DATE: May 13, 2019

TO: Council Sustainability Committee

FROM: Director of Public Works

SUBJECT: Update on Possible Reach Code for Building and Vehicle Electrification

RECOMMENDATION

That the Committee reviews and comments on this report and provides direction to staff.

SUMMARY

This report provides an update on the effort to address natural gas appliances and infrastructure in new construction. Every three years, the California Building Code undergoes a full update and the 2019 Code will be in effect on January 1, 2020. Local jurisdictions can implement codes that are more stringent than the State Code and can address the electrification of buildings and vehicles. If local codes are adopted and approved in 2019, they can also be effective January 1, 2020. This report presents the results of cost-effectiveness studies prepared by the California Energy Codes and Standards program and stakeholder outreach being conducted by East Bay Community Energy (EBCE) and requests the Committee's direction.

BACKGROUND

On July 16, 2018, the Committee considered a report titled *Building Electrification & Reducing Natural Gas Use*[1]. The Committee recommended supporting and encouraging East Bay Community Energy (EBCE) to address electrification of existing buildings. The Committee 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.

[1] Report is available at https://hayward.legistar.com/LegislationDetail.aspx?ID=3551018&GUID=718DCC1C-13F6-41D0-8833-C72B0B86DCE5&Options=&Search=

On January 14, 2019, the Committee considered a report titled *Natural Gas Use in New Construction*[2], which described the current regional effort to develop a Reach Code that would encourage all-electric construction. The report mentioned that the 2019 California Building Standards Code will be effective on January 1, 2020. In order to adopt a Reach Code that will be effective on January 1, 2020, local ordinances must be adopted in September 2019 to allow time for filing with and review by the California Energy Commission and the California Building Standards Commission by the end of 2019. 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.

DISCUSSION

The California Energy Codes and Standards program has completed cost-effectiveness studies for potential Reach Codes that could take effect in January 2020. 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 home, low-rise multi-family building, medium office and medium retail. The computer modeling needed to determine cost-effectiveness for high rise residential buildings (four stories and higher) is still in development. The complete cost effectiveness studies are available on the California Energy Codes and Standards program website[3].

As shown in Attachment II, the table titled "2019 Potential Reach Codes Opportunities" shows that there are additional Reach Code elements beyond new construction that can advance all-electric buildings and electric transportation. The following items could be new requirements for existing buildings: panel upgrades, 240-volt wiring for additional electric appliances such as heat pump water heaters, electric vehicle (EV) chargers, and installation of EV chargers. These additional measures do not increase the energy efficiency of a building, so they do not require cost-effectiveness analysis. Staff seeks the Committee's direction regarding the requirements for existing buildings that should be included in the Reach Code.

Cost-Effectiveness Metrics – The studies use two different metrics to assess cost-effectiveness: on-bill, and time dependent valuation (TDV). The on-bill metric considers the customer's on-bill electricity and natural gas savings using utility rates projected over a 30-year timeframe accounting for discount rate and energy cost inflation. The TDV methodology is used by the California Energy Commission and considers fuel source, time of day and season to calculate costs or savings. Cost-effectiveness was evaluated for all sixteen climate zones in California.

[2] Report is available at https://hayward.legistar.com/LegislationDetail.aspx?ID=3834310&GUID=B84DE7FD-6A5A-43D6-A042-26992FFF031C&Options=&Search=

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

Residential Results – Four scenarios of all-electric construction for single-family and multi-family buildings were evaluated. The four scenarios included different combinations of energy efficiency, solar photovoltaics (PV), and batteries and all are cost-effective[4].

Non-Residential Results – The cost effectiveness study for non-residential construction evaluated similar scenarios with different combinations of energy efficiency, PV and batteries. The results found that all-electric construction for office and retail buildings is cost-effective[5].

Potential Code Requirements – The model Reach Code will likely offer two compliance options for most building types: the electric pathway and the mixed fuel pathway. For all building types, the mixed fuel pathway would require higher energy efficiency relative to the state energy code. Also, construction of a mixed fuel building is estimated to cost more than an electric building. Staff will provide more detail on the potential code in a presentation during the Committee meeting.

Potential EV Requirements – Investing in electric vehicle (EV) charging infrastructure during new construction is estimated to save 40% to 400% over the life of the building, compared to the cost of a retrofit. Requirements for EV charging infrastructure in new construction could include the following:

- EV Capable – Raceway (conduit) and electrical service capacity (breaker space);
- EV Ready – Raceway, electrical service capacity, overcurrent protection devices, wire and outlet (i.e. full circuit), and
- EV Supply Equipment – All the equipment needed to deliver electrical energy from an electricity source to the EV.

The current code (2016 CalGreen) requires each new single-family home to have at least one EV Capable parking space for a Level 2 charger. The 2019 CalGreen, effective January 1, 2020, will not change this requirement. The model code being developed could require:

- Increased number of EV parking spaces;
- Increased rate of charging capability (Level 1 versus Level 2), and
- Increased readiness to charge (EV Supply Equipment or EV Ready or EV Capable).

ECONOMIC IMPACT

A Reach Code may only be adopted if it is determined that the proposed requirements are cost-effective. Cost-effectiveness will be measured considering lifecycle costs using a 30-year timeframe. 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

[4] See page 75 of the "2019 Residential New Construction Cost-effectiveness Study – DRAFT", available at https://localenergycodes.com/content/2019-local-energy-ordinances/
[5] See pages 18 – 26 of the "2019 Nonresidential Cost-effectiveness Study – DRAFT", available at https://localenergycodes.com/content/2019-local-energy-ordinances/

the building can be accurately calculated. In addition to TDV, the studies also present cost-effectiveness in terms of the on-bill customer lifecycle benefit-to-cost ratio.
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. Before a Reach Code is adopted in Hayward, the required analysis must show that the code would provide economic benefits to the local community.

FISCAL IMPACT

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. Before a Reach Code is adopted, staff will evaluate the potential impacts that implementation would have on the General Fund.

STRATEGIC INITIATIVES

This agenda item does not directly relate to one of Council's three Strategic Initiatives.

SUSTAINABILITY FEATURES

Meeting the City's long-term GHG reduction goal of 82.5% by 2050 will require that the use of natural gas be significantly curtailed throughout the community. Eliminating the use of natural gas in new construction would be a step toward meeting this goal. Furthermore, a Reach Code that encourages all-electric construction is consistent with the following General Plan policy:

> **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.

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[6] with information and resources. On April 23rd and 24th, 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. Comments received at the meetings included:

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

- Many attendees were hesitant to support a Reach Code without better understanding the economic impacts it would have on current and future businesses.
- Staff from city building departments were concerned about implementation, noting that training staff for the 2020 statewide building code will be a challenge and that adding a Reach Code might slow down permitting processes.
- Berkeley may be developing an ordinance that would prevent any new natural gas infrastructure. The City wants to address mid- and high-rise residential buildings for which cost-effectiveness determination is dependent on the CEC releasing another cost-effectiveness model. The ban on gas infrastructure could be on the grounds of public health (indoor air quality) and safety (earthquake preparation), which would not be subject to the CEC's requirements for cost-effectiveness.
- City Council members from Albany present at the meeting said they plan on copying the ordinance developed by Berkeley.
- Requiring panel upgrades on existing homes could be problematic as some homes will require a new electric service from the utility's main line. Some services are overhead, but some are buried without conduit, which will require more expensive excavation of existing cabling.

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 made at the meeting included:

- Construction cost is always a primary concern. This seems to have been addressed.
- Cooking with a gas range seems to be the most preferred over electric.
    - Response: New induction cooktops are becoming more popular and are safer and easier to control than a gas range. Home builders recently selling all-electric townhomes reported no issues with the sale of homes that have induction stoves.
- One member noted that they own several (older) buildings and one is all-electric. The electric building is significantly more expensive to operate compared to the ones with natural gas.
    - Response: The older electric building most likely has electric appliances that use electric resistance technology. Heat pump technology is now available for space heating and water heating and is much more efficient and cost-effective than electric resistance.

Later this month, EBCE anticipates releasing a draft model code as well as materials and trainings for Building Departments to assist with implementation of the Reach Codes. EBCE plans to hold additional meetings soon for builders, developers and city building department staff.

NEXT STEPS

Upon on direction from the Committee, staff may return to the Committee in July to present a draft Reach Code. Additional steps would be as follows:

May – August 2019	Continue Stakeholder Engagement
September 2019	Present Reach Code for Council Adoption
Late September 2019	Submit Reach Code to CEC for Approval
January 1, 2020	New Code Takes Effect

Prepared by: Erik Pearson, Environmental Services Manager

Recommended by: Alex Ameri, Director of Public Works

Approved by:

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Kelly McAdoo, City Manager