

DATE: April 18, 2023

TO: Council Sustainability Committee

FROM: Danielle Lee, Chief Sustainability and Resiliency Officer

VIA: Audrey Seymour Ramberg, Assistant City Manager

SUBJECT: **Building Decarbonization Opportunities**

PURPOSE

This memorandum provides an update and seeks the Council Sustainability Committee's input in pursuing building decarbonization strategies as a means of achieving carbon neutrality.

RECOMMENDATION

Provide direction on staff questions regarding the approach to developing building electrification initiatives.

BACKGROUND**Carbon Neutrality and Decarbonization Opportunities**

Mountain View must significantly reduce its emissions in order to achieve carbon neutrality by 2045 or earlier. For reference, the California Air Resources Board's scoping plan for carbon neutrality by 2045 entails an 85% greenhouse gas (GHG) emissions reduction by 2045 at the State level. The City can make significant progress toward carbon neutrality by focusing on decarbonization (reducing GHG emissions) within its boundaries.

At the April 19, 2022 and June 22, 2022 Council Sustainability Committee (CSC) meetings, staff presented information regarding the implications for accelerating Mountain View's current adopted carbon-neutrality target year of 2045. The staff reports are included as Attachments 1 and 2. The CSC approved the proposed hybrid approach, which would entail completing targeted analysis to develop a road map for carbon neutrality by 2035, exploring opportunities to build partnerships and to leverage private financing, and developing an approach to address residual emissions that remain after the carbon-neutrality target year. As part of the discussion, staff recommended that the City primarily focus on the decarbonization of buildings and transportation as the primary strategy toward achieving carbon neutrality.

While both decarbonization of buildings and transportation are important, the content of this memo focuses on buildings. Building decarbonization is a fitting initial area of focus because the City has substantial influence on implementation of strategies in this area. Staff is also currently working on transportation decarbonization initiatives, such as the electrification of the City's fleet and the installation of public electric-vehicle charging stations. Future discussions will be scheduled to discuss transportation decarbonization and other decarbonization topics.

Buildings and Carbon Emissions

According to a 2018 Buildings Baseline Study conducted by Silicon Valley Clean Energy (SVCE), buildings account for 35% of emissions in the City of Mountain View. The vast majority of emissions from residential and commercial buildings in the City of Mountain View originates from the use of natural gas. In 2020, natural gas use contributed 76% of emissions from the energy sector.

The City of Mountain View, the City's residents, and businesses receive energy primarily from SVCE, which provides carbon-free electricity. This presents a unique opportunity to greatly cut the City's GHG emissions by transitioning buildings from natural gas to clean electricity.

Decarbonization of Buildings

In 2019, the City passed a Reach Code requiring all new buildings to be built all-electric. In December 2022, the City again passed an all-electric Reach Code, continuing its leadership on building sustainable and resilient new buildings, powered by electricity.

While progress on new buildings is important, most of Mountain View has already been built out. Natural gas use within existing buildings, therefore, remains a major contributor to GHG emissions, and implementing scalable solutions will be needed to cut emissions from existing buildings. Solutions include replacing a significant number of gas appliances in the existing building stock. This includes a rough estimate of 7,000 residential appliances per year for 20 years. That amounts to an estimated total of 30,000 gas water heaters, 20,500 gas furnaces, and 15,500 gas stoves, among other gas appliances. Existing building electrification presents challenges due to technical complexities, project costs, and lack of an adequate workforce to install the appliances.

ANALYSIS

There are many leverage points to accelerate decarbonization of buildings in Mountain View. These include:

- Transforming our City buildings;

- Conducting robust community engagement and education and outreach efforts;
- Adopting policies addressing new and existing buildings;
- Pursuing collaborative efforts with partner organizations; and
- Launching direct installation programs.

City Buildings

Constructing new buildings all-electric and converting existing City buildings from natural gas to electricity reduce the City's carbon footprint as well as demonstrate the feasibility of all-electric projects for the community as a whole. The City has made progress in changing how new facilities are built and electrifying its existing buildings. The Senior Center and the Mountain View Aquatics Center are some recent examples.

The City applied for grant funding from SVCE in November 2022 to convert the Mountain View Senior Center's water heating and kitchen to electric systems. The City was awarded the full requested amount, \$497,000. This was an interdepartmental effort between the Public Works Department, Community Services Department, Multicultural Engagement Program, and the Sustainability Division. The Legislative Advocacy services team, including its consultant, Renne Public Policy Group (RPPG), supported the drafting of the grant application. The Senior Center Electrification Project will utilize the City's own facility as an example of building electrification feasibility, while improving facilities for the 150 seniors who utilize the facility daily. City staff will bring acceptance of the grant to the City Council for approval in spring or summer 2023.

The Mountain View Rengstorff Park Aquatics Center is currently in design and will have multiple sustainability features, such as roof-mounted solar photovoltaic and solar thermal water-heating system, electric vehicle charging stations, and other building elements designed to a LEED Gold® standard. The facility will be fully electric—a cutting-edge example of municipal facilities for the future.

Additionally, Mountain View has converted the HVAC system at Fire Station No. 1 from natural gas and has been working to replace small natural gas appliances with electric or heat pumps as the appliances need replacing. For larger replacement projects, the City will evaluate eliminating natural gas and includes conversion when feasible.

Mountain View reduced emissions from its government operations by half between the years of 2005 to 2018. In particular, between 2015 and 2018, emissions from City buildings and facilities decreased by 44%, largely due to the purchase of 100% renewable electricity from SVCE. Staff is currently developing the 2022 government operations greenhouse gas inventory and will present

updated metrics in summer or fall 2023. Mountain View can continue to advance building decarbonization and clean-energy projects by seeking out grant and financing opportunities. The Inflation Reduction Act (IRA), for example, provides a unique opportunity to pursue City building decarbonization projects in a cost-effective way. More information about the IRA is included later in the “Monitoring Legislative, Policy, and Funding Opportunities” section.

City Policies

Mountain View passed its Reach Code for new buildings in December 2022. The City can build upon this momentum to advance existing building decarbonization through policies and collaborative strategies. Policies are essential for Mountain View to exceed its currently adopted 2045 carbon-neutrality goal.

City staff has been working with SVCE to explore existing building policy options. In January of this year, staff participated in a “policy sprint” with SVCE to identify potential decarbonization policies and strategies that SVCE and jurisdictions can pursue to accelerate progress towards decarbonization. Identifying and evaluating different policies showed that multiple strategies will be needed to reach carbon neutrality in a timely manner. Additionally, careful consideration for the timing of when to consider adoption of these policies is also critical. For example, is the cost burden of the new requirement reasonable; is newly required equipment available for purchase; and is the workforce available and prepared to install new equipment? Some examples of building decarbonization policies for consideration include:

- Appliance replacement policy—requires electrification when gas appliances fail;
- Major renovation policy—requires electrification during renovations; and
- Property transfer policy—requires electrification when property is sold or lease transferred.

At this time, staff recommends assessing for feasibility of an appliance replacement policy and a major renovation policy. An appliance replacement policy would require building owners to replace certain gas appliances when they stop working with electric ones. The City’s Reach Code already has all-electric requirements for major renovations; staff recommends discussing regionally the potential for amending codes to expand the definition of major renovations to increase the impact of the code’s electrification requirements.

The two policies, if implemented, would help residents accomplish gas appliance replacements in a strategic manner, during points in time when they are already considering home improvements. Some home improvements are especially cost-effective when done during a renovation or upon appliance burnout. For example, mandating space-cooling installations to include heat pump space heating has no incremental cost, compared to installing a gas heating and air-conditioning system. Installing a heat pump water heater upon burnout of a gas water

heater has an incremental cost of \$2,000 after incentives per appliance, compared to installing the gas equivalent. This is compared to \$4,000 after incentives if installing a heat pump water heater during the gas water heater's useful lifetime, also known as "early retirement." It will be worthwhile to explore replacing gas appliances that are nearing the end of their useful lifetime, before burnout. That may allow residents to proactively replace appliances, in a cost-effective way. Different appliances may necessitate different policy approaches due to nuances in cost and permit compliance levels.

Assessing the feasibility of these policies will require coordination with SVCE and other cities in the region and robust community engagement. The City would continue to participate in SVCE's effort to develop model, existing building-electrification policies for cities, including studying the potential costs and impacts of each policy and identifying which appliances are the most cost-effective to electrify. Staff would also coordinate with other cities to maintain consistency in building code requirements across the region. This process would also include outreach to key stakeholders, including contractors, businesses, and residents.

Question 1: Does the CSC agree with the recommendation to direct staff to assess the feasibility of adopting an appliance replacement policy and expanding the definition of major renovation in the City's Reach Code?

Building Decarbonization Direct Install Pilot Program

Residents that would like to electrify their buildings face many barriers, such as project cost, lack of information or misinformation, and shortage of home contractors prepared to install electric appliances. Mountain View residents would benefit from a service that provides information and project support all in one place. City staff is in the process of contracting with a vendor, BlocPower, to provide this kind of turnkey project support.

The proposed pilot program will focus on multi-family properties as they currently face the greatest barriers to electrification. BlocPower will help identify multi-family properties that can most benefit from energy improvements. In addition, a certain number of households representing traditionally underserved households will be prioritized in the project which includes, for example, low-income and/or non-English-speaking households.

The vendor will project manage the partial electrification of 300 building units. Partial electrification is defined as having at least one measure (hot water heat pump or atmospheric heating-cooling heat pump) installed in the home. Another 100 units will be made electrification-ready, meaning that they would have the wiring and electrical capacity to accommodate future electrification. Furthermore, BlocPower will provide project financing, which could be utilized at the discretion of building owners. The City will ensure that financing terms are transparent and that participants are aware that taking part is entirely voluntary.

Following the project, the City and BlocPower will publicize the results of the pilot to build awareness about and generate additional interest in building decarbonization. City staff will analyze lessons and will identify any successes that can be implemented on a greater scale.

Staff is planning to fund the decarbonization pilot with grant funding from the Department of Energy's (DOE) Energy Efficiency and Conservation Block Grant (EECBG) Program. Staff plans to commence the pilot in the second quarter of 2023, pending DOE review of the proposed scope.

Question 2: Does the CSC agree with the recommendation to direct staff to develop a building decarbonization direct install pilot program?

Community Engagement, Education, and Outreach

The Sustainability Division conducts a suite of community engagement and outreach activities that accelerate building decarbonization in Mountain View. Whether community members are learning about decarbonization for the first time or working to go fully electric, the City has resources to support where they are in the journey. Through each method, the City provides information, connects residents to funding opportunities such as rebates, and encourages community action in building decarbonization. When possible, resources for community members are also provided in Spanish, Chinese, and Russian and are created to be culturally appropriate through consultation with the City's Multicultural Engagement Program.

The suite of building decarbonization outreach efforts currently includes:

Engagement Level	Engagement	Description
One-way communication	Sustainability website	Connect residents/businesses to rebates, provide information, news, and encourage decarbonization.
One-way communication	Community newsletter	Connect residents/businesses to rebates, provide information, and encourage decarbonization.
One-way communication	Sustainability dashboard	Display includes subsection on building decarbonization.
Two-way communication	AskMV	Direct resident outreach to staff, including questions on decarbonization.

Engagement Level	Engagement	Description
Two-way communication	Sustainability social media—Facebook, Instagram, and Nextdoor.	Connect residents and businesses to rebates, provide information, and encourage decarbonization. Paid ads on these platforms reach thousands of people beyond account followers.
Two-way communication	Collaborate Mountain View	In addition to providing information, residents post stories and engage with each other as a community and with staff.
Interactive	Sustainability-hosted events	Events hosted by Mountain View educates and encourages decarbonization, answers questions, and connects residents to decarbonization resources.
Interactive	Partner events	At partner events, Sustainability highlights decarbonization opportunities in an engaging way. For example, by providing induction stove resources at our plant-based eating events and creating games around the topic for Arbor Day.
Deepest engagement	Electrify Mountain View	Personalized recommendations on home electrification, rebates, marketplace, and continuing to expand resources for users.
Deepest engagement	Cool Block	Neighborhood (or other groups) meet eight (8) times to build community, sustainability, and resilience. Planned transition to narrow focus to support participants in decarbonizing their home during the program.

Collaborative Strategies

To successfully achieve decarbonization, the use of natural gas, a fossil fuel, must ultimately be discontinued. As a critical first step in this process, staff recommends pursuing neighborhood-level electrification strategies as a proof of concept that electrification at scale can be achieved. Electrification upon utility company upgrade to the natural gas delivery system (also known as gas pruning) is a neighborhood-level approach to electrify and improve the electrical distribution

system as an alternative to costly repairs or replacement of the natural gas system. This approach would facilitate investment of resources towards the future energy needs of the community rather than in natural gas infrastructure that Mountain View and other governmental agencies are working to discontinue using. This approach requires collaboration between many stakeholders, including SVCE, PG&E, the California Public Utilities Commission (CPUC), the City, and the City's businesses and residents.

Staff is working to assess the feasibility of a gas-pruning pilot. Data requests have been submitted to PG&E to begin the process of understanding planned gas infrastructure upgrades and opportunities for neighborhood-scale electrification. Additionally, RPPG is tracking policy discussions at the CPUC, which is considering allowing utilities to participate in pruning pilots. Finally, staff will be requesting permission from the County of Santa Clara to focus the next Cool Block cohort to implement deep community engagement in pursuit of neighborhood-scale electrification.

Question 3: Does the CSC agree with the recommendation to direct staff to assess the feasibility of a gas pruning pilot?

Monitoring Legislative, Policy and Funding Opportunities

New policies and legislation at the regional, State, and Federal level will impact Mountain View's decarbonization efforts. Mountain View can position City policy proposals in light of regional action and can leverage funding from the Federal Inflation Reduction Act for decarbonization, resiliency, renewable energy, and more. The City also has the opportunity to advance municipal solar projects to lock in more favorable payback rates before the new CPUC Net Energy Metering Program goes into effect.

Bay Area Air Quality Management District Phase-Out of Natural Gas Appliances

On March 15, 2023, the Bay Area Air Quality Management District voted to phase out the sale of natural gas-powered furnaces and water heaters beginning in 2027 to improve local air quality and public health. This regional action strengthens the case for City-level appliance replacement policies as a way to smooth and accelerate the community's transition to a future of all-electric appliances.

California Public Utilities Commission Net Energy Metering Program Changes

On December 15, 2022, the CPUC issued a decision to modify the State's Net Energy Metering (NEM) program, which compensates solar customers for excess electricity sent to the grid. Since 2017, all major investor-owned utilities have operated under the second version of this policy, NEM 2.0, which allows solar customers to sell excess electricity back to the grid at the retail rate, which averages about 30 cents per kWh. Effective April 14, 2023, new solar installations will be

subject to “NEM 3.0,” also known as “Net Billing.” The NEM 3.0 is based on the “avoided cost” to the utility of buying clean electricity elsewhere. Under NEM 3.0, utilities will pay solar customers about 8 cents per kWh for excess electricity, which is roughly 75% less than under NEM 2.0. According to the CPUC, NEM 3.0 will incentivize battery storage adoption and improve California’s grid reliability. When the sun starts to set in the late afternoon and early evening, solar output declines, and other energy resources must ramp up to meet electricity demand. Battery storage allows customers to save solar energy for use or export in the evening hours, when the grid is most stressed.

Mountain View has until April 14, 2023 to grandfather future solar systems into NEM 2.0 by submitting an interconnection application. However, submitting an interconnection application does not commit Mountain View to solar system installation but ensures the City can benefit from more favorable payback rates if a system is installed within three years. NEM 2.0 rates are effective for 20 years after solar installation. Staff is submitting interconnection applications for the Senior Center, Cuesta Park Tennis Center, City Hall, and the Center for the Performing Arts and is assessing the feasibility of other sites. The City will further assess the viability of solar installations coupled with battery storage at these sites upon approval of the interconnection applications.

Inflation Reduction Act

On August 16, 2022, the United States Congress passed H.R. 5376, also known as the Inflation Reduction Act (IRA), which invests \$369 billion in climate and energy initiatives at the Federal, State, and local levels over the next 10 years. The IRA’s climate-related provisions primarily take the form of tax credits and financing mechanisms, with smaller amounts available as grants. About half of IRA-climate funding goes to expanding tax credits for renewable electricity and providing incentives for battery production, clean hydrogen, and decarbonization of vehicles, buildings, and industrial processes. The bill also directs substantial investments into healthier, more efficient housing, clean manufacturing, and clean vehicles.

Over \$325 billion is available to local governments, and notable funding opportunities include:

- Section 13801 of the IRA enables nontax-paying entities, including local governments, to access the financial benefit of many of the clean energy tax credits through an “elective payment of applicable credits.” The provision applies to the tax credits for clean electricity production and investment, commercial clean vehicles, alternative-fuel vehicle refueling equipment, and clean fuel production, among others. In most cases, the tax credits became available beginning January 1, 2023 and will continue for 10 years;
- \$87 million through the Low Emissions Electricity Program, which funds projects that reduce emissions from electricity generation and use through consumer-related education, partnerships, outreach, and technical assistance;

- \$7 billion in competitive grants for rapid deployment of low- and zero-emissions products, technologies, and services to low-income and disadvantaged communities;
- \$4.75 billion for Greenhouse Gas Air Pollution Planning and Implementation Grants; and
- \$1 billion to improve building energy codes.

Many IRA-funded programs are covered by Justice40, the Biden-Harris Administration's commitment to deliver at least 40% of the overall benefits from investments in climate, clean energy, and related areas to disadvantaged communities. As shown in Figure 1, the White House Climate and Economic Justice Screening Tool (CEJST) identifies three Justice40 census tracts within Mountain View located along Rengstorff Avenue and in the North Bayshore.

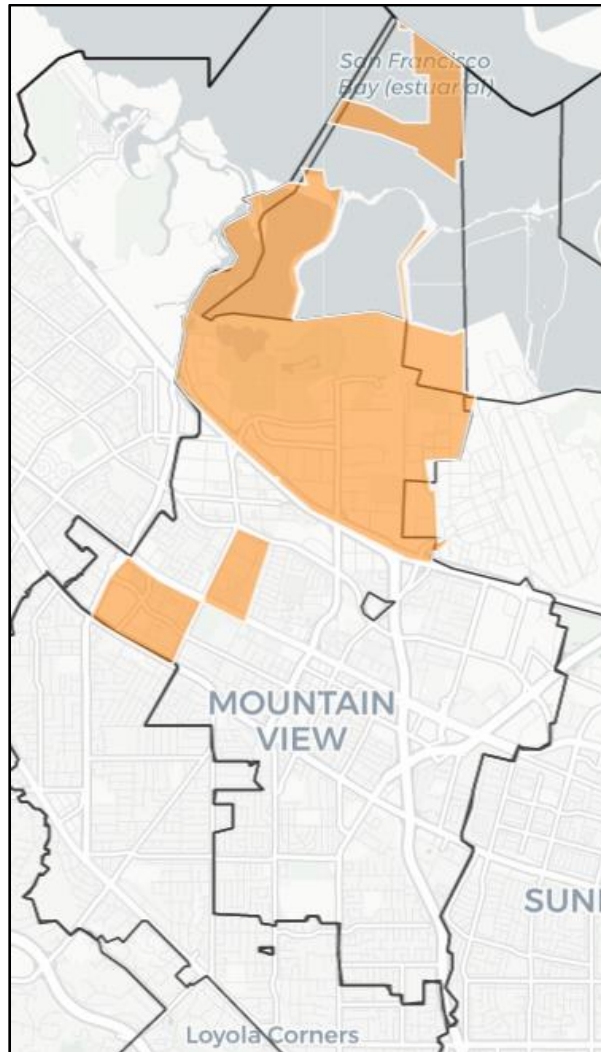


Figure 1: Justice40 Census Tracts in Mountain View

NEXT STEPS

1. Staff will incorporate feedback from the CSC to develop and implement initial building decarbonization policies and programs.
2. The CSC will meet again in May to review preliminary results of the most recent GHG Inventories, to receive a status update on the Sustainability Action Plan 4 (SAP-4), and to consider proposed amendments to SAP-4.
3. Staff will bring proposed SAP-4 changes to Council in June 2023.
4. Staff will develop a full decarbonization plan upon completion of SAP-4 for CSC and Council consideration.

CONCLUSION

Decarbonization is key to achieving carbon neutrality. Mountain View has made progress on reducing its GHG emissions, and it can accelerate that progress by focusing on a number of key building decarbonization strategies. The City can leverage funding and financing opportunities, collaborate with program partners, and build community support to implement these strategies.

DL/LA/1/MGR
624-04-18-23M

Attachments: 1. CSC Memo—April 19, 2022
 2. CSC Memo—June 22, 2022