File #: LB 20-002

DATE: March 3, 2020

TO: Mayor and City Council

FROM: Director of Public Works

SUBJECT

Electrification Reach Codes: Adopt a Resolution and Introduce an Ordinance to Adopt Electrification Reach Codes for the 2019 California Energy Code and California Green Building Standards Code

RECOMMENDATION

That Council adopts a resolution (Attachment II) and introduces an ordinance (Attachment III) to adopt electrification reach codes for the 2019 California Energy Code and California Green Building Standards Code.

SUMMARY

This report presents an ordinance to address the electrification of buildings and vehicles related to new construction. Every three years, the California Building Code undergoes a full update and the 2019 Code became effective on January 1, 2020. Local jurisdictions can implement codes that are more stringent than the State Code. These are known as "Reach Codes" and can address the electrification of buildings and vehicles at the time of construction of new buildings.

The proposed Reach Codes would modify Part 6 (California Energy Code) and Part 11 (California Green Building Standards Code, aka CALGreen) of the California Building Code (Title 24 of the California Code of Regulations). This report includes an overview of the Statewide cost-effectiveness study, details findings, and provides recommended reach codes for the 2019 building cycle.

The Council Sustainability Committee reviewed this item at several Committee meetings including the September 17, 2019 and October 30, 2019 meetings, and recommended draft ordinances that would require:

- New low-rise residential (single-family and multi-family up to three stories) buildings be constructed as all-electric (with no natural gas plumbing);
- Non-residential and high-rise residential buildings be either all-electric or be constructed as mixed-fuel, but with extra energy efficiency, solar, and battery storage; and
- Additional electric vehicle (EV) charging infrastructure in all new buildings.

ATTACHMENTS

Attachment I	Staff Report
Attachment II	Resolution
Attachment III	Reach Code Ordinance
Attachment IV	GHG and Cost Savings
Attachment V	Editorial from Wall Street Journal
Attachment VI	The Windsor Times: Town of Windsor Sued Over Reach Code
Attachment VII	Comments Received

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Development Services Director

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- Additional electric vehicle (EV) charging infrastructure in all new buildings.

BACKGROUND

All-electric buildings are one of the key strategies to decarbonizing the state's building stock. The state's electric system is rapidly becoming cleaner, driven by escalating renewable portfolio standards and cleaner product offerings by the utilities and community choice energy programs, including East Bay Community Energy (EBCE). In addition, advances in electric heat pumps and other electrical equipment are yielding much higher overall efficiencies than their natural gas counterparts. Electric heat pumps, unlike traditional electric resistance heaters, do not generate heat, but concentrate and transfer it for end uses such as space conditioning/heating and water heating. This process uses less primary energy and emits much less carbon, particularly when it is powered by renewable energy. Induction cooktops are also gaining popularity and are significantly more efficient than gas stoves.

Figure 1. Example of a Commercial Induction Cooktop

Figure 2. Example of a Residential Heat Pump Water Heater

According to EBCE, on a BTU basis, electricity is approximately three times more expensive than natural gas. However, some heat pump equipment is approximately three times more efficient than similar natural gas-powered equipment. A heat pump water heater is more expensive than a natural gas water heater, but over the life of the equipment, the overall cost is similar. More significant cost savings associated with building electrification come from the avoided infrastructure and plumbing needed to serve a new building with natural gas.

Reach Code Adoption Process

Every three years, the State of California adopts new building standards that are organized in Title 24 of the California Code of Regulations, referred to as the California Building Standards Code. This regular update is referred to as a "code cycle." The last code cycle was adopted in 2016 and was effective as of January 1, 2017. The 2019 code was adopted in 2019 and became effective January 1, 2020. Cities and counties can adopt reach codes that require items that are above minimum state code requirements. However, these reach codes must be filed with the State.

In addition, the California Energy Commission (CEC) requires that a cost-effectiveness study be conducted and filed in the case of local amendments to the Energy Code (Title 24, Part 6). It is required that the City demonstrate to the CEC, using a cost-effectiveness study, that the amendments to the code are financially responsible and do not represent an unreasonable burden to non-residential and residential applicants. A cost-effectiveness study is not required for amendments to the Green Building Code (Title 24, Part 11).

Funded by the California investor-owned utilities, the California Statewide Codes and Standards Program led the development of a cost-effectiveness study[1] for Energy Code reach codes that examined different performance-based approaches for new construction of low-rise residential (single-family and multi-family up to 3 stories) and non-residential building types. Staff has worked closely with EBCE's consultants to interpret the study's results and infer what options may or may not be cost-effective for the building types that are prevalent in Hayward.

EBCE has also provided consultant support to assist cities in understanding the cost-effectiveness study results and adopting reach codes. The proposed reach codes meet the requirements of the CEC for cost-effectiveness, and are also a cost-effective approach for constituents, contractors, and developers pursuing new construction with the city limits. In addition, the analysis results show that all-electric buildings are typically less expensive to construct. Costs include incremental capital costs, and, in some cases, higher energy costs. In general, the first costs of an all-electric building are lower than a mixed-fuel building due to the lack of gas plumbing. More detail about the cost-effectiveness of the proposed reach code is included in the Economic Impact section of this report and in Attachment IV.

Sustainability Committee Meetings

The Committee has considered several reports on building and vehicle electrification. All reports are available on the City's website[2].

On July 16, 2018, the Committee considered a report titled *Building Electrification & Reducing Natural Gas Use*[3]. The Committee recommended supporting and encouraging East Bay Community Energy (EBCE) to address electrification of existing buildings. The Committee

[1] https://localenergycodes.com/content/2019-local-energy-ordinances/
[2] https://www.hayward-ca.gov/reach-code
[3] Report is available at https://hayward.legistar.com/LegislationDetail.aspx?ID=3551018&GUID=718DCC1C-13F6-41D0-8833-C72B0B86DCE5&Options=&Search=

also expressed support for phasing out the use of natural gas in new construction and, eventually, no longer permitting new natural gas lines for new construction. The Committee noted that heat pump water heaters in new construction may be a good place to start and that any new regulations should come with sufficient advance notice to developers and builders.

On January 14, 2019, the Committee considered a report titled *Natural Gas Use in New Construction*[4], which described the current regional effort to develop a reach code that would encourage all-electric construction. The Committee supported the idea of a reach code and asked staff to engage with local builders and developers and noted that a reach code would be most effective if all cities in the area would adopt the same requirements.

On May 13, 2019, the Committee considered a report titled *Update on Possible Reach Code for Building and Vehicle Electrification*[5] that included a summary of the cost-effectiveness studies prepared by the California Energy Codes and Standards program. The Committee indicated support for not allowing natural gas in new single-family and low-rise (up to three stories) multi-family homes. For non-residential, the Committee prefers that buildings be all-electric, but mixed fuel buildings should be allowed where flexibility is needed for certain building types. The Committee also supported requiring electric vehicle (EV) charging infrastructure in new construction.

On September 17, 2019, the Committee considered a report titled *Draft Electrification Reach Codes for 2019 California Energy Code and California Green Building Standards Code*. The Committee was in favor of an electric-only requirement for low-rise residential construction and noted that the codes are necessary to help meet the State's goal of carbon neutrality by 2045.

On October 30, 2019, the Committee considered a report titled *Revised Draft Electrification Reach Codes for 2019 California Energy Code and California Green Building Standards Code*. One community member spoke and asked about the electrical grid's potential threats from hacking and earthquakes. The Chair of the Committee, Councilmember Mendall, responded that these issues are being addressed on several fronts and that the City will continue to consider and discuss these issues with EBCE and the California Public Utilities Commission (CPUC). The Committee asked about electrifying existing buildings and staff indicated this issue would be addressed at a later date. The Committee noted that new buildings need to be all electric in order to meet Hayward's and the state's long term GHG reduction goals.

Since the Committee meeting on October 30, 2019, staff made several changes to the draft codes:

[4] Report is available at https://hayward.legistar.com/LegislationDetail.aspx?ID=3834310&GUID=B84DE7FD-6A5A-43D6-A042-26992FFF031C&Options=&Search=
[5] Report is available at https://hayward.legistar.com/LegislationDetail.aspx?ID=3946057&GUID=61EEA528-55E8-4C6D-BAD3-24211EC64ABA&Options=&Search=

- Added exemptions in the Energy Code amendments for unusual circumstances where an applicant can show that due to exceptional characteristics of the structure, property, or business involved, a literal enforcement of the code will result in practical infeasibility.
- Added exemptions in the Green Building Standards amendments for cases where an applicant provides documentation detailing that the increased cost of utility service or on-site transformer capacity would exceed an average of $4,500 among parking spaces with Level 2 EV Ready Spaces.
- Provided for the use of automatic load management systems, which allow multiple EV chargers or EV-Ready electric vehicle outlets to share a circuit or panel and automatically reduce power at each charger, providing the opportunity to reduce electrical infrastructure costs and/or provide demand response capability.
- Replaced the term "natural gas" with "fuel gas." Fuel Gas is defined in the California Mechanical and Plumbing Codes to include both natural gas and propane.
- Added language to specifically allow the use of outdoor cooking appliances or backup power generation fueled by a free-standing Fuel Gas tank.

Reach Codes in Other Cities

As of February 13, 2020, a total of 27 local jurisdictions throughout California have adopted electrification reach codes. On July 16, 2019, the City of Berkeley adopted a ban on the installation of natural gas infrastructure in new buildings. The ban, effective January 1, 2020, is not an amendment of the Energy Code, but is incorporated into the city's health and safety code and will be implemented as conditions of approval during the planning approval process. Because some development proposals do not require formal planning approval prior to submittal of a building permit application, the City of Berkeley also adopted a reach code, which will apply to projects that do not require a planning permit or a zoning certificate. In November 2019, the California Restaurant Association sued the City of Berkeley claiming that Berkeley's gas ban "imposes irreparable harm," that certain foods can only be prepared using gas, and that the ban will increase operational costs for restaurants. The Association also argues that the City of Berkeley doesn't have the authority to impose the ban.

The cities of San Jose, San Mateo, Menlo Park, and some cities outside of the Bay Area have adopted reach codes that became effective January 1, 2020. On October 16, 2019, the Town of Windsor adopted a reach code requiring low-rise residential buildings to have only electric appliances and mechanical systems. As described in Attachments V and VI, on November 19, 2019, a lawsuit was filed against both the Town of Windsor and the town council claiming that an environmental impact report (EIR) should be prepared to satisfy the requirements of the California Environmental Quality Act (CEQA). Of all the cities that have adopted reach codes, none have prepared an EIR.

The City of Berkeley is currently the only city in Alameda County with a reach code, which bans natural gas. Staff is working with EBCE and the other cities in Alameda County to develop similar reach codes. Some cities expect to have reach codes take effect during the first quarter of 2020 and some will be later in 2020. Following is a brief summary of activities in neighboring cities:

- Albany – Developing an ordinance similar to Berkeley's gas ban. City Council consideration is tentatively scheduled for December 2020.
- Berkeley – Reach Codes adopted on December 3, 2019.
- Emeryville – City Council held a study session on November 19, 2019.
- Fremont – Sustainability Commission discussed reach codes in September and October 2019. Staff expects to present to City Council in January or February 2020.
- Livermore – Exploring idea of reach codes during update of climate action plan.
- Oakland – Staff is expecting to present reach codes to City Council in the near future.

DISCUSSION

For multiple reasons, including health, safety, economics, and environmental benefits, there is growing interest in all-electric new construction, or "building electrification," which means that the buildings would not have any fossil fuel services. All-electric buildings have electric appliances for space heating, water heating, clothes-drying, and cooking. A major reason to encourage building electrification stems from the fact that EBCE is providing carbon-free electricity and eliminating the use of natural gas can greatly reduce greenhouse gas emissions from the building sector.

The proposed codes are similar to those being considered by other local governments and are based on a model ordinance developed through a collaborative effort involving the CEC, the State's major utilities, several community choice aggregators including EBCE, and representatives from local governments.

Recommended reach code requirements for newly constructed buildings are:

Single-family Residential
- All new single-family homes must be all-electric and meet the basic requirements of the state's 2019 Code, which includes some solar photovoltaics.
- Free-standing accessory dwelling units less than 400 square feet are exempt, which means they can include natural gas appliances for water heating, space heating, etc.[6]

Multi-family Residential (up to 3 stories)
- All new low-rise multi-family buildings must be all-electric and meet the basic requirements of the state's 2019 Code.

Non-residential (including high-rise residential)
- An all-electric building must meet the basic requirements of the state's 2019 Code.
- Mixed-fuel buildings must:

[6] A home of this size may not have the space needed for a heat pump water heater and may be connected to the main panel of the primary dwelling, which may have capacity constraints.

- Install solar panels on the entire Solar Zone[7]; and
- Meet a minimum compliance margin of 10% (or 15% for office and retail) better than the calculated energy budget; or
- Comply with a prescriptive list of energy efficiency requirements.

For non-residential buildings, staff feels it is important to allow the flexibility that the mixed-fuel option provides. There are certain commercial and industrial building types that would be very challenging or infeasible to build as all-electric. For residential construction (single-family and multi-family up to three stories), all-electric construction is a practice already demonstrated in several completed projects across California and will be incorporated in some projects already approved in Hayward. The full text of the recommended amendments to the Energy Code (California Building Code, Title 24, Part 6) is included in Attachment III.

Reach Code for Electric Vehicle Charging Infrastructure

Local residents are showing a significant interest in electric vehicles. It is widely known that availability of EV charging infrastructure is a critical component to EV adoption. Meanwhile, it is significantly more expensive to install charging infrastructure as a retrofit than it is during new construction. As such, ensuring that newly constructed residential and non-residential parking has ample EV charging capability will reduce long-term costs of EV infrastructure installation, while helping to increase EV adoption and decrease transportation-related greenhouse gas emissions. While California's new minimum requirements are a step forward, it is unlikely that the requirements are enough to keep pace with expected EV growth looking towards 2030.

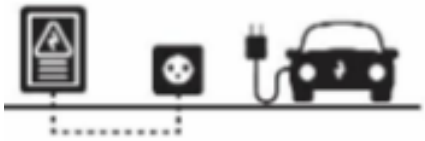
Unlike amendments to the Energy Code, a cost-effectiveness study is not required for amendments to Title 24, Part 11, or the Green Building Code "CALGreen" which covers items such as electric vehicle (EV) charging infrastructure.

Electric Vehicle (EV) charging requirements in California can generally be broken into three categories:

Table 1. EV Charging Infrastructure

EV Capable:		Conduit is installed to parking space, and building electrical system has ample capacity to serve future load. An electrician would be required to complete the circuit before charging is possible.

[7] *Solar Zone* – The Energy Code defines the solar zone as an allocated space that is unshaded, unpenetrated, and free of obstructions. It serves as a suitable place that solar panels can be installed at a future date.

EV Ready:		Parking space is provided with all power supply and associated outlet, such that a charging station can be plugged in and a vehicle can charge.
EV Charger Installed:		All supply equipment is installed at a parking space, such that an EV can charge without additional equipment. (Staff does not recommend installation of charging equipment. EVs and EV charger technologies are evolving rapidly and unused installations could become outdated quickly.)

EV charging capacity and speed can be summarized as three categories:

- Level 1: Capable of charging at 120V, 20A. This is equivalent to a standard home outlet and can provide approximately 5 miles of Range Per Hour (RPH) of charging. (Staff is not recommending requirements for Level 1 chargers as they are not expected to be useful as technology advances. In the near future, EVs are expected to have larger capacity batteries, which will take a very long time to charge using a Level 1 charger.

- Level 2: Capable of charging at 240V, 30-40A. This is the service capacity typically used for larger appliance loads in homes and can provide 12 to 25 miles of RPH.

- Level 3 (Direct Current or DC Fast Charging): Capable of charging at 480V and can provide 100 miles or more of RPH. This is the type of charger used for Tesla Superchargers and DC Fast Chargers at some shopping centers (There are two at the City Hall parking structure and two at the Target store parking lot along West A Street.)

The 2019 California Green Building Code Update (Title 24, Part 11) increases requirements for electric vehicle charging infrastructure in new construction, including:

- New one- and two-family dwellings and townhouses with attached private garages: must be Level 2 EV-capable
- Multi-family dwellings: 10% of parking spaces must be Level 2 EV-capable
- Non-residential: 6% of parking spaces must be Level 2 EV-capable

Recommended reach code requirements for EV infrastructure are:

Residential

- Single Family Dwelling: For each dwelling unit, install two dedicated Level 2 EV Ready circuits.

    - Exception: For each dwelling unit with only one parking space, install one Level 2 EV Ready circuit
- Multi-Unit Dwelling, <20 units: Per unit, a single Level 2 EV Ready circuit
    - Exception: Not required for units without parking
- Multi-Unit Dwelling, >20 units: 75% of the units, a single Level 2 EV Ready circuit per unit; 25% of the units, a single Level 2 EV Capable circuit per unit
    - Exception: Not required for units without parking

Non-Residential Office

- When 10 or more parking spaces are constructed, 20% of the parking spaces must have a Level 2 EV Ready circuit
- An additional 30% of the parking spaces must be EV Capable at the "pinch points" utilizing at least Level 2-sized conduit with panel capacity sufficient to accommodate the required number of EV capable parking spaces. Pinch points are defined as the areas where conduit should be installed at the time of new construction so that future installations do not require walls to be opened or asphalt dug up.

Non-Residential, Non-Office

- When 10 or more parking spaces are constructed, 15% of the parking spaces must have a Level 2 EV Ready circuit
- For parking lots with more than 100 spaces, after a minimum of 15 Level 2 EV Ready spaces are installed, a single DC fast charger (Level 3) may be installed to substitute for the next 15 Level 2 EV Ready spaces.

The full text of the recommended amendments to CALGreen (California Building Code, Title 24, Part 11) is included in Attachment III.

Grid Resiliency – A recent letter to the editor in a Bay Area newspaper argued that PG&E's Public Safety Power Shutoffs (PSPS) are reason for local governments to reconsider building electrification efforts. The letter stated that gas appliances are beneficial during grid outages. However, those in favor of electrification codes point out that some gas appliances cannot be operated during a grid outage. For safety and performance reasons, newer furnaces and water heaters that run on natural gas also require electricity to operate. The one appliance that can be operated without electricity is a gas range if lit manually. An outdoor propane grill or cooktop for emergency use can serve a similar function. For an all-electric home to be fully prepared for a power outage, a battery backup would need to be installed.

EBCE and other community choice energy programs are working to help residents and businesses be more resilient to grid interruptions. On November 5, 2019, EBCE, along with Peninsula Clean Energy, Silicon Valley Power, and Silicon Valley Clean Energy released a request for proposals to install more than 30 megawatts of battery storage. The program will provide solar power combined with battery storage to approximately 6,000 homes and hundreds of businesses in Alameda, San Mateo, and Santa Clara counties, including those affected by the recent Pacific Gas & Electric (PG&E) power shutoffs. The new battery systems

on homes and businesses, which may be combined with new or existing solar systems, will lower energy bills, increase reliability, and help stabilize the power supply for local customers.

Environmental Review

Adoption of the proposed Reach Codes is not a project under the requirements of the California Environmental Quality Act, together with related State CEQA Guidelines (collectively, "CEQA"), because it has no potential for resulting in a physical change to the environment. In the event that this Ordinance is found to be a project under CEQA, it is subject to the CEQA exemption contained in CEQA Guidelines section 15061(b)(3) because it can be seen with certainty to have no possibility that the action approved may have a significant effect on the environment. CEQA applies only to actions that have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. In this circumstance, the proposed action would have no or only a de minimis effect on the environment. The Ordinance is also exempt from CEQA under CEQA Guidelines section 15308, because it is a regulatory action for the protection of the environment.

ECONOMIC IMPACT

A reach code may only be adopted if it is determined that the proposed requirements are cost-effective. Cost-effectiveness is measured considering lifecycle costs using a 30-year timeframe. Generally, electric appliances are not more expensive compared to those fueled by natural gas. When considering the avoided cost of installing gas infrastructure (piping), in most cases, all-electric construction is cost-effective. The CEC requires that the cost-effectiveness analysis incorporate the time-dependent valuation (TDV) of energy so that the costs for the construction and operation of the building can be accurately calculated[8]. In addition to TDV, the studies also present cost-effectiveness in terms of the on-bill customer lifecycle benefit-to-cost ratio. The on-bill method shows that a new all-electric single-family home is not cost-effective when meeting the minimum 2019 state code requirements. This is because the study assumed appliances that meet minimum federal efficiency standards. In most cases, more efficient appliances are installed, which would cause the project to be cost-effective.

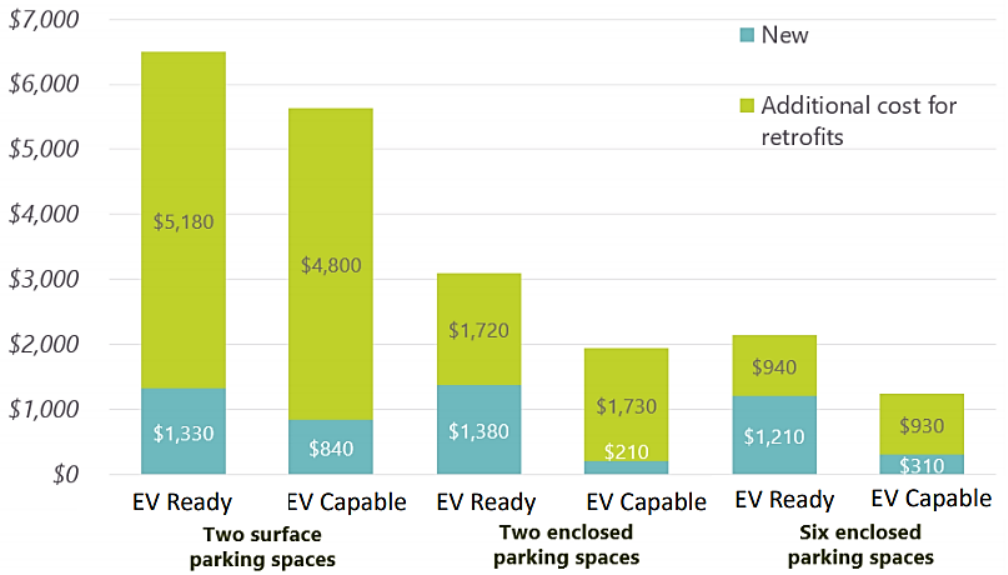
Two studies were completed; one for single-family and low-rise residential and one for non-residential construction. In general, the studies found that all-electric construction is cost effective for new construction for several building prototypes including: single-family homes; low-rise multi-family building; medium office; and medium retail. The complete cost

[8] As defined in the cost-effectiveness studies, the TDV calculation is "intended to capture the "societal value or cost" of energy use including long-term projected costs such as the cost of providing energy during peak periods of demand and other societal costs such as projected costs for carbon emissions, as well as grid transmission and distribution impacts. This metric values energy use differently depending on the fuel source (gas, electricity, and propane), time of day, and season. Electricity used (or saved) during peak periods has a much higher value than electricity used (or saved) during off-peak periods (Horii et al., 2014). This is the methodology used by the Energy Commission in evaluating cost-effectiveness for efficiency measures in Title 24, Part 6."

effectiveness studies are available on the California Energy Codes and Standards program website[9] and are summarized in Attachment IV.

The requirements for EV charging infrastructure will increase the cost of construction, but future residents or employees can benefit from the cost savings of operating an EV compared to a gasoline vehicle. In addition, significant savings can be realized when installing EV Capable and EV Ready circuits at the time of new construction as compared with the retrofit of an existing building or existing parking lot. Figure 3 below illustrations the typical costs of EV Capable and EV Ready circuits.

Figure 3. EV Charging: Cost of New vs. Retrofit



While the recommended draft code does not require installation of actual charging equipment, the following cost ranges are provided for reference:

- Level 2 charger (non-networked) – $3,500-$5,000 per unit
- Level 2 charger (networked) – $4,500 to $9,000 per unit
- DC Fast Charger – $40,000 to $100,000 per unit depending on site conditions

Networked chargers may be installed in multifamily or non-residential settings and allow the owner to manage access and rates charged and can include smart power management to share electrical capacity, avoiding expensive infrastructure upgrades. These costs are dependent on variables such as: whether or not electrical panel or transformer upgrades are needed; whether or not physical site upgrades are necessary to meet accessibility requirements; or trenching distance from the panel to the stations. A non-networked charger may be more typical for a single-family home.

[9] https://localenergycodes.com/content/2019-local-energy-ordinances/

FISCAL IMPACT

The proposed energy performance amendments parallel the structure and terms of the State code and, as such, any incremental plan check and inspection time should be minimal. The electric readiness provisions will require plan checkers and inspectors to apply additional check lists to mixed-fuel buildings. These items are not expected to require very much additional staff time. Any incremental costs of administering these requirements will be covered through existing permit fees.

East Bay Community Energy (EBCE) is assisting its member jurisdictions with community outreach and development of local ordinances. EBCE will provide a grant of $10,000 to each city that presents an ordinance to its Council as compensation for the staff time spent on the effort.

STRATEGIC ROADMAP

This agenda item supports the Strategic Priority of *Combat Climate Change.* Specifically, this item relates to the implementation of the following projects:

Project 1, Part 1.a: Ban natural gas in new residential buildings
Project 1, Part 1.b: Require EV charging infrastructure in new construction

SUSTAINABILITY FEATURES

In 2018, the Intergovernmental Panel on Climate Change (IPCC) released a special report titled *Global Warming of 1.5°C*[10] detailing the impacts of global warming of 1.5°C above pre-industrial levels. The report states that:

- Climate change is already affecting people, ecosystems and livelihoods all around the world.
- Limiting warming to 1.5°C is not physically impossible but would require unprecedented transitions in all aspects of society.
- There are clear benefits to keeping warming to 1.5°C compared 2°C or higher. Every bit of warming matters.
- Limiting warming to 1.5°C can go hand in hand with reaching other world goals such as achieving sustainable development and eradicating poverty.

In 2019, the Science Advisory Group to the United Nations Climate Action Summit 2019 released a report titled *United in Science*[11]. The report states that current carbon emissions reductions need to be roughly tripled to be in line with the 2°C goal and increased fivefold for the 1.5°C goal.

California's Senate Bill 32 (Pavley), signed into law on September 8, 2016, states that "continuing to reduce greenhouse gas emissions is critical for the protection of all areas of the state, but especially for the state's most disadvantaged communities, as those communities are affected first, and, most frequently, by the adverse impacts of climate change, including an

[10] https://www.ipcc.ch/sr15/
[11] https://public.wmo.int/en/resources/united_in_science

increased frequency of extreme weather events, such as drought, heat, and flooding." SB 32 calls for statewide GHG emissions to be reduced by at least 40 percent below 1990 levels by 2030. In addition, on September 10, 2018, Governor Jerry Brown issued executive order B-55-18, establishing a statewide goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter."

The cost-effectiveness study mentioned above and summarized in Attachment IV estimates the GHG emissions for both mixed-fuel and all-electric single-family homes. Assuming that each home meets the minimum requirements of the 2019 building code, the mixed-fuel home will have emissions of 1.8 pounds of carbon dioxide equivalent/square foot of floor area, where an all-electric home's emissions will be 1.0 pound of carbon dioxide equivalent / square foot of floor area. In Hayward, because the City Council elected to make EBCE's Brilliant 100 (100% carbon free electricity) the default product for Hayward's electric customers, the potential for GHG savings is even greater.

To help meet the state's GHG reduction goals, in January of 2018, Governor Jerry Brown issued executive order B-48-18 to "boost the supply of zero-emission vehicles and charging and refueling stations in California." The Executive Order directs state government to meet a series of milestones toward a long-term target of 1.5 million ZEVs on California's roadways by 2025 and 5 million by 2030. The proposed amendments to CalGreen are necessary to accomplish the state's goals.

Furthermore, a reach code that encourages and requires all-electric construction is consistent with the following General Plan policies:

- **Natural Resources Policy 2.2: New Development.** The City shall review proposed development applications to ensure projects incorporate feasible measures that reduce construction and operational emissions for reactive organic gases (ROG), nitrogen oxides (NOX), and particulate matter (PM10 and PM2.5) through project location and design.
- **Natural Resources Policy 2.4: Community Greenhouse Gas Reduction.** The City shall work with the community to reduce community-based GHG emissions by 20 percent below 2005 baseline levels by 2020 and strive to reduce community emissions by 61.7 percent and 82.5 percent by 2040 and 2050, respectively.
- **Natural Resources Policy 2.6: Greenhouse Gas Reduction in New Development.** The City shall reduce potential greenhouse gas emissions by discouraging new development that is primarily dependent on the private automobile; promoting infill development and/or new development that is compact, mixed use, pedestrian friendly, and transit oriented; promoting energy-efficient building design and site planning; and improving the regional jobs/housing balance ratio.
- **Natural Resources Policy 4.3: Efficient Construction and Development Practices.** The City shall encourage construction and building development practices that maximize the use of renewable resources and minimize the use of non-renewable resources throughout the life-cycle of a structure.
- **Natural Resources Policy 4.11: Green Building Standards.** The City shall require newly constructed or renovated public and private buildings and structures to meet

energy efficiency design and operations standards with the intent of meeting or exceeding the State's zero net energy goals by 2020.

- **Mobility Policy 9.9 Alternative Fuel Vehicle Parking.** The City shall require new private parking lots to grant low-carbon vehicles access to preferred parking spaces and shall require new private parking lots to provide electric vehicle charging facilities. The City shall provide electric vehicle charging facilities in public parking lots.
- **Mobility Policy 9.11 Multifamily Charging Stations.** The City shall consider requiring electric vehicle charging stations in new multifamily development projects.

PUBLIC CONTACT

East Bay Community Energy is coordinating the preparation of draft reach codes and stakeholder engagement for its member agencies. EBCE has developed a website[12] with information and resources. On April 23 and 24, EBCE held four meetings in Fremont and Berkeley. Each location had one meeting for city staff and one for community members and stakeholders. In total, more than 100 people attended, including city staff from at least seven EBCE jurisdictions. On May 3, 2019, staff met with the Chamber of Commerce's Government Relations Council where staff from EBCE presented an overview of the need for and the benefits of a reach code. Comments received at the April and May meetings were summarized in the report presented to the Committee on May 13, 2019.

On August 26, 2019, staff partnered with BayREN to offer a workshop to local plumbing contractors to provide code compliance information related to heat pump water heaters. During the meeting, staff informed attendees that the City is developing a reach code, which could require heat pump water heaters in new construction. Staff created a webpage dedicated to the reach code effort. It includes links to previous Committee reports as well as links to external resources. In September 2019, staff mailed and emailed letters to hundreds of developers and contractors with information about the reach code development, including information about the September 17 Committee meeting.

On September 24, 2019, an article about the Reach Code was published in *The Leaflet*, which is the City's environmental newsletter, distributed every other month to approximately 3,000 people. Staff communicated with one industrial property owner regarding the requirements for the installation of solar panels on mixed fuel buildings and staff received two emails from residents and a letter from the Western Propane Gas Association (see Attachment VII).

In response to the Leaflet article, one resident submitted comments expressing opposition to the idea of limiting natural gas plumbing in new construction. They state that the majority of California's electricity is not carbon free and that, due to the nature of the grid, Hayward is not receiving 100% carbon-free electricity. Staff acknowledges that the electricity Hayward receives through the grid includes sources that are beyond our local control; however, the state's energy mix is getting cleaner every year. The renewable portfolio standard requires that all of California's electricity come from carbon-free sources by 2045. The buildings built today will be around for 100 years or more, so new all-electric

[12] https://ebce.org/reach/

buildings will become cleaner over time and benefits from the lower emissions will continue for decades to come.

An email from another resident supported the efforts to reduce carbon emissions but was concerned with the safety and security of the electrical grid. While PG&E is responsible for maintaining the grid, EBCE also has a vested interest in ensuring electricity is delivered in a safe and reliable manner and is in communication with the California Public Utilities Commission to that end.

Proponents of propane gas are also against all electric buildings. The Western Propane Gas Association suggests that building electrification efforts are "misguided" and that "Propane provides affordable, clean energy for low income communities as well as a vital back-up power…". While staff does not have data on the number of Hayward homes that use propane for uses beyond barbeques, it is typically used in rural areas where natural gas is not available. The Association also asks that Hayward "look to the example that the City of San Luis Obispo is setting with the development of their Reach Codes…". San Luis Obispo included several exemptions in their reach code including "Gas line connections used exclusively for emergency generators." Propane is not widely used as an internally plumbed fuel gas in Hayward's residential buildings. However, propane is commonly used for backyard barbeques and in some cases for backup power generation. As noted above, staff has added language in the draft codes to specifically allow the use of outdoor cooking appliances and backup power generation fueled by a free-standing propane fuel tank.

NEXT STEPS

If Council approves the attached resolution, a second reading of the ordinance will be scheduled for a subsequent meeting. If the ordinance is adopted, the CalGreen Code (regarding EV charging) would be effective in 30 days. The Energy Code reach code would become effective upon approval by the CEC, which is expected to be completed by the end of May 2020. The codes will only apply to new building permits that are submitted after the effective date. Staff will work with EBCE to provide educational materials about the reach codes to contractors, developers, and building designers.

Prepared by: Erik Pearson, Environmental Services Manager

Recommended by: Alex Ameri, Director of Public Works
Laura Simpson, Development Services Director

Approved by:

Kelly McAdoo, City Manager

HAYWARD CITY COUNCIL

RESOLUTION NO. 20-

Introduced by Council Member _____

RESOLUTION FINDING AND DETERMINING THE NEED FOR ADOPTION OF MODIFICATIONS TO THE 2019 CALIFORNIA BUILDING STANDARDS CODE

WHEREAS, in 2014, the City of Hayward adopted the Hayward 2040 General Plan including policies to reduce community and municipal operational emissions by 20% below 2005 baseline levels by 2020, 61.7% by 2040, and 82.5% by 2050; and

WHEREAS, on September 18, 2018, California Governor Jerry Brown signed Executive Order B-55-18, committing California to achieving carbon neutrality no later than 2045, and achieving and maintaining net negative emissions thereafter; and

WHEREAS, the countries that signed the 2015 Paris Agreement vowed to keep warming this century "well below 2°C above pre-industrial levels" and to "pursue efforts to limit the temperature increase even further to 1.5°C."; and

WHEREAS, scientific evidence has established that natural gas combustion, procurement and transportation produce significant greenhouse gas emissions that contribute to global warming and climate change; and

WHEREAS, the electric space heating, water heating, cooking appliances, and clothes drying equipment associated with all-electric, buildings are linked to significantly lower greenhouse gas emissions and reduced costs to build; and

WHEREAS, all-electric building design benefits the health, welfare, and resiliency of the City of Hayward and its residents; and

WHEREAS, the most cost-effective time to integrate electrical infrastructure is in the design phase of a building project because building systems and spaces can be designed to optimize the performance of electrical systems and the project can take full advantage of avoided costs and space requirements from the elimination of natural gas piping and venting for combustion air safety; and

WHEREAS, the City Council Sustainability Committee received reports and presentations on building and vehicle electrification reach codes on July 16, 2018, January 14, 2019, May 13, 2019, September 17, 2019, and October 30, 2019; and

WHEREAS, on October 30, 2019, Hayward's City Council Sustainability Committee recommended adoption the draft reach codes; and

WHEREAS, Public Resources Code Section 25402.l(h)2 and Section 10-106. of the Building Energy Efficiency Standards (Standards) establish a process which allows local adoption of energy standards that are more stringent than the statewide Standards, provided that such local standards are cost effective and the California Energy Commission finds that the standards will require buildings to be designed to consume no more energy than permitted by the California Energy Code; and

WHEREAS, local agencies that adopt energy standards which exceed minimum Building Energy Efficiency Standards must demonstrate that the requirements of the proposed ordinance are cost effective and do not result in buildings consuming more energy than is permitted by Title 24; and

WHEREAS, the California Codes and Standards Reach Code Program, has determined specific modifications to the 2019 State Energy Code for each climate zone that are cost effective; and

WHEREAS, that such modifications will result in designs that consume less energy than they would under the 2019 State Energy Code; and

WHEREAS, based upon these analyses, the City Council of the City of Hayward finds that the local amendments to the California Energy Code contained in this ordinance are cost effective and will require buildings to be designed to consume no more energy than permitted by the California Energy Code; and

WHEREAS, the provisions in this Ordinance are designed to reduce greenhouse gas emissions; increase resource conservation; provide durable and sustainable buildings that are efficient and economical to own and operate; promote the health and productivity of residents, workers, and visitors to the City recognize and conserve the energy and reduce the environmental footprint of new developments; and reduce disturbance of natural ecosystems; and

WHEREAS, adoption of the reach codes as part of the 2019 California Building Standards Code is consistent with and would advance goals and policies contained in the Hayward 2040 General Plan related to climate change, greenhouse gas reductions, and public health and safety; and

WHEREAS, California Health and Safety Code section 17958 requires that cities adopt building regulations that are substantially the same as those adopted by the California Building Standards Commission and contained in the California Building Standards; and

WHEREAS, the California Energy Code is a part of the California Building Standards which implements minimum energy efficiency standards in buildings through mandatory requirements, prescriptive standards, and performances standards; and

WHEREAS, California Health and Safety Code Sections 17958.5, 17958.7 and 18941.5 provide that the City may make changes or modifications to the building standards contained in the California Building Standards based upon express findings that such changes or modifications are reasonably necessary because of local climatic, geological or topographical conditions; and

WHEREAS, the City Council of the City of Hayward finds that each of the amendments, additions and deletions to the California Energy Code contained in this ordinance are reasonably necessary because of local climatic, geological or topographical conditions described in Section 1.

NOW, THEREFORE, BE IT RESOLVED that the aforementioned amendments to the *2019 California Building Standards Code* are based on local climatic, geological, or topographical conditions. The "Findings of Facts" contained herein addresses present local conditions which either singularly or in combination cause the aforementioned amendments to be adopted.

SECTION 1: FINDINGS AND DETERMINATIONS.

The following local climatic conditions justify modifications to the California Building Standards Code.

1. The City of Hayward is already experiencing the repercussions of excessive greenhouse gas emissions including increased temperatures and more extreme weather events,
   decreased precipitation, and increased wildfire risk. From 2012 to 2017, Hayward, like the rest of the State, experienced one of the worst droughts on record.

2. Portions of the City of Hayward are situated along a wildland-urban interface and are extremely vulnerable to wildfires, and human activities releasing greenhouse gases into the atmosphere cause increases in worldwide average temperature, drought conditions, vegetative fuel, and length of fire seasons—all of which contribute to the likelihood and consequences of fire.

3. The City of Hayward's natural gas building infrastructure is a potentially significant source of fire during earthquakes, fire, and other natural disaster events.

4. Marginalized communities in the City of Hayward and worldwide—including people of color, immigrants, indigenous communities, low-income people, those with disabilities, and the unhoused—are already disproportionately affected by climate change and are especially vulnerable to heat events.

5. City of Hayward residents suffer from asthma and other health conditions associated with poor indoor and outdoor air quality exacerbated by greenhouse gas emissions of San Francisco Bay. Both of these faults are considered major Northern California earthquake faults which may experience rupture at any time. Thus, because the City is within a seismic area.

6. Local conditions have a definite impact upon buildings in Hayward. Therefore, it is found to be reasonably necessary that the *2019 California Building Standards Code* be changed or modified to mitigate the effects of the above conditions.

SECTION 2. CEQA Finding.

The City Council finds that this Ordinance is not a project under the requirements of the California Environmental Quality Act, together with related State CEQA Guidelines (collectively, "CEQA") because it has no potential for resulting in a physical change to the environment. In the event that this Ordinance is found to be a project under CEQA, it is subject to the CEQA exemption contained in CEQA Guidelines section 15061(b)(3) because it can be seen with certainty to have no possibility that the action approved may have a significant effect on the environment. CEQA applies only to actions which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. In this circumstance, the proposed action would have no or only a de minimis effect on the environment. The Ordinance is also exempt from CEQA under CEQA Guidelines section 15308, because it is a regulatory action for the protection of the environment. The foregoing determination is made by the City Council in its independent judgment.

SECTION 3. Determination of Cost Effectiveness.

Cost effectiveness studies was prepared for the Statewide Code and Standards Program titled "2019 Cost Effectiveness Study: Low-Rise Residential New Construction" and "2019 Nonresidential New Construction Reach Code Cost Effectiveness Study" ("Studies"). The Studies analyzed the feasibility and cost effectiveness of requiring new construction to be all-electric for 16 different climate zones in California, including climate zone 3, within which the City of Hayward is located. The Studies determined the efficiency standards in this ordinance will meet the Study's cost-effectiveness requirements in climate zone 3. Based on this, the City Council of the City of Hayward hereby determines that the all-electric measures being adopted by the City are cost effective as documented in the Studies**.**

BE IT FURTHER RESOLVED that the City Clerk is hereby directed to cause a copy of this resolution, together with the modifications or changes to the 2019 California Building Code, to be filed with the California Energy Commission.

IN COUNCIL, HAYWARD, CALIFORNIA _____, 2020.

ADOPTED BY THE FOLLOWING VOTE:

AYES: COUNCIL MEMBERS:
MAYOR:

NOES: COUNCIL MEMBERS:

ABSTAIN: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

MAYOR:_____

ATTEST:_____
City Clerk of the City of Hayward

APPROVED AS TO FORM:

_____
City Attorney of the City of Hayward

ORDINANCE NO. 20-____

AN ORDINANCE ESTABLISHING REACH CODES FOR THE CITY OF HAYWARD; AMENDING PART 6 (CALIFORNIA ENERGY CODE) AND PART 11 (CALIFORNIA GREEN BUILDING STANDARDS CODE) OF THE CALIFORNIA BUILDING STANDARDS CODE (TITLE 24 OF THE CALIFORNIA CODE OF REGULATIONS)

THE CITY COUNCIL OF THE CITY OF HAYWARD DOES ORDAIN AS FOLLOWS:

Section 1. In accordance with state law, effective January 1, 2020, Chapter 9 Article 1, the Building Code for the City of Hayward, is hereby amended as follows:

BUILDING CODE
OF THE CITY OF HAYWARD

SECTION 1.00
2019 CALIFORNIA BUILDING STANDARDS CODES, ADOPTION BY REFERENCE.

The *2019 California Energy Code (Part 6 of C.C.R. Title 24) and the 2019 California Green Building Standards Code (Part 11 of C.C.R. Title 24)*, published by the International Code Council, as amended by the State of California pursuant to Health and Safety Code section 17922, and as further modified by the amendments, additions, and deletions as set forth hereinafter, is hereby adopted by reference as the Building Code of the City of Hayward.

A printed copy of such *2019 California Building Codes* together with the State and local amendments thereto, is on file in the office of the building official, to which reference is hereby made for further particulars.

SECTION 2.00
SUMMARY OF LOCAL AMENDMENTS

CODE SECTION	Added to Code	Code Change	Deleted from Code	Notes / Justification
CEC 100.0(i)	X			Energy Reach Code - Purpose and Intent
CEC 100.1(b)		X		Adds definitions
CEC 150.0 (e through s)		X		Modifies mandatory features and devices
CEC 140.0(b)		X		Modifies mandatory measures for nonresidential, high-rise residential and hotel/motel buildings
CEC 140.1		X		Modifies energy budget requirements
CEC 140.2		X		Modifies prescriptive requirements for mixed fuel buildings.
CBC 202		X		Add definitions for EV charging
CBC 4.106.4		X		Modifies EV charging requirements for new construction
CBC 4.106.4.1		X		Modifies EV charging requirements for New one- and two-family dwellings and town- houses
CBC 4.106.4.2		X		Modifies EV charging requirements for New multi-family dwellings
CBC 5.106.5.3		X		Modifies EV charging requirements for new nonresidential buildings

Section 3. Purpose and Intent. It is the purpose and intent of this Ordinance to expressly enact local amendments to Sections 100.0, 100.1, 140.0, 140.1, 150.1, 200, 4.106, and 5.106 of the 2019 California Building Code applicable to new construction to provide standards for new buildings to improve community health and safety while reducing greenhouse gas emissions.

Section 4. Enactment of Local Amendments to The California Building Standards Code, Title 24, Parts 6 and 11 (Amendments to Chapter 9 of the Hayward Municipal Code). The local amendments to Sections 100.0, 100.1, 140.0, 140.1, 150.1, 200, 4.106, and 5.106 of the 2019 California Building Standards Code, Title 24, Parts 6 and 11, are hereby enacted. The local amendments being enacted amend Chapter 9 of the Hayward Municipal Code as follows (additions are shown in double underline and deletions are shown as ~~strikethrough~~). Sections of the California Building Standards Code that are not addressed are not modified.

SECTION 4.00
LOCAL AMENDMENTS TO THE CODE BY CHAPTER

CALIFORNIA BUILDING STANDARDS CODE TITLE 24 PART 6: ENERGY CODE LOCAL AMENDMENTS

Section 100.0 is modified to add a new section (i) as follows:

(i) Energy Reach Code - Purpose and Intent.

In addition to all requirements of the California Energy Code applicable to new construction, the following shall apply:

1. New low-rise residential buildings, other than Free Standing Accessory Dwelling Units that are no greater than 400 square feet, shall be an All-Electric Building as defined in Section 100.1(b).
2. New nonresidential buildings that are designed to utilize mixed-fuel (Fuel Gas in addition to electricity) shall be required to install solar panels on the entire Solar Zone, as defined in Section 110.10, and comply with either the prescriptive requirements of Section 140.2, as amended herein, or have compliance margins, as defined in Section 140.1, that meet or exceed the Standard Design Building by the amounts below:
   A. Office and retail occupancies: 15%
   B. Hotel/Motel and High-Rise Residential occupancies: 10%
   C. All other occupancies in buildings with both indoor lighting and mechanical systems: 10%
   D. All other occupancies in buildings with indoor lighting or mechanical systems but not both: 10%
3. If a Certified Energy Analyst prepares the Nonresidential Certificate of Compliance, the design shall be credited with one (1) percent of compliance margin, to the extent that the resultant energy budget is no greater than the energy budget for the Standard Building Design.

Section 100.1(b) is modified by adding the following definitions:

ALL-ELECTRIC BUILDING is a building that has no Fuel Gas plumbing installed within the building, and that uses electricity as the source of energy for its space heating, water heating, cooking, clothes drying, and fireplace appliances. An All-Electric Building may include solar thermal collectors. An All-Electric Building may include outdoor cooking appliances or backup power generation fueled by a free-standing Fuel Gas tank and which is not plumbed to a building, gas line or gas main. The term "Fuel Gas" shall be as defined in the California Mechanical and Plumbing Codes.

CERTIFIED ENERGY ANALYST is a person registered as a Certified Energy Analyst with the California Association of Building Energy Consultants as of the date of submission of a Certificate of Compliance as required under Section 10-103.

FREE STANDING ACCESSORY DWELLING UNIT is a detached building that is not intended for sale separate from the primary residence, on a lot that is zoned for single family or multifamily use, located on the same lot as an existing dwelling, and does not exceed 1,200 square feet of total floor area.

MIXED-FUEL BUILDING is a building that is plumbed for the use of Fuel Gas as fuel for space heating, water heating, cooking, clothes drying, and/or fireplace appliances.

Low-Rise Residential Buildings

Section 150.0 - Mandatory Features and Devices. Section 150.0 of the 2019 California Energy Code is amended to read as follows:

Low-rise residential buildings shall comply with the applicable requirements of Sections 150(a) through 150(~~r~~s**).**

NOTE: The requirements of Sections 150.0 (a) through (r) apply to newly constructed buildings. Sections 150.2(a) and 150.2(b) specify which requirements of Sections 150.0(a) through 150.0(r) also apply to additions or alterations. The local amendments to Sections 150.0(e), 150.0 (h), 150.0 (n), and 150.0 (s) do not apply to additions or alterations.

EXCEPTION 1 to Section 150.0. The local amendments to Sections 150.0(e), 150.0 (h), 150.0 (n), and 150.0 (s) do not apply to Free Standing ADUs less than 400 square feet.

EXCEPTION 2 to Section 150.0. If an applicant believes circumstances exist that make it infeasible to meet the local amendments to Sections 150.0(e), 150.0 (h), 150.0 (n), and 150.0 (s), the applicant may request an exemption from the Building Official. The applicant must still comply with the mandatory measures of the California Green Building Standards Code and can only receive an exemption from the Hayward amendments to the code. In applying for an exemption, the burden is on the applicant to show infeasibility. An exemption will be granted only in unusual circumstances where, due to exceptional characteristics of the structure, property, or business involved, a literal enforcement of this code will result in practical infeasibility, provided that no such exemption will be contrary to the intent of this code.

Section 150.0(e) Installation of fireplaces. Fireplaces shall be electric, not fueled by Fuel Gas.

Section 150.0(h) Space-conditioning equipment. Space-conditioning equipment shall be electric, not fueled by Fuel Gas.

Section 150.0(n) Water heating system. Water heating systems and equipment shall be electric, not fueled by Fuel Gas.

~~A. A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, within 3 feet from the water heater and accessible to the water heater with no obstructions. In addition, all of the following:~~

~~i. Both ends of the unused conductor shall be labeled with the word "spare" and be electrically isolated; and~~

~~ii. A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above and labeled with the words "Future 240V Use"; and~~

~~B. A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; and~~

C. A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance, and

~~D. A gas supply line with a capacity of at least 200,000 Btu/hr.~~

~~4. Instantaneous water heaters with an input rating greater than 6.8 kBTU/hr (2kW) shall meet the requirements of Section 110.3(c)7.~~

…

Section 150.0 (s) Clothes Drying and Cooking.

1. Clothes Drying. Clothes dryers shall be electric, not fueled by Fuel Gas.
2. Cooking Range. Cooking appliances shall be electric, not fueled by Fuel Gas.

Nonresidential and High-Rise Residential Buildings

Mandatory Measures

SECTION 140.0(b) is modified as follows:

(b) The requirements of Sections 120.0 through 130.5 (mandatory measures for nonresidential, high-rise residential and hotel/motel buildings). and for all newly constructed mixed-fuel buildings:

1. The entire solar zone, as specified in Section 110.10, shall have a solar PV system installed that meets the minimum qualification requirements as specified in Joint Appendix JA11, subject to the exceptions in Section 110.10.

   EXCEPTION 1 to 140.0(b)1. The PV system may be sized to cover less than the entire Solar Zone provided that the system is sized to generate annual electrical output equal to the building's modelled annual electric load.

   EXCEPTION 2 to 140.0(b)1. Newly constructed all-electric buildings.

SECTION 140.1 is modified as follows:

SECTION 140.1 – PERFORMANCE APPROACH: ENERGY BUDGETS
A newly constructed All-Electric Building complies with the performance approach if the energy budget calculated for the Proposed Design Building under Subsection (b) is no greater than the energy budget calculated for the Standard Design Building under Subsection (a).

A newly constructed Mixed-Fuel Building complies with the performance approach if the energy budget calculated for the Proposed Design Building under Subsection (b) has a compliance margin, relative to the energy budget calculated for the Standard Design Building under Subsection (a), of at least the value specified for the corresponding occupancy type in Table 140.1-A below.

Table 140.1-A MIXED-FUEL BUILDING COMPLIANCE MARGINS

Occupancy Type	Compliance Margins
Office/Retail	+15%
Hotel/Motel and High-Rise Residential	+10%
All other occupancies in buildings with both indoor lighting and mechanical systems	+10%
All other occupancies in buildings with indoor lighting or mechanical systems but not both	+5%

(a) Energy Budget for the Standard Design Building. The energy budget for the Standard Design Building is determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, service water heating, and covered process loads.

(b) Energy Budget for the Proposed Design Building. The energy budget for a Proposed Design Building is determined by calculating the TDV energy for the Proposed Design Building. The energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation and service water heating and covered process loads.

(c) Calculation of Energy Budget. The TDV energy for both the Standard Design Building and the Proposed Design Building shall be computed by Compliance Software certified for this use by the Commission. The processes for Compliance Software approval by the Commission are documented in the ACM Approval Manual.

EXCEPTION 1 to Table 140.1-A. For newly constructed buildings, if the Certificate of Compliance is prepared and signed by a Certified Energy Analyst and the energy budget for the Proposed Design is no greater than the Standard Design Building, the required compliance margin is reduced by 1%.

EXCEPTION 2 to Table 140.1-A. If an applicant believes circumstances exist that make it infeasible to meet the requirements of Table 140.1-A, the applicant may request an exemption from the Building Official. The applicant must still comply with the mandatory measures of the California Green Building Code and can only receive an exemption from the Hayward amendments to the code. In applying for an exemption, the burden is on the applicant to show infeasibility. An exemption will be granted only in unusual circumstances where, due to exceptional characteristics of the structure, property, or business involved, a literal enforcement of this code will result in practical infeasibility, provided that no such exemption will be contrary to the intent of this code.

NOTE: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code. Reference: Sections 25007, 25008, 25218.5, 25310, 25402, 25402.1, 25402.4, 25402.5, 25402.8, and 25943, Public Resources Code.

SECTION 140.2 is modified as follows:

To comply using the prescriptive approach, a building shall be designed with and shall have constructed and installed systems and components meeting the applicable requirements of Sections 140.3 through 140.9 and additionally the following measures as applicable intended to exceed the remaining prescriptive requirements:

(a) Mixed-Fuel Buildings of Hotel, Motels or High-Rise Multifamily Occupancies

1. Install fenestration with a solar heat gain coefficient no less than 0.45 in both common spaces and guest rooms.

2. Design Variable Air Volume (VAV) box minimum airflows to be equal to the zone ventilation minimums.
3. Include economizers and staged fan control in air handlers with a mechanical cooling capacity ≥ 33,000 Btu/h.
4. Reduce the lighting power density (Watts/ft2) by ten percent (10%) from that required from Table 140.6-C.
5. In common areas, improve lighting without claiming any Power Adjustment Factor credits:
   A. Control to daylight dimming plus off per Section 140.6(a)2.H; and
   B. Perform Institutional Tuning per Section 140.6(a)2.J
6. Install one drain water heat recovery device per every three guest rooms that is field verified as specified in the Reference Appendix RA3.6.9.

(b) All Other Nonresidential Mixed-Fuel Buildings

1. Install fenestration with a solar heat gain coefficient no greater than 0.22.
2. Limit the fenestration area on east-facing and west-facing walls to one-half of the average amount of north-facing and south-facing fenestration.
3. Design Variable Air Volume (VAV) box minimum airflows to be equal to the zone ventilation minimums where VAV systems are installed.
4. Include economizers and staged fan control in air handlers with a mechanical cooling capacity ≥ 33,000 Btu/h.
5. Reduce the lighting power density (Watts/ft^2) by ten percent (10%) from that required from Table 140.6-C.
6. Improve lighting without claiming any Power Adjustment Factor credits:
   A. Perform Institutional Tuning per Section 140.6(a)2.J, and
   B. In office spaces, control to daylight dimming plus off per Section 140.6(a)2.H, and
   C. Install Occupant Sensing Controls in Large Open Plan Offices per Section 140.6(a)2.I.

CALIFORNIA BUILDING CODE TITLE 24 PART 11: GREEN BUILDING STANDARDS LOCAL AMENDMENTS

Section 202 - Definitions:

EV Capable: A parking space linked to a listed electrical panel with sufficient capacity to provide at least 208/240 volts and 40 amperes to the parking space. Raceways linking the electrical panel and parking space only need to be installed in spaces that will be inaccessible in the future, either trenched underground or where penetrations to walls, floors, or other partitions would otherwise be required for future installation of branch circuits. Raceways must be at least 1" in diameter and may be sized for multiple circuits as allowed by the California Electrical Code. The panel circuit directory shall identify the overcurrent protective device space(s) reserved for EV charging as "EV CAPABLE." Construction documents shall indicate future completion of raceway from the panel to the parking space, via the installed inaccessible raceways.

Level 1 EV Ready Space: A parking space served by a complete electric circuit with a minimum of 110/120 volt, 20-ampere capacity including electrical panel capacity, overprotection device, a minimum 1" diameter raceway that may include multiple circuits as allowed by the California Electrical Code, wiring, and either a) a receptacle labelled "Electric Vehicle Outlet" with at least a ½" font adjacent to the parking space, or b) electric vehicle supply equipment (EVSE).

Level 2 EV Ready Space: A parking space served by a complete electric circuit with 208/240 volt, 40-ampere capacity including electrical panel capacity, overprotection device, a minimum 1" diameter raceway that may include multiple circuits as allowed by the California Electrical Code, wiring, and either a) a receptacle labelled "Electric Vehicle Outlet" with at least a ½" font adjacent to the parking space, or b) electric vehicle supply equipment (EVSE) with a minimum output of 30 amperes.

Electric Vehicle Charging Station (EVCS): A parking space that includes installation of electric vehicle supply equipment (EVSE) with a minimum capacity of 30 amperes connected to a Level 2 EV Ready Space. EVCS installation may be used to satisfy a Level 2 EV Ready Space requirement.

Automatic Load Management Systems (ALMS): (ALMS) A control system which allows multiple EV chargers or EV-Ready electric vehicle outlets to share a circuit or panel and automatically reduce power at each charger, providing the opportunity to reduce electrical infrastructure costs and/or provide demand response capability. ALMS systems must be designed to deliver at least 1.4kW per charger to each EV Capable, EV Ready, or EVCS space served by ALMS. The connected amperage on-site shall not be lower than the required connected amperage per Part 11, 2019 California Green Building Code for the relevant building types.

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SECTION 4
RESIDENTIAL MANDATORY MEASURES

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Sections 4.106.4.1 and 4.106.4.2 to facilitate future installation and use of EV chargers. ~~Electric vehicle supply equipment (EVSE) shall be installed in accordance with the California Electrical Code, Article 625.~~

Exceptions:

1. ~~On a case-by-case basis, where the local enforcing agency has determined EV charging and infra- structure are not feasible based upon one or more of the following conditions:~~
   Where there is no commercial power supply.

   ~~1.1. Where there is evidence substantiating that meeting the requirements will alter the local utility infra- structure design requirements on the utility side of the meter so as to increase the utility side cost to the homeowner or the developer by more than $400.00 per dwelling unit.~~
2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities, unless the electrical panel is upgraded, or a new panel is installed in which case only the electrical capacity requirements apply.
   3. Spaces accessible only by automated mechanical car parking systems are excepted from providing EV charging infrastructure.
4.

4.106.4.1 New one- and two-family dwellings and town- houses with attached private garages.
For each dwelling unit, install two Level 2 EV Ready Spaces ~~a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV char- ger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.~~

Exception: For each dwelling unit with only one parking space, install a Level 2 EV Ready Space.

4.106.4.1.1 Identification. ~~The service panel or sub- panel circuit directory shall identify the overcurrent protective device space(s) reserved for future~~

~~EV charging as "Level 2 EV CAPABLE".~~ The raceway termination location shall be permanently and visibly marked as ~~"EV CAPABLE".~~ "Level 2 EV Ready Space".

4.106.4.2 New multifamily dwellings. ~~If residential parking is available, ten (10) present in total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future EVSE. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number.~~ The following requirements apply to all new multifamily dwellings:

1. For multifamily buildings with less than or equal to 20 dwelling units, one parking space per dwelling unit with parking shall be provided with a Level 2 EV Ready Space.

2. When more than 20 multifamily dwelling units are constructed on a building site~~, provided for all types~~:

    a. 75% of the dwelling units with parking ~~facilities,~~ space(s) shall be provided with at least one Level 2 EV Ready Space ~~spaces) capable of supporting future EVSE~~. Calculations for the required minimum number of Level 2 EV Ready spaces shall be rounded up to the nearest whole number.

    b. In addition, each remaining dwelling unit with parking space(s) shall be provided with at least a Level 2 EV Capable Circuit.

Notes:

~~1. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.~~
~~2. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.~~

1. ALMS may be installed to decrease electrical service and transformer costs associated with EV Charging Equipment subject to review of the authority having jurisdiction.
2. The requirements apply to multifamily buildings with parking spaces including: a) assigned or leased to individual dwelling units, and b) unassigned residential parking.
3. In order to adhere to accessibility requirements in accordance with California Building Code Chapters 11A and/or 11B, it is recommended that all accessible parking spaces for covered newly constructed multifamily dwellings are provided with Level 2 EV Ready Spaces.

4. If a building permit applicant provides documentation detailing that the increased cost of utility service or on-site transformer capacity would exceed an average of $4,500 among parking spaces with Level 2 EV Ready Spaces, the applicant shall provide EV infrastructure up to a level that would not exceed this cost for utility service or on-site transformer capacity.

4.106.4.2.2 Electric vehicle charging space (EV space) dimensions. Refer to local authority having jurisdiction for parking dimension requirements. ~~The EV spaces shall be designed to comply with the following:~~

~~1. The minimum length of each EV space shall be 18 feet (5486 mm).~~

~~2. The minimum width of each EV space shall be 9 feet (2743 mm).~~

~~3. One in every 25 EV spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet (3658 mm).~~

~~1. Surface slope for this EV space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction.~~

~~**4.106.4.2.3 Single EV space required.** Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV spaces. Construction documents shall identify the raceway termination point. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit over- current protective device.~~

~~**4.106.4.2.4 Multiple EV spaces required**. Construction raceway termination point and proposed location of future EV spaces and EV chargers Construction documents shall also pro- vide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. Plan design shall be based upon a 40-ampere minimum branch circuit. Raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.~~

~~**4.106.4.2.5 Identification.** The service panel or sub- panel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.~~

SECTION 5
NONRESIDENTIAL MANDATORY MEASURES

5.106.5.3 Electric vehicle (EV) charging. ~~[N]~~ New construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 to facilitate future installation and use of EV chargers ~~of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code,* the *California Electrical Code* and as follows:~~

Exception: Where there is no commercial power supply.

5.106.5.3.1 Office buildings: In nonresidential new construction buildings designated primarily for office use:

1. When 10 or more parking spaces are constructed, 20% of the available parking spaces on site shall be equipped with Level 2 EVCS;
2. An additional 30% shall be at least Level 2 EV Capable.

Calculations for the required minimum number of spaces equipped with Level 2 EVCS, Level 2 EV Ready spaces and EV Capable spaces shall all be rounded up to the nearest whole number.

Construction plans and specifications shall demonstrate that all raceways shall be a minimum of 1" and sufficient for installation of EVCS at all required Level 2 EV Ready and EV Capable spaces; Electrical calculations shall substantiate the design of the electrical system to include the rating of equipment and any on-site distribution transformers, and have sufficient capacity to simultaneously charge EVs at all required EV spaces including Level 2 V Ready and EV Capable spaces; and service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

Notes:

1. ALMS may be installed to increase the number of EV chargers or the amperage or voltage beyond the minimum requirements in this code. The option does not allow for installing less electrical panel capacity than would be required without ALMS.

5.106.5.3.2 Other nonresidential buildings: In nonresidential new construction buildings that are not designated primarily for office use, such as retail or institutional uses:

1. When 10 or more parking spaces are constructed, 15% of the available parking spaces on site shall be equipped with Level 2 EVCS;

   Calculations for the required minimum number of spaces equipped with Level 2 EV Ready spaces shall be rounded up to the nearest whole number

Exception: Installation of each Direct Current Fast Charger with the capacity to provide at least 80 kW output may substitute for 15 EV Ready spaces after a minimum of 15 Level 2 EV Ready spaces are installed.

5.106.5.3.3 Clean Air Vehicle Parking Designation. EVCS qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.

Notes:

1. The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices (California MUTCD) to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives number 13-01. www.dot.ca.gov/hq/traffops/policy/13-01.pdf.
2. See Vehicle Code Section 22511 for EV charging spaces signage in off-street parking facilities and for use of EV charging spaces.
3. The Governor's Office of Planning and Research published a Zero-Emission Vehicle Community Readiness Guidebook which provides helpful information for local governments, residents and businesses. www.opr.ca.gov/ docs/ZEV_Guidebook.pdf.
4. Section 11B-812 of the California Building Code requires that a facility providing EVCS for public and common use also provide one or more accessible EVCS as specified in Table 11B-228.3.2.1.
5. If a building permit applicant provides documentation detailing that the increased cost of utility service or on-site transformer capacity would exceed an average of $4,500 among parking spaces with Level 2 EV Ready Spaces, the applicant shall provide EV infrastructure up to a level that would not exceed this cost for utility service or on-site transformer capacity.

~~**5.106.5.3.1 Single charging space requirements. [**N] When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed at the time of construction and shall be installed in accordance with the California Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:~~

~~1. The type and location of the EVSE.~~
~~2. A listed raceway capable of accommodating a 208/240-volt dedicated branch circuit.~~
~~3. The raceway shall not be less than trade size 1."~~

4. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure or equivalent.
5. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40- ampere dedicated branch circuit for the future installation of the EVSE.

5.106.5.3.2 Multiple charging space requirements.
When multiple charging spaces are required per Table 5.106.5.3.3 raceway(s) is/are required to be installed at the time of construction and shall be installed in accordance with the California Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. The raceway(s) shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.
3. Plan design shall be based upon 40-ampere mini- mum branch circuits.
4. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution
5. transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.
6. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

5.106.5.3.3 EV charging space calculation. [N] Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.
Exceptions: On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

1. Where there is insufficient electrical supply
2. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

~~TABLE 5.106.5.3.3~~

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CHARGING SPACES
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201 and over	6 percent of total[1]

~~1. Calculation for spaces shall be rounded up to the nearest whole number.~~

5.106.5.3.4 [N] Identification. ~~The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as "EV CAPABLE".~~ The raceway termination location shall be permanently and visibly marked as "EV ~~CAPABLE~~ Ready".

~~**5.106.5.3.5 [N]** Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.~~

SECTION 5. Severability. The provisions of this Ordinance are severable, and if any clause, sentence, paragraph, provision, or part of this Ordinance, or the application of this Ordinance to any person, is held to be invalid or preempted by state or federal law, such holding shall not impair or invalidate the remainder of this Ordinance. If any provision of this Ordinance is held to be inapplicable, the provisions of this Ordinance shall nonetheless continue to apply with respect to all other covered development projects and applicants. It is hereby declared to be the legislative intent of the City Council that this Ordinance would have been adopted had such provisions not been included or such persons or circumstances been expressly excluded from its coverage.

INTRODUCED at a regular meeting of the City Council of the City of Hayward, held the 3rd day of March, 2020, by Council Member _____.

ADOPTED at a regular meeting of the City Council of the City of Hayward held the 17th day of March, 2020, by the following votes of members of said City Council.

AYES: COUNCIL MEMBERS:
MAYOR:

NOES: COUNCIL MEMBERS:

ABSTAIN: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

APPROVED: _____
Mayor of the City of Hayward

DATE: _____

ATTEST: _____
City Clerk of the City of Hayward

APPROVED AS TO FORM:

_____
City Attorney of the City of Hayward

Greenhouse Gas, Energy and Cost Savings

The California Statewide Codes and Standards Program led the development of a cost-effectiveness study[1] for Energy Code reach codes that examined different performance-based approaches for new construction of low-rise residential (single-family and multi-family up to 3 stories) and non-residential building types. The study finds that all-electric buildings, even those with no other energy performance enhancements, provide significant greenhouse gas (GHG) reductions. The addition of energy efficiency and more solar can drive net energy use to nearly zero from some building types and GHG emissions to less than a third of a mixed-fuel 2019 State code compliant building.

The charts below compare total GHG emissions and net energy consumption (after onsite generation) of various strategies for typical building types.

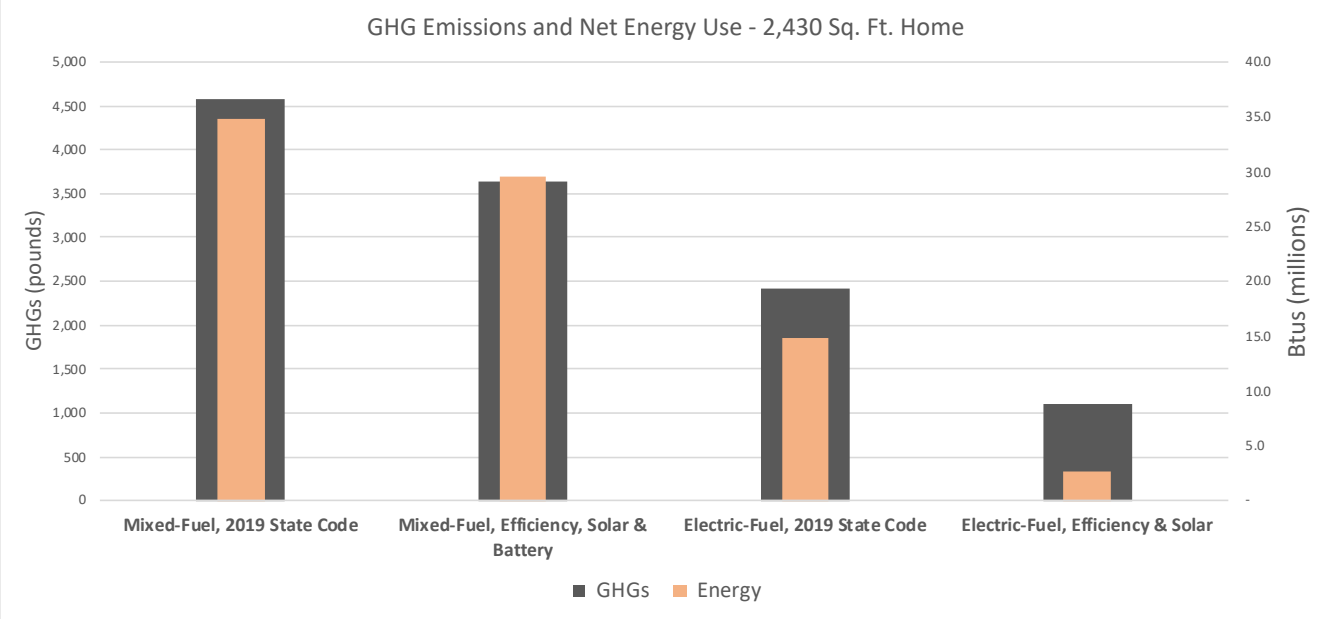


Figure 1: GHG and Energy Impact, Single Family Home

[1] https://localenergycodes.com/content/2019-local-energy-ordinances/

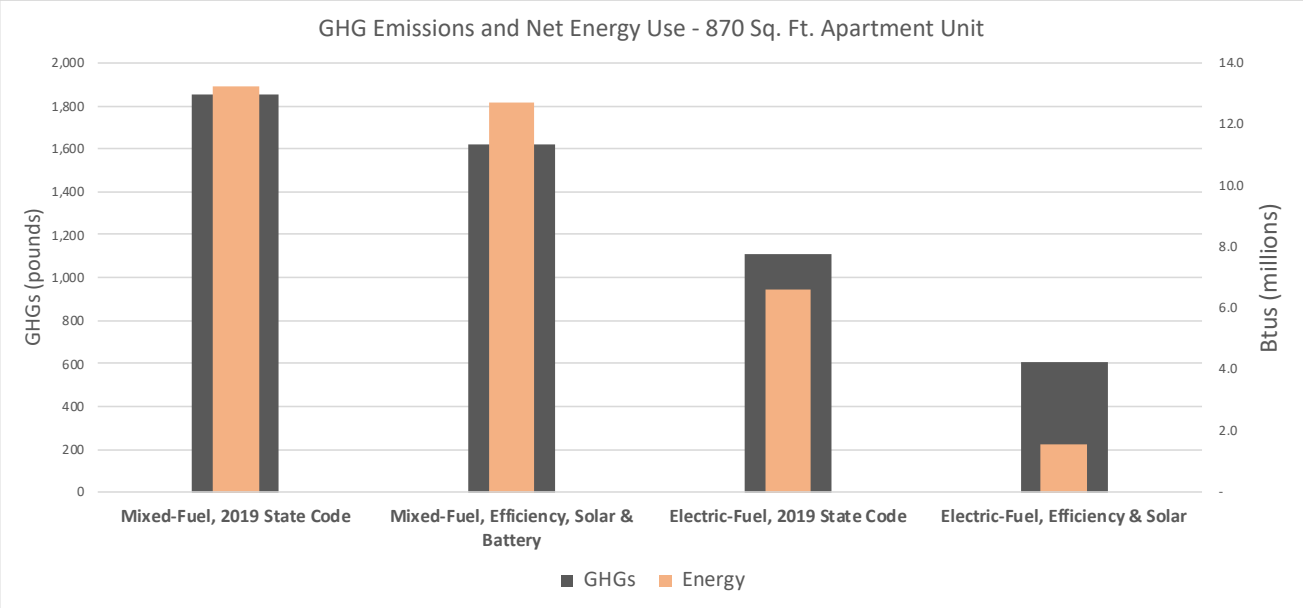


Figure 2: GHG and Energy Impacts, Low-Rise Multifamily Unit

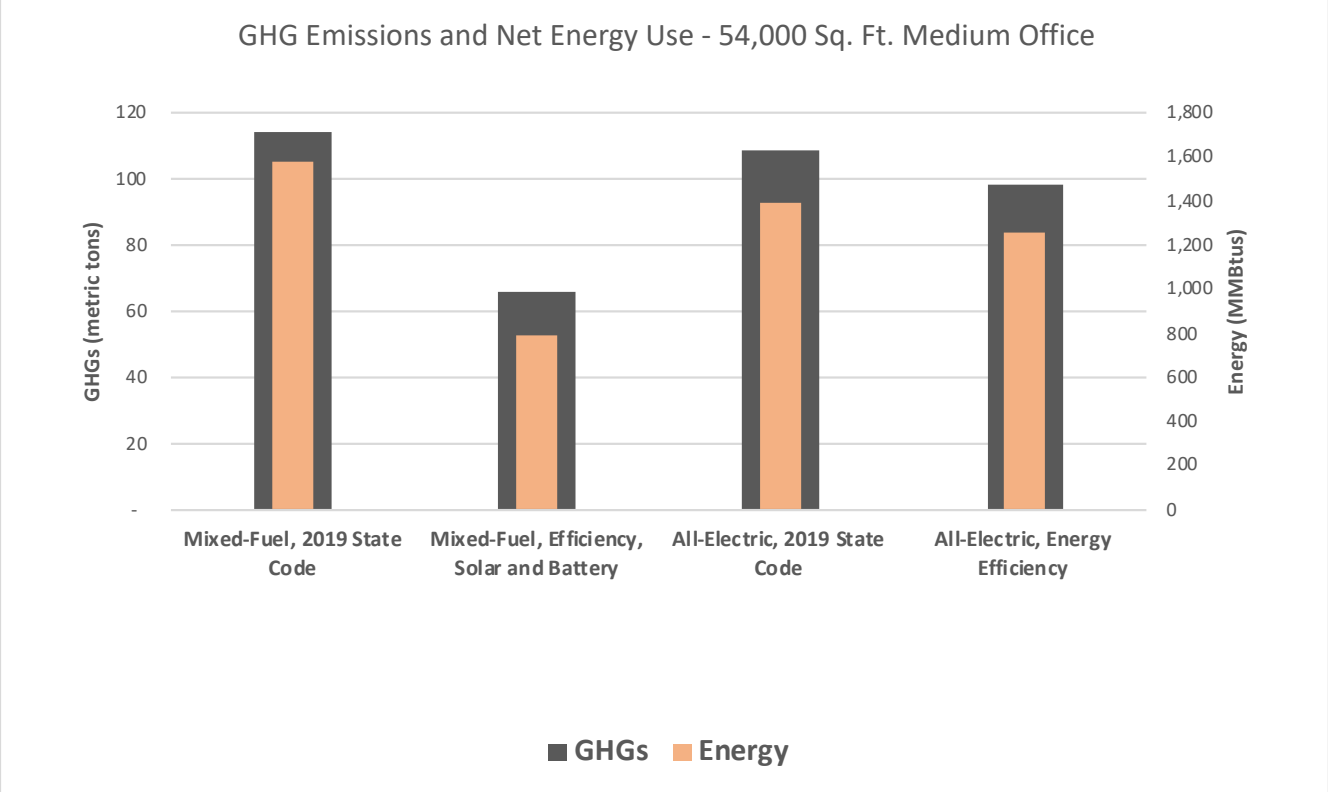


Figure 3: GHG and Energy Impact, Medium Office Building

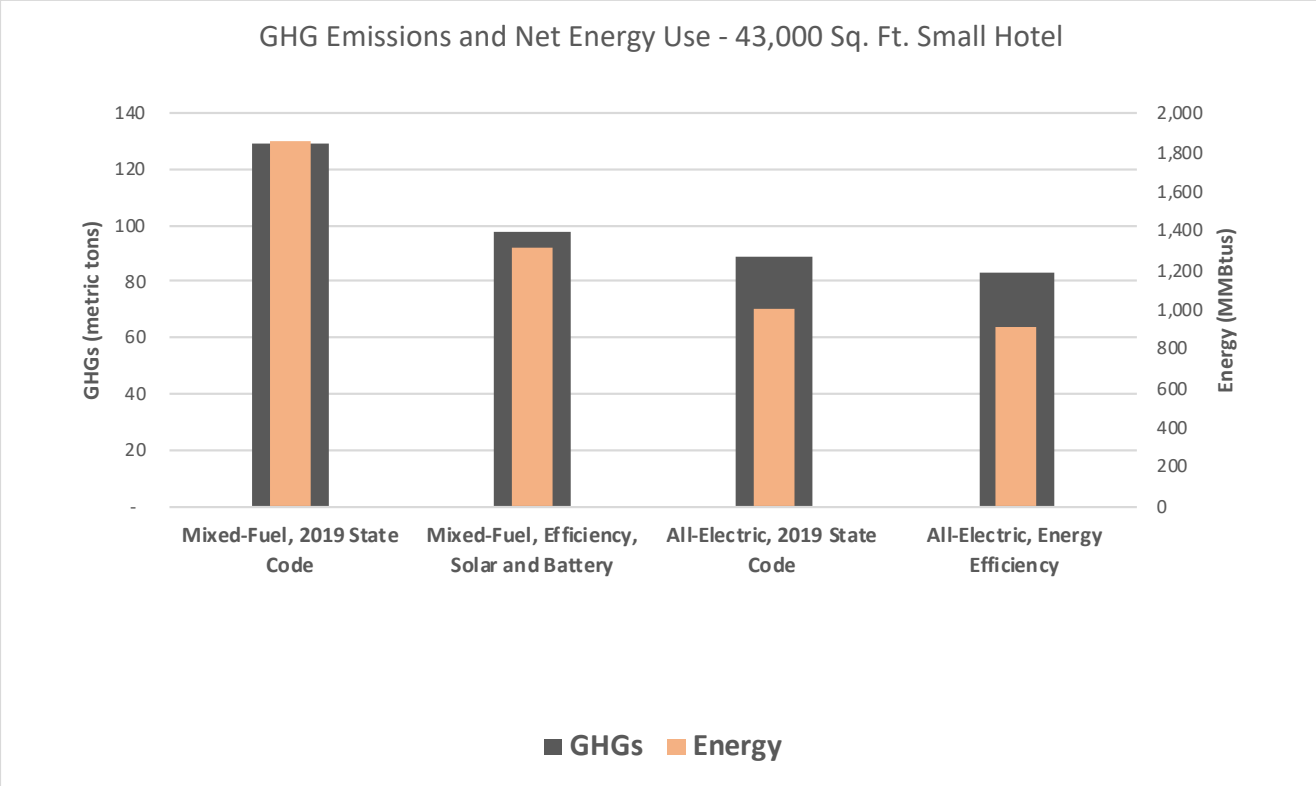


Figure 4: GHG and Energy Impact Small Hotel

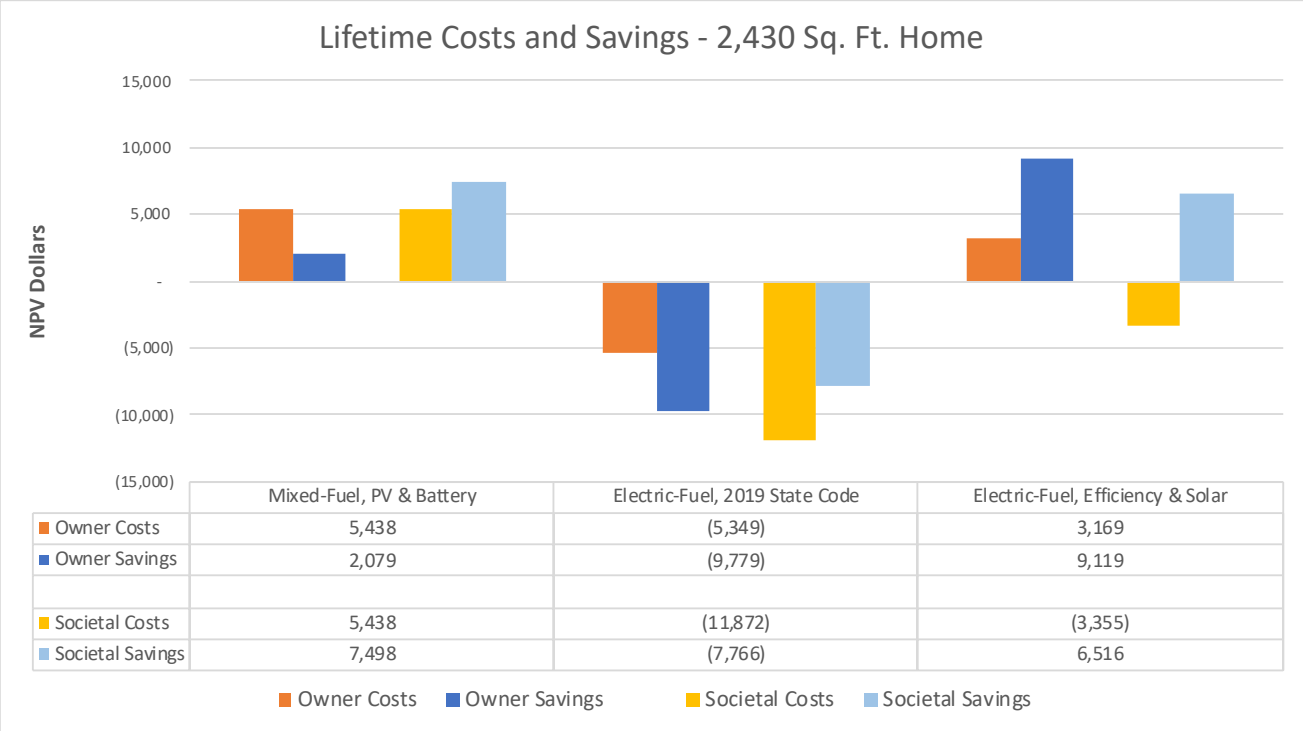
Economic Impacts

All-electric buildings are generally cheaper to build due to the elimination of running gas plumbing to the building. These lower first costs generally make all-electric construction more cost-effective on a life-cycle basis. This is particularly true for low-rise residential buildings, where it is also often increasingly more cost-effective for the owner to exceed the code by improving efficiency and adding solar. In fact, if one invests the savings from the gas infrastructure in additional PV capacity to offset more of the electricity load, in many cases the building is cost-effective for the owner and society from day one, meaning the building is both less expensive to build and cheaper to operate. This is shown as the "Neutral Cost" scenario in row 13 of Figure 6 below.

The charts below depict the incremental net present value costs and savings of various designs relative to a State-code-complaint mixed-fuel design. Note, each building type is examined from two perspectives: one from the owners/operator's point of view; the other from society's point of view[2]. The latter reflects benefits that accrue to other ratepayers and society.

[2] The societal point of view incorporates the time-dependent valuation (TDV) of energy, which is required by the CEC when determining cost-effectiveness.

In the following charts, Cost values less than zero indicate lower capital cost. Savings values less than zero indicate higher energy costs. "Mixed-Fuel, PV & Batter" corresponds with row 5 in the table; "Electric-Fuel, 2019 State Code" corresponds with row 11; and "Electric-Fuel, Efficiency & Solar" corresponds with row 12.

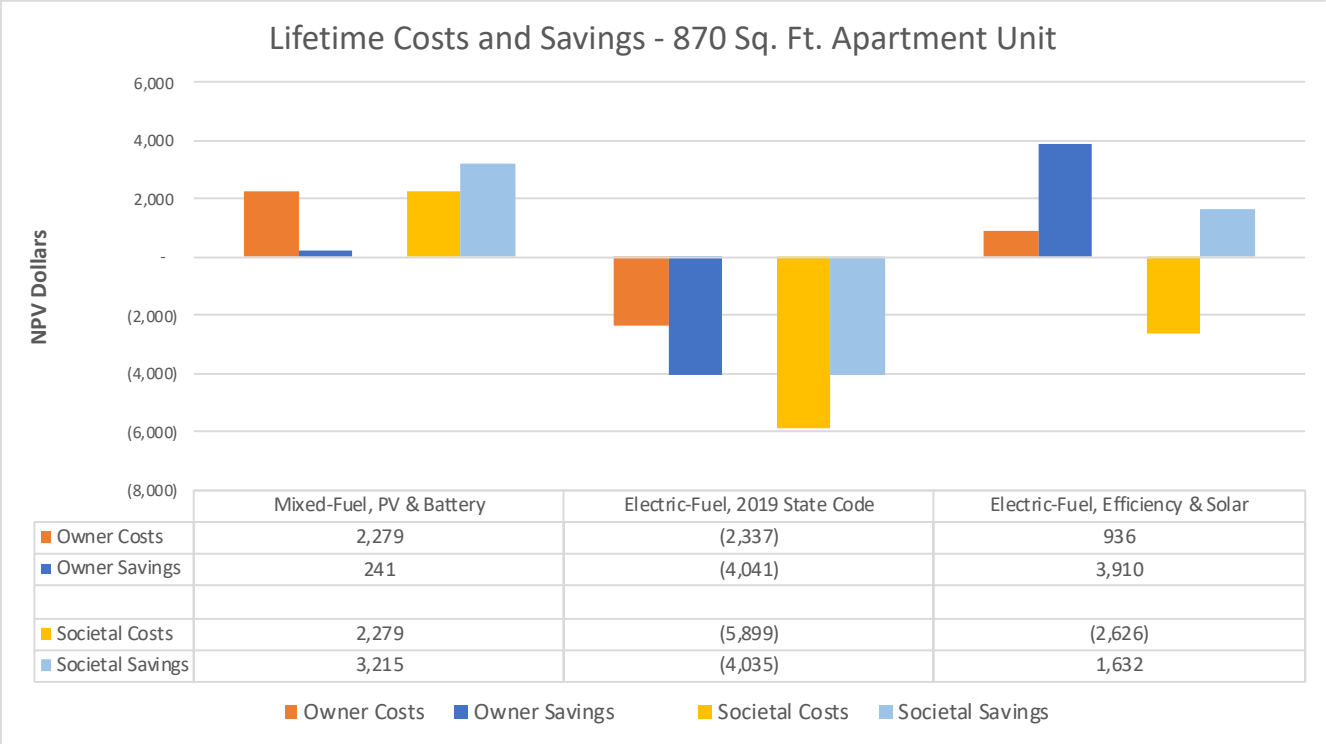


	Mixed-Fuel, PV & Battery	Electric-Fuel, 2019 State Code	Electric-Fuel, Efficiency & Solar
Owner Costs	5,438	(5,349)	3,169
Owner Savings	2,079	(9,779)	9,119
Societal Costs	5,438	(11,872)	(3,355)
Societal Savings	7,498	(7,766)	6,516

Figure 5: Costs and Benefits - Single-Family Home

	Climate Zone 3 PG&E Single Family		Annual Net kWh	Annual therms	EDR Margin[4]	PV Size Change (kW)[5]	CO2-Equivalent Emissions (lbs/sf)		NPV of Lifetime Incremental Cost ($)	Benefit to Cost Ratio (B/C)	
							Total	Reduction		On-Bill	TDV
2	Mixed Fuel[1]	Code Compliant	(0)	348	n/a	n/a	1.88	n/a	n/a	n/a	n/a
3		Efficiency-Non-Preempted	(0)	296	2.5	(0.03)	1.63	0.26	$1,552	1.28	1.31
4		Efficiency-Equipment	(0)	273	4.0	(0.03)	1.52	0.37	$1,448	1.91	1.97
5		Efficiency & PV/Battery	(20)	296	10.0	0.07	1.50	0.38	$5,438	0.38	1.38
6	All-Electric[2]	Code Compliant	4,355	0	n/a	n/a	1.00	n/a	n/a	n/a	n/a
7		Efficiency-Non-Preempted	3,584	0	4.5	0.00	0.85	0.15	$1,519	2.60	2.36
8		Efficiency-Equipment	3,670	0	4.0	0.00	0.86	0.14	$2,108	1.76	1.62
9		Efficiency & PV	790	0	18.0	1.77	0.46	0.54	$8,517	2.22	1.68
10		Efficiency & PV/Battery	(12)	0	29.0	2.37	0.23	0.76	$14,380	1.50	1.58
11	Mixed Fuel to All-Electric[3]	Code Compliant	4,355	0	0.0	0.00	1.00	0.89	($5,349)	0.55	1.53
12		Efficiency & PV	790	0	18.0	1.77	0.46	1.43	$3,169	2.88	>1
13		Neutral Cost	2,217	0	10.5	1.35	0.70	1.18	$0	>1	>1

Figure 6: Benefit to Cost Ratios - Single-Family Home



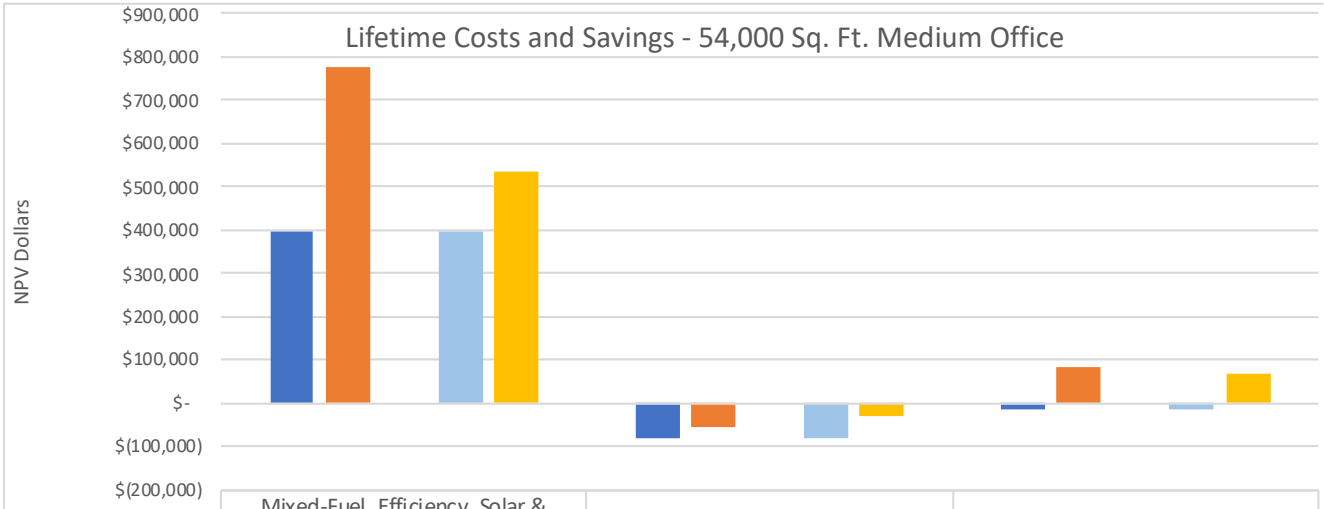
	Mixed-Fuel, PV & Battery	Electric-Fuel, 2019 State Code	Electric-Fuel, Efficiency & Solar
Owner Costs	2,279	(2,337)	936
Owner Savings	241	(4,041)	3,910
Societal Costs	2,279	(5,899)	(2,626)
Societal Savings	3,215	(4,035)	1,632

Figure 7 Costs and Benefits - Low-Rise Multifamily Unit

	Climate Zone 3 PG&E Multifamily		Annual Net kWh	Annual therms	EDR Margin[4]	PV Size Change (kW)[5]	CO2-Equivalent Emissions (lbs/sf)		NPV of Lifetime Incremental Cost ($)	Benefit to Cost Ratio (B/C)	
							Total	Reduction		On-Bill	TDV
2	Mixed Fuel[1]	Code Compliant	(0)	133	n/a	n/a	2.13	n/a	n/a	n/a	n/a
3		Efficiency-Non-Preempted	(0)	127	0.5	(0.00)	2.06	0.07	$175	1.00	1.11
4		Efficiency-Equipment	(0)	119	1.5	(0.00)	1.94	0.19	$403	1.11	1.23
5		Efficiency & PV/Battery	(10)	127	10.0	0.05	1.86	0.27	$2,279	0.11	1.41
6	All-Electric[2]	Code Compliant	1,944	0	n/a	n/a	1.27	n/a	n/a	n/a	n/a
7		Efficiency-Non-Preempted	1,944	0	0.0	0.00	1.27	0.00	$0	-	-
8		Efficiency-Equipment	1,698	0	2.5	0.00	1.13	0.14	$795	1.73	1.58
9		Efficiency & PV	457	0	16.0	0.92	0.69	0.58	$3,272	2.43	1.73
10		Efficiency & PV/Battery	(7)	0	29.5	1.26	0.33	0.94	$6,344	1.32	1.64
11	Mixed Fuel to All-Electric[3]	Code Compliant	1,944	0	0.0	0.00	1.27	0.86	($2,337)	0.58	1.46
12		Efficiency & PV	57	0	16.0	0.92	0.69	1.43	$936	4.18	>1
13		Neutral Cost	845	0	11.5	0.70	0.85	1.28	$0	>1	>1

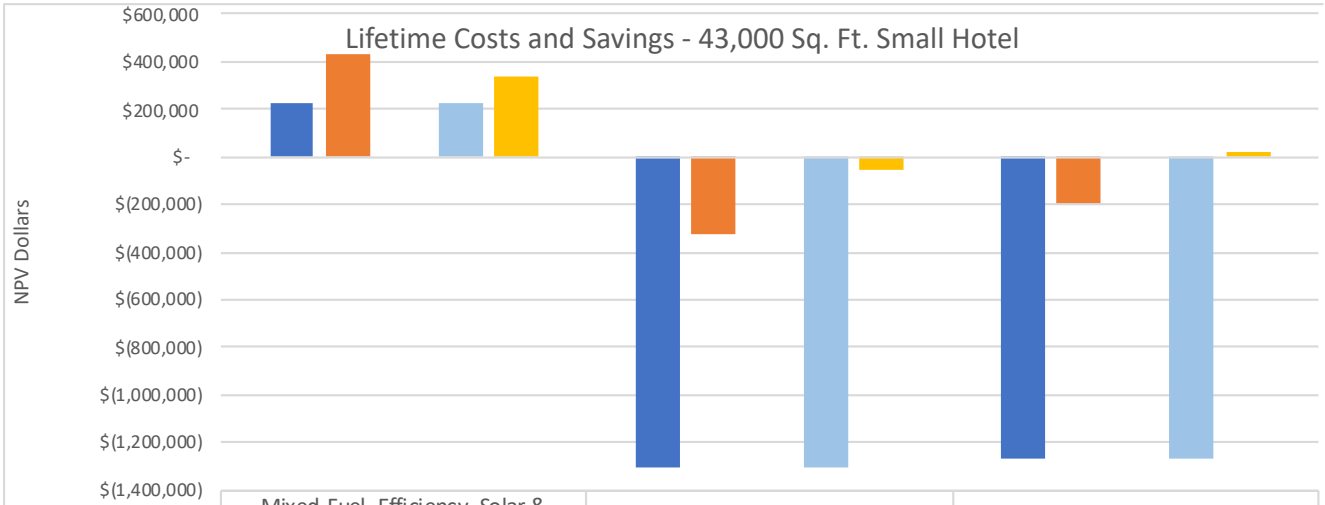
[1]All reductions and incremental costs relative to the **mixed fuel** code compliant home.
[2]All reductions and incremental costs relative to the **all-electric** code compliant home.
[3]All reductions and incremental costs relative to the **mixed fuel** code compliant home except the EDR Margins are relative to the Standard Design for each case which is the **all-electric** code compliant home. Incremental costs for these packages reflect the cots used in the On-Bill cost effectiveness methodology. Costs differ for the TDV methodology due to differences in the site gas infrastructure costs (see Section 2.6).
[4]This represents the Efficiency EDR Margin for the Efficiency-Non-Preempted and Efficiency-Equipment packages and Total EDR Margin for the Efficiency & PV, Efficiency & PV/Battery, and Neutral Cost packages.
[5]Positive values indicate an increase in PV capacity relative to the Standard Design.

Figure 8 Benefit to Cost Ratios - Low-Rise Multifamily Unit



	Mixed-Fuel, Efficiency, Solar & Battery	All-Electric, 2019 State Code	All-Electric, Energy Efficiency
Owner Costs	$397,405	$(82,330)	$(15,681)
Owner Savings	$777,156	$(57,345)	$85,241
Societal Costs	$397,405	$(82,330)	$(15,681)
Sociatel Savings	$536,330	$(29,592)	$68,682

Figure 9: Costs and Benefits - Medium Office



	Mixed-Fuel, Efficiency, Solar & Battery	All-Electric, 2019 State Code	All-Electric, Energy Efficiency
Owner Costs	$228,341	$(1,300,029)	$(1,267,509)
Owner Savings	$430,737	$(326,633)	$(198,234)
Societal Costs	$228,341	$(1,300,029)	$(1,267,509)
Sociatel Savings	$335,758	$(51,166)	$20,729

Figure 10: Costs and Benefits - Small Hotel

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OPINION | REVIEW & OUTLOOK

A Green Rule Boomerang

California cities are violating environmental laws to ban natural gas.

By The Editorial Board
Dec. 23, 2019 7:26 pm ET

Liberals use California's stringent environmental regulations to block new oil and gas pipelines and electric power plants. So it's no small irony that businesses are now invoking the same rules to block local bans on new natural gas hookups.

Earlier this year the city of Berkeley prohibited natural gas connections in nearly all new buildings, while Windsor in Sonoma County banned natural gas in new low-rise residential buildings. Liberal groups are urging other cities to do the same, though switching to electric appliances would cost about $7,200 and increase energy bills by an average $388 per year.

PHOTO: GETTY IMAGES

It also creates conundrums for businesses. The California Restaurant Association notes in a lawsuit against Berkeley's natural-gas ban that "losing natural gas will slow down the process of cooking, reduce a chef's control over the amount and intensity of heat, and affect the manner and flavor of food preparation."

The restaurant group claims that the Berkeley City Council circumvented a state law requiring cities to obtain approval from the California Energy Commission for energy-efficiency standards more stringent than the state's. The law requires cities to submit their findings on the "cost effectiveness" of their proposed standards, but that's hard to show given how much more expensive electric appliances are.

Separately, Sonoma County developers are challenging Windsor's ban under the California Environmental Quality Act, which requires an environmental impact report including notice and comment for almost any local government action. Windsor simply declared its natural-gas ban exempt from the law because it is "more protective of the environment than State Standards"—end of discussion.

But as one developer argues, Windsor failed to consider "whether the existing electrical grid is sufficient to satisfy the demand of all new construction under a 100% electricity standard," which the state has mandated for 2045. And if new homes can't use natural-gas for their backyard barbecues, fireplaces or generators, might they use more carbon-intensive fuels like gasoline, wood or charcoal? And might those fuel sources increase the risk of forest fires?

Attachment V

Progressive cities can't flout state environmental regulations merely because they are advancing an anti-carbon agenda.

City sued over reach code

sonomawest.com/the_windsor_times/news/city-sued-over-reach-code/article_84556d94-1d16-11ea-9ed7-

By Heather Bailey, Times Editor,
heather@sonomawest.com

December 12, 2019

Two developers filed suit claiming violation of CEQA in plan to reduce town's greenhouse gas emissions

A pair of lawsuits filed in the wake of Windsor passing an all-electric reach code has brought the conflict between housing needs and the future of energy use and the climate crisis into to stark relief.

The lawsuit was not unexpected, when the council passed the code 4-0-1 (Bruce Okrepkie abstained) and was remarked on in the Oct. 16 meeting where the code was passed.

"We know we're under the threat of litigation, at least," Councilmember Sam Salmon said in that meeting. "I know that it very well may be adopted, and a lawsuit filed and we may revoke it. But, the key here is to proceed and let the public know what we're up against in terms of climate protection.

I hope the public understands that even if it doesn't stay, this will make the public more aware of the fight to save this planet."

Throughout, there had been veiled threats from developers during the public process that such an action was coming.

"The filing of the lawsuits is not surprising, particularly given that Windsor was the first in the county to adopt an all-electric code," said Town Manager Ken MacNab. "The issues raised in the lawsuits generally follow the issues raised in communications received from the

plaintiffs during the adoption process and were anticipated."

On Nov. 19, Bill Gallaher filed a suit in Sonoma County Superior Court against both the Town of Windsor and the town council. Gallaher is a prominent local developer who has projects in Windsor. He was also present during public comment at the council meetings and warned of this outcome.

The 17-page lawsuit claims the passing of the reach code was a violation of the California Environmental Quality Act (CEQA) process of the code, and argues that a faulty study was used as the basis for the benefits of the code and the exemption from the CEQA process. The suits claim a full environmental impact report and review under CEQA is the only way to legally change the building code.

In a letter dated Sept. 18, Matthew C. Henderson, a lawyer representing Gallaher stated, "I want to emphasize that climate change is real and the goal of reducing greenhouse gas emissions in is a laudable one. However, the law of unintended consequences applies to even the best-intended legislation . . . Without meaningful environmental review under CEQA, neither the town or the public is in a position to understand the trade-offs this ordinance may entail. A half-baked "net-benefit" analysis is legally insufficient. Accordingly, an environmental impact report must be prepared and certified before the town may lawfully adopt the ordinance."

At an Oct. 16 council meeting, then-vice mayor Deborah Fudge said, "It's really sad to me when I see CEQA misused. It's sad to me when I see a local developer using it to try to subvert something good for the environment. We are in a climate emergency. There is no more time to talk. We may already be too late. We must do all of it, everything, and be at net zero by 2050. We have to start now; we know that, even those who fight it, know it. It's precedent setting, and that's why the threat is thrown at us. It's a scare tactic. To me it feels like a bully tactic."

On Nov. 22, Windsor-Jensen Land Co. LLC, the developer planning to build 200 new homes along Jensen Lane (a project that has its own controversies), filed a second lawsuit citing similar issues.

"The next steps are for the town council to consider how they would like to proceed in response to the lawsuits," MacNab said. Several closed-door-session meetings about the litigation have already occurred since the filing.

Both lawsuits make reference to fire-related issues, as well as the uncertainty of public safety power shutoffs as reason not to rely on electric. However, PG&E, the company responsible for delivering both natural gas and electric to Windsor, has provided a letter of support for the code to Windsor.

In public meetings, developers have said that anything which is a hindrance to development

and home sales is problematic, due to the significant housing shortage in California. However, the town's response has been to be equally concerned about the climate crisis and how Windsor can do its part to help meet greenhouse gas reduction goals.

"Our main concern is about plaintiffs who do not appear interested in supporting the town council's effort to take a small step towards addressing the environmental impacts of climate change," said MacNab.

Though the town is confident in the legal basis for its code change, MacNab acknowledges that lawsuits are always problematic.

"We are confident that the ordinance is consistent with local policies and state mandates to reduce greenhouse gas emissions and that the process we used in adopting the ordinance was correct," he said. "But, the length of time needed to resolve any case where there is uncertainty or complexity is difficult to assess. A trial could take months to complete — possibly longer."

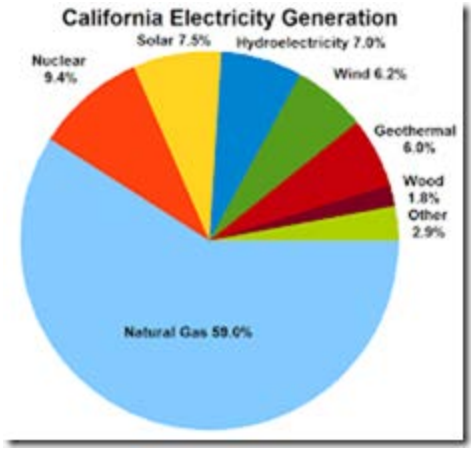
The lawsuit is not predicted to impact the adoption of the code, though it could ultimately cause it to be rescinded should the plaintiffs win. However, there is still a process that may impact the adoption date for the code.

"Currently we anticipate that the reach code will take effect Jan. 1, 2020," MacNab said. "This presumes that the California Energy Commission reviews and approves the code language beforehand. If we do not receive approval before Jan. 1, the code would take effect sometime after Jan. 1."

Comments Received

From: Loren Long
To: Environment
Subject: No Gas Is Bad Idea
Date: Thursday, October 3, 2019 4:41:37 PM
Attachments: untitled[1].png

The proposed “reach code”, to not plumb gas to new construction is ridiculous. Bad decision to follow Berkeley’s radical lead. They are the laughing stock of the nation.



The majority of California electricity production is NOT “carbon free”. A very large portion of CA electricity is produced at power generation facilities which burn fossil fuels. All electricity feeds into the grid, so to say that “most residents and business owners receive 100% carbon-free electricity” in Hayward is NOT true. Yes some electric energy comes for solar, wind and hydro, but more comes from burning fossil fuels and once it is comingled with the electricity generated form fossil fuel it is all the same and the source is indistinguishable. Hayward is NOT receiving electricity for a 100% carbon-free sole source as stated by the city.

Also, what is the end plan for all the spent solar panels, batteries and wind mills. I guess it is not convenient to think about that now. We will deal with that when it too becomes a major problem.

It would be refreshing if Hayward would try to be an example of innovation and put forth a common sense approach to solving it’s problems instead of following the rest of the sheep.

I have lived in Hayward for most of my 66 years and am sad to say that I want very much to move away from this city and out California, as they have an uncontrollable obsession to control every possible thing. By doing so you are stealing our freedom of choice.

Feel free to respond if you wish.

Loren Long
[redacted]
Hayward, CA 94542
[redacted]

From: Rudell O"Neal
To: Erik Pearson
Subject: Hayward"s Plans for Electric Reach Codes
Date: Saturday, October 5, 2019 8:55:50 AM

Hello Mr. Pearson,

I received your name from Nicole Grucky as a referral for questions I have about Hayward's interest in electric reach codes.

First, let me say in general I am in favor of reduced carbon emissions, smaller impact footprints and more cost effective energy. Got the Prius and solar panels on my home to back that up.

My concerns deal with safety precautions that are planned for, when and how (not if) Hayward moves in the direction of electric reach codes.

Specifically, what is Hayward (and Alameda County) thinking of doing to guard against damage to our electrical grid in the event of an earthquake along the Hayward fault or a digital attack on that grid? Are we adequately prepared to handle such devastation? Or is it too early to expose ourselves to such vulnerable conditions, even if it will help our carbon footprint?

Nicole's response to those questions was, "that's PG&E's responsibility". I don't take comfort in hearing that as the final answer. So, I'm asking you:
- What plans has Hayward considered to ward against these very possible disruptions?
- To the extent PG&E does play a role in these plans, what review of the companies "disaster plans" has the City done and what did we think of those plans?

Finally, given this increase in reliance on electricity, what impact will this changeover have on taxes, and other City services?

I plan to attend the meeting on the 30th of Oct., but I do hope to hear back from you before then.

Rudelle O'Neal

October 15, 2019

Barbara Halliday, Mayor
City of Hayward
Attn: Hayward City Council
777 B Street
Hayward, CA 94541
Barbara.Halliday@hayward-ca.gov

SUBMITTED VIA EMAIL

RE: City of Hayward Development of Reach Codes

Dear Mayor Barbara Halliday:

Thank you for the opportunity to comment on the City of Hayward's proposed Reach Codes aimed at reducing greenhouse gas emissions in the building sector. The Western Propane Gas Association (WPGA) seeks to be a valuable contributor in both the development of these codes and the policies and procedures that may emerge as a result of these discussions.

While we applaud efforts for building decarbonization, WPGA believes that Reach Codes disincentivizing propane as a complementary fuel source to electric are fundamentally misguided. WPGA hopes that regulators will look to the example that the City of San Luis Obispo is setting with the development of their Reach Codes and recognize the value that propane provides on a number of levels.

Propane provides affordable, clean energy for low income communities as well as a vital back-up power for solar powered homes when battery power is low. Disincentivizing propane as a complementary power to solar has an unintended consequence to make solar homes more expensive and less reliable when power generation is not at peak levels.

Furthermore, there has been numerous discussions throughout California regarding planned power outages and safety black-outs. In a recent article published by Politico (PG&E begins massive power shut-off in California to avoid wildfires) it is noted that the Public Safety Power Shutoff could affect 2.4 million electricity users. Propane delivers energy resiliency for communities facing safety black-outs which can be critical for those powering life-sustaining equipment. Vulnerable citizens such as people on dialysis or simply the many individuals using electric powered wheelchairs can use propane energy for reliable power.

When looking towards the future, our industry is investing in renewable propane, derived from sustainable sources like beef tallow or vegetable oil. We hope that regulators take a more holistic view of the complementary role propane plays alongside decarbonization efforts including solar, wind and other renewable fuels.

The Western Propane Gas Association appreciates your work in this area and looks forward to working with you as the City of Hayward and the State strive to reduce greenhouse gas emissions through comprehensive clean energy solutions.

Sincerely,

Ben Granholm
Regulatory Affairs Specialist

cc: Kelly McAdoo, City Manager