



AGENDA REPORT

TO: Edward D. Reiskin
City Administrator

FROM: William A. Gilchrist
Director, PBD

SUBJECT: Proposed Reach Code for All-Electric
Construction in Newly Constructed
Buildings

DATE: November 2, 2020

City Administrator Approval 

Date: November 19, 2020

RECOMMENDATION

Staff Recommends That The City Council Adopt The Following Legislation:

- 1. An Ordinance Amending The Oakland Municipal Code (O.M.C.) To Add Building And Construction Code Chapter 15.37, Entitled “All-Electric Construction In Newly Constructed Buildings”; And Adopting California Environmental Quality Act (CEQA) Exemption Findings; And**
- 2. A Resolution Of Findings Supporting The Adoption Of Oakland Municipal Code (O.M.C) Chapter 15.37, Entitled “All-Electric Construction In Newly Constructed Buildings”; And Adopting CEQA Exemption Findings.**

EXECUTIVE SUMMARY

As set forth in detail in the proposed Resolution and Ordinance, the proposed Ordinance is intended to improve community health, safety, and resilience by reducing the emissions of greenhouse gases (GHGs), which have numerous deleterious health and environmental effects from the results of global warming. These goals are achieved by requiring all-electric building construction, for both residential and commercial uses, in newly constructed buildings, as defined in Chapter 15.37.020 of the Oakland Municipal Code (O.M.C.).

This Ordinance is exempt from the California Environmental Quality Act (CEQA) on the grounds that its regulatory standards are more stringent than those in the State Building Standards Code (Building Code) and is a regulatory action for the protection of the environment. As a result, there is no reasonably foreseeable adverse impacts associated with these higher standards.

BACKGROUND / LEGISLATIVE HISTORY

The City of Oakland has been a leader in ambitious and equity-driven climate action for decades, frequently surpassing California statewide goals. Resolution No. 82129 C.M.S. (2009) directed staff to develop the City's first climate strategy - the 2020 Energy and Climate Action Plan - with a GHG emission reduction target of 36 percent below 2005 levels; it also established a long-term GHG reduction target of 83 percent by 2050. In 2015, as a signatory to the Under2 Memorandum of Understanding and the Global Covenant of Mayors, the City declared its commitment to reducing its GHG emissions to levels consistent with the targets established in the 2015 Paris Climate Accord.

In 2016, California enacted Senate Bill (SB) 32, which built on the 2006 California Global Warming Solutions Act by requiring Statewide GHG emissions be reduced to 40 percent below 1990 levels by 2030. In 2018, the Oakland City Council adopted Resolution No. 87183 C.M.S., establishing a GHG emissions reduction target of 56 percent below 2005 levels by 2030. The City Council also adopted Resolution No. 87397 C.M.S. in 2018, declaring a climate emergency and calling for regional collaboration and a "citywide just transition and urgent climate mobilization effort to reverse global warming ... as quickly as possible towards zero net emissions."

In July 2020, the City Council adopted the [2030 Equitable Climate Action Plan \(ECAP\)](#), a comprehensive plan responsive to the abovementioned Resolutions. The ECAP addresses both GHG mitigation and climate resilience through an equity lens, leveraging the tools and policy levers available through the City's regulatory and legal spheres of control to reduce local GHG emissions on a path projected to exceed Council's adopted 2030 and 2050 reduction targets. Alongside the 2030 ECAP, the City Council also adopted a Carbon Neutrality Target of 2045 (Resolution No. 88268 C.M.S.). Achieving carbon neutrality will require complete decarbonization (ensuring that all mechanical systems run on clean electricity) of Oakland's building sector.

Action B-1 (*Eliminate Natural Gas in New Buildings*) in the 2030 ECAP directs staff to prohibit new buildings and major renovations from connecting to natural gas infrastructure, specifying both climate and public health reasons for doing so.

The local building code is an important tool for cities to further local climate goals, including those set forth in Oakland's ECAP. Local jurisdictions are required to enforce the California Building Standards Code, codified as Title 24 of the California Code of Regulations (hereafter, Title 24), whether or not the jurisdiction formally adopts the Code. Title 24, Part 6, governs energy and energy efficiency in residential and nonresidential buildings.

Local jurisdictions are permitted to adopt local amendments that exceed the State building code to address local conditions. Local jurisdictions may not adopt or implement less stringent standards. California Health & Safety Code Section 17958.7 provides that before making any modifications to the California Green Building Standards Code or any other applicable provisions published by the State Building Standards Commission, a governing body must make an express finding that each such change or modification is reasonably necessary because of specified local conditions. The findings must be filed with the State Building Standards

Commission before the local changes or modifications go into effect. The recommended findings are set forth in the proposed Resolution.

As of October 30, 2020, at least 39 California jurisdictions (including Berkeley, Palo Alto, San Jose, and San Francisco) have adopted ordinances to begin decarbonizing buildings in their boundaries, using an array of building code approaches. This includes 15 cities that have adopted “all-electric, whole-building” requirements. The proposed Ordinance would continue to advance the City’s commitments to reach the abovementioned and shared goals with that of its neighbors to reduce greenhouse gas emissions.

ANALYSIS AND POLICY ALTERNATIVES

Oakland’s 2017 Climate Action for Urban Sustainability (CURB) analysis indicated the City would not achieve its GHG emission reduction targets without eliminating natural gas combustion in buildings. In 2017, the most recent year for which data is available, 25.8 percent of Oakland’s local GHG emissions originated from buildings, of which more than 70 percent came from natural gas combustion. That same analysis listed electrification of building space-heating systems as one of the top five strategic actions necessary to achieve those goals.

Oakland’s primary source of electricity is East Bay Community Energy (EBCE), a local joint powers authority electricity supplier in Alameda County that prioritizes local renewable generation and local green jobs and development. EBCE’s electricity generation was 85 percent renewable in 2019 and likely to be fully renewable and carbon free well before 2030. Increases in Oakland’s consumption of electricity therefore draw from a clean and equitable electric grid, one that supports local economic development.

Failure to address and significantly reduce GHG emissions will result in continued increases in sea level rise that could put Oakland homes and businesses, public facilities, and portions of major local and regional transportation infrastructure at risk. Additional direct impacts of an unmitigated climate crisis likely to affect Oakland, as described in the Intergovernmental Panel on Climate Change (IPCC) reports and the 2030 ECAP, include severe weather events, increasing droughts, more frequent heat events and wildfires, smoke inundation from regional fires, erosion, flooding, and landslides.

Impacts of Natural Gas

Natural Gas and the Climate Crisis – Natural gas is primarily comprised of methane, a short-lived climate pollutant whose contribution to climate change (“global warming potential”) is 86 times greater than carbon dioxide. Stopping methane pollution is necessary to keep global warming below the 1.5 degree-Celsius target identified in the Paris Climate Accord and in the subsequent agreements to which Oakland is a signatory. Methane pollution happens throughout the natural gas system, from leakages at the point of extraction and along the distribution system, to incidental leakage within homes and buildings. Additional climate emissions occur when natural gas is burned in home and building appliances, including for cooking, clothes drying, water heating, and space heating.

Oakland cannot meet its climate goals without shifting quickly away from natural gas use. State policies and lower prices of renewable energy mean that substituting natural gas with electricity is one of the quickest, safest, and least expensive pathways to eliminating GHG emissions from buildings.

Natural Gas and Public Health – Indoor natural gas use, particularly for cooking, worsens indoor air quality, which disproportionately harms frontline communities, i.e., communities that experience the first and worst consequences of climate change. Burning natural gas creates indoor air pollutants including carbon monoxide, formaldehyde, and nitrogen dioxide, all of which contribute to respiratory ailments. These impacts are compounded in small, poorly-ventilated spaces like older apartments. Children living in homes with gas cooking are 42 percent more likely to have asthma.

Natural Gas and Public Safety – Natural gas presents combustion risk for buildings, especially during and after major earthquakes. It is well known that gas pipelines can cause catastrophic disasters, with perhaps the most infamous example being the 2010 San Bruno explosion. In 2017, the U.S. Geological Survey conducted its “HayWired Scenario,” simulating a 7.0 quake on the Hayward fault line with the epicenter in Oakland. The agency’s report predicted that “about 450 large fires could result in a loss of residential and commercial building floor area equivalent to more than 52,000 single-family homes and cause property (building and content) losses approaching \$30 billion.” The report identified ruptured gas lines as a key fire risk factor. This finding mirrors the reality of the destructive gas fires resulting from the 1989 Loma Prieta and 1994 Northridge earthquakes.

Natural Gas and Resilience – Gas lines are also more difficult to repair following disasters than electric infrastructure, and as such reduce a city’s resilience. In times of disaster, the fossil fuel supply chain will likely be disrupted. Conversely, all-electric buildings can increase resilience. Electric appliances in conjunction with battery storage technology and renewable energy generation (such as rooftop solar) can operate absent the grid’s electric supply chain. Moreover, newer gas appliances, such as stoves and water heaters, require electricity to start. Thus, in times of power outages, gas appliances in new buildings will not provide the resilience that many people desire.

Cost Implications

The transition to all-electric buildings envisioned in the 2030 ECAP and required by the City’s proposed Carbon Neutrality Resolution must begin with new construction, where it is easiest and most cost-effective. In 2019, costs for all-electric new construction were already either on par with or less than those for mixed-fuel (i.e., electricity plus natural gas) construction ([2019 Cost-Effectiveness Study: Low-Rise Residential Construction prepared by Frontier Energy Inc. and Misti Bruceri & Associates, LLC](#) and [2019 Nonresidential New Construction Reach Code Cost Effectiveness Study prepared by TRC and Energy Soft](#)). All-electric construction avoids the need for redundant infrastructure going to and within buildings, which reduces overall construction costs. Letters from Stone Energy Associates and Redwood Energy to the California Energy Commission in 2017 described the significant net cost savings per unit in multifamily projects due to the avoidance of costly trenching and gas infrastructure. In 2018, the Rocky Mountain Institute found that new single-family, all-electric homes could “save \$1,000 to more

than \$24,000 per single-family home, with a median value of \$8,800.” The Natural Resources Defense Council also found that all-electric new multi-family construction saw “upfront capital savings, partly [as] a result of not piping for gas.” If the cost savings from avoiding gas infrastructure are invested in onsite photovoltaic (solar) energy generation, an all-electric building can be less expensive to operate from day one even without factoring in the reduced construction costs.

Moreover, as the Bay Area region experiences more and more extreme heat events, more Oaklanders are choosing to install air conditioning. Heat pumps—the most common efficient electric alternative to a gas furnace—provide both heating and cooling, avoiding the need for two separate systems.

Operating costs of all-electric buildings are similarly favorable. Modern electric appliances are significantly more efficient than gas appliances, using fewer units of energy for the same work. Electric heat pump water heaters are up to five times more efficient than gas water heaters. Moreover, electric energy costs can be offset through local renewable generation such as rooftop solar, while gas must be purchased from an outside source. All-electric buildings can achieve net-zero operational costs, which is impossible for buildings with gas appliances.

While gas rates are currently less than those of electricity, trends show it increasing at a faster pace. As more buildings become all-electric, gas infrastructure will become more costly to maintain, which will drive up gas rates further. The trend toward all-electric buildings statewide is clear, with an increasing number of cities pursuing all-electric local building codes, and a Statewide mandate for carbon neutrality by 2045.

Higher gas rates will increasingly fall on low-income households who have the highest energy cost burden to begin with. By ensuring that new buildings are all-electric, the City can better ensure that the benefits of decarbonized buildings—from improved public health to lower and more stable energy bills—can accrue to frontline communities.

Restaurants

Just as there are today ample, efficient electric alternatives for all residential gas appliances, so are there for all commercial culinary appliances. Traditional electric stoves have created a stigma for all-electric cooking; however, induction cooking technologies are now prevalent, with many top chefs across the world choosing induction over gas. Induction stoves are available from numerous brands at a range of prices, and provide a more finely-tuned cooking experience than gas stoves while eliminating the harmful air emissions and burn risk.

Induction appliances heat up faster than gas alternatives, are modular and efficient, safer, and easier to clean. By minimizing harmful air pollutants and burn risk, and conveying less heat to indoor cooking space, they also provide critical health and safety benefits to an important frontline community: food service workers, many of whom are immigrants, non-English speakers, low-income, and people of color, and tend to work grueling shifts.

Induction appliances are available for every commercial cooking approach, from woks to fryers. While the upfront capital cost is higher, the operational costs are equivalent. With higher-

precision cooking and safer “back of house” environments, all-electric restaurants offer many benefits for new and existing owners and staff. Additional financial benefits of induction cooking include the following:

- Efficiency: According to Redwood Energy, an induction fryer can produce six times the output of french-fries versus its gas alternative, enabling a restaurant to serve more customers during a lunch rush.
- Cooler kitchen: Induction appliances transfer less heat to the kitchen, reducing the cost of space cooling.
- Safety: Induction appliances produce precisely the amount of heat that is needed and transfer the heat directly to the cookware, reducing the possibility of burns.

Numerous resources exist to support restaurant owners and food service workers in considering induction technologies and energy-efficient cooking. The Food Service Technology Center, operated by Frontier Energy in partnership with Pacific Gas & Electric (PG&E) and others, supports sustainability in the food service industry through field research, appliance testing, and training in their demonstration center. EBCE has also launched a lending program for induction cooktops for individuals and commissary kitchens. The Bay Area Regional Energy Network (BayREN) currently provides a \$300 rebate for induction stoves, and both BayREN and EBCE are actively exploring new ways to support cities as they encourage shifts to fully decarbonized buildings.

Building Code Approach

The new version of Title 24, Part 6 that became effective in January 2020 allowed for new all-electric low-rise residential buildings. Except for attached accessory dwelling units and buildings demonstrating infeasibility, this proposal will extend the all-electric designation beyond this class of buildings to all newly constructed buildings.

By requiring all new buildings to be constructed without gas, the City will send a strong market signal to retailers, construction workers, contractors, repair technicians, and more that they need to prepare for a rapid transition to all-electric appliances and infrastructure. This approach “primes the market,” ensuring that the shift to all-electric buildings begins where the cost-effectiveness is proven, and enabling a smooth transition for existing buildings.

FISCAL IMPACT

There are no negative fiscal impacts anticipated with the adoption of this ordinance. Electric infrastructure has been found to have lower installation and operational costs, which is the primary factor contributing to its cost effectiveness, even with necessary increases in electrical capacity. Although a modest increase in staff time is expected to review and discuss electrical transformer systems, some of which may be larger than in a mixed-fuel system, a decrease in staff time related to field inspections should be expected as the gas piping aspects of the inspection phase will be eliminated. Similarly, no net increase in staff time related to plan check functions is expected as the elimination of the review of gas pipe sizing and configuration is offset by an increase in electric service review. Overall, department staff time related to permitting, plan review, and inspection, should be affected very minimally.

PUBLIC OUTREACH / INTEREST

Building electrification workshops were conducted on the dates of June 13, 2019 and September 12, 2019 with stakeholders consisting of developers, heating, ventilation and air conditioning (HVAC) designers, contractors, architects, engineers, business leaders, and City staff. Individual interviews with stakeholders were also conducted between workshops.

Additionally, this action was a major subject of discussion in the extensive community engagement conducted by City Sustainability staff in development of the 2030 ECAP. ECAP community engagement was conducted in partnership with a local Equity Facilitator team, led by Environmental / Justice Solutions and the Oakland Climate Action Coalition, with a particular focus on engaging frontline communities, including Black, Latino, non-English speaking, and low-income Oaklanders. More than 2,100 Oaklanders directly engaged in the process. Building electrification, energy efficiency, clean energy provision, and energy resilience were all major subjects that arose during the process. The Equity Facilitator team conducted a [Preliminary Equity Analysis of the ECAP Actions](#), and concluded that all Actions in the Plan, including those pertaining to building electrification (B-1 and B-2), fully addressed equity goals as written.

On Friday, November 20, 2020, staff conducted a public engagement webinar to share the final draft Ordinance, explain how the draft Ordinance is responsive to stakeholder values and concerns as expressed in 2019 and early-2020 engagement, and answer questions.

COORDINATION

Collaboration for this effort included the Oakland Public Works Department Environmental Services Division, Planning and Building Department Bureau of Building, and the Office of the City Attorney. This report and legislation have been reviewed by the Office of the City Attorney and the Budget Bureau.

SUSTAINABLE OPPORTUNITIES

Economic: The requirement of all-electric buildings will lead to lower installation costs for newly constructed buildings, and in many cases will reduce operational costs as well, keeping more money in Oakland. All-electric buildings will also provide improved indoor air quality and reduced safety hazards associated with gas cooking, which is likely to marginally reduce healthcare costs, particularly for frontline communities. Eliminating gas infrastructure will also significantly reduce the risks of fires and explosions, particularly after seismic events, which will further save the City money by reducing disaster response and recovery costs.

Environmental: Natural gas, or methane, is a Short-Lived Climate Pollutant, with 86 times the global warming potential of carbon dioxide over a 20-year period. There is broad consensus among climate scientists that the world cannot limit global warming to 1.5 degrees Celsius without drastically limiting methane emissions, including from buildings. The reduction of greenhouse gas emissions from all-electric buildings will help mitigate climate change and its negative effects such as extreme heat events, droughts, intense storms, flooding, and

displacement. This ordinance would fulfill Action B-1 in the 2030 ECAP, *Eliminate Natural Gas in New Buildings*, and prime the market for a smoother transition to full electrification for Oakland's existing buildings—the subject of 2030 ECAP Action B-2, *Plan for All Existing Buildings to be Efficient and All-Electric by 2040*.

Race & Equity: Ensuring that new buildings are constructed without fossil fuel infrastructure and instead with local, carbon-free renewable energy sources will bring health and economic benefits to low-income communities. Modern electric systems and appliances are more efficient than older gas technologies, and in some cases offer lower overall installation costs and utility bills. They also offer improved air quality and less exposure to pollutants known to exacerbate asthma and other pulmonary diseases, which disproportionately impact vulnerable populations like children and seniors. Heat pumps add air conditioning capacity in areas with heat stress, and induction cooking is safer with lower exposure to hot surfaces and no open flames. Eliminating natural gas in buildings can lower the risk of fire after earthquakes, and reduce the likelihood of childhood asthma. All of these benefits disproportionately improve wellbeing in frontline communities, who face higher baseline levels of pollution exposure and pay a higher proportion of income for energy.

The potential for good, green jobs resulting from this Ordinance that can flow to local Oaklanders, including youth and those who are unemployed, underemployed, or with lower education, is also significant. The increased demand for electricians, electric appliance retailers, and energy advisors would inherently start at the local level. As mentioned above, requiring all-electric new construction will lower the costs and build the understanding among the current workforce of electrifying existing buildings. This could positively impact plumbers, electricians, general construction workers, roofers, solar installers, and other related professions. As new all-electric buildings come online as a result of this ordinance and broader economic trends, new jobs specializing in green building will continue to emerge. Nationwide, in 2017, jobs in the clean energy sector eclipsed those in the fossil fuel industry, despite record fossil fuel exploration and recovery. EBCE also continues to expand their local renewable energy generation infrastructure—work that goes hand-in-hand with an increasingly all-electric building sector, and that similarly provides good, green jobs with lower educational requirements as the replacement of existing gas appliances to all-electric appliances and their maintenance will provide increased demand for tradespeople providing such services.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The Health and Safety Code Section 18941.5, with reference to Section 17958.7, allows more restrictive local amendments to the Building Code that are reasonably necessary due to local climatic, geologic, or topographical conditions. This ordinance is exempt from CEQA under CEQA Guidelines sections 15061(b)(3) and 15308 due to the fact it is a regulatory action for the protection of the environment and that there are no reasonably foreseeable adverse impacts that would result from this action. As a result, there is no possibility that the activity in question would have a significant effect on the environment.

ACTION REQUESTED OF THE CITY COUNCIL

Staff Recommends That the City Council Adopt the following legislation:

1. An Ordinance Amending The Oakland Municipal Code (O.M.C.) to Add Building and Construction Code Chapter 15.37, Entitled "All-Electric Construction in Newly Constructed Buildings"; And Adopting CEQA Exemption Findings; And
2. A Resolution of Findings Supporting the Adoption of Oakland Municipal Code (O.M.C) Chapter 15.37, Entitled "All-Electric Construction in Newly Constructed Buildings"; And Adopting CEQA Exemption Findings.

For questions regarding this report, please contact William A. Gilchrist, Director of the Planning and Building Department, 510-238-2229.

Respectfully submitted,



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