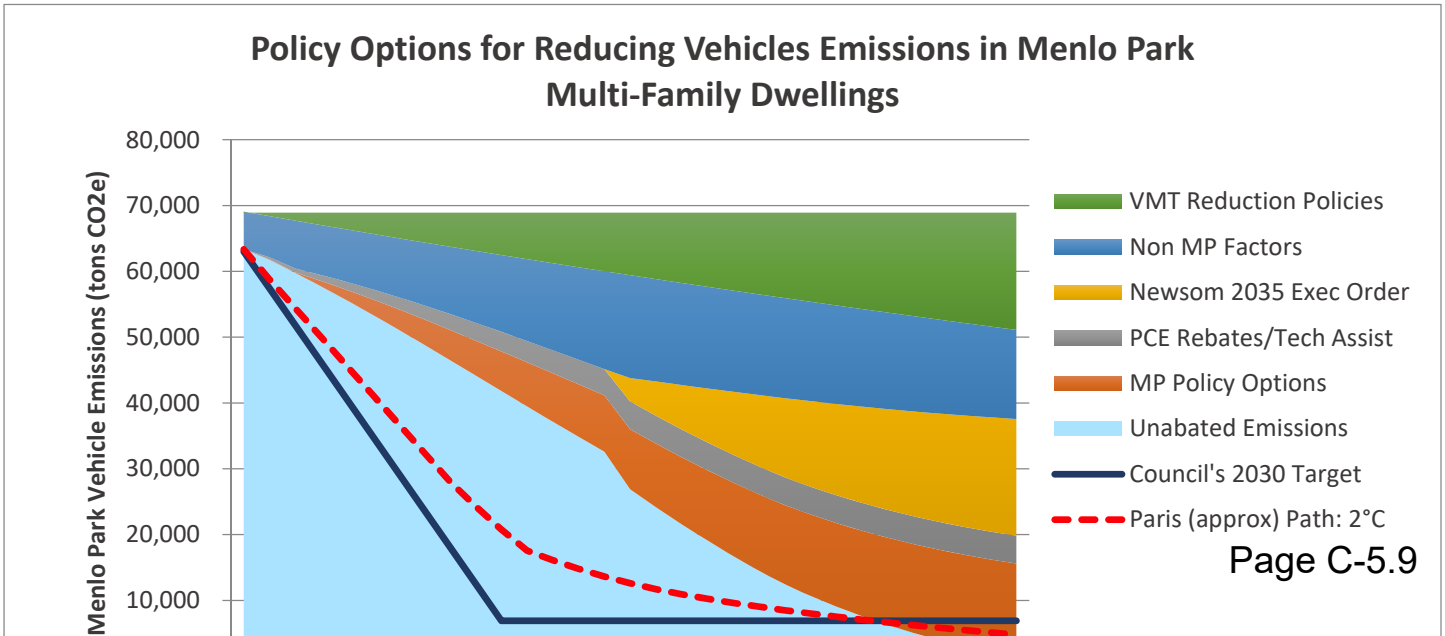
- Explore and implement policies to both concentrate, and increase the density of, development near transit in order to reduce VMT
- Explore other policies/programs to reduce gasoline sales and usage
- Implement the current municipal fleet vehicle electrification plan that was adopted by resolution in April 2020

Graph of impact of proposed 2021 priorities:



The graph above shows that market developments and other factors (depicted in dark blue above and not specific to Menlo Park), are projected to drive the bulk of vehicle conversions. However, the city does have an opportunity to adopt policies that support accelerated EV adoption and thereby increase our chances of achieving the Paris goals.

One notable finding was that city policies directed at vehicles owners (in orange) had a much higher impact among residents living in multi-family housing than among those living in single-family dwellings. In other words, the city can make a bigger impact on vehicle emissions by focusing on policies that support multi-family dwelling residents.



Goal #3: Reduce emissions from waste by 90% by 2030

Note: this goal has overlap with the community zero waste plan passed in 2017. This category accounts for roughly 3% of the total GHG inventory in Menlo Park. Therefore, staff and city resources should be allocated proportionally, recognizing the minor role that waste plays in achieving carbon neutrality.

Proposed 2021 Priorities:

- Continue implementation of the city's adopted Zero Waste Plan

Goal #4: Implement programs to sequester remaining emissions in 2030, equivalent to 10% of 2005 emissions Note: this goal has potential overlap with goal 1, if emissions associated with construction are included in that goal, and goal 6, as building materials are a potential opportunity for negative emissions.

Proposed 2021 Priorities:

- Explore and implement policies/programs to sequester 35,000 tons/year of CO2e by 2030

Goal #5: Develop climate adaptation plans to protect portions of Menlo Park that are threatened by climate change

Note: this goal has overlap with one existing 2020 CAP goal – "Develop a climate adaption plan to protect the community from sea level rise and flooding". In addition to sea level rise, the city should also explore adaptations to defend against increased fire risk, drought and extreme heat We recommend continuing with the core measure, "CAP #6," and enhancing it through the following improvements that will lead to greater efficacy and success of the measures. .

Proposed 2021 Priorities:

- Develop plan for protecting community from sea level rise
- Develop plan for protecting community from drought, extreme heat and wildfires
- Develop plan for adapting urban forest to changing climate
- Propose a risk-limiting building moratorium or other policy to indemnify City against increased climate related damages on or near future developments on flood-prone property near the Bay, including release of any obligation to maintain critical infrastructure: roads, sewers, etc. for future developed at-risk properties.

Goal #6: Reduce emissions from construction 90% by 2030

Note: this goal addresses industrial emissions from construction materials such as concrete and steel, which are significant and not currently included in Menlo Park's GHG inventory because they occur outside of the city's boundaries

Proposed 2021 Priorities:

- Explore policies/programs requiring low embodied carbon building materials for new construction and remodels

Proposed Staffing Requirements to Achieve CAP Goals

Menlo Park's ability to achieve its climate goals will be determined in large measure by the creativity, skill and technical expertise of staff working on the problem. Climate change is somewhat unique among issues that cities typically face in its breadth, technical complexity, and urgency, requiring high levels of cross-functional collaboration across departments and even with other agencies. Fortunately Menlo Park is not alone in setting bold goals for climate action. Neighboring cities, Palo Alto and Mountain View, have done the same and may already be a few steps ahead of us in staffing these effort to match the scope and scale of the problem. As Menlo Park considers its staffing options, there may be a benefit in looking to these neighboring cities for lessons learned and guidance on how to staff appropriately.

Given both the climate-related technical expertise and the professional resource planning skills maintained by members of the EQC's CAP Subcommittee, it is possible that the subcommittee is uniquely positioned to identify staffing challenges and opportunities that could either threaten or enhance successful implementation of the city's CAP. In an effort to transfer as much knowledge as possible to key decision makers, the subcommittee has attempted to document its knowledge about key staffing requirements in the following staffing matrix, entitled "Staffing Requirements to Achieve CAP Goals." This is intended to assist the critical conversation between staff, community and council as to the best response to the unfolding climate emergency.

Staffing Requirements to Achieve CAP Goals

CAP Goal	Actions	#	Staff Skills Required	Skills Required: Policy	Legal	Engineering	Building Science	Building Codes	Energy Analytics	Urban Planning/Aboriculture	Finance	Economics	Climate Damage Analysis	Public Relations	Marketing	Stakeholder Engagement	Organizational Design	Process Improvement	Information Technology	City Department: Dept	Sustainability	Legal	Public Works	Planning	Public Engagement	Information Technology	Skills Gaps	2020-21	2021-22	Beyond 2022	CAP Goal #
#1 Reduce emissions from buildings by 90% by 2030	Research and analyze CAP #1 policy options	1	Policy, engineering, building science, quantitative analysis, finance	x		x	x		x		x									Sustainability	x						Engineering, building science, quantitative analysis, finance	x			1
	Analyze cost effectiveness of CAP #1 policies	2	Finance, economics, energy analytics, building science, climate damage analysis	x		x	x		x		x	x	x			x				Sustainability	x						Finance, economics, energy analytics, building science, climate damage analysis	x			1
	Analyze legal implications of policies	3	Legal, policy	x	x			x												Legal		x						x			1
	Conduct community outreach for CAP #1 policies	4	Public relations, marketing, market analysis, stakeholder engagement, engineering, finance			x					x			x	x	x				Public Engagement, Sustainability	x				x		Engineering, finance, market analysis		x		1
	Draft policies and related code language	5	Legal, policy, code enforcement, engineering, finance	x	x	x		x			x									Legal, Planning (Building Dept), Sustainability	x	x		x					x		1
	Develop plan for enforcing CAP #1 policies	6	Organizational design, change management, building codes expertise					x									x		x	Planning (Building Dept), Sustainability	x			x			Organizational design, change management		x		1
	Simplify permit application and process for electrification	7	Process improvement, change management, information technology (Accela system design), building codes expertise					x									x	x	x	Planning (Building Dept), Information Technology, Sustainability	x			x		x	Process improvement, change management		x		1
	Create and implement electrification plan for all municipal buildings	8	Engineering, finance, building science, energy analytics			x	x	x	x		x		x	x						Public Works, Sustainability	x		x				Energy analytics, climate damage analysis, economics		x		1
#2 Reduce emissions from vehicles by 90% by 2030	Explore and implement policies/programs to increase employer-based EV charging	9	Policy, legal, engineering, urban planning, energy analytics, finance, stakeholder engagement	x	x	x			x	x	x					x				Sustainability, Planning, Legal, Public Engagement	x	x		x	x		Engineering, energy analytics, finance		x		2
	Explore and implement policies/programs to increase EV charging at multi-family buildings	10	Policy, legal, engineering, urban planing, energy analytics, finance, stakeholder engagement	x	x	x			x	x	x					x				Sustainability, Planning, Legal, Public Engagement	x	x		x	x		Engineering, eergy analytics, finance		x		2
	Develop clear network of protected pedestrian/bike paths throughout town in order to reduce VMT	11	Engineering, urban planning, stakeholder engagement			x				x						x				Sustainability, Planning (Transportation), Public Works, Public Engagement	x		x	x	x		Multi-modal transportation engineer			x	2
	Explore and implement policies to both concentrate, and increase the density of, development near transit in order to reduce VMT	12	Engineering, urban planning, stakeholder engagement		x	x				x						x				Sustainability, Legal, Planning (Transportation), Public Engagement	x	x		x	x				x		2

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	Explore other policies/programs to reduce gasoline sales and usage	13	Policy, legal, engineering, finance, stakeholder engagement	x	x	x					x					x				Sustainability, Planning, Legal, Public Engagement	x	x		x	x		Engineering, Finance		x		2
	Explore policies/programs to convert commercial fleet vehicles to EV	14	Policy, legal, engineering, energy analytics, finance, stakeholder engagement	x	x	x			x		x					x				Sustainability, Planning (Transportation), Public Engagement	x			x	x		Engineering, energy analytics, finance			x	2
	Implement municipal fleet vehicle electrification plan	15	Engineering, energy analytics, finance			x			x		x									Public Works, Sustainability, Planning (Transportation)	x		x	x			Engineering, energy analytics, finance		x		2
#3 Reduce emissions from waste by 90% by 2030	Explore policies and programs to expand recycling and composting services to multi-family housing dwellers	16	Policy, legal, engineering, stakeholder engagement	x	x	x										x				Sustainability, Legal, Stakeholder Engagement	x	x								x	3
	Identify and tightly manage methane emissions from all local sources, inc. landfills, waste water treatment facility, etc.	17	Engineering, climate damage analysis, finance			x					x		x							Sustainability, Public Works	x		x				Engineering, finance, climate damage analysis			x	3
	Explore policies/programs to promote a circular economy	18	Policy, legal, engineering, finance, stakeholder engagement	x	x	x					x					x				Sustainability, Legal, Public Engagement	x	x			x		Engineering, Finance			x	3
	Explore policies/programs to reduce plastic waste	19	Policy, legal, stakeholder engagement	x	x						x					x				Sustainability, Legal, Public Engagement	x	x			x		Finance			x	3
	Adopt Foodware Ordinance to reduce/eliminate plastics and singl use disposable foodware	20	Policy, legal, stakeholder engagement	x	x						x					x				Sustainability, Legal, Public Engagement	x	x			x		Finance			x	3
	Update waste requirements in Construction and Demolition Ordinance	21	Policy, legal, stakeholder engagement	x	x						x					x				Sustainability, Legal, Public Engagement	x	x			x		Finance			x	3
#4 Implement programs to sequester 10% of emissions by 2030	Explore and implement policies/programs to sequester 35,000 tons/year of CO2e by 2030	22	Policy, engineering, climate damage analysis, finance	x		x					x		x							Sustainability, Public Works, Public Engagement	x		x		x		Engineering, finance, climate damage analysis		x		4
	Explore partnership w/ local land conservation trusts (e.g. POST) to sequester carbon on local lands with afforestation, regenerative agriculture	23	Policy, engineering, climate damage analysis, finance	x		x					x		x							Sustainability, Public Works, Public Engagement	x		x		x		Engineering, finance, climate damage analysis			x	4

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	Explore and implement policies/programs to sequester carbon in building materials, such as concrete	24	Policy, legal, engineering, building science, building codes, climate damage analysis, finance, stakeholder engagement, public relations, marketing, information technology	x	x	x		x			x			x	x	x			x	Sustainability, Legal, Planning, Public Engagement, Information Technology	x	x		x	x	x	Engineering, Finance			x	4
#5 Develop adaptation plans to protect people and property threatened by climate collapse	Develop plan for protecting community from sea level rise	25	Policy, legal, engineering, building codes, urban planning, climate damage analysis, stakeholder engagement	x	x	x		x		x			x			x				Sustainability, Legal, Planning Public Works, Public Engagement	x	x	x	x	x		Engineering, climate damage analysis		x		5
	Develop plan for protecting community from drought, extreme heat and wildfires	26	Policy, legal, engineering, building codes, urban planning, climate damage analysis, stakeholder engagement	x	x	x		x		x			x			x				Sustainability, Legal, Planning Public Works, Public Engagement	x	x	x	x	x		Engineering, climate damage analysis		x		5
	Develop plan for adapting urban forest to changing climate	27	Aboriculture, urban planning, climate damage analysis, hydrology, stakeholder engagement						x				x			x				Public Works, Public Engagement			x	x	x		Climate damage analysis		x		5
	Propose building moratorium or other policy to indemnify City against climate related damages on or near flood-prone property being developed on the Bay, inc. release of any obligation to maintain critical infrastructure: roads, sewers, etc.	28	Climate damage analysis, legal, engineering, urban planning, stakeholder engagement, policy	x	x	x			x	x		x			x					Planning, Legal, Public Engagement, Public Works, Finance		x	x	x	x		Engineering, climate damage analysis		x		5
#6 Substantially reduce emissions from construction by 2030	Explore policies/programs requiring low embodied carbon building materials for new construction and remodels	29	Policy, legal, engineering, building science, building codes, energy analytics, finance, climate damage analysis, marketing, stakeholder engagement, process improvement	x	x	x	x	x	x		x		x		x	x			x	Sustainability, Legal, Planning, Public Engagement, Information Technology	x	x	x	x	x	x	Engineering, building science, energy analytics, finance, climate damage analysis		x		6
	Explore policies/programs requiring zero emissions construction equipment for new construction and remodels	30	Policy, legal, engineering, building codes, finance, climate damage analysis, marketing, stakeholder engagement	x	x	x	x				x		x		x	x				Sustainability, Legal, Planning, Public Engagement	x	x	x	x	x		Engineering, building science, finance, climate damage analysis			x	6
			Totals	21	18	23	5	9	8	8	21	1	11	3	4	20	2	1	4		27	17	12	17	20	3		3	16	11	