STAFF REPORT

AGENDA NO: Study Session

MEETING DATE: February 18, 2020

To: **Honorable Mayor and City Council**

Date: **February 18, 2020**

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Subject: **Discussion of Building Electrification and Electric Vehicle Infrastructure Reach Codes**

RECOMMENDATION

Staff requests that the City Council discuss Building Code reach codes and electric vehicle (EV) infrastructure in new developments.

BACKGROUND

Reach codes are local building code amendments that go beyond the State's requirements for energy efficiency and green building standards. Local governments adopt reach codes to increase energy efficiency, reduce greenhouse gas (GHG) emissions, and meet climate action goals. The City of Burlingame last adopted reach codes in 2010 to require new development to complete the GreenPoint rated checklist to improve energy efficiency. That reach code has since been superseded by CALGreen, the state's green building code.

Reach codes that encourage new developments to reduce or eliminate natural gas in new construction have gained momentum over the past year. Natural gas usage in buildings represents one of the largest sources of GHG emissions for local municipalities, usually second to transportation, and California is taking significant action to eliminate GHG emissions from buildings. In 2018, California adopted SB 100 mandating that all electricity in California be carbon free by 2045; Executive Order B-55-18 calls for California to be carbon neutral by 2045. These ambitious targets ignited efforts on the local level for cleaner electricity and a move away from fossil fuels. Local community choice aggregation programs have accelerated the use of renewable energy and commitments for carbon-free electricity. Peninsula Clean Energy, Burlingame's local electricity provider, is on the path to 100% renewable energy for San Mateo County by 2025 and currently offers 90% carbon-free electricity.

Peninsula Clean Energy (PCE), with the support of the San Mateo County Office of Sustainability and Silicon Valley Clean Energy, is encouraging local jurisdictions to adopt reach codes that eliminate or limit the use of natural gas for space heating, water heating, and cooking; require solar

installations on new multi-family and commercial developments; and require electric vehicle (EV) charging infrastructure in all new development. PCE awarded the City of Burlingame, along with other San Mateo County municipalities, a $10,000 grant to assist with staff work related to consideration of reach codes.

PCE developed proposed reach codes for cities to consider. The initial proposed PCE model recommended a mixed fuel option for new buildings. Under this model, new developments may choose to build all-electric, or they may use natural gas provided they meet 15% higher efficiency standards and install wiring and circuits for electric appliances. This approach incentivizes builders to choose all-electric since meeting higher efficiency standards and prewiring for electric appliances adds considerable cost to projects.

The City of Menlo Park considered the PCE proposed code but decided to require all low rise residential (one-three stories) to use electric space and water heating (with some exceptions) and the option of natural gas for cooking; and new commercial and high rise multifamily buildings to be all electric (with some exceptions). Menlo Park took this route to simplify the permit process, achieve higher GHG emissions reductions, and benefit from the high cost savings of building electrification at the design phase rather than as a future retrofit. The exceptions in Menlo Park's code include:

- Life science buildings may use natural gas for space heating.
- Public agency owned and operated emergency operations centers (such as fire stations and police stations) may use natural gas.
- Nonresidential kitchens (such as for-profit restaurants and cafeterias) may appeal to use natural gas stoves.
- For all exceptions that are granted, natural gas appliance locations must be electrically pre-wired for future electric appliance installation.

Following Menlo Park's reach code adoption, local jurisdictions opted to consider what is known as the Menlo Park model, or all-electric with limited natural gas, in lieu of the PCE proposed reach code. The Menlo Park model is supported by PCE and is considered to be simpler and more effective to implement. PCE released a new proposed reach code based on the Menlo Park model in January 2020.

More than 50 cities in California have adopted reach codes to limit or eliminate the use of natural gas, including the cities of Berkeley, San Jose, Menlo Park, Morgan Hill, and Los Angeles, as well as the University of California. Both the City of Berkeley and the Town of Windsor have been sued following their adoption of reach codes. Berkeley was sued by the restaurant association in federal court after enacting a total ban on natural gas in new construction. Windsor was sued in state court after adopting an all-electric mandate for certain low-rise residential development. The theory of that case is that Windsor's invocation of CEQA exemptions was inappropriate and that the town should have done a full environmental review. To date, local jurisdictions have adopted the following:

TABLE 1. Reach Code Status in Local Cities

City	Reach Code
Morgan Hill	Adopted NG ban
Brisbane	Adopted all-electric with limited NG
Menlo Park	Adopted all-electric with limited NG
Mountain View	Adopted all-electric with limited NG
Pacifica	Adopted all-electric with limited NG
Palo Alto	Adopted all-electric with limited NG
San Jose	Adopted all-electric with limited NG
Redwood City	In process for all-electric with limited NG
San Mateo County	In process for all-electric with limited NG
San Mateo	Adopted fuel choice option
Milpitas	Adopted fuel choice option
Foster City	Early in process
San Carlos	Early in process
Millbrae	Early in process

DISCUSSION

On November 4, 2019 the City Council held a study session to discuss reach codes for building electrification and electric vehicle infrastructure. The City Council directed staff to conduct outreach to local developers on the reach codes to identify and address potential issues and concerns and then come back for a second study session. Subsequently, staff hosted two stakeholder meetings and invited local developers with experience in single family, multi-family, and commercial construction. Three developers, one from each of the respective sectors, attended the first session on November 21, 2019, along with representatives from Peninsula Clean Energy and Menlo Park. The developers provided valuable feedback on refinements. Upon request by the developers, staff hosted a second meeting on January 8, 2020, to address concerns and input shared at the first meeting. Staff also discussed reach codes with the Citizen's Environmental Council (CEC) at their January 8, 2020 monthly meeting.

Based on stakeholder input, action by neighboring jurisdictions, guidance from PCE, and Burlingame's greenhouse gas reduction goals, staff recommends that the City Council consider and discuss the PCE recommended Menlo Park model reach codes for building electrification and solar. Staff is recommending slightly different EV infrastructure requirements than the PCE recommended version based on discussions from the stakeholder meetings. The reach code recommendations are listed in Table 2.

Table 2. Recommended Reach Codes for Discussion

Proposed Reach Code	Building Electrification	Solar	EV Infrastructure
Single Family Homes and Townhouses with Private Garages	All electric; NG allowed for cooking with prewiring.	NA - Solar already required by Building Code.	One level 2 (dryer plug/220volt) and one level 1 (standard outlet) charging. Single space garages to have one level 2 charging.
Multi-family Buildings	All electric; NG allowed for cooking with prewiring. Exemption allowed if electric water heating is demonstrated to be infeasible.	< 10,000 sq. ft. – min. 3kW PV system. >10,000 sq. ft. – min 5kW PV system. Exemptions for buildings with limited solar zones and shading.	10% of units with level 2 charging; 90% of units with level 1 charging. A level 1 outlet may be shared between two units. Load management software allowed. Exemption allowed if installation cost exceeds $4,500/space.
Commercial Buildings	All electric; NG allowed for restaurants, cafeterias. Exemption for Life Science buildings and buildings over 100,000 sq. ft. if all-electric demonstrated to be infeasible.	< 10,000 sq. ft. – min. 3kW PV system. >10,000 sq. ft. – min 5kW PV system. Exemptions for buildings with limited solar zones and shading.	Office: 10% of parking spaces with level 2 charging; 10% with level 1 charging. Other: 6% with level 2; 5% with level 1 charging. Exemption for mechanical parking systems and locations without commercial power supply.

The discussion below addresses questions, concerns, and comments raised by stakeholders and Councilmembers on reach codes.

Electric water heating for large multi-family buildings can be costly and infeasible, especially for buildings located in a flood zone area.
Staff agrees that this issue can pose challenges for new large multi-family developments and in response made an exemption for such circumstances.

Residents do not want to give up cooking with natural gas.
Many people are used to and comfortable with natural gas cooking and are most likely not aware of the benefits of cooking with electric stovetops, specifically induction ranges. Developers have

indicated concerns with competitiveness in the market if they are not able to offer gas cooktops, at least until induction ranges receive greater market acceptance.

Staff recommends that natural gas be allowed for cooking in response to strong preferences and following the example of other cities; however, installing natural gas for cooking eliminates significant cost savings possible from avoiding natural gas hook-ups and the health benefits of an all-electric home. Staff recommends that developers be required to share information on the benefits of an all-electric home with their clients. Staff can create outreach materials including flyers and online information. Information on all-electric buildings may also be integrated into the pre-application process for new developments.

All-electric is fine for buildings less than 25,000 square feet. However, for large buildings it can be costly and infeasible.

Staff received mixed responses on this issue. Some construction experts say that all-electric is more of a problem for buildings larger than 100,000 square feet. One construction expert noted that buildings less than 100,000 square feet may be built more cost effectively as all-electric than with natural gas. Other experts noted that all-electric is possible and cost-effective for buildings larger than 100,000 square feet. All-electric can be a challenge for life science buildings and hospitals due to high demands for sterilization and high hot water loads.

Is an all-electric new building cost effective over a mixed-fuel new construction?

Building electrification reach codes make local amendments to the state's Energy Code, and the California Energy Commission (CEC) requires such reach codes to demonstrate that the amendments are cost effective and do not cause unreasonable burden to builders. The California Statewide Codes and Standards Program (a statewide utility program) has been supporting the reach code effort and prepared cost-effectiveness studies analyzing all-electric and mixed-fuel new construction that jurisdictions can apply in their reach codes.

The CEC's most recent study, 2019 Nonresidential New Construction Reach Cost Effectiveness Study, reports that avoiding the installation of natural gas infrastructure in nonresidential (office, retail, and hotels) buildings results in significant cost savings, even with necessary increases in electricity capacity. The CEC stated similar results for their Low-Rise Residential New Construction cost-effectiveness study. In particular, the report found that an all-electric single family home has a cost savings of $5,349 over a new mixed-fuel home. The cost savings for multifamily was $2,337/apartment.

A summary of input from Bay Area architects and engineers on the cost effectiveness of all-electric buildings is attached to this report. The summary was provided by Scott Shell, Principal Architect with the architectural firm ehdd, and highlights support and examples of all-electric buildings.

The EV Infrastructure Cost Analysis Report funded by PCE and Silicon Valley Clean Energy found that installing EV infrastructure in new buildings costs four times less than retrofitting a building later on. Installing conduit in new construction also saves significant costs compared to retrofitting.

How will the reach codes apply to projects in the pipeline?
Projects that have been granted planning entitlements within one year or less of the effective date of the ordinance are not required to comply.

What are the greenhouse gas reduction estimates for implementing the reach codes?
The City's Climate Action Plan currently estimates reductions from green building and efficiencies in natural gas to about 3,300 MTCO2e by 2030 (CAP Measures 11 and 12). Adopting an all-electric building reach code would contribute an additional 3,000 MTCO2e reduction by 2030. Reductions from a mixed fuel approach would be much less since the reach code would rely on voluntary participation.

The EV infrastructure reach code directly implements Measure 6 in Burlingame's CAP that requires new residential developments to include level 2 charging. The measure is estimated to reduce 29 MTCO2e in 2030.

How big of an impact would reach codes have in Burlingame?
On average, the City permits approximately 14 new single family homes per year, one or two new major multi-family projects per year, and one or fewer new commercial buildings per year.

Can Peninsula Clean Energy keep up with the increased electricity demand of reach codes?
PCE anticipates a modest impact from reach codes on their electricity load. PCE will be modeling the outcomes of the countywide reach code efforts and has high confidence that they will be able to meet the growth in demand.

Solar PV systems do not make sense on roofs that experience a lot of shade or are too steep.
Staff agrees and is allowing for exemptions for new development where solar is infeasible due to existing shading, roof slopes, and other limitations to rooftop solar zones.

EV infrastructure is difficult to install in parking lots that use automated mechanical parking systems.
Staff agrees and recommends that mechanical parking systems be exempt from the EV infrastructure requirements.

EV infrastructure costs increase dramatically if a new transformer is required to meet power needs.
Staff agrees and is following PCE's recommendation that an exception to the EV infrastructure requirements can be made if the cost per space for EV infrastructure exceeds $4,500.

Do the EV charging spaces have different size specifications?
No. Spaces must comply with regular planning and building code parking space specifications.

New developments should not be burdened with providing EV charging for all users; especially since charging technology is still changing.

Staff understands that developers are cautious about installing technologies that may be unused or abandoned in the future. Still, demand for electricity access for EVs and electric bikes and scooters is expected to continue to increase over time. The staff recommended EV infrastructure requirements were formulated at the stakeholder meetings and entail lower requirements than PCE's proposed model.

Are the EV Infrastructure requirements part of the reach code?
EV infrastructure is considered one reach code and building electrification a separate reach code.

How will building electrification be impacted by power outages?
Power outages affect mixed fuel and all-electric buildings similarly because most natural gas appliances, other than gas stovetops, rely on electricity to operate. Also, reach codes do not affect diesel powered back-up generators commonly used by buildings during power outages.

PCE has started exploring how to minimize risks from power outages and is collaborating with other Bay Area community choice energy programs on resiliency projects. For example, PCE and its community choice partners issued a joint solicitation for the installation of battery storage for their customers. The program will provide reliable power to about 6,000 homes through the use of backup battery storage during power outages.

How will the reach codes be implemented?
The reach codes will be enforced as part of the City's building code requirements. Staff will integrate the reach code requirements into the Building Division's existing CALGreen checklist, which will inform applicants about the exact specifics of the reach code measures and be part of the Building Division's review process.

When would the reach codes go into effect?
Following Council direction, staff will propose a reach code ordinance for Council approval. If approved, staff will file the reach code with the CEC and await a 15-day comment period. Once approved by the CEC, the reach code would go into effect at the end of the CEC comment period, or later depending on the City's timeline.

Can Burlingame offer incentives for all-electric building instead of mandating it?
The City of Burlingame may encourage, but not require, new developments to be designed for all-electric construction. For example, the interim zoning created for Burlingame's North Rollins Road and North Burlingame Mixed Use Districts includes an option for increased floor area and building height for "Net Zero Energy" projects that receive 100 percent of total energy from renewable sources. One option would be to offer a similar incentive approach elsewhere in the city.

Another option would be to encourage passive solar design in new development. This would allow energy savings through solar water heating and/or windows, walls, and floors that collect, store, reflect, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer.

Next Steps
Staff is seeking direction from the City Council on the best reach code route for Burlingame. Following Council direction, staff will propose a reach code ordinance for City Council consideration.

FISCAL IMPACT

None.

Exhibit:

- Cost Effectiveness of All-Electric Buildings