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TO: Council Sustainability Committee

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SUBJECT: **Carbon-Neutral Target Date**

PURPOSE

This memorandum responds to Council Sustainability Committee guidance from the December 1, 2021 meeting to provide information regarding the implications for accelerating Mountain View's current adopted carbon neutrality target year of 2045.

RECOMMENDATION

Provide direction on staff questions regarding the approach to developing an accelerated carbon neutrality target and strategies.

BACKGROUND**Latest Climate Research**

The Intergovernmental Panel on Climate Change (IPCC) prepares Assessment Reports about the current research on climate change every few years. The IPCC has recently released three reports during its Sixth Assessment Report cycle, which will be completed in 2022, that underscores the urgency for limiting the impacts of climate change. In August 2021, the IPCC released the first report, *Climate Change 2021: the Physical Science Basis*. Compiling years of peer-reviewed scientific studies, the report is considered the most comprehensive assessment of climate science to date. The report included the following findings:

- The climate has already warmed by 1.1 degrees Celsius (about 2 degrees Fahrenheit) since 1850-1900, which is the hottest Earth has been in 100,000 years.
- A net 1.5 degrees Celsius warming is expected by 2040.

- Humans are the cause of this temperature increase, which is driven largely by the burning of fossil fuels.
- Irreversible tipping points are approaching.

In February 2022, the IPCC released the second report, *Climate Change 2022: Impacts, Adaptation and Vulnerability*, which establishes areas where the world is most vulnerable to climate change and highlights climate impacts and ways to adapt to them. Significant findings included the following:

- Our time to adapt to the impacts of climate change is running out.
- In many areas, climate impacts have already been greater than previously predicted.
- The most vulnerable populations are disproportionately impacted by climate change.
- We can prepare for worsening conditions by conserving at least one-third of the world's natural habitats.

In April 2022, the IPCC released the final report, *Climate Change 2022: Mitigation of Climate Change*, which explains developments in emission reduction efforts and evaluates the effectiveness of national climate pledges in relation to long-term emissions goals. The report finds:

- Without immediate and deep emissions reductions across all sectors, it will be impossible to limit global warming to 1.5 degrees Celsius.
- Urban infrastructure and activities are responsible for two-thirds of today's emissions.
- Cities and urban areas offer significant opportunities for emissions reductions.
- While funding to address climate change is much lower than needed to limit global warming, there is sufficient global capital and liquidity to close the investment gap.

Accelerated Carbon Neutrality—State- and Municipal-Level Action

In 2018, the State of California established a goal of achieving carbon neutrality by 2045. In July 2021, Governor Gavin Newsom directed State agencies to evaluate advancing this target year to 2035. The California Air Resources Board (CARB) and California Public Utilities Commission (CPUC) are currently assessing pathways for the state to be carbon-neutral by the

new 2035 target year. A detailed description of regional, State, and Federal initiatives that support climate action and carbon neutrality is included in Attachment 1.

Many municipalities across the U.S. have carbon neutrality goals, and some have begun the process of accelerating those goals. Several municipalities, including San Jose; Irvine; Menlo Park; Petaluma; Sacramento County; Ann Arbor, Michigan; Flagstaff, Arizona; Ithaca, New York; and Park City, Utah, have now committed to achieving carbon neutrality by 2030. Other cities such as San Diego, San Luis Obispo, and Santa Barbara have set carbon neutrality goals for 2035. A few of these municipalities have developed plans to map out how they will achieve carbon neutrality by their target date, while others have first set carbon neutrality targets and then developed implementation plans. This is the approach Mountain View opted for in setting its original 2045 carbon neutrality target, and it is likely the approach that staff would recommend if the Council ultimately decides to set an earlier date for carbon neutrality.

Mountain View Greenhouse Gas Reduction Targets and Carbon Neutrality Goal

On November 3, 2009, the City Council adopted voluntary greenhouse gas (GHG) reduction targets for the community, with initial targets for 2012, 2015, 2020, and 2050. These targets set an absolute reduction in total emissions below a baseline year of 2005. The targets were developed and adopted in response to the Global Warming Solutions Act of 2006 (Assembly Bill 32), which requires California to reduce Statewide GHG emissions. Subsequently, through the City's Climate Protection Road Map, the City Council adopted interim targets at five-year intervals between 2020 and 2050.

On December 3, 2019, the City Council adopted revised GHG reduction targets for the years 2025 to 2050. Table 1 below shows Mountain View's current communitywide GHG reduction targets.

Table 1: Community GHG Reduction Targets

Year	Reduction Target (below 2005 baseline level)
2025	33%
2030	47%
2035	59%
2040	68%
2045	75%
2050	80%

On April 21, 2020, the City Council passed a resolution for Mountain View to become a carbon-neutral city by 2045. To be carbon-neutral, a city must achieve net zero GHG emissions through a combination of emissions reductions and removal of GHGs from the atmosphere. This means

that in addition to achieving the adopted 2045 greenhouse gas (GHG) reduction target of 75% below 2005 levels, Mountain View would either need to exceed the adopted reduction target or balance any remaining GHG emissions with emission removal projects (such as planting trees or restoring wetlands) or carbon offsets.

Acceleration of Carbon Neutrality Goal

At its November 9, 2021 meeting, the City Council referred the topic of achieving carbon neutrality as early as 2030 to the Council Sustainability Committee (CSC). At the CSC meeting on December 1, 2021, the CSC directed staff to provide information regarding the implications of accelerating the City's communitywide carbon-neutral goal from 2045 to as early as 2030.

ANALYSIS

Wide-Scale Change: Legislation and Financing

To solve the problem of climate change, cities need to drastically reduce GHG emissions and ultimately achieve carbon neutrality. The science indicates that time is of the essence, and there are still pathways available that make this goal possible. Mountain View cannot arrive at carbon neutrality on its own. The City will need significant action from regional, State, and Federal governments to achieve the necessary GHG reductions. Additionally, the City will need access to the financial resources required to achieve the wide-scale change to bring about carbon neutrality.

Legislative Advocacy

Mountain View's carbon-neutral strategy should include efforts to advocate for legislation, programming, and funding at the regional, State, and Federal level to support cities in reducing GHG emissions. This could be pursued through the City's existing legislative advocacy resources at the State and regional level. Additional resources may be needed to advocate effectively at the Federal level. Intergovernmental relations and solutions will be particularly important in cases where the City does not have significant control over an emissions source (i.e., freight traffic, air travel, or consumption) or the infrastructure needed to reduce emissions (i.e., public transit services).

Establish Avenues for Private Financing

Toward an accelerated carbon neutrality goal, the City could explore opportunities to leverage private financing. For example, Ithaca, New York, is pioneering a program that has already secured \$100 million in private funds to pay for actions needed to achieve their 2030 carbon neutrality goal, and they are looking for an additional \$250 million to further their efforts. Their strategy "...is to not rely on government money, but to tap into private investors and combine it

with incentives from government which can reduce the cost of capital and interest rates for project finance.”¹ Mountain View could consider a similar approach to access to sufficient resources to achieve wide-scale decarbonization while minimizing impacts to the City’s budget.

Achieving Carbon Neutrality

To move the City’s carbon neutrality goal to as early as 2030, Mountain View would need to significantly accelerate emissions reductions and identify appropriate emission removal projects and/or carbon offsets. It is critically important for governmental agencies, private organizations, and individuals to take action to achieve carbon neutrality. However, technological and cost constraints, workforce availability, and the sheer volume of change that needs to be achieved all contribute to the scale of the challenge before the City. Furthermore, there are tradeoffs between investing resources in achieving long-term emissions reductions, a slower yet longer-lasting effort, and investing in costly, recurring carbon offsets which would make up the gap in emissions reductions to achieve carbon neutrality more quickly.

There are not many models for how to achieve carbon neutrality. Many of the cities with accelerated carbon neutrality targets have not yet developed their carbon neutrality action plans. Most pathways to carbon neutrality use a combination of policy (carbon neutrality goal-setting) and accountability (commitment to offsets) to achieve their goals. One approach is to set an accelerated carbon neutrality target that is aspirational, and either offset the remaining emissions—potentially at significant cost—or focus the policy goal on maximizing emissions without incorporating financial repercussions for not meeting that goal. Another approach is to set a carbon neutrality target that is measured and achievable and offset residual emissions, or not include offsets at all. A third approach the City could consider would be to develop a new model that blends an aspirational carbon neutrality goal with accountability measures through a reasonable but bounded commitment to offsets. This approach could incorporate rapid climate action and accountability, while keeping the investment of resources focused on achieving emissions reductions rather than purchasing offsets.

Staff proposes that the CSC direct staff to incorporate direction from this meeting, continue analysis and develop recommendations for an accelerated carbon neutrality target and strategies to achieve that goal in a way that is tailored to Mountain View and that builds on what the City has already achieved and is positioned to accomplish.

Question 1: Does the CSC agree with the recommendation to direct staff to develop specific accelerated carbon neutrality goals and implementation recommendations for further discussion at the next CSC meeting (anticipated in mid to late May)?

¹ [Ithaca Is First U.S. City to Begin 100% Decarbonization of Buildings \(cnbc.com\)](https://www.cnbc.com/2019/05/01/ithaca-is-first-u-s-city-to-begin-100-decarbonization-of-buildings.html)

Strategies to Reduce Emissions Toward Carbon Neutrality

Emissions reductions would likely include an initial focus on the transportation and energy sectors, which contributed about 90% of communitywide emissions in 2020; however, this would ultimately extend to all sectors. Staff reviewed carbon neutrality plans adopted by municipalities with carbon-neutral by 2030 goals, which are primarily aspirational, and identified some common strategies. Current progress and analysis of potential strategies that could be implemented in Mountain View are included below.

Building Energy

Achieving carbon neutrality by 2030 will require deep reductions in emissions from existing building energy use. In 2020, the energy sector contributed about 32% of communitywide GHG emissions, with natural gas use responsible for the majority of these emissions (76%). Building electrification and natural gas phase-out, switching to clean electricity, and energy efficiency are the primary strategies to decarbonize and eliminate emissions from buildings. These strategies are interrelated and must be pursued in tandem. For example, building electrification and natural gas phase-out only achieve emissions reductions if the resulting electricity use is based on clean electricity. Similarly, without energy efficiency to moderate demand on the grid, the increased electricity use resulting from natural gas phase-out could strain electricity supply.

Building Electrification and Natural Gas Phase-Out

The City has already taken significant action toward building electrification. On November 12, 2019, the City Council adopted a Building Electrification Reach Code requiring all newly constructed buildings to be all-electric. This also applied to all significant remodels (working on more than 50% of the home). Additionally, the City launched Electrify Mountain View and a Cool Block program to engage residents in electrification and other aspects of sustainability. Electrify Mountain View is an online platform to help educate and empower homeowners and renters to make informed decisions about switching to more cost-effective, lower carbon emission solutions in their homes and lifestyles. The Cool Block program helps neighbors come together to learn and take collaborative action on disaster preparation and resilience, sustainability, and community-building.

Notwithstanding this progress, attaining carbon neutrality will require the City to expedite its efforts to electrify existing buildings and greatly reduce natural gas use. The City could include the following types of actions to support further decarbonization of buildings:

- As the building code continues to be updated and model reach codes also stretch towards decarbonization of buildings, continue to adopt updated reach codes that accelerate the City's progress towards electrification and carbon neutrality.

- Support the electrification of existing buildings through outreach, financing, and incentives for fuel-switching and/or mandates (i.e., incorporate existing buildings into the Reach Codes to require electrification upon a lower renovation threshold or enact a “burn-out” ordinance requiring natural gas systems and appliances be replaced with electric alternatives upon their expiration).
- Select a certain date for an “end-of-flow” of natural gas in Mountain View.

As noted above, adopting a target date for phasing out natural gas and achieving end-of-flow to all gas customers in Mountain View is one potential strategy to reduce GHG emissions from buildings. This would establish a date by which community members would need to make any electrification updates to their homes for water heating, cooking, space heating, and swimming pool heating. **Although electrification and the eventual end of natural gas use in the community are critical steps to achieving carbon neutrality, staff also recognizes the wide-ranging impacts that such a commitment would have within the community**, including impacts to economically vulnerable homeowners and renters, the trades, and certain industries reliant on natural gas. Additionally, there can be significant cost and space challenges associated with retrofitting existing buildings with the technology available today.

A few cities have adopted or are currently considering end-of-flow target dates as part of their climate action plans, including Los Altos Hills, Menlo Park, and Half Moon Bay. Setting an end-of-flow date would create momentum for actions that would accelerate progress towards electrification and shift the market more quickly by signaling that electrification is coming by a set date.

As the City transitions away from natural gas, whether through an end of flow decision or through policies and incentives, it is essential that equity considerations be addressed. To aid the community with this transition and in recognition of the significant costs associated with building electrification, partnerships and advocacy at the regional and State level to provide funding and incentives and to enact State laws to phase out natural gas (for example, a law prohibiting the sale of natural gas appliances) will be essential. The City could supplement these incentives with:

- Workforce support to those transitioning to jobs in the electrification sector.
- Financing and incentives for electrical upgrades and fuel-switching.
- Implementing a bulk buying program for electric equipment such as water heaters, heat pump HVAC units, and induction stoves and cooktops.

Clean Electricity

Clean electricity makes building and transportation electrification effective at reducing emissions. **The City has already greatly decarbonized its electricity supply** by joining with Sunnyvale, Cupertino, and the County of Santa Clara to create Silicon Valley Clean Energy (SVCE), a community choice energy program that sources carbon-free power, mainly from renewables, such as solar and wind, and hydropower.

Mountain View could continue to support clean energy and communitywide renewable energy use through the following types of actions:

- Support the deployment of solar panels with battery storage to existing residential and commercial buildings.
- Support the increase in the percentage of renewable electricity use communitywide:
 - Promote SVCE's GreenPrime option (100% renewable energy generation service) to residents and businesses.
 - Support SVCE in pursuing 24/7 renewable energy (renewable energy supply at all times) to reduce overall market demand for fossil fuels.
 - Support non-SVCE customers (Direct Access and PG&E) in accessing renewable energy.

Energy Efficiency

Energy efficiency is foundational to electrifying buildings and decarbonizing electricity supply. If buildings need less energy, then less renewable energy is needed to supply them. To date, Mountain View's efforts have included running the successful, multi-year Energy Upgrade Mountain View program and partnering with the Bay Area Regional Network (BayREN) to host community energy efficiency workshops.

Pathways to carbon neutrality by 2030 would include promoting and expanding access to energy efficiency retrofits for residential and commercial buildings. Additional actions could involve:

- Providing incentives or financing.
- Conducting outreach and education.
- Implementing programs to encourage energy efficiency.

Transportation

Transportation accounted for 58% of communitywide emissions in 2020 with passenger vehicles responsible for the majority of these emissions (78%). To achieve carbon neutrality, Mountain View's approach to reducing transportation-related GHG emissions will focus on reducing vehicle dependence and electrifying transportation systems and the remaining vehicles on the road.

Reducing Vehicle Dependence

Prioritizing mode shift from vehicle use to active transportation, public transit, and electric micro-mobility solutions is an essential carbon neutrality strategy. Mode shift is encouraged by complete neighborhoods and transit-oriented development, where people can access all the things they need within walking distance and can access public transit for commuting if they are unable to telecommute. These strategies also improve safety for all road users, support the health of the community, improve air quality, and reduce congestion. **The City has already undertaken many initiatives to reduce transportation emissions**, such as hiring a Transportation Demand Manager, improving bicycle and pedestrian infrastructure, developing *AccessMV: Mountain View's Comprehensive Modal Plan*, expanding Mountain View Community Shuttle service, and adopting the North Bayshore and East Whisman Precise Plans, which promote complete neighborhoods and decrease vehicle miles traveled by addressing the jobs-housing imbalance. While these precise plans will result in a decrease in vehicle dependence, staff notes that many of these efforts will take 10 to 20 years to be built and realize reductions in vehicle dependence. In some cases, the precise plans will take even longer; for example, the North Bayshore Master Plan will take 20 to 30 years to build.

Mountain View could further reduce vehicle dependence through continuing to take a comprehensive approach to transportation. The strategies involved in reducing vehicle dependence are interrelated, and one cannot be successfully implemented without the other. For example, building transit-oriented development and encouraging more public transit use is most effective when there are also enhancements to public transit services to make them widely available as an alternative. Promoting active transportation is linked to projects that provide the infrastructure to walk and bike.

Taking this into account, **Mountain View could pursue a suite of actions that include:**

- Continue to encourage or require transit-oriented, mixed-use, and infill developments that allow people to live close to public transportation and other services and amenities.
- Increase density in residential neighborhoods through zoning where mixed-use retail and job areas are available nearby.

- Implement or expand Transportation Demand Management (TDM) programs, including developing a TDM ordinance to reduce or eliminate parking requirements Citywide.
- Support regional efforts to enhance public transportation services to Mountain View.
- Encourage active and public transportation use through outreach, incentives, and infrastructure.
- Prioritize projects within Mountain View's transportation plans (i.e., AccessMV, Bicycle Transportation Plan, Pedestrian Master Plan, etc.) that reduce vehicle miles traveled.

Vehicle Electrification

Achieving carbon neutrality will also rely on the electrification of vehicles. Due to the high percentage of renewable energy and other carbon-free sources in California's electricity mix, the annual emissions from electric vehicle (EV) usage are about 50% of the national average and only 17% of the annual GHG emissions from a similar gasoline powered vehicle. EVs charged in Mountain View and 12 other local jurisdictions in Santa Clara County can take advantage of carbon-free electricity provided by SVCE to further reduce GHG emissions.

The City has already made efforts to promote EV use in Mountain View. In November 2019, the City Council adopted an EV Charging Infrastructure Reach Code requiring most newly constructed buildings to install a prescribed quantity of EV chargers, and in 2022 staff plans to recommend expanding on this effort through the next cycle of Building Code updates. In December 2021, the City completed an Electric Vehicle Action Plan, which identifies strategies, policies, and programs to support electric vehicle adoption and deployment of EV charging infrastructure. In spring 2022, Mountain View will install 35 new EV chargers among its downtown parking structures at 850 California Street and 135 Bryant Street. Another 33 EV chargers are already installed among the 850 California Street and Civic Center parking structures and the Community Center. Additionally, the City is preparing to analyze how to electrify its own fleet and will start this work in 2022.

Although significant progress has been made in the electrification of passenger vehicles, challenges remain in fully electrifying transportation. At this time, the EV technology is still developing for medium/heavy-duty vehicles and is not yet proven for many emergency response vehicles. Electric buses and shuttles also present challenges in terms of finding options that have sufficient range to complete a full day of service without charging. The City will need to build on the progress that has been made and participate and support regional and State efforts to further electrification of more challenging sectors within transportation.

To achieve carbon neutrality, **the City can consider the following types of actions to further electrify transportation:**

- Support regional and State efforts to advance the electrification of public transit, freight, and other medium/heavy-duty vehicles, and provide the corresponding charging infrastructure needed to operate these vehicles.
- Promote community EV adoption through expanded outreach, incentives, bulk buys, outreach, and other policies and programs.
- Continue to expand access to EV charging through Electric Vehicle Infrastructure Reach Codes and installation of EV charging infrastructure in new and existing buildings (including multi-family and commercial) and public locations.
- Encourage the use of electric bikes and electric micro-mobility devices through charging infrastructure, outreach, and/or pilot programs.

Question 2: Does the CSC agree with the recommendation to focus carbon neutrality strategies on the electrification of buildings and transportation?

Other Actions

Sustainable Consumption and Waste Management

Mountain View will need to reduce emissions from solid waste and consumption to achieve carbon neutrality. While solid waste contributed about 3% of Mountain View's communitywide GHG emissions in 2020, reducing those emissions could avoid the need for additional offsets or emission removal efforts. Consumption-based emissions, or life-cycle emissions from food, air travel, and purchased goods and services, are not included in the City's annual GHG emission inventories but are a significant emissions source both locally and globally.² Efforts to reduce consumption-based emissions, therefore, will not count towards the City's carbon-neutral goal but remain important to the City's overall sustainability efforts.

Mountain View has already undertaken several actions to reduce waste-related emissions, such as implementing commercial and residential food scraps collection programs and adopting the Food Service Ware Ordinance to reduce single-use plastics. The City has adopted the California Green Building Code (CALGreen), which includes requirements for the recycling and salvage of construction and demolition debris. In addition, Mountain View continues to support a plant-rich diet through the City's Plant-Based Eating Program.

² For more information on consumption-based emissions, see the December 3, 2019 Council report entitled ["Community Greenhouse Gas Accounting, Reduction Targets, and Carbon Neutrality."](#)

The following types of actions could be implemented to further reduce emissions from consumption and solid waste:

- Strengthen the City's requirements for construction and demolition debris handling to increase the amount of material diverted from landfills and recycled and/or repurposed.
- Implement zero-waste plans to expand efforts to comply with SB 1383 and divert organic materials from landfills.
- Continue supporting and expanding the City's compost and recycling programs to ensure the City's goal of diverting 90% of waste from the landfill by 2030 is met or exceeded.
- Expand reuse, repair, and tool sharing programs to ensure materials are recovered, reused, and recycled to their highest purpose.
- Enhance refrigerant recycling programs.
- Continue to support a plant-rich diet through the City's current Plant-Based Eating Program.

Local Tree Canopy and Biodiversity

Preserving and enhancing Mountain View's tree canopy will lead to both increased carbon sequestration and increased resiliency by mitigating urban heat island impacts. The City has made great strides to enhance Mountain View's tree canopy with efforts, including engaging with the nonprofit Canopy to help develop new educational opportunities for residents to learn about the importance of trees and working to increase tree and vegetation plantings on City property with specific species that provide added shade and biodiversity. Currently, the Community Services Department is working on a scheduled five-year update to the Community Tree Master Plan (CTMP). A tree canopy and land cover assessment summary report will be completed as part of the update. The summary report will include Mountain View's total canopy percentage, canopy health and historic changes to the canopy. In addition, it will help focus more tree plantings in areas of the City that may be vulnerable to climate impacts such as extreme heat and, therefore, in need of more tree canopy coverage. The update will also include a Story Map with interactive maps and a priority planting plan for a way to share the importance of preserving and growing the urban forest.

Through the development of the City's Strategic Roadmap, Council prioritized the development of a Biodiversity Strategy to assist with landscaping standards for City and private property. The strategy will help guide decisions related to species that will withstand climate change, increase local habitat, and aid in the preservation and rewilding of our urban forest for a more sustainable

environment. Staff has begun work with the San Francisco Estuary Institute, and it is anticipated that a consultant will be selected later this summer to start this project.

To further preserve and enhance Mountain View’s local tree canopy, the City could implement the following measures:

- Continue to increase the number of trees planted on City property and consider the specific species that will maintain the City’s biodiversity.
- Incentivize shade trees and vegetation planting for private projects.
- Emphasize more tree plantings in communities that could be more vulnerable to climate impacts such as extreme heat such as low-income communities and communities of color, that have historically had significantly less tree canopy.

Carbon Dioxide Removal and Carbon Offsets

Given the challenge of eliminating all emissions, there are two primary ways to offset remaining GHG emissions to achieve carbon neutrality. The first option is to remove emissions by implementing high-quality, quantifiable carbon dioxide removal (CDR) projects. CDR creates “negative emissions” by removing carbon dioxide from the atmosphere and storing it for long periods of time, typically in terrestrial, geological, or oceanic reservoirs.³ Examples of nature-based CDR projects include enhancing carbon sequestration in soil and vegetation through methods like regenerative agriculture, wetlands restoration, biochar, and reforestation. Other municipalities with carbon-neutral by 2030 goals like Flagstaff, Arizona, have opted to incorporate CDR projects in their carbon neutrality plans because they offer multiple co-benefits, including improved air quality, soil quality, habitat restoration, reduced wildfire risk, and public health benefits. Mountain View’s parks and open space, Shoreline region, community gardens, and tree canopy are some of the primary areas within the City with potential to implement these types of projects. This approach would require a substantial portfolio of CDR projects with quantifiable annual sequestration potential.

The second option for addressing the remaining emissions to achieve carbon neutrality is the purchase of carbon offsets. Carbon offsets do not reduce GHG emissions in Mountain View but, instead, “offset” local emissions by funding equivalent reductions elsewhere. These projects can include efforts such as installation of renewable energy, methane capture, or tree planting. To ensure a net decrease in GHG emissions, the reductions must:

- Be quantifiable and verifiable using a transparent calculation methodology.

³ <https://www.wri.org/initiatives/carbon-removal>

- Be new and “additional,” meaning the project would not have otherwise occurred (i.e., the project does not create reductions required by regulations).
- Not result in negative impacts, including “leakage” (increasing emissions outside the project boundary).
- Be permanent, meaning the reductions cannot be reversed.

There are several third-party organizations that verify whether carbon offsets meet these criteria and ensure there is no double-counting of emissions reduction measures (e.g., an offset project is not also being used to comply with a regulatory mechanism such as cap-and-trade, and multiple entities are not receiving credit for the same offset).

Staff surveyed several organizations that offer verified carbon offsets for purchase to determine potential costs. Additionally, staff calculated the cost of Palo Alto’s carbon offset program, which adds a per-therm surcharge on natural gas to purchase offsets, because this example illustrates likely costs for offsets procured through a public bidding process. While the funding mechanism used by Palo Alto is not available to Mountain View, the City could choose to purchase offsets through a similar process using a different funding source. The results are shown in Table 2.

Table 2: Sample Costs of Verified Carbon Offsets

Carbon Offset Source	Cost per MT CO₂e
Palo Alto Offset Program	\$0.00-\$18.80
Carbon Offsets to Alleviate Poverty (COTAP)	\$15.00
Native Energy	\$15.50
Carbon Fund	\$16.25
Terrapass	\$16.99

Staff used the information in Table 2 to calculate the estimated annual cost of offsetting the City’s emissions that are not eliminated prior to the carbon neutrality target year. The estimated costs were calculated using a range of \$15.00-\$18.80/MT CO₂e. The resulting cost ranges are shown in Table 3 below. It should be noted that this table reflects the current cost of offsets. As more offset projects become available on the market, increasing supply may drive down price, although this impact to prices is not predictable currently.

As an anchor to this information and to illustrate how much work remains in achieving carbon neutrality, for 2019 and 2020 emissions, the annual cost range to offset emissions would be \$9.0 million to \$11.4 million and \$6.7 million to \$8.4 million respectively.

Table 3: Cost of Carbon Offsets By % GHG Reduction

GHG Emissions As % of 2005 Levels	Remaining Emissions to be Offset (MT CO₂e)	Cost (\$) Per Year
30%	211,216	\$3.2M-\$4M
25%	176,014	\$2.6M-\$3.3M
20%	140,811	\$2.1M-\$2.6M
15%	105,608	\$1.6M-\$2.0M
10%	70,405	\$1.1M-\$1.3M
5%	35,203	\$0.5M-\$0.7M
0% (Carbon Neutrality)	0	\$0

As shown in Table 3, the recurring cost of offsets is substantial, especially before the City has achieved most of its anticipated emissions reductions. This liability is significant if the City accelerates its carbon neutrality goal and commits to offsetting all emissions, regardless of the levels. Although offsets offer benefits in the global strategy to address climate change, they do not typically achieve sustained impact locally. As discussed previously, if an accelerated carbon neutrality goal is adopted, staff would likely recommend an approach that balances policy and accountability, keeping a primary focus on reducing emissions with a secondary use of offsets.

Question 3: Does the CSC agree with the recommendation to focus primarily on investing resources into strategies that reduce emissions, balanced with a lesser amount of purchasing offsets to achieve carbon neutrality?

Community Engagement and Equity

Community engagement is the foundation of a sustainable future for Mountain View. It elevates sustainability as a community priority and fosters empowerment and ownership of our shared climate goals. Many of the actions required to achieve carbon neutrality will require robust community engagement with a particular focus on equity. Some examples of equity considerations were discussed previously in the electrification and natural gas section. Mountain View will need to engage the full community to identify additional equity considerations such as better understanding needs and obstacles; ensuring equitable access to resources; and promoting broad participation in sustainability programs offered by the City and other organizations. Outreach for these programs would include partnering with local leaders and trusted community organizations and developing outreach materials that are culturally and linguistically appropriate.

The Sustainability Division, the Communications and Outreach Division, and the Multicultural Engagement Program will need to collaborate with City departments, local businesses, nonprofits, and other organizations to engage the community in achieving carbon neutrality. Current programs such as Electrify Mountain View, Cool Block, educational events, and workshops will be promoted, and new efforts such as a sustainability grant program or other approaches to engage the community may also be initiated. The City may also consider collaborating with other municipalities with carbon-neutral by 2030 goals to offer new and innovative engagement programs. For example, Ann Arbor, Michigan, is implementing a “Sustainability Concierge” service where residents can receive free advice and assistance with enhancing energy efficiency, home electrification, solar, and other sustainability-related actions. Mountain View could partner with other local municipalities to launch a similar regional effort locally.

Question 4: Does the CSC agree with the recommendation to consider equity implications in the identification of appropriate carbon neutrality goals and strategies?

Operational Impacts

All of the functions within the City have a part to play in achieving an accelerated carbon neutrality of as soon as 2030. This effort will involve cross-departmental collaboration and planning as well as changes to municipal operations. Mountain View will need to expand incorporation of climate action into the budget process, procurement decisions, strategic planning, and facility management. The City already operates a manager-level Sustainability Working Group and department head-level Sustainability Governance Committee. These teams would need to convene more frequently and improve cross-functional communication and decision-making under an accelerated carbon neutral timeline.

Achieving carbon neutrality on an accelerated timeline would also require additional staff resources. Current staff across City departments, although committed to sustainability, are working at full capacity. This need was recognized in the most recent Sustainability Action Plan as well as the through the Environmental Sustainability Task Force 2.

Program and Staff Funding

Progress has been made to increase staffing and funding to support sustainability, including funding the addition of a Chief Sustainability and Resiliency Officer, electrification specialist, Deputy Building Official, and Transportation Demand Manager; however, under an extremely ambitious 2030 carbon neutrality scenario, the City would need to consider the financial and staffing implications that would be required to accelerate existing programs and develop new programs. At this time, staff is not able to quantify the potential funding needed for additional programs and staff but will develop these projections at the time of developing a Carbon Neutrality Plan for the City. Staff will also need to consider budgetary resources over the next

five-year forecast period as part of this analysis. Staff will return to Council with a request to fund a consultant to support this effort.

Carbon Neutrality Target Date Options

Mountain View has already taken many steps to reduce GHG emissions. We are on the right path. Significant planning has been undertaken to identify priority sustainability actions required and integration of these efforts across City operations is under way. (A detailed description of all sustainability plans is included in Attachment 2). However, to be carbon-neutral by as soon as 2030, the City would need to amplify and accelerate these efforts, particularly those focused on reducing emissions from transportation and buildings. While 2030 is an ambitious accelerated carbon-neutral target year and the year most responsive to climate scientist recommendations, the City could also choose a different target year, such as 2035 or 2040. Table 4 outlines high level considerations for adopting an accelerated carbon-neutral target year.

Table 4: Relative Cost and Effort by Carbon Neutrality Target Year

Programs	Policy Adoption	Staffing	Offsets	Comments
Carbon Neutrality by 2030: Taking a leadership position on climate action could create an opportunity to leverage significant private financing. This would enable the City to accelerate progress on electrification of our buildings and transportation. It could also provide resources to address some of the equity considerations associated with carbon neutrality, specifically who bears the cost burden. Additionally, an ambitious carbon neutrality target would galvanize the community and enhance our legislative advocacy efforts by making a significant commitment to climate action. One consideration of a carbon neutrality by 2030 goal is the recognition that technological improvements may not meet this accelerated pace. Staff would recommend a balanced strategy related to emissions reductions and offsets where accountability is maintained but the focus would be on emissions reductions over offsets and resources would be invested accordingly.				
+++	+++	+++	+++	<ul style="list-style-type: none"> • Deep, seamless integration across all City departments • Significant new programs and policies to accelerate electrification of transportation and buildings • Substantial funding for incentives and increased staffing • Broad policy changes and reach codes • Deep community engagement and equity lens fully integrated • Leverage private financing and regional, State, and Federal incentives
Carbon Neutrality by 2035: A carbon neutrality by 2035 goal would represent a significant commitment to climate action, balanced with a recognition of the significant challenges involved in achieving carbon neutrality. The State as well as many municipalities are exploring a 2035 carbon neutrality goal, and there could be benefits to building momentum and aligning climate goals across the region. This goal, while still ambitious, could potentially be slightly less galvanizing to funders. Technological improvements may still not keep pace, making it challenging to be able to achieve wide-scale emissions reductions. Again, a strategic approach to balancing accountability with investing in local emissions reductions would need to be developed.				
+++	++	+++	++	<ul style="list-style-type: none"> • Extensive integration across all City departments • Expanded new programs and policies to accelerate electrification of transportation and buildings • Funding for incentives and increased staffing • Policy changes and reach codes • Robust community engagement and equity lens integrated • Leverage private financing and regional, State, and Federal incentives
Carbon Neutrality by 2040: The City's currently adopted carbon neutrality goal is 2045. An accelerated goal of 2040 would show commitment to climate action and a recognition of the urgency of reducing emissions even faster than is called for in the IPCC report. Technological advances could make this goal ambitious and achievable.				
++	+	++	+	<ul style="list-style-type: none"> • Integration across target City departments • New programs and policies to support electrification of building and transportation • Funding for increased staffing • Policy changes and reach codes • Community engagement and equity lens included • Leverage regional, State, and Federal incentives; explore alternative financing models

+ Represents level of effort/funding required.

Staff recommends that the City continue to explore setting a target date that achieves carbon neutrality as quickly as possible, and requests input and feedback on the staff recommendations below. Committee feedback will be used to develop a recommended carbon neutrality target date and approach for CSC consideration.

Does the CSC agree with the following staff recommendations?

1. Direct staff to develop specific accelerated carbon neutrality goals and implementation recommendations, for further discussion at the next CSC meeting (tentatively scheduled for late May).
2. Focus primarily on investing resources into strategies that reduce emissions, balanced with a lesser amount of purchasing offsets.
3. Focus carbon neutrality strategies on the electrification of buildings and transportation.
4. Consider equity implications in the identification of appropriate carbon neutrality goals and strategies.

NEXT STEPS

1. Staff incorporate feedback and continue analysis to develop carbon neutrality goals and implementation recommendations for CSC consideration.
2. Hold CSC meeting in May or June to review staff carbon neutrality recommendations.
3. Bring the CSC carbon neutrality recommendations to Council in late summer or early fall.
4. Hire consultant to develop a carbon neutrality plan in Fiscal Year 2022-23.
5. Concurrently continue progress on emissions reductions towards carbon neutrality through implementation of sustainability priorities as identified in Sustainability Action Plan 4.

CONCLUSION

By establishing a carbon-neutral target year of 2045, Mountain View has already demonstrated its commitment to addressing climate change and reducing GHG emissions. Achieving carbon neutrality by as soon as 2030, or even 2035, would require the City to accelerate GHG reduction efforts, particularly those focused on electrifying buildings and transportation. Within the next

fiscal year, the City plans to hire a consultant to develop a Carbon Neutrality Plan, which would inform the specific actions needed to attain carbon neutrality by the adopted target year.

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- Attachments:
1. Federal, State, and Regional Climate Initiatives
 2. City Climate Sustainability Plans

FEDERAL, STATE, AND REGIONAL CLIMATE INITIATIVES

Federal Initiatives

In December 2021, President Biden issued Executive Order 14057, which sets a range of goals to reduce U.S. greenhouse gas (GHG) emission by 50% to 52% from 2005 levels by 2030 and limit global warming to 1.5 degrees Celsius.¹ Federal goals relevant to carbon neutrality include:

- 100% carbon-free electricity by 2030, including 50% on a 24/7 basis;
- 100% zero-emission vehicle (ZEV) acquisitions by 2035, including 100% light-duty acquisitions by 2027; and
- Net-zero emission buildings by 2045, including a 50% reduction by 2032.

State Initiatives

In October 2020, the California Air Resources Board (CARB) released a report, *Achieving Carbon Neutrality in California*, that evaluates scenarios to achieve carbon neutrality in California by 2045.² This report found that ambitious near-term actions focused on energy efficiency, transportation and building electrification, carbon-free electricity, and reductions in nonenergy, noncombustion GHG emissions were needed to achieve this goal. The report also highlighted the importance of scaling up the State's research, development, and deployment efforts around GHG removal strategies. In 2021, Governor Newsom directed State agencies to assess pathways for the State to achieve carbon neutrality by a more advanced target year of 2035.

Senate Bill (SB) 100, or the "100 Percent Clean Energy Act of 2018," requires 100% of electric retail sales to end-use customers to be supplied by renewable energy and carbon-free sources by 2045 and updates the State's Renewables Portfolio Standard to ensure that at least 60% of California's electricity is renewable by 2030. As required by this legislation, the California Energy Commission (CEC), California Public Utilities Commission (CPUC), and California Air Resources Board (CARB) prepared a report that found the State can achieve SB 100 through multiple pathways.³

The State has set goals for adoption of ZEVs, which include both electric vehicles (EV) and hydrogen fuel cell vehicles. California's ZEV Action Plan outlines the strategy to reach Statewide

¹ Office of the Federal Chief Sustainability Officer, *Federal Sustainability Plan*: <https://www.sustainability.gov/federalsustainabilityplan/index.html>.

² The California Air Resources Board, "Carbon Neutrality": <https://ww2.arb.ca.gov/our-work/programs/carbon-neutrality>.

³ The California Energy Commission, "California Releases Report Charting Path to 100 Percent Clean Energy": <https://www.energy.ca.gov/news/2021-03/california-releases-report-charting-path-100-percent-clean-electricity>.

goals for ZEV adoption: 1.5 million by 2025 and 5 million by 2030, established by Executive Orders B-16-12 and B-48-18, respectively. These Executive Orders also created targets for EV charging infrastructure: 250,000 EV charging stations Statewide, including 10,000 DC fast charging stations, by 2025. State agencies and utilities have developed incentive programs for both vehicles and charging infrastructure to support these ambitious goals. In September 2020, Governor Newsom signed Executive Order N-79-20, which establishes goals to phase out fossil fuel use in the transportation sector.⁴ This Order establishes the following goals for new vehicle sales in California:

- 100% of new passenger cars and trucks will be ZEVs by 2035;
- 100% of off-road vehicles and equipment will be zero-emission by 2035; and
- 100% of medium-duty and heavy-duty vehicles will be ZEVs by 2045 (for all feasible applications).

Efforts to promote building decarbonization are also under way at the State level. As directed by Assembly Bill 3232, the California Energy Commission (CEC) developed the California Building Decarbonization Assessment to evaluate the potential to reduce GHG emissions in residential and commercial buildings by at least 40% below 1990 levels by 2030.⁵ Published in August 2021, the report found that the State could achieve this goal by expanding the use of electric heat pumps, weatherizing and electrifying existing buildings, decreasing refrigerant leakage, promoting fuel switching from natural gas to electricity, and investing in clean energy workforce training. Per SB 1477, the CEC has launched the Building Initiative for Low-Emissions Development (BUILD) program, which provides technical assistance and financial incentives for new, low-income residential building projects using near-zero-emission building technologies.⁶

Regional Initiatives

Silicon Valley Clean Energy (SVCE) has a decarbonization strategy focused on procuring and maintaining a carbon-free power supply, electrifying the built environment and transportation, and promoting energy efficiency and successful grid integration.⁷ In 2019, SVCE adopted an EV Infrastructure Join Action Plan to assess EV charging needs across the service territory and identify new SVCE programs focused on charger deployment. These programs include a transportation electrification workgroup, regional EV leadership recognition programs,

⁴ California Air Resources Board, Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20), January 19, 2021: <https://ww2.arb.ca.gov/resources/fact-sheets/governor-newsoms-zero-emission-2035-executive-order-n-79-20>.

⁵ The California Energy Commission, Building Decarbonization Assessment: <https://www.energy.ca.gov/data-reports/reports/building-decarbonization-assessment>.

⁶ The California Energy Commission, "The BUILD Program Guidelines": <https://www.energy.ca.gov/publications/2022/building-initiative-low-emissions-development-build-program-guidelines-1st>.

⁷ Silicon Valley Clean Energy, Decarbonization Strategy and Programs Roadmap: <https://www.svcleanenergy.org/decarbonization/>.

incentives for DC fast-charging in SVCE-defined priority areas (multi-unit dwellings and corridor uses), technical assistance for multi-unit dwelling residential charging projects, workplace charging rebates, and fleet electrification grants.⁸ Adopted in 2020, SVCE's Building Decarbonization Joint Action Plan identifies strategies to decarbonize new and existing buildings. Strategies include more advanced reach codes for 2022, a feasibility assessment for natural gas phase-out by 2045, local policies to decarbonize existing buildings, the FutureFit Homes and Buildings program, accessible financing, and efforts to support market development.⁹

Santa Clara County is currently developing a Climate Roadmap 2030 to align existing GHG emission reduction efforts across the County and facilitate regional partnerships. The County is also considering a carbon-neutrality goal for the unincorporated areas of the County and has launched a County Climate Collaborative, which brings together staff from various cities, community-based organizations, and institutions across the County to collaborate on sustainability efforts.

⁸ Silicon Valley Clean Energy, EV Infrastructure Joint Action Plan: <https://www.svcleanenergy.org/decarbonization/#>.

⁹ Silicon Valley Clean Energy, Building Decarbonization Joint Action Plan: <https://www.svcleanenergy.org/decarbonization/#>.

CITY CLIMATE SUSTAINABILITY PLANS

Since 2008, Mountain View has developed four types of sustainability plans:

- **Sustainability Action Plans (SAPs):** In 2008, the City developed its first of four SAPs, with each including specific actions for implementation over a three-year time frame.
- **Greenhouse Gas Reduction Program (GGRP):** Developed in 2012, this plan mitigates the environmental impacts of the 2030 General Plan to comply with the California Environmental Quality Act (CEQA). Mandated by the Bay Area Air Quality Management District, the GGRP identifies five strategies and 20 measures to help the City achieve its GHG emissions reductions goals through 2030.
- **Climate Action Plans (CAPs):** In 2015, Mountain View developed CAPs for both the community (Climate Protection Roadmap) and municipal operations (Municipal Operations Climate Action Plan). Each plan identifies short- and long-term strategies and actions across multiple sectors to reduce emissions 80% (below the 2005 baseline) by 2050.
- **Sustainability Strategic Plan:** In 2018-19, the City assessed its own program and developed a strategic plan that mapped out four levels of impact and three levels of response to climate change (Foundational, Advanced, Innovative). This plan directly informed the City Council's significant commitment to sustainability in Sustainability Action Plan 4.

Furthermore, the City is committed to developing two additional sustainability plans:

- **Resilience and Adaptation Plan:** As part of adopting Sustainability Action Plan 4, the City committed to developing a plan that identifies the strategies and actions needed to adapt to the increasing effects of climate change, including how to be more resilient in the face of these impacts.
- **Carbon Neutrality Plan:** On April 21, 2020, the City Council adopted a resolution to become carbon-neutral by 2045 and directed staff to develop a plan by 2025 for how to achieve this goal.

With a need to update its CAPs and GGRP and develop a Resilience and Adaptation Plan and Carbon Neutrality Plan, staff anticipates hiring a consultant to develop an overarching plan that consolidates these plans. This consolidated sustainability framework would then inform the strategies and actions in Sustainability Action Plan 5.