



INTER OFFICE MEMORANDUM

TO: ECAP ad hoc Community Advisory Committee

FROM: Daniel Hamilton

SUBJECT: Building Electrification Information

DATE: July 23, 2019

Foundation: IPCC Report for Policy Makers: Climate change caused by greenhouse gas emissions is significantly impacting the livability of the planet, and urgent action is needed to ensure the long-term viability of cities and nations. [The 2018 IPCC report](#) finds that limiting global warming to 1.5°C would require “rapid and far-reaching” transitions in land, energy, industry, buildings, transport, and cities. The majority of reductions in GHG emissions must occur by 2030 to avoid the most serious impacts of climate change. Globally, this translates to a reduction in emissions of 45% between 2010 and 2030.

In addition to the global analysis above, the State of California, through the California Energy Commission (CEC), has provided strong evidence of the need for building electrification to be a foundational piece of the State’s climate change strategy. The CEC has published reports that all-[electric building requirements are beneficial](#) to all utility customers, will improve the electricity grid, and significantly improve both GHG reductions and resident health. [Multiple long-term strategy reports](#) from the CEC indicate that all-electric buildings will be required Statewide in the future, and that leading cities are needed to demonstrate the effectiveness of the approach.

GHG Emissions in Oakland: Across the city, [the majority of emissions](#) in Oakland come from the burning of gasoline and diesel to power vehicles, as well as burning natural gas to provide heating and cooking for homes and businesses. With the creation of East Bay Community Energy, Oakland is now served with electricity that is more than 85% carbon free; expected to reach 100% carbon free within the next 10 years. With an abundant supply of clean green electricity, transitioning all remaining fossil-fuel based energy systems to electric alternatives becomes the City’s most impactful and cost-effective strategy for meeting the deep GHG reductions necessary to meet this global challenge and protect our community from deeper impacts of climate change. For newly constructed buildings, this memo provides a summary of the analysis demonstrating that all-electric buildings are a viable policy solution today.

Cost Effectiveness: Staff and stakeholders have been conducting analysis over the past several years to identify the most cost-effective ways to transition these building and transportation systems to electric alternatives. Working with the City, Bloomberg Associates prepared a [Cost Effectiveness Study for Reducing GHG Emissions in Oakland](#). This study concluded that electrifying the buildings and vehicles in Oakland are both cost-effective and critical items for the City to pursue, particularly the electrification of newly constructed buildings in the near term. This study is the most robust local government analysis ever undertaken to ascertain the costs

and benefits of such a policy, and conclusively demonstrates that Oakland is a prime location for requiring all newly constructed buildings to utilize electricity for all energy systems.

In addition to the Bloomberg Analysis, the Rocky Mountain Institute, a think tank focused on energy issues, [prepared an analysis of the costs and benefits of electrifying buildings](#) for four cities, including Oakland. This analysis came to a similar conclusion that all-electric buildings in Oakland are both cost-effective to build and to operate. The report concluded that the City should “Recognize and encourage all-electric new construction buildings as both a cost-reducing and carbon-reducing measure through new building codes”. The report also focused on the benefits of ending the construction of gas infrastructure in new residential buildings, documenting that the City should “Limit or stop further expansion of the natural gas distribution system to service more homes. Electric space and water heating is likely to provide the same service to customers for less cost and carbon emissions, and avoid the risk of stranded gas distribution assets”.

Health Benefits: Requiring all-electric buildings not only reduces the cost of both construction and lowers utility bills for residents and businesses, there are also significant health benefits for people using these buildings. Research into the impacts of natural gas systems in homes has been occurring across the medical and community health fields, documenting significant risks and impacts associated with natural gas cooktops, leaking natural gas from appliances, and poorly ventilated kitchens. Studies by [Lawrence Berkeley National Laboratory](#), the [National Institutes of Health](#), [California Energy Commission](#), and [Johns Hopkins University](#) have documented unhealthy levels of nitrous oxides (NOx) in homes with gas cooktops, particularly noting the disproportionately negative impact on inner city African American children. The Johns Hopkins University study calls for interventions to reduce exposure to natural gas to reduce asthma symptoms and morbidity in African American children, a critical policy consideration in considering whether to require gas-free buildings.

Regional and National Action to Electrify Buildings: Oakland is among more than 50 cities [actively considering policies](#) to reduce or eliminate the use of natural gas systems in buildings. In July 2019, the City of Berkeley became the first City to [ban natural gas systems](#) in all new construction, garnering a unanimous vote of Council following public support for the policy from residents, developers, the California Energy Commission, and PG&E. More than 30 cities in the Bay Area, in addition to cities along the central coast of California and in the Los Angeles area, have indicated that they are actively considering building codes that will eliminate natural gas systems from some or all building types. East Bay Community Energy (EBCE), in coordination with multiple other community choice energy providers, has provided cost-effectiveness studies for cities to use in considering this policy solution. EBCE has provided the City of Oakland with [analysis of all-electric buildings](#) in our climate zone, concluding that all-electric buildings are cheaper to build and will result in lower utility bills for all building types. This analysis was done in coordination with the standards set forth by the California Energy Commission, and can serve to meet the regulatory requirements of any Council action to eliminate natural gas options in newly constructed buildings. Similar studies have been completed for the peninsula and south bay, documenting similar results. These combined

analyses will enable dozens of Bay Area cities to consider all-electric building codes during the fall and winter of 2019.

Technologies for All Electric Buildings: Developers and contractors, as well as interested residents, have sought to learn whether there are appropriate technologies to replace the natural gas systems. Developers tend to focus mostly on replacements for gas furnaces, while residents tend to care most about gas cooktops. Staff in Oakland and elsewhere, including PG&E and other utilities, have been preparing materials to help interested parties learn about the wide range of technologies currently available for use in all-electric buildings. [Electric heating systems](#) such as heat pumps are available from many manufacturers, in sizes and configurations for any residential or commercial building type. Cooking systems for both homes and businesses have a variety of options, including [induction cooktops for homes](#), that are not only more energy efficient, but also far superior in cooking times and temperature control to natural gas cooktops. Working with other cities and industries, the Building Decarbonization Coalition has helped to demonstrate that all residential, commercial, and specialty building types can be designed as all-electric without any disruption to the ways residents and businesses currently use their homes and offices.

Conclusions: The City of Oakland is in an excellent position to reduce GHG emissions, decrease construction costs, lower utility bills, and improve the health of all residents through the elimination of natural gas systems in newly constructed buildings in Oakland. There is sufficient evidence of the cost effectiveness of the approach, market availability of technologies, and understanding within the impacted industries to ensure that the policy can be implemented as intended. Following the recent natural gas ban in Berkeley, multiple other cities in our region will be considering similar policies to this for these reasons. The cumulative impact of these policies will further aid rapid market transformation in the construction industry, and help Oakland take another major step forward in protecting the community from climate impacts.

City staff are conducting workshops with relevant stakeholders throughout the summer, and the proposed all-electric building code is tentatively scheduled to be publicly considered by the Community and Economic Development Committee on October 22nd. Full City Council consideration could then occur as early as November 5th.

Sincerely,

Daniel Hamilton
Oakland Public Works
Acting Manager, Environmental Services
