



EAST PALO ALTO CITY COUNCIL STAFF REPORT

DATE: March 7, 2023

TO: Honorable Mayor and Members of the City Council

VIA: Melvin Gaines, City Manager

BY: Amy Chen, Community & Economic Development Director
Romeo Herrera, Chief Building Official

SUBJECT: Introduction of 2023 Reach Codes: Proposed Electrification Reach Codes for 2022 Green Building Standards Code

Recommendation

Waive the first reading and introduce an ordinance amending Chapter 15.11 of the East Palo Alto Municipal Code to adopt local amendments to the 2022 edition of the California Green Building Code to adopt a “Reach” Code, and make any necessary conforming amendments.

Alignment with City Council Strategic Plan

This recommendation is primarily aligned with:

Priority No. 6: Create a Healthy and Safe Community

Background

On December 6, 2022, the City Council unanimously adopted the 2022 California Building Standards Code and asked staff to return with a potential update to the local Building Code that would exceed minimum State code standards (known as Reach Codes). East Palo Alto had previously adopted Reach Codes on October 20, 2020 that were tied to the 2019 California Building Standards Code. Thus, this staff report contains a new proposed 2023 Reach Code ordinance to go above and beyond the 2022 California Building Standards Code.

The City of East Palo Alto has reengaged with Peninsula Clean Energy to explore the update to the Reach Codes. Peninsula Clean Energy is a not-for-profit and community-owned energy provider based in San Mateo County that provides expert technical assistance cities like EPA to develop and implement building reach codes. Peninsula Clean Energy has several incentive programs supporting electrification regardless of what reach codes EPA adopts, including electric appliances, zero-interest loans, and EV Infrastructure rebates. The programs have enhanced offerings for income-qualified households.

The City of East Palo Alto has demonstrated leadership in sustainability when adopting reach codes during the 2019 code cycle and is in the process of updating a Community Climate Action Plan and Adaptation Strategies 2030 (Draft CAP 2030). The Draft CAP 2030¹ is currently under public review and it is anticipated to undergo a CEQA review to ensure compliance. The original Climate Action Plan (CAP) was adopted in December 2011 with a goal of reducing greenhouse gas emissions by 15%. This CAP matured in 2020, with the 23 actions yielding about 20% reduction in GHG emissions from the City’s baseline year of 2005. The proposed 2023 Reach Codes will help reduce carbon emissions associated with new construction, reduce costs in new construction, improve indoor air quality and safety of our building stock, support affordable housing, and increase adoption of electric vehicles.

In alignment with the above, staff recommends modifying Part 11 of the California Building Code. This report provides an overview of the Statewide cost-effectiveness study, detailed findings, and provides language recommended for the associated reach code for the 2022 code cycle.

Analysis

The following is a summary of the proposed 2023 Reach Code specified by building type. These requirements would be applicable to new construction.

Proposed 2023 Reach Code Requirements

	Building Electrification	EV Infrastructure
Single Family Homes and Townhouses with Private Garages	<p>All electric</p> <p>Exceptions:</p> <ul style="list-style-type: none"> • No prescriptive pathway • ADUs and Junior ADUs (consider removing) • Physical constraints (consider removing) 	<p>Same as 2019</p>
Multifamily	<p>All electric</p> <p>Exceptions:</p> <ul style="list-style-type: none"> • No prescriptive pathway • Central water heating in entirely affordable building (may consider removing) • Domestic water heating projects granted entitlements (consider removing) 	<ul style="list-style-type: none"> • 40% of units with parking spaces, Level 2 EV Charging Stations (EVCS); • 60% of units with parking spaces, Level 1 EV Ready. <p>Exceptions:</p> <ul style="list-style-type: none"> • Planning entitlements if installation cost exceed \$4,500/space for market rate or \$400 /space for affordable

¹ Climate Action Plan Website: <https://www.cityofepa.org/econdev/page/climate-action-plan>

	<ul style="list-style-type: none"> Physical constraints (consider removing) 	
Nonresidential	<p>All electric</p> <p>Exceptions:</p> <ul style="list-style-type: none"> Restaurants, cafeterias No prescriptive pathway Scientific Laboratory Building (may consider removing) Emergency operation centers Physical constraints (consider removing) 	<p>Offices:</p> <ul style="list-style-type: none"> 20% Level 2 EVCS 30% Level 2 EV Capable <p>Other non-res:</p> <ul style="list-style-type: none"> 10% Level 2 EVCS 10% Level 2 EV Capable <p>Exceptions:</p> <ul style="list-style-type: none"> If installation cost exceeds \$4,500 /space Automated mechanical car parking systems

Reach Code Adoption Process

Every three years, the State of California adopts new building standards that are organized in Title 24 of the California Code of Regulations, referred to as the California Building Standards Code. The 2019 Code became effective on January 1, 2020, and the 2022 Code will become effective on January 1, 2023. Cities and counties can adopt reach codes that set conditions above the minimum state code requirements. However, these reach codes must be filed with the California Building Standards Commission.

A cost-effectiveness study is not required for amendments to efficiency or conservation standards, such as only requiring electrification, and the amendments can be made to the Green Building Standards Code (Title 24, Part 11, also known as CALGreen). Calif. Pub. Res. Code Sec. 25402.1(h)(2); CCR, Title 24, Part 1, 10-106. However, a cost-effectiveness study has been performed to demonstrate to the public that amendments to the code are financially responsible and do not represent an unreasonable burden to the residential and nonresidential building owners and occupants.

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) is leading the development of cost-effectiveness studies for Energy Code reach codes that examine different performance-based approaches for new construction of specific building types.

The Statewide Program is analyzing the cost-effectiveness of several new construction building prototypes. A Single Family and Accessory Dwelling Unit (ADU) cost-effectiveness study², including one-story and two-story single-family homes, and a 650 ft² ADU, has been published thus far. A nonresidential cost-effectiveness study³ has been released that analyzes cost-effectiveness of a three-story office building, a one-story retail building, a four-story hotel,

² Single Family and Accessory Dwelling Unit (ADU) cost-effectiveness study:
https://localenergycodes.com/download/1364/file_path/fieldList/2022_PCE_SVCE_SF_NewCon_CE_Report.pdf

³ A nonresidential cost-effectiveness study:
https://localenergycodes.com/download/1266/file_path/fieldList/2022_Nonres_New_Construction_Cost-eff_Report.pdf

and a quick-service restaurant. In early 2023, a multifamily building cost-effectiveness will be released.

The Single-Family and ADU study prototypes are directly applicable to City of East Palo Alto development. The City has averaged five new single-family homes constructed each year over the past five years. Additionally, many approved development projects include photovoltaic, reroofs, commercial tenant improvements, signs, and antennas.

The Statewide Program team analyzed the capital and operational costs of mixed-fuel and all-electric new construction over 30 years for residential buildings. Results generally indicate that all-electric new construction is cost-effective in East Palo Alto's climate zone using an energy policy metric used by the California Energy Commission (CEC) that takes into account the societal costs of greenhouse gas emissions. While there is an on-bill cost-effective pathway for all-electric new construction electrification, this package requires the addition of some limited efficiency measures and/or increases in on-site solar photovoltaics (PV) beyond what is already required by the state. Generally, all-electric buildings are less costly upfront to construct, but operational costs increase compared to mixed-fuel buildings, thus additional solar PV and efficiency measures are necessary to be on-bill cost-effective.

Lastly, the nonresidential cost-effectiveness study highlights some exceptions that would be prudent to include in the code to reflect significant hurdles in cost-effectiveness or code compliance. Namely commercial kitchen appliances, and building systems that do not have designated compliance pathway in the Energy Code.

Electrification Policy Types

Building appliance electrification options in California can generally be broken into four categories:

- All-Electric Municipal Ordinance: No gas hookup allowed (via municipal ordinance), with limited exceptions. Is not tied to the building code and can be adopted indefinitely.
- All-Electric Required: Appliances must be electric (via CALGreen, Title 24 Part 11), with some exceptions. Must be re-adopted with every code cycle.
- All-Electric Required plus Efficiency and/or Solar PV: Appliances must be electric and include a package of efficiency and solar PV measures (via Energy Code, Title 24 Part 6), with some exceptions. Must be approved by the CEC and re-adopted with every code cycle.
- All-Electric Preferred: Allows mixed-fuel buildings with high energy performance, requiring additional energy efficiency measures, battery storage, and/or pre-wiring for buildings to be electric-ready (via Energy Code, Title 24 Part 6). Must be submitted to the CEC and re-adopted with every code cycle. The state's 2022 Energy Code already represents an All-Electric Preferred model in a number of ways, such as improved time dependent valuation (TDV) performance, pre-wiring for gas appliances, and higher ventilation rates for gas stoves. This local amendment would tip the scales even more toward all-electric new construction.

Electric Vehicle Charging Infrastructure

Electric Vehicle (EV) charging requirements in California can generally be broken into three categories:

- EV Charging Station: All supply equipment is installed at a parking space, such that an EV can charge without additional equipment.

- EV Ready: Parking space is provided with all power supply and associated outlet, such that a driver-provided supply equipment can be plugged in, and a vehicle can charge.
- EV Capable: Conduit is installed to the parking space and building electrical panel and transformers have reserved capacity to serve future load. An electrician would be required to complete the circuit and/or increase the gauge of upstream wiring before charging is possible.

EV charging capacity can be summarized as three categories:

- Level 1: Capable of charging at 110/120V, 16A. This is equivalent to a standard home outlet.
- Level 2: Installation of a 208/240V, 40A circuit or 208/240V, 20A circuit for low-power. This is the service capacity typically used for larger appliance loads in homes.
- Level 3 (DC Fast Charging): Capable of charging at 20-400kW. This is the type of charger used for Tesla Superchargers and DC Fast Chargers at some supermarkets.

The 2022 California Green Building Code update (Title 24, Part 11) increased requirements for electric vehicle charging infrastructure in new construction compared to 2019; including:

- New one- and two-family dwellings and townhouses with attached private garages: must be Level 2 EV-capable
- Multi-family dwellings:
 - 5% must be Level 2 EV Charging Stations
 - 25% must be Low Power Level 2 EV Ready, and
 - 10% of parking spaces must be Level 2 EV Capable.
- Non-residential:
 - 5% must have Level 2 EV Charging Stations, and
 - 15% of parking spaces must be Level 2 EV Capable.

Building Appliance Electrification

Each option for building electrification has unique benefits and demerits. Attachment 3 contains a table of ordinances that have been adopted in San Mateo County, Santa Clara County, and Alameda County jurisdictions under the October to December 2022 time period, which includes 36 cities that have adopted an all-electric reach and/or EV infrastructure reach codes.

All-Electric Municipal Ordinance

Several cities, including the cities of Berkeley, Morgan Hill, San Francisco, and San Jose, have adopted all-electric municipal ordinances (also referred to as gas prohibitions), that are more aggressive than the all-electric and electric-preferred model reach codes. These ordinances eliminate the installation of gas infrastructure at the property with limited exceptions, and thus guarantee significant decreases in greenhouse gas emissions.

All-Electric Required Building Code Amendment

The all-electric required model requires installation of electric appliances for specific end-uses, including space heating, water heating, clothes-drying, and cooking, with limited exceptions. Efficiency or solar PV measures may be added to improve on-bill savings.

All-Electric Preferred Building Code Amendment

The all-electric preferred approach encourages electrification by giving builders two options:

1. Achieving a higher energy efficiency level than the Energy Code using mixed fuels (fuel

- gas and electricity); or
2. Building an all-electric building at the minimum efficiency as required in the Energy Code.

The all-electric preferred model is NOT recommended by Peninsula Clean Energy because the California Energy Code is already an electric-preferred model. There are limited incremental greenhouse gas emissions reduction that can be attained by pursuing this model, compared to the All-Electric Required Municipal Ordinance or All-Electric Required Building Code Amendment.

Electric Vehicle Charging Infrastructure

Local residents are showing a significant interest in electric vehicles. The number of registered plug-in vehicles in San Mateo, Santa Clara, and Alameda counties increased 30% from 2019 to 2021. In that same time frame, the total number of registered gas combustion vehicles in these counties *shrank* by 4%.⁴ In San Mateo County, 1 in 4 personal new vehicles purchases was an EV in 2021.

It is widely known that availability of EV charging infrastructure is a critical component to EV adoption. Meanwhile, it is significantly more expensive to install charging infrastructure as a retrofit than it is during new construction. As such, ensuring that newly constructed residential and non-residential parking has ample EV charging capability will reduce long-term retrofit costs of EV infrastructure installation, while helping to increase EV adoption and decrease transportation-related greenhouse gas emissions.

While California's new minimum requirements are a step forward, it is unlikely that the requirements for multi-family dwellings and non-residential buildings are enough to keep pace with expected EV growth looking towards 2030. The Statewide Program's team reviewed approaches to increase the amount of EV infrastructure in new construction buildings, while keeping construction costs as low as possible.

Building Appliance Electrification Reach Codes

Staff have worked closely with Peninsula Clean Energy's consultants to interpret the Statewide Program study's results and research⁵, and to infer what options may or may not be cost-effective for the building types that are prevalent in East Palo Alto but were not analyzed by the team. Peninsula Clean Energy also provided consultant support to assist cities in understanding the cost-effectiveness study results and adopting reach codes.

The proposed reach codes meet the requirements of the CEC for cost-effectiveness if needed,

⁴ Light-Duty Vehicle Population in California: <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/light-duty-vehicle>

⁵ Other Studies:

AB3232 Decarbonization Assessment 2021: <https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment>

CA Energy Commission 2018: <https://www.energy.ca.gov/publications/2018/deep-decarbonization-high-renewables-future-updated-results-california-pathways>

CA-ISO 20-Year Transmission Outlook: <http://www.caiso.com/InitiativeDocuments/Draft20-YearTransmissionOutlook.pdf>

LA Times Op-Ed: <https://www.latimes.com/opinion/story/2022-09-13/california-electric-grid-batteries-heat-wave-september-2022>

California Public Utilities Commission:

<https://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&docid=496876177>

and are cost-effective over the lifetime of the building systems for new construction buildings within city limits. Notably, the results of the analysis show that all-electric buildings are typically less expensive to construct.

The recommended reach code for newly constructed buildings is the All-Electric Required Building Code Amendment, which requires all newly constructed residential and non-residential buildings to be built all-electric. Buildings will have no fuel gas infrastructure installed, and electricity will be the sole source of energy for all space heating, water heating, cooking, and clothes drying appliances. Some limited exceptions may include:

1. Commercial cooking equipment
2. Industrial processes
3. 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 may grant a modification.
4. ADUs and Junior ADUs
5. When improvements to existing buildings contain physical constraints that prevent conformance to the All-Electric Building requirements, the applicant may request an exception
6. Central water heating in entirely affordable building
7. Planning entitlements granted prior to January 1, 2021.
8. Scientific laboratory
9. Emergency centers

Staff recommends removing exceptions 4 and 8.

Buildings that invoke these exceptions would be required to prepare the location of fuel gas appliances for future electrification, in order to reduce future retrofit costs. Attachment 4 gives a summary of the 2019 EPA requirement, the 2022 CalGreen requirement, and the 2023 proposed reach code requirement.

Electric Vehicle Charging Infrastructure Reach Codes

To evaluate the financial impact on first costs, Peninsula Clean Energy commissioned an analysis of the total cost of implementing various EV infrastructure measures. Staff have worked closely with Peninsula Clean Energy to establish new construction EV requirements which are more in-line with local EV adoption trends, while providing flexibility for the builder and keeping construction costs as low as possible.

Staff incorporated some existing building requirements that are triggered when new parking facilities are added or existing parking facilities alterations involve electrical or lighting work. These requirements include that 10% of these new or altered parking facilities be Electric Vehicle Charging Stations (EVCS), and that any existing EV Capable spaces on-site to be converted to EV Ready spaces.

Recommended requirements for EV infrastructure are:

Residential

- Single Family Dwelling:
 - One dedicated EV ready Level 2 circuit, and
 - One dedicated EV ready Level 1 circuit if there is a second parking space.
- Multi-Unit Dwelling:

- 40% of units with parking spaces, Level 2 EV Charging Stations;
- 60% of units with parking spaces, Level 1 EV Ready.

Non-Residential Office

- 10% of the parking spaces, Level 2 EV Charging Stations installed
- 10% must have Level 1 EV Ready, and
- 30% of the parking spaces, Level 2 EV Capable

Non-Residential, Non-Office

- 10% of the parking spaces, Level 2 EV Charging Stations installed
- 10% of the parking spaces, Level 2 EV Capable

With regards to potential grid impacts, Peninsula Clean Energy's consultants point to the following facts:

1. Reliability is a concern only during summer peak cooling times. Increases in cooling demand are primarily due to climate change increasing summer temperatures.
2. California Energy Commission's AB3232 analysis indicates that aggressive electrification will result in 20 percent additional summer peak load through 2030. Winter load expected match summer peak load.
 - a. Note: Represents PG&E territory. Assumes all-electric for 100% new construction, 90% replace on burnout, and 70% early retirement for remaining existing buildings.
3. All-electric technologies can draw power flexibly. Electric vehicles can charge during off-peak periods, water heating tanks can increase temperature ahead of peak periods, thermostat setbacks can reduce space conditioning demand, and several other approaches will avoid power outages.
4. CEC has determined that electrification is the lower cost, lower risk approach to decarbonization, compared to all alternatives.
5. CA-ISO has performed a 20-year study and has recommended over \$30B in transmission investments to account for increased renewables and decommissioned gas power plants
6. Utility-scale battery power output increased 27-fold during heatwaves from August 2020 to August 2022. Having diversity in electrical power sources has already improved grid performance.
7. PG&E has a regulated service obligation to meet customer needs.

Attachment 4 gives a summary of the 2019 EPA requirement, the 2022 CalGreen requirement, and the 2023 proposed reach code requirement.

Applicability

The 2020 Reach Codes only applied to new development projects and to projects that have not yet received their approved planning entitlements. Multifamily projects with their approved planning entitlements before January 1, 2021 would be exempt from all-electric domestic water heating, and would only need to meet the parking percentage requirements in the baseline code (CALGreen Part 11). All other portions of the Reach Code would still apply. Here is the language of the exceptions:

- Multifamily residential building projects that have been granted entitlements within two years or less, or have been submitted for entitlement, before the effective date of the EPA 2019 ordinance are not required to install all-electric water heating systems. If the Building Official grants a modification pursuant to this Exception, the applicant shall comply with the pre-wiring provision noted above.
- Multifamily residential building projects that have approved entitlements before the 2019

reach code effective date shall provide the minimum 2022 California Green Building Standards Code requirements. If adopted by City Council, the ordinance would take effect 30 days after the second public hearing which could be as soon as the next City Council meeting: March 21 approval.

Although Reach Codes apply to the building phase of a development project, it is important for development projects to build in these improvements early on in their design and in the planning phase. The next building code update will be implemented January 1, 2026. Thus this Reach Code ordinance will further help development projects prepare their projects for further changes to the building code over the next few years.

Public Input

On February 16, 2023, a virtual public meeting was held to discuss the potential update to the EPA Reach Code ordinance. The public meeting was posted on the City website, promoted through the City's email newsletter (4,400 recipients) and social media, including the City's Facebook page (2,300 subscribers). A total of 5 developers and community stakeholders participated, and the following key topics were discussed:

- Overview of Reach Codes: A presentation by Rupam Singla, from TRC, a consultant brought on by Peninsula Clean Energy.
- Peninsula Clean Energy incentives: Design assistance and financial incentives available for affordable housing and non-residential buildings, and how to access them.
- Potentially maintaining exceptions in the all-electric mandate for restaurants that prefer gas cooking.

Next Steps

The second reading of this recommended ordinance would occur at the next available City Council meeting.

Fiscal Impact

There is no fiscal impact with the items described in this staff report.

Public Notice

Notice of the public hearing was published in the local newspaper: Palo Alto Daily News on February 24, 2023. Additionally, on March 3, 2023, the City Council agenda and staff report were made available on the City's website and on a bulletin board located at City Hall: 2415 University Avenue, East Palo Alto.

Environmental

This action is exempt from 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 Plan.

Attachments

1. Resolution
2. Ordinance
3. Table of Other Jurisdictions
4. Summary of Current and Proposed Requirements