



Building Electrification Proposal for New Construction

DRAFT Policy Snapshot

November 4, 2022

Reach Code Proposal

Every three years the Green Building codes are updated at the State level and local jurisdictions are allowed and encouraged to adopt more stringent “reach codes” to help drive future State code updates. Attached is the Policy Summary Chart. Staff are proposing to adopt reach codes for new construction this year along with one measure for existing buildings, and to otherwise address remodels of existing buildings in 2023. For new construction it is being proposed to disallow natural gas in new residential or commercial buildings. Exceptions or exemptions would be made in certain situations where it may be necessary for emergency power generation or cause extraordinary hardship due to infeasibility or costs. The requirements would apply to multifamily development and detached accessory dwelling units (ADUs) as well as single family homes. Restaurants would be exempt. Included in the reach codes would be an increase in electric vehicle charging infrastructure to ensure that multifamily buildings have the wiring and outlets necessary to install chargers with the least barriers and costs possible to meet future demand.

The one code change for existing buildings being proposed would prohibit any increase of existing gas lines and capacity unless for emergency backup power. This is because the Building Division is seeing installations of luxury appliances such as outdoor fireplaces and hot tubs that are dramatically increasing natural gas use in single family homes, requiring pipe and meter increases. Finally, the proposal is to continue the analysis into 2023 for other code changes for existing buildings and to put together an “implementation plan”. The plan would include a resource hub of incentives and technical assistance as well as a proactive outreach strategy to support residents and contractors in electrification and energy efficiency work. The State is compiling this information as well, and there is a Bay Area web resource called The Switch Is On that will be updated with all incentives in one place.

Rationale

In 2019 the City adopted the 2030 Climate Change Action Plan which set a goal to reduce greenhouse gas emissions 40% by 2030. 30% of San Rafael’s community greenhouse gas emissions are in the building sector; 6% from electricity consumption and 24% from the consumption of natural (methane) gas. Methane gas has significant greenhouse gas (GHG) emissions associated with its generation, transmission, and end-use. It also has health consequences, including increased asthma, illness, and death. Building electrification allows for reductions in emissions as the California electrical grid becomes greener and includes more renewable sources such as wind, solar, and biomass. This is even more so for buildings that include solar and battery storage on site and rely less on the grid for energy. Installing electric appliances and infrastructure is much cheaper during the new construction phase rather than retrofitting later. Over the last decade, in-state renewable energy generation, such as

solar, wind, biomass, and geothermal, increased from 29 percent in 2010 to 43 percent in 2020. California is investing over \$3 billion to boost grid reliability and facilitate more renewable energy over the next several years, and hundreds of millions more to increase long-duration storage systems to serve the grid. With the State moving to an all-electric future, requiring new construction to be all-electric removes the challenges and expense of retrofitting later when appliances get to end-of-life. Further, there are a plethora of incentives existing and impending in 2023 and 2024 that builders can access. Pairing an all-electric mandate with the timing of these incentives telegraphs the transition to the building community and relieves the up-front cost burden, while ensuring polluting gas-fired amenities and appliances are not installed.

Climate Change Action Plan (CCAP) Measures addressed by this proposal

- 1. Green Building Reach Code (EE-C4)**
- 2. Building and Appliance Electrification (RE-C3)**
- 3. Energy Efficiency Programs (EE-C1)**

The Green Building Reach Code represents the potential to contribute between 1.8 – 8.4% of the City's total 2030 greenhouse gas (GHG) reduction goal. Combined, these three programs represent a potential to contribute up to 18,990 MTCO_{2e}, 20% of the City's total 2030 GHG reduction goal.

Challenges and Opportunities

Rapid decarbonization will not always be easy to do in all cases. One of the main questions posed at the outset of this project was how to best meet our GHG reduction goals while also meeting our housing production and economic development goals, especially as it relates to cost. Exemptions and exceptions have been built into the proposal to accommodate those occasional cases where it would be infeasible or prohibitively costly to meet the code. In addition, some building and use-cases can be extremely difficult to electrify such as certain industrial processes, restaurants, and other operations that require large amounts of water heating. These have been exempted for now, with the option to scale back or remove exemptions as the industry matures and solutions become more readily available in these situations. However, these hard use-cases are very rarely built in San Rafael.

Another question posed had to do with resiliency: How does an all-electric building fare during a power outage, and can the electrical grid handle the increase in demand? Currently many gas appliances require electricity to operate, meaning in many cases space heating and hot water impacts will be felt by those in mixed-fuel homes as well. Exceptions for backup power generation were included for multifamily properties that might require it to have lighting and elevator function during power outages. However, local power distribution has been hardened and most of San Rafael is no longer at threat for a PG&E Public Safety Power Shutoff event. Common power outages are lasting shorter amounts of time. California is investing over \$3 billion in grid reliability and backup power in the next several years to reduce these impacts even further. New State codes are requiring most new construction to have battery backup power and solar, adding resilience on-site. If demand for electrification of buildings and vehicles outpaces utility upgrades and increases in clean energy production, the grid could face challenges in the future. However, utilities believe the grid will not be

compromised with the investments the State and utilities are making to ensure reliability, especially since new building is a small percentage of the demand on the grid.

Economy and Social Equity

For single family homes and ADUs electrification will be relatively straightforward and, in many instances, will save owners money when building. Slight utility bill cost increases may occur at current energy prices though the California Public Utilities Commission projects the price of natural gas will increase at almost double the rate of electricity in the coming decade. Multifamily housing and certain commercial applications can often be harder and more expensive to build but show utility bill savings for tenants. However, builders can also save costs by not having to install gas lines and meters. The State and utilities are providing numerous incentives to help offset initial costs of build, and soon the Federal government will be providing additional incentives through the Inflation Reduction Act. Locally, the reach code proposal includes certain exceptions and exemptions to allow for those specific cases where the cost burden may be too great, especially in the case of affordable multifamily housing. The State also provides technical assistance to multifamily and affordable housing developers to achieve its electrification goals, including help in applying for the incentives.

With projected increases in extreme heat events, building electrification can provide residents with highly efficient air conditioning at about ¼ the energy use of typical air conditioners. This is because heat pump space heaters can reverse the flow of air and provide cool air as well as heat, offering tenants air conditioning options that were previously out of reach. Also, currently there is very little opportunity for apartment dwellers to charge electric vehicles (EV) at home. Having more EV charger availability in apartment complexes, public parking lots, and workplace settings will enable renters to acquire EVs and plug-in hybrids. There are currently several programs and incentives for multifamily and affordable housing developers to offset costs of chargers and electrical infrastructure with more in the works. New State legislation will remove long-standing subsidies for gas line installations for new buildings, and a new ruling will require that utilities cover the cost of additional electrical infrastructure for EV charging in multifamily housing and commercial properties.

Co-Benefits & Potential Unintended Consequences

Two potential unintended consequences of adopting a reach code are additional costs and confusion for contractors due to hard-to-understand code language and burdensome Building Division implementation. However, the City of San Rafael's Building Division demonstrates collaboration and simplification and was consistently referenced as the easiest to work with in Marin during engagements with builders and the Marin Builders Association. Other potential unintended consequences may include the challenges of installing and using new technologies, added time and associated costs for permitting transformers for larger projects, and the ability to find contractors that can do the work. An added element to this proposal is the City's commitment to compile and promote all the technical assistance and incentives available to owners and contractors for ease of implementation in the coming year. Electrify Marin and Bay Area Regional Energy Network have been training contractors and providing incentives to build the capacity necessary to transition to an electric future and have seen a thousand-fold increase in qualified contractors since 2019. Supply chain issues

and availability of materials is another concern for builders but is not specific to electrification materials and appliances.

Co-benefits include resident health and workforce development. Over 40 studies have documented the negative health effects of having gas (methane) in the home, including asthma, increased deaths and illness. Local workforce programs include MCE Clean Energy's Workforce, Education and Training program in conjunction with Strategic Energy Innovations focused on building electrification and energy efficiency. More workforce programs are being funded and developed across the region and the City will be exploring opportunities to enhance them for local residents through our upcoming Economic Inclusion in Climate Action project. The EV requirements in this proposal will provide EV chargers on-site for a small percentage of parking spaces, as well as the infrastructure to easily install more based on demand, providing renters with a much-needed resource to be able to own an electric vehicle.

Engagement

This proposal and analysis were guided by multiple meetings with our ad-hoc subcommittee comprised of Councilmembers Bushey and Llorens Gulati. In addition, staff sought input from the Mayor and other Councilmembers throughout the year. City staff participated in the countywide building decarbonization steering committee, which convened a number of engagements with a wide array of stakeholders over 10 months. These engagements included builders, developers, appliance installers, other jurisdictions' planning and building staff, nonprofit partners, and affordable housing entities. Engagements included focus groups, presentations to community groups, public meetings, individual meetings with key stakeholders, and a public survey. This proposal is based on the County's Model Reach Codes and incorporates feedback received during these public engagements.

Question Prompts for the Study Session

These prompts are provided to lead off the discussion of the proposed reach codes based on key questions staff has received throughout the development process, but staff and subject matter experts will be available to answer any questions Council and the public may have.

1. Are there any other thoughts or concerns you have about how we are proposing to balance our GHG reduction goals with our affordable housing goals?
2. Do you need any more information prior to this item coming to City Council for consideration?
3. Are you supportive of including a natural gas limit for existing buildings at this time?

Attachments

- A. Sources and references (see pages 6 & 7 below)



Sources

Climate Change Action Plan Measures

- [San Rafael Climate Action Plan Energy Efficiency Measures](#)
- [San Rafael Climate Action Plan Renewable Energy Measures](#)

Reach Code Proposal

- [Statewide Reach Codes Website](#)
- [Building Standards Codes and Green Building Website](#)
- [Equitable Building Decarbonization: Implementation Approaches](#)
- [Marin County Model Reach Code Development](#)
- [South and East Bay Reach Code Initiative](#)
- [All-electric Reach Code Listing, California](#)
- [California Energy Commission Building Decarb and EV Resources](#)
- [Switch is On Electrification Resources for Owners and Contractors](#)

Rationale

- [California Energy Policy Report 2021 Data and Studies](#)
- [2021 Total System Generation Report](#)
- [PG&E Energy Mix 2021](#)
- [PG&E System Battery Storage Projects](#)
- [Electric Water Heating GHG Study](#)
- [Marin Climate GHG Inventories](#)
- [Health Impacts of Natural Gas Stanford Study](#)
- [Health Impacts of Natural Gas Meta Analysis](#)
- [Assessment of Impacts of Electrifying Residential Buildings in California](#)
- [UCLA Report Residential Gas Appliances](#)

Challenges and Opportunities

- [BUILD Program for Technical Assistance and Incentives Multifamily](#)
- [CPUC Utility Costs and Affordability Evaluation](#)
- [Building Decarbonization Practice Guide](#)
- [PG&E Public Safety Power Shutoff Map](#)
- [Article: California Electric Grid and EVs](#)
- [Grid Impacts Study California EVs](#)



- [MCE Clean Energy Electric Load Planning](#)

Economy and Social Equity

- [Cost Effectiveness Studies](#)
- [Prioritizing California’s Affordable Housing in the Transition Towards Equitable Building Decarbonization](#)
- [Low-Rise Residential Cost-Effectiveness Study](#)
- [MCE Clean Energy Workforce Program](#)
- [County of Marin Model EV Reach Code Policy Brief](#)
- [Inflation Reduction Act Fact Sheet](#)
- [Inflation Reduction Act Incentives Calculator](#)
- [California Eliminates Natural Gas Subsidies](#)
- [EV Rule 29 Providing for EV charging infrastructure for multifamily and non-residential installations](#)

Co-benefits & Potential Unintended Consequences

- [Electrify Marin Rebate Program](#)
- [Bay Area Regional Energy Network Resources for Public, Government, and Contractors](#)
- [Heat Pump Systems](#)
- [Heat Pumps and Heat Waves, Rocky Mountain Institute*](#)

Engagement

- [Model Reach Code Development Engagements](#)