

**Rincon Consultants, Inc.**

180 North Ashwood Avenue
Ventura, California 93003

805 644 4455 OFFICE AND FAX

info@rinconconsultants.com
www.rinconconsultants.com

M E M O R A N D U M

Date: June 22, 2022

To: David Jones
Sustainability Officer
City of Glendale

Via: djones@glendaleca.gov

From: Ryan Gardner Climate Action Program Manager
RGardner@rinconconsultants.com
(510) 671-0177

Subject: Building Electrification, Photovoltaic Infrastructure, and Electric Vehicle Charger
Building Codes Information & Recommendations for the City of Glendale

Project Number: 21-11996

Attachment A: 2019 Building Reach Code Summary

Ordinance Recommendations Summary

Pursuant to the request of the City of Glendale, Rincon Consultants, Inc (Rincon) has developed this memorandum detailing the options for building electrification, photovoltaics (PV) and electric vehicle (EV) charging ordinances to help align city staff and the consultant team on the type of ordinances to be proposed to City Council. The memorandum includes analysis of ordinance type (i.e., performance, prescriptive, and hybrid reach codes or municipal ordinances), details best practices for ordinance development, and provides examples of existing ordinances for other cities in California.

Implementation of building electrification, PV and EV charging are currently cornerstones of modern climate action planning and can lay the foundation for significant greenhouse gas (GHG) reduction across the building and transportation sectors. According to the California Energy Codes & Standards *Cost Effectiveness Study* (2019), all-electric low-rise residential buildings are less expensive to build and operate than mixed-fuel buildings in a majority of Glendale (in Climate Zone 9). The results also show that the inclusion of a PV system increases the cost-effectiveness of all electric buildings. While EV charging ordinances can provide for consistent design, reduce installation costs, mitigate GHG emissions that fuel climate change and bring more equity to underserved communities.

Executive Summary

This section provides a high-level summary of the research conducted by Rincon on the current best practices for reach code development and adoption in California. Based on an analysis of several criteria,

including effectiveness in reducing GHGs, feasibility of implementation, and cost-effectiveness, the following ordinance modifications have been identified as best practice for the City of Glendale in the effort to mitigate GHG and work towards achieving the State of California's carbon neutrality target of 2045.

Building Electrification: Require all new construction (including standalone additional dwelling units, [ADU]) to be all-electric with no exemptions except for an infeasibility waiver.

- This approach advances the strongest climate benefit by requiring developers to prove infeasibility of building electrification, instead of categorizing entire building types as electrification exempt.
- This structure maximizes long-term cost savings by keeping new gas infrastructure from being deployed, as most, if not all, new buildings in the City will be electrified (Gridworks 2020).

PV Infrastructure: Require non-residential and multifamily PV systems be installed on all new buildings to at a minimum offset 50 percent of projected electricity use or cover at least 50 percent of rooftop space. Include an infeasibility waiver for projects unable to meet the requirement due to shading or other constraints.

- This approach allows for PV installation sizes that produce a more ambitious GHG reduction for lower density buildings, while allowing flexible implementation in Glendale's urban environment where buildings with a large energy footprint may have a small available amount of rooftop space.
- The suggested percentages in this ordinance can be further adjusted.
- Current percentages based on existing example ordinances

EV Charging Infrastructure: Require at least one Level 2 EV-Ready space per unit for one- and two-family homes/low-rise multifamily units with consideration for an additional Level 1 EV-Ready space per unit; at least 40-50 percent Level 2 EV-Capable spaces for larger high-rise multifamily complexes, hotels, and motels with consideration for between 15-33 percent of total spaces to be Level 2 EV-Installed spaces; and 40-75 percent EV-Capable for non-residential properties with 33-50 percent of these spaces requiring Level 2 EV-Installed spaces.

- High level of EV-Capable spaces allows for future electric vehicle supply equipment (EVSE) installations without high cost.
- EV-Capable ensures new technologies which require different wiring standards do not result in stranded assets associated with EV-Ready spaces.
- Some EVSE units encourage EV usage today.

Existing Building Requirements: In addition to the new construction ordinances suggested above for all-electric buildings, additional solar PV, and EV charging, the City also has the option to expand some or all of these requirements to substantial remodels (remodels over a designated size or dollar amount).

Ordinance Adoption Pathways

There are two primary pathways for ordinance adoption, a local building code amendment of Title 24, or a municipal zoning or health and safety amendment. Both pathways have been taken by other jurisdictions and are feasible for Glendale. A brief summary of pros and cons of each approach are summarized in Table 1.

Table 1 Municipal Code Change Vs. Building Code Amendment

Policy Type	Pros	Cons	Notes
1. Building Code- Local Amendment to Title 24 (Reach Code)	<ul style="list-style-type: none"> Can be adopted as part of building code update already underway Majority of cities have taken this approach May cover buildings that are already entitled (but have not had building permits issued) 	<ul style="list-style-type: none"> Requires CEC approval and cost-effectiveness study (except for electric vehicles) Climate zone 16 could be challenging to prove cost-effectiveness (pending 2022 cost-effectiveness numbers) 	Local amendments to Title 24 are common and encouraged by the CEC and Local Codes and Standards team. Cost-effectiveness studies are readily available.
2. Municipal Zoning or Health and Safety Code Amendment (Municipal Ordinance)	<ul style="list-style-type: none"> Can proceed without CEC approval or cost-effectiveness study Not required to renew every code cycle 	<ul style="list-style-type: none"> May not cover buildings which have already been entitled Uncertainty on existing or potential legal challenges Less common (although several examples are available) 	Although less common, pursuing a municipal zoning or health and safety code ordinance provides some benefits such as removing the need for a CEC approval or cost-effectiveness study. No need to update every 3 years which could be a pro or con depending on perspective.

CEC = California Energy Commission

Local amendments to the building code (reach codes) are similar to other local ordinances, but there are special requirements for reach codes, such as evidence of cost effectiveness and approval by the California Energy Commission (CEC). Because of these requirements, the City of Glendale may face hurdles in implementing a Title 24 amendment for electric buildings as the current 2019 California Energy Codes & Standards do not project cost savings for single-family home electrification in Climate Zone 16 (Glendale’s building stock falls both in Climate Zone 9 and Climate Zone 16). However, cost-effectiveness data for the updated Building Code cycle (2023-2025) is set to be released in July.

Preliminary results suggest that building electrification in Climate Zone 16 may now be cost-effective but cannot be confirmed until the data is released in July. If building electrification for all building types in Climate Zone 16 is found to be cost-effective, then the City would be able to develop an electrification ordinance via an amendment to the Building code (CEC 2022, California Energy Codes & Standards 2019).

Local Conditions and Policy Overview Summary

City of Glendale Building Stock Overview

California is divided into several climate zones. Climate zones are defined by an area’s weather, including annual maximum and minimum temperatures, precipitation, and other factors. Each climate zone has an assigned energy budget, which is determined using geographic area-based temperatures, including weather, temperature, and typical energy use. Climate zones are important for building ordinances (especially building electrification and PV) since they determine how much heating and cooling load and days of sun a building is likely to receive. The California Energy Codes & Standard’s Cost-Effectiveness Model includes projections on local building stock as a base for their forecasts on



energy and cost savings, which are analyzed below (Local Energy Codes 2022). Both Climate Zone 9 and 16 are found in the City of Glendale, which means Glendale will need to show cost-effectiveness in both zones for any local amendment to the building code. The majority of Glendale's commercial and residential building stock, as well as projected future growth, is located in Zone 9.

Policy Landscape Overview

2022 Title 24 Building Energy Efficiency Standards

Title 24 of the Code of Regulations sets the building code standards for all jurisdictions in California. The 2022 Title 24 (Building Energy Efficiency Standards) was adopted by the CEC in August 2021, requiring buildings whose permit applications are applied for on or after January 1, 2023, to be in compliance with the 2022 Energy Code (CEC 2022).

Major updates found in the 2022 Title 24 Standards include:

Homes

- Establishes residential energy budgets based on efficient heat pumps for space or water heating.
 - Incentivizes builders to install heat pumps instead of gas-fueled water heaters and heating, ventilation, and air conditioning (HVAC) units.
- Requires new homes to have dedicated 240-volt electric circuits and space in addition to plumbing for water heaters (electric-ready homes). Electric-ready homes also includes requirements for cooktop and clothes-dryer-specific, 240-volt branch circuit wiring.
 - Allows for easy and lower cost electric replacement of gas appliances and includes electrical circuits for space heating, battery storage, etc.
- Clarifies calculations needed to determine a building's solar access in order to better calculate a minimum PV size, establishes battery storage standards for high-rise multifamily buildings and tenant space (Energy Ace Resources 2022).
 - Increases on-site renewable energy generation, while allowing for size exceptions (e.g., smaller homes and vertical development where a large roof area is not available).
- Increases kitchen ventilation requirements, increasing airflow to capture efficiency of fans over cooktops.
 - Improves indoor air quality, more effectively exhausting pollution from gas cooking.

Businesses

- Establishes combined solar PV and battery standards for certain businesses (hotel-motel, office, retail, grocery, restaurants, schools, civic).
 - Maximizes PV sizing while allowing for lower electricity demand during times when the grid is pulling from fossil fueled energy sources instead of renewables.
- Improves efficiency standards for building envelope, internal systems, and grid integration equipment.
 - Increases grid stability while increasing energy efficiency savings to businesses.
- Establishes an air-to-water, heat-pump standard for grocery, retail, libraries, schools, offices, and banks.
 - Increases electric heat-pump adoption in the commercial sector.



Local Amendments to Title 24 or Reach Codes

Jurisdictions are allowed to develop local ordinances that amend Title 24 to require local development to incorporate more stringent energy efficient design and technology. These more stringent codes are generally referred to as reach codes, energy code amendments, or building code amendments, and are generally established to increase both energy efficiency and cost-effectiveness, reduce GHGs, and help a local government meet their GHG-reduction goals. These amendments to Title 24 fall under Part 6 (energy conservation standards) and Part 11 (green building standards) of the 2022 Energy Code (CEC 2022). According to the California Energy Codes & Standards database, 27 California cities have adopted CEC-approved modifications to Title 24, Part 6, which requires some level of all-electric new construction projects. These reach code amendments to Part 6 require an application to the CEC which includes:

- A description of proposed energy standards,
- Local jurisdiction findings and analysis on energy savings and cost effectiveness,
- A statement of finding by the local jurisdiction that the new local energy standards will not require buildings to consume more energy than permitted by Part 6, and
- Any other findings, determinations, or reports, including an environmental impact report or negative declaration required pursuant to the California Environmental Quality Act (CEQA).

After the CEC confirms that the local analysis was accurate, the Title 24 amendment proposal will be brought before the Energy Commission for approval. After CEC approval, local governments can start to legally enforce local ordinances (California Building Standards Commission 2019).

In addition to the energy efficiency reach codes, a City can also adopt changes to other portions of a building not related directly to energy efficiency. These amendments to Title 24 fall under Part 11 (green building standards) of the 2022 Energy Code. These would include requirements that new developments be electric vehicle ready or include higher voltage electric panels or electric panel upgrades that could accommodate new, more efficient electric technologies. Recent reach codes addressed under Part 11 of the 2022 Energy Code include requiring electric vehicle charging stations (San Francisco) or EV charging readiness (Oakland). These codes generally do not require cost-effectiveness studies or approval by the CEC, although they will need to meet other requirements.

Municipal Codes

Another option for making changes to building requirements is through municipal codes, which are local requirements adopted through an ordinance that do not amend Title 24. Municipal codes modify either the zoning or health and safety codes of a city. A major benefit of municipal code adoption is that it does not require a cost-effectiveness study or CEC approval, though politically, understanding costs will be important. Municipal reach codes allow for a streamlined approval process, as the municipality does not have to go through the Title 24 amendment CEC approval. Though municipalities will have to get internal buy-in to pass the ordinance updates through City Council, the municipality will not be required to prove cost effectiveness through local analysis or go through CEC approval as they would if adopting the codes through a Title 24 amendment process. Municipal ordinances also do not need to be re-approved with each energy code update.

Municipal codes are less common for all three reach codes analyzed by this memo. However, examples of successful codes are available. **10 California cities** have adopted all-electric new construction



ordinances through the modification of municipal codes (including zoning, health, and safety). In addition, the City of Oceanside uses a municipal code for their PV and EV charging codes.

Timing for Reach Code Development

As the current building code cycle will sunset at the end of 2022, there is an option for the City to align with the 2022 cycle to adopt both the 2023 California Green Building Standards Code and the local amendments. This will allow the City to bring one suite of ordinances before the City Council. However, if needed, changes to municipal ordinance (e.g., through health and welfare, or zoning) will not sunset at the next building code cycle and will thus not be constrained by the Title 24 requirements, would outlast the building code cycle, and would not require cost-effectiveness studies or CEC approval (Engelman 2022).

Further analysis on each ordinance (building electrification, PV infrastructure, and EV infrastructure), including pros and cons of adopting the recommended ordinance modification(s), municipal case studies, and details on implementation are elaborated upon below.

Building Electrification

Building Electrification Overview

Building electrification is a critical tool to achieve climate action plan targets and protect residents and businesses from future increases in natural gas prices. Unlike some other climate solutions, this permanent reduction in GHGs from future buildings can be achieved through local policy and with today's technologies.

In many climate action plans, electrifying ~25 percent of existing buildings is necessary to achieve the State's 2030 climate targets (40 percent reduction in GHG emissions from 1990 levels). In order to achieve California's ambitious climate goals on such a short timeframe, jurisdictions will not only need to electrify all future new building stock, but also start electrifying existing building stock. Electrifying existing buildings is also more expensive than electrifying new construction, which has been found to have upfront cost savings in both Climate Zone 9 and 16 (Cost Effectiveness Explorer 2019).¹

Continuing to develop new gas infrastructure into the urban landscape will make achieving carbon neutrality by 2045 increasingly difficult, if not impossible. Meanwhile, under Senate Bill (SB) 100, all retail sales of electricity in California are required to be carbon-free by 2045, which will mean that electrified homes and businesses will become carbon-free on the same timeline (Cohen et al. 2021). Going above and beyond state building requirements, which are updated every 3 years, provides an important opening for municipalities to achieve their climate goals by ensuring that building stocks can expand while keeping the City on track for achieving its climate goals.

Building electrification reach codes have taken several forms, including electrification of some but not all appliances, electric preferred², all-electric ready, and full natural gas bans. While each of these code types progress electrification in some way, there are distinct risks associated with some approaches. Exemptions for specific end uses (such as stoves) mean no decrease in the development of natural gas

¹ It should be noted that based on 2019 cost effectiveness data, single-family homes are not cost-effective over time due to increased energy bills (mostly due to the need to demonstrate cost-effectiveness with non-heat pump technologies).

² Electric preferred codes require mixed-fuel buildings (those with gas and electric) to meet higher energy efficiency standards, therefore increasing building costs and disincentivizing gas use.

infrastructure. Exemptions like this saddle remaining natural gas users with increasing costs, as the costs of maintaining the natural gas infrastructure (e.g., transporting increasingly small volumes of natural gas through an established pipeline system) remain the same but are shifted onto an increasingly small number of consumers as building electrification expands. Building electrification is an important tool to protect residents and businesses from future increases in natural gas prices (Gridworks 2020). For this reason, tactics like electric-ready requirements that establish panel capacity and pre-wiring in new construction, but fall short of full-electrification, mean that developers have increased costs to build but none of the future cost-savings of an electric-only building if they still pursue a mixed-fuel building.

For these reasons, building electrification of all new buildings with no exemptions presents the strongest future climate and cost benefit to the City of Glendale.

Policy Pathways for Building Electrification

As described in the Ordinance Pathway Summary, the City can adopt a building electrification ordinance through two pathways: Pathway 1) modifies Title 24, Part 6, California's Building Energy Efficiency Code, and Pathway 2) amends the City's zoning health and safety or other municipal code.

The City could choose to use either ordinance type so long as the new 2022 cost-effectiveness studies show buildings in Climate Zone 16 to be cost effective. In the 2019 code cycle Climate Zone 16 was one of the few areas in California proven to not be cost-effective for single-family buildings (but was for all other types). However, due to expected changes in the 2022 code in the near future, all building types are anticipated to be cost-effective. The preliminary data has been released for single-family zones in Climate Zone 16 and show that single-family homes are cost-effective under the time-dependent valuation (TDV) metric. This TDV valuation is sufficient to adopt a local amendment to Title 24. When including heat pumps and solar PV single-family homes also become cost-effective based on on-bill savings.

Best Practice Ordinance Overview

Based on this analysis, starting with a reach code that requires 100 percent of new construction to be all-electric with no exemptions appears to be the best practice. However, an infeasibility waiver process should be outlined in the ordinance to allow for specific process loads which cannot currently be all-electric to have a path forward.

Ordinance aspect: 100 percent all-electric new construction ordinance with no exemptions and an infeasibility waiver process.

Reasoning: Allowing exemptions leads to a reduction in climate impact as new categories of buildings are added as exemptions to the municipal ordinance. For example, the City of Ojai's amended 2019 building electrification municipal code includes nine separate exemptions to all-electric construction, from certain sections of affordable housing to swimming pool heaters (Local Energy Codes 2019). Opening the door for exemptions during the ordinance update process will likely lead to a rapid expansion in stakeholders lobbying for exemptions, as well as potential equity implications if affordable housing is placed on the exemption list.

Ordinance aspect: Infeasibility waiver.



Reasoning: An *infeasibility waiver* process places the burden on the project applicant or developer to prove that construction of the new building completely without gas is not feasible, reducing burden on City staff, and taking away the need to make whole categories of buildings exempt.

Cities that have recently chosen this implementation pathway (*100 percent all-electric new construction + infeasibility waiver or very minimal exemptions*) include Berkeley, Fairfax, Morgan Hill, Oakland, Petaluma, San Francisco, San José, Santa Cruz, Encinitas.

Case Study | 2021 City of Sacramento New Building Electrification Ordinance

Pathway 1) Title 24 Part 6 modification

Of the 27 California cities that have implemented building electrification via updates to Title 24 Part 6, the City of Sacramento has one of the most climate-ambitious plans because of its lack of exemptions for entire building types and unique phased timetable for implementation. The Ordinance added to and amended provisions of Title 15 of the Sacramento City Code, in addition to adopting local amendments to Title 24.

Code Requirements

- Starting in 2023: all-electric requirement for buildings three stories or less; starting in 2026: all-electric requirement for buildings four stories or above.
- All building types included under all new construction.

Financing and Enforcement

- The ordinance includes provisions for an infeasibility waiver, as well as guidelines for an infeasibility waiver process where an all-electric project, or portion of a project is impossible.
- Adoption of local guidelines are timed in accordance with enforcement of the 2022 California Building Standards Code.
- Phased timeline for enforcement

Exemptions

- Limited exemptions for commercial food establishments (cooking equipment only); manufacturing process loads in a manufacturing or industrial facility, regulated affordable housing when virtual net energy metering is not available (water heating only) (Sacramento City Council 2019).

Case Study | 2019 City of Berkeley Municipal Code Prohibiting Natural Gas Infrastructure in New Buildings

Pathway 2) Municipal Code Modification

Of the 10 California cities that have implemented building electrification ordinances through municipal code, the City of Berkeley is among the most climate-ambitious. The City of Berkeley banned the construction of new natural gas infrastructure in buildings through municipal ordinance (Municipal Code Chapter 12.890), with no modification to Title 24, Part 6. Berkeley's approach isn't pinned to the 3-year building code update cycle, but rather, takes effect through the City's Municipal Code for Health and Safety.

Code requirements

- Municipal Code Update: Title 12, Health and Safety, Chapter 12.80; Prohibition of Natural Gas Infrastructure in New Buildings; applies to Use Permit or Zoning Certificate applications submitted in Berkeley. All new construction must be all electric.
- Building types included under all new construction: single-family and low-rise multifamily, high-rise multifamily, and non-residential.

Financing and Enforcement

- Funded a 2-year position in the Building & Safety Division of the Department of Planning and Development to assist in implementation and enforcement.

Exemptions

- Berkeley's ordinance does not allow electrification exemptions by building type. Natural gas infrastructure can only be permitted in new construction if the applicant proves physical infeasibility of construction. This means that if an all-electric system or design is available for a building type, it must be implemented.
- Berkeley also has a Public Interest Exemption which allows construction of natural gas infrastructure if it is determined to be in the public interest, post-City consideration of the availability of electric technologies/systems and any other impacts (City of Berkeley 2019).

Other Considerations:

The City of Berkeley is currently facing litigation over its electrification ordinance by The California Restaurant Association. The California Restaurant Association argued that banning a building's piping needed to supply natural gas is a functional ban on these appliances and is preempted by the federal Energy Policy and Conservation Act (EPCA). The case was dismissed in July 2019 by the Northern District of California court, with Judge Gonzales Rogers citing the right of a city to exercise "its power to regulate building infrastructure to protect public health and safety" which was widely considered a win for local climate governance. However, the judge did not rule on if Berkeley's natural gas ban is preempted by the California Energy Code, or California Building Standards Code, and sent the case to be further

litigated in state court. The case is currently being argued in the Ninth Circuit and highlights a potential drawback to expansive electrification reach codes (Earls 2022, Teale 2021).

PV Infrastructure

PV Infrastructure Overview

Glendale's existing building stock is urban and has a significant number of high-density buildings with limited roof space. This presents two challenges to installing PV infrastructure in Glendale. First, tall buildings may not be able to fit large arrays on their limited roof space. Second, large buildings with high-energy demand (ex. industrial buildings, refrigerated warehouses) may not be able to generate enough energy to offset a high percentage of their energy spend even if they used their entire roof space for PV.

Policy Pathways for PV Infrastructure

The City can adopt a PV ordinance through two pathways: Pathway 1) modifies Title 24, Part 6, California's Building Energy Efficiency Code, and Pathway 2) amends the City's zoning health and safety or other municipal code. The City could choose to use either ordinance type.

Due to physical limitations associated with PV sizing on different building types, there have been a variety of strategies developed that are intended to encourage installation of PVs across a wide breadth of building types. From our review, we have identified the three primary ways in which other California cities have drafted solar PV requirements:

- Requiring a small minimum solar PV size. Example: 3 kW if < 10,000 square feet (sf) and 5 kW if > 10,000 sf.
- Requiring some percentage of rooftop be solar. Example: 15 percent or 50 percent of rooftop area
- Requiring some percentage of projected annual electrical usage. Example: Supply 50 percent of estimated electricity demand with solar PV.

The majority of California cities (15) that have adopted PV ordinances or amendments to Title 24, Part 6 have required a small minimum system capacity (e.g., 3 kW if < 10,000 sf, 5 kW if > 10,000 sf) on major high-rise multifamily or non-residential projects (Santa Monica, Brisbane, Burlingame, Encinitas, Menlo Park, Milpitas, Pacifica, Redwood City Richmond, San Carlos, San Luis Obispo, San Mateo, Santa Clara, Sunnyvale).

Thirteen California cities have adopted rooftop-percentage-based PV ordinances, with the majority adopting a >15 percent roof area requirement which fills out the existing PV-ready zone mandated by Section 110.10 of Title 24 (Mountainview, Alameda, Albany, Berkeley, Daly City, East Palo Alto, Emeryville, Half Moon Bay, Hayward, Millbrae, Palo Alto, Santa Clara County, Solana Beach).

Two California cities have adopted electricity-demand-percentage-based PV ordinances (Oceanside and Carlsbad), both of which incentivize larger PV arrays. Table 2 summarizes the options for PV ordinances, as well as the pros and cons of each approach.

Table 2 Menu of Ordinance Options for PV Installation

Policy Type	Pros	Cons	Rincon Recommendation
1. PV system that establishes a minimum % of rooftop space (50%) if an array sized to offset 50% of the building's energy spend is not feasible.	<ul style="list-style-type: none"> PV, particularly large arrays, end up being long-term cost effective Greater savings when combined with energy efficiency Can produce greater GHG reduction over building life 	<ul style="list-style-type: none"> Can be a large incremental cost Variable investment requirements distributed across different project types/developers Physical constraints on rooftop 	Maximum Climate Benefit, Adapted to Glendale's urban environment with potentially variable rooftop space. <i>Note that this recommendation blends together two policy approaches (% offset energy spend and % rooftop installation)</i>
2. Small minimum PV size requirement based off building square footage	<ul style="list-style-type: none"> Greater savings when combined with energy efficiency Small minimum system size allows project sizing flexibility Cost-effective under most major project scenarios 	<ul style="list-style-type: none"> Requires external documents and/or calculations If install minimum only, offsets small percentage of total usage 	Medium Climate Benefit; High Feasibility (largest # of adopters) Cost-Effective
3. PV system requiring some percentage of offset projected annual electricity usage	<ul style="list-style-type: none"> Greater savings when combined with energy efficiency Cost effective under most major project scenarios Can produce more ambitious GHG reduction over the life of the building 	<ul style="list-style-type: none"> Can be a considerable incremental cost Variable investment requirements Physical constraints on rooftop Sizing may not be feasible for different project sizes 	Not Recommended without adaptation for urban rooftop space (%) as does not include considerations for roof size, Less Feasible, Climate-Ambitious

PV = photovoltaic

Recommended Ordinance Overview:

Require non-residential and multifamily PV systems to offset 50 percent of projected electricity use if roof space is sufficient; or cover at least 50 percent of rooftop space for buildings where a 50 percent offset of building electricity usage by a PV array is not possible.

Ordinance aspect: Require non-residential and multifamily PV systems to offset 50 percent of projected electricity use if roof space is sufficient, or cover at least 50 percent of rooftop space for buildings where a 50 percent offset of building electricity usage by a PV array is not possible. Exclude any specific exemptions.

Reasoning: This ordinance presents a hybrid-model between mandated percentages for roof size and energy spend, allowing for flexibility, while maximizing GHG reduction and local renewable energy production.

Ordinance aspect: Physical infeasibility waiver (e.g., shading, vegetation, other structures). Burden falls on project applicant to prove infeasibility.



Reasoning: Adopting 50 percent of roof space for PV arrays allows for flexibility for projects that cannot offset 50 percent of their gross sf energy spend via rooftop PV alone, which is consistent with Glendale's urban environment building stock and potentially limited roof size.

PV maximum and minimum size arrays are shown to be cost-effective when compared with a mixed-fuel scenario in both Glendale climate zones for both residential and non-residential buildings (Local Energy Codes Cost Effectiveness Explorer 2022)³. Separate cost effectiveness study for just PV may be requested through Local Codes and Standards Team.

Ordinance aspect: Infeasibility waiver.

Reasoning: An infeasibility waiver process places the burden on the project applicant or developer to show that a PV array offsetting 50 percent of electricity demand or taking up 50 percent of total roof space is impossible (e.g., shading, vegetation, topography). Rincon suggests a hybrid approach between City of Mountain View (percent requirement of roof space) and City of Oceanside (percent requirement of energy spend).

Case Study | 2019 City of Mountain View; PV System on Major High-Rise Multifamily or Non-Residential Projects

Pathway 1: Title 24 Subsection 101.10 Amendment

Ordinance Requirements

- Amends Chapters 8, 14, and 24 of the City Code as well as Title 24, also satisfies CEC cost-effectiveness requirements.
- High-rise multifamily new construction: install PV on 50 percent of roof area.
- Non-residential new construction: install PV on 50 percent of roof area.

Financing and Enforcement

- The return on PV installation and energy generation can be highly variable. However, there are federal tax credits available that can be leveraged to help limit the cost to developers and improve the return on the PV investment.

Exceptions

- A project may submit an exception by providing documentation that the required percentage of PV would produce more electricity than is required to operate the building annually (both high-rise residential and non-residential) (City of Mountain View 2019).

³ There is no PV-only scenario assessed under the Cost-Effectiveness Explorer Tool for residential buildings, so a dedicated solar PV study may need to be requested from the local codes and standards team.

Case Study | 2019 City of Carlsbad; PV System on Major High-Rise Multifamily or Non-Residential Projects; Large Minimum System Capacity

Pathway 1: Title 24, Subchapter 3 Amendment

Ordinance Requirements

- Amends Section 18.30.130 of municipal code, as well as Title 24 (submitted as part of a larger Title 24 modification package) part of Climate Action Plan ordinances adopted by the City.
- High-rise multifamily new construction: new constructions, or alterations of 2,000 sf: install 15 kW PV per 10,000 sf of new building; OR a minimum of 5kW for less than 10,000 sf.
- Non-residential new construction: same kW requirements based on square footage as above, OR the developer can, offset 80 percent of load based on TDV—a metric for code compliance that incorporates social and environmental impacts into the cost of energy.
 - TDV energy use includes both conditioned and unconditioned space and must be calculated using a modeling software or other Building-Official-approved method.

Financing and Enforcement

- The return on PV installation and energy generation can be highly variable. However, there are federal tax credits available that can be leveraged to help limit the cost to developers and improve the return on the PV investment.

Exceptions

- Infeasibility waiver, which falls on the applicant to prove requirement infeasibility due to practical challenges. The Building Official can waive or reduce PV requirements post-exemption application by the applicant (City of Carlsbad 2019).
- Federal tax credit help improve cost-effectiveness.

Case Study | 2020 City of Oceanside; PV System on Major High-Rise Multifamily or Non-Residential Projects; Large Minimum System Capacity

Pathway 2: Zoning Amendment, no Title 24 Modification

Ordinance Requirements

- Amends Article 60, Section 3047 (zoning ordinance); CEC approval is non-applicable and does not amend Title 24.



- High-rise multifamily new construction (over 25 units): requires PV to supply 50 percent of estimated electricity demand.
- Additions (1,500 sf gross floor area): required to be solar-ready as defined by the California Energy Code.
- Non-residential (commercial development over 12,500 sf, industrial development over 25,000 sf, institutional development over 12,500 sf): requires PV to supply 50 percent of electricity demand.

Financing and Enforcement

- The return on PV installation and energy generation can be highly variable. However, there are federal tax credits available that can be leveraged to help limit the cost to developers and improve the return on the PV investment.

Exceptions

- If feasibility is deemed impossible by City staff, applicants can purchase a minimum of 75 percent renewable energy portfolio through their electric utility, if it is available (currently only available to residential customers) (City of Oceanside 2019).

EV Charging

EV Charging Overview

We understand that the City is also exploring options to increase EV adoption and improve access to EV chargers. Charging infrastructure for EVs is still in the early stages of development and is therefore, limited in availability. Besides the upfront cost of the EV itself, the largest barrier to entry for widespread EV adoption is accessibility to charging infrastructure. In March 2012, Governor Brown issued Executive Order (EO) B-16-12 directing the state government to accelerate the adoption of zero-emissions vehicles (ZEV) in California. This EO established a goal of 1.5 million (M) ZEVs by 2025. In January 2018, Governor Brown signed EO B-48-18, establishing a target for 250,000 Level 2 EV chargers and 10,000 Direct Current (DC) Fast Chargers⁴ to support the 1.5M ZEVs goal by 2025 and new goal of 5M ZEVs by 2030. New EV charging infrastructure will play an important role in supporting the growing EV fleet in California, as installing charging infrastructure in new buildings is significantly less expensive than retrofitting existing buildings.

EV charging infrastructure requirements are subject to CALGreen regulatory standards which are set forth in Title 24 of the California Code of Regulations. They are updated on a 3-year cycle, and the 2022 CALGreen requirements are set to be released in July 2022. The CALGreen standards include required standards for new developments, as well as two sets of voluntary standards, Tier 1, and Tier 2, that are more ambitious. In April 2022, the Bay Area Air Quality Management District (BAAQMD) released a report outlining design elements necessary for a project to be consistent with California's long-term climate goals. BAAQMD is one of the only air quality management districts that has done analysis of the 2022 CALGreen mandatory EV charging infrastructure requirements. BAAQMD's finds that while 2022

⁴ DC Fast Chargers are the most advanced form of EV charging units to date, ranked ahead of Level 1 and Level 2 charging units and requiring advanced infrastructure for construction and deployment. These chargers typically provide 125-1,000 miles of charge per hour and are the most expensive charging unit on the market to date.



CALGreen EV charging infrastructure mandatory requirements ensure that charging infrastructure needs of 2025 are met, current mandatory requirements will not sufficiently meet long-term state climate goals. Therefore, the BAAQMD recommends adopting the more aggressive CALGreen Tier 2 voluntary standards to support charging needs after 2025 (BAAQMD 2022). Many California jurisdictions are adopting voluntary reach codes to increase EV charging requirements and help the state meet its long-term climate goals.

Policy Pathways for EV Infrastructure

The City could choose either a municipal code or a local amendment to Part 11 of the building code. While Rincon has found that building code amendments are more common, several cities have used municipal codes for EV requirements. Since no cost-effectiveness study is required for EV charging reach codes, there is little difference between a municipal ordinance and a building code amendment. Rincon suggests using whichever pathway is chosen for the other ordinances/reach codes.

Benefits of Adopting at Least CALGreen Code Tier 2 Voluntary Standards

Avoid Retrofit Costs

According to the California Air Resources Board (CARB), installing EV charging infrastructure in a new building can save an estimated \$7,000 to \$8,000 per parking space compared with retrofitting it later (CARB 2019).

Increase Equity

Providing access to more Level 2 chargers in workplace and public locations allows residents of multifamily households with ZEVs to charge more easily especially if they do not have access to parking at home (BAAQMD 2022).

Maximize GHG-Emission Reductions

Adopting the suggested code changes for a 10 percent EV-Capable requirement for EV charging infrastructure would lead to an estimated total 690,000 to 820,000 metric tons of carbon dioxide equivalent reduction over a 4-year time frame (CARB 2019).

EV Charging Units

To be able to develop an ordinance that will best support EV adoption, minimize cost impacts, and avoid inequities, it is necessary to understand the different EV charging options. There are three standardized levels of EV charging facilities that provide charge at different rates. These include Level 1, Level 2, and Level 3 chargers, which are summarized in Table 3 and further described below.

Table 3 EV Charging Levels

Type of Charger	Voltage Required (Volts)	Charge per Hour (Miles)	Estimated Time for Full Charge (Hours)	Typical Land Use Type
Level 1	120	3-6	8-12	Residential



Level 2	208-240	14-35	3-4	Residential, Commercial
Level 3, DC Fast Chargers	200-600	80-600	0.5-0.75	Commercial (e.g., offices)

Sources: (Drive Clean 2021) (U.S. Department of Energy 2021) (Western Planner 2019)

Level 1

Level 1 chargers are the most basic approach to EV charging and are considered slow charging, operating on a 15- to 20-amp breaker on a 120-volt AC circuit, which is standard for most household outlets. Level 1 chargers are typically the least expensive EV charger, ranging from \$300 to 600 for the parts before labor, and \$1,000 to \$1,700 with cost of installation (Carvana 2021). This level of charger provides approximately 3 to 4 miles per hour of charge and typically takes 8 to 12 hours to reach full charge. As a result, Level 1 chargers are typically used and best suited for residential properties, such as single-family homes, condos, or multifamily units. However, as a result of many units and limited parking space in bigger, high-rise multifamily units, not every resident of this land use type may have access to overnight charging, raising equity concerns of EV charging accessibility.

Level 2

Level 2 chargers are the next step up from Level 1, operating on a 40- to 100-amp breaker on a 208- or 240-volt alternating current (AC) circuit, which is typical of the energy use exhibited by electric clothes driers. CARB staff estimate that the cost of non-residential new construction for a raceway and 40-amp, 208/240-volt panel capacity per space is between \$870 to \$960 (CARB 2019). Including installation, Level 2 chargers may see costs range between \$2,000 to \$5,000 for a non-networked charger and \$4,500 to \$9,000 for a networked charger (Carvana 2021). A networked charger implies enhanced connectivity to the grid and may include smart power management to share electrical capacity, avoiding expensive infrastructure upgrades and allowing the user to manage rates of charge. Additional cost variables may include an electrical panel or transformer upgrade or trenching distance from a similar panel. A non-networked charger may be more typical for a single-family home where electrical demand is more uniform and more easily managed. These chargers feature a unique electrical outlet for the car connection, providing 25 to 30 miles per hour of charge and taking 3 to 4 hours to fully charge an EV. Due to their enhanced charging rate, Level 2 chargers are typically used by both residential and commercial service properties.

Level 3

To date, Level 3 chargers, also referred to as DC Fast Chargers, are the most advanced form of EV charging infrastructure. Operating on a 60- to 400-amp breaker on a 200- to 600-volt DC circuit with special grounding equipment, these chargers provide charge at a rate of 125 to 1,000 miles per hour with a full recharge typically taking 30 to 45 minutes. These chargers are characterized by industrial-grade car connection electrical outlets and are expensive to purchase and install as a result of the required utility infrastructure. Therefore, these chargers are used primarily for commercial charging stations, especially in office settings, and are not well suited for personal use at residential properties (Western Planner 2019). It is important to note that the rapid increase in EV charging infrastructure, in particular growth of Level 3 chargers, can have detrimental effects on the power grid. For instance, the high-charging loads associated with fast charging stations can result in increased peak demand, reduced

reserve margins, voltage instability, and reliability problems. These effects need to be understood before developing ordinances requiring their installation (T&D World 2021).

EV Charging Infrastructure Definitions

EV charging infrastructure requirements are generally described in three terms of completeness, as seen below in Table 4.

Table 4 EV Charing Infrastructure

Type of Space	Infrastructure Included	Infrastructure Not Included	Unique Attributes	Typical Land Use Type
EV-Capable	Parking stall, underground conduit	Charger hardware, wiring, charging plug, charging station	Can be easily converted to charging space, avoids costly future retrofits	Residential
EV-Ready	Parking stall, underground conduit, wiring, wire outlet	Charging plug, charging station	Baseline “Plug and Play” charging station	Residential, Commercial
EV-Installed ⁵	Parking stall, underground conduit, wiring, wire outlet, charging plug, charging station	N/A	Most advanced and least prevalent space available	Commercial, (e.g., offices and mixed-use lots)

EV-Capable

EV-Capable is the most basic first step into the development of EV infrastructure. These spaces require the infrastructure for future installation of an EV charging station and do not require any charging equipment to be installed at the time of construction. This includes the underground conduit and parking stall but lacks any charger hardware, wiring, or plug to charge an EV. This charging space type requires some assembly prior to charging an EV. When the space is deemed ready to upgrade, any type of EV charging wire can be pulled through the already constructed conduit to connect to the charger. By accommodating for future development of EV charging spaces without committing to a specific number of charging spaces and technologies, EV-Capable spaces exhibit a low barrier to entry in the development of EV infrastructure, flexibility on the type of chargers, and an opportunity to increase the number, as necessary. Furthermore, integrating EV readiness into new construction avoids future retrofit costs of development. Per the City and County of San Francisco and a study conducted by Southwest Energy Efficiency Project, the cost to retrofit a charging station is nearly four times the cost of a new construction job, avoiding tens of thousands of dollars that would otherwise be spent at a later date (Southwest Energy Efficiency Project 2018, Peninsula Clean Energy 2019). Furthermore, not including wiring during construction helps reduce the chance that new technologies render the existing wiring obsolete. A downside to providing too many EV-Capable spaces that do not include pre-wiring is providing an inadequate supply of EV charging opportunities to a local community that exhibits an immediate need for EV charging. Despite the convenient opportunity to set some EV-Capable spaces aside for future development, it is paramount to fully evaluate the need of the local community first and foremost to strategically place EV-Capable spaces in areas where EV charging is not an immediate need.

⁵ EV-Installed charging spaces, the most advanced level of EV readiness, is also sometimes referred to as an Electric Vehicle Charging Station or Electric Vehicle Supply Equipment in electric vehicle infrastructure literature.



As EVs proliferate through a given community and demand for charging increases, then local governance can return to these EV-Capable spaces and upgrade, as necessary.

EV-Ready

EV-Ready is the next step above EV-Capable and is also referred to as “Plug and Play.” These charging spaces require both the infrastructure and a wire outlet, the latter of which is not included in EV-Ready spaces. Although a charging unit is not required at this level, these spaces allow EV drivers to plug-in their own portable chargers into the outlet and begin charging. Given that a portable charging piece is required to charge the EV, these spaces are ideally suited for residential properties where the EV driver can easily store their portable charger at their residence. However, EV-Ready spaces are also in common use at commercial properties as well. While EV-Ready spaces increase the ease of which EV chargers are installed, there is a chance that new charging technology would require different wiring, making the existing infrastructure obsolete. However, as mentioned above, addressing the immediate needs of the local community is most important. Just as it is critical to be mindful of future updates to EV charging technology, it is equally important to address the immediate EV needs of a given community to ensure no one is left behind in the transition to California’s EV future. If a given community exhibits an immediate need for EV charging infrastructure, EV-Ready spaces offer a cost-effective means for EV drivers to satisfy their transportation needs. To accommodate equity concerns, it would be wise to consider a proper distribution of EV charging opportunities across one’s area of jurisdictional control rather than just providing EV charging access to the most affluent areas of a community.

EV-Installed

EV-Installed spaces, also referred to as EVSE and EV Charging Stations (EVCS), include everything an EV driver needs to charge their vehicle. Here, all the infrastructure necessary to charge an EV is available to the driver, including wiring, conduit, and the charging station itself. Currently, the cities of San Luis Obispo and Palo Alto require EV-Installed spaces in all new development (Charged Future 2021). This approach best enables rapid adoption of EVs, putting to rest all fears of not having a place to charge your vehicle. In just 1 year, the City of San Luis Obispo’s mandatory EV charging ordinance resulted in nearly 300 plugs as part of the approved developments, more than tripling its EV charging stations. However, there is the potential that as EV technology develops these EV-Installed spaces will become outdated, requiring future investments and retrofits to keep up with EV innovations.

Land Use Type Recommendations

The City should consider developing EV reach codes that are specific to varying land use types.

1. New One-and Two-Family Homes and Townhomes with Attached Private Garages
2. New Multifamily, Hotels, and Motels
3. New Non-Residential

New One- and Two-Family Homes and Townhomes with Attached Private Garages

This land use type is characterized by new one- or two-family homes and townhomes with attached private garages, otherwise referred to as low-rise multifamily units. Due to slower rates of charging,



Level 1 and Level 2 chargers are ideally suited for residential properties where drivers have privately accessible garages and can charge their EVs overnight. This is reflected in the adoption of a number of California city reach codes. The cities of Cupertino, Davis, East Palo Alto, Encinitas, and Hayward all require at least one Level 2 EV-Ready space per unit. Additionally, Cupertino, Carlsbad, and East Palo Alto require one Level 1 EV-Ready circuit to accompany the space. Mountain View requires both a Level 1 and Level 2 EV-Ready circuit per unit. As is demonstrated above, there exist several variations to the type of charger and charging space made available to residential properties. At the lower bound of this land use category, all municipalities with EV codes require at least one Level 1 EV-Ready space per unit while more progressive EV leaders require at least one Level 2 Charger per unit available.

2022 CALGreen Code requirements for one- and two-family homes/low-rise multifamily units, as well as 2022 CALGreen Tier 1 and Tier 2 voluntary standards for this category, are described below in Table 5.

Table 5 New One- or Two-Family Homes/Low-Rise Multifamily Requirements

2022 CALGreen Requirement	Tier 1	Tier 2
One EV-Ready space per unit	One Level 1 EV-Ready circuit per space	One Level 2 EV-Ready space per unit and Level 1 circuitry

New Multifamily, Hotels, and Motels

This land use type is characterized by larger, high-rise dwelling units, such as typical multi-family units, hotels, and motels. EV reach codes for this category tend to vary based on the number of units available. For example, in the cities of Cupertino and Hayward, multi-family units that comprise less than 20 units require one Level 2 EV-Ready space per unit. This is consistent with requirements for one- and two-family homes and townhomes with private garages. For complexes with more than 20 units, Cupertino requires 25 percent of spaces be Level 2 EV-Ready while Hayward requires 75 percent of spaces be Level 2 EV-Ready with the remaining spaces Level 2 EV-Capable. This difference in percentage requirements beyond the threshold of 20 units demonstrates how rapidly each city intends to enable adoption of EVs. Hayward's 75 percent Level 2 EV-Ready requirement for multifamily units is the second highest percentage requirement in this category in California to date besides the City of Mountain View, which requires all new spaces regardless of lot size be at least EV-Ready, requiring Level 2 charging at 15 percent of these spaces and 3 EV-Installed spaces for every additional 100 spaces added. Generally, we see that complexes that exceed a given unit threshold for multi-family units tend to see a reduction in EV space requirements. For example, a city may require multifamily lots with less than 20 spaces to have a Level 2 EV-Ready space per unit, while a building with more than 20 spaces may only require 20 percent of these spaces be Level 2 EV-Ready. Given that most families are not able to install EV chargers themselves, this lack of a 1:1 ratio for charging space per unit presents some concern regarding equity of accessibility to EV charging infrastructure. Whereas a single-family unit may always have access to an EV charger, a family in a multifamily complex may have to compete for charging spaces in their own living complex, perhaps leading to frequent off-site visits to public charging facilities. For these reasons, public charging facilities are critical to ensuring proper access to EV charging infrastructure.

On the other hand, there are many California cities that position their EV requirements for multifamily units without unit thresholds, the most progressive of which is the City of Encinitas, requiring 15 percent of all spaces be EV-Installed, followed by the City of Sacramento, which requires 20 percent of spaces be Level 2 EV-Ready. At the lower bound of EV readiness for high-rise multifamily units, hotels, and motels, California cities at this time typically reserve up to 20 percent of new spaces to be Level 2 EV-Ready,

while more progressive cities like Hayward may include up to 75% of spaces be Level 2 EV-Ready. Others may require lower percentages of more advanced EV infrastructure, such as the City of Encinitas, which requires 15 percent Level 2 EV-Installed spaces.

2022 CALGreen requirements for new multifamily units, hotels, and motels, Tier 1 and Tier 2 requirements, and examples of requirements beyond Tier 2 are described in below in Table 6 (California Department of Housing and Community Development 2021).

Table 6 New Multifamily, Hotels, and Motels Requirements

2022 CALGreen Requirement	Typical EV Code Considerations (Number of Spaces)	Tier 1	Tier 2	Beyond Tier 2	Municipal Examples Referenced
40% EV-Ready 25% of parking spaces require low power Level 2 receptacles 5% of parking spaces in buildings with 20 or more units require high power Level 2 chargers (EVSE)	<20 spaces	35% of parking spaces to be EV Ready	40% of parking spaces to be EV Ready	40-50% Level 2 EV-Ready, plus 25-30% EV-Capable	Cupertino, Hayward, Davis, Mountain View, Palo Alto, Sacramento, Carlsbad
	>20 spaces	If a project has >20 units, the 10% of total parking spaces to have Level 2 EVSE	If a project has > 20 units, then 15% of total parking spaces to have Level 2 EVSE	40-75% Level 2 EV-Ready, plus 15-33% Level 2 EV-Installed	

EVSE = electric vehicle supply equipment

New Non-Residential

Despite the fact that residential charging is much more heavily utilized, the expansion of public charging infrastructure is an important way the City can help develop the local EV market and provide for equitable access. The convenience of making EV charging infrastructure available is critical to establishing EV driver confidence in the local community. Public charging encourages EV drivers to use their full range, increases general awareness, and offers comfort to existing drivers and prospective buyers. Most up-to-date analysis finds that even 2022 CALGreen Tier 2 voluntary non-residential requirements will not be sufficient to meet EV penetration past 2025. Therefore, several cities in California have adopted more ambitious requirement (BAAQMD 2022).

A 45-55 percent EV-readiness requirement for non-residential properties, in addition to at least 33 percent of these spaces be EV-Installed, would position the City as an EV leader, comfortably within range to achieve the climate objectives outlined by state-legislated goals. Other California cities have exceeded these measures to further support EVs in the local community. In fact, CARB acknowledges in their 2019/2020 Cost and Technical Analysis Report that non-residential public charging infrastructure is critical to lowering barriers to entry for prospective EV drivers. Many cities in California are developing EV codes for commercial properties and have developed specific codes for office parking and non-office parking. For example, the City of East Palo Alto requires 6 percent of non-office parking spaces be equipped with Level 2 EV-Installed and 5 percent with Level 1 EV-Ready for a total of 11 percent of spaces requiring some level of EV-readiness. Additionally, for office lots they have developed specific codes for developments with more than 10 spaces, 50 percent are equipped with some form of EV-



readiness; 10 percent Level 2 EVCS, 10 percent Level 1 EV-Ready, and 30 percent Level 1 EV-Capable. The City of Hayward also exhibits significant differences in EV-readiness when comparing office spaces to other non-residential spaces. Here, non-office lots with more than 10 spaces are required to be 15 percent Level 2 EV-Installed, while 50 percent of office spaces are equipped with some form of EV-readiness, 20 percent Level 2 EV-Installed and 30 percent Level 2 EV-Ready.

2022 CALGreen requirements for new non-residential requirements, as well as Tier 1 and Tier 2 requirements and examples of requirements that exceed CALGreen, are described in Table 7 (BSC 2021).

Table 7 New Non-Residential Requirements

2022 CALGreen Requirement	Tier 1	Tier 2	Beyond Tier 2	Municipal Examples Referenced
Parking spaces >10 must install Level 2 EV capable infrastructure in 15% of spaces	Adopt an additional 5% Level 2 EV Charging requirement and 5% Level 2 EV Capable space requirement with 10> spaces	Adopt an additional 10% Level 2 EV Charging requirement and 15% Level 2 capable spaces requirement for new non-residential buildings with 10 > spaces	45-55% EV-readiness and 33-50% of these spaces at Level 2 EV-Installed	Palo Alto, Hayward, Mountain View, Carlsbad, Cupertino, East Palo Alto and Encinitas
Parking spaces >26 must install Level 2 EV chargers in 5% of spaces				

EV = electric vehicle

Code Considerations

It is well documented that limited access to EV charging infrastructure can limit EV adoption and slow progress on GHG reduction. While it may be tempting to require EV infrastructure in some form at every parking location, it is important other impacts such as grid capacity and future technology changes to maximize efficiency while incentivizing EV adoption.

Grid Considerations

As EV's and charging technologies advance, charging times are decreasing. Faster charging times mean more electricity is entering the cars battery in a shorter time, meaning more strain on the grid and potentially the need for new grid infrastructure when high levels of charging are occurring at the same time. Furthermore, having more EVs and faster chargers means more vehicles can cycle through fewer charging stations and exhibit more strain on the electrical grid. New demands placed on existing electrical infrastructure should be carefully reviewed and incorporated into community planning efforts. In addition, as a result of these new demands placed on the grid, additional considerations should be made to increase electrical infrastructure in certain parts of the City, where applicable.

Access Considerations

Because EV charging stations are a service, they are covered by the Americans with Disabilities Act (ADA). As a result, ADA-accessible EV charging stations must be provided, and this segment of the population must be accounted for. This reduces the total number of parking spaces that can be provided. The number of accessible charging spaces per standard EV charger is included below in Table 8 (City of Palo Alto 2016).

Table 8 EV Charging Stations for Public and Common Use

Total Number of EV Charging Stations at a Facility	Minimum Number (by Type) of EV Charging Stations Required to Comply with Section 11B-228.3.2.1		
	Van Accessible	Standard Accessible	Ambulatory
1 to 4	1*	0	0
5 to 25	1	1*	0
26 to 50	1	1	1*
51 to 75	1	2	2*
65 to 100	1	3	3*
101 and over	1, plus 1 for each 300, or fraction thereof, over 100	3, plus 1 for each 60, or fraction thereof, over 100	3, plus 1 for each 50, or fraction thereof, over 100

EV = electric vehicle

Notes: Where an EV charger can simultaneously charge more than one vehicle, the number of EV charging stations provided shall be considered equivalent to the number of EVs that can be simultaneously charged.

* Accessible EV charging station designed for accessibility but not reserved for exclusive use by the disabled.

Technological Considerations

Another consideration when determining what percentage of parking spaces should be EV-Capable, EV-Ready, or EV-Installed is how fast technologies are changing. Faster EV chargers and new charging technologies are being developed at a rapid pace. For example, Level 1 chargers which take many hours to charge have been replaced in large part with Level 2 and even Level 3 chargers which can charge up to 80 percent in an hour or less. Wiring every parking space to support cutting edge chargers today, may be obsolete by the time every charger is fully installed. Therefore, limiting the amount of installed infrastructure by requiring higher levels of EV-Capable and lower levels of EV-Installed/EV-Ready may help limit the amount of stranded assets in the future while keeping retrofit costs low.

Case Study | City of Hayward Low-Rise Multifamily, High-Rise Multifamily, and Non-Residential EV Charging Infrastructure Requirements (2019)

Pathway 1: Title 24 Amendment

Ordinance Requirements

- Amendment of Part 11 of Title 24, Section 4 (Residential Mandatory Measures) and Section 5 (Non-Residential Mandatory Measures) minor exceptions
- Low-rise multifamily new construction
 - Less than 20 spaces: 1 Level 2 EV-Ready space per unit.
 - More than 20 spaces 75 percent of spaces Level 2 EV-Ready; remaining units Level 2 EV-Capable.
- High-rise multi-family new construction
 - More than 10 spaces 15 percent must be equipped with Level 2 EVCS.



- Non-residential new construction
 - More than 10 spaces 20 percent must be equipped with Level 2 EVCS and 30 percent must be Level 2 EV-Capable.

Funding and Enforcement

- While including EV charging in new construction does increase costs, they are small compared to the cost for a retrofit. The City of Hayward found that installing two EV-Capable spaces during construction would cost \$840 while retrofit costs would be \$4,800.
- Enforcement of the ordinance to occur during building inspection.

Exceptions

- Where there is no commercial power supply.
- ADU and Junior Accessory Dwelling Units (JADU) without additional parking facilities, unless the electrical panel is upgraded, or a new panel is installed in which case only the electrical capacity requirements apply.
- Spaces accessible only by automated mechanical car parking systems are excepted from providing EV charging infrastructure (City of Hayward).

Case Study | City of Santa Monica Low-Rise Multifamily, High-Rise Multifamily, Hotels/Motels, and Non-Residential EV Charging Infrastructure Requirements (2019)

Pathway 1: Title 24 Amendment

Ordinance Requirements

- Amendment of Part 11 of Title 24, Section 4 (Residential Mandatory Measures) and Section 5 (Non-Residential Mandatory Measures) minor exemptions
- Low-rise multifamily new construction: EVSE charging required at 10 percent of spaces and EV-Capable at 20 percent
- Hotels/motels new construction: EVSE charging required at 10 percent of spaces
- High-rise multifamily new construction
- Non-residential new construction

Funding and Enforcement

- While including EV charging in new construction does increase costs, they are small compared to the cost for a retrofit. The City of Hayward found that installing two EV-Capable spaces during construction would cost \$840 while retrofit costs would be \$4,800.
- Enforcement of the ordinance would occur during building inspection.



Exceptions

On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:

- Where there is no commercial power supply
- Where there is evidence substantiating that meeting the requirements will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost by more than \$400 per dwelling unit
- ADU and JADU without additional parking facilities (City of Santa Monica 2019)

Recommended Ordinance Overview

Most EV drivers rely on home charging, followed by workplace and public charging (Searle and Lutsey 2016). As such, the City's EV codes should reflect these priorities. Based on the EV code data analysis the following trends appear to highlight the inclusion of the following:

- At least one Level 2 EV-Ready space per unit for one- and two-family homes/low-rise multifamily units with consideration for an additional Level 1 EV ready space per unit.
- At least 40-50 percent Level 2 EV-Capable spaces for larger high-rise multifamily complexes, hotels, and motels with consideration for between 15 percent and 33 percent of total spaces to be Level 2 EV-Installed spaces.
- 40-75 percent EV-Capable for non-residential properties with 33-50 percent of these spaces requiring Level 2 EV-Installed spaces.

On a case-by-case basis, allow for lower EV requirements when the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:

- Where there is no commercial power supply
- Where there is evidence substantiating that meeting the requirements will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost by more than \$400 per dwelling unit
- ADU and JADU without additional parking facilities

Existing Building Substantial Retrofit Options

The City is also interested in understanding the opportunities around extending reach codes to requirements retrofits. While new construction represents the most straightforward and cost-effective way to ensure buildings being developed today will support the City's long-term climate goals, the City of Glendale is mostly built out, and a significant portion of emissions come from existing building stock. Therefore, extending PV, energy efficiency, EV, and electrification requirements to retrofits represents an opportunity for the City to further their climate goals. Furthermore, targeting existing buildings already undergoing significant renovations is the most cost-effective time for this work, allowing easy access to building systems, as well as access to financing which can significantly increase cost effectiveness of projects. Summarized below are the EV, PV, and electrification ordinances which have been adopted in California. In addition, Rincon has included an approach which utilizes a scorecard



which has been adopted by cities like Piedmont and Carlsbad to provide a performance-based approach for existing building retrofits.

Retrofit Thresholds

Many reach codes use the term “substantial” remodel or retrofit as a threshold for when a reach code would take effect. A substantial retrofit could be defined in several ways including percentage value of the work compared to the building market value, percent of floor area addressed or length of time. Based on research by California Local Codes and Standards on 28 cities in California, 21 of them listed projects that affected over 50 percent of floor area as substantial.

The City of Carlsbad which has several major retrofit requirements defines a major retrofit as such, “Alterations and additions to existing residential structures and construction sites where: (A) for one and two family dwellings and townhouses with attached private garages, alterations have a building permit valuation equal to or greater than \$60,000 or include an electrical service panel upgrade; or (B) for multifamily dwellings (three dwelling units or more), alterations have a building permit valuation equal to or greater than \$200,000, interior finishes are removed and significant site work and upgrades to structural and mechanical, electrical, and/or plumbing systems are proposed”.

Other retrofits (such as the scorecard listed above) use a lower dollar amount to target medium sized retrofits as well. Ranges for these requirements appear to be between \$25,000 and \$60,000.

Ordinance Pathways

The ordinances for existing buildings are predominantly extensions of the new construction requirements that also cover “substantial remodels” as defined above. Therefore, the existing building ordinance pathway would coincide with whichever pathway is chosen for the new construction ordinance. The one exception for this is the performance pathway described below which is specifically developed to be a local building code amendment to Part 6. This approach has already been shown to be cost-effective by the Local Codes and Standards team.

Building Electrification

As of writing this memo, no cities that specifically require electrification at time of retrofit could be identified. However, Rincon has spoken with several cities (including those in Sacramento, Oakland, and San Mateo counties) that are looking at enacting these policies. An ordinance of this type could be triggered by a substantial retrofit or when a retrofit triggers Title 24 requirements (such as when external walls are modified). While this type of ordinance would be an important tool in progressing existing building electrification in Glendale, this would be a first-of-its-kind ordinance, which carries some level of risk to the City. Additional discussions with the Codes and Standards team could be helpful in this area.

EVs

The City of Carlsbad adopted an EV charging requirement for major renovations (see definition above) that requires major renovations to comply with the new construction requirements of their EV ordinance for any new parking that is built as part of the project. The City of Glendale could also extend their EV charging ordinance to cover all additional spaces added due to renovations of existing buildings.



Solar PV

Several cities including, Carlsbad, Piedmont, and Santa Monica, require solar PV installation for major additions. Santa Monica defines a major addition as “The addition to any building of either: (1) an additional story; or (2) additional floor area equal to or greater than 50 percent of the building’s existing floor area prior to the addition.” Piedmont requires solar if adding an additional level or increasing the roof area by more than 30 percent. Carlsbad triggers their ordinance for non-residential retrofits that exceed \$1,000,000 and affect more than 75 percent of existing floor area or an addition that increases the roof area by more than 2,000 sf. Both ordinances utilize a local amendment to Title 24. The solar requirement types are included in Table 9.



Table 9 Options for Solar Requirements on Additions/Retrofits

Watts	GFA	Annual Energy Use
1.5 – 2 watts per sf	<10,000 sf – 5kW >10,000 sf – 15kW*(GFA/10,000)	Annual TDV Energy Use * 0.8

kW = Kilowatt
GFA = gross floor area
sf = square feet
TDV = Time dependent valuation. TDV is a calculation that takes into account the societal cost/benefit of energy based on the climate zone, time of use, and environmental factors.

Existing Building Retrofit Performance Pathway

In addition to the prescriptive approaches for Building Electrification, EVs, and PV listed above, cities have begun adopting performance requirements for existing building retrofits. Due to the many variables associated with existing buildings, it can be difficult to identify specific actions that are cost effective and impactful in all scenarios. A performance pathway solves this issue by providing multiple options that each project can review and choose those approaches that suit their project best. The Local Energy Codes team has recently developed a tool for jurisdictions to create their own performance pathway which establishes a target score and a menu of individual measures with points weighted by site energy savings.

As structured, the ordinance amends the California Energy Code, and the intent is that an ordinance adopted in 2021 or 2022 would require only minor updates to remain effective in the 2022 code cycle, through 2025.

As proposed below, such an ordinance could be structured to amend Title 24, Article 6, Section 150.0 to require compliance as part of a defined project scope. The intent is to target medium-sized projects that are not otherwise subject to more comprehensive requirements under the State Energy Code. The amendment includes a table with the targets and points available for each measure and home vintage. It also includes specifications for each measure and exceptions. Compliance could be supported by an addendum to the Certificate of Compliance and building inspector verification. The ordinance could also include mandatory electric-readiness measures. Table 10 shows potential target scores for buildings by vintage year.

Table 10 Example Target Score by Vintage for City of Glendale

Single Family - Climate Zone 12	Building Vintage		
	Pre-1979	1979-199	1993-2011
Target Score	13	11	8



Table 11 Measures Developed for Glendale Single-Family Renovations via Cost Effectiveness Explorer

Single Family - Climate Zone 9 Measures	Building Vintage		
	Pre-1979	1979-1992	1993-2011
Air Sealing	1	--	--
Cool Roof	1	1	--
Duct Sealing	3	2	--
Heat Pump Clothes Dryer	1	1	1
High Eff HPWH	12	12	12
High Eff HVAC Heat Pump	7	5	4
HPWH	12	12	12
HVAC Heat Pump	5	4	3
Induction Cooktop	1	1	1
LED + Exterior Photosensor	Mandatory	Mandatory	Mandatory
New Ducts + Duct Sealing	6	4	1
PV	14	14	14
PV + Battery	13	13	13
PV + Electric Ready Pre-Wire	14	14	14
PV (points per KW)	6	6	6
R-13 Wall Insulation	3	--	--
R-49 Attic Insulation	5	2	1
Water Heating Package	1	1	1
Windows	4	3	--
Inductive Cooktop	2	2	2
Eff - Efficient			
HPWH – Heat pump water heater			
HVAC –Heating, ventilation, and air conditioning			
LED- Light emitting diode			
PV – Solar photovoltaic			
KW- Kilowatt			

Case Study | City of Piedmont (2019)

Pathway: Title 24 Amendment

Ordinance Requirements

- Amendment of Part 6 of Title 24
- A renovation project that costs \$25,000 or more must include an energy efficient insulation or heating system electrification improvement to include in the renovation.



- A renovation project that costs \$100,000 or more must include two energy efficient insulation or heating system electrification improvements to include in the renovation.
 - The energy efficient insulation or heating system requirement can be modified with a Home Energy Score of at least a 7 completed in the last five years. This modification is included so homes that have been pursuing energy efficiency measures can be recognized for their efforts.

Funding and Enforcement

- Several incentives exist from the utility and regional energy efficiency groups, such as BAYREN.
- Enforcement of the ordinance would occur during building inspection.

Exceptions

- A Home Energy Score Report for the low-rise building, completed within 5 years, demonstrating that the building already has a minimum Home Energy Score of 7 is submitted to the Building Official.
- In accordance with Section R104.10 Modifications, the Building Official shall not require the installation of R 106.6 Energy Efficient Measures E and/or F if one or more of the following conditions apply:
 - The unique features of the construction of the low-rise residential structure, including, but not limited to, existing heating and/or cooling system(s) that are not configured for conversion to forced air systems preclude installation of those measures.
 - The installation of the measures is not commensurate with the project's scope and budget, as determined by the Building Official, because the cost of those measures would exceed 20 percent of the total project cost or require substantial construction in areas of the residential structure that would otherwise not be part of the project.



Memo References

- Bay Area Air Quality Management District (BAAQMD). 2022. CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans. <https://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa-thresholds-2022/justification-report-pdf.pdf?la=en>
- California Air Resources Board (CARB). 2019. EV Charging Infrastructure: Non-residential Building Standards. https://ww2.arb.ca.gov/sites/default/files/2020-09/CARB_Technical_Analysis_EV_Charging_Nonresidential_CALGreen_2019_2020_Intervening_Code.pdf
- _____. 2022. <https://ww2.arb.ca.gov/zev-collaboration>
- California Building Standards Commission. 2019. Guide for Local Amendments of Building Standards, 2019 3rd Edition. (Accessed June 2022).
- _____. 2021. CARB Submission for EV Charging Infrastructure Provisions for Nonresidential Buildings in the Green Building Standards (CALGreen) Code. <https://www.dgs.ca.gov/BSC/Rulemaking/2021-Triennial-Code-Adoption-Cycle/2021-code-advisory-committee-review>
- California Energy Commission (CEC). 2022. Local Ordinances Exceeding the 2019 Code. “Local Reach Codes <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency-3>
- _____. 2022. “2025 Building Energy Efficiency Standards”. <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-building-energy-efficiency>. (Accessed June 2022).
- _____. 2022. “2022 Building Energy Efficiency Standards Summary”. https://www.energy.ca.gov/sites/default/files/2021-08/CEC_2022_EnergyCodeUpdateSummary_ADA.pdf. (Accessed June 2022)
- California Energy Codes & Standards. 2019. *2019 Cost-Effectiveness Study: Low-Rise Residential New Construction*. August 01, 2019.
- California Department of Housing and Community Development. 2021. Proposed Buildings Standards Regarding the 2022 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11. <https://www.hcd.ca.gov/docs/building-standards/2022-calgreen-fet.docx>
- Carvana. 2021. How much does it cost to install an EV charger. <https://blog.carvana.com/2021/07/how-much-does-it-cost-to-install-an-ev-charger/>
- Charged Future. 2021. EV Capable, EV-Ready, EV-Installed. <https://www.chargedfuture.com/ev-capable-ev-ready-and-%20EV-installed/>
- City of Berkeley. 2019. *City of Berkeley All-Electric Ordinance Staff Report*. (Accessed June 2022).
- City of Hayward. 2019. EV Ordinance. https://localenergycodes.com/?seo_name=map&lid=348
- City of Santa Monica. 2019. EV Ordinance. https://localenergycodes.com/?seo_name=map&lid=288

- City of Palo Alto. 2016. New Regulations for Electric Vehicle Charging Stations. <https://www.cityofpaloalto.org/files/assets/public/development-services/building-division/accessibility-files/evcs-palo-alto-presentation-final-rev.-11.18.16.pdf>
- City of Hayward. 2020. "Reach Code Initiative." <https://www.hayward-ca.gov/reach-code>. <https://www.hayward-ca.gov/reach-code>. (Accessed June 2022).
- City of Oceanside. 2019. "Staff Report". https://localenergycodes.com/download/863/local_government_adoption_staff_report/fieldList/Oceanside%202019%20-%20Staff%20Report%20Zoning%20Ammendment%20A20-00002.pdf
- City of Mountain View. 2019. PV System on Major High-rise Multifamily or Non-Residential Projects. https://library.municode.com/ca/mountain_view/codes/code_of_ordinances?nodeId=PTIITHCO_CH8BU_ARTIBUCO_DIVIIIIRBUCO_S8.20.1CAGRBUSTCODO. (Accessed, 2022).
- City of Carlsbad. 2019. Photovoltaic (PV) System on major high-rise multifamily or nonresidential projects. https://localenergycodes.com/download/462/local_government_adoption_ordinance/fieldList/Carlsbad%20-%20Ordinance%20CS-347.PDF; (Accessed June 2022).
- Cohen, Armond et al. 2021. "Clean Power is the Key to California's Clean Energy Future." Issues in Science and Technology. <https://issues.org/california-decarbonizing-power-wind-solar-nuclear-gas/>
- Delforge, Pierre, Stamas, Maria. 2019. "San Jose's Proposed Building "Reach Code," Explained. Sept 4, 2019. NRDC. <https://www.nrdc.org/experts/pierre-delforge/san-joses-proposed-building-reach-code-explained#:~:text=A%20reach%20code%20is%20a,creating%20roadmaps%20for%20other%20lo>cal. (Accessed June 2022).
- Drive Clean. 2021. Electric Charging is Easy. <https://driveclean.ca.gov/electric-car-charging>
- Earls, Maya. City of Berkeley to Defend New Natural Gas Ban in Ninth Circuit. May 11, 2022. Bloomberg Law. <https://news.bloomberglaw.com/litigation/city-of-berkeley-to-defend-new-natural-gas-ban-in-ninth-circuit>. (Accessed June 2022)
- Energy Ace Resources. 2022. "What's New in 2022". <https://energycodeace.com/resources>
- Engelman, Eric. 2022. "Considering a New Construction Reach Code for your City or County in California?". Cost Effectiveness Explorer. <https://intercom.help/explorer-local-energy-codes/en/articles/5789919-considering-a-new-construction-reach-code-for-your-city-or-county-in-california>. (Accessed June 2022).
- Gridworks. "California's Gas System in Transition." 2020. <https://gridworks.org/initiatives/cagas-system-transition/>; (Accessed June 2022)
- Local Energy Codes. 2022. "City of Glendale Summary". <https://explorer.localenergycodes.com/jurisdiction/glendale-city/summary>
- Local Energy Codes Cost Effectiveness Explorer. 2022. "Building Estimates for City of Glendale". https://explorer.localenergycodes.com/jurisdiction/glendale-city/building-estimates?only_building_type=residential-buildings. (Accessed June 2022)



Local Energy Codes. 2019. City of Ojai Ordinance.

https://localenergycodes.com/?seo_name=map&lid=664. (Accessed June 2022).

Peninsula Clean Energy. 2019. Building Electrification & Electric Vehicle Reach Codes.

https://bayareareachcodes.org/wp-content/uploads/2019/04/DraftModelReachCodes_STV2_24Apr19.pdf

Searle, Stephanie and Lutsey, Nicholas. 2016. Leading edge of electric vehicle market development in the United States an analysis of California cities.

https://www.researchgate.net/profile/Nicholas-Lutsey/publication/308155468_Leading_edge_of_electric_vehicle_market_development_in_the_United_States_An_analysis_of_California_cities/links/57db795108ae72d72ea38736/Leading-edge-of-electric-vehicle-market-development-in-the-United-States-An-analysis-of-California-cities.pdf

Sacramento City Council. 2019. An Ordinance Adding to and Amending Various Provisions of Title 15 of the Sacramento City Code and Adopting Local Amendments to the California Building Standards Code, Relating to Green Building Standards Including Electrification.

https://localenergycodes.com/download/813/local_government_adoption_ordinance/fieldList/Sacramento%202019%20-%20Ordinance.pdf; (Accessed June 2022).

Southwest Energy Efficiency Project. 2018. <https://www.swenergy.org/cracking-the-code-on-ev-ready-building-codes>

Teale, Chris. 2021. "Challenge to Berkeley gas regulation dismissed, a win for cities in carbon emissions fight". Smart Cities Dive. <https://www.smartcitiesdive.com/news/challenge-to-berkeley-gas-regulation-dismissed-a-win-for-cities-in-carbon/603415/>

T&D World. 2021. How Will the Grid Adjust to EV Charging?

<https://www.tdworld.com/electrification/article/21168252/how-will-the-grid-adjust-to-ev-charging>

U.S. Department of Energy. 2021. Developing Infrastructure to Charge Electric Vehicles.

https://afdc.energy.gov/fuels/electricity_infrastructure.html

Western Planner. 2019. Planning for Electric Vehicle Charging Facilities.

<https://www.westernplanner.org/2019articles/2019/4/10/planning-for-electric-vehicle-charging-facilities>

Attachment A

2019 Building Reach Code Summary

2019 Code Cycle - Locally Adopted Energy Ordinances									
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
Alameda	PV	6/1/2021	8/11/2021	N/A	New: PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	New: PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	2019 LR Res NC / 2019 Non Res NC	Section 140.0	Ord. No.
Albany	EE	12/21/2020	5/12/2021	<u>New:</u> SF mixed-fuel ≥ 10 EDR margin / SF all-electric ≥ 4.7 efficiency EDR margin / MF mixed fuel ≥ 10.3 EDR margin / MF all-electric ≥ 0 EDR <u>Add/Alts:</u> prescriptive measures	<u>New:</u> MF mixed fuel ≥ 10.3 EDR margin / MF all-electric ≥ 0 EDR <u>Add/Alts:</u> prescriptive measures	<u>New:</u> mixed fuel office ≥ 20% compliance margin / all-electric office ≥ 10% compliance margin / mixed fuel retail ≥ 16% compliance margin / all-electric retail ≥ 16% compliance margin <u>Add/Alts:</u> prescriptive measures	2019 LR Res NC / 2019 Non Res NC	12-6.1.b.4 (p)	Resolution No. 2020-127
	PV	12/21/2020	5/12/2021	N/A	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10			
Berkeley	EE	12/3/2019	2/20/2020	<u>New:</u> All-electric OR Mixed Fuel, Total EDR margin ≥ 10 AND electric-ready	<u>New HRR/Hotel:</u> All-electric OR Mixed-Fuel and >10% compliance margin	<u>New:</u> All-electric OR Mixed-Fuel: 10% compliance margin AND electric-ready Exception: Labs, industrial, manufacturing occupancies	2019 LR Res NC / 2019 Non Res NC	19.36.040	Ord. No 7,678-N.S.
	PV	12/3/2019	2/20/2020	N/A	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10		19.36.100.3	
Brisbane	PV	12/12/2019	2/20/2020	N/A (see All-electric sheet)	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft OR Solar thermal	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft OR Solar thermal	2019 LR Res NC / 2019 Non Res NC	15.81.050	Ord. No. 643

2019 Code Cycle - Locally Adopted Energy Ordinances									
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
Burlingame	PV	8/17/2020	10/14/2020	N/A (see All-electric sheet)	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. Alternative: Solar thermal > 40 sq.ft. collector area	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. Alternative: Solar thermal > 40 sq.ft. collector area	2019 LR Res NC / 2019 Non Res NC	110.0	Ordinances 1979, 1980, 1981
Carlsbad	EE	3/12/2019	8/14/2019	<u>New:</u> HPWH OR solar thermal <u>Adds/Alts:</u> > \$60k: Presc. measures	<u>New:</u> HPWH OR increased solar fraction	<u>New:</u> Electric water heating OR solar thermal > 0.4 SF	Carlsbad Energy Conservation Ordinance CE Study	18.30.190	Ord. No. CS-348
	PV	3/12/2019	8/14/2019	N/A	<u>New/Alt:</u> 15 kW per 10,000 s.f.; min 5kW for < 10,000 s.f.	<u>New/Alt:</u> PV that offsets 80%; 15 kW per 10,000 s.f.; min 5kW for < 10,000 s.f.	2016 NR New Construction	18.30.130	Ord. No. CS-347
Chula Vista	EE	12/1/2020	1/25/2021	<u>Add/Alts:</u> performance/prescriptive efficiency reqs. for pre-2006 buildings (CZ specific)	N/A	N/A	2019 Existing LR	Chapter 15.26.040	Ord. No. 2020-3495
Daly City	PV	5/10/2021	7/15/2021	N/A (see All-electric sheet)	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	2019 LR Res NC / 2019 Non Res NC	Section 15.60.030	Ord. No. 1448
Davis	EE	10/8/2019	1/22/2020	<u>New SE:</u> All-electric OR Mixed Fuel, EDR margin of 9.5; <u>New LR ME:</u> Mixed fuel, EDR margin of 10; electric-ready	N/A	N/A	2019 LR Res New Construction	8.01.092	Ord. No. 2565
East Palo Alto	PV	10/20/2020	12/9/2020	N/A (see All-electric sheet)	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	2019 LR Res NC / 2019 Non Res NC		Ord. No. 07-2020
Emeryville	PV	9/13/2021		N/A (see All-electric sheet)	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New Hotel/Motel:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.11	2020 LR Res NC / 2019 Non Res NC	Section 8-10.03	Ord. No. 21-006

2019 Code Cycle - Locally Adopted Energy Ordinances

Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
	PV	10/13/2021		N/A	<u>New:</u> PV of 5 kW min. for < 10,000 sq. ft. and 15 kWdc per 10,000 sq. ft. for > 10,000 sq. ft. OR TDV valuation method (includes additions that increase roof by 1,000 sq. ft and alterations with permit value over \$1,000,000 that affects 75% of floor area	<u>New:</u> PV of 5 kW min. for < 10,000 sq. ft. and 15 kWdc per 10,000 sq. ft. for > 10,000 sq. ft. OR TDV valuation method (includes additions that increase roof by 1,000 sq. ft and alterations with permit value over \$1,000,000 that affects 75% of floor area	2019 LR Res NC / 2019 Non Res NC	Section 120.10	Ord. 2021-13
Encinitas	EE	10/13/2021		<u>Additions/Alterations of pre-1978 buildings >\$50k:</u> duct sealing OR cool roof <u>Additions/Alterations of post-1978 buildings >\$50k:</u> LED lighting package OR insulated hot water pipes OR upgraded water fixtures; <i>Exception for buildings that score >7 on DOE Home Energy Score</i>	<u>Additions/Alterations of pre-1978 >\$50k:</u> R-38 attic insulation <u>Additions/Alterations of 1978-1990 buildings >\$50k:</u> duct sealing OR cool roof <u>Additions/Alterations of 1991-present buildings:</u> LED lighting package OR water heating package; <i>Exception for buildings that score >7 on DOE Home Energy Score</i>	<u>Additions/Alterations of 1,000 sq. ft. >\$200k:</u> Inclusion of outdoor lighting- one prescriptive measure / Steel Framing- prescriptive measure	2019 Existing LR	Section 23.12.080	Ord. 2021-13
Half Moon Bay	PV	12/21/2021		N/A (see All-electric sheet)	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New Hotel/Motel:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.11	2020 LR Res NC / 2019 Non Res NC	Section 140.3	Ord. No. C-2021-

2019 Code Cycle - Locally Adopted Energy Ordinances

Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
Hayward	EE	3/17/2020	6/10/2020	N/A (see All-electric sheet)	<u>New</u> : All-electric OR 10% compliance margin	<u>New</u> : All-electric OR 10% compliance margin (15% for Office/Retail)	2019 LR Res NC / 2019 Non Res NC	9-1.02	Ord. No. 20-05
	PV	3/17/2020	6/10/2020	N/A (see All-electric sheet)	<u>New</u> : PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New</u> : PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10			
Los Angeles County	EE	11/26/2019	4/8/2020	<u>New and Re-roof</u> : Low-slope Aged Refl. ≥ 0.65 , TE ≥ 0.85 , SRI ≥ 78 Steep-slope: Aged Refl. ≥ 0.25 , TE > 0.85 , SRI ≥ 20	<u>New and Re-roof</u> : Low-slope Aged Refl. ≥ 0.65 , TE ≥ 0.75 , SRI ≥ 78 Steep-slope: Aged Refl. ≥ 0.25 , TE > 0.75 , SRI ≥ 20	<u>New and Re-roof</u> : Low-slope Aged Refl. ≥ 0.68 , TE ≥ 0.85 , SRI ≥ 82 Steep-slope: Aged Refl. ≥ 0.28 , TE > 0.85 , SRI ≥ 27	2016 Cool Roofs	Title 31	Ord No. 2019-0061
Marin County	EE	10/8/2019	12/11/2019	<u>New</u> : All-electric OR Limited Mixed-Fuel prewire for induction, EE EDR Margin ≥ 3 OR Mixed-Fuel, pre-wire for induction, EE EDR Margin ≥ 3 and Total EDR Margin ≥ 10	<u>New</u> : All-electric OR Limited Mixed-Fuel: 5% compliance margin, prewired for induction OR Mixed-Fuel: 10% compliance margin, pre-wired for induction	<u>New</u> : All-electric OR Limited Mixed-Fuel: 5% compliance margin, prewired for induction OR Mixed-Fuel: 10% compliance margin, pre-wired for induction	2019 LR Res NC / 2019 Non Res NC	19.04.130	Ord. No. 3712
Menlo Park	PV	9/24/2019	12/11/2019	<u>N/A</u> (see All-electric sheet)	<u>New</u> : PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. (some exceptions)	<u>New</u> : PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. (some exceptions)	2019 LR Res NC / 2019 Non Res NC	12.16.110.10	Ord. No. 1057
Millbrae	PV	11/10/2020	1/25/2021	<u>N/A</u> (see All-electric sheet)	<u>New</u> : PV on 50% of roof area	<u>New</u> : PV on 50% of roof area	2020 LR Res NC / 2019 Non Res NC	9.50	Ord. No. 2020-
Mill Valley	EE	11/18/2019	4/8/2020	<u>New</u> : All-electric OR Limited Mixed-Fuel: prewire for induction, with EE EDR Margin ≥ 3 OR Mixed-Fuel, pre-wire for induction, EE EDR Margin ≥ 3 and Total EDR Margin ≥ 10	<u>New</u> : All-electric OR Limited Mixed-Fuel: 5% compliance margin, prewired for induction OR Mixed-Fuel: 10% compliance margin, pre-wired for induction	N/A	2019 LR Res NC / 2019 Non Res NC	Chapter 14.48	Ord. No. 1313

2019 Code Cycle - Locally Adopted Energy Ordinances

Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
Milpitas	EE	12/3/2019	2/20/2020	<u>New:</u> All-electric OR Elec. Space and Water Heat: Eff. EDR Margin of 2 for SF and 1 for MF Mixed-Fuel: Total EDR Margin of 10 for SF and 11 for MF; AND electric-ready	<u>New HR MF/ Hotel:</u> All-electric OR > 6% compliance margin AND electric-ready	<u>New:</u> All-electric OR Office & Retail: >14% compliance margin; Industrial/ Manufacturing + 0%; All other NR occupancies > 6% compliance margin; AND electric-ready	2019 LR Res NC / 2019 Non Res NC	Title 2, Chapter 11, Section 2	Ord. No. 65 148
	PV	12/3/2019	2/20/2020	N/A	N/A	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft.			
Mountain View	PV	11/12/2019	2/20/2020	N/A (see All-electric sheet)	<u>New:</u> PV on 50% of roof area	<u>New:</u> PV on 50% of roof area	2019 LR Res NC / 2019 Non Res NC	Chapter 8, Article 1, Division 3, Section 8.20	Ord. No. 17.19
Pacifica	PV	11/25/2019	4/8/2020	N/A (see All-electric sheet)	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft.	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft.	2019 LR Res NC / 2019 Non Res NC	Section 8.6.08	Ord. No. 852-CS
Palo Alto	EE	12/2/2019	2/20/2020	N/A (see All-electric sheet)	<u>New:</u> All-electric OR > 5% compliance margin AND electric-ready	<u>New:</u> All-electric OR Office & Retail: >12% compliance margin; Industrial/ Manufacturing + 0%; All other NR occupancies > 5% compliance margin; AND electric-ready	2019 LR Res NC / 2019 Non Res NC	16.17.040 et. seq.	Ord. No. 5485
	PV	12/2/2019	2/20/2020	N/A	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New:</u> PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10			

2019 Code Cycle - Locally Adopted Energy Ordinances									
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
Piedmont	EE	2/1/2021	5/12/2021	<u>Add/Alts:</u> > \$25k Prescriptive EE reqs.	N/A	N/A	2019 Cost Effectiveness Study for Existing LR Residential Building Upgrades	Section 8.02.020	Ord. No. 750NS
	PV	2/1/2021	5/12/2021	<u>Add/Alts:</u> Additional level or roof area increased by >30%	N/A	N/A	2019 Cost-Effectiveness Study: Low-Rise Residential Addendum	Section 8.02.070	
Redwood City	PV	9/21/2020	12/9/2020	N/A (see All-electric sheet)	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. <u>Alternative:</u> Solar thermal > 40 sq.ft. collector area (some exceptions)	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. <u>Alternative:</u> Solar thermal > 40 sq.ft. collector area (some exceptions)	2019 LR Res NC / 2019 Non Res NC	Section 9.255	Ord. No.
Richmond	PV	3/3/2020	6/10/2020	N/A (see All-electric sheet)	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. <u>Alternative:</u> Solar thermal ≥ 40 sq.ft. collector area	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. <u>Alternative:</u> Solar thermal ≥ 40 sq.ft. collector area	2019 LR Res NC / 2019 Non Res NC	Chapter 6.02.100	Ord No. 06-20 NS
San Anselmo	EE	4/14/2020	9/9/2020	<u>New:</u> All-electric OR Limited Mixed-Fuel prewire for induction, EE EDR Margin ≥ 3 OR Mixed-Fuel, pre-wire for induction, EE EDR Margin ≥ 3 and Total EDR Margin ≥ 10	<u>New:</u> All-electric OR Limited Mixed-Fuel: 5% compliance margin, prewired for induction OR Mixed-Fuel: 10% compliance margin, pre-wired for induction	<u>New:</u> All-electric OR Limited Mixed-Fuel: 5% compliance margin, prewired for induction OR Mixed-Fuel: 10% compliance margin, pre-wired for induction	2019 LR Res NC / 2019 Non Res NC	Section 9-19.040	Ord. No. 1145
San Carlos	PV	1/25/2021	5/12/2021	N/A (see All-electric sheet)	<u>New:</u> PV of 2 W/sq. ft for buildings < 10 habitable stories	<u>New:</u> PV of 2 W/sq. ft for buildings < 3 habitable stories , healthcare facilities excepted	2019 LR Res NC / 2019 Non Res NC	Section 9.255	Ord. No. 1570

2019 Code Cycle - Locally Adopted Energy Ordinances									
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
San Francisco	EE	1/7/2020	4/8/2020	<u>New</u> : All-electric OR Mixed Fuel; Total EDR Score ≤ 14	<u>New HRR/Hotel</u> : All-electric OR Mixed-Fuel and >10% compliance margin	-	2019 LR Res NC / 2019 Non Res NC	Section 4.201.3 Section 5.201.3	Ord. No 003-20
San Jose	EE	10/1/2019	12/11/2019	N/A (see All-electric sheet)	<u>New HR MF/ Hotel</u> : All-electric OR > 6% compliance margin and electric-ready	<u>New</u> : All-electric OR Office & Retail: >14% compliance margin; Industrial/Manufacturing + 0%; All other NR occupancies > 6% compliance margin; and electric-ready	2019 LR Res NC / 2019 Non Res NC	24.12.100	Ord. No. 30311
San Luis Obispo	EE	7/7/2020	8/11/2020	<u>New SF</u> : All-electric OR Mixed Fuel, EDR margin of 9; <u>New LR MF</u> : Mixed fuel, EDR margin of 9.5 AND electric-ready	<u>New</u> : All-electric OR Hotel/HRR > 9% compliance margin; AND electric-ready	<u>New</u> : All-electric OR Office/Retail 15% compliance margin, Others 5% compliance margin AND electric ready	2019 LR Res NC / 2019 Non Res NC	Chapter 15.50	Ord. No. 1684
	PV	7/7/2020	8/11/2020	N/A	<u>New</u> : PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10	<u>New</u> : PV system to fill solar zone (>15% of roof area) as defined in Sec. 110.10		Chapter 15.04.110	Ord. No. 1684
San Mateo (City)	EE	9/3/2019	12/11/2019	(see All-electric sheet) <u>New SF and Duplexes</u> : All-electric OR min Eff. EDR reduction of 2.5	N/A	(see All-electric sheet) <u>New Office Buildings</u> : All-electric OR Mixed-Fuel + 10% compliance margin	2019 LR Res NC / 2019 Non Res NC	23.23.040	Ord. No. 2019-9
	PV			Prewire PV system for expansion to all-electric design	<u>New</u> : PV: ≥ 3 kW. Alternative: Solar thermal ≥ 40 sq ft collector area	<u>New</u> : <10,000 s.f.: min. 3 kW PV; 10,000+ s.f.: 5 kW PV Alternative: Solar thermal ≥ 40 s.f. collector area	2019 LR Res NC / 2019 Non Res NC	23.24.030	Ord. No. 2019-9
	EE	10/5/2020	12/9/2020	(see All-electric sheet) <u>New 100% Affordable LR MF</u> : All-electric OR at least .5 EDR less than Standard Design OR Prescriptive measures	<u>New 100% Affordable HR MF</u> : All-electric OR >5% compliance margin OR Prescriptive measures	(see All-electric sheet)	2020 LR Res NC / 2019 Non Res NC	23.24.020	Ord. No. 2020-17

2019 Code Cycle - Locally Adopted Energy Ordinances									
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
San Rafael	EE	11/18/2019	4/8/2020	<u>New:</u> CALGreen Tier 1: Mixed fuel, EDR ≥ 10, All-elec EDR ≥ 14	<u>New:</u> CALGreen Tier 1 (5% compliance margin)	<u>New:</u> CALGreen Tier 1 (10% compliance margin)	2019 LR Res NC / 2019 Non Res NC	Chapter 12.100	Ord. No. 1974
Santa Clara	PV	11/16/2021		N/A (see All-electric sheet)	<u>New HR MF/ Hotel ≤ 10 stories:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. Alternative: Solar thermal	<u>New ≤ 3 stories:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. Exception for healthcare facilities Alternative: Solar thermal	2020 LR Res NC / 2019 Non Res NC	Chapter 15.36.090	Ord. No. 2034
Santa Clara County	PV	12/14/2021		N/A (see All-electric sheet)	<u>New:</u> PV system to fill 15% of roof area	<u>New:</u> PV system to fill 15% of roof area	2021 LR Res NC / 2019 Non Res NC	Section C3-63	Ord. NS-1100.135
Santa Monica	EE	9/24/2019	12/11/2019	<u>New:</u> All-electric OR Mixed-Fuel with CalGreen Tier 1	<u>New HRR/Hotel:</u> All-electric OR Mixed-Fuel and >5% compliance margin	<u>New:</u> All-electric OR Mixed-Fuel and >10% compliance margin	2019 LR Res NC / 2019 Non Res NC	<u>8.36.020</u>	Ord. No. 2617
	PV			<u>Major Additions:</u> PV system 1.5 watts per sq. ft.	<u>New and Major Additions:</u> 2 watts per sq. ft.	<u>New and Major Additions:</u> 2 watts per sq. ft.	2019 LR Res NC: PV + Additions Addendum	<u>8.106.055</u>	Ord. No. 2617
Solana Beach	PV	12/8/2021		N/A	N/A	<u>New:</u> PV of 5 kW min. for < 10,000 sq. ft. and 15 kWdc per 10,000 sq. ft. for > 10,000 sq. ft. OR TDV valuation method <u>Add/Alts:</u> additions > 50% additional floor area/ permit value of \$300,000/or alters 50% of structural components	2021 LR Res NC / 2019 Non Res NC	Chapter 15.22.04	Ordinance 518

2019 Code Cycle - Locally Adopted Energy Ordinances

Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Single Family and Low-rise Multifamily Requirement	High-rise Multifamily Requirement	Nonresidential Requirement	Cost-effectiveness Study	Municipal Code Link	Ordinance
Sunnyvale	PV	12/1/2020	1/25/2021	N/A (see All-electric sheet)	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. Alternative: Solar thermal ≥ 40 sq.ft. collector area	<u>New:</u> PV of 3 kW min. for < 10,000 sq. ft. and 5 kW min. for > 10,000 sq. ft. Alternative: Solar thermal ≥ 40 sq.ft. collector area	2019 LR Res NC / 2019 Non Res NC	Section 16.42.090	Ord. No. 3168-20
West Hollywood	EE, Cool Roofs	8/19/2019	12/11/2019	<u>New or Alteration > 10,000 sq. ft.:</u> PV to offset 15% of usage OR solar thermal with min. .5 solar fraction OR vegetative roof covering min. 30%	<u>New or Alteration > 10,000 sq. ft.:</u> PV to offset 15% of usage OR solar thermal with min. .5 solar fraction OR vegetative roof covering min. 30%	<u>New or Alteration > 10,000 sq. ft.:</u> PV to offset 15% of usage OR solar thermal with min. .5 solar fraction OR vegetative roof covering min. 30%	2019 NR+ Retrofits PV / 2019 Non Res NC	19.20.060	Ord. No. 19-1072
<p>This report was prepared for the California Statewide Codes & Standards Program. The program is funded by California utility customers and administered by Pacific Gas and Electric Company, San Diego Gas & Electric Company (SDG&E®), and Southern California Edison Company under the auspices of the California Public Utilities Commission and in support of the California Energy Commission.</p> <p>© 2021 Pacific Gas and Electric Company, San Diego Gas and Electric Company, and Southern California Edison. All rights reserved, except that this document may be used, copied, and distributed without modification</p>									

2019 Code Cycle - Locally Adopted All-Electric Only Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Scope			Municipal Code Link	Ordinance
				Single Family and Low-rise Multifamily	High-rise Multifamily	Nonresidential		
Alameda	All-Electric	6/1/2021	8/11/2021	<u>New:</u> All-electric (excluding ADUs)	<u>New:</u> All-electric	<u>New:</u> Exception for non-electric space heating and process systems in Fire, High-Hazard, Laboratory occupancies; public/employee cafeteria; pre-wire for electric	13-11.3	Ord. No.
Berkeley	All-Electric	7/16/2019	N/A	<u>New:</u> All-electric	<u>New:</u> All-electric	<u>New:</u> All-electric	Chapter 12.80	Ord. No. 7,672-N.S
Brisbane	All-Electric	12/12/2019	2/20/2020	<u>New:</u> Exception for cooktops/fireplaces; pre-wire for electric	<u>New:</u> All-electric	<u>New:</u> Except Life science occupancies and gas specific for profit kitchen	15.83.060	Ord. No. 643
Burlingame	All-Electric	8/17/2020	10/14/2020	<u>New:</u> Exception for indoor/outdoor cooking appliances and fireplaces; pre-wire for electric. <u>Adds/Alts:</u> > 50% valuation when HVAC included	<u>New:</u> All-electric	<u>New:</u> Exception for-profit kitchen cooking equipment; pre-wire for electric	110.0	Ordinances 1979, 1980, 1981
Campbell	All-Electric	2/18/2020	1/25/2021	<u>New:</u> All-electric space/water heating. Natural gas OK for other uses; pre-wire for electric	N/A	N/A	18.18.020	Ord. No 2,260
Contra Costa County	All-Electric	1/18/2022		<u>New:</u> All-electric (excluding dwelling units)	<u>New:</u> All-electric	<u>New:</u> All-electric	Section 74-2.002	Ord. No. 2022-02
Cupertino	All-Electric	1/21/2020	4/8/2020	<u>New:</u> All-electric (excluding ADUs)	<u>New:</u> All-electric	<u>New:</u> Exception for Fire, High-Hazard, Laboratory, and "Essential Facilities" occupancies; pre-wire for electric	16.54.100 et. seq.	Ord. No. 19-2193
Daly City	All-Electric	5/10/2021	7/15/2021	<u>New:</u> All-electric (excluding dwelling units)	<u>New:</u> All-electric	<u>New:</u> Exception for Fire, High-Hazard, Laboratory occupancies and for-profit kitchen cooking equipment	Section 15.160.020	Ord. No. 1448

2019 Code Cycle - Locally Adopted All-Electric Only Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Scope			Municipal Code Link	Ordinance
				Single Family and Low-rise Multifamily	High-rise Multifamily	Nonresidential		
East Palo Alto	All-Electric	10/20/2020	12/9/2020	<u>New:</u> Exception for ADUs; and cooktops/fireplaces; pre-wire for electric	<u>New:</u> Exceptions cooktops/fireplaces, gas water-heating for affordable housing; pre-wire for electric	<u>New:</u> Exception for Life Science buildings, Emergency operations, and for-profit cooking; pre-wire for electric	Chapter 15.25	Ord. No 07-2020
Emeryville	All-Electric	9/13/2021		<u>New:</u> All-electric (including ADUs > 400 sq. ft.) <u>Adds/Alts:</u> > 50% of foundation or existing framing	N/A	N/A	Section 8-10.03	Ord. No. 21-006
Encinitas	All-Electric	10/13/2021		<u>New:</u> All-electric	<u>New:</u> All-electric	<u>New:</u> Exception for Essential facilities and for-profit kitchens with business-related reason to cook with flame	Section 23.12.080	Ord. 2021-13
Fairfax	All-Electric	9/1/2021		<u>New:</u> All-electric	<u>New:</u> All-electric	<u>New:</u> Exception for public interest projects and for-profit cooking equipment	Chapter 15.05	Ord. No.
Half Moon Bay	All-Electric	2/15/2022		<u>New:</u> All-electric + Prohibition on conversion to Mixed-Fuel buildings + Termination of gas service 2045	<u>New:</u> All-electric + Prohibition on conversion to Mixed-Fuel buildings + Termination of gas service 2045	<u>New:</u> All-electric + Prohibition on conversion to Mixed-Fuel buildings, Exception for commercial greenhouses	Section 14.06.030	Ord. No. C-2022-
Hayward	All-Electric	3/17/2020	6/10/2020	<u>New:</u> All-electric (including ADUs > 400 sq. ft.)	<u>New:</u> All-electric OR 10% compliance margin	<u>New:</u> All-electric OR 10% compliance margin (15% for Office/Retail)	9-1.02	Ord. No. 20-05
Healdsburg	All-Electric	12/16/2019	2/20/2020	<u>New:</u> Exception for cooktops, fireplaces, pool/spa; pre-wire for electric	<u>New:</u> Exception for cooktops, fireplaces, pool/spa; pre-wire for electric	<u>New:</u> Exception for cooktops, fireplaces, pool/spa, Essential Services, technical processes; pre-wire for electric	15.04.08	Ord. No. 1196

2019 Code Cycle - Locally Adopted All-Electric Only Ordinances							
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Scope		Municipal Code Link	Ordinance
				Single Family and Low-rise Multifamily	High-rise Multifamily	Nonresidential	
Hillsborough	All-Electric	5/9/2022		<u>New</u> : All-electric space/water heating (including ADUs). Natural gas OK for other uses; pre-wire for electric	N/A	N/A	Section 15.10.50 Ord. No.
Los Altos Hills	All-Electric	2/20/2020	12/9/2020	<u>New</u> : All-electric space/water heating (including ADUs). Natural gas OK for other uses; pre-wire for electric	N/A	N/A	8.1.6.02 Ord. No. 589
Los Altos	All-Electric	11/10/2020	1/25/2021	<u>New</u> : Exception for cooktops/fireplaces; pre-wire for electric	<u>New</u> : All-electric for developments > 10 units	<u>New</u> : Exception for Scientific Laboratory/ Public buildings and for-profit cooking; prewire for electric	Chapter 12.22 Ord. No. 2020-470A C
Los Gatos	All-Electric	12/17/2019	2/20/2020	<u>New</u> : All-electric (including ADUs); pre-wire for battery storage	N/A	N/A	Chapter 6, Article 7, Section 6.70.010 Ord. No. 2299
Menlo Park	All-Electric	9/24/2019	12/11/2019	<u>New</u> : All-electric space/water heating and clothes dryers. Natural gas OK for cooktops/fireplaces; pre-wire for electric	<u>New</u> : All-electric	<u>New</u> : All-electric	12.16.010 Ord. No. 1057
Millbrae	All-Electric	11/10/2020	1/25/2021	<u>New</u> : All-electric space/water heating and clothes dryers. Natural gas OK for cooktops/fireplaces; pre-wire for electric	<u>New</u> : All-electric	<u>New</u> : Exception for Life Science/ Public buildings. For-profit cooking may appeal for exception; prewire for electric	9.50 Ord. No. 2020-
Morgan Hill	All-Electric	10/23/2019	N/A	<u>New</u> : All-electric	<u>New</u> : All-electric	<u>New</u> : All-electric	15.63 Ord. No. 2306 N.S.

2019 Code Cycle - Locally Adopted All-Electric Only Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Scope			Municipal Code Link	Ordinance
				Single Family and Low-rise Multifamily	High-rise Multifamily	Nonresidential		
Mountain View	All-Electric	10/22/2019	2/20/2020	<u>New SF and Duplexes:</u> Exception for cooktops/fireplaces; pre-wire for electric. <u>New LR MF:</u> Exception for-profit kitchen cooking equipment	<u>New:</u> exception for F, H, and L occupancies and for-profit kitchen cooking equipment	<u>New:</u> Exception for Fire, High-Hazard, Laboratory occupancies and for-profit kitchen cooking equipment	Chapter 8, Division 3, Section 8.20	Ord. No. 17.19
Oakland	All-Electric	12/1/2020		<u>New:</u> All-electric	<u>New:</u> All-electric	<u>New:</u> All-electric		Ord. No.
Ojai	All-Electric	11/10/2020		<u>New:</u> Exception for ADUs, pool/spa, for-profit kitchen cooking equipment	<u>New:</u> All-electric	<u>New:</u> Exception for-profit kitchen cooking equipment	Section 9-1.1002	Ord. No.
Pacifica	All-Electric	11/25/2019	4/8/2020	<u>New:</u> Exception for ADUs; and cooktops/fireplaces; pre-wire for electric. <u>New LR MF:</u> Exception for-profit kitchen cooking equipment	<u>New:</u> Exception for cooktops/fireplaces; pre-wire for electric	<u>New:</u> Exception for Fire and Police occupancies and for-profit kitchen cooking equipment	Section 8.6	Ord. No. 852-CS
Palo Alto	All-Electric	12/2/2019	2/20/2020	<u>New:</u> All-electric	<u>New:</u> All-electric OR > 5% compliance margin; electric-ready	<u>New:</u> All-electric OR Office & Retail: >12% compliance margin; Industrial/ Manufacturing + 0%; All other NR occupancies > 5% compliance margin; pre-wire for electric	16.17.040 et. seq.	Ord. No. 5485
Petaluma	All-Electric	5/17/2021		<u>New:</u> All-electric <u>Add/Alts:</u> > 50% exterior wall perimeter/ floor area	<u>New:</u> All-electric <u>Add/Alts:</u> > 50% exterior wall perimeter/ floor area	<u>New:</u> All-electric <u>Add/Alts:</u> > 50% exterior wall perimeter/ floor area. Exception for Essential Services	17.09	Ord. No.

2019 Code Cycle - Locally Adopted All-Electric Only Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Scope			Municipal Code Link	Ordinance
				Single Family and Low-rise Multifamily	High-rise Multifamily	Nonresidential		
Piedmont	All-Electric	2/1/2021	5/12/2021	<u>New</u> : All-electric	N/A	N/A	8.02.070	Ord. No. 750NS
Redwood City	All-Electric	9/21/2020	12/9/2020	<u>New</u> : All-electric (excluding ADUs)	<u>New</u> : exception for Fire, High-Hazard, and Laboratory occupancies and for-profit kitchen cooking equipment; additional exceptions	<u>New</u> : exception for Fire, High-Hazard, and Laboratory occupancies and for-profit kitchen cooking equipment; additional exceptions	Section 9.249	Ord. No.
Richmond	All-Electric	3/3/2020	6/10/2020	<u>New</u> : All-electric space/water heating and clothes dryers. Natural gas OK for cooktops/fireplaces; pre-wire for electric <u>Replace/Upgrade Equipment</u> : all-electric	<u>New</u> : All-electric	<u>New</u> : Exception for Fire/Police, Life Sciences, For-profit kitchen cooking equipment; pre-wire for electric	Chapter 6.02.100	Ord No. 06-20 NS
	All-Electric	11/16/2021		<u>New</u> : All-electric	<u>New</u> : All-electric	<u>New</u> : Exception for public interest projects	Chapter 9.64	Ord. No.
Sacramento	All-Electric	6/1/2021		<u>New Buildings ≤ 3 Stories</u> : All-electric EFFECTIVE 2023 <u>New Buildings ≥ 4 Stories</u> : All-Electric EFFECTIVE 2026	<u>New Buildings ≤ 3 Stories</u> : All-electric EFFECTIVE 2023 <u>New Buildings ≥ 4 Stories</u> : All-Electric EFFECTIVE 2027	<u>New Buildings ≤ 3 Stories</u> : All-electric EFFECTIVE 2023 <u>New Buildings ≥ 4 Stories</u> : All-Electric EFFECTIVE 2028	Chapter 15.30.030	Ord. No.
San Carlos	All-Electric	1/25/2021	5/12/2021	<u>New</u> : Exception for cooktops/fireplaces; pre-wire for electric <u>Adds/Alts</u> : > 50% of structure	<u>New</u> : exception Laboratory occupancies and for-profit kitchen cooking equipment upon review; additional exceptions	<u>New</u> : exception Laboratory occupancies and for-profit kitchen cooking equipment upon review; additional exceptions	Section 110.0	Ord. No. 1570

2019 Code Cycle - Locally Adopted All-Electric Only Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Scope			Municipal Code Link	Ordinance
				Single Family and Low-rise Multifamily	High-rise Multifamily	Nonresidential		
San Francisco	All-Electric	11/17/2020		<u>New</u> : All-electric	<u>New</u> : All-electric	<u>New</u> : All-electric	Section 106A	Ord. No.
San Jose	All-Electric	9/17/72019	N/A	<u>New</u> : All-electric	N/A	N/A	Chapter 17.845	Ord No. 30330
		12/1/2020	N/A	<u>New</u>	<u>New</u>	<u>New</u> : Exception for hospitals and facilities with a Distributed Energy Resource	Chapter 17.845	Ord. No. 30502
San Mateo City	All-Electric	10/5/2020	12/9/2020	<u>New</u> : All-electric (including ADU's)	N/A	<u>New Office Buildings</u> : All-electric	Section 23.24	Ord. No. 2020-17
San Mateo County	All-Electric	2/25/2020	9/9/2020	<u>New</u> : All-electric	<u>New</u> : All-electric	<u>New</u> : Exception for Laboratories, Emergency operations, and for-profit cooking (requires approval)	Section 9200	Ord No. 4824
Santa Clara	All-Electric	11/16/2021		<u>New</u> : All-electric <u>Add/Alts</u> : > 50% exterior wall / 50% wall plate raised	<u>New</u> : Exception for on-site laundry in hotels > 80 rooms <u>Add/Alts</u> : > 50% exterior wall / 50% wall plate raised	<u>New</u> : Exception for on-site laundry in hotels > 80 rooms <u>Add/Alts</u> : > 50% exterior wall / 50% wall plate raised	Chapter 15.36	Ord. No. 2034
Santa Clara County	All-Electric	12/14/2021		<u>New</u> : All-electric	<u>New</u> : All-electric	<u>New</u> : exception for Fire, High-Hazard, Hospitals, Correction Facilities, and Laboratory occupancies	Section C3-62	Ord. NS-1100.135
Santa Barbara	All-Electric	7/27/2021		<u>New</u> : All-electric	<u>New</u> : All-electric	<u>New</u> : Exception for public interest projects, Laboratories, clean rooms, and for-profit cooking equipment	Section 22.100.040	Ord. No.
Santa Cruz	All-Electric	4/14/2020	N/A	<u>New</u> : All-electric (including ADUs > 750 sq. ft.)	<u>New</u> : All-electric	<u>New</u> : Exception for industrial heat processes and for-profit kitchen cooking equipment	Chapter 6.100	Ord. No. 2020-06

2019 Code Cycle - Locally Adopted All-Electric Only Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	CEC Approval Date	Scope			Municipal Code Link	Ordinance
				Single Family and Low-rise Multifamily	High-rise Multifamily	Nonresidential		
Santa Rosa	All-Electric	11/12/2019	2/20/2020	<u>New</u> : All-electric	N/A	N/A	Chapter 18-33.040	Ord. No. 2019-019
Saratoga	All-Electric	12/4/2019	4/8/2020	<u>New</u> : All-electric space/water heating. Natural gas OK for cooktops/fireplaces/clothes dryer; pre-wire for electric	<u>New</u> : All-electric space/water heating; pre-wire for electric	<u>New</u> : All-electric space/water heating. Except public agency owned emergency centers; pre-wire for electric	Chapter 16.51.015	Ord. No. 366
Solana Beach	All-Electric	12/8/2021		<u>New</u> : Exception for cooktops, fireplaces; pre-wire for electric appliances AND battery storage <u>Add/Alts</u> : > 700 sq. ft or alterations > 50% of structural components)	<u>New</u> : Exception for cooktops, fireplaces; pre-wire for electric	<u>New</u> : Exception for for-profit cooking; pre-wire for electric <u>Add/Alts</u> : additions > 50% additional floor area/ permit value of \$300,000/or alters 50% of structural components)	Chapter 15.22.050	Ordinance 518
South San Francisco	All-Electric	6/9/2021		<u>New</u> : All-electric <u>Adds/Alts</u> : > 50% of structure	<u>New</u> : All-electric	N/A	Chapter 15.22	Ord. No.
Sunnyvale	All-Electric	12/1/2020	1/25/2021	<u>New</u> : All-electric	<u>New</u> : All-electric	<u>New</u> : Exception for Fire, High-Hazard, Laboratory occupancies and for-profit kitchen cooking equipment; prewire for electric	Chapter 16.42	Ord. No. 3168-20
<p>This report was prepared for the California Statewide Codes & Standards Program. The program is funded by California utility customers and administered by Pacific Gas and Electric Company, San Diego Gas & Electric Company (SDG&E®), and Southern California Edison Company under the auspices of the California Public Utilities Commission and in support of the California Energy Commission.</p> <p>© 2021 Pacific Gas and Electric Company, San Diego Gas and Electric Company, and Southern California Edison. All rights reserved, except that this document may be used, copied, and distributed without modification</p>								

2019 Code Cycle - Locally Adopted Electric Vehicle Ordinances							
Jurisdiction	Ord. Type	Council Adopted Date	Scope				Exceptions
			Single Family, Duplexes, and Townhouses	Multifamily	Nonresidential - Office	Nonresidential - Other	Ordinance
Albany	EV	12/20/2020	N/A	<u>New MF</u> : 20% of spaces equipped with EVCS	N/A	N/A	Resolution 2020-127
Brisbane	EV	12/12/2019	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : Level 2 EV-Ready space per unit / min. 50% required guest spaces EVCS spaces	<u>New Office</u> : >10 spaces- 15% equipped with Level 2 EVCS + 10 % Level 1 EV-Ready + 25% Level 1 EV-Capable	<u>New Other NR</u> : >10 spaces- 15% equipped with Level 2 EVCS + 10 % Level 1 EV-Ready	Ord. 643
Burlingame	EV	8/17/2020	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : 10% of units with Level 2 EV-Ready space ; remaining units with Level 1 EV-Ready	<u>New Office</u> : >10 spaces- 10% equipped with Level 2 EVCS + 10 % Level 1 EV-Ready	<u>New Other NR</u> : >10 spaces- 6% equipped with Level 2 EVCS + 5 % Level 1 EV-Ready	ADU/JADU without parking facilities Ord. 1979/1980/1981
Carlsbad	EV	3/12/2019	<u>New</u> : Level 2 EV-Ready space per unit <u>Add/Alts</u> : >\$60k OR panel upgrade	<u>New</u> : 10% of units with Level 2 EV-Capable space AND 50% of those spaces installed with EVSE <u>Add/Alts</u> : >\$200k	<u>New</u> : 10% of units with Level 2 EV-Capable space AND 50% of those spaces installed with EVSE	ADU/JADU without parking facilities / utility service cost > \$400	Ord. CS-349
Contra Costa County	EV		N/A	<u>New</u> : 5% of spaces EVSE equipped	<u>New</u> : EVSE charging at each space required by TABLE 5.106.5.3.3	<u>New</u> : EVSE charging at each space required by TABLE 5.106.5.3.4	Amendment to 74-4.006 CGBSC
Colma	EV	2/24/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : 15% of units with Level 2 EV-Ready space	N/A	N/A	Ord.
Cupertino	EV	1/21/2020	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : < 20 units: Level 2 EV-Ready space per unit ; remaining spaces Level 1 EV-Ready / > 20 units: 25% of spaces Level 2 EV-Ready	<u>New Office</u> : >10 spaces- 20% equipped with Level 2 EVCS + 10 % Level 1 EV-Ready + 30% Level 1 EV-Capable	<u>New Other NR</u> : >10 spaces- 6% equipped with Level 2 EVCS + 5 % Level 1 EV-Ready	ADU/JADU without parking facilities Ord. 19-2193
Daly City	EV	5/10/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : < 20 units: Level 2 EV-Ready space per unit/ > 20 units: 75% of spaces Level 1 EV-Ready ; remaining units Level 2 EV-Ready	<u>New</u> : 10% of spaces to be Level 2 EVCS + 10% spaces Level 2 EV-Ready + 30% Level 2 EV-Capable	<u>New Other NR</u> : 6% equipped with Level 2 EVCS + 5 % Level 1 EV-Ready; >100 spaces- 80kW fast charger per 100	Ord. 1449
Davis	EV	4/23/2019	<u>New</u> : Level 2 EV-Ready space per unit	<u>New</u> : < 20 units: Level 1 charging at 5% of spaces / >20 units: Level 2 charging at 1% of spaces (min. 1)	Add/Alts: Panel upgrade must include capacity for 20% Level 2 EV-Capable	N/A	Ord. 2554

2019 Code Cycle - Locally Adopted Electric Vehicle Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	Scope				Exceptions	Ordinance
			Single Family, Duplexes, and Townhouses	Multifamily	Nonresidential - Office	Nonresidential - Other		
East Palo Alto	EV	10/20/2020	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : 10% of units with Level 2 charging + 90% of units with Level 1 charging. Outlets may be shared between two units.	<u>New</u> : Office: >10 spaces- 10% equipped with Level 2 EVCS + 10% Level 1 EV-Ready + 30 % EV-Capable	<u>New Other NR</u> : >10 spaces- 6% equipped with Level 2 EVCS + 5 % Level 1 EV-Ready	ADU/JADU without parking facilities + MF: utility service cost > \$4500	Ord. 07-2020
Encinitas	EV	11/13/2019	<u>New</u> : Level 2 EV-Ready space per unit	<u>New</u> : EVSE charging at 15% of spaces	<u>New NR + Hotel/Motel</u> : EVSE charging at 8% of spaces <u>Add/Alts</u> : > 10k sq. ft.		ADU/JADU without parking facilities / utility service cost > \$400 per unit	Ord. 2019-22
Fremont	EV	4/20/2021	<u>New</u> : Level 2 EV-Ready space per unit	<u>New</u> : EV-Ready spaces calculated based on total spaces	N/A	N/A	Utility service cost > \$400 per unit	Ordinance 05-2021
Half Moon Bay	EV	12/21/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : < 20 units: Level 2 EV-Ready space per unit / > 20 units: 25% of spaces Level 2 EV-Ready + remaining spaces Level 1 EV-Ready / Affordable MF: 10% spaces Level 2	N/A	N/A	ADU/JADU without parking facilities	Ord. C-2021-
Hayward	EV	3/17/2020	<u>New</u> : Two Level 2 EV-Ready spaces for each unit (one Level 2 if only 1 space exists).	<u>New</u> : < 20 units: Level 2 EV-Ready space per unit. > 20 units: 75% of spaces Level 2 EV-Ready ; remaining units Level 2 EV-Capable	<u>New Office</u> : >10 spaces- 20% equipped with Level 2 EVCS + 30 % Level 2 EV-Ready Capable	<u>New Other</u> : >10 spaces; 15% equipped with Level 2 EVCS	ADU/JADU without parking facilities	Ord. 20-05
Los Altos	EV	10/27/2020	<u>New</u> : Level 2 EV-Ready spaces for each unit (Two Level 2 if multiple spaces exist)	<u>New</u> : < 20 units: Level 2 EV-Ready space per unit/ > 20 units: 25% of spaces Level 2 EV-Ready + remaining spaces Level 1 EV-Ready	<u>New</u> : Office: >10 spaces- 10% equipped with Level 2 EVCS + 30 % Level 2 EV-Ready Capable + 10% Level 1 EV-Ready	<u>New</u> : Other NR: >10 spaces- 6% equipped with Level 2 EVCS + 5% Level 1 EV-Ready	ADU/JADU without parking facilities	Ord. 2020-471
Marin County	EV	10/8/2019	<u>New</u> : Level 2 EV-Ready space per unit <u>Add/Alts</u> : Panel upgrade must include Level 2-Ready circuit	<u>New</u> : Level 2 EV-Ready space per dwelling unit <u>Add/Alts</u> : Panel upgrade must include capacity for 20% Level 2 EV-Capable spaces	<u>New</u> : 10% of spaces to be Level 2 EV-Ready + remaining spaces EV-Capable OR 20% spaces Level 2 EV-Ready + EVCS in 5% spaces (min. 2) <u>Add/Alts</u> : Panel upgrade must include capacity for 20% Level 2 EV-Capable		ADU/JADU without parking facilities	Ord. 3712

2019 Code Cycle - Locally Adopted Electric Vehicle Ordinances								
Jurisdiction	Ord. Type	Council Adopted Date	Scope				Exceptions	Ordinance
			Single Family, Duplexes, and Townhouses	Multifamily	Nonresidential - Office	Nonresidential - Other		
Millbrae	EV	11/10/2020	<u>New:</u> Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New:</u> < 20 units: Level 2 EV-Ready space per unit / > 20 units: 25% of spaces Level 2 EV-Ready + remaining spaces Level 1 EV-Ready / Affordable MF: 10% spaces Level 2	<u>New Office:</u> >10 spaces- 10% equipped with Level 2 EVCS + additional 10 % LeMF: utility service cost > \$4500vel 1 EV-Ready + additional 30% EV-Capable	<u>New Other NR:</u> >10 spaces- 6% equipped with Level 2 EVCS + additional 5 % Level 1 EV-Ready	ADU/JADU without parking facilities + MF: utility service cost > \$4500	Ord. No. 2020-20
Mill Valley	EV	11/18/2019	<u>New:</u> Level 2 EV-Ready per unit <u>Add/Alts:</u> Panel upgrade must include Level 2-Ready circuit	<u>New:</u> One Level 2 EV-Ready space per dwelling unit	<u>Add/Alts:</u> Panel upgrade must include capacity for 20% Level 2 EV-Capable		ADU/JADU without parking facilities	Ord. 1313
Milpitas	EV	12/3/2019	<u>New:</u> Level 1 EV-Ready circuit + Level 2 EV-Ready circuit per unit	<u>New:</u> < 20 units: Level 2 charging at 15% of spaces + Level 1 EV-Capable at 35% of spaces / >20 units: Level 2 charging at 20% of spaces + Level 1 EV-Capable at 35% of spaces	<u>New Office:</u> 5% equipped with Level 2 EVCS + 10 % Level 1 EV-Ready + 20% Level 2 EV-Capable	<u>New Other NR:</u> >10 spaces- 4% equipped with Level 2 EVCS + 3 % Level 1 EV-Ready; >100 spaces- 80kW fast charger per 100	MF Affordable Housing Projects	Ord. 65 148
Mountain View	EV	11/12/2019	<u>New:</u> Level 1 EV-Ready circuit + Level 2 EV-Ready circuit per unit	<u>New:</u> Level 2 charging at 15% of spaces + remaining spaces EV-Ready + Level 3 EVCS for every 100 spaces	<u>New Mixed Use:</u> Level 2 charging at 15% of spaces + remaining spaces EV-Ready + Level 3 EVCS for every 100 spaces <u>New Commercial/Hotel/Motel :</u> < 10 spaces- Level 2 EVCS + EV-Ready remaining spaces / >10 spaces - 15% equipped with Level 2 EVCS + EV-Ready remaining spaces / >100 spaces - Level 3 DC EVCS			Ord. 17.19
Oceanside	EV	8/19/2020	N/A	New MF and NR: 15% of spaces reserved for ZEV (> 5 parking spaces) and Level 2 charging at 50% of those reserved spaces				Ord. No.
Redwood City	EV	9/21/2020	<u>New:</u> Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New:</u> <20 units- Level 2 EV-Ready space per unit ; remaining spaces Level 1 EV-Ready / >20 units- 25% of spaces Level 2 EV-Ready	<u>New Office:</u> >10 spaces- 10% equipped with Level 2 EVCS + additional 10 % Level 1 EV-Ready + additional 30% EV-Capable	<u>New Other NR:</u> >10 spaces- 6% equipped with Level 2 EVCS + additional 5 % Level 1 EV-Ready	ADU/JADU without parking facilities	Ord. No.

2019 Code Cycle - Locally Adopted Electric Vehicle Ordinances						
Jurisdiction	Ord. Type	Council Adopted Date	Scope			Exceptions
			Single Family, Duplexes, and Townhouses	Multifamily	Nonresidential - Office	Nonresidential - Other
Sacramento	EV	4/20/2021	N/A	<u>New</u> MF: 20% of spaces Level 2 EV-Ready	<u>New</u> : 20% of spaces Level 2 EV-Ready <u>New Hotel/Motel</u> : 20% of spaces Level 2 EV-Ready	
San Anselmo	EV	4/14/2020	<u>New</u> : Level 2 EV-Ready per unit <u>Add/Alts</u> : Panel upgrade must include Level 2-Ready circuit	<u>New</u> : Level 2 EV-Ready space per dwelling unit <u>Add/Alts</u> : Panel upgrade must include capacity for 20% Level 2 EV-Capable spaces	<u>New</u> : 10% of spaces to be Level 2 EV-Ready + remaining spaces EV-Capable OR 20% spaces Level 2 EV-Ready + EVCS in 5% spaces (min. 2) <u>Add/Alts</u> : Panel upgrade must include capacity for 20% Level 2 EV-Capable	ADU/JADU without parking facilities
San Carlos	EV	1/25/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready space (Level 2 if only 1 space exists)	<u>New</u> : 10% of units with Level 2 EV-Ready space ; remaining units with Level 1 EV-Ready /MF exception: utility service cost > \$4500	<u>New Office</u> : >10 spaces- 10% equipped with Level 2 EVCS + additional 10 % Level 1 EV-Ready + additional 30% EV-Capable	<u>New Other NR</u> : ≥10 spaces- 6% equipped with Level 2 EVCS + additional 5 % Level 1 EV-Ready
San Jose	EV	10/1/2019	<u>New</u> : Level 2 EV-Ready space per unit	<u>New</u> : EVSE charging at 10% of spaces + 20% of spaces EV-Ready + 70% EV-Capable	<u>New</u> : EVSE charging at 10% of spaces + 40% EV-Capable <u>New Hotel/Motel</u> : EVSE charging at 10% of spaces + 50% EV-Capable	ADU/JADU without parking facilities + Detached garages
San Mateo County	EV	2/25/2020	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : 10% of units with Level 2 EV-Ready space + 40% of units Level 1 EV-Ready spaces	<u>New Office</u> : >10 spaces- 10% equipped with Level 2 EVCS + 10 % Level 1 EV-Ready + 30% Level 1 EV-Capable	<u>New Other NR</u> : >10 spaces; 6% equipped with Level 2 EVCS + 5 % Level 1 EV-Ready
Santa Clara	EV	11/16/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : <20 units- Level 2 EV-Ready space per unit / >20 units- First 20 units, Level 2 EV Ready per unit; 25% of spaces Level 2 EV-Ready 75% Low power Level 2	<u>New Office</u> : Level 2 EVSE charging at 35% of spaces + 35% EV-Capable <u>New Hotel/Motel</u> : Level 2 EVSE charging at 10% of spaces + 50% EV-Capable	<u>New Other NR</u> : EVSE charging at 10% of spaces + 30% EV-Capable
Santa Clara County	EV	12/14/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : <20 units- Level 2 EV-Ready space per unit / >20 units- First 20 units, Level 2 EV Ready per unit; 25% of spaces Level 2 EV-Ready, remaining Level 1 EV-Ready	<u>New Office</u> : >10 spaces- 20% equipped with Level 2 EVCS + 30% Level 1 EV-Capable (Fast Charger may substitute 11 spaces)	<u>New Other NR</u> : >10 spaces- 10% equipped with Level 2 EVCS (Fast Charger may substitute 11 spaces)

2019 Code Cycle - Locally Adopted Electric Vehicle Ordinances							
Jurisdiction	Ord. Type	Council Adopted Date	Scope			Exceptions	Ordinance
			Single Family, Duplexes, and Townhouses	Multifamily	Nonresidential - Office	Nonresidential - Other	
Santa Monica	EV	4/28/2020	<u>New</u> : Level 2 EV-Ready space per unit	<u>New</u> : EVSE charging at 10% of spaces + 20% of spaces EV-Ready + 70% EV-Capable	<u>New Office</u> : EVSE charging at 10% of spaces + 20% EV-Ready + 30% EV-Capable <u>New Hotel/Motel</u> : EVSE charging at 10% of spaces + 30% EV-Capable	<u>New Other NR</u> : EVSE charging at 10% of spaces + 30% EV-Capable	ADU/JADU without parking facilities / utility service cost > \$400 per unit Ord. 2634
Solana Beach	EV	12/8/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Capable space (Level 2 if only 1 space exists)	<u>New MF/Hotel</u> : Level 2 EVSE charging at 25% of spaces + 75% of spaces EV-Capable	<u>New</u> : Level 2 EVSE charging at 20% of spaces + 15% of spaces EV-Capable	<u>New</u> : Level 2 EVSE charging at 20% of spaces + 15% of spaces EV-Capable	ADU/JADU without parking facilities Ordinance 518
South San Francisco	EV	6/9/2021	<u>New</u> : Level 2 EV-Ready space per unit + Level 1 EV-Ready circuit (Level 2 if only 1 space exists)	<u>New</u> : < 20 units: Level 2 EV-Ready space per unit / > 20 units: 25% of spaces Level 2 EV-Ready + remaining spaces Level 1 EV-Ready / <u>Affordable</u> <u>MF</u> : 10% spaces Level 2 + remaining Level 1	N/A	N/A	ADU/JADU without parking facilities Ord. No.
Sunnyvale	EV	12/1/2020	<u>New</u> : Level 2 EV-Ready + Level 1 EV-Ready space per unit (Level 2 if only 1 space exists)	<u>New</u> : < 20 units: Level 2 EV-Ready space per unit / > 20 units: 25% of spaces Level 2 EV-Ready + remaining spaces Level 1 EV-Ready / <u>Affordable</u> <u>MF</u> : 10% spaces Level 2	<u>New Office</u> : >10 spaces- 10% equipped with Level 2 EVCS + additional 10 % Level 1 EV-Ready + additional 30% EV-Capable	<u>New Other NR</u> : >10 spaces- 6% equipped with Level 2 EVCS + additional 5 % Level 1 EV-Ready / >100 spaces - Level 3 DC EVCS	ADU/JADU without parking facilities Ord. No. 3168-20
<p>This report was prepared for the California Statewide Codes & Standards Program. The program is funded by California utility customers and administered by Pacific Gas and Electric Company, San Diego Gas & Electric Company (SDG&E®), and Southern California Edison Company under the auspices of the California Public Utilities Commission and in support of the California Energy Commission.</p> <p>© 2021 Pacific Gas and Electric Company, San Diego Gas and Electric Company, and Southern California Edison. All rights reserved, except that this document may be used, copied, and distributed without modification</p>							