2030 CLIMATE ACTION PLAN

Prepared by the Environmental Quality Commission
Adopted by City Council July 2020 (Resolution No.6575)

A 2030 PLAN TO ELIMINATE CARBON EMISSIONS & PROTECT OUR COMMUNITY FROM CLIMATE CHANGE

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INTRODUCTION

Menlo Park is uniquely threatened by climate change and uniquely positioned to tackle it.

Menlo Park's location on the shore of San Francisco Bay places approximately $1.3 billion[1] of property in our Belle Haven neighborhood at risk of flooding from climate change by as early as 2070.[2] While it is impossible for Menlo Park alone to halt the global sea level rise that threatens our city, bold climate leadership on our part is perhaps our only hope of keeping sea level below the height of an "affordable" sea wall. The San Francisquito Creek Joint Powers Authority estimated in a 2016 feasibility study that a combination of levees and sea walls built along the shoreline of Menlo Park and East Palo Alto to address just three feet of sea level rise would cost approximately $100 million.[3]

If we do not provide visible and inspiring leadership on climate and global greenhouse gas emissions continue rising at their current rate, no sea wall or levee will save the portion of our city between Route 101 and the Bay. That land, which includes a disproportionate percentage of our city's low income residents and residents of color, will be inundated and residents and businesses will have to permanently relocate. On the other hand, if we take a leadership position and our bold climate action inspires rapid and far reaching climate action by other cities, we may be able to save our Belle Haven neighborhood with a combination of sea walls and levees.

The good news is that if there is any city well positioned to lead on climate action, it is Menlo Park. Located in Silicon Valley, our residents and leaders embrace innovation. Our county (San Mateo) is one of the wealthiest in the country,[4]

Source: http://data.pointblue.org/apps/ocof/cms/index.php?page=flood-map

YEAR: 2070-2100

the Bay is projected to rise 3.3 feet

which means we have the financial resources to tackle the issue of climate change head on. Analysis conducted by members of the Environmental Quality Commission's Climate Action Plan subcommittee shows that every dollar spent now by the City on bold climate action can be expected to save City residents $100 in future adaptation costs[5] addressing sea level rise alone, not to mention the healthcare costs associated with treating ailments caused by air pollution (see "Natural Gas Phase Out" section below).

Finally, our City Council and staff have already demonstrated a capacity for leadership by passing an innovative all-electric Reach Code that virtually eliminates natural gas from new buildings. At last count, 15 other California cities had adopted a "Menlo Park style" all electric Reach Code for new buildings, proving that courageous action on climate does in fact inspire others to follow.

[1] According to County of San Mateo Sea Level Rise Vulnerability Assessment p. 139, sea level rise of 3.3 feet will inundate Menlo Park real estate valued at $1.288 billion and a rise of 6.6 feet will inundate $1.621 billion in real estate.

[2] Griggs, G, Árvai, J, Cayan, D, DeConto, R, Fox, J, Fricker, HA, Kopp, RE, Tebaldi, C, Whiteman, EA (California Ocean Protection Council Science Advisory Team Working Group), Rising Seas in California: An Update on Sea-Level Rise Science, California Ocean Science Trust, April 2017. Ranges shown are from the median (50th percentile) to the extreme (99.9th percentile) range of the projections.

[3] 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.

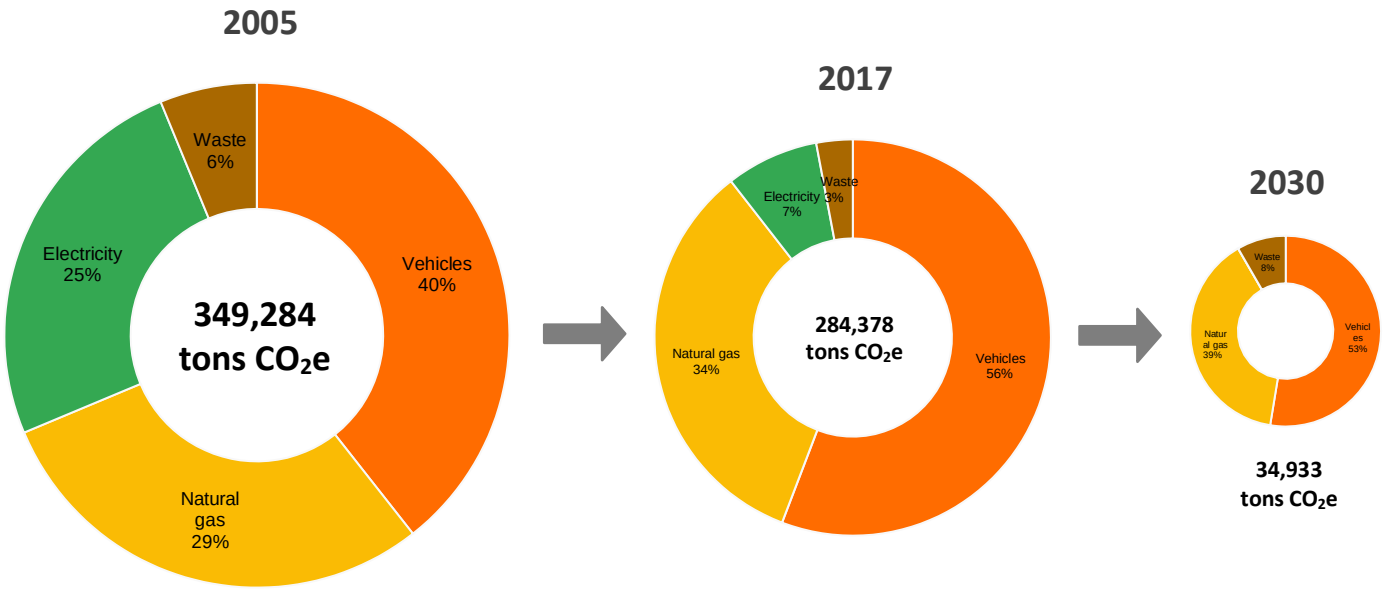
[4] https://en.m.wikipedia.org/wiki/List_of_highest-income_counties_in_the_United_States

[5] Supporting analysis available in PDF format in Appendix C and in Excel format upon request

ZERO CARBON BY 2030

In order to address the significant threat to Menlo Park posed by climate change, the City Council adopted a bold climate goal of zero carbon by 2030. This will be achieved through a 90% reduction in carbon dioxide equivalent emissions (CO_2e) from 2005 levels, and elimination of the remaining 10% of CO_2e through direct carbon removal measures.

An inventory of greenhouse gas emissions conducted in December 2019 revealed that emissions in Menlo Park fell from 349,284 tons in 2005 to 284,378 tons of CO_2e in 2017, a reduction of 19%. The aim of this plan will be to reduce community-wide emissions by another 71% for a total reduction of 90% from 2005 emissions, leaving just 34,933 tons of CO_2e per year by 2030.



Menlo Park Community Greenhouse Gas Emissions (metric tons of CO_2e)			
	2005	**2017**	**2030**
Vehicles	137,628	158,686	18,373
Natural gas	102,295	95,742	13,656
Electricity	87,617	21,528	-
Waste	21,745	8,424	2,903
Total Emissions	349,285	284,380	34,933

OPTIONS FOR ACTION

In order to achieve a goal of "Zero emissions by 2030," Menlo Park must begin taking bold action immediately. Fortunately, the City has already decarbonized its electricity supply by joining with other cities in the County to create a joint powers authority (Peninsula Clean Energy) that sources power mainly from renewables and hydropower. This creates a clean energy stepping stone from which to decarbonize the rest of the City's economy.

Our next step is to decarbonize all of our buildings and transportation. In an ideal world with more time, the City's climate goals could be achieved simply by unleashing the power of free enterprise and relying on markets and educated consumers to transform our fossil-fuel dependent economy to one that stops emitting greenhouse gases in time to avert catastrophic climate change. Members of the Climate Action Plan (CAP) subcommittee of the Environmental Quality Commission (EQC), who prepared this plan, certainly would prefer this type of approach, as it limits the role of government and would reduce the likely opposition from some interest groups. However, no matter how carefully the subcommittee considered various incentive- and education-based laissez-faire approaches, none of them appears able to solve the climate problem in time to avert catastrophic change to our daily lives. In fact, the less action the City takes now, the costlier the government intervention will be later to deal with the resulting climate disasters.

The key reasons that market approaches alone cannot solve climate change are three-fold:

1) markets are currently distorted by the absence of accurate pricing for key externalities, such as the right to dump harmful greenhouse gas emissions into the atmosphere, which today is virtually free to any person or business who wishes to do it, leaving the rest of us bear the ever increasing cost,

2) powerful political interest groups such as the fossil fuel industry have successfully spread enough disinformation about climate change that Americans significantly underestimate the problem and therefore underestimate the actions that must be taken to address it, and

3) polluting devices last far too long once installed and we simply do not have enough time for the typical market signals to trickle down to those who determine product offerings and today offer environmentally obsolete products to customers.

Just as the US government stepped in forcefully after the bombing of Pearl Harbor to require that much of America's free market economy be transformed to support the war effort, so too must the government now step in forcefully and confidently to lead the American public away from the brink of climate disaster.

Thankfully, the actions required of every American citizen to forcefully combat climate change are much less onerous than the food rations or military conscription imposed on World War II-era Americans. We are fortunate that a robust private sector has already provided every technological solution and innovation necessary to almost completely retire fossil fuels as an energy source in America today.

PERSONAL ACTION

Below is a list of the personal actions that, if every citizen took them, would halt global warming in its tracks:

- Retire all gas vehicles immediately and replace them with electric vehicles, bikes, transit or another form of non-fossil transport
- Replace every gas appliance in a home (including furnace, water heater and stove) with an efficient electric version
- Power every home and car with 100% renewable electricity, either by installing solar panels or purchasing renewable energy from one's utility
- Consider the greenhouse gas emissions associated with every purchase decision and choose "low-carbon" products and services whenever possible

- Reduce weekly consumption of meat and animal products, a move which has significant ancillary health benefits.

GOVERNMENT ACTION

At the local government level, climate action must focus on eliminating the use of two categories of fossil fuels: 1) gasoline and diesel fuel in vehicles, and 2) natural gas in home appliances. Given the 25-year expected life of a typical gas furnace, it is critical for the City to begin prohibiting the installation of new replacement gas furnaces and water heaters as soon as possible.

In considering the wide-reaching actions and change required to meet the City's proposed climate goals, researchers reviewed dozens of approaches employed by cities all over the world, including:

- A "5-minute city" approach to zoning implemented in Copenhagen, Denmark that drastically reduced vehicle miles traveled (VMT) and made the city more walkable
- A carbon fee on buildings recently implemented in New York City
- An announced plan to end the flow of natural gas in the City of Arcata, California and now being considered by Palo Alto.

After months of weighing each of the dozens of approaches, the CAP subcommittee identified three basic options for action: 1) a Bold Plan with 22 actions to be implemented over one year, 2) a Moderate Plan with 76 actions to be implemented over three years and 3) a Go Slow Plan with no specific actions other than to follow evolving state rules.

PLAN CHANGES DUE TO COVID-19 PANDEMIC

Shortly after the CAP subcommittee fleshed out the three different approaches to climate action described above, the world was gripped by the global pandemic of COVID-19. The pandemic has significantly affected the context in which this plan is presented, namely:

- The time and attention of City Council and staff has understandably shifted almost entirely to managing the health risks and economic consequences of the pandemic
- Almost overnight, the country has gone from enjoying robust economic growth to experiencing one of the starkest economic recessions in US history
- Due to the economic recession, the City's budget has shrunk dramatically, with a 2020-21 shortfall of $12.7 million
- Layoffs of dozens of City staff as a result of the City's budget shortfall
- City commissions, including the Environmental Quality Commission (EQC), unable to meet for 4 months, which means the CAP subcommittee has been delayed in vetting the CAP with the EQC

Despite disrupted City operations, the CAP subcommittee continued refining the Climate Action Plan and vetting it with the City Council's CAP subcommittee (distinct from the EQC's CAP subcommittee) to receive their input on what might be politically viable in Menlo Park. The result of that continued work is a significantly pared down plan, presented below. While the CAP subcommittee still believes that the original Bold or Moderate Plans (presented in Appendix B), with their 22 and 76 actions respectively, are in fact what the Climate Crisis requires, we have decided to propose a significantly pared down plan, with the thought that some action is better than no action. This plan includes only the highest impact actions. This does not mean it is the best plan. It means it is only a good subset of the best plan and future efforts should be made to expand it as our ability and the wisdom of doing so becomes ever more apparent.

THE PLAN

Action	#	Description	2030 GHG Reduction (tons/yr)	Estimated Initial Investment for FY 2020-2021
Explore policy/program options to convert 95% of existing buildings to all-electric by 2030	1	Two basic options: **1)** Announce the "end of flow" of natural gas in the City by 2030 **OR** 2) Enact a "burn-out ordinance" requiring that when gas appliances expire, they must replaced by electric (preferably high efficiency heat pump) alternatives; phase in for large commercial, small commercial, residential; may require follow-on compliance ordinance as current permit compliance for residential gas appliances is low; will require follow-up "cash-for-clunkers" program to achieve 2030 goal; relies on PCE subsidies to reduce or eliminate cost differential; may require use of UUT funds to cover additional cost differential for low-income residents. Extend burnout ordinance to expiring air conditioners, to be replaced with heat pumps, eliminating need for separate gas heating.	1) 86,465* **OR** 2) 51,636*	$195,000 to $275,000 *Initial investment to hire contract staff (building official, legal aid, energy analyst) and provide policy options that would lead to adoption of a policy, ordinance, and/or program
Set citywide goal for increasing EVs and decreasing gasoline sales	2	Announce and promote goals of 1) making all new vehicles be electric by 2025 and 2) reducing gasoline sales each year by 10%, based on the total reported in 2018. Track progress on both goals publicly on an annual basis.	<7,120*	$0-$20,000 to influence regional agency to lead on behalf of the city
Expand access to EV charging for multifamily and commercial properties	3	Install or assist building owners in installing EV chargers throughout the City, siting them preferably where they will be used during daylight hours (when solar electricity is abundant on our grid) and also where residents of multi-family housing can access them. Current project to explore and evaluate policy options for existing multifamily properties.	7,370* <13,000* for multifamily	$140,000 *Initial investment for contract analyst to evaluate multifamily properties
Reduce vehicle miles traveled (VMT) by 25% or an amount recommended by the Complete Streets Commission	4	Reduce VMT, especially by gasoline vehicles, through a two-pronged approach: 1) Change zoning to encourage higher density (esp. for housing) near transit 2) Make the City easier to navigate without a car by accelerating implementation of the Transportation Master Plan with an emphasis on developing a clear network of protected pedestrian/bike paths throughout town Current projects underway that help achieve this goal: SB2 Housing grant, Transportation Management Plan, Transportation Management Association, and implementation of new VMT guidelines for new development	31,743*	Explore in 2021 or 2022 after current and complimentary projects are completed
Eliminate the use of fossil fuels from municipal operations	5	Replace 100% of the following municipal assets with efficient electric substitutes for: 1) Gas pool heating equipment 2) Gas and diesel municipal fleet vehicles 3) Gas furnaces 4) Gas hot water heaters 5) Gas-powered gardening equipment	879*	Currently budgeted for end of life assets/ appliances, and new community center/library
Develop a climate adaptation plan to protect the community from sea level rise and flooding	6	Develop a climate adaptation plan focused on protecting areas of the community vulnerable to sea level rise and flooding, as forecasted by the National Oceanic and Atmospheric Administration (NOAA) and California State agencies. Consider requiring developers to fund efforts to protect the community.	0	Flood and Sea Level Rise Resiliency District to Lead
		TOTAL (assumes option 2 is chosen in action #1)	**98,748+**	**$355,000 - $435,000**
***GHG emission reductions have been estimated and have not been verified**				

You will notice that the plan, as presented, falls well short of the goal of reducing our greenhouse gas emissions by 249,447 tons/yr by 2030. 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. The CAP subcommittee hopes that market momentum in the EV sector will make a significant contribution to the reduction of Menlo Park's greenhouse gas emissions, an effect not accounted for 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.**

NATURAL GAS PHASE OUT

Ending the use of natural gas has multiple benefits, including the avoidance of failures in gas system operations, such as the one that destroyed homes and caused death in Brookline, Massachusetts in 2018 and the one that did even greater harm in San Bruno, California in 2010.

The normal operation of gas appliances in buildings has also been found to cause indoor air pollution that would be illegal outdoors due to its negative health impacts, according to a recent study from UCLA.[6] That study links chronic exposure to the NO_2 emitted from gas stoves to a range of health ailments, including: asthma, lung inflammation, increased risk of respiratory infection, lung and breast cancer and low birth weight in babies. Doctors in a January article in the New England Journal of Medicine wrote the following, "As physicians deeply concerned about climate change and pollution and their consequences, we consider expansion of the natural gas infrastructure to be a grave hazard to human health." They continued, "We also recommend that new residential or commercial gas hookups not be permitted, new gas appliances be removed from the market, further gas exploration on federal lands be banned, and all new or planned construction of gas infrastructure be halted."[7] It is therefore within the City's normal powers, which are aimed at protecting the health and safety of its citizens, to seriously consider announcing the "End of Flow" (EOF) of natural gas.

This is similar to an approach proposed in the City of Arcata, California whereby the City would explore and pass an ordinance that sets an end date, for example 7/4/2030, for the flow of natural gas to all gas customers within the City limits. This sets a date certain by which community members would want to make any needed electrification updates to their homes for water heating, cooking and space heating. The City could then either stand back and let community members educate themselves on choices that would work for them, or the City could be an active partner to interested citizens, perhaps leading a helpful bulk buying program for: water heaters, heat pump HVAC units, EV chargers and installation services, or performing other joint effort transformation activities. There is already a local model for city-led bulk buying called Sunshares, which performs bulk buying for home solar systems and electric vehicles. While the idea of city-led bulk buying may sound new and different at first, we should realize that the City of Menlo Park already performs bulk buying of commodities and services for its citizens and businesses, including water supply, public safety services, street tree maintenance, roads and sidewalks, etc.

SOURCES OF FUNDS

Some of the six proposed actions can most likely be implemented by existing staff with extra support from a contractor/consultants.

Other than the General Fund, there are two other potential sources of funds:

1) the $400,000 presented in the 2020-21 Capital Improvement Plan (CIP) as earmarked for implementation of the Climate Action Plan and

[6] 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

[7] New England Journal of Medicine, "The False Promise of Natural Gas," Philip J. Landrigan, M.D., Howard Frumkin, M.D., Dr.P.H., and Brita E. Lundberg, M.D., https://www.nejm.org/doi/full/10.1056/NEJMp1913663

2) issuing debt or borrowing money.[8]

Saving our community for future generations seems like one of the most prudent uses of borrowed funds one can imagine. Conversely, if we wait until extra City revenue is available to fund climate action, we will most certainly lose the climate fight.

There will be additional capital expenditures incurred as part of the Climate Action Plan, as well, including:

- Investment in EV charging infrastructure
- Street improvements related to the TMP implementation
- Investment in electric replacements for municipal gas and diesel assets

If funds for these capital expenditures have not already been allocated in the City's Capital Improvement Plan (CIP), an amendment would need to be made to the CIP for that purpose. The EQC's CAP subcommittee recommends **against** using funds currently earmarked in the CIP for climate action to pay for municipal greening projects. Such projects are good candidates for outside financing or borrowing, whereas the CAP funds in the CIP should be focused on high impact activities to reduce community-wide greenhouse gas reductions, such as policy development, programs, incentives, education and marketing.

PLAN METRICS

Climate Action Plans have a poor history of being effectively implemented and one reason for that is that progress is typically only measured every five years and with staff turnover, well intentioned plans can go unexamined for years. In order to avoid such an outcome, the CAP subcommittee recommends that a short list of concrete metrics be adopted and that the City Council request quarterly, if not monthly, updates on those metrics.

Key metrics to track include:

1. Number of gas hot water heaters citywide that are replaced with electric versions (data source: Menlo Park Building Department)
2. Number of gas furnaces citywide that are replaced with electric versions (data source: Menlo Park Building Department)
3. Number of utility natural gas accounts terminated (data source: Peninsula Clean Energy or PG&E)
4. Number of new cars registered that are gas vs. EV (data source: DMV)
5. Number of total cars registered that are gas vs. EV (data source: DMV)
6. Gallons of gasoline sold in Menlo Park (data source: City sales tax reports)
7. Percentage of municipal assets converted from gas or diesel to electric (data source: Menlo Park Public Works Department)
8. Vehicle miles traveled, including trips inbound, outbound and within the City (Google Environmental Insights Explorer)
9. Number of other cities that query and/or copy Menlo Park's climate policies and programs (data source: outreach efforts and research by Menlo Park Sustainability staff)

While Sustainability staff and members of the CAP subcommittee question the value of conducting frequent high level greenhouse gas inventories, we do all agree that measurement is important and believe that tracking the specific items listed above will help staff and Council gain insight into the effectiveness of the climate actions that the City decides to undertake. County efforts to measure greenhouse gas emissions are expected to continue and will hopefully reflect progress made by cities within the County.

METHOD FOR EVALUATING ACTIONS

The six actions detailed above were selected from over 76 actions included in the original Bold and Moderate Plans, because they offer the City the most potential for Greenhouse Gas Reductions per dollar spent.

Dozens of potential climate actions were considered. Actions took many forms, including: city ordinances, city directives, programs and collaborations. Each action was evaluated for the

[8] An interesting model for borrowing against existing financial assets (such as the City's reserves) has been employed during the COVID recession by leading charitable Foundations who are borrowing at low interest rates against their endowments in order to continue disbursements, https://www.nytimes.com/2020/06/10/business/ford-foundation-bonds-coronavirus.html.

following key criteria:

- Potential to reduce greenhouse gas (GHG) emissions
- City staff resources required to implement
- City cost to implement
- Out-of-pocket expenses for community members to implement (lifecycle economics for user)
- Political feasibility
- Potential for replication by other cities

The cost estimates above should be viewed as preliminary, requiring further thorough analysis by City staff prior to policy adoption.

THE TRUE COST OF CARBON

As mentioned above, there is in fact a societal cost to burning fossil fuels, sometimes referred to as the "cost of carbon." There are debates today over how best to calculate that cost. Some say it should be based on the damages caused by those emissions. Others say it should be based on the cost to remove those carbon emissions from the atmosphere, once that becomes possible. In the absence of a global consensus, the EQC's CAP subcommittee attempted to estimate the cost of carbon to Menlo Park by taking the projected losses from sea level rise in our city alone, $1.3 billion, and dividing that by the tons of CO_2e we expect to emit over the next 40 years in a business as usual situation. Using this simple methodology, we arrived at a "cost of carbon" of $130/ton for Menlo Park.

There are a number of ways the City could use this figure. We could consider levying a tax of $130/ton on fossil fuels, in order to cover future damages the City will incur, in essence internalizing the externalized "cost of carbon." Another way to use this figure would be for the City to factor it in to all decisions concerning assets in the City that consume fossil fuels, for example in calculating the true cost to the City of a gasoline-powered police car or the true cost to citizens of a gas furnace.

NOTE ON LEADERSHIP

Saving our City from sea level rise will require collective global action, which Menlo Park can likely only influence through bold leadership. In evaluating the relative effectiveness of various climate actions, the CAP subcommittee noted the significant impact that replicability and demonstration of feasibility of a policy or program had on its potential to generate emissions reductions. If other cities can easily copy a policy or program, it is likely to **catalyze emissions reductions many times greater** than our City's emissions reductions alone. Therefore, it is strongly advised that City staff favor simplicity and replicability in its design of climate policies and programs and it is further advised that the City invest resources in proactively sharing its climate policies and programs with other cities, counties and government entities.

We must also be nimble and ready to act on economic stimulus opportunities that may present themselves, as the Country attempts to pull itself out of a recession.

NOTE ON UTILITY PARTNERS

An analysis of community member economics for each action revealed that rebates can make or break the economics behind purchasing decisions for equipment like electric vehicles and electric heat pumps for space and water heating, all of which are essential for progress on climate action. The City can greatly increase the political feasibility of many climate actions included in this plan by calling on its local Community Choice Energy (CCE) provider to rapidly deploy the significant capital currently held on its balance sheet to fund rebates on electric replacements of gas appliances. Such rebates can make climate friendly replacements cost effective and that enables city councils like ours to pass ordinances requiring such replacements. In turn, the new electric devices generate net revenue that rebuilds the CCE's financial reserves.

To this end, Peninsula Clean Energy's board recently signaled its support for local cities' efforts to electrify, voting on May 28, 2020 to invest $6 million to electrify existing buildings in San Mateo County. This program will reportedly include substantial incentives for: 1) the installation of electric heat pump water heaters, 2) upgrades to electric service panels so they can handle the increased electric demands of all-electric homes, and 3) whole-home electric conversions for low income residents. Such programs are a promising

signal that local CCEs intend to help ease the financial burden of converting homes from natural gas to all-electric, since it is not only essential for fighting climate change but also in their long-term financial interest to do so.

NOTE ON EQUITY

Climate change does not affect all members of society equally. Tragically it disproportionately affects low income people and people of color, as evidenced right here in Menlo Park, where sea level rise is expected to have a devastating impact on residents of our Belle Haven neighborhood. A similar pattern is observed all over the globe, where poor island nations are becoming the first to be wiped off the globe. Climate justice advocate Hop Hopkins illustrates the connection between climate change and racism by explaining how allowing climate change to occur requires that we accept that portions of our local and global communities are "sacrifice zones, and you can't have sacrifice zones without disposable people, and you can't have disposable people without racism."

Meanwhile wealthier segments of society go on emitting greenhouse gases at ten times the rate of poorer segments, unwilling to make even small changes to their purchasing decisions. The COVID crisis has shed a light on the shocking inequity in health outcomes for people of color, some of which can be attributed to well documented racial disparities in exposure to air pollution from fossil fuels. Menlo Park must ask itself whether it wishes to continue contributing to this global and local inequity, or whether it can strongly prioritize leadership in solving these interconnected problems.

Finally, although Menlo Park is situated in one of the wealthiest Counties in the country, that wealth is not equally distributed and some residents may find it difficult to afford at least the capital outlay for the changes recommended in this plan. To address issues of equity, there are a number of options for ensuring that low-income residents have the financial support they need to make the required changes to their homes and vehicles. Both the State and local CCEs have shown a willingness to provide financial subsidies specifically targeted at low income residents. Peninsula Clean Energy recently set aside $2 million, out of a $6 million program, just to assist low-income residents with all-electric retrofits of their homes. If the City wishes to further bolster that support, it could consider allowing the Utility User's Tax (UUT) on natural gas sales to increase from its current 1% level to the existing voter-approved level of 3.5%. That would provide an estimated $500,000 in additional funding every year to low-income families converting gas appliances to all-electric. The City must take an active role in ensuring that low-income residents are not unfairly disadvantaged by the requirements of its Climate Action Plan.

ANOTHER NOTE ON COVID-19

Lastly, this Climate Action Plan is being presented to City leaders in the midst of a generation-defining event, namely the global COVID-19 pandemic. It is understandable and appropriate that City leaders would devote their immediate attention to protecting the health and wellbeing of our community, as we fight this deadly virus.

As the health emergency wanes, however, the CAP subcommittee hopes that Council members will view the proposed Climate Action Plan as an opportunity for Menlo Park. COVID-19 has jolted us all out of our routines and everyday existence, highlighting in a graphic way our vulnerability as a species. Climate change has the potential to do the same, only on an even greater scale. If we are able to take in the lessons presented to us by this current crisis, we will be better prepared to address the climate crisis that is coming. For example, we should ask ourselves: Do we want to be like South Korea and flatten the carbon "curve" by proactively investing in mitigating the carbon dioxide "contagion"? Or will we delay, like Italy, and only take decisive action once the problem has ballooned? Is it still acceptable to stand by and watch one window of opportunity after another close before our eyes, leaving us with a much larger problem, the only response to which threatens to destroy our economy? Can we accept that this problem, like COVID, will ravage poor communities and people of color? The choice is ours. How will we act?

This Climate Action Plan presents us with economic opportunities as well. If enacted, this plan will jumpstart a new local market in electric appliance installation, injecting money into the

economy and providing hundreds of new jobs, just when they are needed.

Finally, as medical professionals learn more about the adverse health impacts of burning fossil fuels in our homes, the Climate Action Plan offers Menlo Park an opportunity to set a new standard for health and safety in our homes and places of work by removing fossil fuels from our air completely.

Our future is in our hands. It is time to act.

APPENDIX A

ORIGINAL PLAN OPTIONS – BOLD, MODERATE AND GO SLOW

Dr. John Holdren, scientific advisor to President Obama, advised that humans have three basic choices when it comes to climate change: 1) mitigate the problem by reducing our emissions, 2) adapt to the problem and try to move out of harm's way, or 3) suffer. What every civic leader must do today is pick the mix of those three options that they are willing to bring to their communities.

A summary of the benefits and drawbacks of each plan, from a City official's perspective, is offered below.

Bold Plan	Moderate Plan	Go Slow Plan
• A few bold actions • One-year implementation • Achieves goal of Zero by 2030 • Less $ now (staff resources) • Less $ later (lower sea walls) • Subject to opposition • Less human suffering • Regional leadership role	• Many moderate actions • Three-year implementation • Makes progress toward goal of Zero by 2030 • More $ now (staff resources) • Some $ later (sea walls) • Subject to some opposition • Some human suffering • Regional leadership role	• No proactive actions • No specific implementation time • Falls well short of Zero by 2030 goal • Less $ now (staff resources) • More $ later (high sea walls) • Subject to some opposition • More human suffering • No regional leadership role

THE MODERATE PLAN

The Moderate Plan is a set of 60+ actions (Appendix B), implemented over 3 years, that involve working with the community (residents, businesses and commuters) to assist and compel them to change, while simultaneously working with other cities, the County, the State and utilities to make such change easier. This would be accomplished by changing laws, capabilities and economics in a way that transforms standard practice, similar to the way that our all-electric Reach Codes are transforming standard practice in new construction. Menlo Park is gaining credibility in this area and therefore has a reasonable chance of catalyzing regional change through bold leadership and knowledge sharing.

The Moderate Plan would also seek an expanded vision and commitment from Community Choice Energy providers (CCEs), who will reap considerable benefit in the form of increased net revenue from electrification, just as oil companies will see diminishing revenue. According to this plan, the CCEs would be advised to rapidly deploy their net revenue, in order to quickly transform the market to support building electrification.

The Moderate Plan is the most time-intensive option of those presented, with significant staff resources deployed in the next three years to pass incremental ordinances that will drive needed behavior change. **Sustainability staff currently estimate that implementing the Moderate Plan would require approximately 6 incremental full time equivalent (FTE) staff for the first year and a similar or smaller number in the remaining two years included in the plan.** These incremental staff resources could be hired as consultants and would not be needed past the 3-year term of the plan.

While the action-intensive approach of the Moderate Plan may seem cumbersome, the CAP subcommittee suspects that the public requires incremental education and a piecemeal approach to rule changes, in order to have time to adjust to change. As such, the Moderate Plan also includes significant public outreach and education efforts to

assist the public and businesses in understanding the benefits of mutual cooperation.

Finally, the Moderate Plan by itself would not guarantee that the City would reach its proposed climate goal of Zero emissions by 2030. Instead, this plan would put us on a path to achieve that goal in a later year or, alternatively, could be seen as laying the groundwork for implementation of additional measures, such as those outlined in the Bold Plan, starting in year 4 of climate action when the public may be more receptive to bolder action.

THE BOLD PLAN

The Bold Plan is much simpler (Appendix B) in that it involves far fewer actions and therefore fewer staff resources to implement. It also has the advantage of nearly guaranteeing achievement of the City's climate goals. It achieves this primarily by announcing to the community that the City will stop the flow of natural gas (a potent greenhouse gas) and restrict the use of gasoline vehicles within City limits by a certain date in the future, possibly by the year 2030. This approach gives community members time to make the needed adjustments to their homes and transportation, all of which are perfectly feasible, within an announced 10-year timeframe.

As for the elimination of gasoline and diesel (GAD) fuels from Menlo Park vehicles, the Bold Plan could include a normal health-and-safety powers type ordinance, requiring the phasing out of underground fuel tanks by 7/4/2030, for example. Any businesses that used underground fuel storage tanks would need to remove them for certain by that date. If climate preservation is being seriously pursued in the next decade and automobile makers follow their plans for electric vehicle production, there will be much lower need for GAD stations left in our area and those that remain will be selling a fraction of the volume of gasoline that they do now. This could mean that, regardless of which climate plan the City pursues, the number of local gasoline stations is likely to drop significantly within the next decade from the current 12 to as few as six. Some locations could be repurposed as EV charging stations with amenities such as a coffee shop, convenience store or car wash.

Another approach to eliminating GAD fuels would be for the City to pass a number of ordinances that reduce the subsidies currently offered to GAD-powered cars and trucks. Some of the subsidies that could be reduced or eliminated for GAD vehicles include City-provided free parking in downtown lots and free parking on the side of public streets, a subsidy the City already limits overnight in Menlo Park. Both of these measures would encourage reductions in vehicle miles traveled (VMT) in the City, as well as conversions to electric vehicles (EVs). These shifts would also offer residents the ancillary benefits of reduced traffic congestion and/or reduced air pollution.

THE GO SLOW PLAN

The Go Slow Plan (GSP) would entail stepping back from climate leadership and following other entities, if and when they step forward to lead. The City would forgo the opportunity to carve out its own unique approach to problems, as we did with the recent Reach Codes, and would likely end up joining County efforts or copying other Cities' approaches. A Go Slow Plan would likely entail sitting quietly on the sidelines and following plans developed and offered by regional or state entities, as they emerge. The Go Slow Plan is by far the most risky of the plans in that it results in the highest likely damage cost to public and private property from sea level rise and would cause the most human suffering in vulnerable parts of our City. Gut-wrenching decisions will face City officials as they decide how much money to spend delaying the eventual loss of real estate valued at over $1 billion along our Bay shoreline. One can imagine weighty decisions about what neighborhoods to save resulting in heated disagreement among residents that would tear at the fabric of our community.

Although the Go Slow Plan may look "easy" in the short term, due to the lower staffing requirements and the slower pace of change required now, this approach may in fact prove to be penny wise and pound foolish. In reality, a Go Slow approach simply hands a growing problem to a future City Council, who would have even less time and resources at their disposal to battle climate change and oversee adaptation on multiple fronts.

We understand from the worldwide scientific body, the Intergovernmental Panel on Climate Change (IPCC), that time is of the essence and that in order to have a meaningful impact on climate change,

any mitigation efforts must start immediately. This would render the Go Slow Plan scientifically imprudent, leaving the City Council to choose between: a) implementing the Moderate Plan immediately and simultaneously exploring the Bold Plan for later implementation if needed, b) cutting to the chase and just pursuing the Bold Plan immediately or c) developing a plan they feel would perform better.

City of Menlo Park
Moderate 3-yr Climate Action Plan - 2020

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost ($/ton) *	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
A: Municipal Greening												
Develop and implement plan for electrifying municipal fleet	1	Directive	Public Works/ Sustainability		0.05		446	-$7,624	3,000	$980,000	$3,406,667	Develop clear plan for converting 100% of municipal vehicles to EVs
Expand city owned, public EV charging infrastructure throughout City	2	Directive	Sustainability/ Public Works		0		714	-$53.16	6,000	$400,000	$151,880	CAP sub note: Focus on parking lots at city facilities, inc. parks, library, community center and areas that serve multi-family housing. (1) Analyze EV infraststruce needs of the city and design accordingly (2) Establish rules for use of chargers and best practices for signage and other use factors (3) Jump start infrastructure development with initial public investments (4) Develop partnerships with utilties and private businesses as long term investors when building out the city's EV-charging infrastructure (5) Monitor and adapt to trends in the eV market and with EV technologies, use of city infrastructure, and shifts in national, regional policy
Develop and Implement plan for electrifying all municipal buildings + pools	3	Directive	Public Works/ Sustainability		0.05		433	-$33.94	39,000	$360,000	$225,305	Install heat pumps and heat pump water heaters in all municipal buildings and the 2 pool complexes
For Resiliency purposes only: Develop and implement plan for installing batteries for resiliency in key municipal facilities, starting with new community center	4	Directive	Public Works/ Sustainability		0.05		1	$16,781	109	$360,000	-$300,000	Install solar and batteries in municipal facilities for resiliency during emergencies.
Adopt CA regulations + Marin concrete language on embodied carbon in municipal construction, e.g. sidewalks	5	Directive	Public Works		0		54	$16.67	3,000	$9,000	-$9,000	Review state purchasing guidelines published recently and adopt those as a starting point, create signage for carbon-free sidewalks.
Raise Nat Gas UUT to 3.5% (to fund electrification of low income households, municipal electrification program and other Council-directed GHG reductions)	6	Directive	Finance/ Sustainability		0.125		579	$2.16	35,000	$5,000	$473	First step is to increase UUT rate on natural gas. City Council then decides where to apply funds: electrification (+ batteries?) in 1) day cares, 2) municipal buildings, 3) schools, 4) low income residents' homes.
				Subtotal	**0.275**							
B: Commercial Greening												
Facilitate daytime EV charging at commercial establishments and allow public access use at night	7	Ordinance	Sustainability/ Planning/ Building		0.5		1,428	$3.50	85,700	$90,000	$134,256	Facilitate installation of EV chargers for commercial establishments of a certain size to encourage charging from 9am to 3pm when supply of renewable energy is abundant and cheap; also allow public charging access at night
Work with Facebook to develop a bus electrification plan, including shuttle	8	Collaboration			0.05		1,631	$0.61	8,200	$1,400,000	-$110,000	
Require electrification of gas appliances (space heating and water heating) and A/C upon burnout to heat pump - commercial	9	Ordinance	Sustainability/ Building		0.5		19,469	$0.26	3,115,100	$24,000	$7,650	Require property owner to replace gas HVAC units at end of life with electric heat pump HVAC. Also require that replaced A/C be provided by heat pumps; limit to commercial establishments of a certain size
Adopt Marin limits on embodied carbon in construction and require materials that sequester carbon in commercial construction	10	Ordinance	Sustainability/ Building		0.5		2,835	$1.76	170,100	$3,600	-$3,600	
				Subtotal	**1.55**							

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City of Menlo Park
Moderate 3-yr Climate Action Plan - 2020

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost ($/ton) *	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
C: Residential Greening												
Require access to EV charging in existing multi-family buidlings	11	Ordinance	Sustainability/ Planning/ Building		0.5		5,942	$1.68	178,300	$21,000	$21,048	Ideas: 1) City resources could defray costs for projects at affordable housing developments, 2) Prohibit landlord from raising rent as a result by exempting this change from "significant renovation" definition in rent control laws. Copy Mountain View?
Achieve 100% permit compliance for heating and water heating appliances upon property sale	12	Ordinance	Sustainability/ Building		0.5		15,449	$0.32	772,500	$500	-$500	This action is needed to make a burnout ordinance enforcable. Build in a 1-year lag to give market time to adjust. Deferred date of implementation: Jan 1, 2021.
Explore legislation to require homebuyer notification re: sea level rise in flood areas	13	Collaboration			0.05		-	$0.00	-	$0	$0	
Require residents installing solar to also install conduit and circuits for heat pump water heater and EV charger	14	Ordinance			0		7,784	$0.00	653,900	$300	$2,338	This facilitates conversion to electric for emergency water heater burnouts
Update permits and fees to encourage electrification, including battery storage. Recommend to contractors and clients that they electrify all gas burnouts and that they heat pump all AC burnouts.	15	Directive			0		1,712	$0.00	41,100	-$200	$200	Develop recommended device type lists for building department display (and handouts)
				Subtotal	**1.05**							
D: VMT Reduction												
Explore options for VMT reduction and set a city goal	16	Ordinance	Transportation/ Planning		0.5		5,714	$0.88	228,500	-$20,000	$20,000	Consider adjusting zoning & land use regs to encourage mixed use, dense development near transit to reduce the number of cars and car trips due to commuting; reduce parking minimums for new development; rezone single-family to include multi-family; explore electric shuttle service between Belle Haven and Caltrain; expand network of multi-use paths; explore electric "last mile" options from transit to common destinations
Establish a Transportation Management Association (TMA)	17	Program			0.5		647	$15.45	9,700	$0	$0	Leverage small and large businesses for transit pass discounts, shuttle shares, discounts, etc.
Electrify city shuttle buses to transit, esp. on busy streets	18	Program			0.5		126	$49.67	2,000	$280,000	-$22,000	Possible e-bus vendors: Proterra (US), BYD (China)
Bike/Scooter Share Ordinance	19				0.5		286	$35.00	2,900	$0	$0	
Consider Copenhagen-style zoning oriented around 5-minute walking city approach	20	Ordinance			0.5		660	$5.05	39,600	$0	$4,557,940	
				Subtotal	**2.5**							
E: Zero Waste												
Adopt Foodware Ordinance to reduce/eliminate plastics and single use disposable foodware	21	Ordinance			0		136	$0.00	300	$2,000	-$2,000	San Mateo County has a model ordinance for compostable only and is willing to enforce on behalf of cities.
Apply single-use plastic prohibition to City operations	22	Directive			0		0	$0.00	-	$2,000	-$2,000	
Update solid waste ordinance to require recycling and composting services for all accounts	23	Ordinance			0		404	$0.00	8,100	$600	-$600	
Implement zero waste requirements for new development in the Bayfront area	24	Directive			0		168	$0.00	800	$25,000	-$25,000	

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City of Menlo Park
Moderate 3-yr Climate Action Plan - 2020

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost ($/ton) *	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
				Subtotal	**0**							
G: Adaptation Measures												
Monitor and participate in County preparations for sea level rise	25	Directive	Public Works		0.05		-	N/A	-	$100,000,000	-$100,000,000	Strongly recommend that Council request quarterly update from Public Works on City's plans and projected cost for addressing Sea Level Rise
Increase urban canopy in Belle Haven to protect against urban heat island effect	26	Directive	Public Works		0.05		7	$12,736	100	$12,000	-$912,000	
				Subtotal	**0.1**							
H: Public Education												
Launch CAP education campaign w/ churches, Rotary clubs and PTAs	27	Program	Public Engagement/ Sustainability		0.125		1,447	$1.73	28,900	$0	$0	Council members present to local groups
Create City web page featuring Climate Action Plan, building electrification	28	Program			0.125		579	$4.32	31,800	$0	$0	
Develop and publish electrification FAQ (copy an available version)	29	Program			0.125		579	$4.32	31,800	$0	$0	Post on a City web page for Climate Action Plan and give to elected officials to help them counter misinformation and answer questions from public
Speaker series on climate change and solutions	30	Program			0.125		96	$25.91	1,400	$0	$0	- Stanford professors: Mark Jacobson, sea level rise expert, VMT expert? - Berkeley professors: Dan Kammen, Bay sea level rise expert, levees and sea walls experts - Carbon-free aviation experts - Location: City hall
Invite "ride and drive" organizers to showcase EVs at every City public event	31	Program, Collaboration	Sustainability/ Public Engagement		0.125		1,223	$2.56	9,800	$200	-$200	Connect city to Acterra
Induction cooking demonstration party for realtors, kitchen designers, architects, home cooks	32	Program, Collaboration			0.125		24	$103.57	500	$0	$0	
Educate public on the merits of solar + batteries for resiliency during power outages	33	Program			0.125		644	$6.47	5,800	$0	$0	
Hire marketing firm for city-wide CAP campaign	34	Program	Communication/ Sustainability		0.125		3,859	$1.08	$11,600	$0	$0	Share aspirational CAP goals; Educate residents about what they can do; Share what will happen if we don't act; Digital campaign, newspaper articles, speakers, classes, radio PSAs, TV?, mailers, signs around town, billboard?, signs on buses, banners downtown
				Subtotal	**1**							
				Grand Total	**6.5**							
				Cost/ FTE	$100,000							
				Costs	$647,500	0						

Based on Future prices			
Nat Gas	$	2.00	Per Therm
Gasoline	$	3.40	Per Gallon
Electricity	$	0.22	Per kWh

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City of Menlo Park
Moderate 3-yr Climate Action Plan - 2021

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost * ($/ton)	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
A: Municipal Greening												
Require % of construction vehicles to be EV on municipal construction projects	35	Directive			carry over resources from 2020		76	-$512.90	1,500	$80,000	$244,000	
B: Commercial Greening												
Install highway exit signs for EV fast charging	36	Directive			carry over		159	$105.01	2,900	$8,000	-$8,000	Shows residents and commuters that EV Fast charging will help them go EV.
Consider other cities' ordinances requiring clean (EV) commercial fleets w/i city limits, e.g. FedEx, UPS	37	Ordinance	EQC		0.50		1,438	$4.97	40,300	$45,000	$150,000	Consider: Recology garbage trucks, package delivery, Uber, construction vehicles, USPS, etc.
Apply reach codes to commercial remodels	38	Ordinance			0.50		6,922	$2.41	124,600	$5,000	$5,550	Similar to ROB ordinance but captures opportunities before waiting for burnout after remodel
C: Residential Greening												
Set City goal of 100% new cars to be EV within 3 years	39				0.05		7,120	$0.18	113,900	$0	$0	Metrics
Require electrification of gas appliances and A/C upon burnout - residential	40	Ordinance			carry over		9,463	$1.06	236,600	$2,000	$1,956	Also require A/C be converted Heat Pump
Make sure reach codes apply fairly to ADUs, attached and detached	41	Ordinance					2,086	$0.00	4,200	$2,000	$2,748	Plugs gap noticed in other towns where garage is built new and then suddenly converted to ADU
Apply reach codes to residential remodels and additions	42	Ordinance	Sustainability/ Building		0.50		4,171	$4.00	137,700	$2,010	$1,155	
Explore removing exemptions from reach codes	43	Ordinance			carry over		2,773	$9.01	33,300	$0	$528	No gas stoves or fireplaces no gas heating in labs
Create program for assisting low income homes w/ electrification	44	Program			0.25		4,635	$1.80	152,900	$2,000	$1,165	Possibly funded by UUT rev or by collaboration w/ PCE, and Rebuilding Together teaching on a MP home
Adopt Marin limits on embodied carbon in construction and require materials that sequester carbon in residential construction (beyond state mandated GreenCode)	45	Ordinance			carry over		1,862	$5.37	37,200	$25	-$25	
Require electrification upon sale of property + complimentary rebate program	46	Ordinance			carry over		12,583	$0.79	188,700	$10,500	$50	Assumes 30% rebate
Consider extending EV wiring requirement to remodels and at resale	47	Ordinance			carry over		6,602	$1.51	132,000	$400	$44,362	
Consider leading regional effort to prohibit the sale of gas appliances w/i City limits	48	Ordinance			0.50		3,082	$1.62	339,000	$50	$2,060	Includes contracting, distributors & retail. Essentially no permits allowed for gas devices.
D: VMT Reduction												
Designate car-free and low emission vehicle zones or premium parking	49	Ordinance			0.50		1,266	$3.95	151,900	$50,000	$196,375	(1) Design the geographic zone and the restrictions, exemptions, and prices (2) Build public support through consultation and experimentation (3) Designate the use of congestion-charge revenue for investments that benefit the city (4) Invest in mobility alternatives using public transit, bicycles, and walking (5) Consider what related policies may be needed (e.g. reduce parking requirements for new developments).
Create safe thoroughfares for getting across town via protected multi-use paths	50	Directive			0.50		306	$8.18	73,400	$0	$15,000	

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City of Menlo Park
Moderate 3-yr Climate Action Plan - 2021

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost * ($/ton)	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
Explore micro mobility options for last-mile transportation to/from transit	51	Directive			0.50		475	$35.11	17,100	$0	$0	
E: Zero Waste												
Continue 2020 zero waste actions	52				0.00		709	$0.00	8,500	$0	$0	
F: Carbon Removal												
Research multiple options for achieving 10% carbon removal	53	Program			0.125		28,400	$25.44	113,600	$0	-$710,000	
Explore plan for reforestation with Peninsula Open Space Trust (POST) or other partner	54	Program, Collaboration			0.125		9,457	$16.32	37,800	$0	-$141,858	Research where state planted 9 million trees from Carbon Cap and Trade money allocation report
Arbor Day mass tree planting	55	Program					9,457	$10.00	37,800	$0	-$94,572	If every MP resident planted 10 trees per year for 10 years, we would sequester 10% of our annual GHG emissions
Consider having City fund a Recology biochar program, inc. City tree trimmings	56	Directive					9,457	$30.00	37,800	$0	-$283,716	Biochar sequesters carbon by turning dead trees and trimmings into charcoal that is then used as a healthy soil amendment
G: Adaptation Measures												
Propose building moratorium or developer-funded escrow to cover building decommisioning cost in areas to be flooded deeper than 1 foot within 30 years	57	Ordinance			0.50	$200,000		N/A	-	$0	$0	
H: Public Education												
Cooking class/demo with induction stove	58	Program, Collaboration			carry over			$22.19	9,000	$0	$0	
Class for City residents: Zero Out Your Carbon Emissions	59	Program			carry over		1,081	$23.12	8,600	$0	$0	Idea is to create a class for city residents (in the catalogue) that will show them how to reduce their carbon footprint. Intro: What are greenhouse gases and why are they warming our atmosphere? 1. How to calculate your carbon footprint 2. How to buy and drive an EV 3. How to install a heat pump and HPWH 4. How to choose and use an induction stove 5. How to install solar + batteries 6. How to choose low-carbon construction materials 7. How to create a Zero Waste home 8. How to repair your broken items, instead of throwing them out 9. How to buy carbon offsets and other sequestration options 10. How to use transit and "last mile" vehicles to get to transit 11. How to use ride share services

Grand Total	4.6		
Cost/ FTE	$100,000		
Costs	$455,000	$200,000.00	

Based on Future prices

Nat Gas	$	2.00	Per Therm
Gasoline	$	3.40	Per Gallon
Electricity	$	0.22	Per kWh

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City of Menlo Park
Moderate 3-yr Climate Action Plan - 2022

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost * ($/ton)	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
A: Municipal Greening												
Support Menlo Park school districts in transitioning to electric school buses (Not really municipal Greening since it's a separate school district)	60	Collaboration					127	$0.00	3,000	$1,600,000	-$310,000	Improves student health, reduces air pollution, reduces GHGs and could provide power during grid outages. Council members meet w/ superintendents; request vehicle-to-grid charging capability for powering schools during power shut-offs
B: Commercial Greening												
Explore Petaluma-style moratorium on 1) new gas stations and 2) expansion of existing ones or, as an alternative, limiting the permitted life of underground fuel storage tanks	61	Ordinance					159	$0.00	6,000	-$50,000	-$490,000	See Petaluma
Explore a NYC-style carbon emissions fee on buildings	62	Ordinance					2,596	$0.00	104,000	$10,500	$50	
Ban gas-powered lawn equipment	63	Ordinance					15	$0.00	-	$300	$7,292	Encourage county region and state to lead. Although this has tiny GHG savings it has large Nox and Sox polluntant savings
C: Residential Greening												
Announce an Arcata-style end date for the flow of natural gas in Menlo Park	64	Ordinance					86,465	$0.00	3,458,600	$11,250	-$5,777	Assumes higher inc cost than burn-out ordinance because replaced equipment still has useful life
Consider expanding fire inspection to include gas appliances	65	Ordinance					7,471	$0.00	149,400	$0	$0	
Consider Floor Area Ration (FAR) bonus for passive house building construction	66	Ordinance					-	N/A	-	$0	$0	Passive House design increases energy efficiency of homes, important as temps rise with climate change and grid is stressed by increased demand
Decrease subsidies (free parking) and privileges (the ability to pollute roads) for gas cars	67	Ordinance					476	$0.00	19,000	$30,000	$1,250,000	
Adopt ordinance prohibiting idling for vehicles with gas engines	68	Ordinance					286	$0.00	5,700	$0	$0	
Announce gradual plan to make public parking for EVs only: 20%, 40%, 60%, 80%, 100%	69	Ordinance					5,714	$0.00	160,000	$8,000	$81,524	
Increasingly restrict use of gas cars in city (not allowed on certain roads, parking lots)	70	Ordinance					5,714	$0.00	160,000	$8,000	$81,524	

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City of Menlo Park
Moderate 3-yr Climate Action Plan - 2022

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost * ($/ton)	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
Implement public safety rule on underground gasoline tanks	71	Ordinance					7,936	$0.00	317,400	$150,000	-$1,770,000	
D: VMT Reduction												
End subsidies for parking downtown for all vehicles	72	Ordinance					317	$0.00	12,700	$405,000	$10,545,000	
E: Zero Waste Initiatives												
Explore hyper management of fugitive methane emissions from landfill and composting facilities	73	Directive					2,250	$8.00	90,000	$180,000	-$180,000	Could create local offsets for 10%
Update construction and demolition ordinance	74	Directive					189	$0.00	2,300	$600	-$600	
Establish library of things to reduce waste, improve access and equity, and enhance community relations	75	Directive					50	$180.00	2,000	$90,000	$22,500	
Establish a grant program to convert privately owned drinking fountains to bottle filling stations	76	Directive					84	$0.00	1,700	$4,000	$21,000	

Grand Total	**0**	
Cost/ FTE	$100,000	
Costs	$ -	0

Based on Future prices

Nat Gas	$	2.00	Per Therm
Gasoline	$	3.40	Per Gallon
Electricity	$	0.22	Per kWh

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City of Menlo Park
Bold 1-yr Climate Action Plan - 2020

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost * ($/ton)	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
B: Commercial Greening												
Adopt Petaluma-style moratorium on 1) new gas stations and 2) expansion of existing ones	61	Ordinance					159	$0.00	6,000	-$50,000	-$490,000	See Petaluma
Prohibit use of gas vehicles for delivery (e.g. Amazon, FedEx, UPS)	77	Ordinance			0.5		1,438	$4.97	40,269	$45,000	$150,000	
Adopt Marin limits on embodied carbon in construction and require materials that sequester carbon in all commercial, residential and municipal construction	78	Ordinance	Sustainability/ Building		0.5		6,286	$0.80	377,000	$1,200	-$1,200	
C: Residential Greening												
Announce an Arcata-style end date for the flow of natural gas in Menlo Park	64	Ordinance					86,465	$0.00	3,459,000	$11,250	-$5,777	Assumes higher inc cost than burnout ordinance because replaced equipment still has useful life
Announce gradual plan to make public parking for EVs only: 20%, 40%, 60%, 80%, 100%	69	Ordinance					5,714	$0.00	160,000	$8,000	$81,524	
Increasingly restrict use of gas cars in city (not allowed on certain roads, parking lots)	70	Ordinance					5,714	$0.00	160,000	$8,000	$81,524	
Implement public safety rule on underground gasoline tanks	71	Ordinance					7,936	$0.00	317,000	$150,000	-$1,770,000	
Raise Nat Gas UUT to 3.5% (to fund electrification of low income households, municipal electrification program and other Council-directed GHG reductions)	6	Directive	Finance/ Sustainability		0.125		579	$2.16	35,000	$5,000	$473	First step is to increase UUT rate on natural gas. City Council then decides where to apply funds: electrification (+ batteries?) in 1) day cares, 2) municipal buildings, 3) schools, 4) low income residents' homes.
D: VMT Reduction												
Explore options for VMT reduction and set a city goal	16	Ordinance	Transportation / Planning		0.5		5,714	$0.88	228,500	-$20,000	$20,000	Consider adjusting zoning & land use regs to encourage mixed use, dense development near transit to reduce the number of cars and car trips due to commuting; reduce parking minimums for new development; rezone single-family to include multi-family; explore electric shuttle service between Belle Haven and Caltrain; expand network of multi-use paths; explore electric "last mile" options from transit to common destinations
Create safe thoroughfares for getting across town via protected multi-use paths	50	Directive			0.5		306	$8.18	73,400	$0	$15,000	
End subsidies for parking downtown for all vehicles	72	Ordinance					316	$0.00	12,700	$405,000	$10,545,000	
E: Zero Waste Initiatives												
Adopt Foodware Ordinance to reduce/eliminate plastics and single use disposable foodware	21	Ordinance			0		136	$0.00	300	$2,000	-$2,000	San Mateo County has a model ordinance for compostable only and is willing to enforce on behalf of cities.
Apply single-use plastic prohibition to City operations	22	Directive			0		0	$0.00	-	$2,000	-$2,000	

* City Cost = (staff cost + capital inv + operating savings or cost) / tons of CO_2e saved. Negative number is good.
** Participant is emitter targetted by aciton, e.g. muni, business or resident

City of Menlo Park
Bold 1-yr Climate Action Plan - 2020

Action	Action #	Type of Action	Lead Dept/ Supporting Dept	Community Engagement Req'd	FTEs Required (per yr)	3-yr Non-Staff Costs (consultants, studies)	2030 Ann. GHG Reduced (tons/yr)	City Cost * ($/ton)	2030 State-wide GHG Reductions Inspired by MP (tons/yr)	Upfront Incremental Cost to Participant** After Rebates	Net Savings to Participant**	Notes & Assumptions
Update solid waste ordinance to require recycling and composting services for all accounts	23	Ordinance			0		404	$0.00	8,100	$600	-$600	
Implement zero waste requirements for new development in the Bayfront area	24	Directive			0		168	$0.00	800	$25,000	-$25,000	
Explore hyper management of fugitive methane emissions from landfill and composting facilities	73	Directive					2,250	$8.00	90,000	$180,000	-$180,000	Could create local offsets for 10%
Update construction and demolition ordinance	74	Directive					189	$0.00	2,300	$600	-$600	
Establish library of things to reduce waste, improve access and equity, and enhance community relations	75	Directive					50	$180.00	2,000	$90,000	$22,500	Include: toys, kitchen appliances and tools
Establish a grant program to convert privately owned drinking fountains to bottle filling stations	76	Directive					84	$0.00	1,700	$4,000	$21,000	
F: Carbon Removal												
Research multiple options for achieving 10% carbon removal	53	Program			0.125		28,400	$25.44	113,600	$0	-$710,000	
G: Adaptation Measures												
Propose building moratorium or developer-funded escrow to cover building decommisioning cost in areas to be flooded deeper than 1 foot within 30 years	57	Ordinance			0.5	$200,000	-	N/A	-	$0	$0	
Monitor and participate in County preparations for sea level rise	25	Directive	Public Works		0.05		-	N/A	-	$100,000,000	-$100,000,000	Strongly recommend that Council request quarterly update from Public Works on City's plans and projected cost for addressing Sea Level Rise

Grand Total	2.8	
Cost/ FTE	$100,000	
Costs	$280,000	$ 200,000

Based on Future prices			
Nat Gas	$	2.00	Per Therm
Gasoline	$	3.40	Per Gallon
Electricity	$	0.22	Per kWh

* City Cost = (staff cost + capital inv + operating savings or cost) / tons of CO_2e saved. Negative number is good.
** Participant is emitter targetted by aciton, e.g. muni, business or resident

Model Assumptions

Captured below are key assumptions used throughout this model. Input cells are marked in yellow.

City Staff FTE Cost	$100,000	per year

Fossil Fuel Assumptions			
Type	**Units**	**GHG Emissions (CO2e lbs/unit)**	**2020 Future Price Projection ($/unit)**
Natural Gas	therms	11.7	$2.00
Gasoline	gallons	19.6	$3.40
Electricity	kWh		$0.22

Equipment Efficiency Assumptions	
Equipment Type	**Efficiency Ratio (BTUs out/BTUs in)**
Electric Heat Pump	3.5
Natural Gas Furnace	0.8

2017 City-Wide Annual GHG Emissions by Source*				
Buildling Source	**Natural Gas Emissions (tons/year)**	**Electricity Emissions (tons/year)**	**Building Emitter****	**Number of Building Emitters****
Municipal Buildings + Pools	865	-	The City	1
Commercial Buildings	53,414	23,467	Commercial Building Owners	700
Houses + Apartments	32,186	7,013	Homeowners + Landlords	14,000
Community Buildings Emissions	**86,465**	**30,481**	**All Buildling Owners**	**14,701**
Vehicle Source	**Gasoline & Diesel Emissions (tons/year)**		**Vehicle Emitter****	**Number of Vehicle Emitters****
Municipal Vehicles	496		The City	1

Commercial Vehicles	35,954		Business Owners with Fleets	3,000
Residential Vehicles	122,265		Households w/ Gas Vehicles	13,500
Community Vehicle Emissions	**158,715**		**All Vehicle Owners**	**16,501**
Waste Source	**Waste Emissions (tons/year)**		**Waste Emitter****	**Number of Waste Emitters****
Ox Mountain Landfill (active)	8,424		All Building Owners	14,701
Plastic Foodware			Restaurants	200
Marsh Road Landfill (retired)	5,000		The City	1
TOTALS				
Total City-Wide Emissions	**284,085**		**All Bulding Owners**	**14,701**
City-Wide Building & Vehicle Emissions (excl. Waste)	**275,661**		**All Vehicle Owners**	**16,501**

* Taken from December 2019 Sustainability Staff Report on Menlo Park Greenhouse Gas Inventory

** A target "emitter" is an entity that has decision-making authority over an emissions source and therefore may be a target "participant" in CAP policies and programs

From [GHG inventory summary 2005-2017t.xlsx]bucket'!

Building Emitter Qty Breakdown

Building Type	Number of Building Emitters**
Multi-Family Buildings	200
Multi-Family Units	2,000
Single Family Dwellings	12,000
Accessory Dwelling Units	100
Commercial + Multi-Family Buildings	900

Embodied GHG Emissions from Construction Activities in Community Buildings

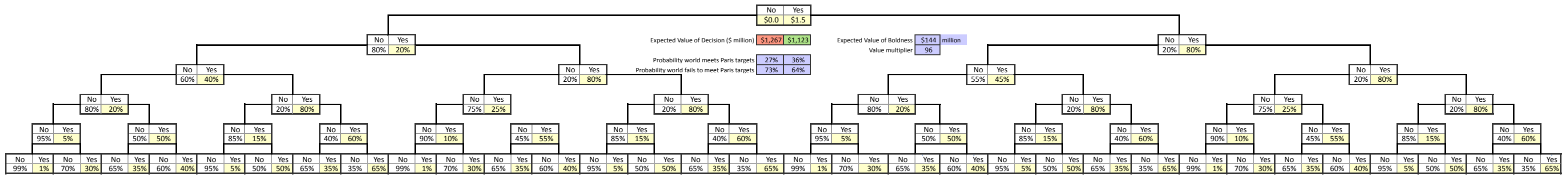
Building Type	Number of Building Owners	Avg. Sq. Footage per Building Owner	% of Building Owners Who Remodel or Build Each Year	Construction Volume (sq ft/year)	Embodied GHG Emissions in Construction Materials (CO2e lbs/sq ft)	Embodied Construction GHG Emissions (tons CO2e)	Number of Building Owners Who Build Each Year
Municipal Buildings + Pools	1	1,200,000	1%	12,000	100	600	0.01
Commercial Buildings	700	20,000	5%	700,000	100	35,000	35

Households	14,000	2,000	5%	1,400,000	60	42,000	700
TOTAL				**2,112,000**		**77,600**	**735**

Expected Value of Menlo Park Expenditures on Climate Action Plan + Related Adaptation Measures - 64 Scenarios and Probabilities

Question: What happens if Menlo Park does or does not fully fund ($500k/yr for 3 yrs) a bold climate action plan (CAP)?

1. Menlo Park fully funds CAP - $1.5 million
2. 20 other CA cities pass bold CAPs
3. CA passes bold climate laws
4. 10 progressive US states enact bold climate laws
5. US meets Paris targets
6. World meets Paris targets



	Adaptation Costs ($ mil)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Probability of this outcome		36%	0%	1%	1%	3%	2%	3%	2%	5%	0%	0%	0%	7%	4%	5%	10%
3-foot Sea Walls req'd @ $100 million*	$100	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6-foot Sea Walls req'd @ $300 million additional**	$300	x		x		x		x		x		x		x		x	
Abandon land between 101 and Bay @ $1.288 billion***	$1,288	x		x		x		x		x		x		x		x	
Adaptation costs ($ million)		$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100
Expected value of adaptation costs ($ million)		$610	$0	$23	$1	$53	$2	$49	$2	$87	$0	$8	$0	$112	$4	$91	$10
Scenario #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Probability of this outcome	3%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	3%	2%	3%	5%
3-foot Sea Walls req'd @ $100 million*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6-foot Sea Walls req'd @ $300 million additional**	x		x		x		x		x		x		x		x	
Abandon land between 101 and Bay @ $1.288 billion***	x		x		x		x		x		x		x		x	
Adaptation costs ($ million)	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100
Expected value of adaptation costs ($ million)	$45	$0	$4	$0	$5	$0	$6	$0	$44	$0	$4	$0	$56	$2	$45	$5
Scenario #	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Probability of this outcome	8%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	2%	1%	2%	3%
3-foot Sea Walls req'd @ $100 million*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6-foot Sea Walls req'd @ $300 million additional**	x		x		x		x		x		x		x		x	
Abandon land between 101 and Bay @ $1.288 billion***	x		x		x		x		x		x		x		x	
Adaptation costs ($ million)	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100
Expected value of adaptation costs ($ million)	$140	$0	$5	$0	$12	$0	$11	$0	$25	$0	$2	$0	$32	$1	$26	$3
Scenario #	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Probability of this outcome	11%	0%	1%	0%	1%	1%	1%	1%	10%	1%	1%	1%	13%	7%	11%	20%
3-foot Sea Walls req'd @ $100 million*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6-foot Sea Walls req'd @ $300 million additional**	x		x		x		x		x		x		x		x	
Abandon land between 101 and Bay @ $1.288 billion***	x		x		x		x		x		x		x		x	
Adaptation costs ($ million)	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100	$1,688	$100
Expected value of adaptation costs ($ million)	$180	$0	$14	$0	$20	$1	$22	$1	$174	$1	$16	$1	$225	$7	$181	$20
Scenario #	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64

* Source: "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 (Task Order 1) October 2016," p. 37/49, http://www.sfcjpa.org/documents/SAFER_Bay_Public_Draft_Feasibility_Report_Summary_Oct._2016_.pdf

** Source: "Choosing a Future Shoreline for San Francisco Bay: Strategic Coastal Adaptation Insights from Cost Estimation," The Journal of Marine Science and Engineering, p. 12 shows that increasing levee height by 2x results in 4x increase in cost, https://www.researchgate.net/profile/Daniella_Hirschfeld/publication/320111123_Choosing_a_Future_Shoreline_for_the_San_Francisco_Bay_Strategic_Coastal_Adaptation_Insights_from_Cost_Estimation/links/5a947590aca2721405674b35/Choosing-a-Future-Shoreline-for-the-San-Francisco-Bay-Strategic-Coastal-Adaptation-Insights-from-Cost-Estimation.pdf?origin=publication_detail

*** Source: "County of San Mateo Sea Level Rise Vulnerability Assessment, March 2018," p. 139. https://seachangesmc.org/wp-content/uploads/2018/03/2018-03-12_SLR_VA_Report_2.2018_WEB_FINAL.pdf