

**INITIAL STATEMENT OF REASONS  
FOR PROPOSED BUILDING STANDARDS  
OF THE CALIFORNIA BUILDING STANDARDS COMMISSION  
REGARDING THE 2025 CALIFORNIA GREEN BUILDING STANDARDS CODE,  
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 11  
(BSC 03/24)**

The Administrative Procedure Act (APA) requires that an Initial Statement of Reasons be available to the public upon request when rulemaking action is being undertaken. The following information required by the APA pertains to this particular rulemaking action:

**STATEMENT OF SPECIFIC PURPOSE, PROBLEM, RATIONALE and BENEFITS**

Government Code Section 11346.2(b)(1) requires a statement of specific purpose of each adoption, amendment, or repeal and the problem the agency intends to address and the rationale for the determination by the agency that each adoption, amendment, or repeal is reasonably necessary to carry out the purpose and address the problem for which it is proposed. The statement shall enumerate the benefits anticipated from the regulatory action, including the benefits or goals provided in the authorizing statute.

**General purpose, problem, rationale and benefits:**

The California Building Standards Commission (BSC) proposes to amend the 2022 California Green Building Standards Code (CALGreen) for inclusion in the 2025 CALGreen, effective January 1, 2026. This action proposes for adoption mandatory and voluntary green building standards for occupancies within BSC-CG authority during the 2024 Triennial Code Adoption Cycle.

The intent of the CALGreen Code continues to:

- 1) Reduce greenhouse gas (GHG) emissions from buildings.
- 2) Promote environmentally responsible, cost-effective, healthier places to live and work.
- 3) Respond to the environmental directives of the administration.

**General Electric Vehicle (EV) Charging statement for ITEMS 2-7, 11 & 12:**

[Senate Bill \(SB 32\)](#) (Pavley, Chapter 249, Statutes of 2016), California Global Warming Solutions Act of 2006: Emissions Limit, which mandates the state board to ensure that statewide greenhouse gas emissions are reduced to 40% below the 1990 level by 2030. SB 32 can be found at ([https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160SB32](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32))

California's transportation sector comprises 41 percent of the greenhouse gas emissions statewide when considering mobile source direct emissions according to California Air Resources Board's (CARB) [Current California GHG Emission Inventory Data](#). Reducing emissions from the transportation sector not only helps California reach its greenhouse gas emission goals but can also lead to better air quality through the reduction of criteria pollutants. The webpage can be found at (<https://ww2.arb.ca.gov/ghg-inventory-data>).

Other agencies acknowledge the importance of building codes in their plans and recommendations to achieve greenhouse gas and air pollutant emission reduction goals. The Governor's Office of Business and Economic Development (GO-Biz) and California Public Utilities Commission (CPUC) indicated building codes are necessary to continue to

increase EV charging infrastructure during new construction. This information can be found at the [California Zero-Emission Vehicle Market Development Strategy](https://static.business.ca.gov/wp-content/uploads/2021/02/ZEV_Strategy_Feb2021.pdf) webpage ([https://static.business.ca.gov/wp-content/uploads/2021/02/ZEV\\_Strategy\\_Feb2021.pdf](https://static.business.ca.gov/wp-content/uploads/2021/02/ZEV_Strategy_Feb2021.pdf)) [453952700.PDF \(ca.gov\)](https://static.business.ca.gov/wp-content/uploads/2021/02/ZEV_Strategy_Feb2021.pdf) and (<https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M453/K952/453952700.PDF>).

Governor's Executive Orders B-16-2012, B-48-2018 and N-79-2020 set the goal of having over 1.5 million zero-emission vehicles (ZEVs) on California roadways by 2025, 5 million ZEVs on California roadways by 2030, and 100 percent sales of electric vehicles by 2035, respectively. CARB adopted the Advanced Clean Cars II Regulation on August 25, 2022, and estimates that as a result there will be approximately 5.8 million ZEVs and Plug in Hybrid Electric Vehicle (PHEVs) on California roads by 2030. By 2035, CARB staff estimates there will be 12.6 million.

CARB staff expects drivers to continue to rely on home charging if available and supplement their charging needs with public charging stations. Currently, early ZEV adopters typically have a higher income and may live in a single-family home with consistent access to home charging. However, as ZEV driver demographics shift away from early adopters to the majority of the market, there may be an increased demand for public and workplace charging.

As of April 2022, there were 28,671 public Level 2 chargers and 6,659 public Direct Current Fast Chargers (DCFC) in California. Per the California Energy Commission's (CEC) staff report pursuant to recent [Assembly Bill 2127](#) (Ting, Chapter 365, Statutes of 2018), California has a gap in the number of Level 2 chargers expected to be installed by 2025 to support California's 1.5 million ZEV target under Executive Order B-16-2012. The gap only widens over longer time horizons. CEC's AB 2127 staff report estimates 186,403 to 189,564 workplace chargers and 17,476 to 17,934 DCFCs will need to be installed statewide to support 5 million ZEVs by 2030. BSC code proposals will help further increase market penetration of ZEVs through increased visibility of charging stations and more charging opportunities to ZEV drivers. Assembly Bill 2127 can be found at ([https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201720180AB2127](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB2127)).

[Assembly Bill 2075](#) (Ting, Chapter 346, Statutes of 2022), mandates BSC to convene a workshop on EV charging infrastructure standards that includes the Department of Housing and Community Development (HCD), Division of the State Architect (DSA), CARB and CEC, and other relevant stakeholders to consider, among other things, projected demand for EV charging infrastructure based on the state's goals, as specified. AB 2075 can be found at ([https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=202120220AB2075](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB2075))

Three workshop meetings have been held between October 19, 2023, and January 11, 2024, for the CALGreen Electric Vehicle Workgroup (CEVW), which addressed the intent and purpose of AB 2075 by collaborating with each of the agencies and stakeholders for the 2024 Triennial Code Adoption Cycle to incorporate robust and comprehensive electric vehicle charging infrastructure standards to achieve relevant anticipated electric load capabilities and the statewide transportation electrification goals.

The proposed changes to the building standards with statewide application will lead to substantial environmental benefits through reduction in energy use, GHG emissions, criteria pollutants, and fossil fuel dependency, leading to improved public health, and potentially result in significant cost savings (avoided costs) associated with future

installation of EV charging stations (EVCS) at nonresidential buildings.

**Specific Proposed Regulatory Actions:**

The rationale for each amendment proposed is listed below by chapter, division, and section.

**ITEM 1**

**CHAPTER 5 NONRESIDENTIAL MANDATORY MEASURES**

***DIVISION 5.1 – PLANNING AND DESIGN***

**SECTION 5.106 SITE DEVELOPMENT**

**Section 5.106.4.1 Bicycle parking with subsections**

Pursuant to [AB 2863 \(Chapter 809, Statutes of 2022\)](#), BSC is proposing to revise the CALGreen minimum mandatory bicycle parking standards using a method that is independent of the number of vehicle parking spaces in nonresidential buildings.

**ITEM 1-1**

**Section 5.106.4.1.1 Short-term bicycle parking**

BSC is proposing to amend this section to change the triggers for compliance by removing the verbiage that states “visitor motorized vehicular parking spaces” and replacing it with “foot traffic visitors” thereby using the person or pedestrian visiting versus the visitor vehicle parking spaces.

Post GREEN CAC held on March 18 and 19, 2024, BSC staff reviewed the Further Study recommendations to clarify the meaning of “visitor foot traffic” and quantify the number of daily visitors. This ISOR has been updated to capture the CAC recommendations.

The proposal also increases the percentages from 5 percent to 20 percent based on the number of anticipated visitors being added. Currently, a new project or an addition or alteration that is anticipated to generate visitor traffic, triggers the requirement which is based on 5 percent of visitor motorized vehicular parking spaces. The new proposal uses anticipated peak daily visitors in lieu of parking spaces. BSC is proposing the increase to 20 percent to trigger the minimum requirement of at least one two-bike capacity rack achieved at 10 visitors. Basically, 10 visitors equate to  $(10 \times 20\%) =$  one two-bike capacity parking rack which is the code minimum.

The proposed change is needed to promote the installation of additional bicycle parking facilities by using anticipated visitors instead of visitor motorized vehicular parking spaces which can vary based on local zoning regulations. Increasing the percentage will set the baseline at the code minimum.

**CAC Recommendation:**

Further Study Required under Criteria #4 and #6. Recommended clarification for the meaning of “visitor foot traffic” and suggested use of “average” or “peak” daily.

**Agency Response:**

BSC accepts the recommendation for Further Study for short term bicycle parking and has amended the Express Terms to remove the words “foot traffic” and added the term “visitors.” The verbiage “peak daily” has been added to quantify the number of visitors needed to determine the number of bicycle racks required. Additionally editorial changes were made to the “Exception” by removing “foot traffic.”

## ITEM 1-2

### Section 5.106.4.1.2 Long-term bicycle parking

BSC is proposing to amend this section to change the triggers for compliance by removing the verbiage that states “tenant-occupant vehicular parking spaces” and replacing it with “tenant-occupants” thereby using the person or tenant-occupant versus the vehicle parking spaces. The proposal also increases the percentages from 5 percent to 10 percent based on the number of tenant-occupants or employees being added. Currently tenant spaces with 10 or more tenant-occupants triggers the requirement which is based on 5 percent of tenant-occupant vehicular parking spaces and equals 0.5 or 1 bicycle parking. The new proposal uses the number of tenant-occupants (employees) in lieu of parking spaces. BSC is proposing the increase to 10 percent to trigger the minimum requirement of at least one one-bicycle parking facility at 10 tenant-occupants. Basically 10 tenant-occupants equates to  $(10 \times 10\%) = 1$  one-bicycle parking facility which is the code minimum.

The proposed change is needed to promote the installation of additional bicycle parking facilities by using tenant-occupants instead of tenant-occupant parking spaces which can vary based on local zoning regulations. Increasing the percentage will set the baseline at the code minimum.

#### Section 5.106.4.1.2.1 (formerly Section 5.106.4.1.3)

BSC is proposing a similar amendment in this section for additions and alterations by making the same changes for tenant-occupants being added with the same increase from 5 percent to 10 percent. BSC is also proposing to renumber this section to clarify that it is applicable to long-term bicycle parking only.

#### Section 5.106.4.1.2.2 (formerly Section 5.106.4.1.4)

BSC is proposing amendments to this section for new shell buildings in phased projects, to once again remove the verbiage that states “vehicular parking spaces” and maintaining the verbiage for “tenant-occupants.” Like previous sections above, the proposed change increases the percentages from 5 percent to 10 percent of anticipated tenant-occupants or employees in a new shell building project. BSC is also proposing to renumber this section to clarify that it is applicable to long-term bicycle parking only.

#### Section 5.106.4.1.2.3 (formerly Section 5.106.4.1.5)

In Section 5.106.4.1.5, BSC is proposing to renumber code section references consistent with other proposed amendments. Additionally, the Note regarding the reference to the bicycle association is repealed since it is no longer relevant.

#### Public engagement and benefits:

BSC prepared a pre-cycle draft proposal and engaged the regulated community via an electronic email blast containing the proposed language, which was also posted on BSC website from October 25 to November 8, 2023, to garner public input from stakeholders and interested parties. Two comments were received during this period. BSC staff analyzed the comments and determined that both comments were outside of the scope of the proposed amendments. However, the comments were logged in for future review and possible consideration in future rulemaking cycles.

The benefits derived for the bicycle parking amendments include promoting bicycle ridership, reducing vehicles on roads which reduces GHGs and traffic congestion, health benefits include both mental and physical benefits of riding a bicycle and other forms of exercise which could reduce health-related costs to business owners.

**CAC Recommendation:**

Approve for ITEM 1-2 with listed code sections.

**Agency Response:**

Accept.

**ITEM 2**

**Section 5.106.5.3 Electric vehicle (EV) charging**

**ITEM 2-1**

BSC is proposing to amend the existing Exception 2 for Parking spaces accessible only by automated mechanical car parking systems. This proposed amendment will align with HCD's current exception which was codified during the recent 2022 Intervening Code Adoption Cycle for various occupancy types. The BSC exception for lifts codified in the 2022 CALGreen Code is similar. However, to align both exceptions for residential and nonresidential occupancies, BSC is proposing to adopt the same language.

The original BSC automated lift exception was proposed because at the time the product and technology were not fully developed and available domestically. There were also safety concerns along with possible enforceability issues and accessibility concerns. During the CEVW #3 held on January 11, 2024, a parking lift manufacturer provided testimony but, while the technology appears to be promising, BSC decided to maintain the exception as amended to align with HCD's amendment.

This proposed change is needed to maintain consistency between the state agencies for similar code language and applications. This provides clarity for the code users and the regulated community.

**CAC Recommendation:**

Further Study Required under criteria #1 and #3 for Section 5.106.5.3, Exception 2 EV at parking lifts. Suggestion to coordinate with HCD. Verify health and safety issues and whether the lift system is UL listed.

**Agency Response:**

Disagree.

Upon further research BSC has decided not to make further amendments to the initial proposed express terms.

HCD conducted a survey/questionnaire addressed to major automated lift manufactures inquiring about various safety and accessibility features when using EV charging with lift systems. BSC received several survey responses from some of the lift manufacturers stating that their systems can support the use of EVSE on their lift mechanisms. Additional comments stated that the lift systems are NFPA compliant and that the EVSE chargers are UL compliant. Some manufacturers stated that compliance with accessibility requirements as stated in CBC, Chapters 11 A and 11B could be challenging and recommended the use of traditional surface parking.

Upon further review of the comments received and coordination with various state agencies, BSC staff has decided to not make any changes to the automated lift

amendments. BSC staff will continue to conduct research with stakeholders and interested parties for consideration of additional amendments in future rulemaking cycles.

### ITEM 3

#### Table 5.106.5.3.1 EV Capable spaces

##### ITEM 3-1

BSC is proposing to amend mandatory Table 5.106.5.3.1 by adding a title, a fourth column and amending related footnote 2. The specific amendments to the mandatory requirements in the table are as follows.

BSC is proposing to amend the table to increase the EVCS requirements:

- For parking spaces between 10-25 actual parking spaces, the number of required EVCS increased from 0 to 2.
- For more than 25 parking spaces, the number of required EVCS increased by 100 percent or double the current requirements in column 3.
- For 201 and over actual parking spaces, the number of required EVCS is based on the calculated number in column 2 multiplied by 50 percent in column 3 (increased from 25 percent, doubling the requirements).
- Footnote 2 is amended to clarify that each EVCS shall reduce the number of required EV capable spaces by the same number.

Basically, the proposal maintains the required 20 percent mandatory EV capable spaces but doubles the required number or percentage of installed chargers. This change creates a balance of approximately 50 percent EV capable and 50 percent EVCS.

Further changes to Table 5.106.5.3.1 include removing the words “EV capable space provided with EVSE” from the title in column 3. This change is to provide clarity for the code user because column 3 is for EVCS requirements which are listed in Section 5.106.5.3.2. Also, “EV capable spaces” is added to the title heading which applies to Section 5.106.5.3.1 for clarity.

To address office and retail buildings specifically, BSC is proposing to add column 4 (Office and Retail) to increase the EVCS requirements specific to those occupancies:

- The required number of EVCS increased to approximately 75 percent of the EV capable spaces shown in column 2.
- For 201 and over actual parking spaces, the increase is based on the calculated number in column 2 multiplied by 75 percent in column 4.
- To clarify that column 4 is independent from column 3, the words “Other than Office & Retail” were added to the column 3 heading title.

The proposed amendments to increase the required number of installed charging stations will lead to substantial environmental benefits through reduction in energy use, GHG emissions, criteria pollutants, and fossil fuel dependency. Additionally, future installation of EV charging stations at nonresidential buildings promotes improved public health, and potentially results in significant cost savings (avoided costs) associated with health care.

**CAC Recommendation:**

Approve.

Even though CAC recommended to approve the proposal, there were also recommendations to clarify table title heading by adding EVCS to the title and to review the use of EV capable and EVCS.

**Agency Response:**

Disagree.

BSC considered the additional recommendations and has made the edits to the table title.

**ITEM 4**

**Section 5.106.5.3.2 Electric vehicle charging stations (EVCS) with subsections.**

BSC is proposing to add three new subsections. Similar amendments are proposed in associated Item 6 below.

**ITEM 4-1**

**Section 5.106.5.3.2.1 Receptacle Configurations**

BSC is proposing to add a new code Section 5.106.5.3.2.1 for receptacle configuration standards. The proposal will require specified 208/240-volt EV charging receptacle configurations for 20, 30 and 50 ampere receptacles using a NEMA standard. This will provide the designer guidance and encourage standardization of installations. This proposed amendment will align with HCD's current EV charger connector requirements in Section 4.106.4.2.2 Multifamily dwellings, Subsection 1e Receptacle Configurations which was codified during the 2022 Intervening Code Adoption Cycle. This proposed change will maintain consistency and uniformity for both residential and nonresidential occupancies and provides clarity for code users and the regulated community.

**ITEM 4-2**

**Section 5.106.5.3.2.2 EV Charger Connectors**

BSC is proposing to add a new code Section 5.106.5.3.2.2 for EV charger connectors. The proposal will require EV chargers to have a SAE J1772 with a maximum output 240 Volts AC or SAE J3400 NACS (North American Charging Standard) connector for nonresidential parking facilities. Similar to HCD's rationale, this proposal ensures that chargers are useable by a majority of EV users, including Tesla drivers. As noted in the CARB Staff Report, Initial Statement of Reasons, dated April 12, 2022, for their Proposed Advanced Clean Cars II Regulations, discussion of Level 1, Level 2, and On-Board Charger Minimum Requirements: "Plug-in EV charging can occur at various charging levels, speeds, and with different charging connectors. Level 2 AC (alternating current) charging uses charging equipment compatible with a 240-volt outlet to charge the vehicle at higher charging speeds through its on-board charger. Currently, battery EVs and plug-in hybrid EVs must comply with charging requirements, which include Level 1 and 2 plug standardization to the SAE J1772 specification and a minimum on-board charger capability."

This code proposal was amended from the initial code changes presented at the CEVW #1 workshop. The revised and current proposal removes the 50% requirement for SAE J1772 chargers and adds J3400 chargers as an option, so now either a J1772 or J3400 chargers

are required to be installed. This code change proposal was made as a result of comments heard at the October 19, 2023, CEVW #1 workshop in which participants mentioned that requiring 50% J1772 was not needed since the J3400 chargers were going to become the national standard. BSC coordinated with HCD for similar code amendments and proposed a simpler approach by allowing for both types of chargers.

After the CEVW #2 workshop, BSC coordinated with CARB, HCD, DSA and CEC to further analyze the potential impact of allowing the J3400 NACS connector as a compliance method. The J3400 connector should work with older Battery Electric Vehicles (BEVs) assuming that the drivers have a physical adapter and the EVSE uses a maximum supply voltage of 250 volts.

The NACS allows for the use of a 480-volt 3-phase supply for a Level 2 EVSE. The NACS connector is also able to capture one portion of the 3 phase and have 277 volts without the use of an expensive step-down transformer. The J3400 committee has not yet decided whether this 480-volt supply option will carry over to the finalized standard. If this higher voltage standard is adopted, there is a possibility that older Combined Charging System (CCS)-based BEVs would not be able to connect to installed J3400 EVSEs that are tied to a 480-volt supply because they are designed for a maximum of 250 volts. The unintended consequence is that if the committee decides to incorporate 480-volt supply into the finalized standard, building developers may find this to be an attractive option which may create a conflict for compatibility with older BEVs. As a result, the new revised proposal requires that when using J3400 NACS connectors for Level 2 EVSE, and if those connectors are supplied by a 480 volt 3-phase service, at least 20% of the site Level 2 EVSE connectors shall be J1772.

#### **Section 5.106.5.3.2.3 (formerly Section 5.106.5.3.2.1)**

BSC is proposing to renumber this section to accommodate the added sections.

#### **ITEM 4-3**

#### **Section 5.106.5.3.2.4.1 for Raceway Capacity Requirements**

#### **Section 5.106.5.3.2.4 (formerly Section 5.106.5.3.2.2)**

BSC is proposing to renumber this section to accommodate the added sections.

#### **5.106.5.3.2.4.1 for Raceway Capacity Requirements.**

BSC is proposing to add new code Section 5.106.5.3.2.4.1 for Raceway Capacity Requirements. The proposal would allow for future proofing of existing low power level 2 receptacles with 208/240-volt 20 ampere branch circuits to be easily upgraded to level 2 receptacles. This allows for future upgrades to the electrical conductors serving low power Level 2 charging receptacles. A listed raceway shall be provided with the capability of accommodating a dedicated 208/240-volt 40-ampere branch circuit.

This proposed amendment aligns with HCD's current voluntary proposal during the 2024 Triennial Code Adoption Cycle found in code Section A4.106.8.2 New multifamily dwellings. While HCD's proposal is voluntary, BSC is proposing it as mandatory. Minor edits were made post CEVW #1 workshop held on October 19, 2023, and CEVW #2 workshop held on November 28, 2023. This proposed change maintains consistency and uniformity for both residential and nonresidential occupancies and provides clarity for code users and the regulated community.



**CAC Recommendation:**

Approve for ITEMS 4-1, 4-2, and 4-3.

**Agency Response:**

Accept.

**ITEM 5**

**Table 5.106.5.3.6 EVCS–Power allocation method**

**ITEM 5-1**

BSC is proposing to amend Table 5.106.5.3.6 by adding a title, a fourth column, amending related footnote 3 and adding new footnote 5. The specific amendments to the mandatory requirements in the table are as follows.

- **“Power allocation method”** is added to the table title which applies to Section 5.106.5.3.6 for clarity.
- **Column 4** is being added to the table to specifically address Office and Retail occupancies with increased required kVA power allocation for installed EVCS over what is required for other occupancies. To further clarify that column 4 only applies to office and retail occupancies and independent from column 3, the words “Other Than Office & Retail” were added to the column 3 heading title.
- **Footnote 3** applies to column 3 and is being amended to specify that the maximum allowed kVA to be utilized for EV capable spaces is 50 percent (reduced from 75 percent). This change doubles the available kVA required to be used for EVCS. Thus, 50 percent of the kVA can be used for EV capable spaces and remaining 50 percent for EVCS, which equates to a 100% increase in EVCS for other than office and retail buildings.
- **Footnote 5** is being added to set the maximum kVA power allowed in column 4 for EV capable spaces to 25 percent. As a result of the added footnote specific to office and retail buildings, the proposed change would reduce the total kVA which can be used for EV capable spaces (rated at 6.6 kVA) to 25 percent of the total available kVA. This change leaves 75 percent of the available kVA required to be used for EVCS which may increase number of EVCS.

For 201 and over actual parking spaces, the maximum kVA allowed for EV capable is based on the calculated number using the formula in column 4 and multiplying the number by 25 percent (as stated in footnote 5), which leaves 75 percent required kVA available for the installation of EVCS.

These amendments are consistent with the proposed changes made to Table 5.106.5.3.1 shown in Item 3 above.

These proposed changes are meant to address the comments received at three different CEVW workshops held October through January, expressing the need for additional installed chargers to fill the gap between multifamily EV charging with supplemental workplace charging in those occupancies. Similar comments were mentioned in previous CEVW workshops during the 2022 Intervening Code Adoption Cycle.

These increased numbers and percentages of EVCS will help in meeting the EV goals set for California by favoring the installation of actual chargers during new construction.

**CAC Recommendation:**

Approve.

**Agency Response:**

Accept.

**ITEM 6**

**Section 5.106.5.6 Electric vehicle charging stations (EVCS)–Power allocation method with subsections.**

BSC is proposing to add these new code subsections. Similar amendments are proposed for associated Item 4 above.

**ITEM 6-1**

**Section 5.106.5.3.6.1 Receptacle Configurations**

BSC is proposing to add a new code Section 5.106.5.3.6.1 for Receptacle Configurations standards. The proposal will require specified 208/240-volt EV charging receptacle configurations for 20, 30 and 50 ampere receptacles using a NEMA standard. This will provide the designer guidance and encourage standardization of installations. This proposed amendment will align with HCD's current EV charger connector requirements in Section 4.106.4.2.2 Multifamily dwellings, Subsection 1e Receptacle Configurations which were codified during the 2021 Intervening Code Adoption Cycle. This proposed change will maintain consistency and uniformity for both residential and nonresidential occupancies and provides clarity for the code users and the regulated community.

**ITEM 6-2**

**Section 5.106.5.3.6.2 EV Charger Connectors**

BSC is proposing to add a new code Section 5.106.5.3.6.2 for EV charger connectors. The proposal will require EV chargers to have a SAE J1772 with a maximum output 240 Volts AC or SAE J3400 NACS (North American Charging Standard) connector for nonresidential parking facilities. Similar to HCD's rationale: This proposal ensures that chargers are useable by a majority of EV users, including Tesla drivers. As noted in the CARB Staff Report, Initial Statement of Reasons, dated April 12, 2022, for their Proposed Advanced Clean Cars II Regulations, discussion of Level 1, Level 2, and On-Board Charger Minimum Requirements: "Plug-in EV charging can occur at various charging levels, speeds, and with different charging connectors. Level 2 AC (alternating current) charging uses charging equipment compatible with a 240-volt outlet to charge the vehicle at higher charging speeds through its on-board charger. Currently, battery EVs and plug-in hybrid EVs must comply with charging requirements, which include Level 1 and 2 plug standardization to the SAE J1772 specification and a minimum on-board charger capability." This code proposal was amended from the initial code changes presented at the CEVW #1 workshop. The revised and current proposal removes the 50% requirement for SAE J1772 chargers and adds J3400 chargers as an option so now either J1772 or J3400 chargers are required to be installed. This code change proposal was made as a result of comments heard at the October 19, 2023 CEVW #1 workshop in which participants mentioned that

requiring 50% J1772 was not needed since the J3400 chargers were going to become the national standard. BSC coordinated with HCD for similar code amendments and proposed a simpler approach by allowing for both types of chargers.

After the CEVW #2 workshop, BSC coordinated with CARB, HCD, DSA and CEC to further analyze the potential impact of allowing the J3400 NACS connector as a compliance method. The J3400 connector should work with older Battery Electric Vehicles (BEVs) assuming that the drivers have a physical adapter and the EVSE uses a maximum supply voltage of 250 volts.

The NACS allows for the use of a 480-volt 3-phase supply for a Level 2 EVSE. The NACS connector is also able to capture one portion of the 3 phase and have 277 volts without the use of an expensive step-down transformer. The J3400 committee has not yet decided whether this 480-volt supply option will carry over to the finalized standard. If this higher voltage standard is adopted, there is a possibility that older Combined Charging System (CCS)-based BEVs would not be able to connect to installed J3400 EVSEs that are tied to a 480-volt supply because they are designed for a maximum of 250 volts. The unintended consequence is that if the committee decides to incorporate 480-volt supply into the finalized standard, building developers may find this to be an attractive option which may create a conflict for compatibility with older BEVs. As a result, the new revised proposal stipulates that when using J3400 NACS connectors for Level 2 EVSE, and if those connectors are supplied by a 480 volt 3-phase service, then at least 20% of the site Level 2 EVSE connectors shall be J1772.

### **ITEM 6-3**

#### **Section 5.106.5.3.6.3 Raceway Capacity Requirements**

BSC is proposing to add a new code Section 5.106.5.3.6.3 for Raceway Capacity Requirements. The proposal would allow for future proofing of existing low power level 2 receptacles with 208/240-volt 20 ampere branch circuits to be easily upgraded to level 2 receptacles. This allows for future upgrades to the electrical conductors serving low power Level 2 charging receptacles, a listed raceway shall be provided with the capability of accommodating a dedicated 208/240-volt 40-ampere branch circuit.

This proposed amendment aligns with HCD's current voluntary proposal during the 2024 Triennial Code Adoption Cycle found in code Section A4.106.8.2 New multifamily dwellings. While HCD's proposal is voluntary, BSC is proposing it as mandatory. Minor edits were made post CEVW #1 workshop held on October 19, 2023, and CEVW #2 workshop held on November 28, 2023. This proposed change maintains consistency and uniformity for both residential and nonresidential occupancies and provides clarity for code users and the regulated community.

#### **CAC Recommendation:**

Approve for ITEMS 6-1, 6-2, and 6-3.

#### **Agency Response:**

Accept.

## ITEM 7

### Section 5.106.5.4.2 Existing buildings or parking areas with previously installed EV capable infrastructure [A]

#### ITEM 7-1

BSC is proposing to amend Section 5.106.5.4.2 for existing buildings or parking areas with previously installed EV capable infrastructure. This proposed change is to provide clarity that all existing EV capable spaces must be built-out prior to any new EV capable spaces being added. This proposed amendment is to address the comments received during the 2022 Intervening Code Adoption Cycle, 45-day public comment period. Minor edits were made post CEVW #1 workshop held on October 19, 2023, and CEVW #2 workshop held on November 28, 2023. The intent is to promote more installed chargers to meet the EV goals set for California by favoring the installation of actual chargers during qualifying additions and alterations.

#### **CAC Recommendation:**

Approve as Amended.

Recommended to replace the term “build out” with other terms that would help to clarify intent of the code language.

#### **Agency Response:**

Accept.

BSC revised the proposed code language.

## ITEM 8

### CHAPTER 5 NONRESIDENTIAL MANDATORY MEASURES DIVISION 5.3 – WATER EFFICIENCY AND CONSERVATION SECTION 5.303 INDOOR WATER USE

#### ITEM 8-1

##### 5.303.3.4.6 Pre-rinse spray valve

BSC is proposing to amend Section 5.503.4.6 Pre-rinse spray valves to repeal references to *California Code of Regulations, Title 20 (Appliance Efficiency Regulations)* and amend the main paragraph to add “Commercial Pre-Rinse Spray Valves.” A new reference to the *California Plumbing Code, Section 420.3* is being added. This change is needed since the 2024 *Uniform Plumbing Code* adopted standards for pre-rinse spray valves and California adopts the same standards by reference and a reference to Title 20 is no longer needed. The proposed changes provide the proper reference based on recent model plumbing code updates. This amendment has been coordinated with the Energy Commission, DSA, and HCD with no intended change in regulatory effect.

#### **CAC Recommendation:**

Approve.

#### **Agency Response:**

Accept.

**ITEM 9**  
**CHAPTER 5 NONRESIDENTIAL MANDATORY MEASURES**  
***DIVISION 5.5 – ENVIRONMENTAL QUALITY***  
**SECTION 5.504 POLLUTANT CONTROL**  
**Section 5.504.1 Temporary ventilation**

**ITEM 9-1**

BSC is proposing to amend Section 5.504.1 Temporary ventilation to change the MERV rating requirement from MERV 8 to MERV 13 and to revise the applicable reference standards. These changes are needed to align with the current MERV 13 requirement for HVAC units found elsewhere in CALGreen and in the California Energy Code. These changes will add uniformity and consistency between temporary and permanent ventilation requirements. The additional benefits derived include improved indoor air quality for construction workers and cleaner air ducts and mechanical systems at close out.

**CAC Recommendation:**

Approve.

**Agency Response:**

Accept.

**ITEM 10**  
**SECTION 5.506 INDOOR AIR QUALITY**  
**Section 5.506.4 Carbon dioxide (CO<sub>2</sub>) monitoring in classrooms. [BSC-CG]**

**ITEM 10-1**

In response to AB-2232 (statutes of 2022) that requires BSC to research, develop, and propose for adoption mandatory standards for carbon dioxide monitors in classrooms of a covered schools and the University of California, BSC has developed this proposal.

BSC is proposing to add a new code Section 5.506.4 related to carbon dioxide (CO<sub>2</sub>) monitoring in newly constructed projects and qualifying additions and alterations (per scope in Section 301.3) for University of California, California State University, and private school classrooms, lecture and post-secondary classrooms. The classrooms shall be equipped with a carbon dioxide monitor or sensors. BSC is proposing to adopt similar code language from DSA Section 5.506.3 which included additions and alterations.

According to a report for [Ventilation Rates in California Classrooms](#) issued by UC Davis in 2019; many California classrooms in the studies performed were found to have very high carbon dioxide levels, and school reopening concerns related to the COVID-19 pandemic have placed an increased focus and urgency to improve classroom indoor air quality.

According to a report for [Effects of low-level inhalation exposure to carbon dioxide in indoor environments](#) by the Environment International Journal (2018) based on extensive published technical data and cited literature research; effects of short-term, low-level inhalation exposure to carbon dioxide (beginning at 1,000 parts per million in indoor environments) has been found to “negatively affect cognitive performances, including decision making and problem resolution.”

According to a research report for [Association of classroom ventilation with reduced illness](#) by EHP Publishing, E. Satish, et al (2012); initial conclusions found that the “direct adverse effects of CO<sub>2</sub> on human performance may be economically important and may limit energy-saving reductions in outdoor air ventilation per person in buildings.”

Improving indoor air quality in classrooms has shown to reduce absenteeism, reduce COVID-19 exposure, and maintain an improved environment for academic success. This proposal aims to provide a mechanism to identify and address indoor air quality concerns with the requirement for carbon dioxide monitors in new classrooms.

CO<sub>2</sub> monitors are needed in UC, CSU and private school classrooms so that teachers can identify and address indoor air quality (IAQ) concerns related to carbon dioxide levels that may compromise student and teacher health. This proposed code amendment for CO<sub>2</sub> monitoring applies to both new construction and qualifying additions and alterations to existing classrooms. The CO<sub>2</sub> monitors required are not costly and would add little to the overall construction cost of even small alterations.

**CAC Recommendation:**

Approve.

CAC suggested to verify there is no conflict with Energy Code Section 120.1(d)3 regarding outdoor air requirements.

**Agency Response:**

Disagree.

Post CAC, in coordination with DSA, BSC has made editorial revisions to Section 5.506.4 subitem 3 to change the words from “...classroom has exceeded” to “...classroom exceeds.” This revision clarifies the intent of the code proposal. BSC has verified no conflicts with Energy Code Section 120.1(d)3 as suggested by the CAC.

**ITEM 11**

**CHAPTER 6 REFERENCED ORGANIZATIONS AND STANDARDS**

**Section 601.1**

**ITEM 11-1**

BSC is proposing to amend the Reference standards table found in Chapter 6, Section 601.1 to align with the Energy Commission’s current energy efficiency standards in Part 6 of Title 24 and the current proposed reference standards updates in Chapter 5 and Appendix A5 of this code.

**CAC Recommendation:**

Approve.

CAC recommended editorial correction for the ASHRAE address on Referenced Standard section.

**Agency Response:**

Accept.

BSC updated the ASHRAE address.

## ITEM 12

### APPENDIX A5 NONRESIDENTIAL VOLUNTARY MEASURES

#### DIVISION A5.1 – PLANNING AND DESIGN

#### SECTION A5.106 SITE DEVELOPMENT

#### Section A5.106.5.3.1 Tier 1 with Table A5.106.5.3.1 Tier 1 EV capable spaces & Section A5.106.5.3.2 Tier 1 Electric vehicle charging stations (EVCS)—power allocation method with associated Table A5.106.5.3.2

BSC is proposing to amend EV charging voluntary requirements for Tier 1. The specific amendments to the two Tier 1 voluntary compliance tables correlate directly to amendments proposed to the mandatory requirements in Table 5.106.5.3.1 (EV capable spaces) and Table 5.106.5.3.6 (Power allocation method) with increased percentages.

Voluntary tiers are intended to further encourage building practices that improve public health, safety and general welfare by promoting the use of building concepts which minimize the building's impact on the environment and promote a more sustainable design.

Jurisdictions are given the broad discretion to adopt as mandatory the tiered options for uniform and consistent EV charging standards in CALGreen. As such, when adopted these requirements can minimize discrepancies in equipment installations between different projects and prevent underserving the growing market of EV drivers.

#### ITEM 12-1

#### Section A5.106.5.3.1 Tier 1

BSC is proposing editorial changes to this section to coordinate with addition of titles to the associated tables.

#### Table A5.106.5.3.1 Tier 1 EV capable spaces

BSC is proposing to amend voluntary Table A5.106.5.3.1 Tier 1 by adding a title, a fourth column and amending related footnote 2. The specific amendments to the voluntary requirements in the table are as follows.

BSC is proposing to amend the table to increase the EVCS requirements:

- For parking spaces between 0-9 actual parking spaces, the number of required EVCS increased from 0 to 1.
- For parking spaces between 10-25 actual parking spaces, the number of required EVCS increased from 2 to 3.
- For more than 25 up to 200 parking spaces, the number of required EVCS increased significantly over the current requirements in column 3.
- For 201 and over actual parking spaces, the number of required EVCS is based on the calculated number in column 2 multiplied by 50 percent in column 3 (increased from 33 percent).
- Footnote 2 is amended to clarify that each EVCS shall reduce the number of required EV capable spaces by the same number.

Basically, the proposal maintains the 30 percent of required EV capable spaces for Tier 1, but significantly increases the required number or percentage of installed chargers. This

change creates a balance of approximately 50 percent EV capable and 50 percent EVCS.

Further changes to Table A5.106.5.3.1 include removing the words “EV capable space provided with EVSE” from the title in column 3. This change is to provide clarity for the code user because column 3 is for EVCS requirements which are listed in Section 5.106.5.3.2. Also, “EV capable spaces” is added to the title heading which applies to Section A5.106.5.3.1 Tier 1 for clarity.

To address office and retail buildings specifically, BSC is proposing to add column 4 (Office and Retail) to increase the EVCS requirements specific to those occupancies:

- The required number of EVCS increased to approximately 75 percent of the EV capable spaces shown in column 2.
- For 201 and over actual parking spaces, the increase is based on the calculated number in column 2 multiplied by 75 percent in column 4.
- To clarify that column 4 is independent from column 3, the words “Other than Office & Retail” were added to the column 3 heading title.

These amendments are consistent with the proposed changes made to mandatory Table 5.106.5.3.1 EV capable spaces shown in Item 3 above. These proposed changes to the voluntary measures are meant to show the coordination between the mandatory and related voluntary provisions for Tier 1 EV charging tables.

**CAC Recommendation:**

Approve.

**Agency Response:**

Disagree.

As a result of the changes made in ITEM 3, BSC has changed the title for the table for consistency between related code sections.

**ITEM 12-2**

**Section A5.106.5.3.2 Tier 1 Electric vehicle charging stations (EVCS)—power allocation method**

BSC is proposing editorial changes to this section to coordinate with addition of titles to associated tables.

**Table A5.106.5.3.2 Tier 1 EVCS— Power allocation method**

BSC is proposing to amend Table A5.106.5.3.2, which is based on the power allocation method, by adding a title, a fourth column, amending related footnote 3 and adding new footnote 5. The specific amendments in the table are as follows.

- **“Power allocation method”** is added to the table title which applies to Section A5.106.5.3.2 for clarity.
- **Column 4** is being added to the table to specifically address Office and Retail occupancies with increased required kVA power allocation for installed EVCS over what is required for other occupancies. To further clarify that column 4 only applies to office and retail occupancies and independent from column 3, the words “Other Than Office & Retail” were added to the column 3 heading title.



- **Footnote 3** applies to column 3 and is being amended to specify that the maximum allowed kVA to be utilized for EV capable spaces is 50 percent (reduced from 67 percent). This change doubles the available kVA required to be used for EVCS. Thus, 50 percent of the kVA can be used for EV capable spaces and remaining 50 percent for EVCS, which equates to a 100% increase in EVCS for other than office and retail buildings.
- **Footnote 5** is being added to set the maximum kVA power allowed in column 4 for EV capable spaces to 25 percent. As a result of the added footnote specific to office and retail buildings, the proposed change would reduce the total kVA that can be used for EV capable spaces (rated at 6.6kVA) to 25 percent of the total available kVA. This change leaves 75 percent of the available kVA required to be used for EVCS which may increase number of EVCS installed in those occupancies.

For 201 and over actual parking spaces, the maximum kVA allowed for EV capable is based on the calculated number using the formula in column 4 and multiplying the number by 25 percent (as stated in footnote 5), which leaves 75 percent required kVA available for the installation of EVCS.

These amendments are consistent with the proposed changes made to Table 5.106.5.3.6 shown in Item 5 above. These proposed changes to the voluntary measures are meant to show the coordination between the mandatory and related voluntary provisions for Tier 1 EV charging tables.

**CAC Recommendation:**

Approve.

**Agency Response:**

Accept.

**ITEM 13**

**Section A5.106.5.3.3 Tier 2 with Table A5.106.5.3.3 Tier 2 EV capable spaces & Section A5.106.5.3.4 Tier 2 Electric vehicle charging stations (EVCS)—power allocation method with associated Table A5.106.5.3.4**

BSC is proposing to amend EV charging voluntary requirements for Tier 2. The specific amendments to the two Tier 2 voluntary compliance tables correlate directly to amendments proposed to the mandatory requirements in Table 5.106.5.3.1 (EV capable spaces) and Table 5.106.5.3.6 (Power allocation method) with increased percentages.

Voluntary tiers are intended to further encourage building practices that improve public health, safety and general welfare by promoting the use of building concepts which minimize the building's impact on the environment and promote a more sustainable design.

Jurisdictions are given the broad discretion to adopt as mandatory the tiered options for uniform and consistent EV charging standards in CALGreen. As such, these requirements can minimize discrepancies in equipment installations between different projects and prevent underserving the growing market of EV drivers.

**ITEM 13-1**

**Section A5.106.5.3.3 Tier 2**

BSC is proposing editorial changes to this section to coordinate with addition of titles to the associated tables.

### **Table A5.106.5.3.3 Tier 2 EV capable spaces**

BSC is proposing to amend voluntary Table A5.106.5.3.3 by adding a title, a fourth column and amending related footnote 2. The specific amendments to the voluntary requirements in the table are as follows.

BSC is proposing to amend the table to increase the EVCS requirements:

- For parking spaces between 0-9 actual parking spaces, the number of required EVCS increased from 0 to 2.
- For parking spaces between 10-25 actual parking spaces, the number of required EVCS increased from 3 to 4.
- For more than 25 up to 200 parking spaces, the number of required EVCS increased significantly over the current requirements in column 3.
- For 201 and over actual parking spaces, the number of required EVCS is based on the calculated number in column 2 multiplied by 50 percent in column 3 (increased from 33 percent).
- Footnote 2 is amended to clarify that each EVCS shall reduce the number of required EV capable spaces by the same number.

Basically, the proposal maintains the 45 percent of required EV capable spaces for Tier 2, but significantly increases the required number or percentage of installed chargers. This change creates a balance of approximately 50 percent EV capable and 50 percent EVCS.

Further changes to Table A5.106.5.3.3 include removing the words “EV capable space provided with EVSE” from the title in column 3. This change is to provide clarity for the code user because column 3 is for EVCS requirements which are listed in Section 5.106.5.3.2. Also, “EV capable spaces” is added to the title heading which applies to Section A5.106.5.3.3 Tier 2 for clarity.

To address office and retail buildings specifically, BSC is proposing to add column 4 (Office and Retail) to increase the EVCS requirements specific to those occupancies:

- The required number of EVCS increased to approximately 75 percent of the EV capable spaces shown in column 2.
- For 201 and over actual parking spaces, the increase is based on the calculated number in column 2 multiplied by 75 percent in column 4.
- To clarify that column 4 is independent from column 3, the words “Other than Office & Retail” were added to the column 3 heading title.

These amendments are consistent with the proposed changes made to mandatory Table 5.106.5.3.1 and voluntary Table A5.106.5.3.1 shown in Items 3 and 11 above. These proposed changes to the voluntary measures are meant to show the coordination between the mandatory and related voluntary provisions for Tier 1 EV charging tables.

### **CAC Recommendation:**

Approve.

**Agency Response:**

Disagree.

As a result of the changes made in ITEM 3, BSC has changed the title for the table for consistency between related code sections.

**ITEM 13-2**

**Section A5.106.5.3.4 Tier 2 Electric vehicle charging stations (EVCS)—power allocation method**

BSC is proposing editorial changes to this section to coordinate with addition of titles to the associated tables.

**Table A5.106.5.3.4 Tier 2 EVCS—Power allocation method**

BSC is proposing to amend Table A5.106.5.3.4, which is based on the power allocation method, by adding a title, a fourth column, amending related footnote 3 and adding new footnote 5. The specific amendments in the table are as follows.

- **“Power allocation method”** is added to the table title which applies to Section A5.106.5.3.4 for clarity.
- **Column 4** is being added to the table to specifically address Office and Retail occupancies with increased required kVA power allocation for installed EVCS over what is required for other occupancies. To further clarify that column 4 only applies to office and retail occupancies and independent from column 3, the words “Other Than Office & Retail” were added to the column 3 heading title.
- **Footnote 3** applies to column 3 and is being amended to specify that the maximum allowed kVA to be utilized for EV capable spaces is 50 percent (reduced from 67 percent). This change doubles the available kVA required to be used for EVCS. Thus, 50 percent of the kVA can be used for EV capable spaces and remaining 50 percent for EVCS, which equates to a 100% increase in EVCS for other than office and retail buildings.
- **Footnote 5** is being added to set the maximum kVA power allowed in column 4 for EV capable spaces to 25 percent. As a result of the added footnote specific to office and retail buildings, the proposed change would reduce the total kVA that can be used for EV capable spaces (rated at 6.6kVA) to 25 percent of the total available kVA. This change leaves 75 percent of the available kVA required to be used for EVCS which may increase number of EVCS installed in those occupancies.

For 201 and over actual parking spaces, the maximum kVA allowed for EV capable is based on the calculated number using the formula in column 4 and multiplying the number by 25 percent (as stated in footnote 5), which leaves 75 percent required kVA available for the installation of EVCS.

These amendments are consistent with the proposed changes made to Table 5.106.5.3.6 and Table A5.106.5.3.2 shown in Items 5 and 11 above. These proposed changes to the voluntary measures are meant to show the coordination between the mandatory and related voluntary provisions for Tier 2 EV charging tables.

**CAC Recommendation:**

Approve.

**Agency Response:**

Accept.

**ITEM 14**

**APPENDIX A5 NONRESIDENTIAL VOLUNTARY MEASURES**

***DIVISION A5.6 – VOLUNTARY TIERS***

**Table A5.601 Nonresidential buildings: Green Building Standards Code Proposed Performance Approach**

**ITEM 14-1**

BSC is proposing to amend Table A5.601 to update the mandatory and voluntary Tiers based on the approved amendments made during the 2022 Intervening Code Cycle.

The table is intended to be used as an aid to illustrate the nonresidential voluntary tier compliance structure, and to correlate with the CALGreen Verification Guidelines for Mandatory and Tier 1 and Tier 2 Checklists.

**CAC Recommendation:**

Approve.

**Agency Response:**

Accept.

**ITEM 15**

**A5.602 through A5.602.2**

**CALGreen VERIFICATION GUIDELINES**

**MANDATORY and VOLUNTARY MEASURES CHECKLISTS**

**ITEM 15-1**

**A5.602 MANDATORY MEASURES CHECKLIST**

BSC is proposing to amend the MANDATORY MEASURES CHECKLIST table to update the code sections listed in the table based on the final proposed code amendment updates to the mandatory code sections and updates to the corresponding Tier 1 and Tier 2 voluntary compliance measures.

**ITEM 15-2**

**A5.602.1 TIER 1 CHECKLIST**

BSC is proposing to amend the TIER 1 CHECKLIST table to update the code sections listed in the table based on the final proposed code amendment updates to the mandatory and corresponding voluntary Tier 1 code sections.

**ITEM 15-3**

**A5.602.2 TIER 2 CHECKLIST**

BSC is proposing to amend the TIER 2 CHECKLIST tables to update the code sections listed in the table based on the final proposed code amendment updates to the mandatory and corresponding voluntary Tier 2 code sections.

These amendments are primarily editorial and align with similar verbiage found in the Tier

1 code Sections A5.601.2.1 Prerequisites and A5.601.2.4 Voluntary measures for Tier 1 and provides consistency between the two similar voluntary tiers.

**CAC Recommendation:**

Approve for ITEMS 15-1, 15-2, and 15-3.

**Agency Response:**

Accept.

**TECHNICAL, THEORETICAL, AND EMPIRICAL STUDY, REPORT, OR SIMILAR DOCUMENTS**

Government Code Section 11346.2(b)(3) requires an identification of each technical, theoretical, and empirical study, report, or similar document, if any, upon which the agency relies in proposing the regulation(s).

**Electric Vehicle: Section 5.106.5.3 Electric Vehicle EV charging for Light-duty electric vehicles proposal**, study and reports are as follows:

- [Current California GHG Emission Inventory Data | California Air Resources Board](https://ww2.arb.ca.gov/ghg-inventory-data) (https://ww2.arb.ca.gov/ghg-inventory-data)
- [\(CEC\) recent AB 2127 staff report](https://efiling.energy.ca.gov/getdocument.aspx?tn=236237), to estimate the number of charging stations that would be required to support 5 million ZEVs by 2030. (https://efiling.energy.ca.gov/getdocument.aspx?tn=236237)
- [California's Employment Development Department \(Size of Business Data\)](https://labormarketinfo.edd.ca.gov/LMID/Size_of_Business_Data_for_CA.html) (https://labormarketinfo.edd.ca.gov/LMID/Size\_of\_Business\_Data\_for\_CA.html)
- 2021 National Construction Estimator, 67th Edition, Edited by Richard Pray, Craftsman Book Company, October 20, 2021 National Construction Estimator 67th Edition.
- [National Electric Vehicle Infrastructure Program \(NEVI\) | California Energy Commission](https://www.energy.ca.gov/programs-and-topics/programs/national-electric-vehicle-infrastructure-program-nevi) (https://www.energy.ca.gov/programs-and-topics/programs/national-electric-vehicle-infrastructure-program-nevi)
- CARB Technical Analysis: [2019 CARB report \(Electric Vehicle \(EV\) Charging Infrastructure-Nonresidential\)](https://ww2.arb.ca.gov/sites/default/files/2020-08/CARB_Technical_Analysis_EV_Charging_Nonresidential_CALGreen_2019_2020_Intervening_Code.pdf) EV Charging Infrastructure Nonresidential Building Standards 2019/2020 Intervening Code Cycle. (https://ww2.arb.ca.gov/sites/default/files/2020-08/CARB\_Technical\_Analysis\_EV\_Charging\_Nonresidential\_CALGreen\_2019\_2020\_Intervening\_Code.pdf)

**CO<sub>2</sub> proposal**, study and reports are as follows:

- [Ventilation Rates in California Classrooms](https://www.sciencedirect.com/science/article/abs/pii/S0360132319306365) issued by UC Davis in 2019. (https://www.sciencedirect.com/science/article/abs/pii/S0360132319306365)
- [Effects of low-level inhalation exposure to carbon dioxide in indoor environments](https://www.sciencedirect.com/science/article/pii/S0160412018312807?via%3DiHub) by the Environment International Journal (2018) (https://www.sciencedirect.com/science/article/pii/S0160412018312807?via%3DiHub)

- [Association of classroom ventilation with reduced illness](https://onlinelibrary.wiley.com/doi/abs/10.1111/ina.12042) by EHP Publishing, E. Satish, et al (2012).  
(<https://onlinelibrary.wiley.com/doi/abs/10.1111/ina.12042>)

## **STATEMENT OF JUSTIFICATION FOR PRESCRIPTIVE STANDARDS**

Government Code Section 11346.2(b)(1) requires a statement of the reasons why an agency believes any mandates for specific technologies or equipment or prescriptive standards are required.

California's building standards codes have historically been a mix of performance and prescriptive provisions and reference standards. This edition of the code is no different, and wherever possible, a performance option is included to provide flexibility to the code user. Proposed EV amendments require relatively new technology; therefore, performance standards are not applicable for this rulemaking. Proposed CO<sub>2</sub> and Bicycle parking regulations require prescriptive standards.

## **CONSIDERATION OF REASONABLE ALTERNATIVES**

Government Code Section 11346.2(b)(4)(A) requires a description of reasonable alternatives to the regulation and the agency's reasons for rejecting those alternatives. In the case of a regulation that would mandate the use of specific technologies or equipment or prescribe specific action or procedures, the imposition of performance standards shall be considered as an alternate. It is not the intent of this paragraph to require the agency to artificially construct alternatives or describe unreasonable alternatives.

BSC, in coordination with CARB, has identified and promulgated alternatives that are listed as voluntary tier measures (see 399 Attachment A).

## **REASONABLE ALTERNATIVES THE AGENCY HAS IDENTIFIED THAT WOULD LESSEN ANY ADVERSE IMPACT ON SMALL BUSINESS**

Government Code Section 11346.2(b)(4)(B) requires a description of any reasonable alternatives that have been identified or that have otherwise been identified and brought to the attention of the agency that would lessen any adverse impact on small business.

No reasonable alternatives that have been identified or that have otherwise been identified and brought to the attention of BSC that would lessen any adverse impact on small business.

## **FACTS, EVIDENCE, DOCUMENTS, TESTIMONY, OR OTHER EVIDENCE OF NO SIGNIFICANT ADVERSE ECONOMIC IMPACT ON BUSINESS**

Government Code Section 11346.2(b)(5)(A) requires the facts, evidence, documents, testimony, or other evidence on which the agency relies to support an initial determination that the action will not have a significant adverse economic impact on business.

## **Electric Vehicle Light-duty vehicle regulation ITEMS 2-7, 11 & 12:**

Of the proposed changes, the only one with a certain cost impact to businesses would be the increase percentage of needed installed chargers for both "other than office and retail buildings" and the newly added category for "Retail and office buildings" found in the EV tables which convert more EV capable parking spaces to installed chargers using various

compliance pathways. BSC has determined that allowing more EV Capable spaces to be replaced with EVCS will marginally increase the cost to businesses.

In all newly constructed nonresidential buildings except for office and retail the mandatory provisions (installing EV Capable and EVSE) will account for 1.00% to 1.05% of the total new construction cost. In newly constructed office and retail buildings, the required provisions of EV capable and Level 2 EVSE will account for 1.33% to 1.46%

While the increased cost to businesses is marginal, the avoided future costs for retrofits outweigh the added initial costs during new construction. Not proposing the requirements for installation of additional chargers would ultimately result in greater building retrofit overall costs than the changes in this proposal (See Attachment A-Cost Analysis).

### **Bicycle parking spaces and CO2 monitoring ITEMS 1, 8-10, 13 & 14:**

Of the proposed changes, the only two with any cost impact to businesses would be Bicycle parking and CO2 monitoring proposals. Both proposals have been made available to public comments during the pre-rulemaking phase of this code cycle and no comments have been made that the proposed changes would have significant statewide adverse economic impact on businesses.

The public is welcome to submit any information, facts, or documents either supporting BSC's initial determination or finding to the contrary.

## **ASSESSMENT OF EFFECT OF REGULATIONS UPON JOBS AND BUSINESS EXPANSION, ELIMINATION OR CREATION**

Government Code Sections 11346.2(b)(2) and 11346.3(b)(1)

BSC has assessed whether and to what extent this proposal will affect the following:

### **A. The creation or elimination of jobs within the State of California.**

These regulations may cause some jobs to be created for the manufacturing, installation, and maintenance of Electric Vehicle Supply Equipment (EVSE), and for EV capable; installation of raceway and panel capacity to support future installation of EVSE. Some jobs may be created for the manufacturing, installation and maintenance of CO<sub>2</sub> monitoring and bicycle parking equipment installation. No jobs are expected to be eliminated.

### **B. The creation of new businesses or the elimination of existing businesses within the State of California.**

These regulations will likely promote the expansion of businesses currently involved with EV manufacturing, installation, maintenance, and technology development, and some special trade construction businesses may be created for EV capable, CO<sub>2</sub> monitoring and bicycle parking equipment installations. No business is expected to be eliminated.

### **C. The expansion of businesses currently doing business within the State of California.**

These regulations will likely promote the expansion of businesses currently involved with EV manufacturing, installation, maintenance, and technology development within the State of California. Promote the expansion of some

businesses for CO<sub>2</sub> monitoring and bicycle storage equipment manufacturing, construction trades, installers & suppliers.

**D. The benefits of the regulation to the health and welfare of California residents, worker safety, and the state's environment.**

These regulations will increase the sustainability of California's natural resources by reducing fuel use, GHG emissions, criteria pollutants, and fossil fuel dependence. CO<sub>2</sub> monitoring will promote better indoor air quality for students & teachers. Bicycle parking will increase ridership, reduce vehicles on roads which reduces GHG emissions and traffic congestion. Additionally, updating and clarifying the minimum current CALGreen codes will provide increased protection of public health and safety, worker safety and the environment.

**ESTIMATED COST OF COMPLIANCE, ESTIMATED POTENTIAL BENEFITS, AND RELATED ASSUMPTIONS USED FOR BUILDING STANDARDS**

Government Code Section 11346.2(b)(5)(B)(i) states if a proposed regulation is a building standard, the initial statement of reasons shall include the estimated cost of compliance, the estimated potential benefits, and the related assumptions used to determine the estimates.

**Electric Vehicle Charging statement:** For Light-duty Vehicles, CARB staff estimates the cost of EV Capable infrastructure (raceway and panel capacity) to range from \$779.32 to \$1,099.92. Staff estimates the average cost of a Level 2 charger ranges from \$1,408.83 to \$2,040.17. Staff took the average of over 30 non-networked and networked chargers to estimate an average cost of a non-networked Level 2 charger and a networked Level 2 charger. The cost of other components (wiring, panel capacity, conduit, protective bollards) adds another \$1,112.32 - \$1,906.62 per Level 2 EVSE space, bringing the total cost for Level 2 EVSE to \$2,521.15 to \$3,946.79 per space. The cost of low power Level 2 charging receptacles (raceway, panel capacity, wiring, receptacles, protective bollards) is estimated to range from \$1,795.03 to \$2,215.90.

The proposed mandatory amendments would apply to new parking facilities with 10 or more spaces and existing parking facilities adding or altering 10 or more spaces. The Power Allocation Method (Table 5.106.5.3.6) allow for any combination of EV Capable, low power level 2 charging receptacles, Level 2 EVSE and DCFC. Staff ran two scenarios with the Power Allocation Method, one without DCFCs and one with DCFCs.

Further, BSC is not proposing any changes to the DCFC Alternative Compliance Pathway. Under this pathway a property owner or manager would have the option of installing 1 DCFC to replace 5 EV Capable Spaces or 5 Level 2 EVSE. Staff notes that in some developments, EVSE unit costs will not be assumed by the developer, and instead could be accounted for through charging service fees by an EVSE provider directly to drivers. For this analysis, CARB staff assume the most conservative approach where costs are assumed by the developer.

**1. Mandatory New Construction Regulations:**

**a. EV Capable and EVSE Requirements for all nonresidential building types excluding Office and Retail:**

In the newly constructed nonresidential buildings excluding office and retail buildings, developers would be required to have 20% of parking spaces be EV



Capable and 50% of those EV Capable spaces to have Level 2 EVSE installed. Staff estimates that 69,850 to 85,545 spaces must be EV Capable, with an initial construction cost ranging from \$54.4 million (69,850 x \$779.32) to \$94.1 million (85,545 x \$1,099.92) and a statewide benefit of \$394.9 million to \$629.9 million. Staff estimate an annual greenhouse gas emissions reduction benefit of 154,000 to 241,000 metric tons of CO<sub>2e</sub>.

The proposed code will require 50% of EV capable spaces to have Level 2 EVSE. Staff estimates that 69,850 to 85,545 Level 2 EVSE will be installed, with an initial construction cost of \$176.1 million (69,850 x \$2,521.15) to \$337.6 million (85,545 x \$3,946.79) and a statewide benefit of \$151.3 million to \$508.3 million. Staff estimate an annual greenhouse gas emissions reduction benefit of 513,000 to 802,000 metric tons of CO<sub>2e</sub>.

Under the proposed code 2 low power level 2 charging receptacles can replace 1 EV capable space. Staff estimates that if every developer elected to install low power level 2 charging receptacles instead of EV capable spaces, there will be 139,700 to 171,089 low power level 2 charging receptacles, with a maximum initial construction cost ranging from \$250.8 million (139,700 x \$1,795.03) to \$379.1 million (171,089 x \$2,215.90) and a maximum statewide benefit of \$598.8 million to \$1,117.9 million. Staff estimates a maximum greenhouse gas emissions reduction benefit ranging from 513,000 to 802,000 metric tons of CO<sub>2e</sub>. The true construction cost, statewide benefit and greenhouse gas emissions reduction will depend on the number of developers that elect to install low power level 2 charging receptacles to replace EV capable spaces and how many low power level 2 charging receptacles are installed.

**b. Power Allocation Method for all building types excluding Office and Retail:**

Staff ran two analyses, one without the installation of DCFCs and one with the installation of DCFCs. Staff estimates for sites without DCFCs, the cost ranges from \$12,222.43 to \$106,885.29 per project and for sites with DCFCs the cost ranges from \$9,411.68 to \$96,803.73 per project. However, the actual costs are highly dependent on the site developer, the building's function, and the charging level distribution (number of EV capable, low power Level 2 receptacles Level 2 EVSE, and DCFC).

**c. DCFC Alternative Compliance Pathway for all nonresidential building types excluding Office and Retail Building Types:**

Staff could not estimate the construction cost of the alternative DCFC pathway, since staff has no way to estimate the number of DCFCs that would be installed or the power levels that developers may be likely to install.

**d. EV Capable and EVSE Requirements for Office and Retail Building Types:**

In newly constructed office and retail buildings, BSC proposes that 20% of spaces must be EV Capable and 75% of EV Capable spaces must have Level 2 EVSE installed. Staff estimates 26,132 to 32,549 spaces will be EV capable, with an initial construction cost ranging from \$20.4 million (26,132 x \$779.32) to \$35.8 million (32,549 x \$1,099.92), and a statewide benefit ranging from \$147.1 million to \$240.0 million. Staff estimates an annual greenhouse gas emissions reduction benefit of 58,000 to 92,000 metric tons of CO<sub>2e</sub>.

The proposed code requires that 75% of EV Capable spaces have Level 2 EVSE installed. Staff estimates that 78,397 to 97,646 Level 2 EVSE will be installed, with an initial construction cost of \$197.7 million (78,397 x \$2,521.15) to \$385.4 million (97,646 x \$3,946.79) and a statewide benefit of \$163.4 million to \$583.5 million estimate an annual greenhouse gas emissions reduction benefit of 576,000 to 916,000 metric tons of CO<sub>2e</sub>.

Under the proposed code 2 low power level 2 charging receptacles can replace 1 EV capable space. If every developer elected to install low power level 2 charging receptacles instead of EV capable spaces, staff estimates a maximum of 52,265 to 65,097 low power Level 2 receptacles would be installed, with a maximum initial cost of \$93.8 million (52,265 x \$1,795.03) to \$144.2 million (65,097 x \$2,215.90), and a maximum statewide benefit ranging from \$221.6 million to \$427.0 million. Staff estimates a maximum annual greenhouse gas emissions reduction benefit of 192,000 to 306,000 metric tons of CO<sub>2e</sub>. The true construction cost, statewide benefit and greenhouse gas emissions reduction depends on if developers elect to install low power level 2 charging receptacles.

**e. Power Allocation Method for Office and Retail Building Types:**

Staff estimates for sites without DCFCs, the cost ranges from \$12,222.43 to \$112,515.86 per project and for sites with DCFCs the cost ranges from \$8,342.76 to \$123,474.33 per project. However, the actual costs are highly dependent on the site developer, the building's function, and the charging level distribution (number of EV capable, low power Level 2 receptacles, Level 2 EVSE and DCFC).

**f. DCFC Alternative Compliance Pathway for Office and Retail Building Types**

Staff could not estimate the construction cost of the alternative DCFC pathway, since staff has no way to estimate the number of DCFCs that would be installed or the power levels that developers may be likely to install.

## **2. Mandatory Existing Facilities Regulations**

**a. EV Capable and EVSE Requirements for all Existing Building excluding Office and Retail:**

The proposed amendments would require during qualifying additions and alterations for a property owner or manager to meet EV charging requirements in Section 5.106.5.3 and Table 5.106.5.3. 1. Staff estimate that 36,440 to 45,754 spaces would be EV capable, with an initial construction cost of \$28.4 million (36,440 x \$779.32) to \$50.3 million (45,754 x \$1,099.92) and a statewide benefit of \$204.8 million to \$337.6 million. Staff estimates an annual greenhouse gas emissions reduction potential benefit of 27,000 to 43,000 metric tons of CO<sub>2e</sub>.

The proposed code requires 50% of EV capable spaces have Level 2 EVSE installed. Staff estimates that the proposed code will result in 36,440 to 45,754 Level 2 EVSE installed with an initial construction cost of \$91.9 million (36,440 x \$2,521.15) to \$180.6 million (45,754 x \$3,946.79) and a statewide benefit of \$74.5 million to \$274.2 million. Staff estimates a total greenhouse gas emissions reduction of 90,000 to 143,000 metric tons of CO<sub>2e</sub>.

Under the proposed code 2 low power level 2 charging receptacles can replace 1 EV capable space. Staff estimates that if every developer elected to install low

power level 2 charging receptacles instead of EV capable spaces, a maximum of 72,880 to 91,507 low power Level 2 receptacles would be installed, with a maximum initial cost of \$130.8 million (72,880 x \$1,795.03) to \$202.8 million (91,507 x \$2,215.90), and a maximum statewide benefit ranging from \$307.4 million to \$601.2 million. Staff estimates a maximum total greenhouse gas emissions reduction potential benefit of 90,000 to 143,000 metric tons of CO<sub>2e</sub>. The true construction cost, statewide benefit and greenhouse gas emissions reduction depends on if developers elect to install low power level 2 charging receptacles.

**b. Power Allocation Method for all Existing Facilities excluding Office and Retail Buildings:**

The power allocation table will also apply to existing facilities. Staff ran two analyses, one without the installation of DCFCs and one with the installation of DCFCs. Staff estimates for existing sites without DCFCs, the cost ranges from \$6,600.93 to \$114,034.06 per project and for sites with DCFCs the cost ranges from \$9,411.68 to \$100,135.61 per project. However, the actual costs are highly dependent on the site developer, the building's function, and the charging level distribution (number of EV capable, Level 2 EVSE, low power Level 2 receptacles and DCFC).

**c. Alternative compliance with DCFC for all existing facilities excluding office and retail Buildings:**

Staff could not estimate the construction cost of the alternative DCFC pathway, since staff has no way to estimate the number of DCFCs that would be installed or the power levels that developers may be likely to install.

**d. EV Capable and EVSE Requirements for Office and Retail Buildings:**

In existing buildings, the proposed amendments would require property owners to have a total of 30% of added or altered spaces must be EV Capable.

Staff estimate that 10,032 to 15,741 spaces would be EV capable, with an initial construction cost of \$7.8 million (10,032 x \$779.32) to \$17.3 million (15,741 x \$1,099.92) and a statewide benefit of \$52.9 million to \$118.1 million. Staff estimates an annual greenhouse gas emissions reduction benefit potential of 11,000 to 15,000 metric tons of CO<sub>2e</sub>.

The proposed code requires 75% of added or altered EV Capable spaces have Level 2 EVSE installed. The average cost of a Level 2 charger ranges from \$1,408.83 to \$2,040.17. Staff estimates that the proposed code will result in 30,095 to 47,224 Level 2 EVSE installed. Staff estimates a construction cost of \$75.8 million (30,095 x \$2,521.15) to \$186.3 million (47,224 x \$3,946.79) and a statewide benefit of \$24.3 million to \$301.9 million. Staff estimates an annual greenhouse gas emissions reduction of 74,000 to 148,000 metric tons of CO<sub>2e</sub>.

Under the proposed code 2 low power level 2 charging receptacles can replace 1 EV capable space. If every developer elected to replace every EV capable space with 2 low power level 2 charging receptacles, staff estimates 20,063 to 31,438 low power level 2 charging receptacles would be installed. Staff estimates a construction cost of \$36.0 million (20,063 x \$1,795.03) to \$69.8 million (31,438 x \$2,215.90) and a statewide benefit of \$70.7 million to \$215.8 million. Staff estimates

an annual greenhouse gas emissions reduction of 25,000 to 50,000 metric tons of CO<sub>2</sub>e.

**e. Power Allocation Method for all existing Office and Retail Buildings:**

Staff estimates that for existing sites without DCFCs, the cost ranges from \$8,342.76 to \$115,847.74 per project and for sites with DCFCs the cost ranges from \$11,153.51 to \$127,906.13 per project. However, the actual costs are highly dependent on the site developer, the building's function, and the charging level distribution (number of EV capable, Level 2 EVSE, low power Level 2 receptacles and DCFC).

**f. Alternative compliance with DCFC for all existing Office and Retail Buildings:**

Staff could not estimate the construction cost of the alternative DCFC pathway, since staff has no way to estimate the number of DCFCs that would be installed or the power levels that developers may be likely to install.

**See Attachment A-Cost Analysis for additional information.**

**Bicycle parking, and CO<sub>2</sub> monitoring statement:** BSC estimates that the estimated cost of compliance, the estimated potential benefits, and the related assumptions used to determine the estimates are as follows:

Estimate the economic impact of the proposed amendments for business and/or employees:

- For CO<sub>2</sub> monitoring: Initial installation costs range \$500-\$1,500.
- For Bicycle parking regs: Initial installation costs range \$300-\$4,500.

Estimate of potential benefits and related assumptions:

- For CO<sub>2</sub> monitoring: The benefits of this regulation include improving California schools' indoor air quality and overall student and teacher health by monitoring and recording CO<sub>2</sub> emissions in classrooms with an emphasis to troubleshooting indoor air quality issues in real time before poor indoor air quality compromises student and teacher health and increases sickness and absenteeism.
- For bicycle parking: The benefits for the bicycle parking regulations promote bicycle ridership, reduce vehicles on roads which reduces GHG emissions and traffic congestion, as well as the mental and physical health benefits of riding a bicycle and other forms of exercise which could reduce health-related costs to business owners, thereby promoting healthier environments for Californians to live and work.

## **DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS**

Government Code Section 11346.2(b)(6) requires a department, board, or commission within the Environmental Protection Agency, the Resources Agency, or the Office of the State Fire Marshal to describe its efforts, in connection with a proposed rulemaking action, to avoid unnecessary duplication or conflicts with federal regulations contained in the Code of Federal Regulations addressing the same issues. These agencies may adopt regulations different from these federal regulations upon a finding of one or more of the following justifications: (A) The differing state regulations are authorized by law and/or (B)

The cost of differing state regulations is justified by the benefit to human health, public safety, public welfare, or the environment.

These regulations do not duplicate nor conflict with federal regulations.