Marin County's Building Electrification Roadmap

Our community's transition to an all-electric future

9/5/24

COMMUNITY DEVELOPMENT AGENCY
COUNTY OF MARIN

MARIN CLIMATE & ENERGY PARTNERSHIP

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- MCEP: Christine O'Rourke, Sustainability Coordinator

Special Thank You to Community Stakeholders participating in the Co-development of this Roadmap

Marin Climate & Energy Partnership
Marin Clean Energy (MCE)
Transportation Authority of Marin (TAM)
PG&E
BayREN
Canal Alliance
North Marin Community Services
Rising Sun Center for Opportunity
San Rafael Chamber of Commerce
Sustainable San Rafael
Sustainable Mill Valley
Marin Conservation League
Marin/Sonoma Electrification Squad
Good Green Work
Marin Center for Independent Living
Marin Asian Advocacy Project
Multicultural Center of Marin
Sausalito Sustainability Commission
Corte Madera Climate Action Committee
Fairfax Climate Action Committee
San Anselmo Climate Action Commission
Novato Sustainability Commission
Marin Environmental Housing Collaborative
Marin Builders Association
MARIN REALTORS
EAH Housing
Hope Housing of Marin
Eden Housing
Community Land Trust Association of West Marin (CLAM) - West Marin
Seagull Prime Real Estate Fund
Rising Design & Construction
GreenLynx
Samina Saude Design & Consulting
Hassler Heating and Air Conditioning, Inc.
Ready-Set-Replace
Marin Academy, Climate and Justice Class

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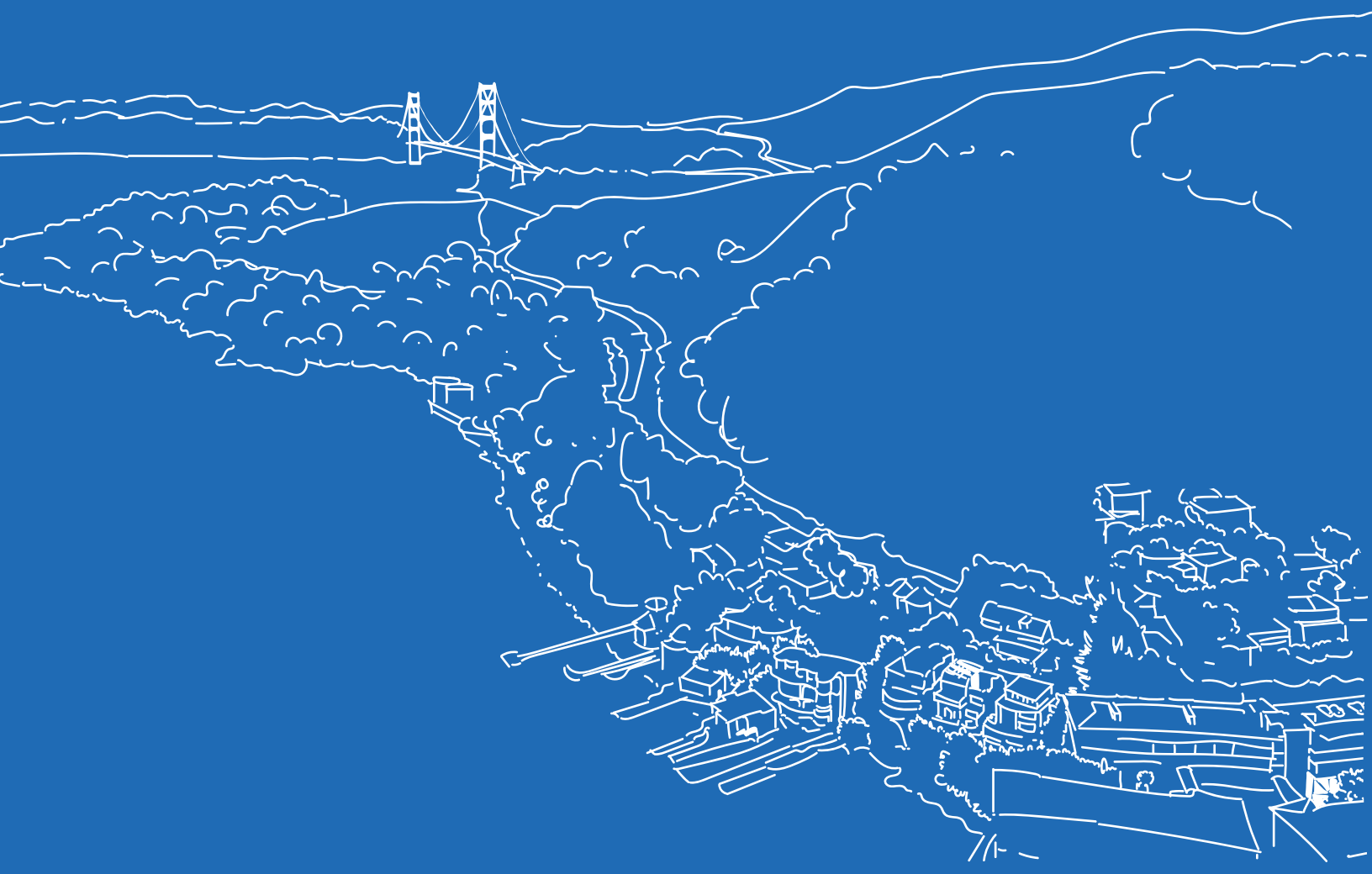

Executive Summary

In response to California AB32 Global Warming Solutions Act of 2006, local governments especially the twelve cities, towns and unincorporated Marin, developed climate action plans that laid out a variety GHG emission reduction strategies to implement. Adopting green building reach codes (building standards that go above and beyond) is one of the best tactics local governments have to directly reduce emissions.

More commonly known green building approaches focus on energy efficiency and solar PV installs, but the urgency of the climate crisis has prompted State, regional and local policy makers to also accelerate emission reductions by rapidly replacing gas combusting appliances and systems in homes and businesses with clean, all-electric ones. However, the use of building requirements alone are not a comprehensive solution to electrification and reducing emissions. Requirements must be accompanied by incentive, rebate, financing, and workforce development programs as well as new innovative policies that incent, support, and accelerate gas to electric conversions for all Marin residents and businesses.

Marin's Countywide Building Electrification Roadmap is a holistic plan to transition buildings equitably and rapidly to an all-electric and more energy-efficient future. The roadmap was developed in response to a 2022 Marin Civil Grand Jury report. It called for the development and coordinated implementation of a countywide building electrification plan. Most of Marin's jurisdictions agreed. Starting January 2023, the County of Marin Sustainability Team and Marin Climate and Energy Partnership (MCEP) began co-developing the roadmap in partnership with a wide range of community stakeholders including:

1. Elected officials,
2. City/Town government staff,
3. Utilities and public/regional agencies,
4. Community-based organizations,
5. Building and development practitioners and industry, and
6. Youth/student groups

The heart of the roadmap document was broken up into three parts:

1. Ten Actions (indexed A to J) recommended to transition to an all-electric future.
2. A proposed timeline (2024 to 2031) that phases implementation of the ten actions.
3. A detailed discussion on how the ten phased actions can be implemented by organizations and people within the community.

The ten actions are as follows and as illustrated on the following page (see The Roadmap):

A. Create a "Central Hub" for easy access to electrification information and resources
B. Implement advanced green building and electrification codes
C. Implement permit streamlining and incentives
D. Provide low-cost financing programs
E. Develop the building energy and electrification workforce pipeline
F. Work with PG&E to improve infrastructure planning and grid interconnections
G. Implement actions in partnership with community-based organizations
H. Implement the Marin Countywide EV Acceleration Strategy
I. Implement a time of listing energy assessment (TLEA) policy
J. Pilot a neighborhood-scale electrification and gas infrastructure decommissioning project

The Roadmap

- **A** Create a "Central Hub" for easy access to electrification information and resources
- **B** Implement advanced green building and electrification codes
- **C** Implement permit Streamlining and Incentives
- **D** Provide low-cost financing programs
- **E** Develop the building energy and electrification workforce pipeline
- **F** Work with PG&E to improve infrastructure planning and grid interconnections
- **G** Implement actions in partnership with community-based organizations
- **H** Implement the Marin Countywide EV Acceleration Strategy
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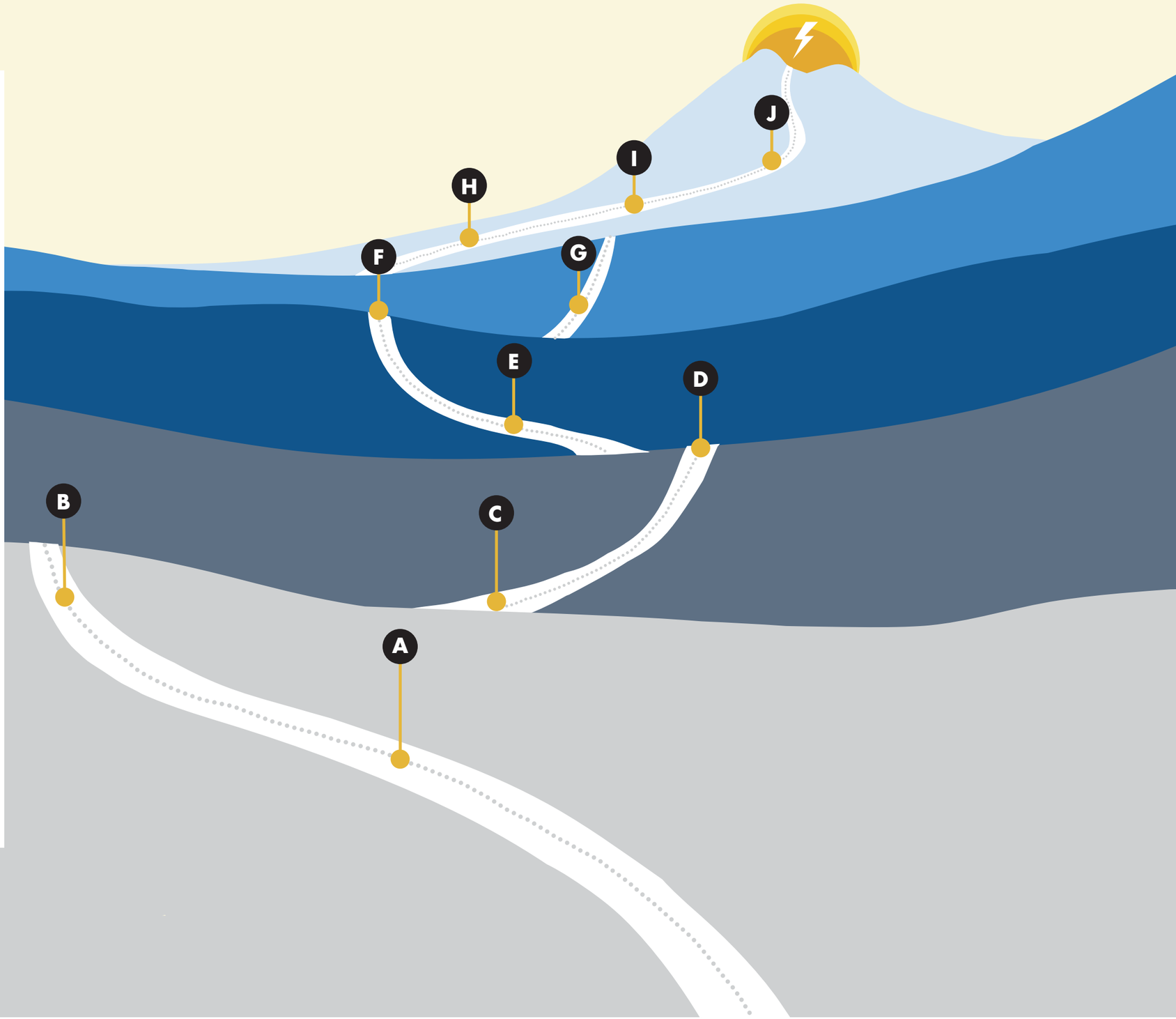
- **J** Pilot a neighborhood-scale electrification and gas infrastructure decommissioning project



Resolution Adoption Template

(Version for City and Town Staff)

Template Resolution and Staff Report

The roadmap can be used by Marin's City, Town and County staff and council to model and adopt, whole or in-part, as stand-alone policy and programs. The roadmap's actions can also be used as an accompaniment to implement emission reduction strategies found in each jurisdiction's Climate Action Plans. Ultimately, it is up to each jurisdiction to determine what and how to implement recommended actions.

For ease, the following a sample resolution for councils to consider adoption is provided– in the format County of Marin uses for resolutions – should a jurisdiction decide to adopt the roadmap as policy.

Sample Resolution

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RESOLUTION NO.___

A RESOLUTION ADOPTING MARIN'S COUNTYWIDE ELECTRIFICATION ROADMAP, PUBLISHED <DATE>, RECOMMENDING ACTIONS TO TRANSITION BUILDINGS EQUITABLY AND RAPIDLY TO AN ALL-ELECTRIC FUTURE

WHEREAS, the <City Name, Town Name, Marin County> Climate Action Plan 2030 identifies reducing building energy use, and specifically natural gas use, as one of the most effective means of meeting the adopted goal of reducing greenhouse gas emissions to 40% below 1990 levels by the year 2030 for the <City Name, Town Name, unincorporated areas>; and

WHEREAS, an inventory of 2022 greenhouse gas emissions for the <City Name, Town Name, unincorporated County) found that the use of energy in residential and non-residential buildings within the <City Name, Town Name, unincorporated County> generates <x%, County = 31%> of the <City, Town, County's> total annual greenhouse gas emissions, <x%, County = 88%> of which comes from the combustion of natural gas in buildings; and

WHEREAS, the <City Council, Town Council, Marin County Board of Supervisors> adopted a resolution on <Date, County = June 15, 2021> declaring a climate emergency and reaffirming the <City's, Town's, County's> commitment to reducing greenhouse gas emissions; and

WHEREAS, on June 6, 2022, a Civil Grand Jury Report entitled *Electrifying Marin's Buildings: A Countywide Approach* was published. The report concluded a need for a comprehensive building electrification plan that lays out countywide strategies local policymakers and the community can implement. A majority of the twelve jurisdictions across Marin agreed that a more coordinated effort to plan for an all-electric transition is needed; and

WHEREAS, from January 2023 until August 2024, the County of Marin's Sustainability Team and Marin Climate and Energy Partnership (MCEP) engaged and partnered with over 40 community stakeholders upfront to co-develop an electrification roadmap that put forth actions and subtasks communities can implement. A total of 20 subcommittee meetings, a 3-part workshop series, and ad-hoc conversations occurred with stakeholders which included the following:

1. Elected officials,
2. City/Town government staff,
3. Utilities and public/regional agencies,
4. Community-based organizations,
5. Building and development practitioners and industry, and
6. Youth/student groups

WHEREAS, on <DATE>, the County of Marin Sustainability Team, Marin Climate and Energy Partnership (MCEP), in partnership with community stakeholders published "*Marin's Countywide Building Electrification Roadmap: Our Community's Transition to an All-electric Future*" that recommended ten key actions (indexed A to J) and subtasks to implement over a phased timeline from 2024 to 2031. See below summarizing the ten actions:

A. Create a “Central Hub” for easy access to electrification information and resources
B. Implement advanced green building and electrification codes
C. Implement permit streamlining and incentives
D. Provide low-cost financing programs
E. Develop the building energy and electrification workforce pipeline
F. Work with PG&E to improve infrastructure planning and grid interconnections
G. Implement actions in partnership with community-based organizations
H. Implement the Marin Countywide EV Acceleration Strategy
I. Implement a time of listing energy assessment (TLEA) policy
J. Pilot a neighborhood-scale electrification and gas infrastructure decommissioning project

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors hereby adopts Marin’s Countywide Building Electrification Roadmap.

PASSED AND ADOPTED at a regular meeting of the Board of Supervisors of the County of Marin held on this ___th day of _____ 20__, by the following vote:

AYES:

NOES:

ABSENT:

_____
PRESIDENT, BOARD OF SUPERVISORS

ATTEST:

_____
CLERK

[Intentionally left Blank]

<DATE>

Honorable <City Council, Town Council, Board of Supervisors>
<Address>
<City, State, Zip>

SUBJECT: Resolution adopting Marin's Countywide Electrification Roadmap, published <DATE>, a plan to transition Marin's buildings from gas to all-electric.

RECOMMENDATION: Adopt a resolution to implement actions detailed in Marin's Countywide Electrification Roadmap.

BACKGROUND: The 2022 greenhouse gas (GHG) emissions inventory identified buildings as accounting for <x%, County = 31%> of the <City, Town, County's> total annual greenhouse gas emissions, <x%, County = 88%> of which comes from the combustion of natural gas in buildings. Marin Clean Energy (MCE) has a goal of providing 100% renewable and carbon-free electricity to its customers by 2045, making building electrification one of the most effective approaches our <City, Town, County> can take to decarbonizing our buildings, and therefore a key strategy in achieving the goal of reaching the <City, Town, County's> carbon neutrality target by 20__.

POLICY CONSIDERATIONS: The Countywide Building Electrification Roadmap is consistent with the actions as laid out in the most recent release of the <City Name, Town Name, County's> Climate Action Plan <List all relevant strategies tying back to your jurisdiction's CAP>:

- <Example: Strategy RE C-2: Encourage residents and businesses to switch to 100% renewable electricity (MCE Deep Green, MCE Local Sol, and PG&E Solar Choice)>.

PROPOSED RESOLUTION: The proposed resolution adopts the following actions as detailed in the Countywide Building Electrification Roadmap <Choose from all or any of the following ten actions as indexed A-J>:

A. Create a "Central Hub" for easy access to electrification information and resources
B. Implement advanced green building and electrification codes
C. Implement permit streamlining and incentives
D. Provide low-cost financing programs
E. Develop the building energy and electrification workforce pipeline
F. Work with PG&E to improve infrastructure planning and grid interconnections
G. Implement actions in partnership with community-based organizations
H. Implement the Marin Countywide EV Acceleration Strategy
I. Implement a time of listing energy assessment (TLEA) policy
J. Pilot a neighborhood-scale electrification and gas infrastructure decommissioning project

COMMUNITY ENGAGEMENT: The roadmap followed the "Housing Electrification Community Roadmap Template" framework as developed by Rocky Mountain Institute (RMI), Emerald Cities Collaborative, and local government staff. The framework for community engagement entailed prioritizing equity, early and often engagement, and giving the community more meaningful participation in the co-development of the roadmap.

From January 2023 until August 2024, the County of Marin's Sustainability Team and Marin Climate and Energy Partnership (MCEP) engaged and partnered with over 40 community stakeholders upfront to co-develop an electrification roadmap that put forth ten actions and subtasks communities can implement. A total of 20 subcommittee meetings, a 3-part workshop series, and ad-hoc conversations occurred in concert with members of the community. Each MCEP subcommittee member spent at minimum at total of 25 volunteer hours and each community stakeholder spent at minimum a total of 7 to 10 volunteer hours to co-develop the actions and provide feedback on the roadmap.

Prior to writing the roadmap, the ten actions were published online as a survey widely circulated throughout the community. The survey garnered 385 respondents, providing comment on which actions are preferred to implement.

EQUITY IMPACT: At the heart of the development process was elaborate engagement with and input from Marin's community stakeholders early and often. While dramatically reducing GHG emissions through electrification policy and programs, it is imperative implementation of actions also ensure that no communities are unfairly impacted nor are left behind in accessing benefits. Through the development process, the County met with the building community (e.g., developers, contractors, realtors), community-based organizations representing seniors aging-in-place, affordable housing advocates, and those serving equity priority/frontline communities. The proposed resolution seeks to balance our ambitious climate, housing, and equity obligations with a combination of sound policy and effective incentive and rebate programs.

The roadmap's actions were enhanced by integrating equity into the development process and each recommended action. In the process of creating action for the roadmap, each action was evaluated for negative impacts and opportunities to benefit those frequently underserved were identified.

The following steps were taken to evaluate and integrate equity into the actions put forth in the roadmap:

1. A Building Inventory of Marin's building stock was performed alongside an equity analysis of its residences. The equity analysis identified the general areas West Marin, North Marin/Downtown Novato, San Rafael's Canal District and Downtown, Strawberry and Marin City as communities most underserved. The intent was not to prefer one community over another, but rather, identify opportunities to reduce barriers when delivering benefits of electrification and building upgrades to the community.

2. A three-part community workshop series with stakeholders was conducted. Stakeholders aided in co-developing the actions as seen on the roadmap.

3. The roadmap integrated equity into each action. Each action was examined and documented to improve equitable outcomes for those most underserved.

ENVIRONMENTAL CONSIDERATIONS:

Climate, Sustainability and Health: Emissions from <City Name, Town Name, unincorporated County) found that the use of energy in residential and non-residential buildings within the <City Name, Town Name, unincorporated County> generates <x%, County = 31%> of the <City, Town, County's> total annual greenhouse gas emissions, <x%, County = 88%> of which comes from the combustion of natural gas in buildings. In conjunction with <City Name, Town Name, County of Marin's> Climate Action Plan, electrification of building equipment, developing energy reach codes, and providing access to energy and electrification incentives and rebates are key tactics to eliminate emissions from Marin's buildings and reach carbon neutrality by 20__. Electrification of buildings also improves indoor and outdoor air quality through elimination of combustion equipment that produces nitrogen oxide, carbon monoxide, and benzene. In addition, electric space and water heating appliances are highly efficient, so electrification of space and water heating appliances is expected to result in a net decrease in energy used by buildings in Sacramento.

California Environmental Quality Act (CEQA): <Check with the County first if a Notice of Exemption needs to be filed. Though, it is anticipated that the resolution is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Further, the resolution, should one or many action be implemented, will protect and enhance the environment and Marin County's natural resources by reducing local greenhouse gas emissions by reducing the use of fossil fuels through building code; by encouraging electrification and electric vehicle infrastructure measures through incentive and rebate programs; by requiring additional energy efficiency, electrification, and electric vehicle infrastructure measures through state approved building standards>.

RATIONALE: <City Council, Town Council, Board of Supervisors> has adopted a resolution on <Date, County = June 15, 2021> declaring a climate emergency and reaffirming the <City's, Town's, County's> commitment to reducing greenhouse gas emissions. The Countywide Building Electrification Roadmap is responsive to the <Council's, Board of Supervisor's> direction and serves as an accompanying feature to implement the <City's, Town's, County's> Climate Action Plan especially to building, electric vehicle, and renewable energy strategies that point to the transition of buildings away from natural gas to all-electric buildings and meet carbon neutrality by 20__.

ECONOMIC IMPACTS: Should all of the actions detailed in the building electrification roadmap be implemented, expect to have a net positive economic impact, reflecting projected post-electrification on-bill savings for households across the County; a range of incentives and rebates designed to assist with the transition; new workforce development opportunities; and, through improved health and productivity benefits derived from improved indoor and outdoor air quality and reduced indoor heat impacts. Implementation of the plan is anticipated to leverage state, federal, and local funding and financing that will benefit Marin's economy.

FISCAL IMPACT: This action does not impact the General Fund.

REVIEWED BY:	☒ Administrator	☐ N/A
	☐ Department of Finance	☒ N/A
	☒ Counsel	☐ N/A
	☐ Human Resources	☒ N/A

SIGNATURE:

Attachments

1. Marin Countywide Building Electrification Roadmap
2. Online Community Feedback Survey Results: February 16 to March 5, 2024

1.0 Introduction

Marin's Countywide Building Electrification Roadmap is a plan to equitably and rapidly transition buildings to an all-electric and more energy-efficient future. Much like a map, it shows steps community actors such as governments, businesses, utilities, and residents can take to reduce their contribution to a worsening climate crisis by switching buildings away from using polluting fossil fuels such as gas.

The roadmap was developed in response to a June 6, 2022, Marin Civil Grand Jury report[1]. The report concluded a need for comprehensive building electrification plan that lays out countywide strategies local policymakers and the community can implement. In response to the Grand Jury report, a majority of the twelve Marin jurisdictions agreed that a more thoughtful and coordinated approach to countywide electrification should take place.

Policies, programs, incentives, and increased market demand for electric appliances and systems are starting to drive down greenhouse gas (GHG) emissions and transition buildings to an all-electric future, yet more is needed. This roadmap details actions the people and communities of Marin can take between now and 2031 to successfully transition away from burning natural gas (referred to herein as "gas") in homes; the predominant source of building GHG emissions.

Four key sections make up this roadmap:

1. Introduction
   a. How to best use the roadmap.
   b. What are the benefits of transitioning to all-electric buildings?
   c. Why and how we lead with equity.
   d. Summary of the challenges and solutions to electrification.
2. Community Participation and Co-Development Process
   a. A brief on the community's participation and contributions to co-developing this roadmap.
3. Proposed Actions to Electrify Our Communities
   a. Details impactful actions the community could implement to make this transition.
4. Appendices
   a. Supplementary information that includes comprehensive analysis, research, and other relevant resources considered when developing this roadmap.

Why Transition to All-Electric Buildings?

Three top reasons Marin's community can benefit:

Climate and Policy Mandates

Gas is responsible for 85% of Marin's building emissions. As a result, the State (starting in 2030) and regional air district covering the nine county SF-Bay Area (starting in 2027) has adopted zero-emission appliance standards that bans the selling and installation of gas space and water heaters.

Health and Safety

Gas-burning appliances and their continued release of harmful pollutants within and outside the home can increase the risk of respiratory infection, asthma, heart disease, and death (UCLA, Zhu et al., 2020). Among the most vulnerable are children seniors, low-income, and Black and Latino communities. Gas is also a contributor to residential fires.

Resiliency and Comfort

When coupled with solar, battery storage, and/or improved insulation, all-electric buildings improve the ability to adapt to climate and natural disaster events. An electrified home is typically well-insulated, which can minimize penetration of smoke and outdoor air pollutants during fires. In contrast to the electrical grid, the gas grid can take longer to restore after an earthquake.

1 Civil Grand Jury Report. 2021-2022. Electrifying Marin's Buildings: A Countywide Approach available for download at https://www.marincounty.gov/departments/grand-jury/civil-grand-jury-reports

1.1 How to Use

Please read the following as a guide to using the roadmap:

Guide	Description
A Recommendation 	The roadmap does not require or compel, rather, it recommends a series of implementable actions to transition buildings away from using fossil-fuels, in particular gas. The roadmap illustrates how and when community stakeholders can act. Community stakeholders are described in Section 2.0 Community Participation and Co-Development Process.
Residential Building 	The roadmap is framed as a countywide electrification roadmap for all building types. Actions will focus on existing residential homes including single-family and multi-unit developments. However the same or similar actions may be applicable to commercial buildings.
Phased Action Timeline 	Section 3.0: Proposed Actions to Electrify Our Communities is the heart of the roadmap. Actions are written as policies, programs, or incentives. Ten key actions are put forth and detailed. The actions were then overlaid on a timeline between 2024 to 2031. The timeline is reflected as a Gantt chart broken up into three phases: immediate-, near-, and long-term. The phasing in of actions on this timeline aligns with regional and State policy and programs. Communities may opt to take earlier action.
Appendices 	Supplementary research and analysis. Anything too long or not referenced in sections 1.0, 2.0, and 3.0 are in the appendices.
Energy Efficiency 	In the context of this roadmap, electrification also includes energy efficiency (e.g., insulation, windows) and electrical systems (e.g., electric panels and service, solar PV, battery back-up). Pairing electrification with energy efficiency improvements will accelerate building performance, save consumers on utility costs, and improve grid reliability and health.
Operational Carbon 	The roadmap proposes actions to reduce carbon emissions resulting from the use of fuels to heat, cool and power buildings. This is commonly referred to as a building's "operational carbon[2]." It does NOT cover "upfront carbon" or carbon resulting from the extraction, manufacturing, transportation, and assembly of building materials, goods, and services consumed by people.
Policy-relevant Tool 	The roadmap can be used by Marin's City, Town and County governments to model and adopt, whole or in-part, as stand-alone policy and programs. It can also be used as an accompaniment to implement emission reduction strategies found in each jurisdiction's Climate Action Plans[3].

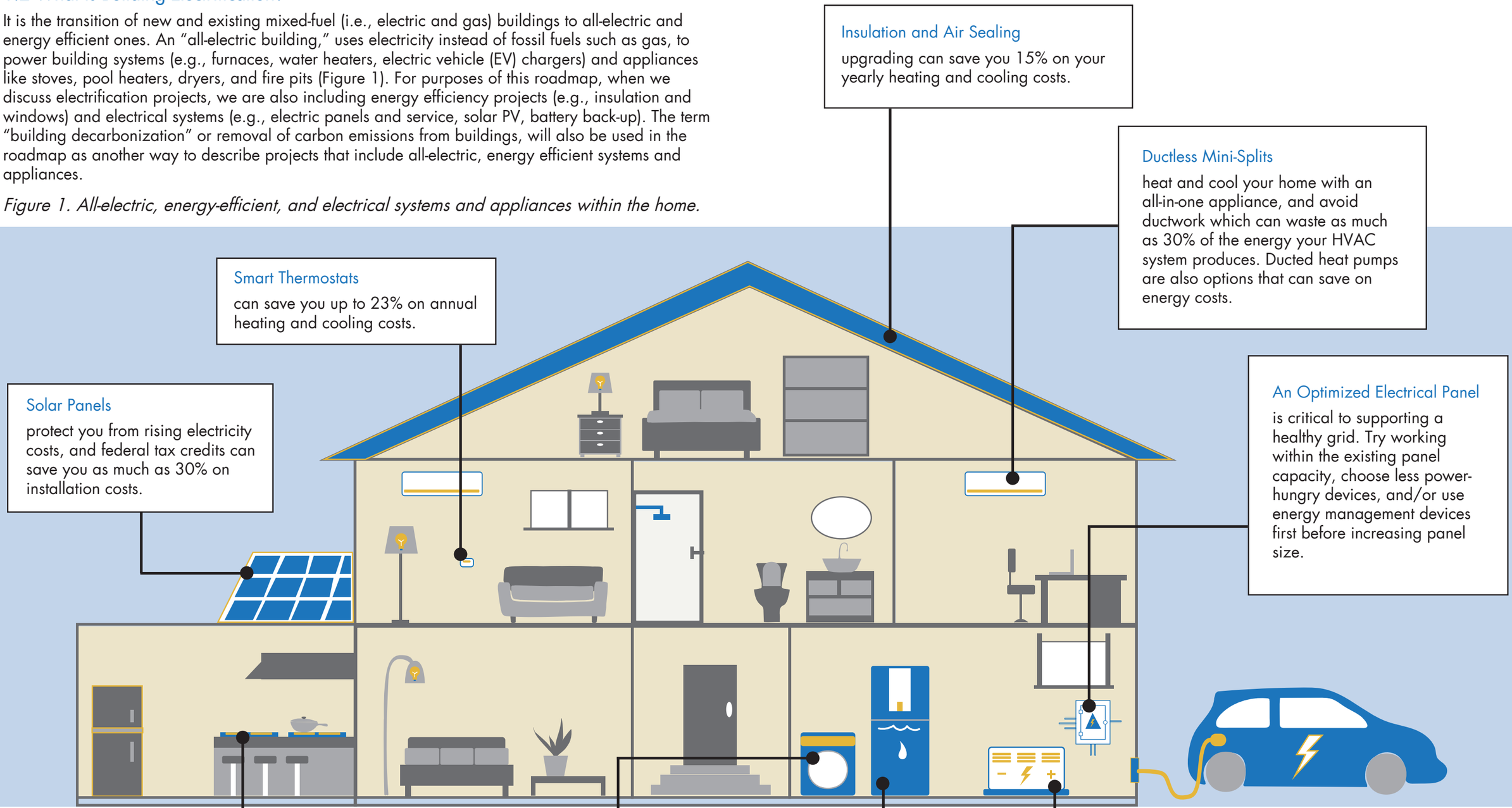
2 Operational and upfront carbon is best described by The World Green Building Council's report on bringing embodied carbon upfront. Accessible at https://worldgbc.org/article/bringing-embodied-carbon-upfront/

3 See Marin Climate & Energy Partnership's website at https://marinclimate.org/climate-action-plans/ for all jurisdictions' climate action plans that show communities how to reduce their carbon footprint.

1.2 What is Building Electrification?

It is the transition of new and existing mixed-fuel (i.e., electric and gas) buildings to all-electric and energy efficient ones. An "all-electric building," uses electricity instead of fossil fuels such as gas, to power building systems (e.g., furnaces, water heaters, electric vehicle (EV) chargers) and appliances like stoves, pool heaters, dryers, and fire pits (Figure 1). For purposes of this roadmap, when we discuss electrification projects, we are also including energy efficiency projects (e.g., insulation and windows) and electrical systems (e.g., electric panels and service, solar PV, battery back-up). The term "building decarbonization" or removal of carbon emissions from buildings, will also be used in the roadmap as another way to describe projects that include all-electric, energy efficient systems and appliances.

Figure 1. All-electric, energy-efficient, and electrical systems and appliances within the home.



1.3 Benefits

All-electric buildings create benefits for building occupants and communities. Consider the following:

1. **Today's electric systems and appliances are critical to reducing climate impact and more efficient when compared to buildings running on mixed fuels** (electric + gas). Modern induction and heat pump technology are substantially more efficient, cheaper to operate when compared to gas or older electric resistance counterparts, and, when run on grid or off-grid renewable energy, can accelerate the reduction of GHG emissions – air pollutants responsible for climate change.

2. **Electrified buildings can reduce health risks.** Electrification can create healthier, safer, and more resilient homes and neighborhoods by eliminating indoor and outdoor pollutants such as nitrous oxides (NOx), particulate matter, carbon monoxide and benzene – gas pollutants known to cause death, asthma and other respiratory illnesses, heart diseases, and cancer, among other health issues[4]. In addition, heat pump technology both heats and cools buildings, providing critical protection from life-threatening heat events, while filtering out dangerous particulates during smoke events.

3. **The risk of gas pipeline ruptures and fires can be eliminated with the absence of gas infrastructure.** Even in more rural West Marin – where there is an absence of PG&E gas infrastructure beneath and within buildings – residences and businesses are required to use large propane tanks or run on inefficient electric resistance systems to power buildings. In addition to eliminating the risk of propane tank ruptures across West Marin, the installation of electric powered heat pumps can reduce the net costs of using propane, especially when systems are connected to battery powered generators.

4. **Electrified buildings can reduce grid strain.** This concept may sound counter intuitive, but electrical demand can be reduced when efficient electrical appliances and electrical systems are appropriately designed and installed through demand management.

Equity Described

This report uses the term "equity" or "equitable" often. Equity can be defined as "the just and fair inclusion into a society in which all can participate, prosper, and reach their full potential" (2022 Race Equity Action Plan), Marin County Office of Equity). However, society has been systemically unfair and not inclusive to all, especially the disparate treatment of people of color, low-moderate income (LMI) households and/or vulnerable communities (e.g., seniors aging-in-place, disabled, marginally housed, etc.). Disparities are exacerbated especially with catastrophic events such as pandemics, earthquakes, fires, heat waves, floods, and storm surges.

4 Physicians for Social Responsibility. 2022. Gas stove pollution factsheet. Downloadable at https://psr.org/wp-content/uploads/2022/05/gas-stove-pollution.pdf.

1.4 Elevating Equity

The roadmap's actions were enhanced by integrating equity into the development process and each recommended action. The roadmap followed the *"Housing Electrification Community Roadmap Template"* developed by Rocky Mountain Institute (RMI), Emerald Cities Collaborative, and local government staff[5]. In the process of creating an electrification plan, it is best practice to evaluate impacts and elevate opportunities to benefit those frequently underserved. In the context of this document, underserved includes people of color, low-moderate income (LMI) households especially renters in multi-unit developments that are typically cost[6]- and/or energy[7] burdened, and vulnerable communities[8].

The following steps were taken to evaluate and integrate equity into the actions put forth in the roadmap:

1. A Building Inventory of Marin's building stock was performed alongside an equity analysis of its residences. (See Appendix A: Building Stock Inventory and Equity Analysis.) The equity analysis identified West Marin, North Marin/Downtown Novato, San Rafael's Canal District and Downtown, Strawberry and Marin City as communities most underserved. The intent is not to prefer one community over another, but rather, identify opportunities to reduce barriers when delivering benefits of electrification and building upgrades to the community.

2. A three-part community workshop series with stakeholders was conducted. Stakeholders aided in co-developing the actions as seen in this roadmap. (See Section 2.0 Community Participation and Co-Development Process below.)

3. The roadmap integrates equity into each action. Each action was examined to improve equitable outcomes for those most underserved. (See Section 3.0 Proposed Actions to Electrify Our Communities below.)

1.5 Challenges and Solutions

All new California homes today are required to be built to modern standards. Newer homes can accommodate today's electric appliances while providing increased comfort and energy efficiency. One of Marin's biggest barriers to electrifying is not its newly constructed buildings, rather, the existing – often much older – buildings. This challenge is exacerbated by an electrical grid in need of modernization.

Six key challenges and solutions to electrifying existing buildings have been summarized (Table 1). Each challenge listed in the table contains a hyperlink which links to a more detailed policy and literature review of that topic. (See Appendix B: Examining the Challenges and Solutions to Marin's All-electric Transition.) Although commercial buildings are not specifically addressed here, there is often an overlap between challenges and solutions for residential homes and commercial buildings.

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5 Rocky Mountain Institute and Emerald Cities Collaborative. Accessed 2024. Equitable home electrification toolkit. Accessed 2024 available at https://rmi.org/equitable-home-electrification-toolkit/.

6 According to HUD, affordable housing costs should equal 30% or less of a household's Income at https://www.huduser.gov/portal/pdredge/pdr_edge_featd_article_092214.html.

7 According to Dept. of Energy, energy burden is the disproportionate percentage of income spent on energy costs at https://www.energy.gov/scep/slsc/low-income-community-energy-solutions.

8 Vulnerable populations are best described as, but not limited to, seniors aging-in-place, youth, unhoused or marginally housed residents, non-English speaking people, immigrants, people with disabilities, people who are socially isolated, and people with pre-existing health conditions.

Table 1. Challenges and potential solutions to electrifying existing homes in Marin.

Challenge	Description	Potential Solutions
Aging Residential Buildings	71% of residential buildings countywide are single-family and 94% of these were built before 2000.	Provide electrification and energy efficiency policies, programs, and incentives for single-family residences especially LMI households and seniors aging-in-place.
Equity, Renter Protection, and Displacement	29% of residential buildings countywide are multi-unit dwellings of which 84% are renters. Renters especially those in older buildings require more repairs, are vulnerable to no-fault evictions or temporary displacement by landlords willing to exploit rent law loopholes during building rehabilitations.	Work with local, regional and/or State policymakers to adopt tenant protection policies that identify and close any substantial remodel loopholes. Voluntary programs that subsidize landlords such as direct install by contractor programs, can include tenant protection assurances as part of the terms and conditions of accepting financial assistance.
Grid Modernization and Reliability	California's electric grid is old and needs upgrading to support increased demands of today's power-hungry buildings. According to a Berkeley Energy Institute study, utilities such as PG&E are not expanding their transmission and distribution network fast enough to upgrade their grid infrastructure and meet the State's climate and energy goals.	PG&E, CAISO, and CPUC needs to help speed up expansion of grid infrastructure. In the meanwhile, local and regional government and policymakers can better coordinate with PG&E to identify locations, then speed up timelines to connect and upgrade customers to the grid. MCE and Marin local governments can improve electric grid health by helping households better manage/reduce energy demand and optimize electric service panels and systems.

Challenge	Description	Potential Solutions
Optimizing Electric Service Panels (aka "breaker box")	With three out of four residential buildings built before 1980, many of Marin's existing homes must choose to optimize (i.e., manage existing capacity and appliances) or upgrade and increase their electrical breaker box and system. The additional costs to increase electrical system sizes can cost owners from ~$3,000 to $25,000. A more economical option would be simply seeking to work within a building's existing system's electrical capacity.	First, local governments should focus on existing buildings when adopting green building and EV charging infrastructure reach (above and beyond) codes. Then, as part of that code, electric readiness standards should be put forth, prioritizing panel optimization over upsizing. Complimentary electric panel rebate and incentive programs should also prioritize panel optimization over panel upsizing. Furthermore, these programs should be designed in a way that prioritizes underserved households.
Policy and Market Trends	Regional (2027) and State (2030) policy is mandating a ban on selling and installing of gas combusting water or space heating appliances. In addition, U.S. heat pump sales outpaced gas furnace sales. Lastly, Marin County new EV sales are amongst the highest per capita in the Country.	California communities, especially Marin, need to rapidly electrify and prepare its electrical capacity to meet growing demand. With one of the lowest rates of home electrification in the U.S., California single-family and multi-unit homes should rapidly scale-up existing and innovative policies (i.e., sticks) and incentive programs (i.e., carrots) that meet climate action obligations and improve community health and safety.
Contracting and Permitting for Electrification Projects	Stakeholder interviews and focus group workshops revealed a lack of qualified, knowledgeable and/or affordable contractors to install all-electric systems including water and space heat pumps, EV chargers, and modern electrical systems and panels. There is also a lack of technical knowledge by the building staff workforce on new technologies such as heat pump water heaters or smart panels. This creates uncertainty and delays permit review timelines.	State and regional authorities have developed and continue to maintain qualified contractor lists. Simultaneously, MCE, local governments, community-based organizations, businesses, and the building and trades community can leverage State and Federal funding to grow and create a diverse and skilled workforce. The funding can be used to retrain existing and generate a new workforce that simultaneously has access to high quality and high road[9] jobs. Continual staff training of building examiners and inspectors in electric appliance and system technologies and installations.

9 "High road jobs" means high industry labor standards and established access to clear training pathways for

Findings are based on a literature review of policies and programs already developed and interviews of government staff, community-based organizations, and building industry across Marin, California, and the U.S. (See Appendix B: Examining the Challenges and Solutions to Marin's All-electric Transition.) Challenges and potential solutions surfaced during community stakeholder workshops and a public survey were also considered. For more details on community workshops and participation, see Section 2.0 Community Participation and Co-Development Process below.

The potential solutions in the table above are not yet recommended actions to take. Recommended actions are put forth in Section 3.0 Proposed Actions to Electrify Our Communities below.

building decarbonization jobs, especially for entry-level and disadvantaged workers. See Rising Sun press release on its convening and promotion of equitable job access in the Bay Area. Available for download at https://risingsunopp.org/wp-content/uploads/Rising-Sun-HRTP-Press-Release.pdf

2.0 Community Participation and Co-Development Process

2.1 Vision, Goal and Equity Principles

At the heart of the roadmap was elaborate engagement with and input from Marin's community members upfront, prior to development of a plan or any decisions made. The County of Marin Community Development Agency and Marin Climate & Energy Partnership (MCEP) embarked on a stakeholder engagement process that started in earnest in January 2023 and concluded June 2024.

The **vision** for the electrification roadmap's engagement process was to provide community stakeholders[10] a forum to participate in co-developing key components of the plan.

The **goal** was to ensure that an implementable countywide plan was developed through comprehensive research and by creating a space for robust collaboration between elected officials, City/Town government staff, public/regional agencies, community-based organization representatives, building and development practitioners and industry, and youth/student voices.

Implementing actions that deliver equitable outcomes was discussed throughout the process, especially during community workshops. The following summarizes the core equity principles surfaced during those engagements:

1. Conduct community engagement activities that give participants the opportunity to develop proposed actions.

2. Prioritize and increase incentive and rebate program access to underserved, hard-to-reach residences, and families.

3. Develop programs that do not escalate costs for renters and homeowners on fixed incomes or considered low-to-moderate income. Develop policy solutions that minimize the potential for gentrification and resident displacement.

4. As the workforce grows, ensure there is a diverse community of new and existing contractors being trained for high quality jobs while simultaneously giving access to wrap-around services (e.g., transportation and childcare subsidies) and career development opportunities.

2.2 Community Engagement Approach and Process

First, a steering committee was established consisting of MCEP members including sustainability and community engagement staff with the County of Marin, City of San Rafael, City of Novato, Town of Corte Madera, Town of San Anselmo, Town of Fairfax, and Marin Clean Energy. The steering committee met every other week over 14 months to establish an approach and strategy to developing the electrification roadmap. In addition to recommending when and who to engage in the community, the committee recommended how to best engage. The committee wanted to ensure a diversity of interests came together in one room over a series of interactive and productive workshops and conversations. They also emphasized the need for attendance of voices typically excluded from engagement, especially organizations and individuals that represent Marin's underserved communities.

Second, stakeholders were invited to participate in three planned workshops over a five-month period. The ask of community stakeholders was to collectively recommend actions to put forth in the electrification roadmap. Based on need, availability, and capacity, some stakeholders volunteered to take a more active role in co-development while some lacked capacity and instead preferred to simply stay informed of the roadmap's progress or not participate at all. Stakeholders ranged from government actors and public agencies (e.g., elected officials, city/town/county staff, and utilities), community-

10 In contrast to individuals, stakeholders are organizations or entities who serve the needs of a group of individuals, neighborhoods, or residences and businesses across Marin. Stakeholders serve communities that will be affected by and can affect building policy and programs.

based organizations (e.g., those who prioritize underserved residences, environmental/climate action, and seniors aging-in-place), the building community (e.g., contractors, developers, REALTORS, architects), and youth and student advocates, among others. See Appendix C: Community Engagement Findings and Results, Table C-1 for a detailed list of workshop series participants.

Third, a survey (in English and Spanish) of the actions co-developed with workshop participants was widely distributed for public feedback. Workshop participants and the organizations they represent, government communications staff and elected officials across 12 jurisdictions, and public regional agencies (e.g., Marin Health and Human Services, MCE, and Transportation Authority of Marin (TAM)) helped distribute the survey. As a result, 385 people responded to the survey which asked for their impression of the 10 recommended actions and how they would prioritize implementation. Survey results were published online[11] and included in the appendices. (See Appendix C: Community Engagement Findings and Results, Public Survey Process and Results.)

Lastly, feedback loops with stakeholders were established. Progress was publicly shared online[12]. In addition, in-person and virtually ad-hoc conversations, progress updates, and presentations to organizations and their members were given. Four iterations of key components to the roadmap were co-developed and shared with workshop participants during and after the completion of the workshop series. (See Appendix D: Key Actions Worksheet – Descriptions, Details, Equity Considerations, and Implementing Partners.) Workshop and survey findings were consolidated to begin writing the electrification roadmap herein.

11 County of Marin Community Development Agency Sustainability Division. 2023. Building Electrification Roadmap Survey: Actions to Electrify Our Buildings and Vehicles. Results available for download at https://www.marincounty.org/depts/cd/divisions/sustainability/electrify-marin/green-building-development/electrification-roadmap.

12 County of Marin Community Development Agency Sustainability Division. 2023-2024. Marin Countywide Building Electrification Roadmap landing webpage. Available at https://www.marincounty.org/depts/cd/divisions/sustainability/electrify-marin/green-building-development/electrification-roadmap.

2.3 Summary of Workshop Findings

Nearly 16 months of active engagement resulted in the following (Figure 2):

1. **Over 20 steering committee meetings**
2. **3 in-person stakeholder workshops**, attended by 42, 36, 26 people, respectively, representing community-based organizations (CBOs), building community and practitioners, government staff, appointed climate commissioners, and regional and public agencies, including utilities.
3. **7.5 to 10 volunteer hours** by each participant to learn, share resources, develop key components of the roadmap, and co-develop actions.
4. **10 key actions** (with 40 sub-actions) were put forth. (See Section 3.1. Ten Actions.)
5. **A public survey of 385 respondents** provided comment on the 10 key actions. (See Appendix C: Community Engagement Findings and Results.)

Figure 2. Stakeholder participation in the co-development of the electrification roadmap.

3.0 Proposed Actions to Electrify Our Communities

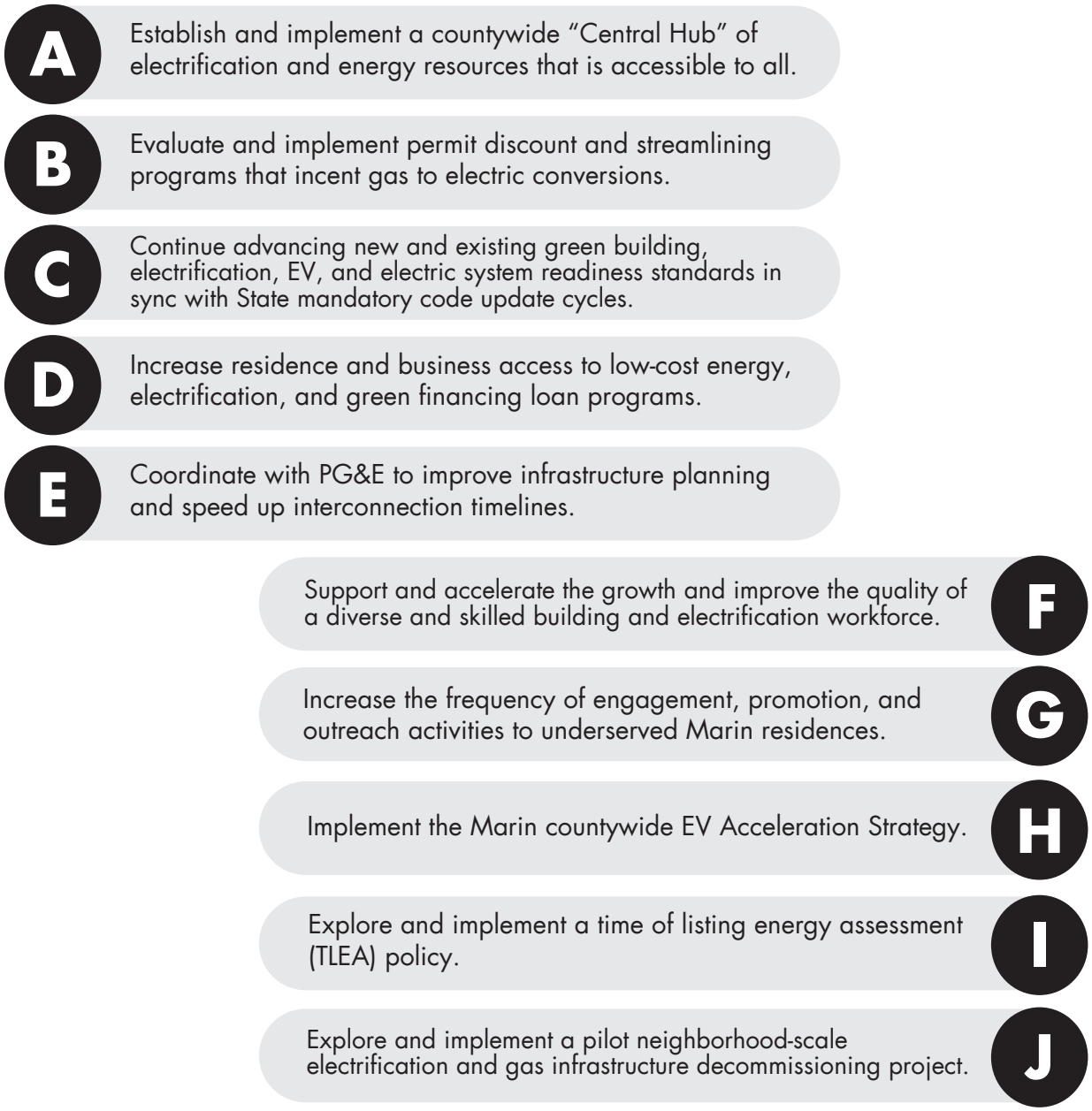
This section is the heart of the roadmap. It can be used as a guide for our community to transition to an all-electric future. It is broken up into three parts:

3.1 Ten Actions to Transition
3.2 Phasing Ten Actions: A Proposed Timeline between 2024 and 2031
3.3 In-depth discussion of the proposed actions and tasks to implement

3.1 Ten Actions

There are ten actions important to unlocking Marin's path to an all-electric future (Figure 3). These actions reflect in-depth research of current and anticipated policies and programs, co-development with community stakeholders, and insight from the broader community.

Figure 3. Recommended ten actions to electrify Marin.



3.2 Ten Actions: A Phased Timeline

Transitioning to an all-electric future is a long-term endeavor that requires advanced planning and thoughtful implementation. Hence, the ten actions above were overlayed onto a three-phase timeline:

1. Immediate (2024–2025)
2. Near Term (2026–2027)
3. Long Term (2028–2031)

The timeline indicates when, ideally, to implement the roadmap's actions over the next six to seven years (Figure 4). However, it can be difficult for a community to implement everything. Government staff and policymakers should also evaluate staff capacity and identify funding mechanisms to meet its electrification goals and 2045 climate action obligations. Simultaneously, other actors in the community should choose which actions they can help with and then decide when and how to support implementation of actions. All actors should coordinate to avoid duplicating efforts.

Figure 4. Gantt chart of ten actions and tasks to implement between CY2024-Q3 and CY2031-Q4.

A Establish and implement a countywide "Central Hub" of electrification and energy resources that is accessible to all.

1. Develop and launch a web-based informational resource hub for community resources.
2. Develop and launch hard copy and in-person promotion and outreach campaigns especially in underserved, hard to reach communities.
3. Investigate the feasibility and procure resources to launch a turnkey countywide concierge and/or technical assist service for residences and businesses.
4. Develop a concierge and/or technical assistance service for residences and businesses while maintaining and integrating the web-based "central hub."
5. Launch a concierge technical assistance service for residences and businesses while continuing to maintain and integrate the web-based "central hub."

B Evaluate and implement permit discount and streamlining programs that incent gas to electric conversions.

1. Evaluate jurisdiction feasibility and capacity to implement an electrification streamlining program that speeds up the permitting process.
2. Evaluate jurisdiction fee structure then implement a subsidized electrification discount program that incentivizes electric over gas installations.
3. Implement permit programs that either reduces mechanical, electrical, and plumbing (MEP) costs and/or expedites permit timelines for renovations and appliance upgrades.

C Continue advancing new and existing green building, electrification, EV, and electric readiness standards in sync with State mandatory code update.

1. 2025 Code Development: Develop prototype green building codes that all twelve Marin jurisdictions can consider to adopt.
2. 2026 to 2028 Code Enforcement: Implement adopted green building code.
3. 2028 Code Development: Develop prototype green building codes that all twelve Marin jurisdictions can consider to adopt.
4. 2029 to 2031 Code Enforcement: Implement adopted green building code.
5. 2031 Code Development: Develop prototype green building codes that all twelve Marin jurisdictions can consider to adopt.

D Increase residence and business access to low-cost energy, electrification, and green financing loan programs.

1. Evaluate existing low-cost financing programs and increase access to residences and businesses through the central hub and promotional campaigns.
2. Evaluate then consider providing complementary financing options such as a regional tariff on bill financing program that serves single-family and multi-unit residences.
3. If funded and partners are in place, pilot a loan financing program(s) that serves single-family and multi-unit residences and/or businesses.

E Coordinate with PG&E to improve infrastructure planning and speed up interconnection timelines.

1. Encourage PG&E to meet SB 410 (Becker), "Powering up Californians Act" which holds utilities accountable to meeting prompt grid interconnection and energization timelines.
2. Proactively coordinate with PG&E on owner/developer planning and communication that helps with PG&E's service and distribution planning, increases reliability, and reduces energization timelines for new housing.

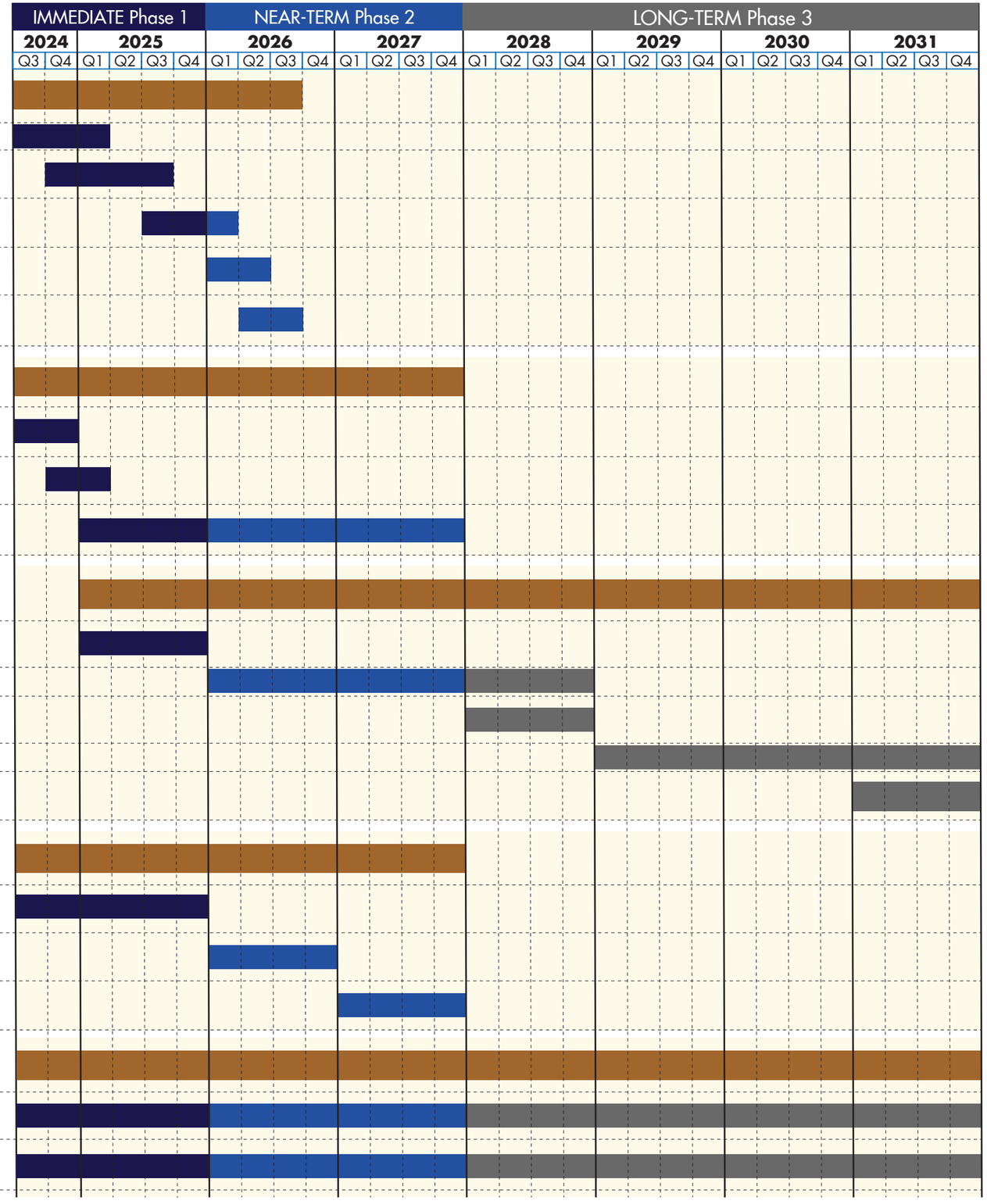


Figure 4. (Continued)

E (Continued)

3. Explore funding to collect and analyze PG&E energy data that will help measure existing and project future countywide electrical capacity needs at the neighborhood scale.
4. If funded, analyze and share out report on countywide existing and future electrical capacity needs.

F Support growth, accelerate and improve the quality of a diverse and skilled building energy and electrification workforce.

1. Continue to fund and expand regional workforce development training programs that benefits a more diverse trades and contractor workforce.
2. Continue growing the pipeline and visibility of regional qualified contractors.
3. Continue to provide free or subsidized access to training programs for builders, realtors, lenders, and local building staff.
4. Continue to explore and support new partnerships with public agencies, local governments, businesses, and/or appliance manufacturers that focus on expanding technology trainings to small, minority-owned businesses.

G Increase the frequency of existing engagement, promotion, and outreach activities to underserved Marin residences.

1. Build stronger partnerships with Marin community-based organizations that increases rebate, incentive, and financing program access to underserved Marin communities.
2. Partner with and consider funding local community-based organizations to communicate energy and electrification programs and campaigns.
3. In partnership with community-based organizations, perform an annual evaluation, or as needed, of all roadmap actions to ensure equitable outcomes.

H Continue to implement, or in-part, the Marin Countywide EV Acceleration Strategy.

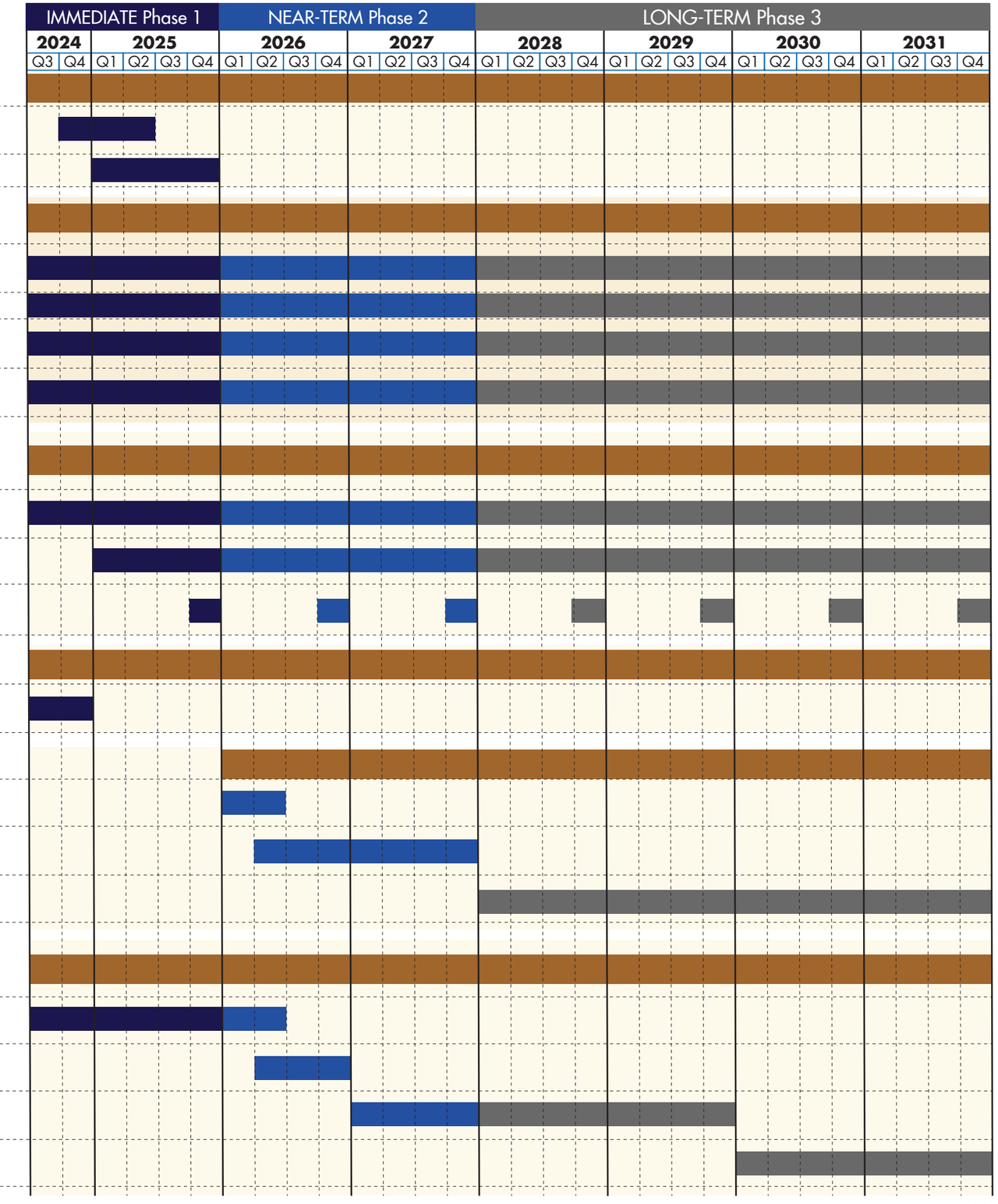
1. Each jurisdiction should adopt and determine which strategies as per the 2023 Marin Countywide EV Acceleration Strategy.

I Explore and map out steps to implement a time of listing energy assessment (TLEA) policy.

1. Conduct a feasibility study and/or survey of stakeholders to implement a voluntary or mandatory energy assessment and code compliance check at the time of a real estate transaction.
2. If feasible and staff capacity is in place to enforce, identify a Marin jurisdiction(s) to pilot the development of a TLEA policy.
3. If feasible and staff capacity is in place to enforce, continue implementing a TLEA policy and expand to other Marin jurisdictions as needed.

J Explore and map out steps to implement a neighborhood-scale electrification and gas infrastructure decommissioning project.

1. Support, as needed, Building Decarbonization Coalition's (BCD) effort to expand neighborhood scale electrification projects statewide.
2. Evaluate feasibility and funding resources, then identify a location to pilot a neighborhood-scale electrification demonstration project anywhere within the 12 jurisdictions across Marin.
3. If appropriately funded and staff capacity is in place, develop and implement a pilot neighborhood-scale electrification demonstration project.
4. If successful and more funding is procured, continue implementing neighborhood-scale electrification pilots in other locations across Marin.



3.3 Ten Actions: Implementing Tasks

This section will discuss, in detail, how the ten phased actions and tasks in Figure 4, can be implemented by organizations and people within the community.

Community Implementors

The roadmap is intended to be a shared endeavor. Much like all climate action strategies, a collective effort is required to successfully implement. All community members (government, elected officials, public agencies, utilities, community-based organizations, builders, developers, realtors, businesses, and residents, among others) can play a role in implementing actions. They can help participate in community engagements, put on community events, incorporate actions into individual work plans, or adopt the roadmap as policy.

Each action will be tagged with potential implementing partners:

LG	Local Government (County, City and Town Staff, Elected Councils w/in Marin)
CBO	Community-Based Organization (not-for-profit organization providing community services)
MCEP	Marin Climate & Energy Partnership (interagency collaborative including local governments, MCE, TAM, and Marin GSA that coordinates climate action)
RES	Residents and neighborhoods
BIZ	Businesses (local privately owned and/or operating within county)
MCE	Marin Clean Energy (Community Choice Aggregation Electricity Provider)
PG&E	Pacific Gas & Electric (Investor-Owned Utility)
TAM	Transportation Authority of Marin (Transportation authority countywide)
MBA	Marin Builders Association (Not-for-profit serving the interests of the construction industry)
CON	Contractor (Individual or Businesses that bid and provide construction project services)
TRA	Trades associations (organizations serving the interests of unionized construction workers and typically run apprenticeship programs)
REAL	Realtors (individual) or Marin REALTORS (Not-for-profit association serving the interests of realtors countywide)
LEND	Banks and Lenders (provides financing for real estate transactions or construction projects)
DEV-C	Commercial or nonresidential developer
DEV-H	Housing Developer (Market-rate and Affordable Housing)
BAY	BayREN (Regional Energy Network of local governments across the 9 county Bay Area)
AIR	Bay Area Air Quality Management District (Air Quality regulator across the 9 county Bay Area)

3rd	3rd Party Service Provider (For-profit vendor typically providing turnkey, concierge energy and electrification installation and planning services)
CPUC	California Public Utilities Commission (Statewide utilities regulator)
TECH	TECH Clean California (Statewide initiative funded to increase clean space and water heater installations)
ZWM	Zero Waste Marin (countywide joint power authority helping to manage and reduce waste)
EDU	Higher education facilities such as community colleges that can provide training programs to those who cannot access apprenticeship programs.

Reading the Actions and Tasks

All actions are illustrated in the following manner:

- Each action starts with elaborating key objective(s), equity considerations, measure(s) of success, and proposed timeframe to implement.
- Each recommended Action (e.g., "A") contains Tasks (e.g., "A1") to implement across three phases.
- All tasks necessary to implement the action are briefly expanded upon.

In addition, note the following:

- Equity considerations are intended to surface possible solutions to ensure inequities are not exacerbated or negative impacts mitigated for vulnerable communities. Solving for underlying and systemic race and social inequities is mostly beyond the scope of this electrification roadmap.
- This roadmap does not require any one person or organization to implement, nor has any one organization yet committed to implementing these actions.
- Actions can be implemented as a whole, in-part, or some not at all.
- Though some actions are already a part of an organization's workplan, some actions are not. Actions will need to be approved by each organization's governing structure.

Action A. A countywide "Central Hub" of electrification and energy resources.

Potential Implementers: LG | MCEP | CBO | MCE | BAY | 3rd | TAM | PG&E

Objective(s)

- Create a countywide hub that connects all residences and business to building energy, electrification, and EV resources and services.
- Make it easy for residents and businesses to get their building energy, electrification, and EV related questions answered by clear, concise, and user-friendly access to resources.
- Simplify and consolidate otherwise complicated, disparate, and confusing polices (e.g., building requirements) and rebate, incentive, and customer service programs (e.g., local, regional, state, and federal) into one accessible location.

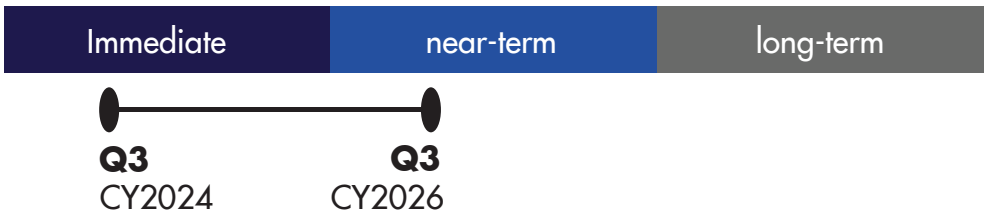
Equity Considerations

- Target campaigns and efforts to benefit low-moderate income (LMI) and hard-to-reach households, renters, and energy burdened communities such as in rural West Marin, North Marin, Downtown San Rafael and the Canal, Strawberry, and Marin City.
- Promote regional workforce development programs or initiatives that focus on developing a more diverse and inclusive trades and contractor workforce. (See Action F regarding workforce development.)
- Increase awareness of and access to programs, rebates and incentives that first address deferred maintenance (e.g., termite damage and dry rot).
- Address Split-Incentives – Structure multi-unit residential programs that incentivize and make it easy for both renters and property owners to install energy efficient and electric systems and appliances.

Measure(s) of Success

- Made resources readily available and accessible to those searching online. Ensured that the information is accessible to those individuals that need more hands-on services, language assistance, or otherwise unable to access digital resources.
- Increased collaboration across all community actors or "Potential Implementers" as listed above.
- All community actors directed inquiries to this hub and designated contacts.
- Used existing and new channels of communications to expand outreach to hard-to-reach residences and businesses.

Proposed Timeframe



Implementation Tasks

- **Task A1. Develop and launch a web-based informational resource hub for community resources.** Consolidate all existing State, regional and local programs, services, energy and electrification planning toolkits, incentives, rebates, building code and permit requirements and process, qualified contractors, financing, research, and other related resources into one central accessible website. All community actors should coordinate to route all building energy, electrification, and EV project questions and inquiries through this webpage. Subsidized rebate and incentives programs constantly change. The County of Marin currently maintains a web-based central resource hub for resources with links to electrification resources, tools, and information.

- **Task A2. Develop and launch promotional and outreach campaigns especially in underserved, hard-to-reach communities.** A web resource is only effective if people are driven to the site to access the hub's resources. A coordinated campaign should be developed with a budget and timeline such that a request for funding can be made by local governments as well as non-profit/community-based organizations looking for grants or to grant-make. Conducting complimentary, offline outreach and engagement activities is critical. This includes in-person, door-knocking, social media, newsletters, mailer campaigns, and tabling at community events that target underserved residences.

- **Task A3. Investigate the feasibility and procure resources to launch a countywide concierge and/or technical assist service for residences and businesses.** State, regional, and local governments, utilities, and private companies are currently testing a variety of turnkey solutions especially for those who prefer in-person, handholding, help services for more complicated projects, or are unable to access web resources. Many turnkey products are currently piloting; hence, evaluation should also include whether using existing over creating a new service will suffice. Any subsidized program will require funding and staff capacity to develop, launch and maintain. A variety of turnkey projects are currently being piloted across the State including, but not limited to:

  1. Local Governments such as City of Sacramento in partnership with Sacramento Municipal Utility District (SMUD) have launched XeroHome, a free online tool that can help single-family and multi-unit homeowners and renters easily estimate the cost of their retrofit project in minutes, connect residences with contractors, and easily find rebates. The City hopes SMUD can scale this online tool across its territory and procure funding to provide wrap-around personal technical assistance services for those unable to access.

  2. Utilities such as PG&E and Peninsula Clean Energy (PCE) have launched turnkey solutions. PG&E currently has a single-point of contact (SPOC) for multifamily program, a free "one-stop shop" model for property owners and managers. In 2025, PG&E has allocated funding to expand a SPOC for residential customers and contractors. PCE currently has an Electrification Technical Assistance Program that provides free technical assistance to architects, builders, developers, design engineers, contractors, and energy consultants to install all-electric systems and EV infrastructure.

  3. Third-party services for residents (e.g., QuitCarbon, Onsemble, RockRabbit, Collaboration Energy, ReadySet Replace, EnergySage, Treehouse, etc.) can be used today; however, note the long-term viability of these services is unpredictable and may not exist in the future.

- **Task A4 + A5. Develop and launch a concierge and/or technical assistance service for residences and businesses while maintaining and integrating the web-based "central hub."** Should the result of task A3 determine that existing technical service providers are not sufficient to support local needs, and funding is procured implement a Marin specific service, then ensure users can access these services through the central hub. The launch should include funding for offline outreach and engagement activities – as discussed in Task A2 – to maximize reach.

COMMUNITY HIGHLIGHT: Marin Green Home Tours

What residents are doing to green their homes

In October 2022, Sustainable Marin launched the first Marin Green Home Tour, a free, virtual event spotlighting 10 homes across the County. Each home served as a local showcase of practices aimed to reduce fossil fuel use, produce and use clean electricity, conserve water, improve air quality, and promote community resilience. Home features included induction cooktops, heat pump HVAC systems, solar panels paired with battery storage, electric vehicle chargers, water harvesting setups, and drought-resistant landscaping. Homeowners shared their experiences installing and using these sustainable features.

Several all-electric homes were featured, including new construction, retrofit projects, and rental properties. The event attracted over 400 attendees during the live sessions, with a much broader audience accessing the recorded tours via YouTube.

Due to popular demand, a second tour was held in October 2023, and a third is scheduled for October 24, 2024. For further details, resources, and to view archived videos of the featured homes, visit the Marin Green Home Tour webpage.

Action B. Permit discounting and streamlining that incent gas to electric conversions.

Potential Implementers

LG BAY MCE

Objective(s)

- Prefer and promote the installation of electric and energy efficient systems over gas and inefficient systems.
- Streamline permitting by reducing permit burden of electric appliances including same day permitting for heat pump water and space heaters, permit discount or waivers, digitizing applications, and scheduling online inspection and approval processes.

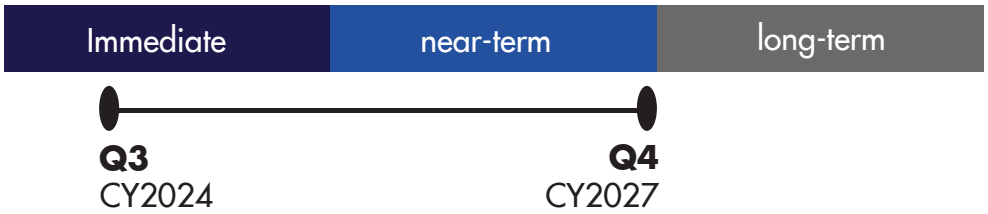
Equity Considerations

- Eliminate or further offset the impact of the potential high cost of permitting for income qualified residences.

Measure(s) of Success

- Increased permitted installs of electric and energy efficiency appliances and systems.
- Increased the safety of electric appliance and system installs.
- Reduced the number of unpermitted electric and appliance installs.

Proposed Timeframe to Implement



Implementation Tasks

- □ **Task B1. Evaluate jurisdiction feasibility and capacity to implement an electrification streamlining program that speeds up the permitting process.** Building and safety departments can use same day permitting and remote video inspections for electric and energy efficient systems and appliances. For example, the State has required same day streamlined solar PV permitting for jurisdictions of a certain size. Also, the County of Marin currently performs Solar PV, reroofing, and EV charging station video inspections. If similar programs were expanded for electrification projects such as for heat pump water heaters, this could increase permit compliance and installs.

- □ **Task B2. Evaluate jurisdiction fee structure then implement a subsidized electrification discount program that incentivizes electric over gas installations.** Building and safety departments can use fee discounts or waivers to incentivize applicants, permitting electric and energy efficient system installs (e.g., heat pumps), that may otherwise avoid obtaining proper permits or install another gas appliance. Incentives can include but are not limited to permitting discounts or waiver, combined mechanical-electrical-plumbing (MEP) and electronic inspections. For example, City of St. Helena implemented a "permit holiday sale" on solar PV. As a result, permit submittals tripled in the same time frame[13]. Also, Santa Clara County's combined mechanical-electrical-plumbing permit application charges a flat rate for up to three items instead of separately[14]. Hence, a heat pump water heater installation would

13 Interview with St. Helena's City Assistant Manager. July 2023.

14 Silicon Valley Clean Energy and TRC. 2020. Best practices guide for streamlining electrification permitting.

require only one permit application and fee for a water heater replacement and the supporting electrical work. If similar incentive programs were expanded for electrification projects, this could increase compliance, quality, and safety of installations.

- ☐ **Task B3. First pilot, then implement permit programs that simultaneously reduce permit costs and speed up permit timelines for renovations and appliance upgrades.** Permit discount programs can be funded and piloted to assess feasibility and impact. County, City, and Town staff, not only has to subsidize the program but also must train building examiners and inspectors on how to permit and identify emerging technologies in the field such as heat pumps, EV chargers, and upgraded electrical systems, among others. Building and safety staff should take ongoing trainings and continuing education classes such as those offered for free by BayREN. Waiving fees alone will not result in more installations if the permit process is too slow or challenging to navigate. Simultaneously reducing cost burden and speeding up permitting is highly recommended as best practice for implementing an effective program.

COMMUNITY HIGHLIGHT: Marin Clean Energy

Bridging the gap with a heat pump loaner program

Starting Fall 2024, MCE's emergency water heater loaner program will provide funding for participating contractors to install temporary replacement "loaner" water heaters while prerequisites to installing a heat pump water heater (HPWH) are being arranged. Once the customer is ready to electrify, the contractor will uninstall the "loaner" and replace it with the HPWH. The program will allow customers whose water heaters have broken to comfortably transition to a high efficiency electric HPWH with minimal disruption to hot water supply. The "loaner" water heaters themselves can then be reused by future customers. On the customer side, installation of HPWHs will reduce indoor and outdoor pollution, increase customer safety, and make homes healthier. In addition, there are several incentive opportunities to reduce total upgrade costs to the system itself as well as ancillary fixes, making the program economically attractive.

For more information contact Info@MceCleanEnergy.org.

Downloadable at https://www.svcleanenergy.org/wp-content/uploads/2020/02/Best-Practices-Guide-for-Streamlining-Electrification-Permitting_Digital.pdf.

Action C. Advancing new and existing green building, electrification, EV, and electric readiness standards.

Potential Implementers: LG, CBO, DEV-H, BAY, MCE, PG&E, MCEP, ZWM

Objective(s)

- Reduce GHG emissions and save energy for consumers by updating local building codes that exceed State minimum standards (aka "reach codes") every three years, which aligns with State mandatory code update cycles.
- Continue developing and implementing proactive green building energy reach codes that are "cost effective" as defined by the California Energy Commission (CEC).
- Create as much code uniformity as possible across all 12 Marin jurisdictions to minimize building permit confusion across jurisdictional boundaries.

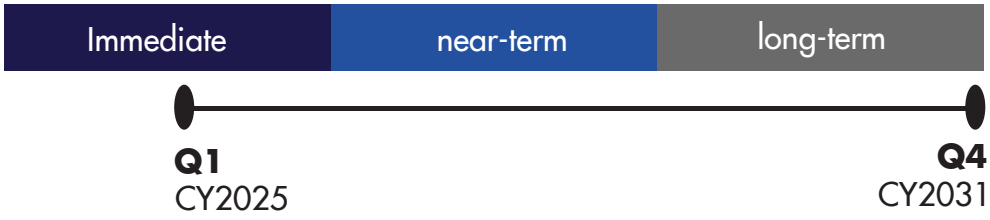
Equity Considerations

- Include building exceptions, hardship, and feasibility waivers especially for low-income residents and households with special medical and accessibility needs.
- Ensure new construction and renovations of low-income multi-unit housing projects are not inhibited.
- Identify sufficient electrification and energy efficiency funding sources for low-income houses.
- Encourage use of programs that subsidize energy efficient, all-electric buildings for new affordable housing developments (e.g., California Electric Homes Program implemented by California Energy Commission and TRC).
- Encourage use of housing programs that disincentivize property owners from displacing multi-unit renters during renovations or rehabilitation (e.g., multi-family energy saving programs implemented by MCE, BayREN, and PG&E).
- Consider anti-displacement policies as put forth by Strategic Actions for a Just Economy (SAJE) or Build-it Green.

Measure(s) of Success

- Engaged and partnered with a wide-variety of stakeholders such as government jurisdictions (local, regional, and State), community-based organizations, businesses, building and trades associations, MCE, PG&E, Transportation Authority of Marin, among others, when developing and modeling reach codes countywide.
- Adopted the County's model green building reach codes that are consistent as possible across all jurisdictions.
- Incorporated policy that anticipates unintended consequences of electrification.

Proposed Timeframe



*Once Every Three Years in alignment with State triennial code cycles

Implementation Tasks

- ☐ **Task C1 + C2. During 2025, develop an update to model green building reach codes that all twelve Marin Jurisdictions can adopt and enforce between 2026 to 2028.** The State mandates building code updates once every three years with the next cycle starting in 2025 and in effect January 1, 2026. Local governments such as in Marin County are allowed and have historically adopted building codes that exceed those standards while complying with the Energy Policy and Conservation Action of 1974. The best practice is to engage all levels of community stakeholders to right-size a building code policy. The County of Marin and Marin Climate and Energy Partnership (MCEP) typically coordinate a triennial effort to engage County, City and Town staff, and community stakeholders to help develop key components of a model reach code. This coordination has been used by government staff and electeds to adopt and implement advanced building codes.

  In the transition to all-electric appliances, codes should anticipate the following, which are not typically considered in today's codes:

  1. From 2027 to 2031, the Bay Area Air Quality Management District (BAAQMD) will begin phasing out space and water heating gas appliances from being sold or installed in homes and commercial spaces. In addition, the California Air Resources Board (CARB) will begin banning gas space and water heaters from being sold statewide starting in 2030.

  2. Require building electrical systems to be properly optimized or sized for the anticipated rapid increase in building electrical needs.

  3. Avoid the costly oversizing of electric systems and panels, hence, prefer panel optimization and efficiency (i.e., work within the existing electrical capacity) over panel upsizing.

  4. Ensure the use of low (e.g., CO2 and nature based) in place of high global warming potential (GWP) refrigerants in equipment such as heat pumps.

  5. Work with Zero Waste Marin (ZWM) to develop and implement disposal protocols for gas and heat pump appliances at end-of-life.

  6. Ensure the proper handling of refrigerants at end-of-life such as through EPA 608 certified technicians.

  This and subsequent tasks C3, C4, and C5 illustrate the commitment Marin communities make to exceed green building standards.

- ☐ **Task C3 + C4. During 2028, develop an update to model green building reach codes that all twelve Marin Jurisdictions can adopt and enforce between 2029 to 2031.**

- ☐ **Task C5. During 2031, develop an update to model green building reach codes that all twelve Marin Jurisdictions can adopt then enforce between 2031 to 2033.**

Action D. Access to low-cost energy, electrification, and green financing loan programs.

Potential Implementers: LG | PG&E | MCE | BAY | LEND | REAL | CBO | CPUC | MCEP

Objective(s)

- Increase access to existing loan programs for single-family and multi-unit residences as well as commercial properties.
- Consider the creation of new loan programs as needed.
- Expand existing real estate industry training and education to banks/lenders and Marin REALTORS.

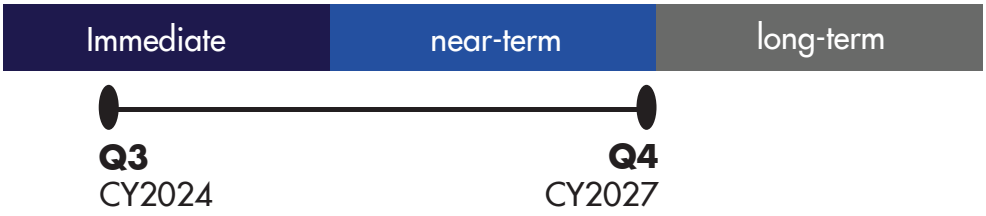
Equity Considerations

- Green financing programs can benefit LMI and credit-constrained customers who otherwise may not qualify for traditional home equity loans for upgrades. However, care must be taken to ensure promoted programs are not predatory and do not put LMI households under additional financial pressure.
- Target promotions and campaigns that benefit LMI households and landlords that serve low-income tenants.
- Ensure financing is available to households who have poor credit.
- Increase access to zero-interest financing for those who can't afford to take on loan debt.

Measure(s) of Success

- Increased use of green financing loan programs for building renovation projects.
- Socialized energy efficiency and electrification as valuable offerings by local realtors and banks/lenders.

Proposed Timeframe



Implementation Tasks

- ☐ **Task D1. Evaluate existing low-cost inancing programs and increase access to residents and businesses through the central hub and promotional campaigns.** Information and resources on financing programs accessible to Marin residents and businesses will be made available through the central hub. (See Action A.) Continue to expand training and education of banks, lenders and Marin Realtors through BayREN's Green Labeling Program so they may be informed and promote green financing options to clients. A variety of financing products exist today for different types of residence projects, including:
    - The State's Go Green Financing program.

- Energy Efficient Mortgages/Green Mortgages such as Fannie Mae Green Financing Loans for single- and multi-unit residences.

- PG&Es zero percent energy efficiency financing program for commercial customers.

- □ **Task D2. Evaluate then consider providing complementary financing options such as a regional tariff on-bill financing program that serves single-family and multi-unit residences.** Determine the feasibility with MCE, PG&E and/or CPUC to launch a tariff on-bill financing program (upgrades repaid through a tariff added to the utility bill over time) that is accessible to the regional customer base. While monitoring the potential of an on-bill financing project, also advocate for increasing access to other financing options as needed. For example, in 2021, MCE financed 0% interest home battery loans for residents. Currently, MCE and PG&Es Agricultural and Industrial (AIR) program provides rebates and financing for agricultural and industrial customers upgrading equipment.

Action E. PG&E to improve infrastructure planning and speed up interconnection timelines.

Potential Implementers: PG&E | LG | DEV-H | DEV-C | MCEP | CPUC

Objective(s)

- Reduce electric service, interconnection, and energization timelines for buildings.

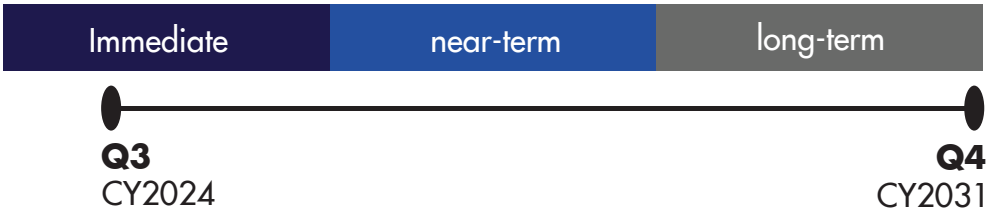
Equity Considerations

- Work with PG&E to identify areas where interconnection upgrades could be costly to residents and target infrastructure accordingly especially in underserved areas including rural West Marin, North Marin, Downtown San Rafael and the Canal, Strawberry, and Marin City.

Measure(s) of Success

- Reduced service, distribution, and energization timelines for housing developments.

Proposed Timeframe



Implementation Tasks

- ☐ **Task E1. Encourage PG&E to meet** SB 410 (Becker)**, "Powering Up Californians Act."** This legislation was adopted October 2023 holding utilities accountable to meeting prompt grid interconnection and energization timelines. Communities can coordinate an ongoing effort to communicate with PG&E any delayed projects.

- ☐ **Task E2. Proactively coordinate with PG&E and owners/developers of projects that help with service and distribution planning.** Collaboration and communication with PG&E will increase reliability and reduce interconnection and energization timelines for new housing. Building owners and local governments, especially when developing multi-unit housing, should communicate electrical capacity and service needs to PG&E as early as possible in the planning and design phase. Local governments should work with PG&E to develop standardized communication systems for collecting this information.

- ☐ **Task E3+E4. Explore funding to collect and analyze PG&E energy data, then, use the data to report countywide electrical capacity needs at the neighborhood scale.** The report can assess existing capacity and project future needs. The report can also map out existing natural gas infrastructure which can help identify ideal locations for neighborhood-scale electrification and gas infrastructure decommissioning.

Action F. Grow and improve the quality of a diverse and skilled building energy and electrification workforce.

Potential Implementers

CBO | BAY | LG | AIR | MCE | CON
MBA | TRA | EDU | REAL | LEND | TECH
MCEP | BIZ | 3rd

Objective(s)

- Prepare and develop the existing trades workforce to meet the increased demand for energy and electrification upgrade services.
- Grow and expand the pipeline of new workers to enter the energy and electrification trades workforce.

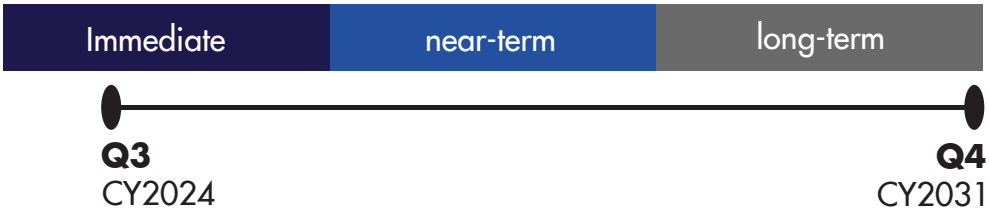
Equity Considerations

- Support and expand regional workforce development training programs for a more diverse (women-owned, minority-owned, and non-English speaking) and inclusive trades and contractor workforce.
- Increase training access to a diverse contractor base by bringing programs closer to or at places of work.
- Adopt regional workforce development initiatives and implement training programs that increase job quality, labor standards, and equitable access for all workers in the residential decarbonization market.

Measure(s) of Success

- Launched new or expanded upon existing workforce development programs that brought trainings to a diverse contractor base.
- Increased number of contractors engaged through outreach.
- Increased number of contractors that attended trainings and networking events.

Proposed Timeframe



Implementation Tasks

- ☐ **Task F1. Continue to fund and expand regional workforce development training programs that benefit a more diverse trades and contractor workforce.** Marin lacks a diverse and qualified contractor base to install energy and electrification projects. Job market development initiatives such as Rising Sun's Bay Area Residential Decarbonization High Road Training Partnership are important to setting high labor standards for the regional trades and contractor community. Programs such as the LIME Foundation's NextGEN Trades Academy is an example of existing training programs that focus on skills and professional

development as well as provide wrap-around services (e.g., transportation subsidies) for a new and more diverse contractor workforce. These programs should be expanded because they can result in growing the pipeline of new workers in the building electrification workforce.

- ☐ **Task F2. Continue growing the pipeline and visibility of regional qualified contractors.** The Switch Is On by Building Decarbonization Coalition has direct install programs (i.e., installations subsidized and performed by pre-qualified and approved contractors) where contractors may apply to and be placed on a qualified contractors list. Third party service providers providing concierge services such as QuitCarbon or ReadySet Replace also have a preferred contractors list. All new and existing contractors should be encouraged to apply and connect with program administrators to become qualified and listed.

- ☐ **Task F3. Continue to provide free or subsidized access to training programs for builders, realtors, lenders, and local building staff.** Programs such as BayREN's Green Labeling and ongoing training and networking events and PG&E's Energy Center should continue to be promoted, encouraged, and made available in-person and online. Free access, continuing education credit, business development opportunities, and on-the-job worksite trainings should be offered to incent attendance of contractor and trades professionals, realtors, lenders, and local building and safety government staff.

- ☐ **Task F4. Continue to explore and support new partnerships with public agencies, local governments, businesses, and/or appliance manufacturers that focus on expanding technology trainings to small, minority-owned businesses.** Local government, BayREN, BAAQMD, TAM, MCE, Marin Builders Association, trade unions, community colleges, community-based organizations, and/or manufacturers can come together and fund the growth of and increase access of energy and electrification trainings for Marin's broader workforce and contractor base.

  Bigger, more well-known contractor businesses may have the staff capacity to attend training, but individual, small-minority owned businesses and contractors typically do not have the same luxury to attend in-person or virtual trainings. Hence, it will be important to bring trainings to those that have little time or limited access to attend. For example, manufacturers can lead heat pump water heater installation trainings at locations including community colleges, showrooms, and big box stores such as Home Depot.

COMMUNITY HIGHLIGHT: NextGen Trades Academy

A community partnership that develops a new workforce

In 2023, spearheaded by the LIME Foundation, a partnership consisting of MarinCAN, County of Marin, BayREN, MCE, and the Transportation Authority of Marin co-funded the NextGen Trades Academy. The academy prepares young adults (ages 18-24) who may not have the opportunity to go to college for well-paying working the construction trades. The 2023 program provided 16 Marin students with soft job skills and general construction, green building, green engineering, and electrification trainings. Each graduate also receives 18-months of follow-up support in their job search.

For more information, see the LIME Foundation's NextGen Trades Academy webpage.

Action G. Frequent engagement, promotion, and outreach to underserved Marin residences.

Potential Implementers: LG | BAY | MCEP | CBO | MCE | TAM

Objective(s)

- Expand engagement with underserved communities well after the roadmap is published.
- Expand upon opportunities to increase awareness of policies and programs to community members using the electrification roadmap as a touchpoint.
- Work with community-based organizations, local government, and public agencies to increase communication channels with "hard-to-reach" community members.

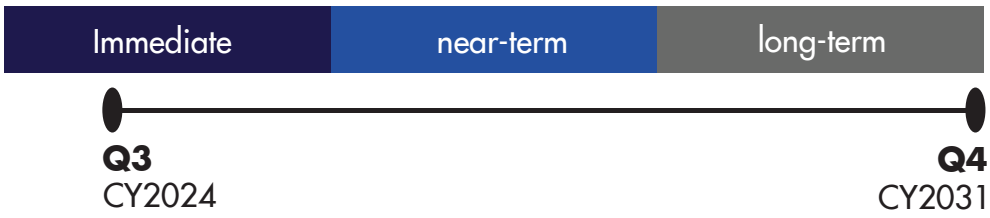
Equity Considerations

- Support community-led planning such as the Marin Climate Justice Collaborative, which includes the Canal Alliance and Marin City Climate and Resilience and Health Justice, among other community-based organizations, public agencies, and local governments.
- Target and increase promotional activities in communities with high concentrations of LMI, renting, and energy burdened households such as in rural West Marin, North Marin, Canal, and Marin City, among others.
- Partner with the County of Marin's Health and Human Services to engage and promote access to hard-to-reach communities through their Community Response Teams that was effective in disseminating critical information during the COVID-19 pandemic.

Measure(s) of Success

- Increased reach to underserved households and/or businesses according to three measures:
- Number engaged,
- Number applied to programs, and
- Number of energy and electrification projects installed.
- Coordinated a public communications campaign across a variety of Marin community-based organizations, local governments, public agencies, and businesses, among others.

Proposed Timeframe



Implementation Tasks

- ☐ **Task G1. Build stronger partnerships with Marin community-based organizations that increase rebate, incentive, and financing program access to underserved Marin communities.** Underserved households in Marin are the last to take advantage of subsidies including rebates, incentives, or financing dollars. In addition

to structuring programs that increase benefit to those underserved such as measures like area median income (AMI), it will be important to increase access through focusing outreach activities. Community-based organization participation and involvement will be critical to expand communication to "hard-to-reach" communities.

- **Task G2. Partner with and consider funding local community-based organizations to communicate energy and electrification programs and campaigns.** Community-based organizations serving Marin City, San Rafael, North Marin and West Marin, among others, have already built capacity, trust and strong community networks. Partnering with and compensating such organizations to perform outreach and promotional activities can speed up and increase access to energy and electrification rebate and incentive programs.

- **Task G3. In partnership with community-based organizations, perform an annual evaluation, or as needed, of all roadmap actions to ensure equitable outcomes.** Planned ongoing engagement with community-based organizations should be a part of the electrification roadmap workplan. Furthermore, review of roadmap actions by community-based organizations that serve underserved residents can help ensure equitable engagement and access to benefits.

COMMUNITY HIGHLIGHT: Marin Climate Justice Collaborative

Inverting the pyramid of power

In May 2023, Canal Alliance and Marin City Climate Resilience and Health Justice launched the Marin Climate Justice Collaborative (MCJC), a 3 to 5 year community-led process co-funded by Strategic Growth Council (SGC) and Partners for Places. In contrast to traditional government led planning, MCJC is a resident-driven, community-informed effort where the vision, priorities, vulnerabilities, and stakeholders are defined by and local decisions about climate health and resilience are made with leaders from Canal and Marin City communities. MCJC will then develop healthy community plans that should result in built capacity (i.e., funding, staffing, support services) for residences, community-based organizations (CBOs), and government. The collaboration is currently under way. Leadership from residents and CBO's and partnerships with local government such as City of San Rafael and the County of Marin will be needed to expand climate program and policy benefits to underserved communities across Marin.

For more information, visit Marin Climate Justice Collaborative's formation announcement and SGC Grantee Profile.

Action H. Adopt and implement the Marin Countywide EV Acceleration Strategy.

Potential Implementers

MCEP | TAM | LG

Objective(s)

- Local governments adopt and implement, whole or in-part, strategies of the 2023 Marin Countywide EV Acceleration Strategy.

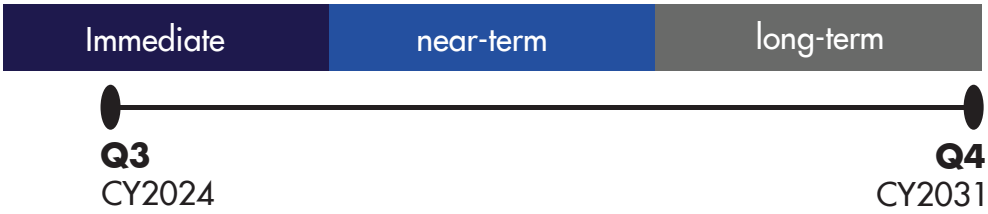
Equity Considerations

- Partner with community-based organizations to increase access and identify quantity and type of charging infrastructure needs in underserved communities, if any. Work with partner CBOs and EV charging installers to minimize potential negative impacts of projects including loss of needed parking and gentrification of communities.
- Use building codes to require charging capability for all residents with parking spaces in multi-unit buildings that are affordable and have cost parity with those charging in single-family homes.
- Increase access to voluntary rebate and incentive programs that subsidize property owners who upgrade EV infrastructure for LMI households and seniors aging-in-place. In return for receiving subsidies, landlords must agree to provide tenant protections as part of the terms and conditions of accepting financial assistance.

Measure(s) of Success

- Adopted all, or in-part, the strategies outlined in the 2023 EV acceleration strategy across all jurisdictions.

Proposed Timeframe



Implementation Tasks

- ☐ **Task H1. Each jurisdiction should adopt and determine which strategies to implement as per the 2023 Marin Countywide EV Acceleration Strategy.**

Action I. A time of listing energy assessment (TLEA) policy.

Potential Implementers: REAL | LG | CBO | BAY | MCEP

Objective(s)

- A residential and/or commercial real estate transaction will trigger an energy assessment (aka energy audit) and disclosure at the time the property is listed.
- Incentivize and/or require energy assessments to baseline and increase the energy efficiency of aging building stock.
- Design a policy where the seller and buyer find value in performing an energy assessment.

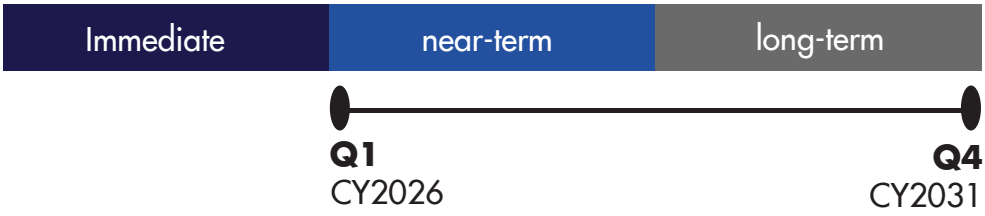
Equity Considerations

- Support and encourage the use of local, legacy, minority, woman-owned and/or BIPOC businesses to conduct energy assessments for homeowners.
- Minimize impact to LMI and energy burdened houses such as in rural West Marin, North Marin, Downtown San Rafael and Canal, Strawberry, and Marin City.

Measure(s) of Success

- Standardized energy assessments as a part of inspection reports and disclosures.
- Increased the number of buildings receiving energy assessments.
- Held community stakeholder meetings between local government, realtors, and community-based organizations to help shape and phase-in a right-sized policy.

Proposed Timeframe



Implementation Tasks

- ☐ **Task I1. Conduct a feasibility study to implement an energy assessment and code compliance check at the time a real estate transaction.** A feasibility study should first be conducted. First, the study should start with a survey to understand a right-sized policy for the community. Engagement with Marin REALTORS and other individual realtors should be conducted with the objective of listening and learning. In the meanwhile, a policy review of model jurisdictions such as City of Berkeley (Time of Listing Ordinance) and City of Davis (Time of Compliance Check Ordinance) and an estimation of communitywide energy saving and GHG reduction potential should be conducted.

  Second, the study should then assess how to best integrate BayREN's Home Energy Score (HES) program as the approved scoring system[15]. Subsidies to perform the work are currently available and qualified contractors are listed on the Switch Is On incentives webpage.

15 BayREN's HES is based on an energy scoring system developed U.S. Department of Energy. BayREN HES program is currently the most widely used to perform energy assessments in the SF-Bay Area. It has recently been approved by the California Public Utilities Commission to launch statewide beginning in 2026.

Third, consider the following mechanisms to ensure effective implementation:

1. Type of data acquired (i.e., from Assessor's, Zillow, and/or Redfin) to track when a property is listed,
2. In addition to an energy score, also assess other types of code compliance checks to conduct as determined by the building official,
3. A refundable transfer tax to ensure compliance,
4. Reduce lead times to perform assessments, and
5. Minimize excess costs and timelines disproportionate to the overall cost and closing of a real estate transaction.

Lastly, local or regional government should determine which department(s) should implement, then, evaluate the staff capacity and funding available to enforce such a policy.

- □ **Task I2. If feasible and staff capacity is in place to enforce, identify a Marin jurisdiction(s) to pilot the implementation of a TLEA policy.** It is difficult to get a consistent policy countywide because each of Marin's local jurisdictions (12) would need to separately adopt a policy. Instead consider a pilot of one or two jurisdictions. In addition, consider starting with a voluntary TLEA policy. That is, incentivize by subsidizing and not requiring an assessment as part of the initial launch. This should allow time to assess how the market will react, iron out any implementation wrinkles, quantify potential savings, and whether requiring an energy assessment will be necessary and impactful.

- □ **Task I3. If feasible and staff capacity remains in place to enforce, continue implementing a TLEA policy and expand to other Marin jurisdictions as needed.** Marin local governments have a long history of modeling and sharing policy and program learned lessons with each other. If a pilot proves successful in one or two jurisdictions, then, other jurisdictions should consider adopting a similar policy. Scaling countywide will create more policy and market consistency.

Action J. A neighborhood scale electrification and gas infrastructure decommissioning project.

Potential Implementers: PG&E | RES | LG | MCEP | CBO | DEV-H

Objective(s)

- In contrast to the typical "appliance-by-appliance" or "house-by-house approach," neighborhood scale electrification can demonstrate the feasibility of pooling a community's resources by decarbonizing entire neighborhoods, street segments, or developments.
- Reduce a neighborhoods total cost of installation, increase ratepayer savings, and ensure reliability and safety by decarbonizing at scale.
- Decommission gas piping infrastructure so that it does not become a stranded and expensive asset for communities to maintain and subsidize.

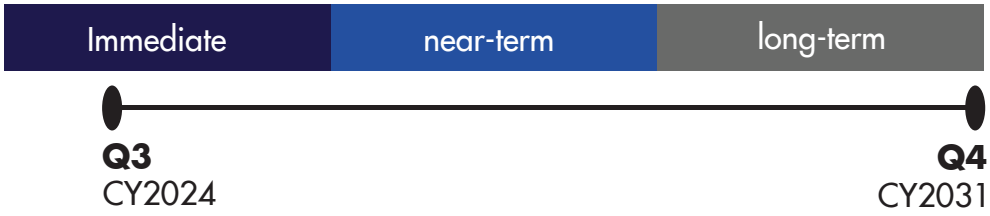
Equity Considerations

- Evaluate prioritizing a pilot in underserved neighborhoods, a demographic typically left out from realizing the benefits of decarbonization. This includes communities such as LMI, hard-to-reach households, renters and energy burdened communities or developments such as in rural West Marin, North Marin, Downtown San Rafael and Canal, Strawberry, and Marin City.
- Ensure funding is available for deferred maintenance in addition to energy and electrification upgrades.

Measure(s) of Success

- Procured funding to evaluate and engage a community to consider a project.
- Procured funding and launched a pilot within one of 12 Marin Jurisdictions.

Proposed Timeframe



Implementation Tasks

- ☐ **Task J1. Support, as needed,** Building Decarbonization Coalition's (BDC) **effort to expand neighborhood scale electrification projects statewide.** Building Decarbonization Coalition is a member-driven, non-profit organization that brings together industry and government looking to eliminate fossil fuels in buildings. BDC has released a neighborhood scale decarbonization brief and is working to align existing State policy and prioritize funding to support statewide neighborhood scale electrification projects. Local and regional government as well as community-based organizations can, for example, write letters of support as need arises.

- ☐ **Task J2. Evaluate feasibility and funding resources, then identify a location to pilot a neighborhood-scale electrification demonstration project anywhere within the 12 jurisdictions across Marin.** Neighborhood scale electrification will require all property owners within a neighborhood or development to agree to participate in a project. A project will require a community's willingness and time. Funding from a variety of community

stakeholders and resources will also be required. Funding must first be procured to assess the feasibility of launching a pilot and to carefully choose a location based on criteria that is fair and equitable.

- ☐ **Task J3. If appropriately funded and staff capacity is in place, develop and implement a pilot neighborhood-scale electrification demonstration project.** The pilot project will require funding, separate from the feasibility study, likely in the form of grants from the State level – pending BDC and other entities' success in lobbying the State to support. Still, at this point, even if one property owner backs out of the pilot, the project will be at risk of not moving forward[16].

- ☐ **Task J4. If successful and more funding is procured, continue implementing neighborhood-scale electrification pilots in other locations across Marin.**

16 In California, regulated utilities, such as PG&E, have an "obligation to serve" which ensures that the utilities offer service to anyone who requests it in their service territory. This can result in one hold-out gas user preventing the whole neighborhood scale project from moving forward. More information is available in the Building Decarbonization Coalition report "Decarbonizing the Obligation to Serve."

4.0 Appendices

4.1 Appendix A

Building Stock and Equity Analysis

Residential Building Inventory and Equity Analysis Highlights

GHG Emissions

26% of GHG emissions come from the consumption of gas in buildings.

Nearly **75%** of gas emissions in buildings come from gas consumption in residential buildings.

Housing Stock

Over **½ million** "machines" including vehicles, appliances, and heating systems will need to be electrified to meet our climate reduction targets.

71% of the residential building stock is comprised of single-family homes, and **82%** of these homes are owner-occupied making them easier to electrify because owners can directly benefit from the change.

Approximately **75%** of homes were built before 1980 meaning they are more likely to need electrical panel upgrades and may be prime candidates for income qualified incentive and rebate programs.

Approximately **6%** of homes were built after 2000 and may already have air conditioning which eliminates one of the benefits of switching to a heat pump system.

17,000+ homes built between 1980 and 2000 are in the "sweet spot" for electrification opportunities because they likely have 200-amp service and aging appliances, and systems in need of replacement.

Equity

1 in 3 households across Marin are below the statewide median income of $78,672 of which the majority are renters.

57% of all renters in Marin County are in the extremely low, very low, and low-income categories.

10% of Marin's populations are considered disabled with high concentrations in San Margarita Valley, Novato, East to Downtown San Rafael, Marin City, Greenbrae, and Tiburon. When overlaid with Social Vulnerability data, San Margarita Valley, Novato, East to Downtown San Rafael, and Marin City are most likely sensitive to utility price changes and building upgrade costs.

6% of low-income residences across West Marin experience energy burden compared to Marin's overall average of 1%. Due to a lack of gas infrastructure piped in via PG&E, West Marin residences rely mainly on the purchase of more expensive bottled gas and fuel oil as the primary source to heat their homes making them more vulnerable to supply chain disruptions during emergencies.

Building Stock Analysis

A building inventory report was completed November 2023. The report summarizes findings from performing a residential and commercial building stock analysis across all twelve of Marin's City, Town, and County jurisdictions. Analyses performed separately for each jurisdiction is available upon request by contacting greenbuilding@marincounty.gov or christine.o@comcast.net.

Building Analysis Summary

I. Building Stock Analysis

MCEP has prepared a study of all residential and commercial buildings countywide and for all twelve Marin jurisdictions.

The study shows the following:

1. GHG emissions from natural gas (referred to herein as “gas”) consumed
2. Housing tenure
3. Age of building (year built)
4. Type of residential building (single-family, multifamily, etc.)
5. Type of commercial building (retail, restaurant, lodging, industrial, etc.)
6. Gas consumption by end use (space heating, water heating, cooking, etc.)
7. Type of electrification needs (water heating, space heating, cooking, etc.)
8. Number of homes that need to be electrified

II. Countywide Summary of Facts and Observations

- **26% of GHG emissions** come from the consumption of gas in buildings. It is essential to reduce these emissions if we are to meet our 2030 emission reduction targets.
- **Over ½ million appliances, equipment and vehicles** will need to be electrified to meet our climate reduction targets.

Residential Building Analysis

- **Nearly three-quarters** of gas emissions come from residential buildings. Focusing efforts on this sector is critical to meeting reduction targets.
- **71% of the residential building stock** is comprised of single-family homes, and **82% of these homes are owner-occupied**. These 60,000 homes might be easier to electrify because the people who own them can make the decision to do so and they will benefit from the change.
- **Approximately three-quarters of homes were built before 1980**. Unless subsequently remodeled, these homes are more likely to have a 100-amp electrical panel that needs to be upgraded to accommodate a heat pump heating system or heat pump hot water heater. This adds to the cost of the project.
- **Approximately 6% of homes were built after 2000** and may already have air conditioning (which eliminates one of the benefits of switching to a heat pump heating system) and/or an instantaneous hot water system (which may be installed in a smaller space that does not accommodate a larger heat pump hot water heater).
- The **“sweet spot” for electrification opportunities may be the 17,000+ homes built between 1980 and 2000** because these homes are more likely to have 200-amp service and aging appliances and systems in need of replacement. Of these, approximately two-thirds are single family homes and/or are owner-occupied.

- The study suggests **countywide efforts should be focused on retrofitting water heaters first**.
    1. Consider the following percent of countywide homes that need to electrify their appliances:
        - 81% water heating
        - 80% space heating
        - 73% ranges/ovens
        - 42% clothes dryers
        - 4% pool heating equipment
        - 3% spa heating equipment
    2. Consider how gas is used in countywide homes:
        - 58% water heating
        - 32% space heating
        - 5% cooking
        - 2% clothes dryers
        - 2% pool and spa heating equipment
        - 1% other uses

Commercial Building Analysis

- **26%** of gas emissions come from consumption in commercial buildings.
- **Nearly half of commercial gas is used for space heating and one-third is used for water heating**. Consider how gas is used in commercial buildings:
    - 47% space heating
    - 32% water heating
    - 10% cooking
    - 9% processing
    - 1% cooling
    - 1% other uses
- **Approximately 60% of commercial buildings were built between 1941 and 1980**. These buildings are most likely at or near the end of their useful life and are prime candidates for electrification when redeveloped. (Note that 15% of the buildings in the dataset did not indicate the year built). Consider the year commercial buildings were built:
    - Before 1901 – 3%
    - 1901-1920 – 9%
    - 1921-1940 – 10%
    - 1941-1960 – 24%
    - 1961-1980 – 35%
    - 1981-2000 – 15%
    - 2001-2020 – 3%
    - After 2020 – 1%

III. Data Sources and Methodology

- The residential building analysis utilizes the best available data from:
    1. US Census Bureau's American Community Survey (2021 5-year estimates),
    2. Department of Finance's E-5 Housing Estimates (2022), and

3. California Residential Appliance Saturation Survey (2019).

- The commercial building analysis utilizes the best available data from:
    1. California Commercial End Use Survey (2006)
    2. CoStar (2023), a private, subscription-based company that provides commercial real estate data. Note that CoStar reports ‘Rentable Building Area”; buildings and spaces that are not rented, such as most schools and public facilities, are underrepresented in the dataset.
    3. 15% of the buildings from the CoStar dataset did not indicate the year built, and thus was excluded from the Year Built analysis.

- The numbers provided in the analysis are estimates only.

Marin Countywide Building Inventory Analysis

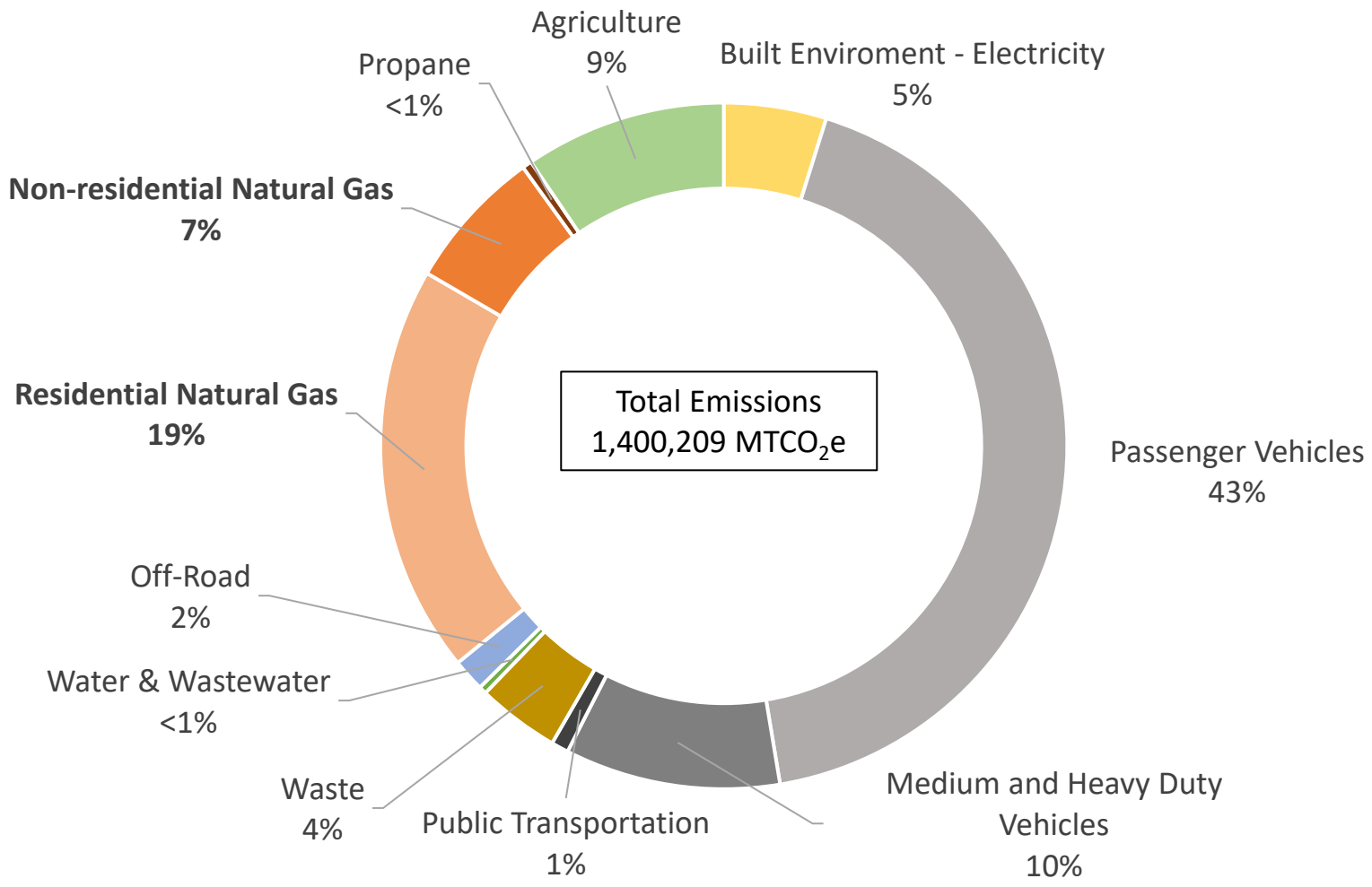
Disclaimer

Many of the tables in this report are sourced from data from the **Census Bureau's American Community Survey (ACS)**, the **California Residential Appliance Saturation Survey**, and the **California Commercial End-Use Survey**, all of which are surveys and as such, are subject to sampling variability. This means that data is an estimate, and that other estimates could be possible if another set of respondents had been reached. We use the five-year release of the ACS to get a larger data pool to minimize this "margin of error" but particularly for the smaller cities, the data will be based on fewer responses, and the information should be interpreted accordingly.

We also use data from the **California Department of Finance** (DOF). Data used in these estimation models come from administrative records of several state and federal government departments and agencies, and from the local jurisdictions for which the DOF produces population estimates.

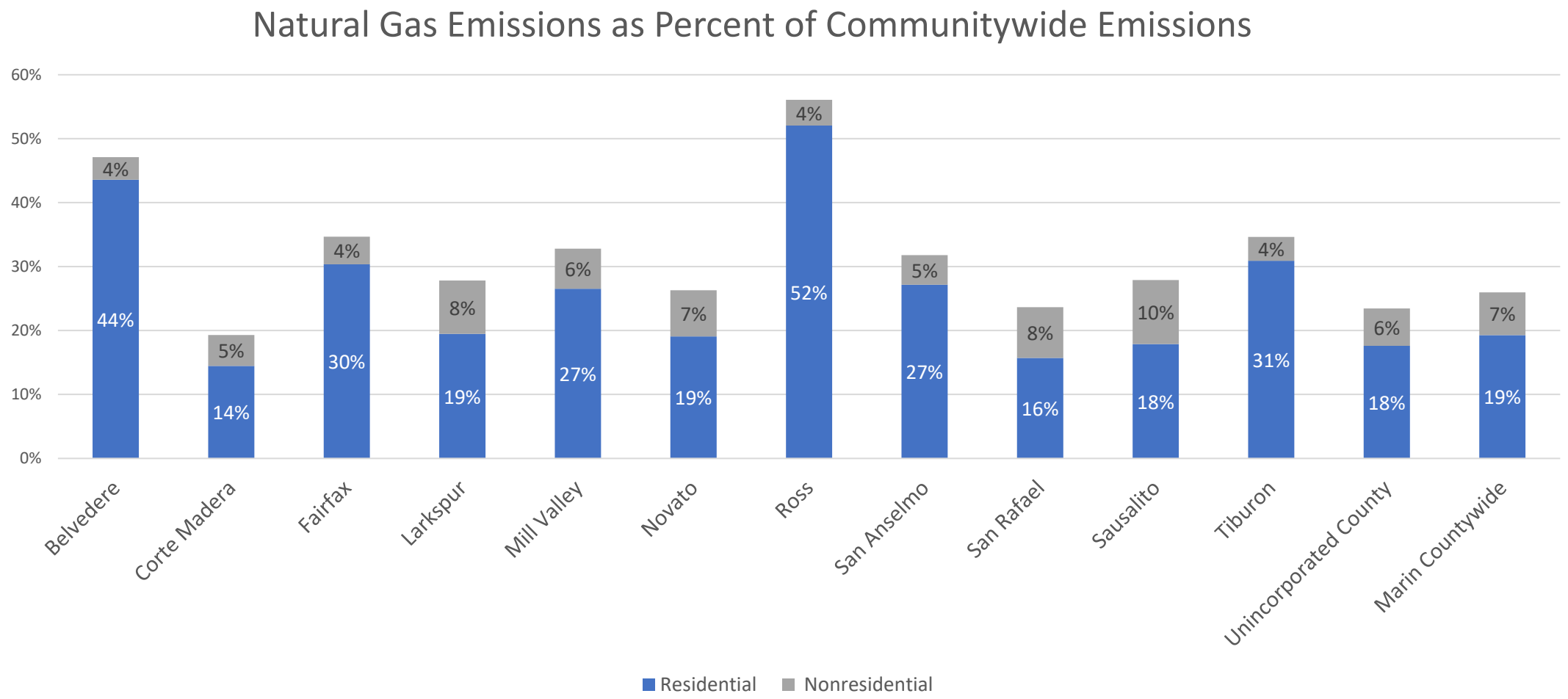
We also use data from **CoStar**, a subscription-based private company that provides commercial real estate data and analytics. CoStar reports data on building use, building age, and rentable building area, which is compiled from sales, lease, and loan information and well as public records like assessor data. Data is incomplete for some properties and may contain errors. Public facilities are not represented unless they are rented or contain space that is rented.

Marin Countywide GHG Emissions 2020



Source: Marin Climate & Energy Partnership

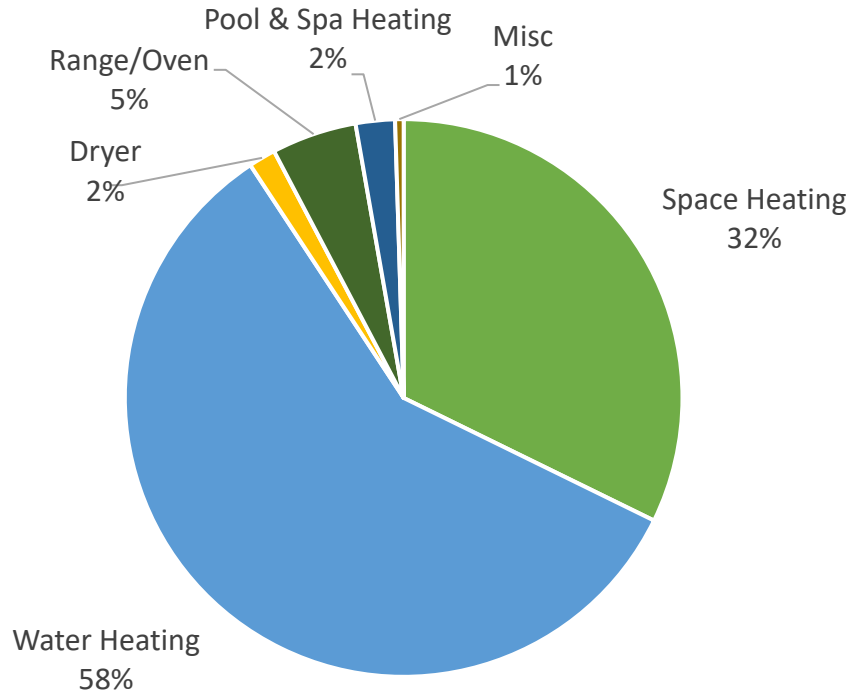
Natural Gas Share of GHG Emissions 2020



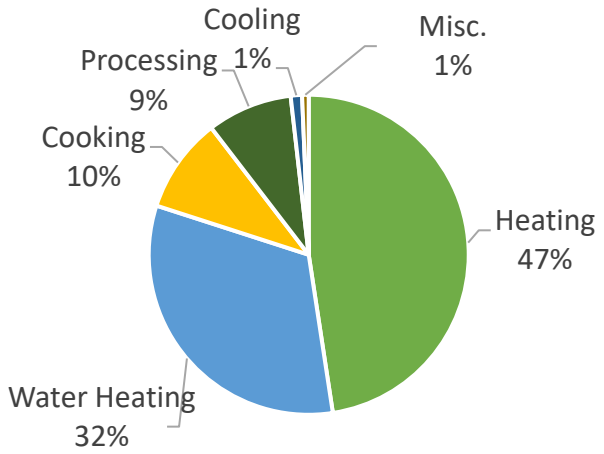
Source: Marin Climate & Energy Partnership

Gas (Natural) Consumption by End Use

Residential



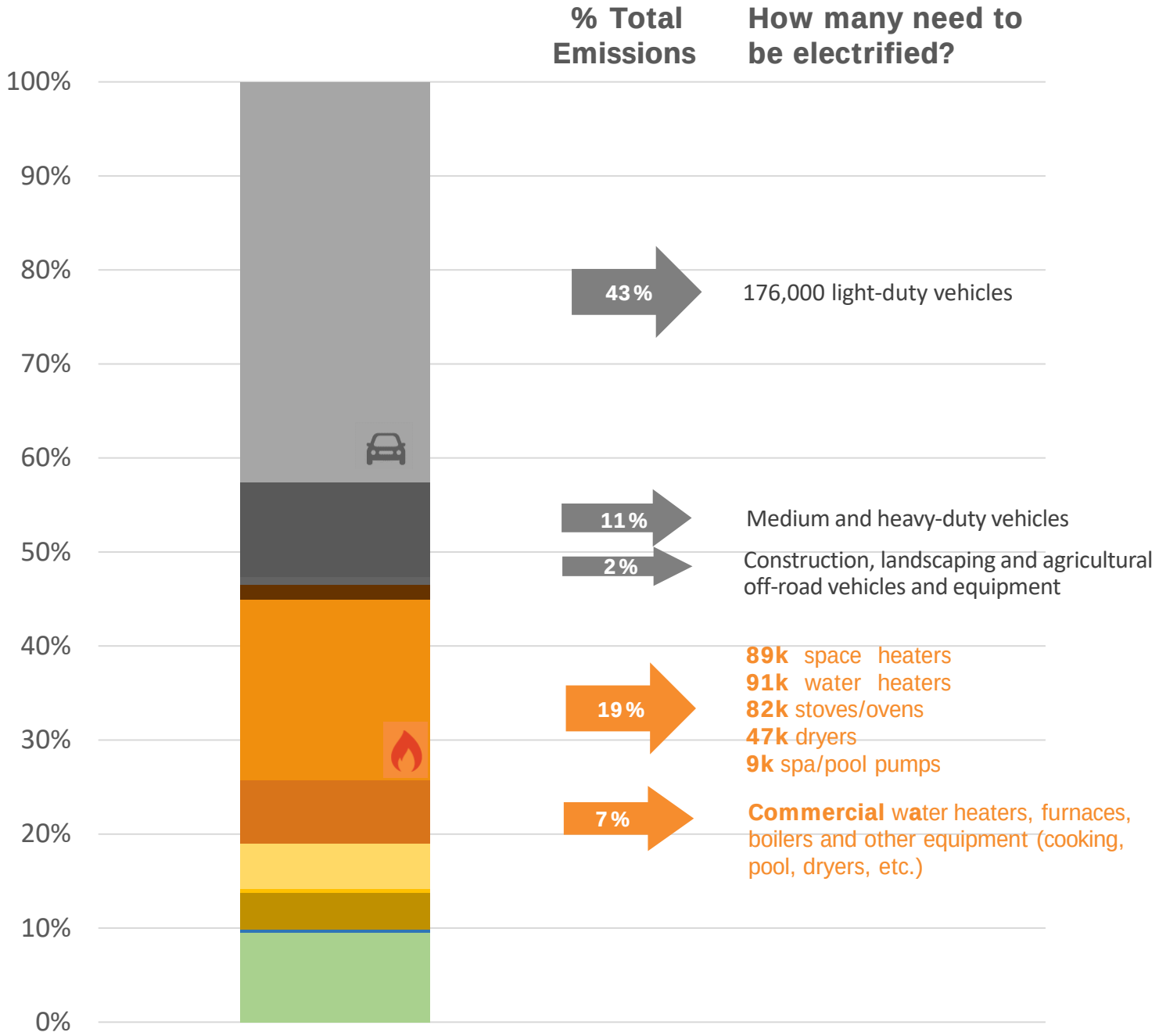
Commercial

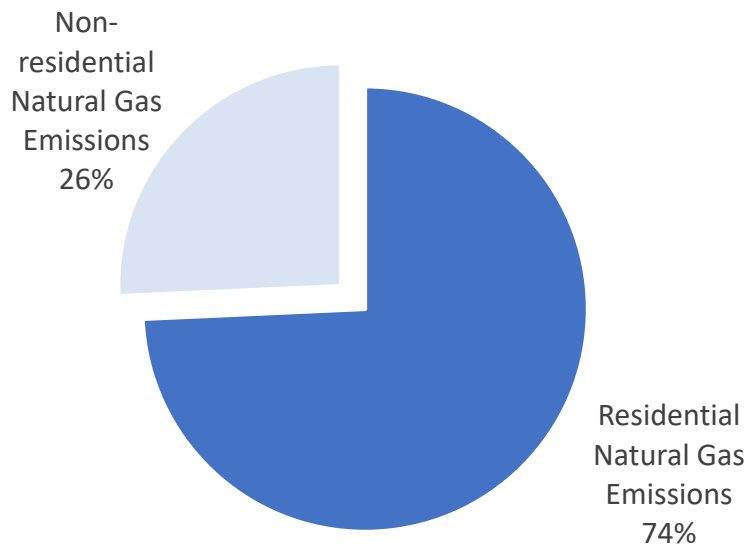


74% / 26% of Countywide Gas Consumed

Sources: California Department of Finance , E-5 (2022); California Residential Appliance Saturation Survey (2019); CoStar (2023); California Commercial End-Use Survey (2006).

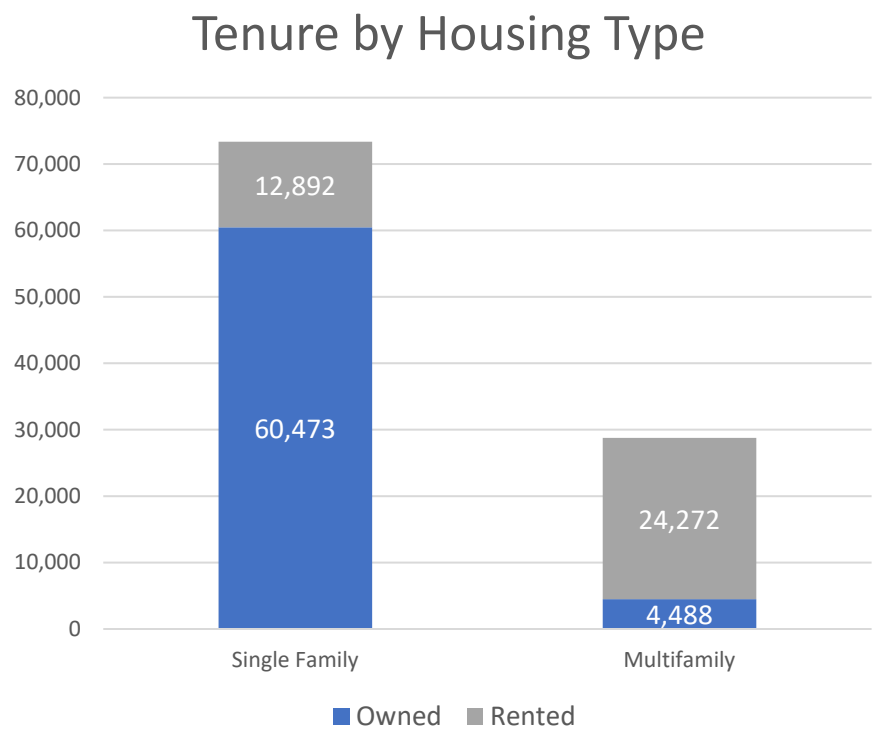
Over ½ Million Appliances, Equipment and Vehicles to Replace





1. Residential Building Inventory Analysis

Housing Counts by Type



Marin County has ~112,000 housing units

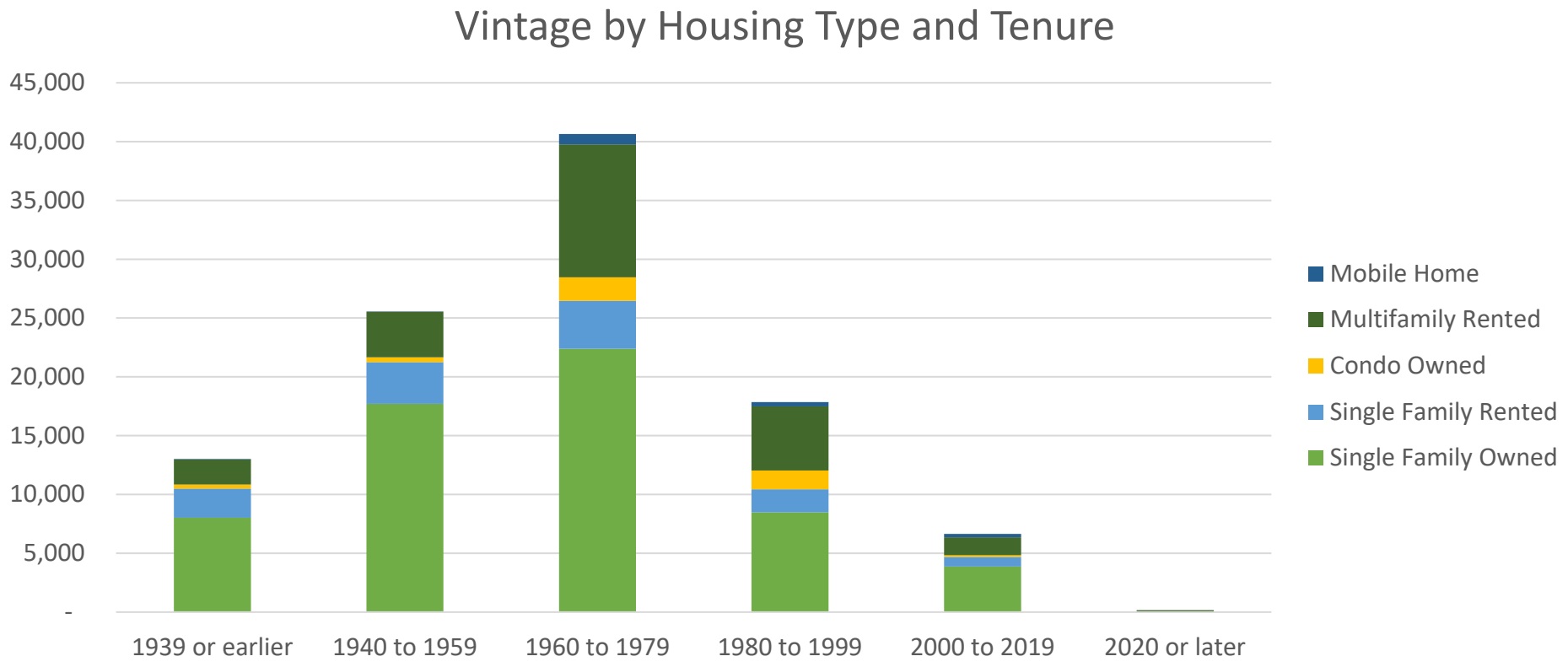
71% are single family

82% of single-family homes are owned

84% of multifamily homes are rented

Source: American Community Survey (2021)

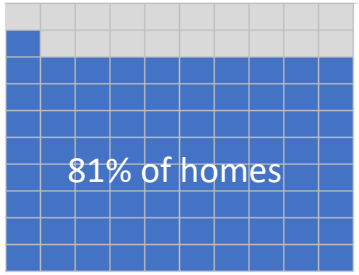
Housing Counts by Vintage and Type



Source: American Community Survey (2021)

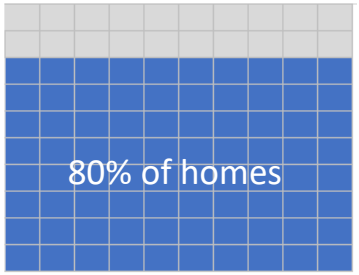
How many homes will need electrification measures?

Water Heating



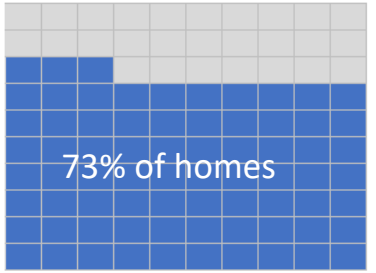
91k water heaters need replacement

Space Heating



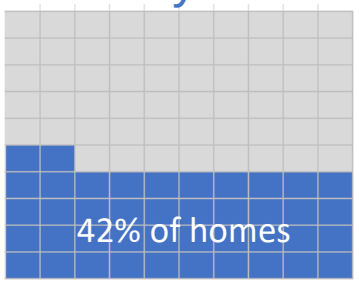
89k heaters need replacement

Cooking



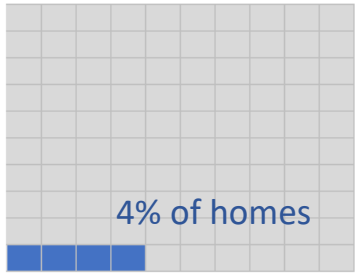
82k cooktops/ovens need replacement

Dryers



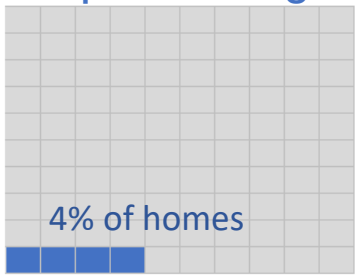
47k dryers need replacement

Pool Heating



4.4k pool heaters need replacement

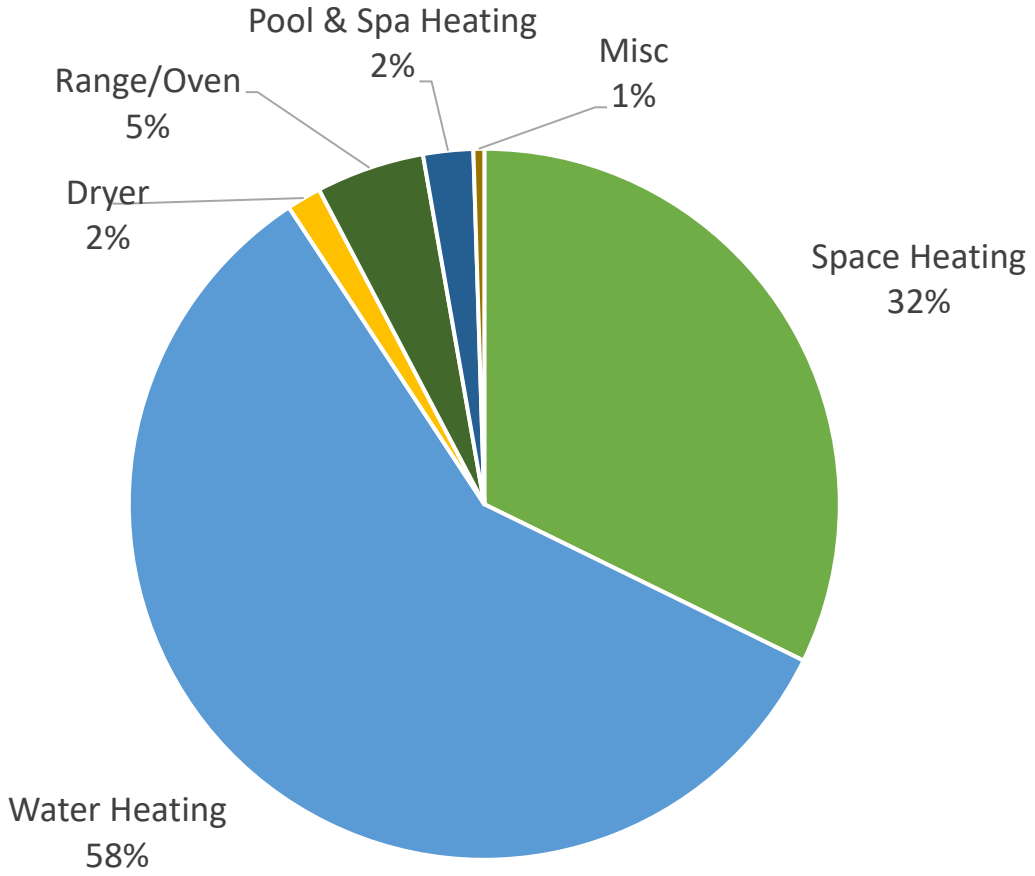
Spa Heating



4.9k spa heaters need replacement

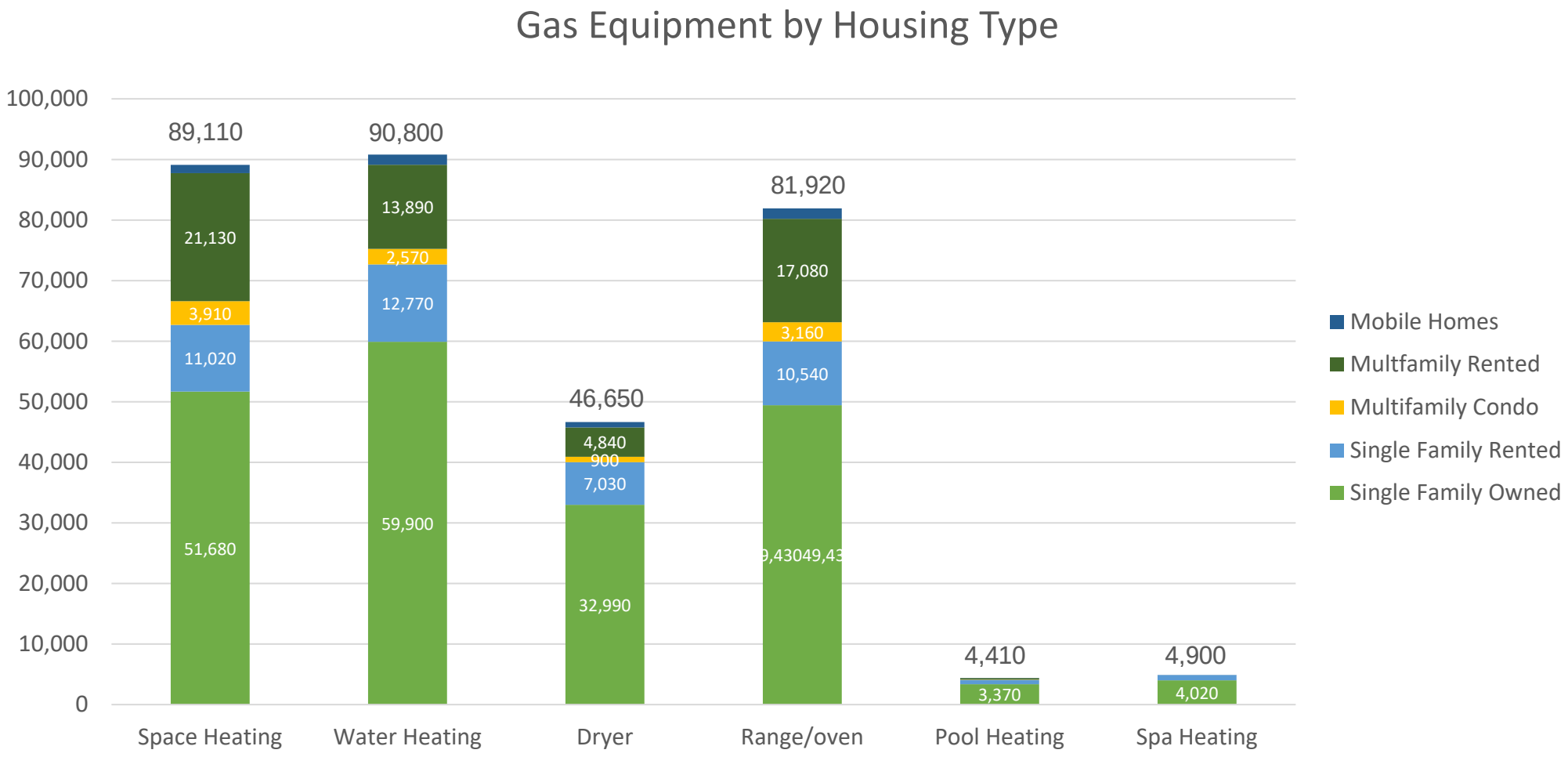
Sources: California Department of Finance , E-5 (2022); California Residential Appliance Saturation Survey (2019)

Residential Gas Consumption by End Use



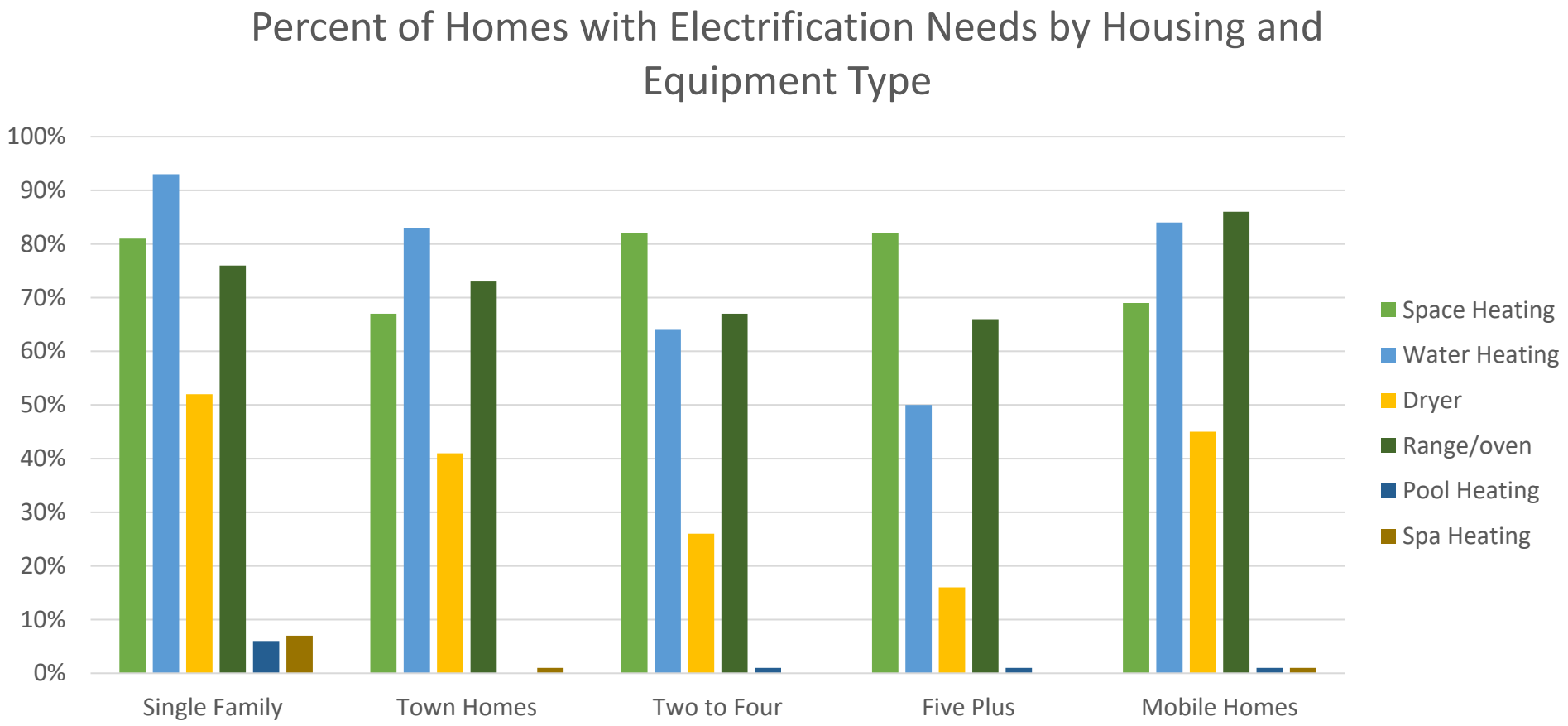
Sources: California Department of Finance , E-5 (2022); California Residential Appliance Saturation Survey (2019)

Scale of Electrification by Housing Type

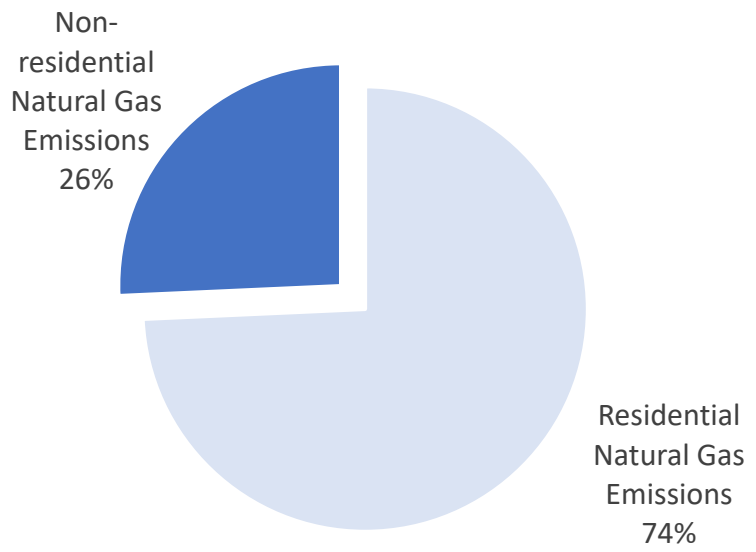


Sources: California Department of Finance , E-5 (2022); California Residential Appliance Saturation Survey (2019)
Numbers may not add due to rounding

Electrification Needs by Housing Type

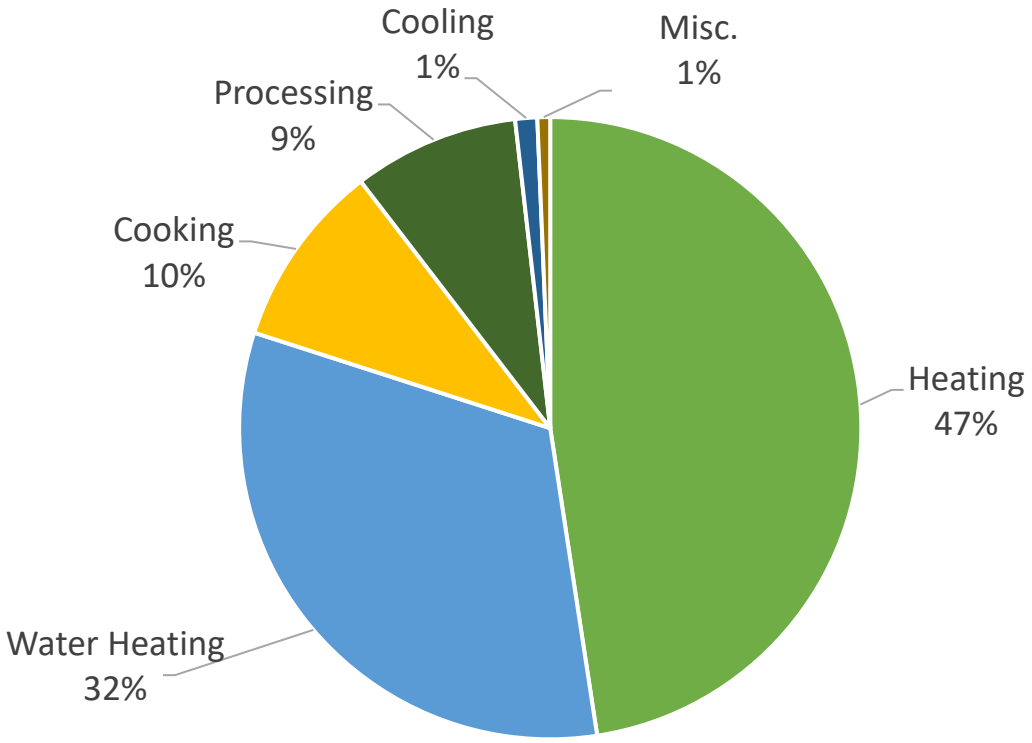


Sources: California Department of Finance , E-5 (2022); California Residential Appliance Saturation Survey (2019)



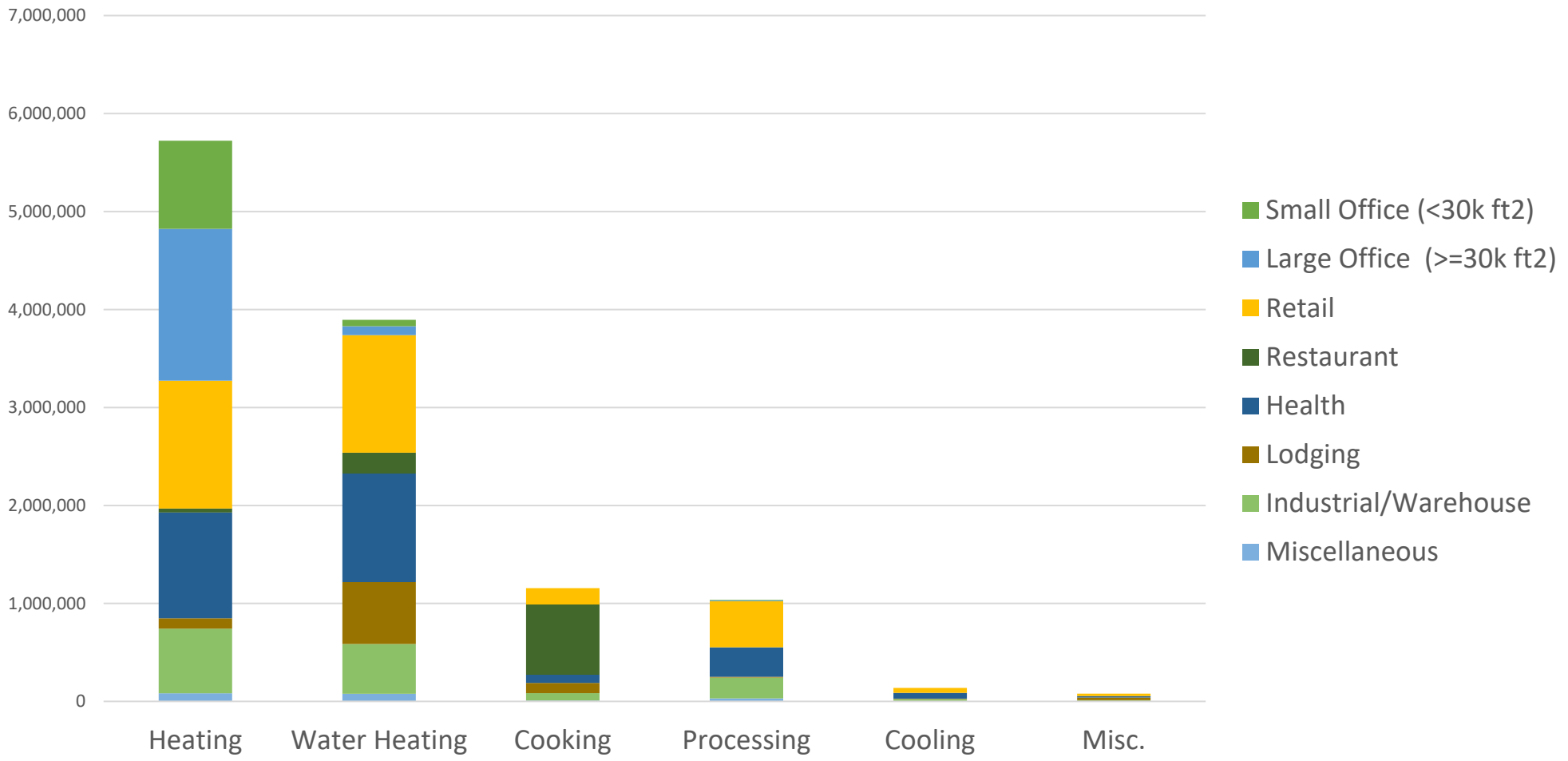
2. Commercial Building Inventory Analysis

Gas Consumption By End Use in Commercial Buildings



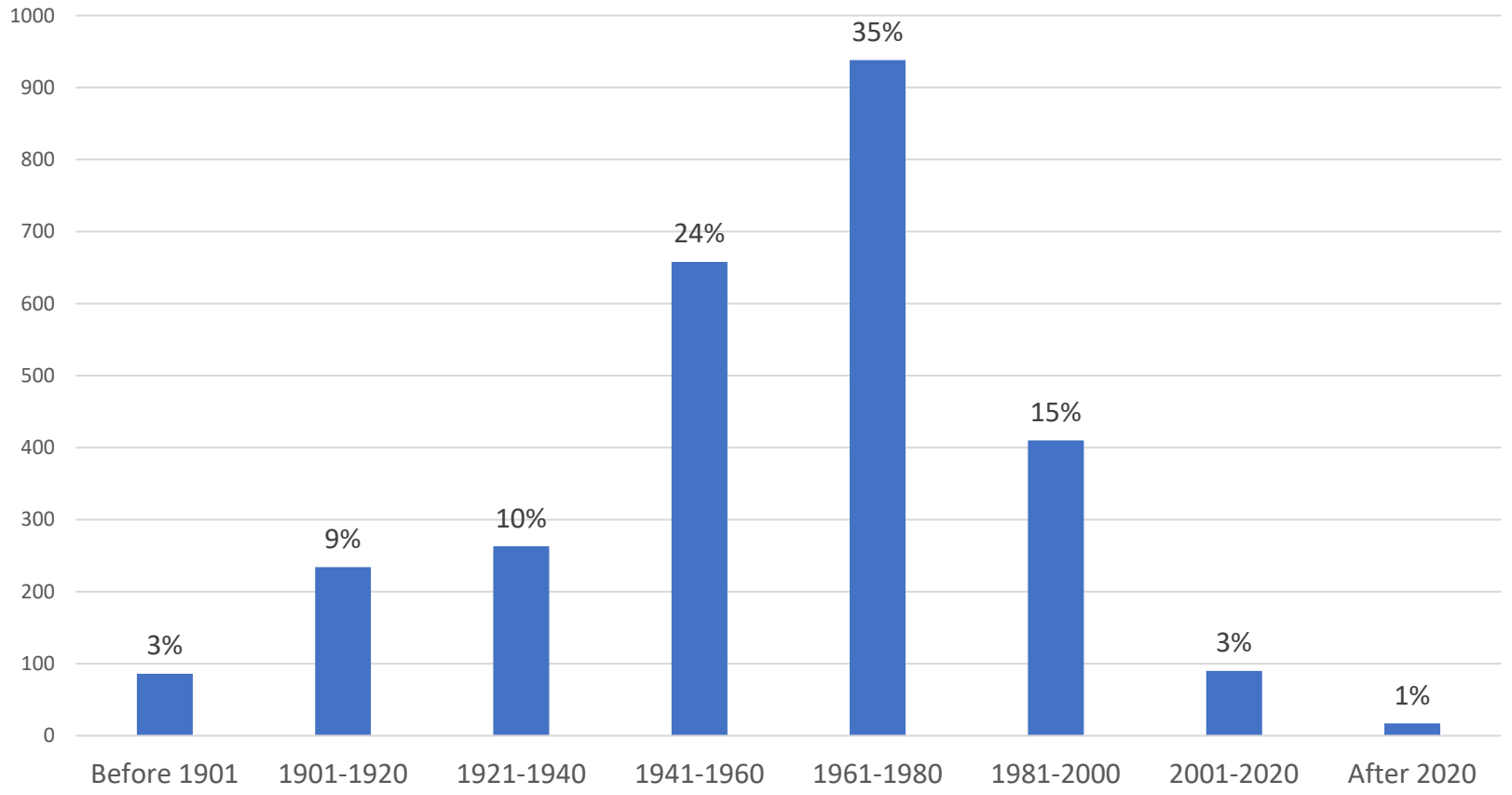
Sources: CoStar (2023); California Commercial End-Use Survey (2006). CoStar data reports Rentable Building Area and underrepresents public facilities and schools

Gas Use By End Use and Commercial Building Type



Sources: CoStar (2023); California Commercial End-Use Survey (2006). CoStar data reports Rentable Building Area and underrepresents public facilities and schools

Commercial Buildings Year Built



Sources: CoStar (2023); approximately 15% of buildings do not have Year Built data

Building Equity Analysis

A Building Equity Report was completed June 2024. The report analyzes demographic data across all twelve of Marin's City, Town, and County jurisdictions.

Building Electrification Equity Analysis

Introduction

Building electrification is a key policy across California to reduce greenhouse gas (GHG) emissions and save energy for the consumer. Developing an electrification plan, or roadmap is prudent because it will prepare the community for this rapid and inevitable transition.

This study examines the impacts of building electrification through an equity lens, aiming to ensure an inclusive transition away from natural gas (also referred to as "gas" herein) to all-electric buildings. Within the context of this report, the term "electrification" and "all-electric" also includes energy efficiency (e.g. insulation) upgrades.

Race and Social Equity

This report uses the term "equity" or "equitable" often. Equity can be defined as "the just and fair inclusion into a society in which all can participate, prosper, and reach their full potential" (Marin County Office of Equity, 2022). However, society has been systemically unfair and not inclusive to all, especially the disparate treatment to people of color. Disparities are exacerbated especially with catastrophic events such as pandemics or climate change. Hence, it is best practice to lead with race (people of color) when assessing climate policies or programs through an equity lens.

This building electrification equity analysis is leading with an equity lens. It also considers intersectionality between race and other forms of marginalization. The interconnected nature of social categorizations (e.g., income, age, disabilities, housing burden, level of education, etc.) can create overlapping and interdependent systems of discrimination and disadvantage. When race is intersected with any other disadvantaged social categorization, the outcomes for that individual or group are worse. If not designed to advance racial and social equity, a building electrification strategy or action will be less likely to succeed in reducing disparate impacts to communities of color.

The use of census data is well established practice to best analyze race and social indicators across census tracts. An example of local governments accounting for race and social indicators is in the development of housing elements. California AB 686 (2017) requires housing elements to include an analysis of barriers that restrict access to opportunity and a commitment to specific meaningful actions to affirmatively further fair housing (AFFH)[1]. Housing elements are required to identify impacts of systemic issues such as residential segregation, housing cost burden, and unequal educational or employment opportunities to the extent these issues create and/or perpetuate discrimination against protected classes[2]. In alignment with the County of Marin's 2023-2031 Housing Element (County of Marin Community Development Agency Housing and Federal Grants Division, 2023) this study will analyze data characteristic of similar geographic populations such as race, low-moderate income (LMI) households especially those cost burdened[3] and/or energy burdened[4], and/or other vulnerable communities[5] across Marin. For context, these populations will be referred to herein as "underserved."

Purpose

The purpose of this study is to analyze the impacts of building electrification on underserved populations across Marin, countywide. It will analyze 2020 census data, overlay geographic locations to identify key communities/areas to consider deployment

[1] "Affirmatively furthering fair housing" is defined to mean taking meaningful actions that "overcome patterns of segregation and foster inclusive communities free from barriers that restrict access to opportunity" for communities of color, persons with disabilities, and others protected by California law.
[2] A protected class is a group of people sharing a common trait who are legally protected from being discriminated against on the basis of that trait.
[3] According to HUD, affordable housing costs should equal 30% or less of a household's Income. See https://www.huduser.gov/portal/pdredge/pdr_edge_featd_article_092214.html.
[4] According to Dept. of Energy, the disproportionate percentage of income spent on energy costs. See https://www.energy.gov/scep/slsc/low-income-community-energy-solutions.
[5] Vulnerable populations are best described as seniors aging-in-place, youth, unhoused or marginally housed residents, non-English speaking people, immigrants, people with disabilities, people who are socially isolated, and people with pre-existing health conditions.

of focused strategies. It will offer some policy and program approaches that target these communities but will stop short of recommending actual actions. Actions will be co-developed with members of the community as part of the countywide building electrification roadmap. This study does not:

1. Imply one community should be preferred over another,
2. Assess the commercial building stock,
3. Include the building stock inventory and characterization study[6], which was conducted separately from this report, and
4. Put forth solutions needed to overcome equity challenges when electrifying.

Rather, this study analyzes key equity indicators, then recommends best practices policymakers, public agencies, or community-based organizations may want to take so they may bolster services to and reduce any unintended consequences a policy or program may have on underserved communities.

Background

The objective of an electrification plan is to put forth actions that reduce carbon emissions in buildings by shifting from gas to all-electric energy sources. This includes changes like installing or decommissioning existing gas infrastructure and/or replacing gas appliances with high-efficiency all-electric appliances in buildings. In the process of creating new policies and implementing an electrification plan, it is important to recognize and address the needs of often overlooked underserved community members. Alongside an electrification plan, an equity analysis can evaluate demographic data to

[6] County of Marin Community Development Agency, Sustainability Division. 2023. Residential and commercial building stock inventory available at https://www.marincounty.org/depts/cd/divisions/sustainability/electrify-marin/green-building-development/electrification-roadmap/building-inventory-equity-analysis.

surface existing inequalities and enable equitable access for households to take steps toward home electrification.

Home electrification and energy efficiency building upgrades may be feasible for higher-income and property-owning residences but may not be feasible for lower income and underserved residences. Areas with a higher number of rentals, lower and fixed income, and/or populations with disabilities, health conditions, or impairments can be considered underserved. These communities tend to see lower rates of building upgrades and higher rates of deferred and necessary maintenance (i.e., dry rot, termite damage). Data will be collected on these equity-priority communities countywide including, but not limited to, commonly known underserved communities such as Northern Novato, the Canal District, Marin City, and West Marin. Implementing an electrification plan would especially be challenging for these communities because of cost barriers and adequate access to resources.

Key Indicators

This study will analyze Marin's community, geographic, and demographic data using six indicators across all census tracts:

1. Social Vulnerability (includes a variety of indicators)
2. Household Income (Median)
3. Rent Burden (Multi-Unit Households)
4. Energy Burden
5. Age
6. Disability (includes a variety of indicators)

These indicators will help identify areas across Marin County that may face barriers to electrifying and upgrading to more energy-efficient homes. Analyzing these areas can surface appropriate and equitable electrification and home upgrade strategies.

Social Vulnerability

Social vulnerability can be measured the Social Vulnerability Index (SVI). By identifying vulnerable areas in Marin using this measure, we can better understand a community's sensitivity to potential utility rate changes.

Levels of social vulnerability across Marin are delineated by census tract. It is based on 2020 Center for Disease Control (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR) data. On a scale of 0.1 to 1.0, the higher the social vulnerability, the greater the risk of that community being put at a disadvantage if electrification policies and programs are not designed and implemented effectively. The CDC and ASTDR use multiple variables to index or measure social vulnerability:

- Socioeconomic Status
    - Below 150% poverty
    - Unemployed
    - Housing cost burden
    - No high school diploma
    - No health insurance
- Household Characteristics
    - Aged 65 & older
    - Aged 17 and younger
    - Civilian (Person) with a disability
    - Single-parent households
    - English language proficiency
- Racial & Ethnic Minority Status
    - Hispanic or Latino (of any race); Black and African American, not Hispanic or Latino; American Indian and Alaska Native, not Hispanic or Latino; Asian, not Hispanic or Latino; Native Hawaiian and other Pacific Islander,

not Hispanic or Latino; two or more races, not Hispanic or Latino; other races, not Hispanic or Latino

- Housing Type & Transportation
    - Multi-unit structures
    - Mobile homes
    - Crowding
    - No vehicle
    - Group quarters

In contrast to census tracts with the lowest levels of social vulnerability (areas such as Mill Valley, Tiburon, and Belvedere), tracts with medium-high levels of social vulnerability are concentrated in the following (Figure 1):

1. Canal District in San Rafael (0.96),
2. St. Vincent's in San Rafael (0.78),
3. Downtown Novato (0.75), and
4. Marin City (0.70)

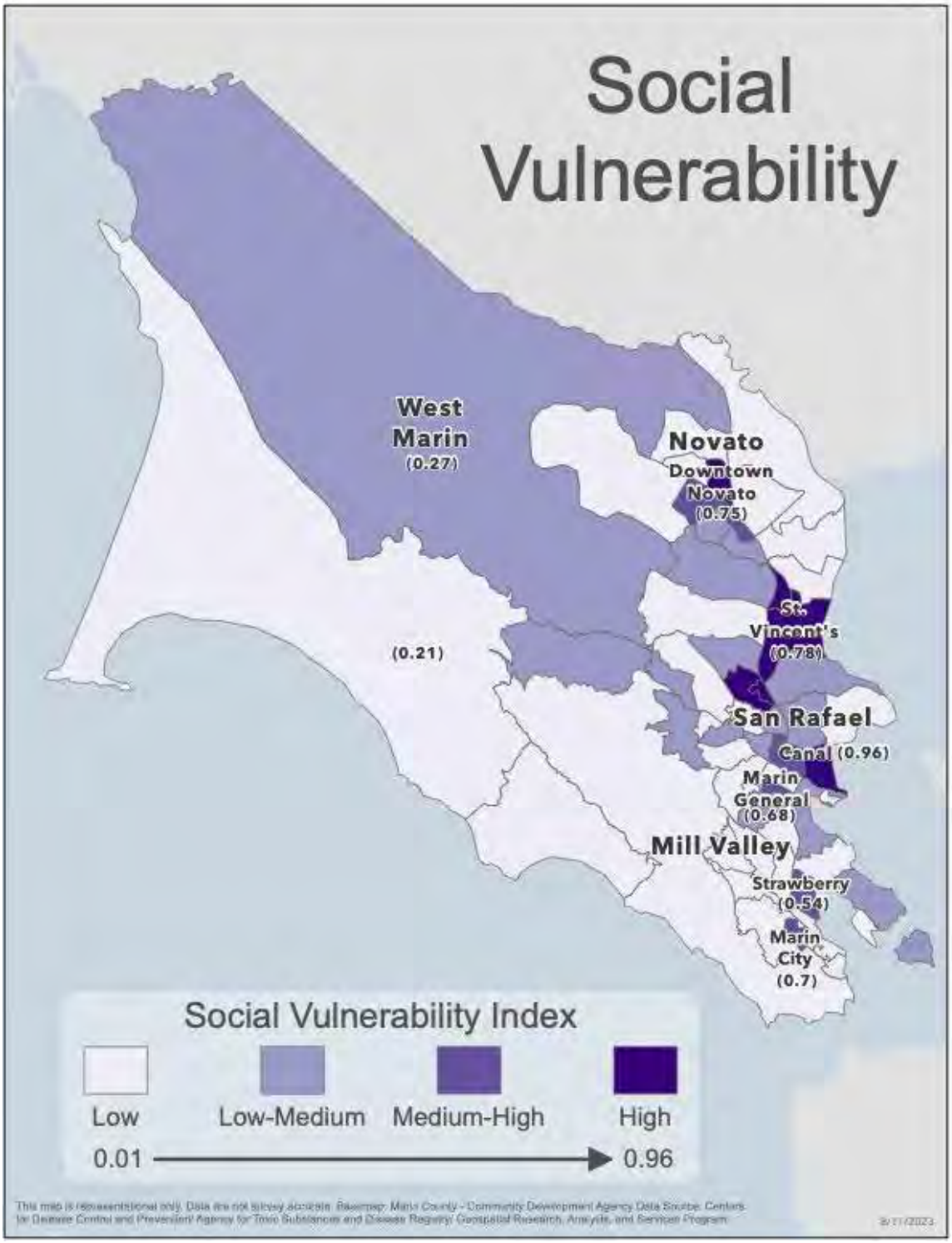


Figure 1. Social vulnerability index by census tract in Marin County.

Comparing the SVI map with an income distribution map, we find that lower-income areas and areas with higher social vulnerability overlap (Figure 1 and Figure 2). These overlaps include Canal District in San Rafael, Marin City, Downtown Novato, and St. Vincent's in San Rafael. The social vulnerability map and the low-income map together illustrate where the greatest need is for equity-based strategies.

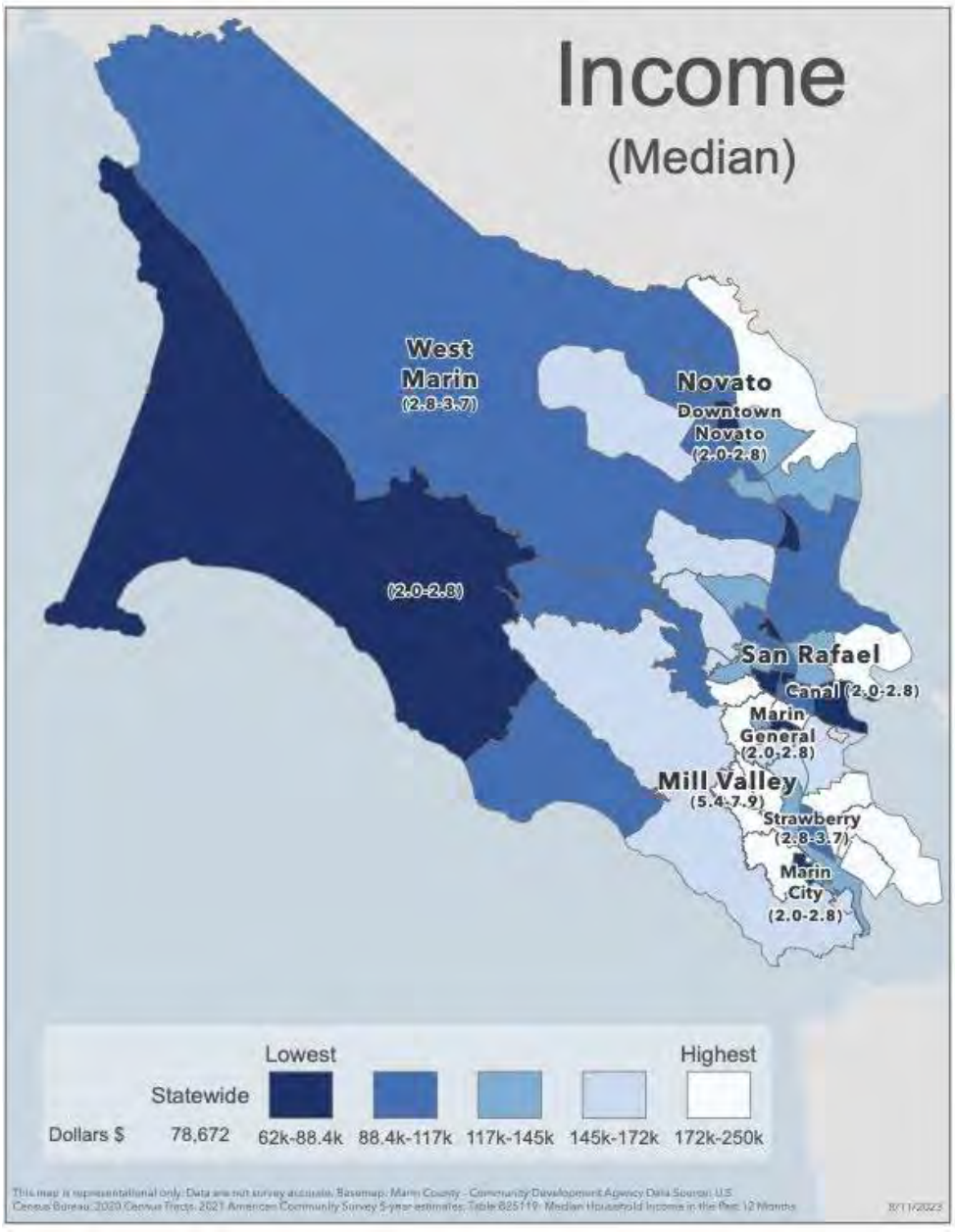


Figure 2. 2020 median income by census tract in Marin County (Census Bureau, 2020).

Income

Low to Moderate income households often have limited access to financial resources and lack qualifying credit to finance building envelope and appliance upgrades. By identifying income constrained communities using census data, we can better understand a community's economic well-being.

According to the 2020 Census, the Statewide median household income was $78,672, which puts upwards of 33% of households across Marin County below this threshold (Figure 2):

1. West Marin ($62-117k),
2. Novato's Downtown ($62-117k),
3. Marin City ($62-88.4k),
4. Strawberry ($62-117k),
5. Households around Marin General ($62-88.4k),
6. San Rafael's Downtown ($62-117k), and
7. San Rafael's Canal District ($62-88.4k)

Families with a lower median income tend to be clustered together. This is partly a result of historic redlining and restrictive deed covenants. It is also driven by the high cost of housing in many parts of Marin County. This makes the option of choosing to move out of these underserved communities difficult. For context, in California the 2020 median household property value was $538,500 compared to Marin County at $1,050,000.

Finding ways to increase access to incentives and affordable ways to finance building upgrades to these communities in Marin will be critical to accelerating electrification and energy efficiency projects. Policymakers and community-based organizations countywide can develop policies and programs that reduce barriers to accessing resources. Direct and tiered financial resources to reduce upfront costs to

electrification among low-income households are commonly used tactics. Non-financial resources such as wrap-around services should be used. This includes:

1. Technical support for installs,
2. Improving access to rebates and incentives so that LMI households can benefit,
3. Considering geographically targeted policies, and
4. Accelerating training programs for a more skilled and diverse contractor and workforce base.

Rent Burden (Multi-unit Properties)

Residents and individuals who live in multi-unit housing can face a variety of challenges in making changes to their buildings. By identifying concentrations of renters using census data, we can better understand a community's housing security and potential need for housing assistance and subsidies.

In many cases, renters have limited control over building equipment, technology, and where their energy sources come from because of the nature of their lease agreements. Challenges can range from restricted decision-making to financial constraints that often lead to deferred maintenance and discourage appliance and mechanical system upgrades. Additionally, the lack of access to information about the benefits of building energy efficiency and electrification upgrades to both renters and their landlords further exacerbates the issue of deferring basic repairs. Therefore, it is important to reduce the barriers both renters and landlords face when upgrading their buildings.

Landlords can face challenges when upgrading their buildings. Financial concerns, including upfront costs and return on investment, can be deterrents to performing building upgrades. Additionally, landlords may be uncertain about the compatibility of existing infrastructure with electric systems and the potential disruption on operations upgrades

can cause during the conversion process. Because renters often pay the electric bill directly, electricity bill savings may not benefit the landlord.

For renters, a major issue to consider is that when landlords undertake improvements, it has the potential to contribute to displacement. This is because there is lack of stronger renter protection in Marin. This can enable landlords to justify raising the rent, temporarily moving tenants out of the property, and/or using substantial remodel loopholes to evict tenants.

The 2020 United States Census Bureau data shows a contrast between owner and renter income levels by census tract in Marin County (Figure 3 and Figure 4). Approximately one-third of Marin residents are renters. In 2022, nearly 44% of renters have spent over 35% of their income on rent alone rising 3% since 2020 – the early days of the pandemic[7]. This leaves very little for discretionary expenses, let alone expenses for building upgrades. Furthermore, nearly three of every five renters (57%) in Marin are considered to be extremely low, very low, and low income (15% - 80% AMI). These renters stretch across the following geographic areas:

1. Northern to Central Coastal Marin,
2. Northern Novato,
3. San Rafael-Canal,
4. Strawberry,
5. Marin General, and

[7] County of Marin Community Development Agency, Marin Compass. Housing affordability for homeowners and renters. Dashboard accessed online, 7/15/2024. Available at https://data.marincounty.org/stories/s/Housing-Affordability-in-Marin/eixh-kvn2/.

6. Marin City

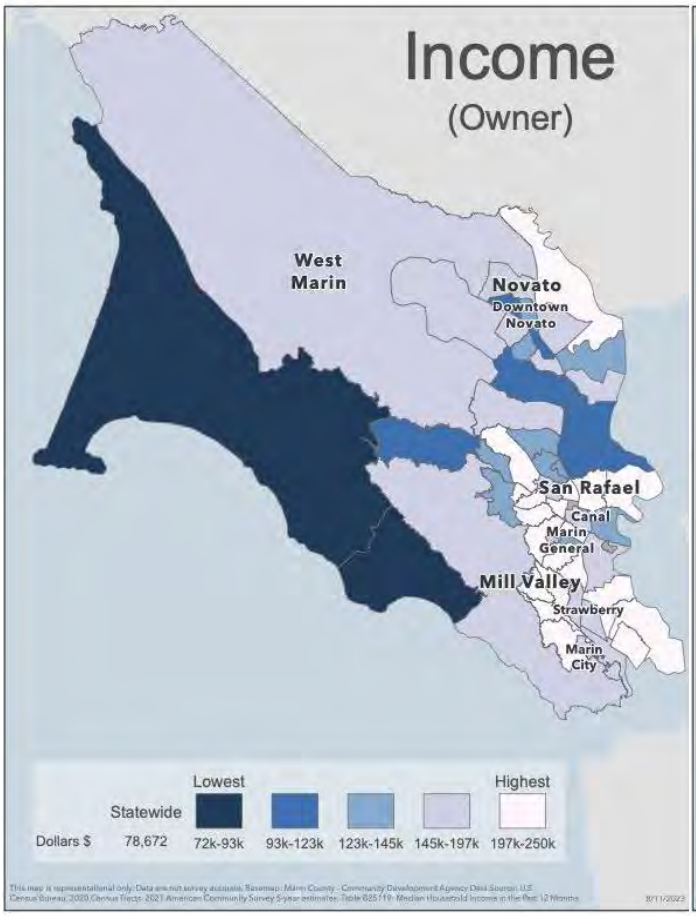


Figure 4. 2020 Median owner's income by census tract in Marin County.

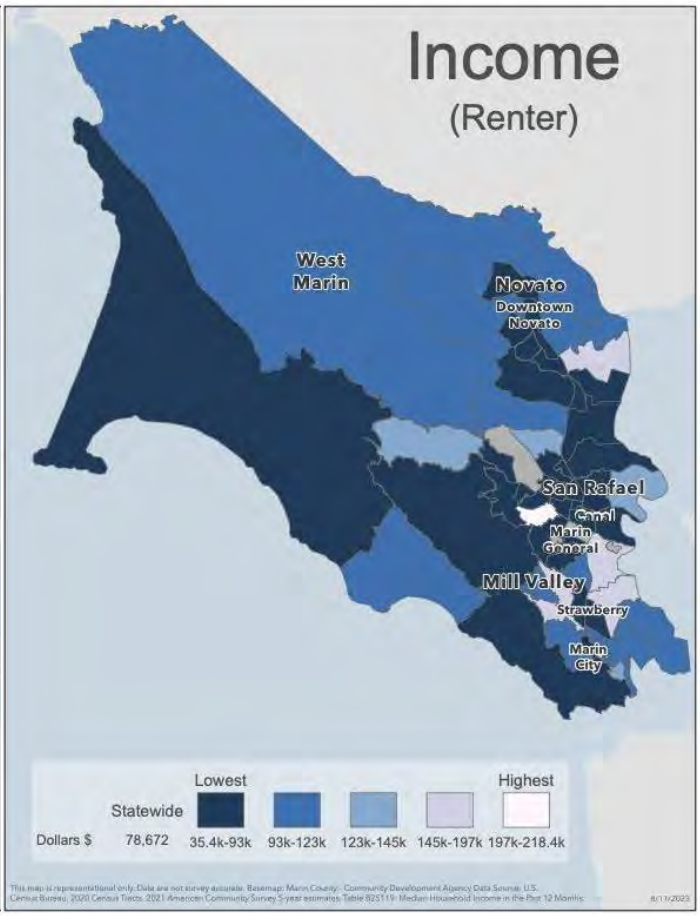


Figure 3. 2020 Median renter's income by census tract in Marin County.

We can encourage and incent landlords to embrace building electrification as a long-term investment that benefits both their tenants and their bottom lines in these geographic areas. In contrast, those that own their homes tend to have higher incomes than those that rent (Figure 3). Hence, renters will face more financial barriers as well as lack decision making authority when it comes to electrifying and upgrading their homes.

Energy Burden

Energy burden is the disproportionate percentage of income spent on energy costs[8]. The Department of Energy created a Low-Income Energy Affordability Data (LEAD) mapping tool, allowing policy and program-makers to make data driven decisions based on LMI household energy characteristics. By identifying concentration of energy burdened areas using the LEAD Mapping tool, we can better understand a community's energy security and potential need for energy efficiency programs and other utility related assistance. Broadly speaking, low-income households tend to experience energy burden more because their income is more sensitive to price changes relative to more affluent households.

The national average energy burden for low-income households is 6% (AMI of 0-80%)[9]; three times higher than that for higher-income households, which is estimated at 2%. Most of Marin falls below (1%) the national and state energy burden average, which is at 2%; however, this average mask energy burdens felt within specific communities across Marin. LMI residences (0-60% AMI) in West Marin face a slightly higher energy burden (5%) compared to LMI residences across the rest of Marin County (4%). Because there are relatively few renters in West Marin, much of the burden falls on LMI owners of properties. This likely reflects a vulnerable population that may be asset rich but aging-in-place with fixed incomes. In addition, there is no infrastructure that pipes gas across rural West Marin. Thus, West Marin residences, especially those in the 0 to 60% AMI, face a higher energy burden because of their reliance on the purchase of more expensive bottled gas and fuel oil as the primary source to heat their homes. Ultimately, it will be important to work with community-based organizations and MCE to increase access to

[8] Department of Energy. Low-income Energy Affordability Data (LEAD) tool and community energy solutions. Accessible online at https://www.energy.gov/scep/slsc/low-income-community-energy-solutions.
[9]U.S. Department of Housing and Urban Development. Income limits. Accessible online at https://www.huduser.gov/portal/datasets/il.html.

subsidized incentives and programs (e.g., solar + energy storage and heat pump water heater rebates, among others) for West Marin residences to lower their energy burden.

Age and Disability

People with disabilities and seniors aging-in-place may face barriers to electrifying their homes. By identifying areas with high concentrations of those disabled and aging-in-place, we can better understand a community's sensitivity to price changes, are likely in need of exceptions to building requirements, and./or are prime candidates for hands-on, turnkey assistance to access the technical complications of implementing electrification and energy efficiency subsidy programs.

For example, those on a utility medical baseline rate rely on electricity for essential medical equipment such as breathing devices, medication refrigeration, and life support apparatus. Seniors, who may not currently live with a disability, likely live on fixed incomes. This group could also perceive electrification as costly. These practical and

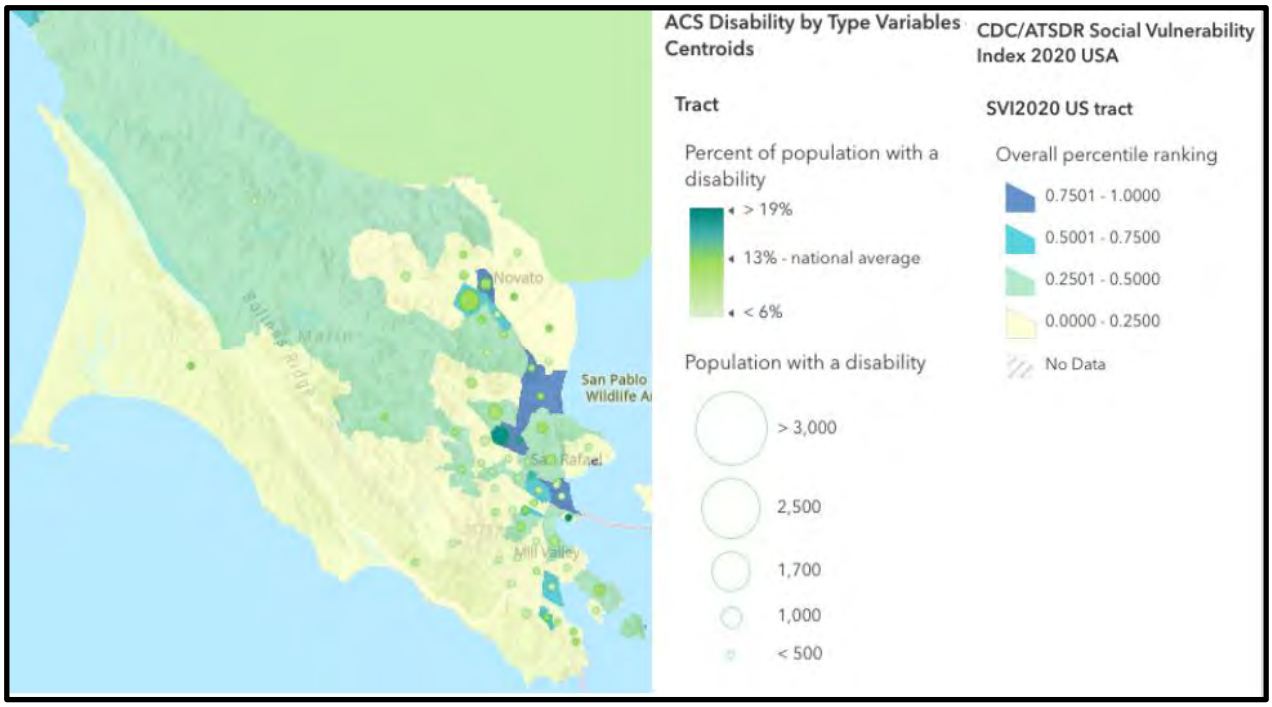


Figure 5. Disability overlaid with Social Vulnerability Index (SVI) by census tract in Marin County.

financial barriers make it challenging for Marin residences aging-in-place from embracing electrification upgrades.

About 10% of Marin's population is considered disabled[10,11]. While this is less than the national average (13%), certain census tracts across Marin exceed the national average. The Social Vulnerability Index was overlayed with disability data to assess where these populations may be concentrated (Figure 5)[12]. The map shows populations with disabilities concentrated in the following areas:

1. San Margarita Valley,
2. San Rafael's Downtown,
3. San Rafael's Canal District,
4. Novato's Downtown, and
5. Marin City

Overlaying areas with the highest disabled populations and social vulnerability illustrates parts of the community most vulnerable. Efforts could be focused in these areas to increase energy efficiency and electrification upgrade subsidies and assistance to those disabled and/or aging-in-place.

[10] U.S. Census Bureau. "Disability Characteristics." American Community Survey, ACS 1-Year Estimates Subject Tables, Table S1810, 2022, https://data.census.gov/table/ACSST1Y2022.S1810?q=disability&g=050XX00US06041. Accessed on July 12, 2024.

[11] Broadly speaking, individuals may experience disability if they have difficulty with certain daily tasks due to a physical, mental, or emotional condition. The Census Bureau collects disability data by asking questions about difficulty with daily activities and other functional limitations. For more information on disability and how its measured see US Census Bureaus resource on disability see https://www2.census.gov/about/training-workshops/resources/disability-onepager.pdf

[12] 2020 Social Vulnerability Index (SVI). Created by the Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR)/Geospatial Research, Analysis, and Services Program (GRASP)., https://www.arcgis.com/home/item.html?id=80010607e93249b2b6d98147805f1f74#overview. Accessed on July 12, 2024.

The Senior Well-Being Map illustrates 65 years and older demographic distribution across various locations within Marin County[13]. Population with high concentrations of seniors aging-in-place are in the following areas (Figure 6):

1. East to Downtown San Rafael,
2. Novato,
3. Tiburon,
4. Marin City
5. Greenbrae, and
6. San Margarita Valley

The map reveals that while many age-in-place in Marin, they are dispersed across numerous areas within Marin County, rather than being concentrated in specific parts. Since all populations inevitably age, it is important to emphasize equity-focused electrification strategies for those aging-in-place. This approach will ensure accessibility, fairness, and inclusivity of policies and programs which are often too complicated for aging populations to implement.

[13] 2020 ACS Context for Senior Well-being - Centroids., https://coronavirus-resources.esri.com/maps/f0fab4b2e96a4e65a0207d9724aca38b/about. Accessed on July 12, 2024.

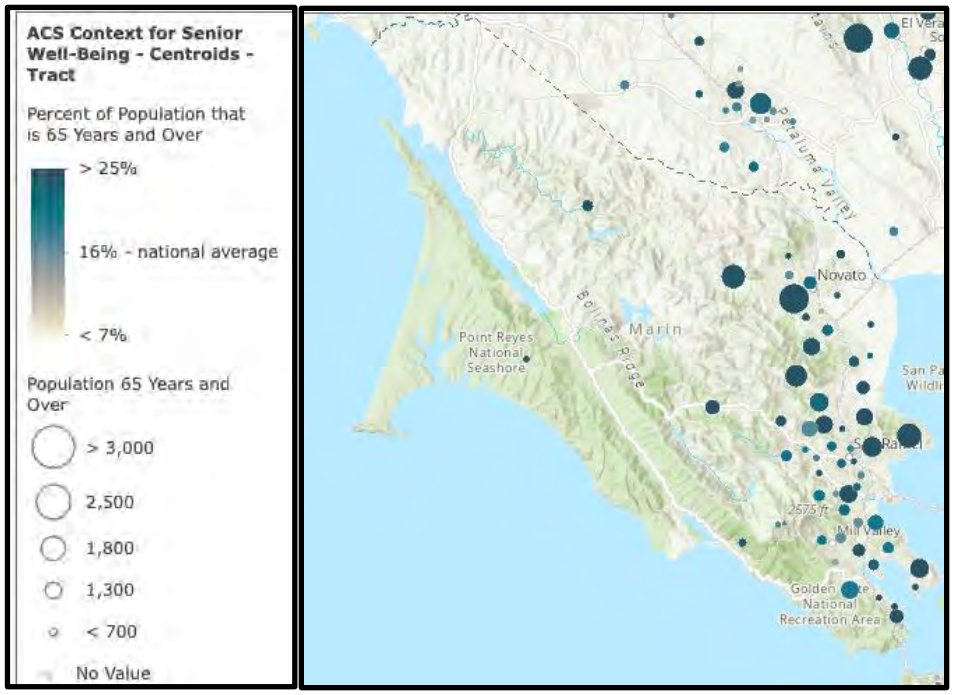


Figure 6. 2020 senior well-being by census tract.

Equity Challenges and Solutions

Challenges and solutions to ensure an equitable building electrification roadmap are illustrated below (Table 1). Recommended solutions are based on this study's findings, best practices used by other local governments, and feedback from engagement with Marin's community stakeholders[14]. The following does not reflect a comprehensive list of recommendations, rather, it serves as a starting point for decision-makers to develop the roadmap.

[14] Electrification Building Workshop Series, Marin's Transition to an All-electric Future. 8/2/2023 at https://www.marincounty.org/depts/cd/divisions/sustainability/electrify-marin/green-building-development/electrification-roadmap.

Table 1. Barriers and recommended solutions to a more equitable building electrification roadmap.

Theme	Barrier	Recommended Solutions
Renter Protection and Displacement	Electrification and/or energy upgrades could give reason for landlords to pass costs onto their tenants and may lead to forced displacement Landlords can exploit rent law loopholes to evict tenants during substantial remodels. Tenants need to be moved during active construction. Alternative, nearby rentals, and supplemental costs for rent will need to be negotiated between tenant and landlord.	Voluntary programs that subsidize costs to landlords such as direct install programs, can include tenant protection assurances (e.g., rent increase limitations, eviction protections, information on tenant/property owner rights and responsibilities, and temporary displacement requirements) as part of the terms and conditions of accepting financial assistance. Identify rent law loopholes to close so that substantial remodels are not used by property owners as a tool to evict tenants Find funding to supplement rent should renters need to find a nearby dwelling during construction.
Split Incentives and Energy Upgrades	The building owner (landlord) pays for the building upgrade and the tenant (renter) pays the energy bill. This scenario can result in renters paying upwards of 2.7% more on energy bills than landlords or households that pay energy bills (Melvin, 2018)	Glean learned lessons from MCEs multifamily (multi-unit) energy savings program and/or Marin County Housing and Federal Grants Division. Combine efforts with the Marin County Housing team as they are currently working on affordable housing strategies to address rent protection for multi-unit properties that undergo electrification. Subsidized could also be directed at the landlord to incentivize upgrades.
Community Engagement	Historically policies have not included comprehensive	Ensure community members help co-develop the roadmap. Marin can

Theme	Barrier	Recommended Solutions
	community partnership and involvement in policy and program development.	use Rocky Mountain Institute's Equitable Electrification toolkit and County of Marin's Office of Equity Race Equity Action Plan for frameworks and best practices when getting community stakeholders involved in policy and program development. The focus on groups that serve historically underserved geographic areas is important.
Deferred Maintenance	Some households, in particular multi-unit low-income tenants and fixed income homeowners have not kept up with basic repairs and maintenance.	Prior to going through an electrification or energy upgrade, focusing outreach, programmatic, technical, and financial support for basic repairs will be important to low-income, seniors aging-in-place, and other vulnerable households that live on a limited or fixed income.
Energy Storage and Back-up Power	Households that need electricity to power medical devices, refrigerate medicine, and more may need constant access to a reliable source of energy.	Local government, utilities, and non-profit organizations can help LMI households access subsidized incentive and rebate programs especially for battery back-up power systems.
Workforce	Stakeholder interviews and focus group workshops revealed a lack of qualified, knowledgeable and/or affordable contractors to install all-electric systems including water and space heat pumps, EV chargers, and modern electrical systems and panels. There is also a lack of technical knowledge by the building staff workforce on new technologies	State and regional authorities have developed and continue to maintain qualified contractor lists. Simultaneously, MCE, local governments, community-based organizations, businesses, and the building and trades community can leverage State and Federal funding to grow and create a diverse and skilled workforce. The funding can be used to retrain existing and generate a new

Theme	Barrier	Recommended Solutions
	such as heat pump water heaters or smart panels. This creates uncertainty and delays permit review timelines.	workforce that simultaneously has access to high quality and high road jobs[15].

Case Studies

Some jurisdictions outside of Marin County have created plans or roadmaps for building electrification with a focus on equity. Examples are included below as a point of reference when developing Marin County's Roadmap.

City of Santa Monica: Community Engagement and Equity Principles

Santa Monica's Existing Building Electrification Roadmap outlines policy recommendations to electrify Santa Monica's existing buildings. The City is working towards a building electrification strategy that is rooted in equity and access. As part of this process, they are working closely with three key organizations to cooperatively develop strategies and goals for building electrification including Santa Monica Black Lives Association (SMBLA), Community Corporation of Santa Monica (CCSM), and Climate Action Santa Monica (CASM). This is to ensure that they carry out a public community engagement process to enable disadvantaged community members to help develop electrification policies and programs.

[15] "High road jobs" means high industry labor standards and established access to clear training pathways for building decarbonization jobs, especially for entry-level and disadvantaged workers. See Rising Sun press release on its convening and promotion of equitable job access in the Bay Area. Available for download at https://risingsunopp.org/wp-content/uploads/Rising-Sun-HRTP-Press-Release.pdf

The City also established equity and funding principles including, prioritizing access to health and safety benefits provided by electrification, supporting anti-displacement & housing affordability, providing funding and financing, supporting electrification jobs, and simplifying the installation process. They are also working towards maximizing incentives for underserved communities to ensure equitable access to affordable funding mechanisms and work with Federal, State, and Regional program providers to get dollars flowing to underserved communities.

City of Berkeley: Centering Equity and Guardrails

The City of Berkeley has developed an Existing Buildings Electrification Strategy. Berkeley's electrification plan is guided by an equity approach, with a focus on prioritizing underserved communities most impacted by change. They have developed a set of guard rails to ensure that all residents, particularly underserved communities impacted by climate change, have equitable access to the health, safety, and economic benefits of electrification. These guard rails include access to health and safety benefits, access to economic benefits, maximizing ease of installation, and promoting housing affordability and anti-displacement. The City of Berkeley is also planning to secure funding and financing needed for low-income property owners and renters tied to tenant protections to address split incentive barriers in multi-unit buildings.

Conclusion

Equitable access to building electrification cannot be achieved solely through a singular policy or program. It requires a comprehensive solution of both building code requirements and accompanying subsidized programs and incentives. It also requires a collaborative approach, where policymakers and community members work together to recognize the diverse needs and barriers of underserved communities countywide. Active involvement of Marin County stakeholders is required for a successful equitable building

electrification roadmap including, but not limited to community-based organizations, Cities and Towns, businesses, the buildings, development, and trades communities, and utilities working together to increase electrification and energy efficiency upgrades to underserved communities. Using publicly available demographic data, primarily through the U.S. Census Bureau, the following underserved geographic areas should be targeted for expanding any policy, programs, incentives and subsidies developed:

1. Canal District in San Rafael,
2. St. Vincent's in San Rafael,
3. Downtown in San Rafael
4. Marin City
5. Downtown Novato/Northern Novato
6. West Marin (Northern to Central Coastal),
7. Strawberry, and
8. Households around Marin General

Through a collective effort, Marin County can greatly expand equitable access to building energy efficiency and electrification building upgrade benefits.

4.2 Appendix B

Examining the Challenges and Solutions to Marin's All-electric Transition

4.2 Appendix B: Examining the Challenges and Solutions to Marin's All-electric Transition

The following is based on an evaluation of policies and programs implemented, a literature review, and interviews of government staff across California and the U.S. Challenges and solutions surfaced during community stakeholder workshops were also included.

Aged Buildings

Much like other California communities, the key building type to address for Marin are existing single-family residential buildings. According to a study conducted by the County of Marin and for the development of this roadmap, 71% of residential buildings are single-family homes[17]. (See Appendix A: Building Stock Inventory and Equity Analysis.) As a result, most building fossil fuel emissions come from this building type. Providing helpful policies, programs, and incentives to owners of single-family residences presents the largest opportunity to reduce GHG emissions countywide.

It will be especially important to upgrade older buildings. Approximately three quarters of all residences were built before 1980 while only 6% were built after 2000. In addition, 60% of commercial buildings were built between 1941 and 1980. It will be prudent to assess whether these buildings need electrical system upgrades to accommodate appliances such as heat pump space or water heaters, EV chargers, solar and/or induction stoves. This may add to project costs, as discussed in the Electrical Panels and Systems section below, so any policy, program or incentive focused on upgrades of older buildings should anticipate these potential extra expenses.

Equity, Renter Displacement and Tenant Protections

Underserved people – especially low-to-moderate income (LMI) residents and seniors aging-in-place – living in single or multi-unit homes are more likely to lack the financial resources and tools to access rebates and incentive programs. Programs and tools such as mailers and in-person promotional campaigns, language and accessible copy, and in-person or phone hot line assistance are common tactics already deployed across Marin. They should continue to be used and expanded upon to increase access. In addition, direct install incentive programs (i.e., installations subsidized and performed by pre-qualified and approved contractors) for LMI renting households need to be retained and expanded upon. This program is the best way to reach renters who do not have the upfront capital to participate in rebate and incentive programs that require a property owner to apply.

However, electrification and energy efficiency upgrades are often not at the top of the list of building rehabs for underserved households. A well-designed policy or program should first perform a needs assessment, then, find new or existing resources to address those immediate needs. Once those needs are met, then electrification and energy efficiency upgrades are more likely to be considered. The challenge with implementing a successful program is procuring sustainable funding, then increasing access to capital for LMI households so they may overcome upfront costs. Fortunately, there are Federal, State, and regional grants that local governments, private businesses, and not-for-profit community-based organizations in Marin can leverage. Today, many grants require a focus on equitably decarbonizing building. It is critical that funding is prioritized for underserved communities.

Still, single-family homeowners should not be the only recipients of financial and health benefits when decarbonizing buildings. According to the Building Stock Inventory and Equity Analysis, 29% of residential buildings are in multi-unit developments (MUDs) of which a majority (84%) are renters. Renters make up a significant portion of Marin's community.

In contrast to homeowners, it is difficult for renters to experience the benefits from upgrading their home because they lack control of building upgrade decisions and there is no motivation for a property

17 County of Marin Sustainability Division. 2024. Building Inventory and Equity Analysis. Available at https://www.marincounty.org/depts/cd/divisions/sustainability/electrify-marin/green-building-development/electrification-roadmap/plan.

owner to make improvements. The owner is hard pressed to justify an expense for benefits they don't directly experience. Consequently, this may result in low uptake of energy efficiency and electrification upgrades especially for those in affordable housing and deed restricted MUDs. For renters, appropriate policies, well designed programs, and accessible resources will be needed to incentivize property owners and renters to consider upgrades. For property owners, a well-designed program that incents and makes building upgrades easier is important to increased participation.

A primary concern for renter communities is the threat of permanent and temporary displacement when building upgrades are performed. Most tenants in Marin County are covered by California's rent stabilization law (AB1482 or the Tenant Protection Act of 2019), but a loophole in the law that allows tenants to be evicted for substantial remodel work makes tenants vulnerable to displacement due to renovations. Landlords exploit the loophole, often dishonestly, as a means of pushing low-income renters out of their homes and replacing them with higher paying tenants. It is crucial that the state and localities with their own rent stabilization or eviction protection ordinances close this loophole and provide tenants with adequate temporary relocation assistance and the right to return, thereby enabling electrification and energy efficiency upgrades to be made without putting tenants at risk of displacement. It is crucial that the state and localities with their own rent stabilization or eviction protection ordinances close this loophole and provide tenants with adequate temporary relocation assistance and the right to return, thereby enabling electrification and energy efficiency upgrades to be made without putting tenants at risk of displacement. Additionally, policies such as local rent stabilization and banning pass-through costs can protect tenants from incurring large rent increases after energy efficiency and electrification upgrades are made.

> "... a well designed tenant protection policy should close any substantial remodel loopholes"

Though it is outside the scope of this roadmap to close such loopholes, it must be emphasized that a well-designed tenant protection policy closes from absorbing the costs of decarbonization upgrades. Immediate actions can also be taken to establish programs that incent multi-unit property owners to make upgrades while protecting tenants from unintended negative consequences. For example, publicly funded direct installation programs can motivate landlords to decarbonize by providing them with the financial and technical assistance required to make upgrades. These programs should also include tenant protection assurances (e.g., rent increase limitations, eviction protections, accessible information on tenant/property owner rights and responsibilities, and temporary displacement requirements) as part of the terms and conditions of accepting financial assistance. A program to model is the State California Energy Commission Equitable Decarbonization program[18]. The program illustrates ways to protect tenants during building rehabilitations.

18 California Energy Commission. 2023. Equitable Building Decarbonization Direct Install Program Guidelines, Chapter 4.C. Downloadable at https://www.energy.ca.gov/publications/2023/equitable-building-decarbonization-direct-install-program-guidelines.

Electric Grid Modernization and Reliability

California's aging electric grid has been operating in much the same way for over 100 years, built to meet the demands of industrial age technology[19]. Today, California's ambitious climate goals require rapid modernization of the grid to support the surge of new, all-electric technologies.

The State and utilities are planning for increased electrical load. Plans to modernize the grid have been put forth such as California Independent Systems Operator (CAISO) releasing a 20-Year Transmission Outlook report outlining steps to meet clean energy goals[20], or the Clean Energy Transition Plan released in 2023[21] by the Governor's Office. However, the grid faces many challenges to support aggressive clean energy and electrification goals. One major challenge is utilities are not expanding their transmission and distribution network fast enough to meet the state's renewable energy and electrification goals. Simply put, utilities are lagging in upgrading the grid's infrastructure. A recent study by Berkeley's Energy Institute revealed PG&E needs to speed up distribution upgrades through workforce expansion or investing more in demand response and battery storage[22]. This is possible to achieve, but the study estimated a range of $1-$10 billion to upgrade; costs that will likely get passed onto rate paying customers. In response, SB 410 (Becker)[23] holds utilities accountable to meeting target timelines to connect and upgrade all customers to the grid and control costs of grid expansions.

The State and large utilities appear to be addressing grid scale challenges. Still, local governments in Marin and regional utilities such as MCE can do their part by investing in policies and programs to better steward electric demand and increase the health of the grid. Tactics such as energy planning, demand management, and electrical system optimization for residential and commercial buildings are currently being deployed.

Be a Good Steward:
Optimize Your Panel

Most Marin homes may not need upsizing of its electric service panel. In fact, most rebate programs encourage upsizing over more efficient devices. This paradigm needs to change to save energy and support a healthy electric grid.

First consider optimization and planning before performing costly and time-consuming panel or service upgrades. This usually entails two approaches:

1. Choose less power-hungry appliances that fit within a panel's existing capacity.
2. Use energy management devices that share, redirect, and/or shut off circuits when current power draw exceeds a set limit.

As a rule of thumb, modern homes with 200-amp panels can meet today's electrical demands. Older homes with at least 100-amp panels can be optimized while those less than 100-amps may need to upsize. If upsizing is necessary, planning for an efficient home saves money.

For more information on circuit sharing devices on the open market see this technology review by CalNEXT.

19 California Public Utilities Commission. Factsheet: California Leads the Nation in Modernizing its Electric Grid. Downloadable at https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/s/3343-sgfactsheet0710.pdf.

20 California ISO. 2022. 20-Year transmission outlook. Downloadable at https://www.caiso.com/InitiativeDocuments/Draft20-YearTransmissionOutlook.pdf.

21 Office of the Governor California. 2023. Building the electricity grid of the future: California's Clean Energy Transition Plan. Downloadable at https://www.gov.ca.gov/wp-content/uploads/2023/05/CAEnergyTransitionPlan.pdf.

22 Energy Institute at Haas. 2023. Can Distribution Grid Infrastructure Accommodate Residential Electrification and Electric Vehicle Adoption in Northern California? Downloadable at https://haas.berkeley.edu/wp-content/uploads/WP327.pdf.

23 Senate Bill SB 410 (Becker, 2023). Powering up Californians Act. Downloadable at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB410.

Optimizing Electric Service Panels and Systems

As discussed previously, approximately three quarters of all homes were built before 1980 while only 6% were built after 2000. In other words, Marin has old building stock. Older homes tend to have outdated electrical service panels (also known as a "breaker box"). They are typically undersized for the power demands of modern homes and appliances. As a result, extra work may be needed to increase a home's electrical capacity or "panel upsize." As a result, upsizing can add to construction costs ($3,000- to $25,000) and extend installation wait times for a homeowner looking to electrify[24]. Consequently, this can discourage much needed building upgrades.

However, most homes do not use all their panel's capacity. Consider the following studies on space and water heating heat pumps installed in single-family homes statewide:

1. California home projects participating in the TECH Clean California incentives program from 2021 to 2023 found that only **4%** needed to upsize their panel.

2. For Marin, homes participating in the TECH program, only **12%** upsized their panel[25].

3. In Marin, of the projects receiving local Electrify Marin program rebates from 2019-2024, only **19%** needed a panel upsize when swapping their gas appliance for an electric appliance[26].

Hence, most building upgrades in California homes do not require panel upsizing. If upsizing is considered, it is worthwhile to first research and work with a contractor on "panel optimization." That is, choosing power-efficient devices that can fit a building's existing electrical needs. This can result in $3,000 to $25,000 of cost savings on a home upgrade project.

Policy and Market Trends

All-electric appliances (e.g., induction stoves, heat pumps) are not new technology. In contrast to California, other countries and the American South have historically used electric appliances because gas piping and infrastructure is either limited or does not exist. In Marin, the more rural westside of Marin does not have access to gas infrastructure and relies either on expensive propane or older electric resistance appliances to power their buildings.

Recent global policy support and incentives for electric appliances such as heat pumps have accelerated. As a result, global heat pumps have seen a double-digit growth in 2022 sales[27]. In the U.S., 2022 heat pump sales outpaced gas furnace sales. EV infrastructure will require an even larger infrastructure upgrade to meet electric demand. Across the U.S. South, heat pumps are commonplace. In 2020, 41% of South Carolina residences used central heat pumps as their primary heat source[28]. At 77%, Florida has the highest percentage of all-electric homes in the U.S. In 2023, the San Francisco Bay Area leads the U.S in purchases of passenger car EVs, of which Marin is amongst the leader of new purchases[29].

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24 Redwood Energy & NV5, Service Upgrades for Electrification Retrofits. 2022. Downloadable at https://techcleanca.com/resources.

25 TECH Clean California TECH Working Data Set. Downloadable at https://techcleanca.com/public-data/download-data/. Data downloaded and analysis performed 3/14/2024.

26 Electrify Marin – Natural Gas Appliance Replacement Program. Data analysis not published but available upon request at https://www.marincounty.org/electrify.

27 International Energy Administration. Heat Pumps predicted to double in sales globally by 2030 and exceeded 2022 gas Furnace Purchases in the United States. Available at https://www.iea.org/commentaries/global-heat-pump-sales-continue-double-digit-growth.

28 U.S. Energy Information Administration. 2020 Residential Energy Consumption Survey (RECS). Available at https://www.eia.gov/consumption/residential/data/2020/index.php?view=state.

29 California Energy Commission. New ZEV sales in California. 2023 sales dashboard. Available at https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales.

In the West, especially in California, aggressive climate ambitions have focused building and zoning policies on all-electric buildings and communities. Yet, California still has one of the lowest rates of home electrification in the U.S., especially for space and water heaters, and the highest use of fossil fuels in the home. Hence, single-family, and multi-unit homes will require rapid scale-up of existing and innovative policies (i.e., sticks) and incentive programs (i.e., carrots) that meet climate action obligations and improve community health and safety.

Workforce Development and High Road Jobs

> "Gas appliances today installed will become polluting sources for at least the next decade and stranded, unusable assets…"

A common refrain by homeowners and surfaced during the electrification stakeholder workshop series, is the lack of qualified, knowledgeable and/or affordable contractors to install all-electric systems such as water and space heat pumps, EV chargers and modern electrical panels. In addition, some contractors are not aware of available incentives and rebates to bring down upfront costs of building upgrades. Unfortunately, not as many property owners are capitalizing on cost savings and/or contractors are not promoting the install of subsidized electric systems and appliances. Consequently, more gas appliances are installed today than are needed. Gas assets installed today will become polluting sources for at least the next decade. They will immediately become stranded, unusable assets as regulatory agencies continue to increase electrification mandates and electric appliances become more efficient and popular.

Moving away from non-gas combusting appliances will require a workforce ready to meet demand. The following policy trends are driving market transformation:

1. For existing buildings and appliance swaps, regional and State air regulators have mandated building electrification upgrades. From 2027 to 2031, the Bay Area Air Quality Management District (BAAQMD) will begin phasing out space and water heating gas appliances from being sold or installed in homes and commercial spaces[30].

2. Recent State green building codes have required newly constructed homes to either install space or water heat pumps[31]. State codes are expected to require more electric and energy efficient appliances as well as EV charging infrastructure as these codes update every three years.

3. The California Air Resources Board (CARB) will begin banning gas space and water heaters from being sold statewide starting in 2030.

To meet the anticipated need for experienced contractors, the State (i.e., Switch Is On[32]) and private 3rd party concierge companies serving the SF-Bay Area have developed a qualified contractor's list that consumers can easily access and shop online. Still, communities across Marin express the following pain points with the contractor base countywide:

1. A knowledge gap especially when installing heat pump technology, optimizing electric panels, and properly leveraging incentives and rebates,

2. Lack of willingness to recommend installation of all-electric appliances over gas appliances,

3. Lack of services to energy burdened rural communities such as West Marin,

4. High bid prices quoted for installing all-electric appliances.

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30 Bay Area Air Quality Management District. 2023. Regulation 9 Rule 6: Nitrogen Oxides Emissions from Natural Gas-Fired Water Heaters. Available at https://www.baaqmd.gov/rules-and-compliance/rules/reg-9-rule-6-nitrogen-oxides-emissions-from-natural-gasfired-water-heaters.

31 California Energy Commission. 2022. 2022 Building energy efficiency standards summary. Downloadable at https://www.energy.ca.gov/sites/default/files/2021-08/CEC_2022_EnergyCodeUpdateSummary_ADA.pdf.

32 California Statewide qualified contractor list available at https://switchison.org/.

Contractors are not the only pain point. Local building enforcement staff can delay projects. Staff may lack the technical knowledge when permitting rapidly evolving technologies such as heat pump water heaters or smart panels. Consequently, this knowledge gap can delay permit issuance timelines. According to a heat pump water heater permit streamlining and installation study by TECH Clean California[33], the statewide average for permitting heat pumps was 5.9 days. Ideally, energy and electrification appliances and systems should be permitted or expedited within one day. Increased applications, compliance, and installation of this technology can be the impact of a streamlined process.

> "'High road jobs' means high industry labor standards and established access to clear training pathways for building decarbonization jobs, especially for entry-level and disadvantaged workers."

There is also a need to further develop and accelerate the growth of a diverse and skilled contractor workforce. MCE, local governments, community-based organizations, and the building and trades community can access State and Federal funding to retrain an existing workforce and build a new one to meet rapidly growing demand to electrify and decarbonize. To grow a skilled workforce, we need to invest in training and good high road[34] jobs for both employees and contractors. High road jobs ensure workers also share in the benefits and career development opportunities as communities rapidly electrify and decarbonize buildings.

33 TECH Clean California. 2024. Streamlining permitting and installation of heat pump water heaters. Available at https://techcleanca.com/pilots/permitting-pilot/.

34 "High road jobs" means high industry labor standards and established access to clear training pathways for building decarbonization jobs, especially for entry-level and disadvantaged workers. See Rising Sun press release on its convening and promotion of equitable job access in the Bay Area. Available for download at https://risingsunopp.org/wp-content/uploads/Rising-Sun-HRTP-Press-Release.pdf.

4.3 Appendix C

Community Engagement Findings and Results

4.3 Appendix C: Community Engagement Findings and Results

Community Stakeholders

Over 40 types of stakeholders, of which an estimated 150 people participated in a variety of ways to contribute to the roadmap's content (Table C-1). Engagement included active participation by stakeholders.

1. The County, BayREN, and PG&E helped fund the project.
2. MCEP helped provide volunteer County, City, Town, and public agency staff to steer the entire development process and document creation.
3. Community-based organizations and advocacy groups, the building community, and businesses participated in workshops, providing feedback on documents published, surveys distributed, and invited staff to give ad-hoc presentations to their members.

Other stakeholders were less active such as those opting to stay updated and informed on progress by local government staff or other organizations, subscribing to newsletter or listserv updates, or periodically checking in on progress updates publicly published on the 2023/2024 Marin Countywide Electrification Roadmap webpage[35].

Table C-1. Community stakeholders that participated in the development of the electrification roadmap.

Stakeholder Group	Stakeholder
Elected Officials	• County of Marin Board of Supervisors • City/Town Council Members
City, Town, County Staff	• Building and Planning Directors • City/Town Managers • Chief Building Officials • Planning and Sustainability Staff
Regional and Public Agencies	• Marin Climate & Energy Partnership (includes Gov't + Regional and Public Agencies) • Marin Clean Energy (MCE) • Transportation Authority of Marin (TAM) • PG&E • BayREN

35 County of Marin Community Development Agency Sustainability Division. 2023-2024. Marin Countywide Building Electrification Roadmap landing webpage. Available at https://www.marincounty.org/depts/cd/divisions/sustainability/electrify-marin/green-building-development/electrification-roadmap.

Stakeholder Group	Stakeholder
Advocacy and Community Based Organizations	• Canal Alliance • North Marin Community Services • Rising Sun Center for Opportunity • San Rafael Chamber of Commerce • MarinCAN • Sustainable San Rafael • Sustainable Mill Valley • Marin Conservation League • Marin/Sonoma Electrification Squad • Good Green Work • Marin Center for Independent Living • Marin Asian Advocacy Project • Multicultural Center of Marin • Sausalito Sustainability Commission • Corte Madera Climate Action Committee • Fairfax Climate Action Committee • San Anselmo Climate Action Commission • Novato Sustainability Commission • Marin Environmental Housing Collaborative
Building Community and Businesses (Developers, Contractors, Practitioners)	• Marin Builders Association • MARIN REALTORS • EAH Housing • Hope Housing of Marin • Eden Housing • Community Land Trust Association of West Marin (CLAM) - West Marin • Seagull Prime Real Estate Fund • Rising Design & Construction • GreenLynx • Samina Saude Design & Consulting • Hassler Heating and Air Conditioning, Inc. • Ready-Set-Replace
Youth and Student	• Marin Academy, Climate and Justice Class • Dominican University, Business Sustainability Class

Public Survey Process and Results

A digital survey (English and Spanish) of the ten actions, as co-developed with workshop participants, was widely distributed publicly from February 16, 2024, to March 5, 2024.

Workshop participants and the organizations they represent, government communications staff and elected officials across 12 jurisdictions, and public regional agencies (e.g., Marin Health and Human Services, MCE, and TAM) were asked to help distribute the survey via their respective newsletter, social media, and other digital communication channels. As a result, 385 people responded to the survey which asked for their impression of the ten proposed actions and how they would prioritize implementation. Survey results were published online. The survey found most respondents were in favor of implementing the following top 3 actions:

1. A countywide "Central Hub" or one-stop shop for all things electrification and energy savings.
2. Connecting residents to existing low-cost financing programs that especially benefits low-to

moderate income households.

3. Programs that reduce permit costs and expedite permit timelines for gas to electric conversions.

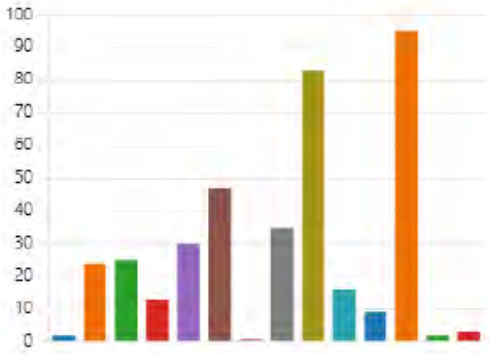
For survey results and details on the remaining actions see below or visit The Building Electrification Roadmap Survey published online[36].

Building Electrification Roadmap Survey: Actions to Electrify Our Buildings and Vehicles

385	14:27	Closed
Responses	Average time to complete	Status

1. Select the City or Town you live, work or reside within the 12 jurisdictions across Marin?

Belvedere	2
Corte Madera	24
Fairfax	25
Larkspur	13
Mill Valley	30
Novato	47
Ross	1
San Anselmo	35
San Rafael	83
Sausalito	16
Tiburon	9
Unincorporated County of Marin	95
I live, work or reside Outside Ma...	2
Other	3



36 County of Marin Community Development Agency Sustainability Division. 2023. Building Electrification Roadmap Survey: Actions to Electrify Our Buildings and Vehicles. Results available for download at https://www.marincounty.org/depts/cd/divisions/sustainability/electrify-marin/green-building-development/electrification-roadmap/plan.

2. **Develop and implement a countywide one-stop shop for all things electrification and energy savings. This "central hub"** should be easier for everyone, especially those who need it most, to learn about and benefit from ways to lower their energy bills and use cleaner power. The Hub will serve people looking to upgrade their home or building, especially low-to-moderate income households, legacy businesses, renters, and energy-burdened communities. The Hub may, but is not limited to, provide the following:

   1) An online resource center: find incentive and rebate information, explore loan options to finance home improvements, use online tools to plan and see where energy can be saved, and/or find qualified contractors

   2) Personal assisted service: technical assistance for residences as well as architects, builders, developers, design engineers, contractors, and/or energy consultants, phone hotline, and/or concierge turnkey services

   3) Expansion of existing outreach efforts and creation of new promotional campaigns.

Promoters	173
Passives	84
Detractors	128

3. **Evaluate and implement programs that reduce permit costs and expedite permit timelines for gas to electric conversions.** Examples include permit fee holidays, discounts and same-day permit approvals.

Promoters	218
Passives	72
Detractors	95

4. **Connect residents to existing low-cost financing programs that especially benefits low-to moderate income households,** while evaluating the feasibility of piloting a Marin-specific program that finances single-family and multifamily residences.

Promoters	190
Passives	78
Detractors	117

5. **Evaluate and consider a neighborhood-scale electrification and gas infrastructure decommissioning project** within Marin County.

Promoters	123
Passives	57
Detractors	205

6. **Expand stakeholder engagement to community-based organizations that represent underserved communities** to build a more equitable electrification transition for low-to-moderate income households, renters and energy burdened communities across Marin.

Promoters	152
Passives	76
Detractors	157

7. **Grow, accelerate and improve the quality of the local and regional building energy and electrification workforce** by supporting and expanding access to programs that train and develop qualified contractors.

Promoters	165
Passives	82
Detractors	138

8. **Continue advancing green building standards for existing and newly constructed buildings** through energy and electrification "reach codes" (above and beyond state standards) and readying our electrical systems across Marin.

Promoters	156
Passives	69
Detractors	160

9. **Continue to implement the Marin Countywide EV Acceleration Strategy,** launched February 2023. See https://marinclimate.org/wp-content/uploads/2023/06/Marin-EV-Acceleration-Strategy.pdf

Promoters	160
Passives	70
Detractors	155

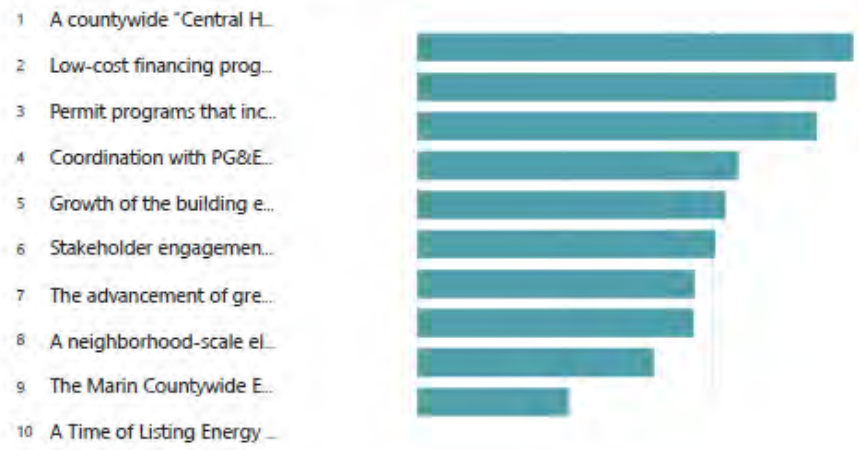
10. **Encourage and coordinate with PG&E to improve infrastructure planning,** especially electric load capacity planning, resiliency, faster interconnection timelines and neighborhood-scale electrification planning projects.

Promoters	229
Passives	67
Detractors	89

11. **Evaluate and consider implementing a Time of Listing Energy Assessment (TLEA) policy** during residential real estate sales. A TLEA is like an energy report card, checking a house's energy use before selling.

Promoters	126
Passives	55
Detractors	204

12. **In order of preference to implement**, please rank the 10 key actions proposed above by using your mouse to drag boxes or the up and down arrows to sort.



4.4 Appendix D

Key Actions Worksheet – Descriptions, Details, Equity Considerations, and Implementing Partners

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
I-1	**Develop, adopt and implement building reach codes for New Construction** that are all-electric, energy efficient, cost-effective, increase electric vehicle charging infrastructure and creates code consistency across all Marin jurisdictions.	• Ensure codes do not preempt federal standards and are justified through the State's cost effectiveness studies. • Create code uniformity by continuing to support all 12 Marin Jurisdictions to align with 2022 Marin Model Reach Codes already developed in collaboration with the community • Apply to all building types (residential and commercial) • Prepares building stock to get ahead of California's ever more stringent Green Building and Energy Codes • Support advocacy and California Air Resources Board's effort that encourages a Statewide zero-emissions standard for residential new construction within the State building code standards aka CALGreen. • Ensure local code allows for use of low GWP refrigerants (e.g., CO2, propane, and other nature-based)	• Exemptions and hardship and feasibility waivers for ○ Low-income households ○ Households with special medical and accessibility needs • Ensure development of Low-income multi-unit housing is not inhibited. • Encourage use of programs that subsidizes building all-electric for affordable housing developments ○ For example, California Electric Homes Program implemented by California Energy Commission and TRC	1. Local Government: Councils/Electeds and Staff 2. Community-based Organizations

I-2	**Develop, adopt and implement building reach codes for Existing Single-Family and Multi-unit Renovations** that implement electric appliance measures, are energy efficient, cost-effective increase access to electric vehicle charging infrastructure and creates code consistency across all Marin jurisdictions.	• Create code uniformity by continuing to support all 12 Marin Jurisdictions to align with 2022 Marin Model Reach Codes already developed collaboration with the community • Prepares building stock to get ahead of California's ever more stringent Green Building and Energy Codes • Apply to all Single-family residential of a certain size or permit valuation • Apply to Multi-unit Developments (MUDs) as long as it complements housing production • Require Electric Readiness requirements especially for buildings built before 1980 • Provide resources on electrical panel optimization vs upsizing • Ensure local code allows for use of low GWP refrigerants (e.g., CO2, propane, and other nature-based)	• Exemptions and hardship and feasibility waivers for ○ Low-income households ○ Households with special medical and accessibility needs • Encourage use of housing programs that disincentivize property owners from displacing multi-unit renters during renovations or rehabilitation ○ For example, Multifamily Energy Savings Assistance (ESA) program implemented by investor-owned utilities (IOUs) • Consider anti-displacement policies (e.g. reference SAJE or Build-it Green)	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. Community-based Organizations 4. PG&E 5. Market-rate and Affordable Housing Developers 6. Marin Clean Energy (MCE)

I-3	**Develop a countywide, web-based "central hub" for community energy and electrification resources** that provides on and offline information to residences and businesses pursuing building upgrade project(s).	• Create a countywide webpage or "central hub" that connects residences and business to building energy, electrification, and EV resources and services
		  ○ Collaborate with and tie-in existing programs and service providers
		  ○ Consolidation and links to existing incentives, programs, building code requirements and service providers, available to all 12 Marin jurisdictions
		  ○ All 12 Marin jurisdictions and community-based organizations should coordinate to route all building energy, electrification, and EV projects through this webpage
		  ○ Include collateral such as steps to electrification and EV infrastructure for residences and businesses and links to local, regional, state and federal resources
		• This action intent is to provide web-accessible "Low Touch" services especially those who don't mind to DIY and are able to navigate platforms that can be used from the convenience of your home such as
		  ○ Incentive and rebate information and applications and qualified contractor list (e.g., Electrify Marin, BayREN, SwitchIsOn, Rewiring America),
		  ○ Virtual home energy assessment tools (e.g., HomeIntel)
		  ○ Online energy planning tools (e.g. Rewiring America, SwitchIsOn)
		• Coordinate more regionally such as
			• Target campaigns and efforts to benefit low-moderate income (LMI) and hard-to-reach households, renters and energy burdened communities such as in rural West Marin, North Marin, Downtown San Rafael and the Canal, Strawberry, and Marin City
			• Support regional workforce development programs or initiatives such as LIME Foundation's NextGEN Trades Academy that focuses on developing a more diverse and inclusive trades and contractor workforce
			• Increase awareness of and access to programs, rebates and incentives that first address deferred maintenance (e.g., termite damage and rot)
			• Address Split-Incentives – Structure multi-unit programs that incentivize and make it easy for both renters and property owners to implement energy efficiency and electrification systems and appliances
				1. Local Government: Councils/Electeds and Staff
				2. Community Based Organizations
				3. MCE
				4. BayREN
				5. PG&E
				6. Platform and Service Providers/Vendors
				7. Transportation Authority of Marin

		across MCE territory and/or across nine-county bay area via BayREN ● A hard copy and in-person promotion and outreach campaign should follow the launch of the central hub website		

I-4	**As part of the "central hub", investigate the feasibility and procure resources to launch a turnkey countywide concierge and/or technical assist service for residences and businesses.**	● Follow-up to Action #I-3 above ● Build upon the countywide "central hub" webpage by integrating a high touch building energy and electrification service ● Evaluate feasibility and impact of San Anselmo's and Fairfax's Ready-Set-Replace pilot campaign: an existing high touch concierge and/or technical assist service for single and/or multi-unit homeowners as provided by Carbon Free Homes ○ Determine whether funding is available or worthwhile to continue development and implementation ○ Note grants and/or a competitive bidding process will be necessary if financed by government ● "High touch" services include those who need technical assistance, full project and concierge turnkey installation services, and/or in-person help ○ Concierge services are for homeowners through third-party private companies such as QuitCarbon and Carbon Free Homes' Ready-Set-Replace ○ Technical assistance for architects, builders, developers, design engineers, contractors, and/or energy consultants can be made available ○ Technical assists programs for multi-units (e.g., BAMBE program, MCE Energy Savings program, PG&E Energy Savings Assistance program, PG&E SPOC program for multi-family and single-family owners and managers) ○ Virtual and/or In-person Home	● Target campaigns and efforts to benefit low-moderate income (LMI) and hard-to-reach households, renters and energy burdened communities such as in rural West Marin, North Marin, Downtown San Rafael and the Canal, Strawberry, and Marin City ● Support regional workforce development programs or initiatives such as Lime Foundation's NextGEN Trades Academy that focuses on developing a more diverse and inclusive trades and contractor workforce ● Increase awareness of and access to programs, rebates and incentives that first address deferred maintenance (e.g., termite damage and rot) ● Address Split-Incentives – Structure multi-unit programs that incentivize and make it easy for both renters and property owners to implement energy efficiency and electrification systems and appliances	1. Local Government: Councils/Electeds and Staff 2. Community Based Organizations 3. MCE 4. PG&E 5. BayREN 6. Third-Party Service Providers/Vendors 7. Transportation Authority of Marin

		Energy Assessment (e.g., Home Energy Score) ○ All-in-one, customizable platforms (e.g, Petaluma/Sacramento via XeroHome, Sonoma Clean Power via YellowTin) ■ Platform should have the ability to quickly: ● Analyze and give energy, GHGs and costs of installing efficiency and electrification measures per house within several minutes ● Summarize and connect user to Federal, State, utility, regional, and/or local rebates and incentives available ● View and connect with a list of qualified contractors ● Links to all 12 Marin local building code requirements and checklists ● Track community-scale impact via energy modeling or energy bill analysis ● Try to coordinate more regionally such as across MCE territory or across nine-county bay area via BayREN ● More funding and staffing resources are needed to provide digital and in-person promotion and outreach campaigns, which may include: ○ Promoting and soliciting through social media and websites as well as in newsletters and/or utility-bill inserts		

		○ Working through County Health and Human Services to engage and promote access to hard-to-reach communities through their Community Response Teams ○ Segmenting outreach campaigns to target audiences ○ Attending, tabling and participating in community-based organization and industry community events countywide ○ Incorporating and keeping up-to-date information such as on regulations, rebates and incentives, programs, contractor lists and other services ○ Evaluate the feasibility of standing up a brick-and-mortar location for in-person resources and education		

I-5	**Expand upon existing promotion and outreach efforts that increases access** to local, regional, state and federal energy and electrification programs and incentives.	• Finding feasible ways to mass promote and expand outreach campaigns. • Partner with, fund and communicate programs and campaigns through local community based organizations that have already built capacity, trust and strong community networks. • Streamline and consolidate existing information while increasing access to the complex and rapidly evolving federal (IRA), State (TECH, SwitchIsOn) utility (PG&E, MCE), regional (BayREN, BAAQMD), and local (Electrify Marin) rebates and incentives available. • Increase disability, health and ESL (language) services and inclusion during community engagements and creation of promotional collateral. • Use existing local government touchpoints with the community to provide information and education (e.g., time of renovation, planning or building permit counter, community events or campaigns, etc.).	• Target campaigns and efforts to benefit low-moderate income (LMI) households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City • Structure rebate and incentive programs to benefit LMI households and renters especially in underserved communities • Increase awareness of and access to programs and incentives that first address deferred maintenance • Address Split-Incentives: Structure multi-unit programs that incent both renters and property owners to implement energy efficiency and electrification measures	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. Community Based Organizations 4. MCE 5. Transportation Authority of Marin (TAM)

I-6	**Expand stakeholder engagement to community-based organizations that represent underserved communities** to build a more equitable electrification transition.	● Engagement doesn't end once the countywide roadmap is finalized. ● Provide periodic and ad-hoc updates of roadmap to electrification workshop participants and community-based organizations ● Work through County Health and Human Services to engage and promote access to hard-to-reach communities through their Community Response Teams ● Community-based organizations serving North Marin, Canal, Marin City and parts of West Marin should be empowered to set their own vision, priorities and implementable actions	● Support community led planning especially by organizations such as Marin Climate Justice Collaborative (Canal Alliance and Marin City CRHJ).	1. Community Based Organizations 2. Local Government: Councils/Electeds and Staff 3. Transportation Authority of Marin
I-7	**Evaluate fee structures and feasibility of permit programs that incent gas to electric conversions by reducing permit costs and expediting permit timelines** for renovations and appliance upgrades.	● Identify and implement pilots - when feasible - that can be tested immediately such as, but not limited to: ○ Permit holidays or discounts ○ Same day permitting ● Evaluate jurisdiction fee structure and feasibility to subsidize such a program ● Continue and increase training of examiners and inspectors on how to permit and identify new heat pump, electric appliances and systems via BayREN trainings and support through other forums ● Simplify permitting such as pairing plumbing and electrical permits to make the process faster and cheaper ● Lays the groundwork to appropriately implement a Time of Sale or Time of Listing policy, if considered	● Offset the impact of the potential high cost of permitting for electrification ○ Restructure and combine mechanical-electrical-plumbing fees ○ Increase permit fees for natural gas installations compared to electric	1. Local Government: Councils/Electeds and Staff 2. BayREN

I-8	**Lay the groundwork to accelerate adoption of electric ready systems for existing buildings** by adopting appropriate codes and standards and accompanied with rebates and incentives.	● Critical to work on in advance of the BAAQMD NOx rules that start in 2027 ● Restructure Electrify Marin's panel upgrade incentives to prefer panel optimization and low amp appliances first, over panel upsizing ● Focus electrical contractor trainings and socialization on alternatives to panel upsizing and panel optimization ● Focus electrical systems trainings on building/code officials ○ Clarify State standards and apply appropriate standards locally ○ Work with officials to provide clear code guidance when approving installs of circuit sharing devices such as Automatic Load Management Systems (ALMS) or Intelligent Power Management Technologies (IPMT) such as smart panels, breakers, relays, splitters, or control units ● Target outreach and incentives campaigns to known older residential and commercial buildings built before 1980 ● Evaluate, develop, and adopt a countywide 2025 model reach building code which includes: ○ More aggressive electric readiness requirements Encourages optimizing capacity over upsizing	● Target campaigns and efforts to benefit low-moderate income (LMI) and hard-to-reach households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City.	1. Local Government: Councils/Elected s and Staff 2. BayREN 3. Marin Builders Association 4. Other contractor associations forums across Marin

I-9	**Continue to implement Marin Countywide EV Acceleration Strategy** launched February 2023.	● Take key actions as outlined in the acceleration plan	● Partner with community-based organizations to increase access and identify charging infrastructure needs. ● Use building codes to require charging capability for all tenants with parking spaces in multi-unit buildings that are affordable and has cost parity with those charging in single-family homes.	1. Marin Climate & Energy Partnership (MCEP) 2. Transportation Authority of Marin 3. Local Government: Councils/Electeds and Staff

I-10	**Encourage and coordinate with PG&E to improve infrastructure planning and speed up grid interconnection timelines,** especially for electric load capacity planning, resiliency, faster grid interconnection and neighborhood-scale electrification planning projects.	• Encourage with PG&E to meet SB 410 (Becker), "Powering Up Californians Act" which holds utilities accountable to meeting prompt grid interconnection and energization timelines.
		• Proactively coordinate w/PG&E on owner/developer planning and communication that helps with PG&Es service and distribution planning, increases reliability, and reduces energization timelines for new housing.
		• Explore funding to collect and analyze PG&E energy data that will help measure existing and project future countywide electrical capacity needs at the neighborhood scale
		  ○ Simultaneously collect and analyze natural gas infrastructure to identify ideal locations for neighborhood-scale electrification and gas infrastructure decommissioning.
		  ○ See action #I-14 for more details on neighborhood-scale electrification
			• Segment underserved populations across Marin when collecting data so we can understand where the best opportunities exist to implement and target pilots or campaigns.	1. PG&E
				2. New Multi-unit affordable and market rate developers
				3. Commercial developers
				4. Local Government: Councils/Electeds and Staff
				5. MCEP

I-11	**Support growth, accelerate and improve the quality of a diverse and skilled building energy and electrification workforce** by expanding upon existing and considering new programs and initiatives that train and develop qualified contractors, realtors, developers and lenders to meet increased demand.	• Through SwitchIsOn by TECH, continue to increase the existing list of qualified contractors that serves the region and direct customers to those lists • Through BayREN continue to provide free trainings, continuing education credit, worksite training, and networking opportunities on energy efficiency, all-electric technology, green financing products, and business development for building, contracting and trades professionals, realtors, lenders, and local building and safety staff (e.g., Green Labeling Program, in-person and virtual training and networking programs) • Attract residential decarbonization professionals and increase high quality jobs by supporting the High Road Training Partnership (HRTP) and consider adopting the recommended labor standards that come out of the partnership	• Support and expand regional workforce development programs such as Lime Foundation's NextGEN Trades Academy that focuses on skills and professional development for a more diverse and inclusive trades and contractor workforce • Adopt regional workforce development initiatives such as Rising Sun's Bay Area Residential Decarbonization High Road Training Partnership that increases job quality and equitable access for all workers in the residential decarbonization market • Increase access to in-person or virtual training and networking opportunities to the trades workforce such as BayRENs ongoing regional training programs.	1. Community Based Organizations 2. MCEP 3. BayREN 4. Local Government: Councils/Electeds and Staff 5. Local businesses 6. Trades associations 7. BAAQMD 8. MCE 9. TECH Clean California

I-12	Evaluate feasibility, staff capacity and **map out steps to implement a Time of Listing Energy Assessment policy for residential and/or commercial buildings**.	● Engage with realtors and community-based organizations to evaluate a voluntary or required energy audit disclosure policy ○ Compliance check and resolutions ○ Home Energy Score/audit ○ Flexible energy and electrification compliance scoring ● First, conduct a feasibility study and/or survey. ○ The policy should minimize excess costs and timelines disproportionate to the overall cost and closing of the real estate transaction. ○ Evaluate the staff capacity of enforcing departments or agencies. ○ Evaluate market conditions, taxes to collect such as a refundable transfer tax, and lead times to implement projects ● Learn from and adapt certain elements of other local governments such as City of Berkeley's Time of Listing ordinance and City of Davis compliance checks. ● Discuss acquisition of data with data aggregators such as Redfin, Zillow, MLS, CoStar, County Tax Assessor's	● Continue to participate and support trainings and regional workforce development initiatives that builds regional contractor base. ● Support and encourage the use of local, legacy, minority/Woman-owned and/or BIPOC businesses to conduct Energy Assessments for homeowners.	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. Marin REALTORS 4. Community-based organizations 5. MCEP

I-13	**Evaluate existing and increase access of low-cost financing programs** that serve Marin single-family and multi-unit residences.	● Assess and promote existing loan programs for single-family and multi-unit residences such as, but not limited to the State's Go Green Financing program and Energy Efficient Mortgages/Green Mortgages such as Fannie Mae Green Financing Loans for single- and multi-unit residences) ● Continue to expand training and education of banks/lenders and Marin REALTORS through BayREN's Green Labeling Program	● Target campaigns and efforts to benefit LMI households and landlords serving low-income tenants. ● Green financing programs can benefit LMI and credit-constrained customers who otherwise may not qualify for traditional home equity loans for upgrades. ● Ensure financing is available to households who have poor credit or can't afford taking on debt	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. PG&E 4. MCE 5. Local Banks and Lenders 6. Marin REALTORS 7. Community Based Organizations
I-14	**Evaluate feasibility and funding resources, then, identify a location to pilot a neighborhood-scale electrification demonstration project** anywhere within the 12 jurisdictions across Marin County.	● Leverage existing and/or collect new electricity and gas data to analyze ideal candidates. ● Coordinate with PG&E and learned lessons from other Bay Area jurisdictions to identify criteria to select an ideal location in Marin County for gas infrastructure decommissioning. ● Find funding to implement a neighborhood-scale electrification pilot project that include both gas infrastructure decommissioning planning and replacement of end-use appliances	● Consider piloting underserved neighborhoods such as LMI, hard-to-reach households, renters and energy burdened communities or developments such as in rural West Marin, North Marin, Canal, and Marin City ● Need to ensure funding is available for deferred maintenance in addition to energy and electrification upgrades	1. PG&E 2. Community members/neighborhoods 3. Existing Single- or Multi-unit affordable and market rate developers 4. Community-based Organizations 5. Local Government: Councils/Electeds and Staff

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
N-1	**Investigate the feasibility and procure resources to launch a turnkey countywide concierge and/or technical assist service for residences and businesses** while continuing to implement and update the countywide "central hub" as necessary.	● Follow-up to Action #I-3 and I-4 ● Assess and find funding resources to launch a concierge and technical assist service, then continue implementing the service for homeowners and/or businesses and updating as needed ● Procure more funding and staffing resources as needed to provide wrap-around support and outreach efforts ● If feasible, consider standing up a brick-and-mortar location for in-person resources and education ● Continue growing qualified contractor list	● Targeted campaigns and efforts to benefit low-moderate income (LMI) households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City ● Structure rebate and incentive programs to benefit LMI households and renters especially in underserved communities ● Increase awareness of and access to programs and incentives that first address deferred maintenance ● Address Split-Incentives: Structure multi-unit programs that incent both renters and property owners to implement energy efficiency and electrification measures	1. Local Government: Councils/Electeds and Staff 2. New and Existing Multi-unit and Commercial Developers 3. Community-based organizations 4. MCE 5. BayREN 6. Transportation Authority of Marin

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
N-2	**Develop and launch a turnkey technical assistance service for residences and businesses** while maintaining and integrating the web-based "central hub".	● Follow-up to Action #N-1 ● If funding was procured and vendor chosen for concierge and technical assist service, then continue implementing the service for homeowners and/or businesses and updating as needed ● Procure more funding and staffing resources as needed to provide additional wrap-around support and outreach efforts ● If feasible, consider standing up a brick-and-mortar location for in-person resources and education ● Continue growing qualified contractor list	● Targeted campaigns and efforts to benefit low-moderate income (LMI) households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City ● Structure rebate and incentive programs to benefit LMI households and renters especially in underserved communities ● Increase awareness of and access to programs and incentives that first address deferred maintenance ● Address Split-Incentives: Structure	1. Local Government: Councils/Electeds and Staff 2. New and Existing Multi-unit and Commercial Developers 3. Community-based organizations 4. MCE 5. BayREN 6. Transportation Authority of Marin

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
			multi-unit programs that incent both renters and property owners to implement energy efficiency and electrification measures	
N-3	**Continue to update promotion and outreach efforts and campaigns** as needed	● Continuation of Action #I-5 ● Continue finding ways to mass market, expand outreach, and streamline and consolidate existing and new programs and incentives as they arise ● Continue partnering with and supporting programs through local community based organizations ● Continue to use existing local government touchpoints with the community to provide timely information and relevant education	● Targeted campaigns and efforts to benefit low-moderate income (LMI) households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City ● Structure rebate and incentive programs to benefit LMI households and renters especially in underserved communities ● Increase awareness of and access to programs and incentives that first address deferred maintenance ● Address Split-Incentives: Structure	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. Community Based Organizations 4. MCE

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
			multi-unit programs that incent both renters and property owners to implement energy efficiency and electrification measures	
N-4	Continue to **integrate equity focused actions developed by community-based organizations** that represent underserved Marin communities	● Continuation of Action #I-6 ● Modify the countywide electrification roadmap to incorporate actions that result in equitable outcomes	● Continue to support community led planning especially by organizations such as Marin Climate Justice Collaborative (Canal Alliance and Marin City CRHJ)	1. Community Based Organizations 2. Local Government: Councils/Electeds and Staff
N-5	**Continue implementing programs** that incent gas to electric conversions by reducing permit costs and expediting permit timelines.	● Continuation of Action #I-7 ● Continue implementing pilots proven to be good approaches to streamlining the permitting process ● Continue to train examiners and inspectors on how to permit new heat pump, electric appliances and systems via BayREN and support through other forums ● Continue to identify ways to simplify permitting (e.g., combine permits) that makes the process faster and less costly to customers	● Offset the impact of the high cost of permitting for electrification ○ Restructure and combine mechanical-electrical-plumbing fees ○ Increase permit fees for natural gas installations compared to electric	1. Local Government: Councils/Electeds and Staff 2. BayREN

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
N-6	**Implement policies and programs that accelerate adoption of electric ready systems for existing buildings** in advance of the BAAQMD NOx rules that start the following year, in 2027	● Continuation to Action #I-8 ● Continue Electrify Marin's upgrade incentives to prefer panel optimization and low amp appliances first, over panel upsizing ● Consider increasing Electrify Marin's incentive for panel upgrade kicker ● Continue electrical contractor trainings and socialization on alternatives to panel upsizing and mitigate the need to perform a service upgrade ● Continue targeted outreach campaigns to known older residential and commercial buildings built before 1980 ● Implement and enforce adopted 2025 building reach codes that includes more aggressive electric readiness requirements while encouraging optimizing electrical capacity over upsizing, where feasible	● Target campaigns and efforts to benefit LMI, hard-to-reach households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City	1. Local Government: Councils/Electeds and Staff 2. BayREN

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
N-7	**Continue to implement Marin Countywide EV acceleration Strategy**	● Continuation of Action #I-9 ● Take key actions as outlined in the acceleration plan	● Partner with community-based organizations to increase access and identify charging infrastructure need ● Use building codes to require charging capability for all tenants with parking spaces in multi-unit buildings that are affordable and has cost parity with those charging in single-family homes	1. MCEP 2. Transportation Authority of Marin 3. Local Government: Councils/Electeds and Staff 4. MCE
N-8	**Continue to coordinate with PG&E to improve infrastructure planning and speed up interconnection timelines** especially electric load capacity planning, faster interconnection timelines, and neighborhood-scale electrification planning projects.	● Continuation of Action #I-10 ● Continue proactive owner/developer planning and communication that helps with PG&Es service and distribution planning ● See action #N-14 for more details on neighborhood-scale electrification	● Segment underserved communities across Marin when collecting data so we can understand where the best opportunities exist to implement target pilots or campaigns	1. PG&E 2. New Mult-unit affordable and market rate developers 3. Commercial developers 4. Local Government: Councils/Electeds and Staff 5. MCEP

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
N-9	**Continue to support the growth of a diverse and skilled building energy and electrification workforce.**	● Continuation of Action #I-11 ● Through TECH, continue to increase the existing list of qualified contractors that serves the region and direct customers to those lists ● Through BayREN continue to provide free trainings, continuing education credit, and networking opportunities on energy efficiency, all-electric technology, green financing products, and business development for building, contracting and trades professionals, realtors, lenders, and local building and safety staff (e.g., Green Labeling Program, in-person and virtual training and networking programs ● Re-evaluate the needs on how local government, community-based organizations, community colleges, utilities, public agencies, BayREN, MCE, TAM, and/or businesses can come together and fund the growth of and backfill program gaps for Marin's energy and electrification workforce and contractor base.	● Continue to participate in regional workforce development initiatives that focus on high road jobs and diversity in the contractor base	1. Community Based Organizations 2. BayREN 3. Local Government: Councils/Elected s and Staff 4. Local businesses 5. Trades associations 6. BAAQMD 7. Contractor workforce 8. TECH Clean California 9. TAM 10. Community Colleges

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
N-10	If feasible and staff capacity is in place to enforce, **identify a Marin jurisdiction(s) to pilot a Time of Listing Energy Audit Policy for residential buildings.**	● Continuation to Action #I-12 ● Consider starting with voluntary compliance check and resolutions and/or Home Energy Score audits ● Consider balancing burdens to the seller and value proposition to the buyer. ● Consider mechanisms such as a refundable transfer tax.	● See #I-12	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. Community-based organization 4. Marin Realtors 5. MCEP
N-11	**Evaluate then consider providing complementary financing options such as a regional tariff on-bill financing program** that serves single-family and multi-unit residences.	● Follow-up to Action #I-13 ● Discuss feasibility with Marin Clean Energy, PG&E, and/or CPUC to launch a tariff on-bill financing program (upgrades repaid through a tariff added to the utility bill over time) accessible to the regional customer base. ● Evaluate other forms of financing targeted to certain communities or specific technologies, For example: ○ In 2021, MCE financed 0% interest home battery loans for residents ○ Currently MCE and PG&Es Agricultural and Industrial (AIR) resources.	● Target campaigns and efforts to benefit LMI households and landlords serving low-income tenants. ● Green financing programs can benefit LMI and credit-constrained customers who otherwise may not qualify for traditional home equity loans for upgrades. ● Ensure financing is available to households who have poor credit or can't afford taking on debt	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. MCE 4. PG&E 5. CPUC
N-12	If funded and partners are in place, **pilot a loan financing program(s)**	● Follow-up to Action #I-14 ● Continue work with partners such	● Same as #N-11	1. Local Government:

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
	that serves single-family and multi-unit residences and/or businesses.	as MCE, PG&E, and/or CPUC, local banks, and/or community-based organizations to provide appropriate financing products		Councils/Electeds and Staff 2. BayREN 3. MCE 4. PG&E 5. TECH Clean CA
N-13	**Develop a disposal plan for end-of-life of gas and heat pump products, appliances, and refrigerant management.**	● Consider codes, campaigns, and educational materials with the goal of capturing refrigerants and other materials for recycling or proper destruction to ensure they are not released into the environment ○ This may involve stickers on appliances, contractor trainings, additional fines and enforcement for illegal disposal, etc. ● Will likely require regional collaboration, coordination and planning with Zero Waste Marin, local waste haulers, landfill operators and County to ensure appropriate disposal ● It may require the need for a regional reuse and salvage market	Unknown	1. Zero Waste Marin 2. Waste Haulers 3. Local Government: Councils/Electeds and Staff 4. Landfill Operator(s)
N-14	**Evaluate feasibility and funding resources, then, identify a location to pilot a neighborhood-scale electrification**	● Leverage existing and/or collect new electricity and gas data to analyze ideal candidates. ● Coordinate with PG&E and	● See #I-14	1. PG&E 2. Community members/neighborhoods

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
	demonstration project anywhere within the 12 jurisdictions across Marin County.	learned lessons from other Bay Area jurisdictions to identify criteria to select an ideal location in Marin County for gas infrastructure decommissioning. ● Find funding to implement a neighborhood-scale electrification pilot project that include both gas infrastructure decommissioning planning and replacement of end-use appliances		3. Existing Single- or Multi-unit affordable and market rate developers 4. Community-based Organizations 5. Local Government: Councils/Electeds and Staff
N-15	If feasible, partners are in place, and necessary, develop and implement a **pilot neighborhood-scale electrification demonstration project**. within Marin County.	● Continuation of Action #I-15 ● Continue to coordinate with PG&E and consult with other Bay Area jurisdictions select an ideal location in Marin County for gas infrastructure decommissioning ● Continue to find funding to implement as needed	● See #I-14	1. PG&E 2. Existing Single- or Multi-unit affordable and market rate developers 3. Community-based Organizations 4. Local Government: Councils/Electeds and Staff

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
L-1	**Develop, adopt and implement updated building and EV infrastructure reach codes for New Construction of all building types** during the 2028 and 2031 State building code cycles.	● Continuation to Action #I-1 ● Ideally develop and adopt during the 2028 and 2031 code cycle	● Exemptions and hardship and feasibility waivers for ○ Low-income households ○ Households with special medical and accessibility needs	1. Local Government: Councils/Electeds and Staff
L-2	**Develop, adopt and implement updated building and EV infrastructure reach codes for Renovations of all building types** during the 2028 and 2031 State building code cycles.	● Continuation to Action #I-2 ● Ideally develop and adopt during the 2028 and 2031 code cycle	● Exemptions and hardship and feasibility waivers for ○ Low-income households ○ Households with special medical and accessibility needs ● Encourage use of housing programs that to disincentivize property owners from displacing multi-unit renters during renovations or rehabilitation ○ For example, Multifamily Energy Savings Assistance (ESA) program implemented by investor-owned utilities (IOUs)	1. Local Government: Councils/Electeds and Staff

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
			● Consider anti-displacement policies (e.g. reference SAJE or Build-it Green)	
L-3	If successful and necessary, **continue enhancing the "all-in-one energy and electrification hub and update the program as necessary.**	● Continuation to Action #N-1 ● Re-evaluate the value and need of the online platform ● If necessary, find more permanent funding to continue providing concierge and technical assist services ● Procure more funding and staffing resources as needed to provide wrap-around support and outreach efforts ● Compliment online platform with traditional outreach engagements such as in-person, webinars, newsletters, media, and promotion through community-based organizations and trade associations ● Continue growing qualified contractor list	● Targeted campaigns and efforts to benefit low-moderate income (LMI) households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City ● Structure rebate and incentive programs to benefit LMI households and renters especially in underserved communities ● Increase awareness of and access to programs and incentives that first address deferred maintenance ● Address Split-Incentives: Structure multi-unit programs that incent both renters and property owners to implement energy	1. Local Government: Councils/Electeds and Staff 2. New and Existing Multi-unit and Commercial Developers 3. Community-based organizations 4. MCE 5. BayREN 6. Transportation Authority of Marin

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
			efficiency and electrification measures	
L-4	**Continue to update promotion and outreach efforts** and campaigns as needed.	● Continuation of Action #N-2 ● Continue finding ways to mass market, expand outreach, and streamline and consolidate existing and new programs and incentives as they arise ● Continue partnering with and supporting programs through local community based organizations ● Continue to use existing local government touchpoints with the community to provide timely information and relevant education	● Targeted campaigns and efforts to benefit low-moderate income (LMI) households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City ● Structure rebate and incentive programs to benefit LMI households and renters especially in underserved communities ● Increase awareness of and access to programs and incentives that first address deferred maintenance ● Address Split-Incentives: Structure multi-unit programs that incent both renters and property owners to	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. Community Based Organizations 4. MCE 5. Transportation Authority of Marin

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
			implement energy efficiency and electrification measures	
L-5	**Continue community engagements to re-evaluate policy and community needs.**	● Continuation to Action #N-3 ● Partner with community to re-assess barriers and solutions ● Look at new policy, program, financing and revenue generating mechanisms to fund energy and electrification projects ● Through BayREN, continue to increase contractor, building professionals and local building staff attendance to free trainings on installing and permitting of heat pumps and electrical appliances and systems	● Ensure community based organizations serving LMIs, hard-to-reach households, renters and energy burdened communities are continually engaged and partnered with to develop actions	1. Local Government: Councils/Electeds and Staff 2. BayREN 3. Community Based Organizations 4. MCE 5. Local businesses 6. Trades associations 7. Contractor workforce 8. Transportation Authority of Marin
L-6	**Continue implementing and enhancing permit streamlining measures that incent electric over gas installations.**	● Continuation to Action #N-4 ● Implement and re-evaluate approaches to continue speeding up the permitting process ● Continue to train examiners and inspectors on how to permit new heat pump, electric appliances and systems via BayREN ● Continue to identify ways to simplify permitting	● Continue to find ways to offset the impact of the high cost of permitting for electrification	1. Local Government: Councils/Electeds and Staff 2. BayREN

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
L-7	**Continue code implementation and rebates and incentives in support of installing electric ready systems for existing buildings** especially during the 2028 and 2031 State building code development cycles.	● Continuation to Action #N-5 ● Develop, implement and enforce adopted 2028 and 2031 building reach codes that includes that advance energy and electrification for residential and nonresidential	● Target campaigns and efforts to benefit LMI, and hard-to-reach households, renters and energy burdened communities such as in rural West Marin, North Marin, Canal, and Marin City	1. Local Government: Councils/Electeds and Staff 2. BayREN
L-8	**Continue to implement the Marin Countywide EV Acceleration Strategy**.	● Continuation of Action #N-6 ● Take key actions as outlined in the acceleration plan	● Partner with community based organizations to increase access and identify charging infrastructure need ● Continue to ensure equitable and affordable access to EV charging	1. MCEP 2. Transportation Authority of Marin 3. Local Government: Councils/Electeds and Staff 4. MCE
L-9	**Continue to coordinate with PG&E to improve infrastructure planning**.	● Continuation of Action #N-8 ● Continue proactive owner/developer planning and communication that helps with	● Segment underserved communities across Marin when collecting data so we can	1. PG&E 2. New Mult-unit affordable and market rate developers

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
		PG&Es service and distribution planning	understand where the best opportunities exist to implement target pilots or campaigns	3. Commercial developers 4. Local Government: Councils/Electeds and Staff 5. MCEP
L-10	**Continue to support growth of the local and regional building energy and electrification workforce.**	● Continuation of Action #N-8 ● Through BayREN, continue to increase contractor, building professionals and local building staff attendance to free trainings on installing and permitting of heat pumps and electrical appliances and systems ● Re-evaluate the needs on how local government, community-based organizations, utilities, public agencies, BayREN and/or businesses can come together and fund the growth of and backfill program gaps for Marin's workforce and contractor base. to best grow Marin's workforce.	● Continue to participate in regional workforce development initiatives that focus on high road jobs and diversity in the contractor base	1. Community Based Organizations 2. Local Government: Councils/Electeds and Staff 3. Local businesses 4. Trades associations 5. Contractor workforce 6. MCEP
L-11	**If pilot is successful, continue implementing a Time of Listing Energy Audit Policy** for residential buildings and expand to other Marin	● Continuation to Action #N-9 ● Work with other Cities and Towns to develop and adopt policy locally	● See #I-12	1. Local Government: Councils/Electeds and Staff 2. BayREN

Action #	Action Description (Policy, Program, Incentives)	Action Details	Equity Consideration(s)	Recommended Implementing Organizations and Partners
	jurisdictions as needed			3. Community-based organization 4. Marin Realtors 5. MCEP
L-12	**If successful, continue to implement a targeted neighborhood-scale electrification pilot**	● Continuation to Action #N-13 ● Continue coordination with PG&E and consulting with other jurisdictions implementing ● Continue to find funding as needed in order to continue implementing	● See #I-14	1. PG&E 2. Community members/neighborhoods 3. Existing Single- or Multi-unit affordable and market rate developers 4. Community-based Organizations 5. Local Government: Councils/Electeds and Staff 6. MCEP
L-13	If feasible, **begin implementation of a disposal plan for end-of-life of gas and heat pump products, appliances, and refrigerant management**.	● Continuation of Action #N-13 ● Implement the plan ● Continue regional collaboration, coordination and planning with Zero Waste Marin, local waste haulers, landfill operators and County to ensure appropriate disposal ● It may require the need for a regional reuse and salvage market	Unknown	1. Zero Waste Marin 2. Waste Haulers 3. County of Marin 4. Landfill Operator(s) 5. CalRecycle