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DRAFT STAFF REPORT

Tracking California's Electric Vehicle Chargers

**Regulations for Improved Inventory,
Utilization, and Reliability Reporting**

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ABSTRACT

This California Energy Commission staff report *Tracking California's Electric Vehicle Chargers: Regulations for Improved Inventory, Utilization, and Reliability Reporting* proposes new regulations for tracking the number of electric vehicle chargers installed in California, the use of the chargers, and their reliability.

California's state policy establishes specific targets for the deployment of electric vehicle chargers. According to Assembly Bill 2127 (Ting, Chapter 365, Statutes of 2018), the responsibility for evaluating the number of EV chargers necessary to support meeting California's electric vehicle adoption goals lies with the California Energy Commission. To assess the number of additional chargers that need to be installed to support California's transition to electric vehicles, the CEC requires a detailed understanding of the number of chargers that are operational as well as real-world utilization. Current voluntary surveys of charging station operators do not provide the level of data required for CEC staff to deliver the charging gap assessments required by statute.

In addition, Assembly Bill 2061 (Ting, Chapter 345, Statutes of 2022) directs the CEC to develop electric vehicle charger uptime recordkeeping and reporting standards and, beginning in 2025, deliver biennial assessments of the reliability of California's charging infrastructure. The CEC lacks the data to estimate the reliability of public and shared private electric vehicle charging stations.

The recordkeeping and reporting regulations proposed in this staff report will allow the CEC to access the data needed to deliver its statutorily required assessments of charging infrastructure needs and charging reliability. These proposed regulations are technically feasible and expected to support equitable access to reliable EV chargers by drivers unable to charge EVs at their own residences. This report also surveys the potential causes of electric vehicle charging reliability issues and the need for additional data.

Keywords: Charging, infrastructure, transportation electrification, electric vehicle, electric charging station reliability

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EXECUTIVE SUMMARY

Assembly Bill (AB) 2127 (Ting, Chapter 365, Statutes of 2018) directs the California Energy Commission (CEC) to assess biennially the number of electric vehicle chargers necessary to support California’s electric vehicle adoption goals.

Furthermore, AB 2061 (Ting, Chapter 345, Statutes of 2022) directs the CEC to develop uptime recordkeeping and reporting standards for electric vehicle chargers and charging stations that receive an incentive from a state agency or through a charge on ratepayers and are installed on or after January 1, 2024.

AB 2061 further directs the CEC to regularly assess the reliability of California’s electric vehicle charging infrastructure beginning in 2025. This assessment will include all chargers, whether or not these chargers received an incentive from a state agency or ratepayers. This comprehensive view of the reliability of California’s electric vehicle charging infrastructure is necessary to ensure a positive driver and consumer experience regardless of the funding source of electric vehicle charging infrastructure.

Pursuant to statutes described in Chapter 3 of this document, this staff report proposes new regulations that will require electric vehicle charging network providers, charging station operators, and site hosts to report the number, utilization, and reliability of electric vehicle chargers in California. The regulatory language proposed by CEC staff is attached to this report as Appendix A; the proposed regulations are summarized in Chapter 5 of this Staff Report. These proposed regulations apply to all electric vehicle chargers except those used solely for private use at a single-family house or located at a multifamily dwelling with four or fewer dwelling units, and apply to chargers serving both light-duty and medium-duty and heavy-duty electric vehicles. These proposed regulations will set the recordkeeping and reporting standards that will be incorporated into future electric vehicle charger funding by the CEC.

These proposed regulations will affect entities that own, operate, or host electric vehicle charging stations in different ways. The categories of entities affected by these regulations are not mutually exclusive, and many entities that operate charging stations may simultaneously fulfill more than one role. For these regulations, a single business entity may be considered a charging network provider at one charging location operated by the entity and a charging station operator or site host at another.

Table ES-1: Entities Affected By Regulation

<u>Entity</u>	<u>Definition</u>
Charging network provider	Entity that operates the digital communication network that remotely manages the chargers.
Charging station operator	Entity that owns the chargers and supporting equipment and facilities at one or more charging stations.
Site host	Electric utility customer of record for electric service to the charger and may also be the charging network provider or the charging station operator of the charger.

Source: CEC staff

The entity responsible for recordkeeping and reporting under these regulations — or the recordkeeping and reporting agent — will vary depending on whether the charger is networked or nonnetworked, when it was installed, and whether it was installed using public or ratepayer funds. The reporting requirements that apply to specific chargers vary based on whether a charger is networked and whether the charger is regulated by AB 2061.

Some data reported to the CEC under these regulations will be held confidential.

Table ES-2: Confidentiality

<u>To Be Held Confidential</u>	<u>May File a Request for Confidential Designation</u>	<u>Not Confidential</u>
<ul style="list-style-type: none"> • Utilization data specific to an individual charging station • Total charge attempts, successful charge attempts, failed charge attempts 	<ul style="list-style-type: none"> • Charger address • Charger geographic coordinates • Charger serial number • Charger and port identification 	<ul style="list-style-type: none"> • All other data • Data that would otherwise be confidential if it has been sufficiently aggregated

Source: CEC staff

These proposed regulations are technically feasible and not expected to result in adverse environmental impacts or significant economic and fiscal impacts for regulated entities or state agencies. Improving transparency into the deployment and reliability of electric vehicle chargers in California is expected to support consumer equity.

The CEC will incorporate data collected through these regulations into future assessments of California’s electric vehicle charging needs and the equity of charger deployment. Beginning in 2025, the CEC will release biennial reports on the reliability of California’s electric vehicle charging infrastructure and equitable access to reliable chargers. To create greater transparency and driver confidence, the CEC intends to publish the reliability of EV charging networks in these assessments and on its website.

If these assessments reveal poor electric vehicle charging reliability and that charging networks are not voluntarily improving reliability, following AB 2061 the CEC may adopt tools to increase uptime of chargers operating in California, including uptime requirements.

CHAPTER 1:

Introduction

More than 1.6 million electric vehicles (EVs) have been sold in California.¹ State policy directs that all new passenger vehicle sales must be zero-emission by 2035, and new regulations mandate that medium- and heavy-duty (MDHD) vehicle fleets increasingly electrify.²

The California Energy Commission (CEC) estimates that California will require about 2.1 million public and shared light-duty EV chargers by 2035 and about 264,500 MDHD EV chargers by 2035.³ State and ratepayer funded programs are deploying tens of thousands of EV chargers across California. The federal National EV Infrastructure (NEVI) Formula Program is also expected to fund thousands of EV chargers across the country, including in California.

Effectively investing public dollars into EV charging necessitates a detailed understanding of how many chargers are installed today, how many additional chargers are needed to meet state goals, and where these chargers must be located to ensure equitable access to EV charging. Assembly Bill (AB) 2127⁴ (Ting, Chapter 345, Statutes of 2022) requires the CEC to prepare regular assessments of the number of EV chargers required to meet California EV adoption goals. Detailed mapping of charging infrastructure is also needed to comply with Senate Bill (SB) 1000⁵ (Lara, Chapter 368, Statutes of 2018), which directs the CEC to regularly evaluate the equity of access to EV charging and determine whether charging infrastructure is disproportionately deployed.⁶ These assessments will benefit from a more precise understanding of the number and location of EV chargers in California.

The CEC currently lacks accurate information on the number of EV chargers in California. Public charging station operators are required to report the number of EV chargers they operate to the U.S. Department of Energy Alternative Fuels and Data Center; however, the

1 Data as of Q2 2023. See California Energy Commission, "[New ZEV Sales in California.](#)"

2 California Air Resources Board, "[Advanced Clean Cars II Regulations,](#)" accessed August 31, 2023; California Air Resources Board, "[Advanced Clean Fleets,](#)" accessed June 12, 2022.

3 California Energy Commission, "[Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles in 2030 and 2035,](#)" August 24, 2023, 1-8.

4 Codified at Pub. Resources Code, § 25229.

5 Codified at Pub. Resources Code, § 25231.

number of chargers reported by Alternative Fuels and Data Center is approximately 50 percent less than that estimated by CEC staff, though this estimate lacks precision.⁷

Staff estimates of the number of EV charging stations in California may be undercounted. Existing estimates of the number of EV chargers rely on combining publicly available data, tallies of chargers installed through state agency and utility programs, and voluntary surveys of charging networks and fleets. These methods are insufficient as California enters mainstream consumer EV adoption and scales up EV charging infrastructure. Many charging networks do not respond to voluntary surveys, leaving the CEC with an incomplete inventory of the number of charging stations. As the number of electrified fleets grows, more fleet operators will also operate their own private charging stations. Without new regulations that allow the CEC to collect accurate data on the number and location of EV chargers, the CEC's charger estimates are likely to grow less accurate over time. These inaccuracies will reduce the effectiveness of the investments of public, ratepayer, and private funding and make it harder to determine whether California is on track to meet state goals.

The number and distribution of EV chargers required to serve California's growing EV fleet also depend on how heavily these chargers are used. A charging station with a high utilization rate can in theory support more EVs — it spends more time charging vehicles — than an equivalent station with a low utilization rate.⁸ The same holds true across California's charging infrastructure. If California's EV chargers tend to be heavily used, it follows that fewer charging stations can serve the state's EV fleet. However, if chargers tend to be used infrequently, then California may need more of them. The utilization rate of EV chargers — and thus the number of charging stations required — may also vary across California. The CEC lacks adequate information about the utilization rate of EV chargers, reducing the accuracy of projections prepared under AB 2127.

For California to meet its EV adoption goals, charging stations must also be reliable. AB 2061 finds that increasing consumer confidence in EVs depends on access to reliable EV charging stations, and that the state must understand whether publicly and ratepayer-funded EV charging stations are reliable. Unfortunately, there is a lack of robust data regarding whether public and shared private EV charging stations are reliable. Media outlets have recently run stories highlighting anecdotal evidence of poor public charging reliability.⁹ Survey data indicate

7 Compare U.S. Department of Energy "[Alternative Fuels Data Center Alternative Fueling Station Locator](#)" with CEC "[Electric Vehicle Chargers in California](#)." Accessed August 31, 2023.

8 This staff report uses the term utilization to refer to the amount of electricity dispensed by a charging station as a percentage of its maximum output. For further discussion, see [Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment](#), page 60.

9 Garza, Mariel, "[Commentary: I'm ready to trade in my electric car. Here's why.](#)" *Los Angeles Times*, April 23, 2023.

that EV drivers see public charging reliability as a major difficulty, and a recent survey by J.D. Powers found that malfunctioning or out-of-service charging stations can prevent drivers from successfully charging their vehicles.¹⁰

The CEC lacks sufficient data on EV charging reliability to assess the reliability of the state's charging network or whether reliability is lower in low and moderate-income communities, as directed by AB 2061. Current studies are limited in geographic scope, rely on a limited set of EV models, and do not require testers to document error codes or other indicators of specific failure modes. It will be imperative to understand failure points and which chargers are experiencing reliability issues.

Despite the current lack of quantitative reliability data, CEC staff recognizes that poor reliability of public and shared private EV charging stations is a barrier to EV adoption. The CEC is working to improve charging station reliability and the related concept of vehicle-charger interoperability through several avenues:

- CEC staff hosted an EV charging infrastructure reliability standards workshop on October 21, 2022. Representatives from Argonne National Laboratory, the charger manufacturer ABB, charging network Electrify America, and standards organization SAE gave presentations on EV charger reliability, and numerous industry participants and advocates attended the workshop and submitted comments.¹¹
- The CEC provided funding for the Vehicle-Grid Innovation Lab (ViGIL), which provides charger conformance and certification testing services in Concord (Contra Costa County). The CEC also funded the Vehicle Interoperability Testing Symposium (VOLTS), which convened stakeholders for charger-vehicle interoperability testing and an industry conference in May 2023.¹²
- The CEC has included reliability requirements in EV charging grants since 2021, which set 97 percent uptime standards, recordkeeping and reporting requirements, and maintenance requirements for grant recipients.
- The CEC has contracted with UC Davis to develop an open-source EV charger test protocol and perform field tests of 3,600 EV chargers in the next three years. This field testing program will include chargers located in rural and urban areas, as well as low-

10 Plug In America, "[The Expanding EV Market: Observations in a year of growth](#)," February 2022; J.D Powers, "[Growing Electric Vehicle Market Threatens to Short-Circuit Public Charging Experience, J.D. Power Finds](#)," August 17, 2022.

11 California Energy Commission, "[Workshop on Electric Vehicle Charging Infrastructure Reliability Standards](#)," October 21, 2022. Submitted comments available at: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=22-EVI-04>.

12 See CEC GFO-20-610 and RFP-21-601.

income and disadvantaged communities. The study will inform the CEC's 2025 assessment of charging station reliability throughout the state, regardless of funding source.

This staff report discusses the causes of poor EV charging reliability and proposes regulations to require charging network providers to report the location, utilization, and reliability of certain EV chargers.

- Chapter 1 introduces the staff report.
- Chapter 2 reviews the EV charging industry and EV charging failure modes.
- Chapter 3 describes the legislative criteria for the proposed regulations.
- Chapter 4 reviews existing regulatory approaches to EV charger reliability.
- Chapter 5 summarizes the proposed regulatory text attached in the Appendix.
- Chapter 6 gives alternative regulations considered but not proposed by CEC staff.
- Chapter 7 shows that the proposed regulations are technically feasible.
- Chapter 8 describes the costs of the regulations and potential savings.
- Chapter 9 shows that an environmental impact analysis is not required for the proposed regulations.
- Chapter 10 describes the economic and fiscal impacts of the regulations.
- Chapter 11 describes the effect of the regulations on consumer equity.
- Chapter 12 provides a conclusion.

The regulatory text proposed by CEC staff is attached to this staff report as Appendix A. The regulations proposed in this report may be adopted by the CEC at a future business meeting.

AB 2061 directs that the CEC prepare biennial assessments of the reliability of California's EV charging infrastructure and equitable access to reliable charging beginning in 2025. Data collected under these regulations and included in the AB 2061 reports may influence future CEC EV infrastructure funding decisions. Transparent information is paramount for decisionmakers and consumers. As such, the CEC may publicly present reliability information of service provider networks on its website or other venues. If EV charging networks do not show improvements in charger reliability, following AB 2061 the CEC may adopt tools to increase uptime of chargers operating in California, including uptime requirements.

CHAPTER 2:

Background

This chapter provides a brief background on the EV charging industry and potential causes of poor EV charger reliability.

EV Charging Power Levels and Standards

California's EV charging ecosystem is made up of numerous charger types and power levels, standards, and market participants.

Alternating Current Level 1 Chargers

Alternating current (AC) Level 1 EV chargers charge an EV at 110/120 volts and may be portable and plug directly into a standard wall outlet. Level 1 chargers are typically not networked and not capable of connecting to a charging network provider or central management system.

AC Level 2 EV Chargers

AC Level 2 EV chargers are typically 208–240 volt chargers that can recharge a light-duty EV in about 8–12 hours. Due to the relatively long charge time, AC Level 2 charges are most common in homes, workplaces, and recreational or retail locations where drivers spend relatively long amounts of time.

Direct Current Fast Charging

Direct current fast charging (DCFC) allows higher charging power than AC Level 2 chargers. Modern commercial DCFCs operate at 50–350 kilowatts (kW) and can charge a typical light-duty EV in under an hour. DCFCs are vital to enabling road trips and may be a convenient charging option for EV drivers unable to charge their vehicles overnight.

In the United States, there are three DCFC connector types:

- The North American Charging Standard (NACS) is a connector specification proposed by Tesla. The specification combines the physical geometry of Tesla's existing connector with the communication protocols used by the Combined Charging System. At the time of the publication of this report, other automakers have announced that they will use the NACS connector on their future vehicles and multiple charging network operators have announced they will install NACS connectors.
- The Combined Charging System (CCS) standard is used by most non-Tesla EV models and DCFC charging networks. As of mid-2023 all fast chargers installed by the NEVI program must include CCS connectors. The California Air Resources Board Advanced Clean Cars II regulations require all new electric vehicles to be equipped with CCS inlets starting in 2026.

- The CHAdeMO standard is used primarily by EVs manufactured by Nissan and Mitsubishi. Vehicle manufacturers are moving away from the CHAdeMO standard, and it is being phased out of future infrastructure deployments.¹³

DCFCs are capital-intensive and in California are dominated by major charging networks. The higher capital and operational costs of DCFCs mean that public fast charging operators nearly universally require payment for charging.

EV Charging Standards and Protocols

The EV charging ecosystem uses several protocols, some of which are developed and formalized by industry bodies into standards. Open standards widely used in the EV charging industry include the following:

- SAE J1772 is a connector design standard and communications protocol for AC and DC charging. Non-Tesla Level 2 AC chargers in North America universally use J1772. The CCS DCFC connector incorporates DC conductors below the AC connector and uses this protocol for EV-to-charger communications.
- *Deutsches Institut für Normung EV* (DIN) 70121 is an EV-to-charger communications protocol for DC charging.
- CHAdeMO is a physical DC connector standard as well as an EV-to-charger communications protocol.
- Open Charge Point Protocol (OCPP) is a communications protocol between the charger and the charging network provider central management system.
- International Standards Organization (ISO) 15118 is an EV-to-charger communications standard. There are two iterations of ISO 15118, which are not backwards compatible.

MDHD EV Charging

Charging infrastructure for MDHD EVs is nascent, and MDHD EV charging standards and protocols are at present not widely adopted. MDHD charging standards that are under development include the Megawatt Charging System.

EV Charging Market Participants and Business Models

Numerous businesses participate in the EV charging process, and EV charging is a diverse market with numerous different business models.

¹³ U.S. Department of Transportation, Federal Highway Administration, [National Electric Vehicle Infrastructure Standards and Requirements](#), February 28, 2023, pg. 12753.

Automaker

The automaker or original equipment manufacturer (OEM) designs and builds EVs. To charge successfully at a charging station the EV must communicate successfully with the charger using a communications protocol, and communication errors may result in a failed or faulty charging session. Automakers may also offer services that allow drivers of the automaker's vehicles to use charging stations operated by multiple EV service providers.

Charger Manufacturer

Charging networks that do not manufacture their own chargers will typically source them from a charger manufacturer. The charger manufacturer may or may not provide maintenance for the charging network during a warranty period.

Charging Network Provider

The charging network provider is an entity that operates a digital communications network that remotely manages EV chargers. Charging network providers may also be referred to as *EV service providers*.

A charging network provider typically manages a group of networked EV charging stations, otherwise known as a *charging network*, and may use its communication capabilities to communicate directly with drivers, share real-time station status, broadcast station locations, collect and store data, and manage payments. Charging network providers often use OCPP to communicate with the charger networks they provide communications services.

Charging network providers may or may not provide technical and maintenance support for EV chargers, may or may not manufacture their own chargers, and are not regulated as utilities in California.

Charging Station Operator

The charging station operator is an entity that owns the chargers and supporting equipment and facilities at one or more charging stations. Although this entity may delegate responsibility for certain aspects of charging station operation and maintenance to subcontractors, the charging station operator retains responsibility for operation and maintenance of chargers and supporting equipment and facilities.

Both charging network providers and charging station operators can be understood to operate a charging network and often are the same entity. Major charging station operators include Electrify America, EVgo, and Tesla.

Payment Processor

Paid EV charging relies on a third-party payment processor to conduct transactions. Successful transactions must be communicated to the charging network provider and EV charger to authorize charging. Nayax Ltd. and Payter are the major payments processors used by the EV charging industry.

Site Host

For this report, the site host is defined as the electrical customer of record who pays the electric utility bill for an EV charger. Site hosts may or may not be the same entity as the charging station operator.

Utilities

Electricity is provided to the EV charging station by an electric utility. EV charging stations may rely on data services provided by a telecommunications utility for communications with charging network providers and payment processors.

EV Charging Reliability Concepts and Fault Categories

EV charger reliability can be expressed as uptime, but uptime has important limitations, and a charger considered “up” may still not provide drivers with their expected charging experience. Charger reliability is also related to the concept of interoperability.

Uptime

EV charger reliability can be most simply defined as uptime, or the percentage of time that a charger is functional. Definitions of uptime vary, as do categories of “excluded” downtime or periods when a charger is not functional but are not counted in uptime statistics. Currently, there is no widely agreed-upon test standard for assessing EV charging station reliability.¹⁴

The NEVI Program Final Rules set criteria for considering a charger “up” and establishes specific categories of excluded downtime:

“A charging port is considered ‘up’ when its hardware and software are both online and available for use, or in use, and the charging port successfully dispenses electricity in accordance with requirements for minimum power level.”¹⁵

Downtime due to electric service interruptions, failure to initiate a charge at the expected power level due to the fault of the vehicle, scheduled maintenance, vandalism, or natural disasters is excluded from the NEVI uptime calculation.¹⁶

Uptime statistics may not capture many situations where a charger is considered “up” but drivers are still unable to charge their vehicles successfully. For example, a payment system

14 SAE International, “[Electric Vehicle Charging: Performance and Reporting](#),” January 2023, 6.

15 U.S. Department of Transportation, Federal Highway Administration, [National Electric Vehicle Infrastructure Standards and Requirements](#), February 28, 2023, pg. 12756.

16 U.S. Department of Transportation, Federal Highway Administration, [National Electric Vehicle Infrastructure Standards and Requirements](#), February 28, 2023, pg. 12756.

fault may leave a driver unable to pay and authorize charging at an “up” charger.¹⁷ A definition of downtime that excludes vandalism may leave drivers unable to charge at damaged chargers that are nevertheless considered “up” for the purpose of calculating uptime.

While real-world data are limited, it is plausible that EV chargers may report high uptime statistics but actually successfully charge vehicles with far less frequency. Other reliability statistics such as the number of failed charging sessions and maintenance records may provide insights in addition to charger uptime.

Interoperability

EV charger reliability is related to interoperability, or the ability of different products and systems to function together without special effort from users. In the context of EV charging, interoperability can include:

- An EV charger successfully interfacing with a broad range of EV models made by different automakers.
- Drivers’ ability to seamlessly pay for charging at chargers operated by any charging network provider.
- The ability of EV chargers to connect to any charging network provider’s software.

Interoperability problems affect EV charger reliability. For example, differing implementations of communication protocols on the EV and EV charger may result in a charging session with lower charging power than expected or the inability to start the session altogether. Failures of EVs, EV chargers, charging network provider systems, and payment systems to seamlessly interoperate produce poor charging experiences and drivers’ perception that EV charging is unreliable. The EV charging industry remains relatively nascent and to date has not implemented a comprehensive approach to interoperability, though charging network operators have stood up test labs intended to test and improve the ability of EV chargers to interoperate successfully with different vehicle models. The regulations proposed in this staff report are not intended to address interoperability comprehensively, although addressing interoperability will improve EV charger reliability, as well as significantly improve the EV driver experience.

The ability to seamlessly pay for EV charging at stations operated by any charging network is a key component of interoperability. SB 123¹⁸ (Committee on Budget and Fiscal Review, Chapter 52, Statutes of 2023) sets new requirements for payments systems accepted at certain EV

17 General Motors, “[GM Comments on CEC Reliability Workshop](#),” November 11, 2022.

18 Section 44268.2 of the Health and Safety Code.

charging stations. These include providing contactless payment methods and an automated toll-free number or short message system to initiate a charging session and submit payment and, for certain DC fast charging stations, Plug and Charge payment capabilities. This legislation grants the CEC the authority to adjust required payment methods as technology evolves. SB 123 additionally states that the CEC may implement interoperability billing standards for roaming between EV charging networks. The CEC anticipates creating new regulations regarding EV charging payment systems and interoperability based on this authority.

EV Charging Failure Points

The EV charging ecosystem has potential failure points. For example, to charge successfully at a fast charger, the EV charger — which is often located outdoors, can be roughly treated, and typically is unattended — must be maintained and in good working order. Further, the driver must be able to connect the charger to the vehicle charging port to establish an electrical and communication link. Then, the vehicle and charger — products that are often designed and manufactured by different entities — must recognize and interface with each other to communicate charging parameters.

The driver must also be able to submit payment information via vehicle-charger communication, a credit card, radio-frequency identification (RFID) card, or a smartphone app. The payment entity must communicate authorization to charge to the EV charger, typically over a wireless data network, and the charger and vehicle must communicate to initiate a charging session.

For a satisfying driver experience, all these steps must occur over the span of a few seconds for any EV, in any weather condition, with no faults. The charger must then maintain the expected flow of electricity for a full charging session.

There are many ways this interaction can go wrong, but EV charging failures can be classified in five broad categories:¹⁹

1. Charger/Network Error

Charger/network errors are persistent failures in communication between the EV charger and the charging network provider's central system and would typically qualify as downtime. These failures include EV charger hardware failures, charger and charging network provider software failures, and charging network provider network failures.

¹⁹ Schell, Dustin. "[Electric Vehicle Charging Infrastructure Reliability Workshop](#)" staff presentation, October 21, 2022.

- *Charger hardware failures:* EV charger internal physical systems such as power electronics can break, leaving the charger inoperable.
- *Charger software failures:* Charger software can fail or require updates, which may leave chargers inoperable.
- *Charger network provider failures:* The charging network provider’s central system must communicate with the charger to authorize charging. Communications or software failures on the interface between the charger and charging network provider’s central system may leave a charger inoperable or drivers unable to pay for charging.

Proactive maintenance and timely corrective maintenance are critical to avoiding charger errors. Anecdotal evidence suggests that the entity responsible for charger maintenance — the charger manufacturer, charging network provider, charging station operator, or site host — is often contested or not clearly understood by all parties. Site hosts that operate chargers and do not have maintenance contracts with third parties may not understand that they are responsible for maintaining the chargers or lack the resources or expertise to do so.

2. Internal Payment System Failures

Processing payments and authorizing a charging session requires the charger or charging network provider’s smartphone app to communicate with the charging network provider’s central system. Because the charger remains nominally operational, internal payments system failures may be reported as uptime but still leave drivers unable to charge.

Payment processing also may incorporate roaming between charging network providers and operators using the Open Charge Point Interface (OCPI) protocol. Failures in this exchange may occur only once a driver has attempted to initiate a charge with a charger that appears operational — a frustrating experience.

3. External Payment System Failures

Processing payments requires the charger payment terminal or charging network provider app to communicate with an external third-party payment processor. Because the charger remains nominally operational, external payments system failures may be reported as uptime but still leave drivers unable to charge.

Physical payment terminals can also fail because of physical damage like dust entering the card reader slot. Communication faults with the third-party payment processor can leave drivers unable to pay for charging and potentially unable to charge. Some charging network providers do not require payment for charging — “default to free” — in the event of a payment failure to keep EV chargers functional, though chargers will not default to free charging if physical damage that leaves a payment terminal inoperable is not detected by the charger.

4. Charge Initiation/Interoperability Failures

Successful charging requires the EV and charger to exchange charging parameters. This communication occurs via standards such as ISO 15118, SAE J1772, DIN 70121,

CHAdEMO, or others. Anecdotal evidence suggests that interoperability failures are common, though the causes of these failures are unclear. Because the charger remains nominally operational, charge initiation/interoperability failures may be reported as uptime but still leave drivers unable to charge.

5. Unmonitored Failures/Other

Chargers can be broken in ways that are not detectable by the charger itself or remotely diagnosed by the network operator. These chargers may be reported as up unless the fault is physically detected by the operator.

EV charging stations are typically uncovered and unprotected from the elements. Connectors can be bent or run over by vehicles. Cables can be cut as acts of vandalism or stolen for copper. EV charging stations frequently incorporate screens that are necessary for operation, but screens can fade in sunlight, break, or be smashed. Because EV charging stations are typically unattended, broken hardware that the charger cannot detect itself will often be noted only by the charging network provider if a customer reports it.

Electrical utility failures, such as power outages, may also leave chargers inoperable. Since charging network providers and payment authorizers frequently use cellular data networks to communicate with chargers, communication utility failures can cause charger/network errors and payment system failures. Wireless data communication can be unreliable or unavailable entirely in certain locations, like rural areas or underground parking garages.

CHAPTER 3:

Legislative Criteria

CEC staff proposes the regulations discussed in this report pursuant to the following statutes and executive orders.

Executive Order B-48-18

Executive Order B-48-18²⁰ sets the target that California install 250,000 EV chargers by 2025, of which 10,000 are DC fast chargers. Tracking California’s progress toward this goal requires an accurate understanding of the number of EV chargers operating in California, data that the CEC lacks because of poor charging station operator responses to surveys.

Assembly Bill 2127

AB 2127²¹ (Ting, Chapter 365, Statutes of 2018) requires the CEC to assess biennially the EV charging infrastructure required to meet the state’s 2030 EV adoption and greenhouse gas reduction goals. Assessing the status of and need for charging infrastructure requires an accurate inventory of the number of EV charging stations in California today. To date the CEC and staff have produced two AB 2127 report but has found that existing data collection is not sufficient to gather a comprehensive picture of the number of EV chargers in California. To estimate the number of needed EV chargers more accurately, CEC staff additionally requires better estimates of the real-world use of EV chargers since understanding utilization is critical to estimating the number of chargers required to serve a given number of EVs.

Senate Bill 1000

SB 1000²² (Lara, Chapter 368, Statutes of 2018) requires the CEC to assess whether charging infrastructure is disproportionately deployed by population density, geographical area, or population income level, including low-, middle-, and high-income levels. This assessment requires accurate information on the number of EV chargers in California and related locations and utilization. To date, the CEC has produced two SB 1000 reports with the available data. More complete data on the number of EV chargers in California and locations will greatly improve the analysis of charging access in future SB 1000 reports.

20 Governor Edmund G. Brown, Jr. [Executive Order B-48-18](#). Issued January 26, 2018.

21 Codified at Pub. Resources Code, § 25229.

22 Codified at Pub. Resources Code, § 25231.

Assembly Bill 1926

AB 1926 (Farr, Chapter 939, Statutes of 1991)²³ requires the CEC to facilitate the development and commercialization of zero-emission electric vehicles, as well as the development of an infrastructure to support maintenance and fueling of those vehicles in California.

Assembly Bill 2061

AB 2061²⁴ (Ting, Chapter 345, Statutes of 2022) directs the CEC, in consultation with the California Public Utilities Commission (CPUC), to develop uptime recordkeeping and reporting standards for EV charging stations installed after January 1, 2024, as well as a definition of charger uptime. These standards will apply to EV charging stations that receive an incentive from a state agency or through a charge on ratepayers. AB 2061 also directs that the CEC, in consultation with the CPUC, may consider additional tools to increase EV charging station uptime, including uptime requirements.

AB 2061 additionally directs the CEC to assess the uptime of EV charging stations in California biennially, beginning January 1, 2025. This assessment must examine equitable access to reliable EV chargers, including access to reliable charging stations in low-, moderate-, and high-income communities. The CEC does not collect the data required to complete a holistic assessment of the reliability of California's charging infrastructure, including the number of public and shared private chargers and information on the reliability of these chargers.

Assembly Bill 126

Proposed AB 126²⁵ (Reyes and Senator Gonzalez, 2023-2024 Reg. Sess.) would direct the CEC to adopt tools to increase EV charging station uptime. The reliability reporting standards proposed in this Staff Report are expected to give new insights into the causes of poor EV charging station reliability, potentially increasing station uptime. Additionally, AB 126 would direct the CEC by January 1, 2025, to set standards for how stations subject to the bill would notify customers about the availability and accessibility of publicly available charging infrastructure.

Integrated Energy Policy Report Statutes

Existing law directs the CEC to release a biennial Integrated Energy Policy Report (IEPR) that provides a cohesive assessment of major energy trends and issues in California. Through the IEPR, the CEC develops assessments and forecasts to conserve resources, protect the

23 Codified at Pub. Resources Code, § 25618.

24 Codified at Pub. Resources Code, § 25231.5.

25 Among other things, would modify Pub. Resources Code, § 25231.5.

environment, ensure energy reliability, enhance the state economy, and protect public health and safety.²⁶ The California Public Resources Code directs that the purpose of the IEPR is to facilitate “reliable energy markets” and “conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices.”²⁷ In conducting assessments and forecasts for the IEPR, the CEC is authorized to collect data from a broad range of market participants. EV charging stations provide energy, and the reliability of these stations falls under the purview of the IEPR. Existing law also allows the CEC to collect customer demand forecasts, resource plans, market assessments and outlooks, historical electric usage data, and demand forecasts from market participants.²⁸

EV charging accounts for an increasing share of California’s transportation energy usage and plays an increasingly important role in the overall reliability of California’s energy infrastructure. An assessment of California energy trends and issues that includes the deployment, utilization, and reliability of EV charging will create a more comprehensive understanding and planning towards IEPR requirements and goals. Therefore, existing statute allows the CEC to collect data about the deployment, utilization, reliability, and maintenance of EV chargers from participants in the EV charging industry.

Public Resources Code Sections 25400 and 25401

Public Resources Code Sections 25400 and 25401 direct the CEC to carry out studies, research projects, data collection, and other activities required to assess the nature, extent, and distribution of energy resources to meet the needs of the state. An assessment of California energy trends and issues that includes the deployment, utilization, and reliability of EV charging will create a more comprehensive understanding.

26 Pub. Resources Code, § 25301(b)(5); see Pub. Resources Code, § 25001, 25300(c) and (d) (“state government requires at all times a complete and thorough understanding of the operation of energy markets” and that “timely reporting, assessments, forecasting, and data collection activities are essential to serve the information and policy development needs of the Governor, the Legislature, public agencies, market participants, and the public.”)

27 Pub. Resources Code, § PR Code 25301(a).

28 Pub. Resources Code, § 25301(a).

CHAPTER 4:

Regulatory Approaches

State agencies in California and elsewhere have set reliability reporting requirements for EV chargers.

California Governmental Agencies

California state agencies have set reliability and uptime reporting standards for EV chargers that receive public funds through specific agency-administered programs. For example, recent CEC grant funding opportunities for EV charging infrastructure have required that chargers be operable 97 percent of the time. Since these grant agreements are ongoing, the CEC does not yet possess data about the actual uptime of chargers installed through these programs or whether they comply with the 97 percent uptime requirement. The CEC has not set general charger reliability standards for EV chargers that are not funded by the CEC.

The CPUC has ordered that EV chargers installed under the Transportation Electrification Framework must have uptime reliability consistent with AB 2061 and the standards adopted in this rulemaking.²⁹

Federal Regulations

The Federal Highway Administration has set minimum uptime requirements for charging stations that receive federal funds and are located along highways, most prominently those funded through the Charging and Fueling Infrastructure Discretionary Grant and NEVI Formula Program.³⁰ States and other direct recipients of federal funds through these programs must ensure that each charging port installed under the program has an average annual uptime of greater than 97 percent as defined in regulation.³¹

29 California Public Utilities Commission [Final Decision 22-11-040](#), November 21, 2022, pg. 184.

30 U.S. Department of Transportation, Federal Highway Administration, [Notice of Funding Opportunity for Fiscal Year \(FY\) 2022 and FY 2023 for the U.S. Department of Transportation's Charging and Fueling Infrastructure Discretionary Grant Opportunity](#), February 1, 2023, pg. 4.

31 U.S. Department of Transportation, Federal Highway Administration, [National Electric Vehicle Infrastructure Standards and Requirements](#), February 28, 2023, pg. 12756.

International Regulations

The United Kingdom Department for Transport recently set a 99 percent reliability requirement for public chargers along portions of the nation’s highway network. Regulators expect to evaluate the reliability of the United Kingdom’s entire charging network in 2024 and may impose a 99 percent reliability requirement on all public EV chargers if no improvements in reliability are seen. Regulators also plan to publicly identify networks that are not reliable in future reporting.³²

³² U.K. Department for Transport, "[Consumer Experience at Public Chargepoints: Government Response to the 2021 Consultation on the Consumer Experience at Public Chargepoints](#)," March 2023.

CHAPTER 5:

Proposed Regulatory Framework

This staff report proposes EV charger inventory, utilization, and reliability reporting regulations. These regulations are proposed following Section 25231.5 of the California Public Resources Code, and Sections 25210, 25213, 25218(e), 25229, 25301, 25303, 25304, 25400, 25401, and 25618 of the California Public Resources Code, and Sections 1220 through 1225 of Title 20 of the California Code of Regulations. The full proposed regulatory text is attached to this report as Appendix A.

These proposed regulations apply to all electric vehicle chargers except those used solely for private use at a single-family residence or located at a multifamily dwelling with four or fewer dwelling units. These regulations apply to EV chargers serving light-duty and MDHD EVs.

The proposed regulatory framework requires reporting and recordkeeping of the following:

- EV charger inventory
- Charger utilization
- Charger reliability

The proposed reporting and recordkeeping requirements vary depending on whether a charger is regulated by AB 2061. Chargers regulated by AB 2061 are chargers that received an incentive from a state agency or through a charge on ratepayers and are installed on or after January 1, 2024. The applicability of the reporting requirement also varies based on whether the charger is networked or nonnetworked.

EV Charger Inventory Reporting Regulations

CEC staff proposes the following regulations for tracking the number of EV chargers operating in California, which are necessary to assess whether California is on track to meet state EV infrastructure goals.

Applicability

This regulation will apply to all charging network providers, charging station operators, and certain site hosts and funding recipients of EV chargers in California, encompassing both those regulated by AB 2061 and those not covered by it.

Exemptions

This regulation excludes chargers installed in single-family homes or multifamily residential buildings of four dwelling units or less.

Reporting Requirements

All recordkeeping and reporting agents subject to this regulation must make semiannual reports to the CEC, which will report the number of chargers operated by the recordkeeping and reporting agent. The required reporting will vary based on the networking status of a charger.

Table 1: Inventory Reporting Requirements

<u>Charger Configuration</u>	<u>Inventory Reporting Requirements</u>
Nonnetworked	<ul style="list-style-type: none"> • Charger address • Charger geographic coordinates • Model of charger • Charger nameplate power • Charger serial number • Statement of whether charger is a replacement of a former charger • Charger characteristics, including whether charger is alternating or direct current and connector standard • Charger’s primary use (e.g., public light-duty, public MDHD, private fleet charging, etc.)
Networked	<p>All information required for nonnetworked chargers, and:</p> <ul style="list-style-type: none"> • Charger ID • Port ID

Source: CEC staff

CEC staff plans to establish an online data portal to enable regulated entities to seamlessly report required data to the CEC. Staff will issue a data specifying the data format required for reporting required data before the regulations come into effect.

EV Charger Utilization Reporting Regulations

CEC staff proposes the following regulations for tracking the use of chargers operating in California. Accurate information about charger utilization is a necessary input for the CEC’s modeling of California’s EV infrastructure needs, as highly used chargers can serve more vehicles than those with lower utilization.

Applicability

This regulation will apply to all charging network providers servicing networked EV chargers in California.

Exemptions

This regulation will not apply to operators of chargers installed in single-family homes or multifamily residential buildings of four dwelling units or less. Nonnetworked chargers are also exempted from this regulation.

Reporting Requirements

All recordkeeping and reporting agents subject to this regulation must make semiannual reports to the CEC, which will report certain charger utilization information. The required reporting will vary based on the networking status of a charger.

Table 2: Utilization Reporting Requirements

<u>Charger Configuration</u>	<u>Utilization Reporting Requirements</u>
Nonnetworked	<ul style="list-style-type: none">• Not Applicable
Networked	<ul style="list-style-type: none">• Average hours per day charger drew power during reporting period• Average hours per day charger was connected to an EV during the reporting period• Average kilowatt-hours per day the charger dispensed during the reporting period

Source: CEC staff

CEC staff will issue a data template specifying the data format required for reporting this data before the regulations come into effect. Charger-specific utilization data reported to the CEC following these regulations will be held confidential by the CEC, as described below.

EV Charger Reliability Reporting Regulations

CEC staff proposes the following regulation setting reliability reporting regulations for EV chargers regulated by AB 2061.

Applicability

This regulation applies to EV charging stations operating in California that receive an incentive from a state agency or through a charge on ratepayers and are installed on or after January 1, 2024. The reliability reporting standards are effective for six years after the date of charger installation. For this regulation, ratepayers are defined as customers of any electric load-serving entity.

Exemptions

These regulations exempt EV chargers installed at buildings with four or fewer dwelling units, off-grid, and temporary EV chargers.³³ Chargers that receive only federal funding or are otherwise not subject to AB 2061 are not required to comply with these regulations.

Reporting Requirement

The proposed regulations define uptime as the percentage of time a charging port is operational with the exception of excluded downtime periods; more details on excluded downtime periods are provided below. The excluded downtime categories proposed by staff are aligned with the excluded downtime categories in the federal NEVI program.

For calculating uptime, downtime begins when nonoperational status is remotely reported to the charging network provider or the recordkeeping and reporting agent becomes aware that a charger is not operational, whichever comes earliest. A charger will be considered not operational due to any equipment or software fault not included in categories of excluded downtime. Certain downtime categories receive a grace period during which they are considered excluded downtime.

These proposed regulations define uptime on a per-port basis. Several commenters following the October 2022 CEC reliability workshop requested that uptime be defined on a per-station rather than per-port basis.³⁴ Yet AB 2061 requires this uptime definition to be consistent with the federal NEVI Program guidelines.³⁵ The NEVI Program defines a charger as “up” on a per-port basis.³⁶ Further, since these are publicly funded or ratepayer funded chargers or both, the expectation is that each port remain functional and operational for use by the public and ratepayers.

Certain categories of downtime will be excluded from the charger uptime calculation. Staff’s intention is that excluded downtime be limited only to situations that are entirely outside the charging station operator’s control or remedy. Proposed exclusions include:

33 Off-grid chargers are defined as a charger that does not draw power from an electric utility, at any time. Temporary charger is defined as a charger that is designed to be portable and available for use intermittently, is not attached at a location, and is not available for use at a single location for more than 30 days in a calendar year.

34 Electrify America, “[o]n Electric Vehicle Charging Infrastructure Reliability Workshop,” November 14, 2022; EVGo, “[o]n EVgo Comments on Electric Vehicle Charging Infrastructure Reliability Workshop,” November 14, 2022, 3; Tesla, “[o]n Tesla Comments October 2022 Reliability Workshop,” November 14, 2022.

35 PR Code Section 25231.5 (a)(3)(B)(ii).

36 U.S. Department of Transportation, Federal Highway Administration, [National Electric Vehicle Infrastructure Standards and Requirements](#), February 28, 2023, pg. 12756.

- Grid power loss.
- Communication network outages provided that the chargers default to free in the event of communications outages.
- Natural disasters.³⁷

The proposed excluded downtimes are in line with NEVI’s exclusion criteria. Planned maintenance is excluded from the uptime calculation, as are nonoperating hours when chargers are routinely not available to drivers. Charging sessions where the charger is unable to meet the customer’s expectation for power delivery due to the fault of the vehicle is also excluded from the uptime calculation. Equipment unavailability due to supply chain delays, labor unavailability, damage, and payment system failures are not considered excluded downtime. Precluding these faults from excludable downtime was supported by several commenters following the 2022 CEC reliability workshop.³⁸

37 Natural disasters are defined as natural events such as a flood, earthquake, or wildfire that causes great damage.

38 ChargerHelp!, “[ChargerHelp! Comments on EV Charging Reliability Standards](#),” November 11, 2022; EV Charging Coalition, “[EV Charging Coalition Comments](#),” November 11, 2022.

Table 3: Reliability Reporting Requirements

<u>Charger Configuration</u>	<u>Reliability Reporting Requirements</u>
Nonnetworked chargers	<ul style="list-style-type: none">• The uptime percentage rate and minutes of excluded downtime• An itemized summary of excluded downtime• Maintain maintenance records and provide them to the CEC upon request
Networked chargers	<ul style="list-style-type: none">• The uptime percentage rate and minutes of excluded downtime• An itemized summary of excluded downtime• Charger operative status and charging attempts (total charge attempts, successful charge attempts, failed charge attempts, and percent successful charges relative to total attempts)

Source: CEC staff

CEC staff will issue a data template specifying the data format required for reporting these data before the regulations come into effect.

Networked Chargers

Recordkeeping and reporting agents that operate networked chargers regulated by AB 2061 are required to report EV charger uptime, downtime, total charge attempts, successful charge attempts, failed charge attempts, and percent successful charges relative to total attempts to the CEC. Reporting charging attempt statistics is intended to aid the CEC in understanding the number of failures customers experience that are not directly attributable to uptime, as payment system failures and interoperability failures are expected to account for a significant number of failed charge attempts. Requiring reporting on failed charging sessions was supported by commenters following the October 21, 2022, CEC reliability workshop.³⁹

Reporting requirements for networked chargers vary based on the installation date of the networked charger.

³⁹ General Motors. "[GM Comments on CEC Reliability Workshop](#)," November 11, 2022; Plug In America, "[PIA Comments on Electric Vehicle Charging Infrastructure Reliability](#)," November 10, 2022.

- Networked chargers installed before January 1, 2026, are required to report the operative status of the charger on a 15-minute interval.
- Networked chargers installed on or after January 1, 2026, are required to report operative status and certain protocol data units using OCPP 2.0.1 or a subsequent version of OCPP.

CEC staff will continue to explore ways to use the operative status data collected through these regulations to improve public knowledge of reliable and accessible EV charging options. AB 126, if enacted, would require the CEC to set standards for how stations would notify customers about the availability and accessibility of publicly available charging infrastructure. The information collected under this proposed regulation could also inform such standards.

Nonnetworked Chargers

Recordkeeping and reporting agents who operate nonnetworked EV chargers are required to report charger uptime and downtime to the CEC. Operators of nonnetworked chargers are also required to maintain maintenance records and provide them to the CEC upon request. The CEC recognizes that nonnetworked chargers cannot provide real-time reliability data in the same manner as networked chargers and seeks to create regulations that do not favor either networked or nonnetworked chargers. Requiring maintenance records for nonnetworked chargers is intended to allow the CEC to evaluate the reliability of nonnetworked chargers while recognizing the limited self-reporting capabilities of nonnetworked devices.

Recordkeeping and Reporting Agent

The recordkeeping and reporting agent is the entity responsible for collecting, storing, and reporting all the information required by the regulations proposed in this staff report, inclusive of charger inventory, utilization, and reliability, as applicable.

An individual charging site's recordkeeping and reporting agent depends on whether the charger is networked or nonnetworked and whether it is regulated by AB 2061. For the purpose of these regulations, a single business entity may be considered a charging network provider at one charging location operated by the entity and a charging station operator or site host at another.

The charging network provider is by default the recordkeeping and reporting agent for networked chargers under these regulations.

Table 4: Recordkeeping and Reporting Agent

<u>Charger Configuration</u>	<u>Recordkeeping and Reporting Agent</u>	<u>Agent Definition</u>
All networked chargers	Charging network provider	Entity that operates the digital communication network that remotely manages the chargers. A charging network provider that agrees to serve as a recordkeeping and reporting agent under these regulations using an Application Programming Interface (API) data reporting tool is considered an <i>enrolled charging network provider</i> .
Nonnetworked chargers that are either not publicly or ratepayer funded <u>or</u> were installed before January 1, 2024	Charging station operator	Entity that owns the chargers and supporting equipment and facilities at one or more charging stations.
Nonnetworked chargers that are publicly or ratepayer funded <u>and</u> were installed on or after January 1, 2024	Site host or their designee	Electric utility customer of record for electric service to the charger.

Source: CEC staff

For nonnetworked chargers — which by definition lack a charging network provider — the site host is the recordkeeping and reporting agent for nonnetworked chargers regulated by AB 2061. The charging station operator is the recordkeeping and reporting agent for nonnetworked chargers not regulated by AB 2061. At many EV charging stations, the charging network provider, charging station operator, and site host may be the same entity.

Recordkeeping and reporting agents are required to submit required data to the CEC executive director in semiannual reports. Recordkeeping and reporting agents may designate one or more entities to fulfill their reporting responsibilities, but the recordkeeping and reporting agent remains legally responsible for complying with the requirements of these regulations.

Recordkeeping and reporting agents are required to submit required data in a format specified by the CEC. CEC staff will issue a data template specifying the data format required for reporting these data before the regulations come into effect.

Before January 1, 2026, recordkeeping and reporting agents for networked chargers regulated by AB 2061 are required to submit required reliability data in the format specified by the CEC. Following January 1, 2026, recordkeeping and reporting agents for networked chargers

regulated by AB 2061 are required to report required data to the CEC through an application programming interface (API) data portal as an *enrolled charging network provider* or retain another enrolled charging network provider capable of submitting data through an API to report this data on their behalf. An enrolled charging network provider is a charging network provider that has completed an application to the CEC and meets the technical requirements of reporting required data through the API data portal.

Equipment operated by charging network providers after January 1, 2026, are required to comply with OCPP Version 2.0.1 or a subsequent version of OCPP.

Confidentiality

Recordkeeping and reporting agents may request that the CEC hold certain data gathered under these regulations confidential. The Commission may disclose data previously designated as confidential if this disclosure is permitted by law.

Table 5: Confidentiality

<u>To Be Held Confidential</u> ⁴⁰	<u>May File a Request for Confidential Designation</u> ⁴¹	<u>Not Confidential</u>
<ul style="list-style-type: none"> Utilization data specific to a charging station Total charge attempts, successful charge attempts, failed charge attempts 	<ul style="list-style-type: none"> Charger address Charger geographic coordinates Charger serial number Charger and port identification 	<ul style="list-style-type: none"> All other data Data that would otherwise be confidential if it has been sufficiently aggregated

Source: CEC staff

Recordkeeping and reporting agents who wish to hold data confidential must identify the data as confidential to the CEC. Charger location, serial number, and port identification data will be held confidential if requested provided the data are not already being reported to the National Renewable Energy Laboratory (NREL) or through the NEVI Program.

40 Following proposed Section 2505(a)(5)(B)(10).

41 Request for confidential designation, form CEC-13, including instructions, may be downloaded here: <https://www.energy.ca.gov/media/3539>.

CHAPTER 6:

Alternatives Considered

CEC staff has assessed two alternatives to the EV charger inventory, utilization, and reliability reporting regulations proposed in this staff report. The CEC invites public feedback on the consideration of Alternatives 1 and 2 and, in particular, the possibility of implementing uptime requirements consistent with those in the NEVI program. We welcome input on how such requirements may impact the reliability and accessibility of EV charging infrastructure in California.

Alternative 1: Require Only Charger Uptime Reporting

The regulations proposed in this staff report set EV charger inventory, utilization, and reliability reporting requirements. An alternative to this proposal would be only to require charging network providers and site hosts to report charger uptime and not set regulations for inventorying chargers or collecting utilization data.

AB 2127 and SB 1000 require the CEC to assess regularly the number of EV chargers needed to meet state goals and whether charging infrastructure is disproportionately deployed. While the CEC has delivered inaugural AB 2127 and SB 1000 reports, the CEC lacks firm charger inventory and utilization reporting regulations, making it difficult to assess the EV infrastructure required to meet California's EV adoption goals and whether charging infrastructure is disproportionately deployed. Utilization data reporting proposed under these regulations could improve CEC charger modeling to estimate more accurately the number of chargers needed to serve California's growing EV fleet, as well as the power consumption characteristics of those chargers.

The charger inventory and utilization reporting requirements proposed in this draft report will improve the robustness of the regular assessments mandated by AB 2127 and SB 1000. CEC staff rejects the alternative of only setting uptime reporting regulations.

Alternative 2: Set Charger Reliability Standards in Addition to Reliability Reporting Requirements

AB 2061 authorizes the CEC to set reliability standards for publicly and ratepayer-funded EV charging stations, and AB 126 would require the CEC to set such reliability standards. Alternative 2 would include reporting standards and additionally set an uptime requirement applicable to all chargers regulated by AB 2061 and, if enacted, AB 126.

Yet there are limited data about the extent and causes of poor EV charger reliability. At present staff is unable to fully assess the causes of EV charging reliability and whether mandating that all EV chargers regulated by AB 2061 meet a 97 percent uptime requirement would actually result in a network that drivers perceive as reliable and dependable. For example, an uptime requirement that does not ensure interoperability could still leave drivers stranded at chargers considered "up," a poor driver experience. Setting uptime requirements

for all new EV chargers before the causes of poor reliability are well understood could be premature.

The CEC will issue biennial reports on the reliability of California's EV charging infrastructure starting in 2025. If these reports do not show improvements in charger reliability, following AB 126, the CEC may set broadly applicable uptime requirements.

CHAPTER 7:

Technical Feasibility

The regulations proposed in this staff report are technically feasible. Recordkeeping and reporting agents are capable of reporting the number of chargers they operate to the CEC. Charging network providers that operate networked chargers are technically capable of reporting the use and reliability of these chargers. The requirement that networked chargers regulated by AB 2061 report the status of the chargers using OCPP 1.6 or later is technically feasible. OCPP is a broadly accepted and well-understood protocol for communication between chargers and charging network providers, and CEC staff's understanding is that most charging network providers use some implementation of OCPP 1.6 or later. This requirement is consistent with other CEC EV charging programs, which require chargers to comply with OCPP 1.6 or later and comply with OCPP 2.0.1 or later after January 1, 2026.

It is technically feasible for recordkeeping and reporting agents to retain an enrolled charging network provider to report required data through the CEC's API data portal after January 1, 2026. Enrolled charging network providers are required to collect the operative status of publicly or ratepayer-funded chargers or both using specified messages defined in OCPP 2.0.1 and transmit the specified messages directly to the CEC via an API, both of which are technically feasible.

The CEC's proposed reliability reporting regulations for nonnetworked chargers require that site hosts operating chargers regulated by AB 2061 make maintenance records available to the CEC upon request, which reflects the limitations on remote reporting by nonnetworked chargers.

CHAPTER 8:

Savings and Cost Analysis

Complying with the EV charger inventory, utilization, and reliability reporting regulations proposed in this staff report will have cost implications for recordkeeping and reporting agents. Because of the significant diversity among the charging stations in California and uncertainty around recordkeeping and reporting agents' existing infrastructure for tracking charger utilization and reliability, this chapter does not estimate the future costs for regulated entities of complying with the proposed regulations. However, the regulations are expected to produce substantial savings for California and benefits for EV drivers.

Recordkeeping and reporting agents' cost to comply with these regulations include one-time expenses to set up the process and architecture necessary for data storage and APIs, as well as ongoing expenses to store data, maintain databases and APIs, and report to CEC. However, these costs may be greatly reduced for those entities who already have systems and processes in place for their own purposes or to report to other agencies, state or federal. A recordkeeping and reporting agent's cost to comply with these regulations will depend on the type of chargers the regulated entity operates and the recordkeeping and reporting agent's existing infrastructure for tracking the location, use, and reliability of their charging stations. CEC staff expects that large charging network providers will be able to absorb these expenses as a cost of doing business. Compliance costs for smaller charging station operators and site hosts who do not contract with a charging network provider to manage their chargers are expected to be low to moderate.

Complying with the regulations proposed in this staff report may produce savings for charging network providers and California overall. Collecting data about EV charger reliability will increase public insight into the causes of poor reliability, which may lead to reliability improvements by the EV charging industry. Technological and business developments that make EV chargers more reliable may reduce long-term operations and maintenance costs by charging network providers, charging station operators, and site hosts.

Improved data on the number of chargers installed in California and associated use will enable the CEC to better estimate the number of additional chargers that should be supported by state funding and better target these investments, potentially requiring less state investment over time. If these reliability reporting regulations produce long-term improvements in EV charging reliability, a smaller number of EV chargers — and public investment — will be needed to support state EV adoption goals, as defective or nonfunctional chargers cannot support the same number of EVs as a reliable charger.

CHAPTER 9:

Environmental Impacts Analysis

The EV charger inventory, utilization, and reliability reporting regulations proposed in this report are not expected to result in adverse environmental impacts. The proposed regulations would not require any new specific materials to be used in constructing EV chargers or result in energy waste, meaning that the regulations are not expected to produce any adverse environmental impact. The proposed reporting regulations may ultimately have beneficial environmental impacts by improving the public's perception of charger reliability, resulting in greater adoption of electric vehicles. Increased EV adoption results in greater use of electricity as a fuel and reduces fossil fuel consumption, reducing greenhouse gas emissions and the impact of local air pollutants.

Not a Project

With regards to the California Environmental Quality Act (CEQA), the CEC has concluded that the proposed regulations do not meet the definition of a "project" under Public Resources Code Section 21065 because they are not an activity that is capable of causing a direct or reasonably foreseeable indirect physical change to the environment. Accordingly, the proposed regulations do not require an environmental impact analysis.

Class 6 Exemption and Common Sense Exemption

Even if adoption of the proposed regulations were a project, the Class 6 Exemption and the common sense exemption would apply. Under Section 15306 of Title 14 of the California Code of Regulations, activities that involve data collection, research, experimental management, and resource evaluation do not result in a serious or major disturbance to an environmental resource, have been determined not to have a significant effect on the environment, and are therefore exempt from CEQA under the Class 6 Exemption. Here, the goal of the proposed regulations is to set recordkeeping and reporting standards and related administrative requirements to track the number of electric vehicle chargers installed in California, the associated utilization, and reliability. These proposed activities involve data collection, research, experimental management, and resource evaluation that do not result in a serious or major disturbance to an environmental resource and thus qualify for the Class 6 Exemption. Moreover, these proposed activities have no potential for causing a significant effect on the environment and, thus, are not subject to CEQA and are exempt under the common sense exemption of Section 15061(b)(3).

CHAPTER 10:

Economic and Fiscal Impacts

This chapter provides an overview of possible economic and fiscal impacts of the proposed regulations.

Economic Impacts

Jobs

The effect of the proposed regulation on employment in California depends on recordkeeping and reporting agents' current recordkeeping practices and ways that they choose to respond to the proposed regulation after enactment. Recording and transmitting required data to the CEC may increase employment at charging network providers and other recordkeeping and reporting agents, but the additional reporting work required under these regulations — and consequently additional employment — is expected to be low.

The effect of jobs from the proposed charger inventory and utilization reporting regulations, respectively, is likely minimal if conducted by charging network providers, as is the default for networked chargers. Charging network providers already collect data on how many chargers are in their network, and most also collect data on charger utilization rates, which are core business metrics for these organizations. The number of jobs created from each of the proposed regulations is likely to be modest and confined to reporting and data storage. Although the proposed regulation would create public benefit through increased public information about the scale and reliability of EV charging infrastructure, it does not create a private benefit charging networks or site hosts can monetize. So, the regulations may modestly reduce the profitability of charging network providers. Conversely, public information about the reliability of EV charging networks may drive customers to more reliable networks, potentially increasing the revenues of reliable networks.

Business Creation and Elimination

The proposed regulations would likely not lead to the direct creation of new businesses, nor would they likely lead to the elimination of existing businesses. The regulations do not limit the sale or distribution of any kind of product or service, nor do they ban a particular business arrangement used by existing firms. The regulations proposed create only new recordkeeping and semiannual reporting requirements for recordkeeping and reporting agents.

It is unlikely that the costs of recordkeeping and reporting requirements in the proposed regulation would lead to the entire closure of recordkeeping and reporting agents' core business. Charging network providers likely record the data required by these regulations in their normal course of business and operators of nonnetworked chargers are only required to report charger inventories and retain maintenance records.

Business Advantages and Disadvantages

The reporting and recordkeeping requirements proposed in this staff report apply to recordkeeping and reporting agents regardless of the number of EV chargers they operate.

Reporting and recordkeeping activities could have economies of scale. In other words, the per-charger cost of reporting to the CEC and maintaining records may be lower for recordkeeping and reporting agents that manage a large number of chargers. Furthermore, recordkeeping and reporting agents that are already collecting and maintaining data specified in the proposed regulation may be advantaged relative to businesses that are not already conducting such processes.

Because the recordkeeping and reporting activities in the proposed regulation create additional costs for businesses, it is possible this cost might be passed along to consumers in the form of modestly higher charging prices.

Investment

The proposed recordkeeping and reporting regulations are unlikely to generate significant investments within California. However, transparent reporting on charger reliability and utilization can boost investor confidence in the EV industry. Increased investment can lead to the expansion of charging infrastructure, creating jobs and stimulating economic growth in California.

Innovation

The recordkeeping and reporting requirements of the proposed regulation are specific and limited in the information they request and designed to allow for compliance with standard tools that are already in use. However, increased public visibility into the reliability of EV charging networks may spur innovations that increase the reliability of EV charging stations.

Benefits

The proposed regulations are expected to provide modest economic benefits by increasing public information on the number and reliability of EV chargers installed in California. Regular reporting of the reliability of major EV charging networks will provide public benefits by allowing drivers to judge whether charging networks are reliable. Improvements in the reliability of public EV charging infrastructure may increase consumer confidence in EVs and grow EV sales, providing additional public benefits.

Fiscal Impacts

CEC staff anticipates that the proposed regulations will not create substantial additional costs for state agencies. Agencies that function as charging station operators or site hosts may incur additional costs to fulfill the reporting requirements of these regulations, but these costs are expected to be small.

CHAPTER 11:

Consumer Equity

The EV charger inventory, utilization, and reliability reporting regulations proposed in this report are expected to have a positive effect on low-income households and disadvantaged communities.

Electric vehicles are typically less expensive to refuel than comparable fossil fuel vehicles and have lower maintenance costs.⁴² These lower ongoing costs mean that wider EV adoption could benefit low-income households and disadvantaged communities. Yet many members of these communities are unable to adopt EVs because of a lack of reliable public charging. Wealthier communities are more likely to reside in owner-occupied homes with garages, allowing for convenient overnight charging. Low-income residents and residents of color are less likely to have access to at-home charging than wealthier communities due to higher rates of living in rental housing or multifamily dwellings without home charging options.⁴³ For drivers without access to home charging to be able to adopt EVs public and shared private charging must be plentiful and reliable.

The regulations proposed in this staff report are intended to improve the CEC's understanding of gaps in EV charging and the reliability of charging infrastructure. This understanding will help the state fill these gaps and potentially improve the reliability of public EV charging, making it easier for members of low-income and disadvantaged communities to adopt EVs and providing direct benefits to these communities.

42 California Energy Commission, "[Electric Vehicle & Charging Infrastructure](#)," accessed August 31, 2023..

43 California Energy Commission, "[Home Charging Access in California](#)," January 2022, 5.

CHAPTER 12:

Conclusion

California statute tasks the CEC with assessing gaps in EV charging and the reliability of charging infrastructure. Currently, the CEC lacks key data about EV charger inventory, use, and reliability. This staff report proposes new regulations for reporting the number, use, and reliability of certain EV chargers. These proposed regulations are technically feasible, are not expected to impose significant new costs or fiscal impacts, and support consumer equity.

CEC staff will use the charger inventory, use, and reliability data collected under these proposed regulations in creating future AB 2127 and SB 1000 reports and will begin issuing biennial assessments of the reliability of California's EV charging infrastructure starting in 2025 under AB 2061. The CEC intends to publicly rank the reliability of major EV charging networks in these assessments.

REFERENCES

California Energy Commission, "Home Charging Access in California," January 2022, <https://www.energy.ca.gov/sites/default/files/2022-01/CEC-600-2022-021.pdf>.

Open Charge Alliance, "Improving Uptime Monitoring with OCPP", March 2023, https://www.openchargealliance.org/uploads/files/improving_uptime_with_ocpp-v10.pdf

Plug In America, "The Expanding EV Market: Observations in a year of growth," February 2022, <https://pluginamerica.org/wp-content/uploads/2022/03/2022-PIA-Survey-Report.pdf>.

SAE International, "Electric Vehicle Charging: Performance and Reporting," January 2023, 6, <https://sms.sae.org/resources/electric-vehicle-charging-data-performance-and-reporting>.

Schell, Dustin, "Electric Vehicle Charging Infrastructure Reliability Workshop" staff presentation, October 21, 2022, <https://www.energy.ca.gov/event/workshop/2022-10/workshop-electric-vehicle-charging-infrastructure-reliability-standards>.

U.K. Department for Transport, "Consumer Experience at Public Chargepoints: Government Response to the 2021 Consultation on the Consumer Experience at Public Chargepoints," March 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1146685/government-response-to-the-2021-consultation-on-consumer-experience-at-public-chargepoints.pdf.

U.S. Department of Transportation, Federal Highway Administration, *National Electric Vehicle Infrastructure Standards and Requirements*, February 28, 2023, <https://www.govinfo.gov/content/pkg/FR-2023-02-28/pdf/2023-03500.pdf>.

GLOSSARY

AB	Assembly Bill
AC	Alternating current — Flow of electricity that constantly changes direction. Almost all power produced by electric utilities in the United States moves in a current that shifts direction at a rate of 60 times per second.
API	Application Programming Interface — A type of software interface that offers service to other pieces of software.
CCS	Combined Charging System — A connector standard for fast charging of electric vehicles that can provide up to 350 kilowatts of power.
CEC	California Energy Commission — The state's primary energy policy and planning agency. It has seven core responsibilities: advancing state energy policy, encouraging energy efficiency, certifying thermal power plants, investing in energy innovation, developing renewable energy, transforming transportation, and preparing for energy emergencies.
CEQA	California Environmental Quality Act.
CHAdeMO	A connector standard for fast charging of electric vehicles that can provide up to 62.5 kilowatts of power.
Charger	A device with one or more charging ports and connectors for charging EVs. Also referred to as electric vehicle supply equipment (EVSE).
Charging network	A collection of chargers located on one or more property(ies) that are connected via digital communications to manage the facilitation of payment, the facilitation of electrical charging, and any related data requests.
Charging network provider	An entity that operates a digital communications network that remotely manages EV chargers.
Charging port	The system within a charger that charges one electric vehicle.
Charging station operator	An entity that owns the chargers and supporting equipment and facilities at one or more charging stations.
CPUC	California Public Utilities Commission — A state agency created by a California constitutional amendment in 1911 to regulate the rates and services of more than 1,500 privately owned utilities and 20,000 transportation companies. The CPUC is an administrative agency that exercises legislative and judicial powers; its decisions and orders may be appealed only to the California Supreme Court. The major duties of the CPUC are to regulate privately owned utilities, securing adequate service to the public at rates that are just and reasonable to customers and

shareholders of the utilities; and the oversight of electricity transmission lines and natural gas pipelines. The CPUC also provides electricity and natural gas forecasting, and analysis and planning of energy supply and resources. Its headquarters are in San Francisco.

DC	Direct current — A current of electricity that flows in one direction and is the type of power that comes from a battery
DCFC	Direct current fast charger — A electric vehicle charging station that operates using direct current and typically provides a maximum power of over 50 kilowatts.
DIN 70121	<i>Deutsches Institut fur Normung</i> EV DIN 70121 — An EV-to-charger communications protocol for direct current charging.
EV	Electric vehicle — A broad category that includes all vehicles that can be fully powered by electricity or an electric motor.
EV charging station	A location where one or more electric vehicle chargers are installed.
IEPR	Integrated Energy Policy Report — A biennial California Energy Commission report that is required by statute to produce an integrated assessment of major energy trends and issues facing California and provide recommendations.
ISO 15118	International Standards Organization 15118 — An EV-to-charger communications standard.
kW	Kilowatt — One thousand watts, a measure of power. On a hot summer afternoon, a typical home — with central air conditioning and other equipment in use — might have a power demand of 4 kW.
MDHD	Medium-duty/heavy-duty.
NREL	National Renewable Energy Laboratory.
NCAS	North American Charging Standard — A connector standard for fast charging.
Networked charger	An electric vehicle charger capable of connecting to a charging network provider or otherwise connected to a central management system.
NEVI	National Electric Vehicle Infrastructure Formula Program.
OCPI	Open Charge Point Interface — A communications protocol between charging network providers' central management systems intended to facilitate customers roaming between networks.
OCPP	Open Charge Point Protocol — A communications protocol between the charger and the charging network provider central management system.

Private charging station	A private charging station has parking space(s) that are privately owned and operated, often dedicated for a specific driver or vehicle (for example, a charger installed in the garage of a single-family home).
Public charging station	A public charging station has parking space(s) designated by a property owner or lessee to be available to and accessible by the public for any period.
RFID	Radio-Frequency Identification.
SAE J1772	A connector design standard and communications protocol for alternating current and direct current charging.
SB	Senate Bill
Shared private	A shared private charging station has parking space(s) designated by a property owner or lessee to be available to and accessible by employees, tenants, visitors, and/or residents. Parking spaces are not dedicated to individual drivers or vehicles.
Site Host	The electrical customer of record who pays the electric utility bill for an EV charger.
ViGIL	Vehicle-Grid Innovation Lab — A California Energy Commission grant to expand capacity at an EV charger testing lab to ensure chargers meet published standards.
VOLTS	Vehicle Interoperability Testing Symposium — A symposium in May 2023 convened stakeholders and facilitated charger-vehicle interoperability testing.

APPENDIX A: Proposed Regulatory Language

California Code of Regulations

Title 20. Public Utilities and Energy

Division 2. State Energy Resources Conservation and Development Commission

Chapter 7. Administration

Article 2. Disclosure of Commission Records

Sections 2505 and 2507

AND

Chapter 12. Alternative and Renewable Fuel and Vehicle Technology Program Regulations

Articles 1 and 2

Express Terms:

Chapter 7. Administration

Article 2. Disclosure of Commission Records

Sections 2505 and 2507 are amended as follows:

§ 2505: Designation of Confidential Records

(a) Third Parties.

...[skipping subsection (a)(1) through (a)(4)]

- (5) Automatic Designation. Information submitted by a private third party shall be designated confidential without an application for confidentiality if the requirements of subsections (a)(5)(A) and (B) of this Section are met. If the requirements of subsection (a)(5)(A) and (B) are not met, the Executive Director shall inform the private third party that the record will not be deemed confidential. Except as provided in Section 2507 of this Article, the record for which confidentiality was requested shall not be disclosed for fourteen days to allow the requirements of subsection (a)(5)(A) and (B) to be met or to allow the filing of an application pursuant to subsection (a)(1) of this section.

- (A) The entity submitting the information shall label each individual item of the submittal that is entitled to be designated confidential.
- (B) The entity submitting the information shall attest under penalty of perjury that the information submitted has not been previously released and that it falls within one of the following categories:
 - 1. Information that is derived from energy consumption metering, energy load metering research projects, or energy surveys provided pursuant to Section 1343 or 1344 of Article 2 of Chapter 3, and that is one or more of the following:
 - a. for the residential customer sector and the commercial customer sector -- customer identifiers, energy consumption, and any other information that could allow a third party to uniquely identify a specific respondent;
 - b. industrial major customer sector -- all information;
 - c. survey design information -- all information used to design a survey, stratify billing records, devise a sample scheme, select a sample, sample specific end-users for participation in a survey or a pre-test of a questionnaire or interview form.

...[skipping subsections 2505(a)(5)(B)(2) through (a)(5)(B)(9)]

- 10. Information regarding a charger submitted pursuant to subsections section 3123(b)(2)(K) or (b)(3)(B)(1) through (b)(3)(B)(3), or section 3125(b)(4), of Article 2 of Chapter 12.

- a. ...[skipping 2505(a)(6) through 2506]

§ 2507: Disclosure of Confidential Records.

...[skipping 2507(a) through 2507(d)]

- (e) Unless an application for confidentiality is granted under section 2505(a)(3) specifying a different confidentiality term, data subject to an automatic confidentiality designation under section 2505(a)(5) will remain confidential in accordance with the following timelines:

...[skipping 2507(e)(1) through 2507(e)(5)]

(6) Confidential EV charger information submitted pursuant to section 3123(b)(2)(K) or (b)(3)(B)(1) through (b)(3)(B)(3), or section 3125(b)(4), of Article 2 of Chapter 12 may be released no sooner than 5 years from the date of submittal.

(f) The Executive Director may release records previously designated as confidential in the following circumstances:

(1) where the confidential information has been masked or aggregated at the levels described below in subdivisions (A)-(E)(D)

...[skipping 2507(f)(1)(A) through 2507(f)(1)(C)]

(D) Confidential data provided pursuant to section 3123(b)(2)(K) or (b)(3)(B)(1) through (b)(3)(B)(3), or section 3125(b)(4), of Article 2 of Chapter 12 may be disclosed in the following manner:

1. For an individual charging network provider or charging station operator, data aggregated at the county or census tract level by year and customer sectors.
2. For the sum of all charging network providers or charging station operators, data aggregated at the county or census tract level by year and customer sectors.

...[skipping the remainder of Chapter 7 through Chapter 11]

Article 1 of Chapter 12 is amended as follows:

Chapter 12. ~~Alternative and Renewable Fuel and Vehicle Technology Program Regulations~~Fuels and Transportation

Article 1. General Provisions Regarding Clean Transportation Program Project Funding

...[skipping the remainder of Article 1]

Article 2 is added to Chapter 12 as follows:

Article 2. EV Charger Uptime Recordkeeping and Reporting Standards

§ 3120: Scope.

This Article applies to all the following:

(a) All charging station operators and charging network providers of one or more AC Level 2s or DCFCs installed in California excluding temporary chargers or off-grid chargers as

defined in section 3121 of this Article as well as any charger used solely for private use at a single-family residence or a multifamily dwelling with four or fewer dwelling units.

- (b) All entities that provide or receive any incentive from a California state agency or through a charge on California ratepayers to install one or more chargers or charging stations that are installed or are intended to be installed on or after January 1, 2024, in California other than at a residential real property containing four or fewer dwelling units.
- (c) All site hosts of any public and / or ratepayer funded charger as defined in section 3121 of this Article.
- (d) All charging network providers that the Commission has enrolled to be, or that have applied to the Commission to be, enrolled-charging network providers pursuant to section 3127 of this Article.

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3121: Rules of Construction and Definitions.

(a) Rules of Construction.

- (1) Where the context requires, the singular includes the plural, and the plural includes the singular.
- (2) The use of "and" in a conjunctive position means that all elements in the provision must be complied with, or must exist to make the provision applicable. Where compliance with one or more elements suffices, or where existence of one or more elements make the provision applicable, "or" (rather than "and/or") is used.

(b) Definitions. In this Article, the following definitions apply:

- (1) "AC Level 2" means a charger that operates on a circuit from 208 volts to 240 Volts and transfers alternating-current (AC) electricity to a device in an EV that converts alternating current to direct current to charge an EV battery.
- (2) "Application programming interface" or "API" means a type of software interface that offers service to other pieces of software. An API allows two or more computer programs to communicate with each other.
- (3) "Charge attempt" means any instance of an EV driver taking action to initiate a charging session by taking one or all of the following steps in any order: 1) attaching the connector to the EV appropriately or 2) attempting to authorize a charging session

by use of radio frequency identification (RFID) technology, credit card, charging network provider smartphone application (app), screen input, or calling the charging network provider's customer service number.

- (4) "Charger" means a device with one or more charging ports and connectors for charging EVs. Also referred to as electric vehicle supply equipment (EVSE). This definition excludes any charger used solely for private use at a single-family residence or a multifamily dwelling with four or fewer dwelling units.
- (5) "Charging network" means a collection of chargers located on one or more property(ies) that are connected via digital communications to manage the facilitation of payment, the facilitation of electrical charging, and any related data requests.
- (6) "Charging network provider" means the entity that operates the digital communication network that remotely manages the chargers. Charging network providers may also serve as charging station operators and/or manufacture chargers.
- (7) "Charging port" means the system within a charger that charges one EV. A charging port may have multiple connectors, but it can provide power to charge only one EV through one connector at a time.
- (8) "Charging session" means the period after a charge attempt during which the electric vehicle is allowed to request energy. Charging sessions can be terminated by the customer, the electric vehicle, the charger, the charging station operator, or the charging network provider.
- (9) "Charging station" means the area in the immediate vicinity of one or more chargers and includes the chargers, supporting equipment, parking areas adjacent to the chargers, and lanes for vehicle ingress and egress. A charging station could comprise only part of the property on which it is located.
- (10) "Charging station management system" means a system that may be used to operate a charger, to authorize use of the charger, or to record or report charger data, such as by using OCPP.
- (11) "Charging station operator" means the entity that owns the chargers and supporting equipment and facilities at one or more charging stations. Although this entity may delegate responsibility for certain aspects of charging station operation and maintenance to subcontractors, this entity retains responsibility for operation and maintenance of chargers and supporting equipment and facilities. In some cases, the charging station operator and the charging network provider are the same entity.
- (12) "Connector" means the device that attaches an EV to a charging port in order to transfer electricity.

- (13) "Corrective maintenance" means maintenance that is carried out after failure detection and is aimed at restoring an asset to a condition in which it can perform its intended function.
- (14) "Direct current fast charger" (DCFC) means a charger that enables rapid charging by delivering direct-current (DC) electricity directly to an EV's battery.
- (15) "Downtime" means a period of time that a charger is not capable of successfully dispensing electricity or otherwise not functioning as designed. Downtime is calculated pursuant to section 3124(c) of this Article.
- (16) "Electric utility" means any person engaged in, or authorized to engage in, generating, transmitting, or distributing electric power by any facilities, including, but not limited to, any such person who is subject to the regulation of the Public Utilities Commission.
- (17) "Electric vehicle" or "EV" means a vehicle that is either partially or fully powered on electric power received from an external power source. For the purposes of this regulation, this definition does not include golf carts, electric bicycles, or other micromobility devices.
- (18) "Enrolled charging network provider" means a charging network provider that meets the technical and administrative criteria of section 3127 of this Article and is granted the status of an enrolled charging network provider by the Commission pursuant to section 3127(c)(2) of this Article.
- (19) "Electric vehicle supply equipment" or "EVSE" means as "charger" as defined.
- (20) "Executive Director" means the Executive Director of the Energy Commission and anyone the Executive Director designates as an agent.
- (21) "Failed charging session" means, following a charge attempt, the criteria for a successful charging session were not met.
- (22) "Funding entity" means any entity that disburses funds from a California state agency or through a charge on ratepayers to install one or more chargers or charging stations that are installed or are intended to be installed on or after January 1, 2024, in California other than at a residential real property containing four or fewer dwelling units.
- (23) "Funding recipient" means any entity that receives any incentive from a California state agency or through a charge on California ratepayers to install one or more chargers or charging stations that are installed or are intended to be installed on or

after January 1, 2024, in California other than at a residential real property containing four or fewer dwelling units.

- (24)** "Hardware" means the machines, wiring, and other physical components of an electronic system including onboard computers and controllers.
- (25)** "Incentive" means any funds received from a state agency or a charge on ratepayers to install or operate the charger or charging station.
- (26)** "Inoperative State" means the charger or charging port is not operational.
- (27)** "Installed" means attached or placed at a location and available for use for a charging session. The date a charger is installed is the date it is first available for use for a charging session.
- (28)** "Interoperability" means successful communication between the software, such as the software controlling charging on the EV and the software controlling the charger. Interoperability failures are communication failures between the EV and charger that occur while the software of each device is operating as designed. Interoperability failure leads to failed charging sessions.
- (29)** "Maintenance" means any instance in which preventive or corrective maintenance is carried out on equipment.
- (30)** "Networked" means a charger can receive or send commands or messages remotely from or to a charging network provider or is otherwise connected to a central management system, such as by using OCPP 2.0.1, for the purposes of charger management and data reporting.
- (31)** "Nonnetworked charger" means a charger that is not networked.
- (32)** "Off-grid charger" means a charger that does not draw power from an electric utility as defined in PRC 25108, at any time.
- (33)** "Open Charge Point Protocol" or "OCPP" means an open-source communication protocol that specifies communication between chargers and the charging networks that remotely manage the chargers.
- (34)** "Operational" or "up" means a charging port's hardware and software are both online and available for use, or in use, and the charging port is capable of successfully dispensing electricity.
- (35)** "Operative state" means the charger is operational.

- (36)** "Operative status" means an electronically transmitted communication from the charger or charging port to the central system indicating whether the charger or charging port is in an operative or inoperative state. Each communication shall include fields for date-timestamp and any error codes associated with the operative status.
- (37)** "Preventive maintenance" means maintenance that is performed on physical assets to reduce the chances of equipment failure and unplanned machine downtime.
- (38)** "Public and / or ratepayer funded charger" means a charger or charging station installed on or after Jan. 1, 2024, except at a residential real property containing four or fewer dwelling units, for which an incentive was received from a state agency or a charge on ratepayers to install or operate the charger or charging station. An incentive from a state agency includes, without limitation, any incentive funded in whole or in part from the Greenhouse Gas Reduction Fund as defined in section 16428.8 of the Government Code. A charge on ratepayers includes charges on the customer of a local publicly owned electric utility as defined in section 224.3 of the Public Utilities Code and community choice aggregators as defined in section 331.1 of the Public Utilities Code.
- (39)** "Recordkeeping and reporting agent" means the entity responsible to ensure timely compliance with the recordkeeping and reporting requirements of this Article. The identity of the recordkeeping and reporting agent is determined according to Section 3122 of this Article.
- (40)** "Replaced" means that the charger has been substantially modified or substituted with another unit, as indicated by a change in the serial number, ID, or the model name.
- (41)** "Site host" means the electric utility customer of record for electric service to the charger and may also be the charging network provider or the charging station operator of the charger.
- (42)** "Software" means a set of instructions, data, or programs used to operate computers and execute specific tasks.
- (43)** "Successful charging session" means, following a charge attempt, a customer's EV battery is charged to the state of charge the customer desires and is disconnected manually by the customer or by the EV's onboard software system terminating the charging session, without an additional charge attempt.
- (44)** "Temporary charger" means a charger that is designed to be portable and available for use intermittently, is not attached at a location, and is not available for use at a single location for more than 30 days in a calendar year. For the purposes of this

definition, a charger that is made available for use for any portion of a day, is considered available for use for that full day.

(45) "Uptime" means the time that a charger is installed during a reporting period excluding downtime pursuant to section 3124(c) and (d) of this Article.

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3122: The Recordkeeping and Reporting Agent.

- (a)** The recordkeeping and reporting agent shall be responsible to ensure timely compliance with the recordkeeping and reporting requirements of this Article.
- (1)** The recordkeeping and reporting agent may designate one or more entities to fulfill the responsibilities of this Article, but the recordkeeping and reporting agent remains responsible to ensure compliance.
- (2)** If there is more than one recordkeeping and reporting agent for a charger, then compliance with any requirements of this Article by any one recordkeeping and reporting agent fulfills those requirements as to the others.
- (b)** Except as to a publicly and / or ratepayer funded charger as provided in subsection (c) of this section, the recordkeeping and reporting agent for a charger is as follows:
- (1)** Each charging network provider that operates the digital communication network that remotely manages a charger during a reporting period is its recordkeeping and reporting agent.
- (2)** If there is no charging network provider for a charger during a reporting period, then each charging station operator of the charger is its recordkeeping and reporting agent.
- (c)** Publicly and / or Ratepayer Funded Chargers.
- (1)** As to a publicly and / or ratepayer funded networked charger installed from January 1, 2024, through December 31, 2025, except as provided in subsections (c)(1)(A) or (c)(1)(B), the site host, or the funding recipient if designated pursuant to subsection (c)(4) of this section, shall retain a charging network provider to serve as the recordkeeping and reporting agent.
- (A)** If the site host of a publicly and / or ratepayer funded networked charger, or the funding recipient if designated pursuant to subsection (c)(4) of this section, is a

charging network provider pursuant to section 3121 of this Article, then it may itself serve as the recordkeeping and reporting agent and if so, it need not retain another.

- (B) If a publicly and / or ratepayer funded networked charger is not used to dispense electricity during a reporting period other than for testing or maintenance, then the site host, or the funding recipient if designated pursuant to subsection (c)(4) of this section, is not required to retain a charging network provider for that charger for the period of non-operation, but if not, then it shall itself serve as the recordkeeping and reporting agent.
- (2) As to a publicly and / or ratepayer funded networked charger installed on or after January 1, 2026, except as provided in subsections (c)(2)(A) or (c)(2)(B), the site host, or the funding recipient if designated pursuant to subsection (c)(4) of this section, shall retain an enrolled charging network provider to serve as the recordkeeping and reporting agent.
- (A) If the site host of a publicly and / or ratepayer funded networked charger, or the funding recipient if designated pursuant to subsection (c)(4) of this section, is an enrolled charging network provider pursuant to section 3127 of this Article, then it may itself serve as the recordkeeping and reporting agent and if so, it need not retain another.
 - (B) If a publicly and / or ratepayer funded networked charger is not used to dispense electricity during a reporting period other than for testing or maintenance, then the site host, or the funding recipient if designated pursuant to subsection (c)(4) of this section, is not required to retain an enrolled charging network provider for that charger for the period of non-operation, but if not, then it shall itself serve as the recordkeeping and reporting agent.
- (3) As to a publicly and / or ratepayer funded nonnetworked charger, the site host, or the funding recipient if designated pursuant to subsection (c)(4) of this section, shall serve as the recordkeeping and reporting agent.
- (4) At any time before six years following the issuance of an incentive for a publicly and / or ratepayer funded charger, a site host may, upon written or electronic notice to the funding recipient at least 60 days before the start of a reporting period, designate the funding recipient to be responsible to fulfill the requirements of the site host under this Article as to the publicly and / or ratepayer funded charger. The site host may revoke or reinstate the designation in the same manner. Any time after six years after receiving the most recent incentive for a charger, a funding recipient may terminate

its duties under this subsection upon written or electronic notice to the site host at least 60 days before the start of a reporting period.

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3123: Semiannual Reporting Requirement.

- (a) Each recordkeeping and reporting agent or designee pursuant to section 3122(a) of this Article, shall collect and submit to the Executive Director a semiannual report as specified in subsection (b) by the following deadlines:
 - (1) Q1-Q2 Reporting Period. For the period from January 1 through June 30 of a year, by September 1 of the same year.
 - (2) Q3-Q4 Reporting Period. For the period from July 1 through December 31 of a year, by March 1 of the following year.
- (b) Except as provided in subsection (c) of this section, each report required by subsection (a) shall include the following for each charger, excluding any charger not used to dispense electricity at any time within two years prior to the end of the reporting period:
 - (1) Contact Information.
 - (A) Each recordkeeping and reporting agent's name, address, telephone number, email address, and, if available, URL (web site) address; provided, however, that if a parent entity is filing on behalf of a subsidiary entity, if a subsidiary entity is filing on behalf of a parent entity, or if an affiliate entity is filing on behalf of an affiliate entity, then each entity shall be clearly identified, and the information shall be provided for both entities.
 - (B) A statement whether each recordkeeping and reporting agent has one or more of the following roles with respect to the charger: charging network provider, charging station operator, funding recipient, or site host, as defined in section 2131 of this Article.
 - (C) If the recordkeeping and reporting agent designated one or more entities to fulfill the responsibilities of this Article pursuant to section 3122(a)(1) of this Article, then each entity's name, address, telephone number, email address, and, if available, URL (web site) address of the site host; provided, however, that if a parent entity is filing on behalf of a subsidiary entity, if a subsidiary entity is filing on behalf of a parent entity, or if an affiliate entity is filing on behalf of an affiliate

entity, then each entity shall be clearly identified, and the information shall be provided for both entities.

(D) The name, affiliation if any, address, telephone number, and email address of an individual to contact concerning the statements pursuant to this Article. Only one individual may be listed as the contact except that the individual may designate another contact during a temporary absence.

(2) Inventory Report. For each charger:

(A) Charger address.

(B) Geographic coordinates (latitude and longitude) of the charger in to within one ten-thousandth of a degree of exact charging station location.

(C) Model of charger.

(D) Charger nameplate power.

(E) Charger serial number.

(F) If a prior semiannual report did not list the serial number, a statement of whether the charger is in addition to or a replacement of a former charger, including the serial number of the charger replaced, if any.

(G) A statement of whether the charger provides alternating current or direct current to the EV.

(H) Connectors—number and connector types available at the charger to connect to the vehicle (e.g., SAE J1772, J1772 Combo, CHAdeMO, NACS).

(I) If networked:

1. Charger ID—a unique identifier for the charger within the network provided by the charging network provider.

2. Port ID—a unique identifier for each port, unique within the context of the charging network provider servicing the charger.

(J) Identify charger's primary use as:

1. Public light duty (gross vehicle weight rating less than 10,000 lbs).

2. Public medium- or heavy-duty (gross vehicle weight rating greater than 10,000 lbs).

3. Private residential multifamily dwelling.
4. Private commercial workplace charging.
5. Private fleet charging (gross vehicle weight rating less than or equal to 10,000 lbs).
6. Private fleet charging (gross vehicle weight rating greater than 10,000 lbs).
7. Other. Specified in report.

(K) If networked, the following utilization data:

1. Average hours per day the charger drew power during the reporting period.
2. Average hours per day the charger was connected to an electric vehicle during the reporting period.
3. Average kWh per day the charger dispensed during the reporting period.

(3) Public and / or Ratepayer Funded Charger Uptime Report.

(A) For each charging port of a public and / or ratepayer funded charger, for the first six years after a charger is installed, the uptime data required by section 3124 of this Article.

(B) For each public and / or ratepayer funded networked charging port:

1. The total number of charge attempts for the reporting period.
2. The total number of successful charging sessions for the reporting period.
3. The total number of failed charging sessions for the reporting period.
4. The percentage of successful charging sessions for the reporting period relative to the total number of charge attempts for the reporting period.

(c) For any charger funded with funds made available under Title 23 of the United States Code and required to submit information pursuant to section 680.112 of Title 23 of the United States Code, the recordkeeping and reporting agent may, as an alternative to submitting the Inventory Report and Public and / or Ratepayer Funded Charger Uptime Report pursuant to subsection (b)(2) and (b)(3) of this section, submit to the Executive Director a copy of the quarterly data submitted pursuant to section 680.112(a) of Title 23 of the United States Code for the reporting period.

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3124: Public and / or Ratepayer Funded Charger Uptime Report Requirements.

- (a) Public and / or Ratepayer Funded Charger Uptime Report. The public and / or ratepayer funded charger uptime report required by section 3123(b)(3) of this Article shall include the following:
- (1) The uptime percentage rate and minutes of excluded downtime for each charger port during the reporting period, calculated according to subsections (b), (c), and (d) of this section.
 - (2) An itemized summary of the date, duration, and category under subsection (d) of all excluded downtime being claimed for a reporting period.
- (b) The uptime percentage rate for a charger port shall be calculated using the following formula:

(1)
$$U = \frac{T-D+E}{T} * 100\%$$

(2) Where:

(A) U = Charging port uptime percentage rate for the reporting period.

(B) T =

1. Q1-Q2 reporting period = 260,640 minutes, except for a leap year, which is 262,080 minutes.
2. Q3-Q4 reporting period = 264,960 minutes.

(C) D = Total charging port downtime during the reporting period, in minutes, calculated according to subsection (c) of this section.

(D) E = Total charging port excluded downtime during the reporting period, in minutes, calculated according to subsection (d) of this section.

(c) **Downtime:**

- (1) **Public and / or Ratepayer Funded Networked Chargers:** Downtime shall be determined on a per charging port basis by summing the durations of all downtime

events during the period. The duration of a downtime event shall be the longest of the following periods:

- (A) The time after the charger has transmitted an operative status indicating the charger or a charging port is in an inoperative state until a subsequent operative status is transmitted indicating the charger has returned to an operative state. The timestamps in the operative statuses shall be used to quantify the downtime.
- (B) If using OCPP version 2.0.1 or a subsequent version of OCPP, the time after the charger has transmitted a Status Notification Request indicating that the charging port associated with that charger is in a "faulted" or "Unavailable" state until a subsequent StatusNotificationRequest is transmitted by that charger indicating that the charging port has transitioned to an "available," "occupied," or "reserved" state. The timestamps in each StatusNotificationRequest shall be used to quantify downtime.
- (C) If using OCPP Version 2.0.1 or a subsequent version of OCPP, the time between a BootNotificationResponse transmitted by the Central Management System and the last HeartbeatResponse transmitted by the Central Management System prior to the BootNotificationResponse. The timestamps in the relevant BootNotificationResponse and HeartbeatResponse shall be used to quantify downtime.
- (D) The time between the earliest record that a charger is not capable of successfully dispensing electricity or otherwise not functioning as designed and the time it is available to deliver a charge. First record that a charger is not capable of successfully dispensing electricity or otherwise not functioning as designed includes, but is not limited to, consumer notification, internal diagnostics, or inspection, whichever is earliest.

(2) Public and/or Ratepayer Funded Nonnetworked Charger: The time that a charging port is in an inoperative state or not capable of successfully dispensing electricity. This may be known by consumer notification, internal diagnostics, inspection, or other methods.

- (A) The downtime shall be calculated from the time the charging port is in an inoperative state until it is restored to an operative state.

(d) Excluded Downtime: Downtime accounted for pursuant to subsection (c) of this section that is caused by events outside of the control of the charging station operator is subtracted from total downtime when calculating uptime percentages. Excluded downtime is limited to the categories below:

- (1) **Before Initial Installation:** Downtime before the charging port was initially installed as defined in section 3121 of this Article.
- (2) **Grid Power Loss:** Downtime during which power supplied by a third-party provider is not supplied at levels required for minimum function of the charging port. This may include, but is not limited to, service outages due to utility equipment malfunction or public safety power shutoffs. This does not include power generation or storage equipment installed to serve the charger(s) exclusively. Documentation from power provider detailing outage is required to claim this as excluded downtime.
- (3) **Vehicle Fault:** Any failure to charge or failure to meet the EV charging customer's expectation for power delivery due to the fault of the vehicle.
- (4) **Outage for Preventative Maintenance or Upgrade:** Downtime caused by any preventative maintenance or upgrade work that takes the charging port offline. This must be scheduled at least two weeks in advance of the charger being placed in an inoperative state. The maximum downtime that can be excluded for preventative maintenance or upgrade work is 24 hours for any 12-month period.
- (5) **Vandalism or Theft:** Downtime caused by any physical damage to the charger or station committed by a third party. This may include, but is not limited to, theft of charging cables, damage to connectors from mishandling, or damage to screens. A maximum of 5 days may be claimed as excluded downtime for each Vandalism or Theft event. A police report or similar third-party documentation is required to claim this as excluded time.
- (6) **Natural Disasters:** Downtime caused by any disruption of the charging port due to a natural event such as a flood, earthquake, or wildfire that causes great damage. Third party documentation such as news reporting must be provided along with a narrative of the direct impacts to the chargers(s) to claim this as excluded downtime.
- (7) **Communication Network Outages:** Downtime caused by loss of communication due to cellular or internet service provider system outages. A Communication Network Outage can be claimed as excluded downtime provided the chargers default to a free charge state during communication losses. A free charge state is when the charger is operational and dispenses energy free of charge to any consumer.
- (8) **Operating Hours:** Hours in which the charging port is in an operative state but that are outside of the identified hours of operation of the charging station.

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3125: Additional Requirements for Public and/or Ratepayer Funded Networked Chargers.

- (a) For public and / or ratepayer funded networked chargers installed on or after January 1, 2026, the site host, or the funding recipient if designated pursuant to section 3122(c)(4) of this Article, shall ensure the charger meets the following requirements:
- (1) Connection to a central management system using OCPP Version 2.0.1 or a subsequent version of OCPP. This does not preclude the additional use of other communication protocols.
 - (2) Transmission of the following protocol data units between the Central Management System and the charger as specified in OCPP Version 2.0.1 or a subsequent version of OCPP:
 - (A) HeartbeatRequest shall be transmitted to the Central Management System by the charger on a set interval.
 - (B) HeartbeatResponse shall be transmitted to the charger by the Central Management System in response to any received HeartbeatRequest.
 - (C) StatusNotificationRequest shall be transmitted by the charger to the Central Management System any time the charger or an associated charging port's operative status changes.
 - (D) BootNotificationRequest shall be transmitted by the charger to the Central Management System any time the charger is powered on.
 - (E) BootNotificationResponse shall be transmitted by the Central Management System to the charger in response to any received BootNotificationRequest.
- (b) For public and/or ratepayer funded networked chargers installed on or after January 1, 2026, the recordkeeping and reporting agent of a public and/or ratepayer funded networked charger shall automatically transmit to the Commission or the Commission's designee the data specified in (1) through (4) within 60 minutes of generation of each instance of HeartbeatResponse, StatusNotificationRequest, and BootNotificationResponse for each charger:
- (1) Charger serial number.
 - (2) Charger ID — a unique identifier for the charger within the network provided by the charging network provider.
 - (3) All instances of HeartbeatResponse and BootNotificationResponse for each charger.

- (4) All instances StatusNotificationRequest for each charging port.
- (c) For chargers installed from January 1, 2024 through December 31, 2025, the recordkeeping and reporting agent of a public and/or ratepayer funded networked charger may comply with subsections (a) and (b) of this section, but if not, then it shall record, and retain for six years from the date of recording, the operative status of each charging port for each public and / or ratepayer funded charger on a fifteen-minute interval.
- (1) The Executive Director may electronically request (sent to the most recent email address filed pursuant to section 3123(b)(1)(D) of this Article) that a recordkeeping and reporting agent provide the Commission with copies of the records retained pursuant to subsection (c) of this section. The charging network provider shall submit the requested records to the Commission within 21 days of the date of the request.

The following documents are incorporated by reference into section 3125.

Open Charge Point Protocol

Open Charge Point Protocol version 2.0.1. <https://www.openchargealliance.org/downloads/>

Copies available from: Superintendent of Documents
U.S. Government Printing Office Washington, DC
20402 www.ecfr.gov

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3126: Additional Requirements for Public and/or Ratepayer Funded Nonnetworked Chargers.

- (a) The recordkeeping and reporting agent of a nonnetworked charger shall create, and retain for six years, the following maintenance records for each public and/or ratepayer funded nonnetworked charger it operates:
- (A) Date and time of any maintenance.
 - (B) Whether the maintenance was corrective or preventive in nature.
 - (C) Whether and for how long the charger was in an inoperative state prior to, during, or after the maintenance.
 - (D) Whether the charger was in an operative state following the maintenance.

- (b) The recordkeeping and reporting agent of a nonnetworked charger shall retain for six years, any customer complaint, internal diagnostic, or inspection report indicating the occurrence or duration of a period when a charger was in an inoperative state or when an attempt to charge a vehicle failed.
- (c) The Executive Director may electronically request (sent to the most recent email address filed pursuant to section 3123(b)(1)(D) of this Article) that the recordkeeping and reporting agent provide the Commission with copies of the records retained pursuant to subsections (a) and (b) of this section. The recordkeeping agent or its designee shall submit the requested records to the Commission within 21 days of the date of the request.

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3127: Enrolled Charging Network Providers for Public and/or Ratepayer-Funded Chargers.

- (a) A charging network provider may apply to be an enrolled-charging network provider by submitting an application to the Executive Director, executed under penalty of perjury of the laws of the State of California, containing the following:
 - (1) The full legal name, address of the principal place of business, telephone number, and email address of the charging network provider submitting the application.
 - (2) The full legal name, title, and telephone number, and email address of the person executing the declaration.
 - (3) A statement that the person executing the declaration is authorized to do so and to submit the application on behalf of the charging network provider.
 - (4) The name, title, and telephone number, and email address of a person to contact regarding the application.
 - (5) A statement that the charging network provider agrees to undertake the duties of a recordkeeping and reporting agent under this Article including reporting the protocol data units required to be reported to the CEC pursuant to section 3124 of this Article.
 - (6) A statement that the charging network provider meets, and will maintain so long as the charging network provider is enrolled, the following technical requirements:

- (A) An API of the Commission's choosing to permit the charging network provider to transfer the data required to be submitted pursuant to 3125(d) of this Article.
 - (B) Subset Certification of the Charging Station Management System in the Open Charge Alliance OCPP Certification Program for OCPP version 2.0.1, published May 24, 2023, or a subsequent version of OCPP for Core, Advanced Security, and ISO 15118 Support functionalities.
- (b) Upon receipt of an application pursuant to subsection (a), the Executive Director shall provide the charging network provider with notice of receipt of the application as follows:
- (1) If the Executive Director determines that an application does not meet the requirements of subsection (a), the Executive Director shall provide the applicant with notice that the application is incomplete and a statement of what is necessary to meet the requirements of subsection (a).
 - (2) If the Executive Director determines that an application meets the requirements of subsection (a), the Executive Director shall provide the charging network provider with notice of receipt of the application and access to an API of the Commission's choosing to permit the charging network provider to demonstrate its ability to transfer the data required to be submitted pursuant to 3125(b) of this Article.
- (c) Within 60 days of the Executive Director granting a charging network provider access to an API pursuant to subsection (b)(2), the charging network provider shall demonstrate its ability to transfer the data required to be submitted pursuant to 3125(b) of this Article.
- (1) If within 60 days, the charging network provider does not successfully demonstrate transfer of data to the Commission via the API enabled in subsection (b), the Executive Director shall notify the charging network provider that the API demonstration was unsuccessful and why if known. Upon notice, the charging network provider shall have an additional 30 days to demonstrate transfer of data to the Commission via the API enabled in subsection (b). If the charging network provider does not successfully demonstrate transfer of data, the Executive Director shall issue a determination denying the application. A charging network provider may reapply at any time following a denial.
 - (2) If the charging network provider successfully demonstrates transfer of data to the Commission via the API enabled in subsection (b), the Executive Director shall deem the charging network provider an enrolled-charging network provider for purposes of this Article and the Executive Director shall list the charging network provider on the Commission's website.

- (d) Revocation. The Executive Director may revoke a charging network provider’s status as an enrolled-charging network provider for repeated failure to meet its obligations under this section.
- (e) Appeal to Commission. A charging network provider may appeal a denial of an application, or revocation, pursuant to section 3129(d) of this Article.
- (f) Renewal. Status as an enrolled charging network provider granted under this section shall remain in effect for five years and then terminate without notice unless renewal is granted. An entity may renew the five-year period of an exemption at any time before its enrolled charging network provider status terminates by applying as set forth in subsections (a) through (c) of this section. Nothing in this section prohibits an entity whose enrolled-charging network provider status has terminated from applying to be an enrolled charging network provider.

Note: Authority cited: Sections 25210, 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25231.5, 25301, 25303, 25304, 25400-25401, 25618, Public Resources Code.

§ 3128: Disclosure of Reporting Requirements for Public and/or Ratepayer-Funded Chargers.

Disclosure. The funding entity shall clearly disclose to the funding recipient the reporting requirements of this Article. If the funding recipient is a charging network provider or other third-party entity that is not the site host, the charging network provider or third-party entity shall provide a separate disclosure to the site host about the site host’s right to designate the charging network provider or third-party as the entity to be responsible to ensure the data is reported on behalf of the site host. The funding recipient shall verify receipt of the disclosure by signing the disclosure, to be confirmed by the funding entity.

Note: Authority cited: Sections 25213, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25231.5, 25400-25401, 25618, Public Resources Code.

§ 3129: General Administration.

- (a) **Forms and Formats Specified by Executive Director.** The Executive Director may specify and require the use of any form or format for the submittal of any data, reports, or other information required by this Article, including but not limited to computer programs or formats.
- (b) **Electronic Filing.**

- (1) Unless otherwise stated in this Article, the statements and other submittals required or allowed by this Article shall be filed electronically to the Commission's database so that the electronic filing to the Commission's database uses a format and characteristics, including without limitation appropriate formatting, that are specified by the Executive Director.
- (2) Any electronic filing to the Commission's database constitutes a representation by the person making the filing that:
 - (A) all applicable requirements of this Article have been met;
 - (B) the person will electronically acknowledge receipt through the Commission's database of all electronic communications concerning the filing from the Executive Director through the Commission's database to the person;
 - (C) all electronic communications concerning the filing from the Executive Director through the Commission's database to the person shall be deemed received by the person upon notification to the Executive Director, by the computer or other electronic device from which the Executive Director communication has been sent, that the communication has been sent; and
 - (D) all electronic communications concerning the filing from the person to the Executive Director shall be deemed received by the Executive Director only upon actual receipt.
- (3) At any time the Executive Director may forbid electronic filings by any person or enrolled charging network provider and may remove affected information from the Commission's database upon finding that an applicable requirement of this Article is not being met.

(c) Retention of Records

- (1) Recordkeeping and reporting agents shall retain all data, forms, information, and all other records required by this Article:
 - (A) For at least two years after the record was generated except as specified in section 3125(c) and section 3126(a) and (b) of this Article; and
 - (B) In a manner allowing ready access by the Executive Director on request.

- (d) Appeal to Commission.** Within 30 days of any decision or determination made by the Executive Director pursuant to this Article, any entity subject to the part of the decision or determination at issue may appeal the decision or determination to the Commission. The following procedures apply to the appeal:

- (1) The appeal shall be in writing and signed by the appellant and submitted to the Commission. The appeal shall consist of a written argument, stating the grounds for modifying or reversing the decision, identifying the statutes and regulations relevant to the appeal, and stating whether an oral hearing is requested, and a copy of all relevant notices, responses, correspondence, documents, and decisions.
- (2) Within 30 days after the date the appeal was filed, the Executive Director shall provide the appellant and the Commission a written argument, stating the grounds for affirming, modifying, or reversing the decision, identifying the statutes and regulations relevant to the appeal, and stating whether an oral hearing is requested. The Executive Director's written argument shall also be accompanied by any relevant notices, responses, correspondences, documents, and decisions not previously provided by the appellant.
- (3) Commission Consideration of Appeal:
 - (A) The proceedings on appeal shall be conducted in a manner consistent with Chapter 4.5 of the Government Code (section 11400 et seq.) and Title 20 CCR sections 1200-1216.
 - (B) The Commission shall review the decision or determination made pursuant to this section for substantial evidence.

Note: Authority cited: Sections 25213, 25216.5, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25231.5, 25400-25401, 25618, Public Resources Code.

§ 3130: Confidentiality.

- (a) An entity submitting information pursuant to this Article may request confidentiality pursuant to section 2505 of Title 20 of the California Code of Regulations, including without limitation, for automatic designation pursuant to the provisions of 2505(a)(5).
- (b) The Commission may disclose information submitted under this Article that was previously designated as confidential if disclosure is permitted by law, including without limitation, pursuant to section 2507(e)(6) and (f)(1)(D) of Title 20 of the California Code of Regulations.
- (c) Nothing in this section is intended to limit or expand the confidentiality of information submitted to the Commission.

Note: Authority cited: Sections 25213, 25218(e), 25231.5, 25400-25401, 25618, Public Resources Code; Reference: Sections 25210, 25216.5, 25229, 25322, 25231.5, 25366, 25400-25401, 25618, Public Resources Code.