

DOCKETED

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Adoption of Resolution Containing Findings of Local Climatic, Geological and Topographical Conditions as Required to Adopt Alameda Local Amendments to the 2019 California Energy Code and Rescinding Resolution 15607 Limiting Natural Gas Infrastructure for New Residential Construction on City Owned Property; and Introduction of Ordinance Amending the Alameda Municipal Code by Amending Article I (Uniform Codes Relating to Building, Housing and Technical Codes) of Chapter XIII (Building and Housing) to Adopt Local Amendments to the 2019 California Energy Code to Require Newly Constructed Buildings to be All-Electric. (City Manager/Planning, Building and Transportation)

To: Honorable Mayor and Members of the City Council

EXECUTIVE SUMMARY

In September 2019, the City Council adopted the City of Alameda's (City) Climate Action and Resiliency Plan (CARP), which included policies directing staff to prepare ordinances requiring all new residential construction to be 100% electric-powered with no gas hookups.

In October 2019, the City Council took a first and significant step in this direction by adopting a resolution limiting natural gas infrastructure for new residential construction on City-owned property (Resolution 15607). This proposed amendment to the Alameda Municipal Code (AMC) currently before the City Council is a targeted "Reach Code," i.e., a local building energy code amendment that "reaches" beyond the state minimum requirements for energy use in building design and construction. It would extend the all-electric requirement adopted for residential construction on city-owned property to new construction throughout Alameda, including nonresidential development, thereby fulfilling a key policy recommendation included in the CARP.

Specifically, staff is recommending the City Council to adopt the all-electric reach code to require all new construction citywide to be all-electric—i.e., no natural gas or propane infrastructure installed and electric appliances for space heating, water heating, clothes-drying, and cooking—with certain exceptions. Even if exemptions are triggered, all new construction under the proposed reach code would need to comply with prewiring requirements (supplemental electric infrastructure to support future electrification).

With Alameda Municipal Power (AMP) now providing 100% clean electricity, Alameda's greenhouse gas (GHG) emissions from buildings comes primarily from natural gas consumption. Natural gas use in buildings accounts for 27% of Alameda's total GHG emissions linked to climate change. The only source sector with more local GHG emissions is the transportation sector (70%).

Requiring new development to be all-electric is the first step towards reducing our building emissions. It also provides a number of important additional benefits, including:

- **Health.** All-electric homes eliminate both indoor and outdoor air pollution from the

production of natural gas and combustion inside homes,¹ which has been linked to various acute and chronic health conditions, including an increased risk of asthma in children, respiratory illness, cardiovascular disease, and premature death.² All-electric homes also reduce the risk of carbon monoxide (CO) poisoning.

- **Safety.** Cooking is linked to almost half of residential house fires,³ which can be reduced with safety features in induction stoves. Damage to natural gas pipelines have been responsible for significant fires and fatalities, including the 2010 San Bruno disaster. While both natural gas and electric infrastructure have had safety issues in the recent years, by investing in the reliability and safety of the electric infrastructure system, we can also reduce the climate impacts of our energy system.
- **Resilience.** A quarter of all post-earthquake fire ignitions are natural gas related.⁴ Following an earthquake, the electric system has been found to restore service in less than two weeks, compared to approximately six months for natural gas.⁵ Public Safety Power Shutoffs (PSPS) outages will be reduced as the electric grid is hardened, however most gas appliances still require electricity for operation. AMP is constantly improving the resilience of our local electric system.
- **Equity.** For low-income communities and communities of color that spend a disproportionate amount of their income on energy, and who are more likely to suffer from asthma due to poor indoor air quality, zero emission homes are an important opportunity to deliver social equity benefits.
- **Climate.** Eliminating natural gas in buildings is a necessary step to achieve Alameda's climate goals and reduces methane emissions, a potent GHG.
- **Cost.** All-electric homes and businesses can reduce construction costs and save residents and business owners money over the lifetime of the building. All-electric construction simplifies building systems and maintenance by eliminating the need for natural gas systems. Like-for-like electric appliances are not any more expensive than natural gas appliances. AMP's low electric rates compared to PG&E make the benefits of converting to all-electric even more beneficial in Alameda. Adding solar PV beyond state minimum requirements can further improve economics while achieving zero net energy.

Staff is recommending that the City Council adopt a resolution containing findings of local climatic, geological, and topographical conditions as required by applicable law, introduce on first reading the attached Ordinance (reach code), and direct staff to file the resolution and ordinance with the California Energy Commission.

BACKGROUND

The City is a leader in climate action and sustainability. In March 2019, the City Council declared a climate emergency and joined a global effort to get to net zero emissions as soon as possible. In September 2019, the City Council adopted an updated and revised CARP with the goal of lowering citywide GHG emissions 50% below 2005 levels by 2030 and achieving the vision of net zero emissions as soon as possible. The CARP identifies the need to reduce greenhouse gas emissions from the use of natural gas in both new and existing buildings in the community. The proposed Ordinance (reach code) would

address natural gas use in new construction, allowing the City Council to address natural gas use in existing buildings at some future date, if the City Council so chooses.

In November 2019, the City Council adopted a resolution limiting natural gas infrastructure for new residential construction on city owned property. Given that the vacant lands owned by the City at Alameda Point represent a major portion of lands available in Alameda for new construction, the 2019 Council resolution represented a significant step forward in addressing this issue. The proposed reach code would be another milestone towards achieving the City's climate goals, by requiring all-electric new construction in all new buildings (both residential and commercial) to all public and private property in Alameda. To avoid confusion and potential conflicting interpretations, staff is further recommending that the City Council rescind its 2019 resolution upon approval of the citywide reach code because the prior resolution will become redundant and unnecessary.

To advance the City's climate goals, staff has also worked with developers in recent years to reduce the use of gas infrastructure in new construction beyond Alameda Point. The 52-unit Mulberry residential townhome project on Clement Avenue, the 21-unit Housing Authority townhome project on Eagle Avenue, the 357-unit townhome and stacked-flats project under construction at Alameda Landing Waterfront, and the proposed re-entitlement of the 589 units at Encinal Terminals are all designed or proposed as all-electric new construction. Adopting the proposed Ordinance (reach code) will provide consistency and certainty for developments going forward.

To further advance the City's climate goals, staff recommends adopting the attached Ordinance (reach code). Specifically, the Ordinance modifies the Alameda Energy Code to require residential and non-residential new construction to be all-electric, with certain exceptions. This report provides an overview of the statewide cost-effectiveness study, details findings, and provides language recommended for the associated reach code for the 2019 building cycle.

Reach Code Adoption Process

Every three years, the State of California adopts new building standards that are organized under 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 current code cycle was adopted in 2019 and became effective on January 1, 2020. The next code cycle will be adopted in 2022 and become effective on January 1, 2023, covering the next three-year period. Cities and counties can adopt reach codes that impose requirements above the minimum state code requirements and file them with the State at any time. Reach codes must be updated with every code cycle.

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 the nonresidential and residential applicants.

Statewide Cost-Effectiveness Study for Energy Code Reach Codes

Funded by the California investor-owned utilities (IOUs), the California Statewide Codes and Standards Program (Statewide Program) led the development of a cost-effectiveness study for Energy Code reach codes that examined different performance-based approaches for new construction of specific building types. There are two kinds of reach code approaches: performance-based ordinances and prescriptive ordinances. Performance-based ordinances mandate an increase in the overall energy efficiency required but leave flexibility for the builder on how to achieve this goal. In contrast, prescriptive ordinances mandate implementation of a specific measure (such as solar panels or cool roofs). The Statewide Program's analysis focused on performance-based ordinances but some conclusions about prescriptive measures can be made from the results.

Building Prototypes

The Statewide Program's analysis estimated cost-effectiveness of several building prototypes including one-story and two-story single-family homes, a two-story and five-story multifamily building, a three-story office building, a one-story retail building, and a four-story hotel. The single-family homes, multifamily homes, and office building prototypes are directly applicable to Alameda development. The City has averaged about 200 units of new multi-family units and townhomes constructed each year over the past five years. Additionally, recently approved development projects include manufacturing, light industrial, office buildings, and retail.

Community Input

Staff conducted significant outreach during the development of this ordinance, including presentations at Alameda Youth Collaborative (March 25), CASA (April 1), and Alameda Chamber of Commerce Government Relations Economic Development Committee (April 7) meetings. Staff also presented at the League of Women Voters/CASA workshop on Electrifying Alameda's Homes on April 8 and held two online info sessions on April 12 and 13 for builders and developers. The proposed ordinance was presented to the Planning Board on April 26 and was included on the consent agenda for the May 17 Public Utilities Board meeting.

Planning Board Input

At its April 26 meeting, the Planning Board reviewed and unanimously recommended that City Council adopt the proposed Ordinance (reach code) and resolution containing findings of local climatic, geological, and topographical conditions with several modifications. Staff has made changes to the ordinance based on the Planning Board recommendations, including adding a reference to the Energy Code to address situations where mechanical equipment on small building roof areas may not provide sufficient space for solar PV and to clarify that more (but not less) than 15 percent of the roof area is allowed. The Planning Board also added recommending making clarifying modifications that the solar PV requirements may be allowed on buildings that install vegetative roofs.⁶

The Board also voted to recommend that City Council rescind Resolution 15607 as it will no longer be necessary upon adoption of the reach code.

DISCUSSION

As of March 2021, more than 40 cities and counties across California, including San Francisco, Oakland, San Jose, Berkeley, Richmond, Hayward, and others, have adopted ordinances to limit or eliminate the use of natural gas in new buildings, a significant contributor to GHG emissions.

FINDINGS

Reach Code Summary

Building on similar ordinances recently passed by neighboring jurisdictions, staff drafted an “all-electric” reach code ordinance for Council’s consideration. The reach code would be applied at permit application for all new buildings seeking construction permits after the ordinance is adopted by City Council and approved by the California Energy Commission.

Staff have worked closely with TRC Advanced Energy to interpret the study’s results, noted above, and infer what options may or may not be cost-effective for the building types that are prevalent in Alameda, but were not analyzed by the team. TRC also provided consultant support to understand the cost-effectiveness study results and adopting reach codes. The proposed reach codes meet the requirements of the CEC for cost-effectiveness and are cost-effective over the lifetime of the building systems for newly constructed buildings within city limits, including upfront and operational costs and savings. Notably, the results of the analysis show that all-electric buildings are typically less expensive to construct.

Newly constructed buildings are defined in Section 100.1 of the Energy Code as “a building that has never been used or occupied for any purpose”. Buildings that undergo significant remodels or renovations are not considered newly constructed buildings for purposes of this Ordinance.

Recommended reach code requirements for newly constructed buildings are:

- **All-Electric Required:** Require all newly constructed residential and non-residential buildings to be built all-electric, meaning that the buildings will have no natural gas or propane plumbing installed, and that electricity will be the sole source of energy for all space heating, water heating, cooking appliances, and clothes drying appliances, with some exceptions, which are still subject to a rewiring requirement (supplemental electric infrastructure to support future electrification).

- **Install Solar Photovoltaic (PV):** Require solar photovoltaic systems on new high-rise residential and non-residential buildings covering at least 15 percent of the roof area, with exceptions allowed for shading or over generation.

The recommended exceptions to the all-electric requirements are:

1. Commercial kitchen cooking appliances for a restaurant or an employee cafeteria in a newly constructed building.
2. Non-electric space heating and process systems in newly constructed buildings containing occupancies F, H, or L (e.g. manufacturing, laboratories, or other specialty R&D). To take advantage of this exception, applicant shall provide third party verification approved by the City that the all-electric process system requirement is not cost effective or feasible.
3. Accessory Dwelling Units constructed on a parcel with an existing residential building with gas infrastructure.
4. Newly constructed buildings with a valid planning entitlement or Development Agreement approved prior to the effective date of the Ordinance.
5. If there is not an all-electric prescriptive pathway for a building under the state Energy Code, and the building is unable to achieve the Energy Code's performance compliance pathway using commercially available technology and an approved calculation method, then the building official has the authority to grant a modification.

Applicants invoking these exceptions must provide additional and supplemental electric infrastructure for future electrification.

Cost Effectiveness/Energy Consumption and Local Amendments Findings

An energy reach code can only be adopted if the jurisdiction adopting it determines that the proposed requirements are cost effective. The City's proposed all-electric reach code can be found to be cost-effective, as discussed below. Additionally, the all-electric reach code would require the diminution of energy consumption levels permitted by the state Energy Code as required by California Health & Safety Code section 25402.1(h)(2).

Cost-effectiveness is measured considering life-cycle costs using a 15-year timeframe for nonresidential buildings and a 30-year timeframe for residential buildings. Generally, electric appliances are not more expensive than natural gas appliances. When considering the avoided cost of installing gas infrastructure (piping), in all modeled cases in Alameda's climate zone, all-electric construction is cost-effective. In these cost effectiveness studies, air-conditioning is assumed to be in the baseline, which staff has indicated to be a reasonable assumption given recent development proposed in the City, consistent with the anticipated change in local climate. 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.⁷

The City's finding that its proposed all-electric reach code is cost-effective can be based on the statewide cost-effectiveness studies, which are available for review at the following websites:

- "2019 Low-Rise Residential New Construction Cost-effectiveness Study," (Aug. 1, 2019) Frontier Energy, Inc., *available at* [https://localenergycodes.com/download/73/file_path/fieldList/2019%20Res%20NC%20Cost-eff%20Report](https://localenergycodes.com/download/73/file_path/fieldList/2019%20Res%20NC%20Cost-eff%20Report;);
- "2019 Nonresidential New Construction Cost-effectiveness Study." (July 25, 2019) TRC, *available at* https://localenergycodes.com/download/74/file_path/fieldList/2019%20NR%20NC%20Cost%20Effectiveness%20Report;
- "2019 Mid-Rise New Construction Reach Cost-effectiveness Study." (June 22, 2020) Frontier Energy, Inc., *available at* https://localenergycodes.com/download/492/file_path/fieldList/2019%20Mid-rise%20NC%20Cost-Eff%20Report.pdf

Additionally, the proposed reach code provides local amendments to Title 24 Part 6, the California Energy Code (CEC). The Planning Board has recommended that the City Council adopt the proposed local amendments to the 2019 California Energy Code.

Staff is also recommending that the City Council consider these cost effectiveness studies as a basis for finding the proposed reach code is cost effective, in addition to making the findings necessary, as required by applicable law, to support the local amendments.

ALTERNATIVES

- Adopt the all-electric reach code, based on local findings, and rescind Resolution 15607, to the extent appropriate.
- Direct staff to revise or remove specific local amendments.
- Request staff to bring back additional information for further consideration.
- Do not adopt the all-electric reach code.

FINANCIAL IMPACT

Adoption of the proposed reach codes is not anticipated to result in additional costs to the City. Alameda building officials are already transitioning to enforcement of the new California Building Standards as adopted by the City with local amendments and modifications, which occurs on a three-year cycle. Implementation material templates, including project checklists and training resources have been developed by the Bay Area Regional Energy Network (BayREN). Thus, the introduction of an all-electric building requirement does not represent a significant increase in staff time to review any new permit applications. One advantage of the all-electric ordinance may be to reduce the

number of items that need to be inspected in the field (for example, air vents and shutoff safety elements for gas appliances), which could reduce plan check and inspection time.

MUNICIPAL CODE/POLICY DOCUMENT CROSS REFERENCE

Amending the AMC to adopt the all-electric reach code supports General Plan policies to protect the health and safety of the community, improve energy efficiency and meet local Climate Action and Resiliency Plan goals for greenhouse gas reductions.

ENVIRONMENTAL REVIEW

This action is exempt from California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines section 15061(b)(3) in that the standards set forth in the ordinance are more protective of the environment than the California Energy Code standards, and there is no possibility that the activity in question may have a significant effect on the environment. As a separate and independent basis, this action is exempt from CEQA pursuant to CEQA Guidelines section 15308 in that the standards set forth in the ordinance assure the maintenance, restoration, enhancement or protection of natural resources and the environment. In addition, CEQA Guidelines section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning) applies to the project in that the standards set forth in the Ordinance are consistent with the General Plan and the Climate Action and Resiliency Plan.

CLIMATE IMPACTS

The all-electric reach code will help implement the City's Climate Action and Resiliency Plan and its goal of reducing greenhouse gas emissions to 50% below 2005 levels by 2030.

Natural gas and the infrastructure needed to transport it to city homes and businesses is a leading source of GHG emissions in the city, and responsible for 27% of the total GHGs released in the City. To reduce these emissions, the CARP recommends requiring new development to be all-electric and to replace gas appliances and furnaces with electric ones in existing homes.

RECOMMENDATION

1. Adopt a Resolution containing Findings of Local Climatic, Geological, and Topographical Conditions as required to adopt Alameda Local Amendments to the 2019 California Energy Code and rescinding Resolution 15607 limiting Natural Gas Infrastructure for new residential construction on City owned property;
2. Introduce an Ordinance amending the Alameda Municipal Code by amending 13-11 (Alameda Energy Code) of Chapter XIII, Article I (Uniform Codes Relating to Building, Housing and Technical Codes) to make local amendments to the 2019 California Energy Code; and

3. Direct Staff to file the adopted Resolution and Ordinance with the Energy Commission following the second reading of the Ordinance.

CITY MANAGER RECOMMENDATION

The City Council took initial action on the climate action and resiliency plan and an initial action on electrification in September and October 2019. In addition, at its April 26 meeting, the Planning Board reviewed and unanimously recommended that City Council adopt the proposed Ordinance (reach code) and resolution containing findings of local climatic, geological, and topographical conditions with several modifications. I concur with the Planning Board's recommendation.

Respectfully submitted,
Danielle Mieler, Sustainability and Resilience Manager

Financial Impact section reviewed,
Annie To, Finance Director

Exhibit:

1. Resolution 15607

cc: Eric Levitt, City Manager
Gerry Beaudin, Assistant City Manager

Endnotes:

¹ Gas Stoves Can Emit Elevated Indoor Nitrogen Dioxide (NO₂) Levels Often Exceeding Indoor Guidelines and Outdoor Standards. *Source*: Health Effects from Gas Stove Pollution, Rocky Mountain Institute, 2020, <https://rmi.org/insight/gasstoves-pollution-health>.

² See for example:

- Weiwei, L., Brunekref, B., Gehring, U. (2013). Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children. *International Journal of Epidemiology*, Volume 42, Issue 6, December 2013, Pages 1724–1737, <https://doi.org/10.1093/ije/dyt150>.
- UCLA Fielding School of Public Health (2020) Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California. coeh.ph.ucla.edu/effects-residential-gas-appliances-indoor-and-outdoor-air-quality-and-public-health-california.
- Lin, Brunekreef, Gehring (2013) Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children. academic.oup.com/ije/article/42/6/1724/737113.
- Nicole (2014). Cooking Up Indoor Air Pollution ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.122-A27.

³ National Fire Protection Council. (2020). Home Structure Fires. <https://www.nfpa.org/News-and-Research/Data-research-and-tools/Building-and-Life-Safety/Home-Structure-Fires>

⁴ Scawthorn, C. (2010). Analysis of Fire Following Earthquake Potential for San Francisco, California. <https://www.sparisk.com/documents/SPASanFranciscoCAPSSFireFollowingEarthquakeOct2010.pdf>

⁵ City and County of San Francisco. (2020). Lifelines Restoration Performance Project. <https://onesanfrancisco.org/sites/default/files/inline-files/Lifelines%20Restoration%20Performance%20Report%20Final-03-02-21.pdf>

⁶ The Planning Board's motion also included a request to amend the Ordinance to more explicitly clarify that it does not apply to existing buildings. However, staff believes this is already clear from the definition of "newly constructed buildings" which is currently in the code under section 100.1, as noted below. As defined in the cost-effectiveness studies, the TDV calculation is:

⁷ "...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).