

State of California
AIR RESOURCES BOARD

**PUBLIC HEARING TO CONSIDER
ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) STANDARDS**

STAFF REPORT: INITIAL STATEMENT OF REASONS

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LIST OF ACRONYMS

ACC.....	Advanced Clean Cars
BEV	Battery Electric Vehicle
CARB	California Air Resources Board or The Board
CEQA	California Environmental Quality Act
DCFC.....	Direct Current Fast Charger
EA.....	Environmental Assessment
EVSE.....	Electric Vehicle Supply Equipment
FCEV.....	Fuel Cell Electric Vehicle
FSOR.....	Final Statement of Reasons
GHG	Greenhouse Gas
ISOR	Initial Statement of Reasons
LDV.....	Light-duty vehicle
LEV I	First generation Low Emission Vehicle program, adopted in a 1990-1991 rulemaking, and generally applicable in the 1994-2003 model years
LEV II	Second generation Low Emission Vehicle program, adopted in a 1998 - 1999 rulemaking, and generally applicable in the 2004-2014 model years
LEV III.....	Third generation Low Emission Vehicle program (criteria pollutant and greenhouse gas emission standards), adopted in 2012, and generally applicable to 2015 and subsequent model years for criteria pollutants, and applicable to 2017 and subsequent model years for greenhouse gas emissions
MY.....	Model Year
NMOG	Non-Methane Organic Gases
NOx	Oxides of Nitrogen
PC.....	Passenger Car
PEV.....	Plug-in Electric Vehicle
PHEV	Plug-in Hybrid-Electric Vehicle
U.S. EPA.....	United States Environmental Protection Agency
ZEV	Zero Emission Vehicle

I. EXECUTIVE SUMMARY

Staff is proposing a new regulation that will create a minimum standard of access for public electric vehicle charging, facilitate roaming agreements between electric vehicle service providers, create a more complete database of location and pricing information for consumer use, and ensure clarity in the cost of a charging session. The purpose of the proposed rulemaking is to provide drivers with ease of access to charging infrastructure.

The California Air Resources Board (CARB) and the State of California are committed to the growth of the zero emission vehicle market. These vehicles are critical to meeting national and State health-based air quality standards. As increasing numbers of plug-in electric vehicles (PEVs) are added to California roads, public charging infrastructure to support the vehicles is also being added.

Existing public charging infrastructure may be confusing to PEV drivers due to varying access and payment modes. Drivers encounter not being able to initiate a charging session due to not being a member of the network, inconsistent charging session pricing formulas, and not being able to find electric vehicle supply equipment (EVSE) at a given location. These problems are exacerbated for low-income drivers (who may have limited access to advanced cell-phone technologies and credit), fleet drivers (who may be limited in payment options), tourists (who may not be familiar with California charging infrastructure and may have limited payment options), and drivers of borrowed or rented vehicles. The proposed regulation will provide these drivers with easier access to, and thus greater confidence in, charging infrastructure in California.

The California Legislature adopted Senate Bill (SB) 454, "Electric Vehicle Charging Stations Open Access Act," in 2013. SB 454 set EVSE performance standards allowing for open access to public EVSE regardless of whether a driver is a member of a charger network. SB 454 also permitted CARB to adopt interoperability billing standards for network roaming payment methods.

CARB staff's proposed regulation establishes six requirements for publicly accessible EVSE:

1. Chargers must be accessible to drivers regardless of membership in an Electric Vehicle Service Provider's (EVSP) network.
2. EVSPs must operate credit card readers and mobile payment options on Level 2 and direct current fast charger (DCFC) EVSE allowing payment by members and non-members.
3. Each EVSE must have a sticker informing drivers of voltage (V) and amperage (A) capabilities of the unit.
4. EVSPs must post all fees associated with a charging session.
5. The interoperable billing standard Open Charge Point Interface (OCPI) must be installed on each EVSE. In addition, other interoperable billing standards may also be used.

6. EVSPs must report new, current and decommissioned EVSE locations and access information to the National Renewable Energy Laboratory's (NREL) Alternative Fuels Data Center (AFDC) and CARB. The information reported will include pricing, EVSE model and location information.

EVSPs will also be subject to initial statement of compliance requirements for EVSE models, and annual location and usage reporting requirements.

This proposed regulation does not require EVSE to be installed for public use; but rather establishes hardware and software requirements for new and existing EVSE. New DCFC installations shall be fully compliant starting July 1, 2020. Existing DCFC EVSE must meet necessary hardware and software requirements by July 1, 2020, or five years after date of installation, whichever is later. New Level 2 EVSE installations shall be fully compliant starting July 1, 2023. Existing Level 2 EVSE must meet necessary hardware and software requirements by July 1, 2023, or five years after date of installation, whichever is later.

EVSPs are the responsible parties ensuring the proposed requirements are met. Currently six of the seven EVSPs operating in California qualify as small businesses. A 0.1 percent drop in job growth resulting from the proposed requirements over time is estimated. CARB staff anticipate that other businesses such as credit card reader suppliers and local electricians will see increased work. State and local governments owning public EVSE will incur small costs associated with compliance with the proposed regulation.

Implementation of the proposed regulation will: (1) enable drivers to more readily locate public EVSE, (2) provide drivers charging session pricing before use, (3) provide drivers convenient and simple payment methods for charging sessions, (4) provide standardized power information on each EVSE, and (5) facilitate EVSP roaming agreements. Consumer benefits of the proposed regulation include familiar payment methods, clear pricing information, and uniform station information.

Staff have continued stakeholder engagement on the proposed regulatory requirements. Should compromises on areas of contention be reached before the board hearing additional modifications resulting from this coordination will be presented at the Public Hearing.

Staff recommends that the Board adopt the proposed regulation in this Initial Statement of Reasons (ISOR). The proposed regulation establishes standardized EVSE access for drivers that will build driver confidence in charging infrastructure. The proposed regulation will also support zero emission vehicle adoption in California.

II. INTRODUCTION AND BACKGROUND

Mobile sources are a significant contributor to emissions of criteria pollutants and greenhouse gas (GHG) emissions in California, accounting for well over 80 percent of ozone precursor emissions and approximately 35 percent of statewide direct GHG emissions. After accounting for fuel production and delivery emissions, mobile sources account for approximately 50 percent of statewide GHG emissions. Zero emission vehicles (ZEV) and transport modes using zero emission drivetrains will help California meet its health based air quality standards and reduce GHG emissions by displacing internal combustion engine cars, trucks, and other vehicles.

The California Air Resources Board (CARB) has adopted several regulations that reduce emissions from light-duty vehicles including the Low Emission Vehicle Criteria Pollution (LEV III Criteria)¹ Regulation, the Low Emission Vehicle Greenhouse Gas (LEV III GHG)² Regulation, and the ZEV Regulation.³ These regulations will result in an increasing number of ZEVs on the road. ZEVs include battery electric vehicles (BEV), hydrogen fuel cell electric vehicles (FCEV), and plug-in hybrid electric vehicles (PHEV).

Plug-in Electric Vehicles (PEVs) consist of two distinct technology types: PHEVs and BEVs. PHEVs use both a battery providing electric range and an internal combustion engine, so rely on both electric charging and gasoline. BEVs have a full electric range, and do not rely on any fuels besides electricity.

In March 2012, Governor Brown issued Executive Order B-16-2012⁴ directing California agencies to establish benchmarks for key milestones to help support and facilitate the ZEV market. The milestones include: 1) achieving over 1.5 million ZEVs on the road by 2025, and 2) ensuring Californians have access to ZEV infrastructure. As a result of this Executive Order, multiple state agencies, including CARB, worked to develop and release the 2013 ZEV Action Plan (2013 Plan).⁵ The 2013 Plan identified over 100 strategies to meet the milestones of the executive order.

The 2013 Plan included four broad goals to advance the ZEV market: 1) complete needed ZEV infrastructure and planning; 2) expand consumer awareness and demand for ZEVs; 3) transform fleets; and 4) grow jobs and investment in the private sector. The 2013 Plan recognized that the charging infrastructure needed to support broad adoption of electric vehicles, known as electric vehicle supply/service equipment (EVSE), would need to be strategically deployed in a variety of locations such as home, work and public locations. The 2013 Plan also highlighted the need to encourage accessibility of charging infrastructure through the development of interoperability

¹ 13 Cal. Code Regs. § 1961.1

² 13 Cal. Code Regs. § 1961.3. Note that Section 1961.3 allows manufacturers to comply with 40 CFR 86.1812-12

³ 13 Cal. Code Regs. § 1962.2

⁴ Executive Order B-16-2012.

⁵ OPR, 2013.

standards, because the common model for EVSE deployment by providers was to require membership for access to a given provider's stations. Interoperability standards would allow drivers to pay for charging regardless of network membership. The 2013 Plan encouraged industry efforts to develop interoperability⁶ standards and recommended that future state-funded EVSE be open to the public and accessible to all drivers regardless of membership or subscription to EVSP networks.

PEVs require charging, which can occur at home using conventional household plugs or upgraded equipment, at private locations such as at a workplace or in a private parking structure, or in public locations. For passenger vehicles, the public generally has access to one or more of the following charging options: Level 1, Level 2 and direct current fast charging (DCFC). Level 1 charging is the slowest, using 110 volt electric service similar to that of a typical wall outlet.⁷ For example, a Chevrolet Bolt with a range of 238 miles⁸ with 1 percent battery left would need around 52 hours to charge to 100 percent.⁹ Level 2 charging, which uses 208–240 volts,¹⁰ is faster than Level 1; that same Chevrolet would take around 10 hours to charge.¹¹ DCFC, which is typically 480 volts and 50 kilowatts (kW) of power, is the fastest charging option.¹² That same Chevrolet Bolt would take around 2 hours and 45 minutes to fully replenish the battery.¹³ DCFCs capable of charging at even faster rates (150 kW, 320 kW) and reduced charging times are now entering the market.^{14,15}

Electric chargers in public locations may or may not require payment for use. Many of the EVSPs that operate EVSE charge for use. These EVSPs require membership or payment of a subscription fee. In return, members are provided with services that can include reserved times for charging, specific EVSE location data, pre-payment or on-site payment options, and fixed prices for electric charging through mobile applications. These EVSE networks currently are not required to: (1) allow non-members to charge, (2) provide payment methods such as credit card readers, or (3) transparently report prices and fees. Thus, many public EVSE are currently restricted to particular drivers, groups, or vehicles, or are burdensome for a non-member to use. The lack of consistency and transparency can make charging stations less accessible, confusing, and more difficult to use, discouraging PEV owners from using public charging options.

Several publicly managed funding programs continue to support the statewide deployment of PEV infrastructure. The Alternative and Renewable Fuel and Vehicle

⁶ Interoperability is defined as the ability of a system to work with or use the parts or equipment of another system, by Merriam-Webster

⁷ CALeVIP, 2018a.

⁸ Chevrolet, 2019.

⁹ Leccy, 2019.

¹⁰ CALeVIP, 2018b.

¹¹ Leccy, 2019.

¹² CALeVIP, 2018c.

¹³ Leccy, 2019.

¹⁴ Electrify America, 2019a.

¹⁵ Electrify America, 2019b

Technology Program, administered by the California Energy Commission (Energy Commission), provides funding to support PEV infrastructure through various grant solicitations.¹⁶ The California Public Utilities Commission (CPUC), under the direction of the Clean Energy and Pollution Reduction Act of 2015 (SB 350, Chapter 547, Statutes of 2015), authorizes utilities to invest in transportation electrification activities.¹⁷ In 2018, the CPUC approved additional investor-owned utility projects to deploy charging infrastructure as part of the SB 350 program. The CPUC has also approved specific charging infrastructure pilot programs for three large investor-owned utilities—Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric—to install EVSE for a combined budget of \$197 million.¹⁸ Separately, Electrify America is investing \$800 million over a 10-year period in ZEV infrastructure, education, and access in California as part of a settlement with CARB and federal agencies.¹⁹ In the first 30-month investment plan cycle, Electrify America expects to invest \$45 million in community chargers in major metropolitan areas and \$75 million in highway fast charging throughout California.²⁰ In the second 30-month investment plan cycle, Electrify America expects to invest \$95–\$115 million in communities and \$25–\$30 million for highway fast charging throughout California.²¹

With sizable funding in place for deploying PEV infrastructure, accessibility and interoperable billing standards continue to be key in enabling consumer PEV adoption. In January 2018, Governor Brown issued Executive Order B-48-18 building on past targets for ZEV commercialization by boosting California’s goal to five million ZEVs and PHEVs on the road by 2030 and setting a target of 250,000 chargers by 2025.²² To move toward this goal, consumers need confidence that they can easily access a robust and growing network of publicly available EVSE.

The purpose of this proposal is to ensure that electric vehicle charging is as easy as or easier than fueling an internal combustion engine vehicle. Gasoline stations offer payment by credit, debit, and company-issued cards, clear signage on types of fuel available, and easily understood pricing information including fees and discounts for company-issued cards and rewards programs. Today, electric vehicle charging can be confusing as payment methods are not consistent, and providers do not clearly articulate costs associated with a charging session. This lack of standardization is a barrier to zero emission mobility in California. Electric vehicle charging must be easy, recognizable, and available to the mass market.

This proposal provides standardization through recognizable payment hardware and consumer price information. In 2013, the legislature responded to consumer requests by setting requirements for publicly available electric vehicle supply equipment in SB

¹⁶ ENERGY COMMISSION, 2019b.

¹⁷ CPUC, 2018a.

¹⁸ CPUC, 2016.

¹⁹ CARB, 2018.

²⁰ Electrify America, 2018c.

²¹ Electrify America, 2018d.

²² Executive Order B-48-18.

454 (Corbett, Chapter 418, Statutes of 2013). CARB has assessed industry developments since the adoption of SB 454, and has determined that industry has not met the requirements of SB 454. Due to industry not implementing these requirements on their own, CARB is now taking regulatory action to ensure the outcomes intended by the legislature.

A. Senate Bill 454, Corbett, Chapter 418, Statutes of 2013

In September 2013, Governor Brown signed the Electric Vehicle Charging Stations Open Access Act (SB 454) into law.²³ SB 454 sought to increase PEV owners' confidence in EVSE and improve PEV drivers' ease of charging access to encourage PEV adoption and market development. A California Assembly Floor Analysis explained, "electric vehicle (EV) consumers need confidence that they can access a robust network of publicly available EVSE. Any EV driver should be able to access any publicly available EVSE, regardless of the system provider."²⁴ According to the California Assembly Floor Analysis, "EV consumers and drivers need to be able to find the stations and know how much they cost."²⁵

SB 454 prohibits a provider of an EVSE from requiring a user to (1) pay a subscription fee or (2) obtain membership to use the EVSE, and "[a]n EVSE that requires payment of a fee shall allow a person desiring to use the station to pay via credit card or mobile technology, or both."²⁶ Additionally, the bill requires total charges for EVSE use, (including any network roaming charges for nonmembers), to be disclosed to the public at the point of sale. To improve consumer knowledge of the EVSE's capabilities, SB 454 requires EVSPs to label EVSE in accordance with federal regulations.²⁷

To assist PEV drivers in finding public EVSE and to improve consumer access to charging information, SB 454 requires the EVSP to disclose to the National Renewable Energy Laboratory (NREL) the station's geographic location, schedule of fees, accepted payment methods, and the amount of network roaming fees charged to non-members.²⁸ Largely through collaboration with infrastructure service providers, NREL gathers and verifies EVSE data. The AFDC website and mobile applications disseminate information on EVSE location, fees, and other relevant data to PEV owners.

SB 454 authorizes CARB to adopt interoperable billing standards for EVSE network roaming payment methods. Roaming enables a member of one EVSP to use that membership credential on a different EVSP. Upon completing the charging session, the two EVSPs send and receive billing information to complete the transaction. Drivers

²³ Cal. Health & Safety Code § 44268.

²⁴ SB 454, 2013.

²⁵ Cal. Health & Safety Code § 44268.1(f).

²⁶ Cal. Health & Safety Code § 44268.2(a)(1).

²⁷ Title 16 CFR Part 309.17.

²⁸ NREL, 2018.

benefit from roaming by using one membership card or mobile application at other networked EVSE.

Another component of SB 454 is the Code of Federal Regulations (CFR) Title 16 Part 309 label requirement. CFR Title 16 includes Commercial Practice rules and regulations set by federal agencies. Part 309.17 describes labeling requirements for electric vehicle fuel dispensing systems (referred to in this staff report as EVSE). This label has size and font requirements. The label must indicate the type of fuel (electricity), if the method of delivery is conductive or inductive, and the voltage, amperage and kilowatt (kW) capabilities of the EVSE. The Federal Trade Commission adopted Section 309.17 on April 23, 2013. The label requirements notify a driver of EVSE capabilities before fueling a vehicle. Compliance with the labeling requirement appears to be minimal on existing EVSE installations.

SB 454 also requires payment components on EVSE for consumer use. SB 454 states “an electric vehicle charging station that requires payment of a fee shall allow a person desiring to use the station to pay via credit card or mobile technology or both.”²⁹ The requirement creates a familiar user interface and interaction point for users. Many drivers have found it difficult and confusing to charge their vehicle in public because the EVSE does not have quickly recognizable payment technology.^{30 31}

B. PEV Growth

CARB designed the ZEV regulation to accelerate the commercialization of PEV and FCEV technology. During the 1990s and early 2000, manufactures produced and marketed a limited quantity of ZEVs, primarily distributed in California. The PEV market has developed considerably since the reemergence of commercially available vehicles with PEV technology in late 2010. The introduction of the model year (MY) 2011 Chevrolet Volt, followed soon after by the MY2011 Nissan Leaf have lead the way to 45³² models offered by 14 manufactures at the beginning of 2019. In addition to PEV model availability, market shares, and sales volumes all have increased steadily over time. Figure 1 shows the California Monthly Sales of PEVs from December 2010 to December 2018.

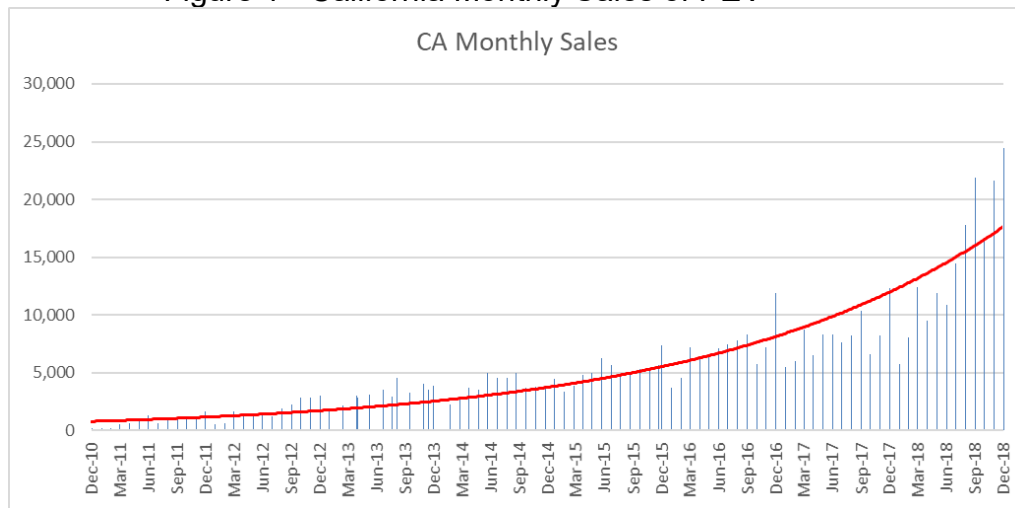
²⁹ Health and Safety Code 44628.2(a)(1)

³⁰ Van Haaren, 2016.

³¹ Brye, 2017.

³² Veloz, 2019.

Figure 1 - California Monthly Sales of PEV^{33, 34}



C. EVSE Technology

This proposal uses specific terminology for EVSE components and locations. A station is the address location where EVSE are located. An EVSE³⁵ is the unit that controls the flow of electricity to the vehicle. A port is the number of vehicles that may charge at the EVSE at one time and is not necessarily the same as the number of connectors. Connectors are the physical plug that connects to the vehicle. There are four common plug standards: SAE J1772, DCFC SAE CCS, DCFC CHAdeMO, and Tesla. Figure 2 displays examples of EVSE with single and multiple connectors. The proposed regulation places requirements on EVSE located in publicly accessible locations but does not place requirements on connector types.

³³ This chart is of PEV only, no FCEV. Veloz, 2019.

³⁴ The red line represents the exponential growth over time.

³⁵ EVSE can be a Level 2 or DCFC unit.

Figure 2 - EVgo DCFC single port dual connector, Blink Level 2 single port single connector, ChargePoint Level 2 dual port dual connector



For the purpose of the proposed regulation, the staff report will focus on publicly accessible Level 2 and DCFC EVSE and not ports, because the proposed regulation affects EVSE. According to the AFDC station locator as of December 31, 2018, there are 6,860 public Level 2 EVSE ³⁶ and 1,031 public DCFCs in California.

A networked EVSE uses a cellular data or other connection to communicate with one or more central servers (which may be cloud-based servers). This data connection permits, among other things, verification of membership access for a prospective charging customer and facilitates payment options. A non-networked EVSE has no data connection to an EVSP.

Level 2 public EVSE are not standardized for consumer access. The display interfaces may vary depending on if the EVSE is networked or not, free, or fee for service. Many EVSE that are not networked only have a start-stop button and indicator lights displaying if the EVSE is dispensing electricity. A networked EVSE typically has a scrolling display or LCD display to share information with the user. These EVSE may be free for drivers to use; however, the ones that are fee-for-service currently do not all display fees associated with use. Depending on the network, drivers may download a smartphone application (app) and enter credit card information, cell phone number, and/or an email address. The lack of uniformity in accessing a fee-for-service EVSE is confusing for new users. If the network is unavailable, or if the driver's cell phone does not have a connection or is incompatible, the driver may be unable to initiate a charging session.

³⁶ This number includes public networked, non-networked, free and paid Level 2 EVSE. This number does not include tesla destination chargers.

A driver may start a charging session at an EVSE using one or more of the following methods, depending on the setup at the specific EVSE. Most EVSE are not set up to accommodate all of these methods, and some EVSE have only a single payment method.

One way to start a networked EVSE charging session is by calling a toll free number. This method requires that the driver give information over the phone, such as identifying the EVSE number, credit card information, and contact information such as phone number or email.

A second method of starting a charging session is by radio frequency identification (RFID) card provided to the driver ahead of time by the EVSP. Typically, this method also requires the driver to download a mobile phone app from the desired EVSP and become a member of their network. Membership requirements vary by EVSP, and may include a monthly fee that may or may not go towards the price of charging, a minimum amount of money kept in the membership account for use towards the cost of charging, or a reduced price for charging with no money held in an account. The driver, if wishing to initiate a charging session with an RFID card, will need to spend time prior to charging in public to create an account, place necessary information into the account, and wait for the RFID card to arrive in the mail. Once the driver has the RFID card, the driver initiates charging at a public EVSE by simply placing the RFID card near the location on the EVSE (Figure 3) to activate the unit.

Figure 3 - Sample EVSE allowing membership RFID card to initiate a charging session



Another method of initiating a charging session is through a mobile app designed by the EVSP (Figure 4). Drivers have the option to download this app either prior to charging at an EVSE or upon arriving at the EVSE. Credit card information is necessary for charging session payments using a mobile app.

Figure 4 - Sample EVSE allowing mobile application to initiate a charging session



A driver may also initiate a charging session by using a physical credit or debit card. This, of course, requires that the EVSE have a credit card reader and that the EVSE provider accept the credit card network type. Payment may be initiated by swiping the card in a magnetic strip reader or inserting the card in a chip reader. More recently, some banks have begun to provide credit cards with RFID chips that allow the driver to hold the card near an RFID reader on the EVSE, comparable to the RFID card described above.

A pressing need to address public EVSE access comes from the pace at which PEVs are entering the California fleet. According to the Clean Vehicle Rebate Project website, over 6,000 new PEVs are being added to California roads each month.³⁷ New PEV drivers will benefit from ready access to public chargers. Addressing transparency in billing, AFDC mapping tools and ensuring multiple payment and non-member access will facilitate consumer adoption.

Open access issues do not just affect individual drivers. Fleet operators such as the California Department of General Services and California Department of Transportation (Caltrans) experience access issues through their drivers. Fleet vehicles typically utilize credit cards for fueling during travel. Lack of credit card payment options limit PEV utility in fleet situations as use of membership-based networks does not work for many fleets. Credit card readers on publicly available EVSE would likely increase fleet PEV usage because users would have greater confidence with fueling the vehicle in public settings.

Staff have identified a number of challenges EVSE users may encounter with today's EVSE. User interfaces for EVSE are not standardized and can cause confusion for PEV drivers because drivers may have to use a number of methods to pay for public charging sessions. EVSE may be located in remote locations that may not have a

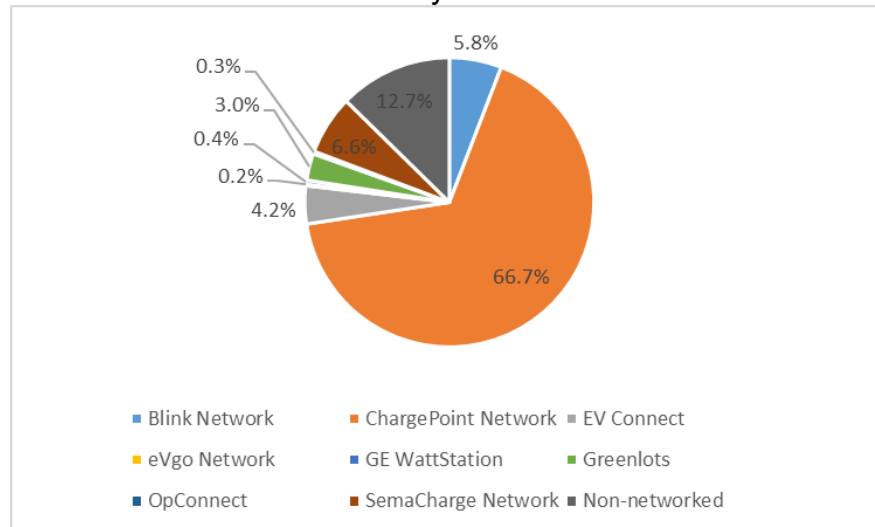
³⁷ CVRP, 2019.

strong cell phone signal. While the EVSE itself may have cellular technology components to maintain network connectivity, drivers with cell phones may not be able to download the smartphone application or place a toll-free call to initiate a charging session.

D. Charging Infrastructure

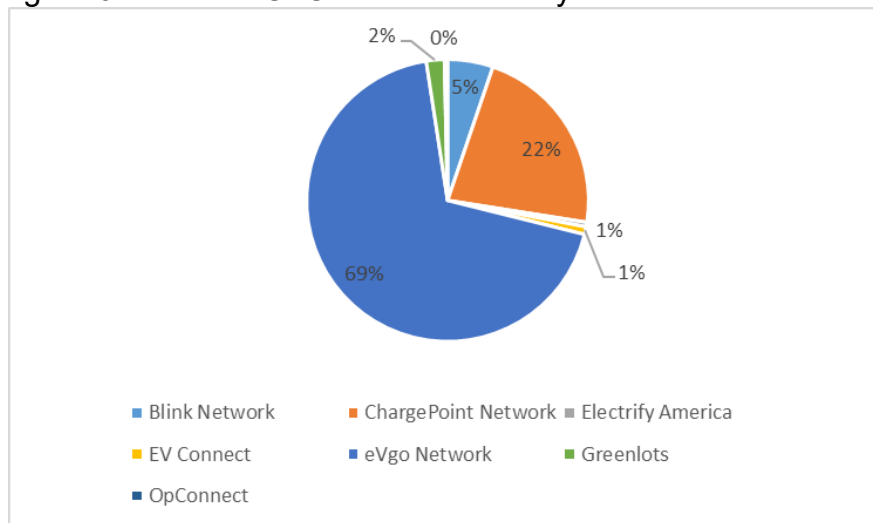
While the predominate form of fueling a PEV is home charging, public infrastructure plays an important role. In California, there are seven EVSPs with networked Level 2 EVSE, and Figure 5 shows their market share. Figure 6 shows the market share for EVSPs operating DCFCs in California. The new Electrify America network opened its first stations in California at the end of 2018, and CARB staff anticipates that the network will expand in the coming years.

Figure 5 - Public Level 2 Market Share by Network and Non-network Providers³⁸



³⁸ AFDC, 2018a.

Figure 6 - Public DCFC Market Share by Network Provider³⁹



A non-networked EVSE, which may also be known as a “dumb” charger, does not connect to a back-end network in order to dispense electricity. Most non-networked EVSE are Level 2 EVSE, but there are a few operational DCFC EVSE that are non-networked. An example of this type of EVSE is the Clipper Creek CS-40, seen in Figure 7. This EVSE does not require confirmation of payment to start a charging session. A driver initiates a charging session by plugging the connector into a vehicle.

Figure 7 - Clipper Creek CS-40



An example of a networked EVSE is the ChargePoint CT4000 Family⁴⁰ seen in Figure 8. This type of EVSE needs an internet connection to send and receive information from a networked server in order to operate.

³⁹ AFDC, 2018c.

⁴⁰ ChargePoint, 2019.

Not all public locations are suited for networked EVSE. Locations that are not suited for a networked EVSE are located in remote locations that have low cellular connections such as underground parking garages. In addition, site hosts may not want to have a networked EVSE for the drivers they expect to charge at that location.

Figure 8 - ChargePoint CT4000 Family



E. Payment Methods

The purpose of this section is to describe the different payment technologies that are currently being used on the EVSE as well what technologies CARB staff propose in this rulemaking. CARB staff researched and examined each of the technologies during formulation of staff's proposal. Sharing the knowledge about the payment methods is crucial to understanding staff's proposal.

1. Europay MasterCard Visa Chip

Initiated by Europay, MasterCard, and Visa (EMV), EMV is a global standard for credit and debit card payments based on computer chip technology – for secure payments made with chip cards. As a response to increasingly frequent and expensive fraudulent activity (estimated to be around \$8.6 billion annually in the U.S.),⁴¹ the payment card networks and bank card issuers in the U.S. adopted the movement to the EMV standard, which had been in use in other parts of the world, such as in Europe and Canada, for many years prior to U.S. adoption.

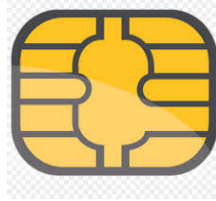
While there is no law that requires businesses to be EMV compliant, liability issues incentivize businesses to make the transition to EMV processing. In October 2015, major global credit card payment networks shifted fraud liability to the party that was not chip-enabled. This shifted liability to merchants who do not accept secure payments

⁴¹ Davidson, D & Turmel, S., 2017. "Chipping" in for Consumer Protection or Chipping Away at Small Business? Southern Law Journal. 52, Vol. XXVII.

using EMV transaction systems and merchants would be liable for fraudulent transactions instead of the processing network.⁴² As a result, merchants, issuers, and processors have largely upgraded their payment systems to an EMV infrastructure for credit and debit cards.⁴³

EMV-compliant chip card payments offer an advantage over older magnetic-stripe cards that use technology that is more prone to counterfeit. Chip cards offer increased security by encrypting data during a card transaction. For consumers, the EMV chip thus offers more security over the mag swipe system, which lacked similar protections against counterfeit and skimming. Figure 9 shows what an EMV chip looks like on credit and debit cards.

Figure 9 - EMV chip



2. RFID

Radio frequency identification (RFID) is a term for technologies that use radio wave wireless communication between system components of tags and readers to identify people or objects.^{44, 45} A common RFID system includes readers, tags, and back-end servers to process and store relevant tag information received by the reader.⁴⁶ With RFID technology, a reader has the capability to emit radio waves via an antenna or coil and receive radio wave signals back from RFID tags using a transceiver.⁴⁷ The counterpart component, an RFID tag, is comprised of a microchip attached to an antenna to transmit information to a reader.⁴⁸ Radio waves sent from the tag to the reader are converted into digital information for computer processing.

RFID systems offer a cost-effective mechanism and added efficiency for certain end-use applications. From a cost perspective, a low-frequency RFID reader circuit board may cost under \$100 USD and passive tags may cost between 1 to 10 cents each.⁴⁹ More elaborate readers that can read multiple frequencies and protocols may cost up to \$750 USD.⁵⁰ However, RFID systems pose security and privacy concerns as data can

⁴² Smart Card Alliance, 2015. EMV and NFC: Complementary Technologies Enabling Secure Contactless Payments.

⁴³ Smart Card Alliance, 2015. EMV and NFC.

⁴⁴ FDA, 2018.

⁴⁵ Roberts, C.M., 2006.

⁴⁶ Bolotnyy, L. and Robins, G., 2007.

⁴⁷ Ali, A.H., Abouhogail, R.A., Tarrad, I.F., and Youssef, M.I., 2014.

⁴⁸ RFID Journal, 2018.

⁴⁹ Roberts, C.M., 2006.

⁵⁰ RFID Journal, 2018.

be extracted from tags to track individuals or purchase habits.^{51 52} As a response to privacy and security issues, RFID technology and regulations have evolved to protect consumers and their data. Due to concerns about consumer privacy, RFID tags were developed with a kill switch to disable tags and blocker tags were developed to prevent tag misuse.⁵³

Many EVSE currently use RFID cards to process payments via an issued membership card. The driver first signs up with an EVSP; shortly thereafter, the EVSP ships a card to the driver. The driver then uses the RFID card to initiate and pay for charging sessions. Currently most networked EVSE have this technology built in.

3. Contactless Payment

One payment method on the horizon is contactless payments. The driver places a card in front of a reader to initiate payment. Some EVSE are entering the market with this hardware enabled for customer use, though it still remains a very small segment of the market. Contactless payments are primarily enabled on credit cards.

While near field communications (NFC) is often used in the context of smartphone platforms for payment applications, NFC technology is a set of communication standards that enables devices in close proximity to communicate with each other.^{54,55} As a subset of radio frequency identification (RFID) technology, NFC occurs via wireless data transfer along high frequency radio waves (13.56 MHz).⁵⁶ This technology enables contactless payments or transactions without the need for an internet connection and without physical contact between a point-of-sale terminal and payment device.⁵⁷

Initially developed in late 2002 by Philips and Sony, NFC was later standardized by the International Organization for Standardization (ISO) and is promoted today through NFC Forum specifications.⁵⁸ The NFC specifications were developed as an extension of the existing ISO 14443 standard for RFID contactless proximity smart cards, which defined physical card characteristics, radio frequency power and signaling, anti-collision provisions, and transmission protocol requirements.⁵⁹

⁵¹ Smiley, 2016.

⁵² Dubin, 2006.

⁵³ Want, Roy, 2006.

⁵⁴ Tushie, David. 2012.

⁵⁵ Smart Card Alliance, 2015.

⁵⁶ Ortiz, 2006.

⁵⁷ Smart Card Alliance, 2016.

⁵⁸ Ortiz, 2006.

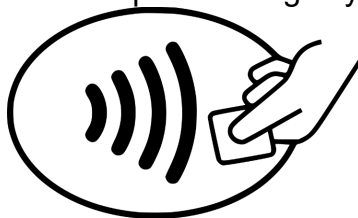
⁵⁹ NFC Forum, 2011.

Contactless payment viability was introduced to the market in the mid-2000s with little success for adoption.⁶⁰ The availability of this technology is still limited throughout the US, but contactless payment hardware and cards are gaining market share for American consumers. Today, about 5% of U.S.-issued payment cards are contactless-enabled.⁶¹ Figure 10 and Figure 11 display symbols that consumers will see if the point of sale hardware is capable of contactless payments.

Figure 10 - NFC symbol



Figure 11- Tap and charge symbol



i. Tokenization – e.g. Apple Pay, Samsung Pay

Mobile NFC devices store cardholder and payment information in a mobile wallet application, such as Apple Pay, and encrypt payment card information when engaged through the NFC process. As such, credit or debit card information is not directly transmitted, and stored information on a smartphone is typically programmed on a phone using a tokenization random number safeguard. A common trend with mobile NFC devices, a token is created from the card information and only the token information is sent to the merchant. As an additional security measure, device management software can wipe information on the phone in the event of a stolen or misplaced device. Contactless transactions that use dynamically encrypted payments enhance security for consumers. Contactless EMV chip and mobile NFC device transactions provide the potential for added levels of security. These NFC-enabled devices utilize both the traditional encrypted function of a contact EMV chip and the added potential of enhanced security features, such as a pass code.

4. Payment Card Industry – Data Security System

⁶⁰ Woodward, 2018.

⁶¹ McCann, 2018.

In order to ensure the EVSE has the highest form of security for payment processing on for both the driver and the EVSP a research into payment card industry standards was necessary. EVSE are typically located in locations that do not have an attendant much like parking meters. The following is a discussion on the Payment Card Industry Data Security Standard (PCI-DSS) which are standards for data security for units that require payment.

The PCI DSS is a set of data security standards established by the PCI Security Standards Council to ensure secure credit and debit card transactions. The PCI Data Security Standards establish standards for safe and secure handling of consumer credit and debit card data to protect against theft and fraudulent activity. Although there is no state or federal regulation guiding PCI DSS compliance, it is a requirement for businesses that process credit or debit card transactions as dictated by the credit card networks of the standards council.

The requirements for PCI DSS compliance vary based on the type of data handled by a given business. The type of business and actions performed determine the risk level of the business and subsequent compliance obligations. For instance, a business that stores customer payment information for online credit card processing would have to meet additional requirements than a retail business that does not have online transactions. PCI compliance requirements also vary based on the number of credit and debit card transactions processed on an annual basis by a business. Level 1 compliance is triggered when merchants process more than six million real-world transactions annually, a merchant that has experienced an attack resulting in compromised card data or a merchant deemed Level 1 by a card association. Level 1 merchants must undergo an internal audit by an authorized PCI auditor once a year and get a PCI scan by an Approved Scanning Vendor every quarter.

PCI DSS primarily acts on twelve main requirements to protect data guided by commonly known best practices for data and network security. The current twelve PCI DSS overarching requirements include:

- 1) Install and maintain a firewall configuration,
- 2) Do not use vendor-supplied security parameter and system passwords,
- 3) Protect stored cardholder data,
- 4) Encrypt cardholder data when transmitted across public networks,
- 5) Keep anti-virus software up to date,
- 6) Maintain secure systems/applications,
- 7) Restrict cardholder data access,
- 8) Assign unique IDs for computer access,
- 9) Restrict physical access to cardholder data,
- 10) Monitor access to data and network resources,
- 11) Maintain and test security systems and processes, and
- 12) Maintain policy to address information security for all personnel.

For most merchants to meet PCI DSS compliance, a self-assessment questionnaire must be completed and updated on an annual basis. Generally, PCI DSS compliance requires maintaining a comprehensive data management system incorporating basic principles of data security for all system users and providing documentation of policies and procedures for compliance.

As a result of PCI DSS compliance requirements, merchant service providers are likely to charge merchants a PCI compliance fee for services such as security scans, data breach insurance, and education/assistance and may also charge a PCI non-compliance fee when a business is out of compliance.

PCI security for handling cardholder data and maintaining secure networks minimizes risk of data breaches and malicious activity that can result in costly repercussions for businesses.

F. Interoperable Billing Standards

An interoperable billing standard is the communications protocol that an EVSP will install and maintain in order to enable roaming agreements for members of the EVSP. Roaming agreements are contracts set up between two or more EVSPs that allow members of the EVSPs to use EVSE operated and maintained by the agreeing parties. There are times a driver may need to use a public charging station for which the driver does not hold membership. For example, the driver may be visiting a new area as part of a longer road-trip. Alternatively, the driver may be borrowing or renting an electric vehicle. In these situations, drivers would greatly benefit from the ability to use a credit card at the EVSE or if there is a roaming agreement in place, be able to use another membership RFID card or smartphone app to initiate a charging session. CARB supports communications protocols and standards that are free of fees associated with intellectual property.

Interoperable billing standards were created to enable driver roaming. Open Charge Point Interface (OCPI), an open source communication protocol-enabling driver roaming, is used by many domestic and international charging infrastructure providers. Five EVSPs announced roaming agreements using OCPI in 2018.^{62,63,64} Open InterCharge Protocol (OICP), a communication protocol implemented by Hubeject, Inc. enables driver roaming in 24 countries to date.

CARB staff evaluated OCPI and OICP based a number of criteria, including the following: current market acceptance, future standardization, open usability, and features of the communication protocol. The features provided by OCPI and OICP are generally similar. At this point in time for the American market, OCPI has greater market acceptance domestically. Roaming agreement announcements have

⁶² Greenlots, 2018.

⁶³ Moran, 2018.

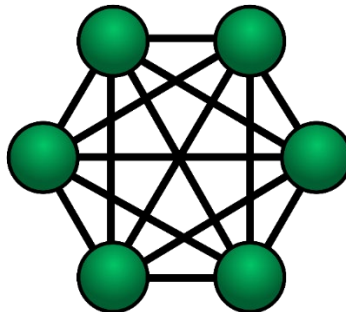
⁶⁴ ChargePoint, 2018.

highlighted the use of OCPI as a common communication protocol for the roaming platform. Stakeholders stated in workshops and meetings that OCPI is the standard to use for facilitating driver roaming. The EVSPs have openly supported having CARB adopt OCPI as an interim test procedure. CARB's adoption of OCPI in this proposed rulemaking may assist industry in having OCPI formally adopted through a traditional standards process with an entity such as OASIS or SAE International. CARB staff is not aware of similar plans for OICP to be standardized. At this point in time, OCPI is the only protocol freely available for market use. In order to install and implement OICP, an EVSP would need to sign an agreement and make a payment to Hsubject, Inc. Once these steps are completed then the EVSP can install and operate OICP. Finally, requiring EVSE to implement OCPI does not prevent them from also using OICP, or for that matter, any other additional communication protocols in addition to OCPI.

1. Mesh Network

A mesh network is composed of individual companies creating contracts with other companies to enable driver roaming. Mesh networks provide EVSPs flexibility to develop contracts with individual companies. The roaming agreements that industry has announced to date in the US fall under the mesh network setup. An interoperable billing standard utilizing a mesh network is OCPI. NKL developed this standard with support from EVSPs in Europe. Figure 12 provides a depiction of a mesh network. Any one EVSP can talk to one or many other EVSPs to enable roaming.

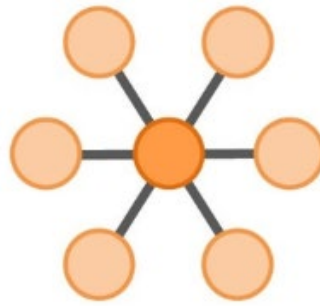
Figure 12 - Sample mesh network connections



2. HUB AND SPOKE NETWORK

Another model for roaming agreements is a hub and spoke network. A hub, also known as an e-mobility service provider, is a single entity that helps information flow between the spokes. A spoke is an EVSP that connects to the hub. Each member of any spoke is able to use any other EVSP connected to the hub. Figure 13 provides a depiction of a hub and spoke network. This model reduces the number of contacts between EVSPs because any one EVSP would need to simply contract with the third party hub to connect to the other EVSPs.

Figure 13 - Hub and Spoke Network



Open InterCharge Protocol (OICP) for Charge Point Operators and OICP for E-mobility Service Providers are the interoperable billing standards used to create this network. Hubject Inc. is a leading example of these communication protocols. The hub and spoke network is a good method for connecting smaller EVSPs to other EVSPs, enabling driver roaming on different networks.

G. NREL Alternative Fuels Data Center

The AFDC is a resource of the U.S. Department of Energy (DOE) Vehicle Technologies Office (VTO). AFDC provides information, data, and tools to help transportation decision makers find ways to reduce cost and improve energy efficiency.⁶⁵ One of these tools is the Electric Vehicle Charging Station Locator (Station Locator)⁶⁶ which holds EVSE station locations in the US and Canada. Infrastructure planners and drivers can use this tool to see what is currently available to use for charging in public spaces. Infrastructure planners also use this central source of information to help plan new locations for EVSE. Currently all EVSPs operating in California send EVSE location information to the AFDC on a regular basis. Most EVSPs have set up an Application Programming Interface (API) with AFDC to port over information every 12-24 hours.

H. Division of Measurement Standards

California Department of Food and Agriculture (CDFA) Division of Measurement Standards (DMS) has proposed a regulation to adopt National Institute of Standards and Technology (NIST) Handbook 44 for all commercial use EVSE within California.⁶⁷ This proposal requires the adoption of type testing procedures for new and installed EVSE models. The proposal also requires the sale of electricity as a transportation fuel in units of kilowatt-hour or mega-joule, and for the EVSE to indicate to the driver how much electricity the EVSE dispensed. Staff from CDFA and CARB have coordinated implementation timelines that are complimentary to each proposed regulation.

⁶⁵ DOE, 2019.

⁶⁶ AFDC, 2018b.

⁶⁷ CDFA, 2019.

III. PROBLEM THAT THE PROPOSAL IS INTENDED TO ADDRESS

This proposal aims to provide a driver the most straightforward and flexible options to use publicly available EVSE in order to minimize one barrier to ZEVs. There are many different methods of initiating a charging session. However, these methods require prior knowledge of the systems or a smart phone. While early adopters of PEVs likely have easy access to smart phones and mobile internet service, drivers in the broader market may not always have access to these technologies. Additionally, driver confusion when trying to fuel a vehicle at public sites may discourage drivers from considering a PEV for their next car.

PEV drivers who are new to charging their cars beyond their place of residence face a learning curve. While their cars will easily connect to most Level 2 EVSE, the interfaces to initiate a charging session are not similar. Some Level 2 EVSE allow tap-and-charge credit cards, and almost all have a phone number displayed for the driver to call an operator and initiate a charging session. The most common way to initiate a charging session is through using a membership RFID card or downloading a smartphone app from the EVSP. With different options for starting a charging session, it may take additional time to initiate the needed charging session due to confusing requirements and lack of industry-wide approaches to payment.

A similar learning curve is present for those drivers who may be visiting California, and even if they are familiar in general with electric vehicle charging, they may not be familiar with the variety of methods presented to them in California. Furthermore, they may not have the membership cards or mobile phone apps necessary to access charging at California EVSE. California has many tourist destinations for local, domestic, and international visitors. As longer-range BEVs and PHEVs become available for visitors to use coming into and around California, it is vital that drivers have access to EVSE that they are familiar with and have the ability to use. In 2017, California saw 223.9 million person trips to the state.⁶⁸ As more visitors in California make the choice to drive in a PEV on the some 195,834 miles of public roads,⁶⁹ the need to make fueling a PEV easy and familiar is a priority. TravelsAmerica completed a survey of trips made to and around California in 2016. Of the 6589 trips surveyed, 5102 of the trips were completed in an auto, truck, rental car or truck and camper.⁷⁰

Fleet drivers also face issues charging in public because they may not be assigned a membership card, but rather provided a company credit card to pay for fueling. Currently fueling at an EVSE with the company credit card would not be an option unless the driver was able to download and install the correct mobile phone application. The driver would be able to call a toll-free number and pay over the phone, but that loses time for the driver who needs to get a charging session started quickly and phone

⁶⁸ Visit California, 2018.

⁶⁹ U.S. DOT, 2015.

⁷⁰ Visit California, 2016

communication is not always available when needed. Lower income drivers may lack access to updated technology such as smartphones that have reliable service. access to bank cards that have contactless payment options and access to traditional bank accounts that issue debit cards is more prevalent but still limited. Many banks issue debit cards that have a credit company logo on it, which opens up accessibility to payment hardware for basic goods and services.

Having a smart phone does not always mean the driver has the ability to pay with the smart phone features. The driver may not have the right type of credit card to input into the phone, as some credit issuers do not subscribe to smart phone payment systems. Some drivers may only have access to prepaid credit cards available at grocery stores or convenience stores. Pre-paid cards cannot currently be used in smartphones, but can be used in traditional card readers. Giving consumers the flexibility of both payment options will create greater open access for the broadest population of drivers.

“Anyone who has used public EVSE [chargers] knows that the process requires a bit of learning.”⁷¹ PEV drivers should be able to easily fuel their car in public settings. Using a single database such as AFDC to get an address and information about a location should be simple. A driver should have the ability to use a uniform payment method of a credit card reader on the EVSE to initiate quickly a charging session. Drivers should also clearly know what they are going to be charged for a charging session before use. Conventional vehicle drivers are clearly notified at the point of sale that they are paying for a gallon of gasoline, the price of that gallon, if there is a credit card fee or not, and if a membership opportunity is available. PEV charging infrastructure does not have comparable standardized information.

The proposed regulation establishes standards for PEV fueling infrastructure. The proposed regulation will standardize the driver charging experience by requiring the installation of credit card readers on all public EVSE. The proposed regulation will require, at a minimum, an EMV chip reader. The credit card industry already requires the EMV chip on all debit and credit cards, so drivers will already have knowledge of what a chip reader looks like and how to use it.

An additional method of payment that is becoming more popular for some drivers to use is NFC, which is a way to remit payment for goods and services using a mobile device like Apple Pay and Samsung Pay. The proposed regulation also requires EVSPs to ensure that all EVSE have a physical credit card reader and a NFC reader (to accept mobile payment). Typically, the credit card reader and NFC reader are incorporated into one payment unit. The credit card reader and NFC reader may be installed either on the EVSE itself or at a nearby kiosk that services one or more EVSE at the site. This provision is to comply with SB 454’s requirement that an EVSE “shall allow a person desiring to use the station to pay via credit card or mobile technology, or both.”⁷² The objective of this proposed requirement is to ensure that consumers have convenient charging session payment access. The benefit of this proposed requirement is to

⁷¹ Field, 2019.

⁷² Cal. Health & Safety Code § 44268.2(a)(1).

provide public charging access for all consumers including those who may not have smart phones or may not be familiar with using public charging infrastructure.

For each EVSE, the service provider shall provide to the PEV user a complete listing of all fees that the user may incur at the time of a charging session. The fees may include, but are not limited to, the connection fee, the kilowatt-hour (kWh) cost of electricity, credit card fees, parking fees, non-membership plug-in fees, increased charges after plug-in session ends, and any other fees chargeable to the PEV user. To ensure the fee structure is transparent to the driver and avoid any surprises regarding cost of use, all fees must be clearly displayed at the point of sale. Consumers paying for a charging session can be billed on different scales such as \$/kWh, \$/minute, \$/hour, or flat fees per session. The Electric Power Research Institute completed a study of National Charging Costs⁷³ that found over 350 unique charging cost examples. The proposed regulatory provision to require complete information about all costs for charging will improve drivers' understanding of their fueling costs and ensure they are aware of all charges before fueling.

Because industry has not adopted national interoperability billing standards, CARB is proposing the use of "California Open Charge Point Interface Test Procedures for Networked Electric Vehicle Supply Equipment for Level 2 and Direct Current Fast Charge Classes."⁷⁴ This document is based on OCPI 2.1.1⁷⁵ CARB supports the use of open source communication protocols and acknowledges that other products are currently in development. Staff continues to track this field and will consider additional communication protocols if warranted.

This proposed regulation fulfills the actions called out in the SB 454 Statute of 2013 including enabling universal access to public charging infrastructure for California drivers, ensuring pricing transparency for PEV fueling, and installing signage at public EVSE that informs drivers of prices per unit of measure and applicable charging voltages. Without this regulation, there would be no standardization as required and no consistency in compliance.

IV. SPECIFIC PURPOSE OF EACH PROVISION, AND RATIONALE FOR CARB'S DETERMINATION THAT EACH ACTION IS REASONABLY NECESSARY

A. Section 2360. Applicability

The proposed regulation will affect all current and future operators of public Level 2 and DCFC EVSE in California. The proposed regulation does not require new installations of new EVSE in California, nor does it require current or future EVSE to be publicly

⁷³ Dunckley, 2017.

⁷⁴ Appendix B

⁷⁵ OCPI, 2017.

accessible. The proposed section identifies the regulated party and adds new definitions.

§ 2360(a) Purpose: Staff is proposing the regulated party be EVSPs who operate in California. Staff is also proposing the affected units be publicly accessible Level 2 and DCFC EVSE. The proposal contains requirements for networked and non-networked EVSE, as well as fee for service and no fee for service EVSE. If an EVSP operates any non-publicly available EVSE in California, the requirements do not apply to that equipment.

§ 2360(a) Rationale: The proposed applicability section explains that EVSPs are the regulated party if they operate EVSE that are publicly accessible in California. In addition, the applicability section limits the proposed regulation to Level 2 and DCFC EVSE, regardless of being networked or non-networked.

§ 2360(b): Staff is proposing a series of definitions:

Charging session.

Purpose: Defining charging session to distinguish event data needed for the annual reporting requirement.

Rationale: Charging sessions will always be initiated either by a driver, or, as technology evolves, by a vehicle. Staff is defining a start and stop period that will help regulated parties for reporting purposes.

Common interest development.

Purpose: Defining a location excluded from the regulation.

Rationale: Staff is implementing Health and Safety code 44268(g) as part of defining publicly available parking space and the exemptions. That statute uses the phrase “common interest development,” which does not have a consistent commonly-understood definition.

Direct Current Faster Charger (DCFC).

Purpose: Defining equipment to which the proposed regulation will apply.

Rationale: Staff is proposing to require EVSPs to meet requirements of Chapter 8.3 on DCFC EVSE. Additionally, some of those requirements for DCFC EVSE are on a separate timeframe than Level 2 EVSE. Thus, it is necessary and appropriate to include a definition for DCFC. CARB staff derived the definition from the definition for

DCFC found in the SAE International's J1772 standard⁷⁶, and it is consistent with industry definitions.

Electric Vehicle Service Provider (EVSP)

Purpose: Defining the regulated party.

Rationale: The definition is a list of common tasks the EVSP does for the operation of the EVSE. Though there are more functions and roles the EVSP provides, these are the minimum functionalities needed to be considered a regulated party for the purposes of this proposed regulation.

Electric Vehicle Supply Equipment (EVSE)

Purpose: Identifying the specific unit that will be the regulated unit.

Rationale: This is a single unit that controls the power supply to a vehicle in a charging session, or multiple vehicles in concurrent charging sessions, including charging sessions requiring payment and not requiring payment. The requirements of this section do not apply to any EVSE that does not meet the definition of Level 2 EVSE or DCFC EVSE.

Kiosk.

Purpose: Identifying the functions of a kiosk to provide an additional option for implementing the credit card and signage requirement.

Rationale: Not all EVSE are in locations that are, or will be, suited for a credit card reader on the EVSE. It is the responsibility of the EVSP to identify when that is the situation and to install a kiosk to fulfill the proposed requirements.

Level 2 Electric Vehicle Supply Equipment (EVSE).

Purpose: Defining equipment for which the proposed regulation will apply.

Rationale: The definition is found in the SAE International J1772 Standard⁷⁷, and is consistent with industry definitions.

Radio Frequency Identification (RFID) card.

⁷⁶ SAE, 2010.

⁷⁷ SAE, 2010.

Purpose: Defining a type of payment technology used by EVSPs for which information must be reported under the proposed regulation.

Rationale: EVSPs currently issue RFID cards for members of their service. This definition distinguishes the different payment technologies for the purposes of reporting.

Mobile payment.

Purpose: Defining a type of payment technology required by the proposed regulation.

Rationale: Mobile payment can mean many different things. Consumers have been using mobile phones to remit payment. The technology needed to complete this payment method is near field communication hardware. This is common terminology used in the payment industry.

Networked Electric Vehicle Supply Equipment (Networked EVSE).

Purpose: Defining an EVSE that has a network connection, because networked EVSEs have different requirements under the proposed regulation from non-networked EVSEs.

Rationale: An EVSP is the controlling entity of a networked EVSE. EVSPs will send and receive commands and messages from the EVSE remotely. These messages can be, but are not limited to, payment, updating the EVSE software, smart charging pricing changes, and if the EVSE is available for use or not. Not all EVSE that are installed or manufactured need a network connection to charge a vehicle.

Non-networked Electric Vehicle Supply Equipment (Non-networked EVSE)

Purpose: Defining an EVSE that has does not have a network connection, because networked EVSEs have different requirements under the proposed regulation from non-networked EVSEs.

Rationale: Non-networked is an industry standard term. Non-networked EVSE do not have a Wi-Fi or communication to an EVSP. EVSE that are non-networked will need to comply with different sections of the proposed regulation. This definition will define the correct equipment that needs to comply with the proposed regulation.

Payment Card Industry Data Security Standard Level 1 (PCI-DSS Level 1)

Purpose: Defining a standard required by the proposed regulation as well as identifying the entity that publishes the standard.

Rationale: Regulated parties need to be able to locate the materials needed to comply with the PCI-DSS standard requirement.

Publicly Available Electric Vehicle Supply Equipment (publicly available EVSE).

Purpose: Delineating exactly which EVSE hardware and locations will be subject to the proposed regulation.

Rationale: Not all locations that host EVSE serve the same purpose or the same clientele. It is important for CARB and regulated parties to distinguish when an EVSE will be required to meet some or all of the proposed regulation. The EVSE must serve the general public and not be limited to a select group of people or vehicles. This is to ensure all drivers of PEVs have access to public EVSE. Properties that are designated only for customers or visitors of a specific business are considered accessible by the public. If a parking space is limited for use part of the time but is open for public use the rest of the time, it is also considered to be publicly accessible, for the purposes of drivers having consistent access to EVSE. There are three exclusions for this definition. The first exclusion pertains to work place settings that are clearly marked for employees, contracted drivers. The second exclusion is for parking spaces associated with residences, visitors, and tenants of a private residence or common interest development. The third exclusion is for EVSE provided by a manufacturer of PEVs for the exclusive use by the vehicles it manufacturers. These exclusions arise from the statutory language.

Service Provider Application.

Purpose: Describing the mobile phone connection and payment conduit used in proposed reporting requirements.

Rationale: The application provides access and payment methods for drivers to connect to EVSE. CARB staff needs to understand the application for the purposes of reporting.

Station ID.

Purpose: Defining the station identifier for proposed reporting requirements.

Rationale: This definition is in line with the AFDC reporting. CARB staff needs to identify the location of the station, as compared to the EVSE ID.

B. Section 2360.1 Requirements for Labeling Electric Vehicle Supply Equipment

This section identifies the responsible party for ensuring the EVSE includes the proper label as required under SB 454. The label clearly indicates the voltage, type of electricity transfer and the amperage to the user of the EVSE.

Purpose: This section identifies the responsible party for ensuring the EVSE includes the proper label as required under SB 454. The section reiterates the labeling

requirement imposed by SB 454 and imposes a compliance deadline for both DCFC and Level 2 EVSEs.

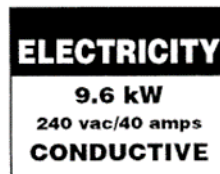
Rationale: All EVSE Level 2 and DCFC that fall under the definition of publicly accessible, need to follow this requirement regardless of payment method. Drivers, regardless if they are paying for a charging session or not, need to clearly see how fast the EVSE can dispense electricity.

The DCFC EVSE deadline, July 1, 2020, will coincide with many different state programs and regulations that affect DCFC EVSE. This creates a seamless timeline for EVSPs to plan to bring up all EVSE to code with as few site visits as possible. EVSPs could place the sticker during one of the earlier site visits for general maintenance

CARB staff intends the EVSE Level 2 deadline, July 1, 2023, to coincide with other requirements in this proposed regulation. This creates a seamless timeline for EVSPs to bring up all EVSE to code with as few site visits as possible.

EVSPs could place the sticker during one of the earlier planned site visits for general maintenance. Figure 14 shows an example of the sticker.

Figure 14 - Sample CFR Title 16 Part 309 Subpart B label



C. Section 2360.2 Payment Method Requirements for Electric Vehicle Supply Equipment

This section describes the hardware, security specifications and what should be displayed to the user. This section also indicates the amount of time the EVSP has to integrate all the hardware and display requirements into the EVSE at a single site.

SB 454 directs that “[a]n EVSE that requires payment of a fee shall allow a person desiring to use the station to pay via credit card or mobile technology, or both.”⁷⁸ A California Assembly Floor Analysis explained, “electric vehicle (EV) consumers need confidence that they can access a robust network of publicly available EVSE. Any EV driver should be able to access any publicly available EVSE, regardless of the system provider.”⁷⁹ According to the California Assembly Floor Analysis, “EV consumers and drivers need to be able to find the stations and know how much they cost.”⁸⁰ Because the Legislature intended SB 454 to benefit consumers and promote EV charging, CARB

⁷⁸ Cal. Health & Safety Code § 44268.2(a)(1).

⁷⁹ SB 454, 2013.

⁸⁰ Cal. Health & Safety Code § 44268.1(f).

is interpreting SB 454's mandate to require EVSPs to give consumers a choice: consumers may use a credit card or consumers may use a mobile payment at an EVSE in California. Therefore, CARB staff has proposed in this regulation that a publicly available EVSE that requires payment will have to permit the consumer to pay using either a credit card or a mobile payment, at the consumer's discretion. The proposed regulation sets forth deadlines to comply with this payment requirement, and imposes related requirements to benefit the consumer.

§ 2360.2(a) Purpose: The requirements of this section apply to publicly available EVSE installed in California that require payment. This section defines which EVSE will be required to follow the proposed regulation requirements.

§ 2360.2(a) Rationale: All EVSE that require payment must meet the requirements of this section. In many instances, EVSE are publicly accessible but do not require payment; these do not need to follow the requirements. It is unnecessary for EVSE to have extra hardware and software if it is not requiring payment for services.

§ 2360.2(b) Purpose: The regulated party is the EVSP, and this section mandates that the EVSP shall ensure that each EVSE that it operates, and for which this section applies, complies with the requirements of this section.

§ 2360.2(b) Rationale: The EVSP by definition will be the responsible entity. CARB needs to define who is responsible for compliance for this regulation

§ 2360.2(c) Purpose: Impose a deadline for compliance for both DCFC and Level 2 EVSE.

§ 2360.2(c) Rationale: Currently 60 percent of DCFC EVSE have credit card readers. Most units also have space available on the exterior cover as well as the circuit boards to add the necessary NFC reader and a credit card reader, if the unit does not have one already. Due to the number of EVSE currently installed, the EVSPs will need a reasonable amount of time to bring EVSE into compliance. New installations of DCFCs must be compliant starting in 2020. This timing aligns with DCFC compliance requirements for the California Department of Food and Agriculture's Division of Measurement Standards rulemaking. There are EVSE that are in use today that need to become compliant and allowing 5 years to become compliant provides an opportunity to work within the 10-year useable lifespan.

July 1, 2023 is a reasonable timeline for implementation for the required hardware on Level 2 EVSE. This will allow almost four years for the EVSP to work with manufacturers and suppliers to create a robust supply chain.

Current adoption of PEVs is at an inflection point. As additional new PEV drivers enter the market, it is imperative that drivers have a stable uniform payment method for a charging session. Retrofitting existing EVSE over a five year time period will prevent

market bifurcation and provide drivers with consistent payment methods. New drivers will have greater confidence in charging in public using easily recognizable payment hardware. Without a retrofit requirement, drivers would be left to figure out on their own whether any given EVSE is a “new” EVSE that accepts credit or debit cards, or an “old” EVSE that does not.

§ 2360.2(d) Purpose: Ensure that each EVSE that accepts payment meets certain minimum standards to accept credit cards for payment.

§ 2360.2(d) Rationale: “According to the author’s office, EV charging stations are currently not as convenient as gas stations. The public has access to only a few stations, and these stations offer few payment options. Most charging stations require a subscription or membership, forcing drivers to buy several memberships and carry them in order to drive longer distances. The author’s office believes this bill will provide the framework for EV charging stations to operate similarly to gas stations, allowing drivers to use their credit cards or phone to pay for charging. Facilitating charging will assist the state in achieving its ZEV, greenhouse gas emission reduction, and air pollution reduction goals, as well as reduce the state’s dependence on petroleum.”⁸¹

Health and Safety Code 44268.2 does not permit service providers to limit charging services to network members.⁸² Under the proposed regulation, service providers may not make payment contingent on becoming a member of the service provider network. Service providers may, however, to continue offering discounts and other promotions to members, provided that non-members are able to pay for charging at the EVSE using the methods previously described.

As stated above, Health and Safety Code section 44268.2 requires EVSE to enable consumers to use a credit card or mobile payment at the consumer’s discretion. Beyond this requirement, however, CARB has determined it is important for EV consumers to have the ability to use either payment technology depending on individual circumstances.

Charging session initiation by a smartphone application is not yet accessible for all drivers. Nearly all California residents (92%) have a cell phone, and 58% have a smartphone. A majority of California residents (56%) access the internet or email by cell phone. However, this usage is associated with higher income and/or younger population segments.⁸³ Mobile payment remains an important option for future EV adoption, particularly because younger population segments tend to be technology influencers.

However, as PEV adoption expands to a broader and more diverse consumer base, smartphone application or internet-based payment mechanisms may not be convenient

⁸¹ Senate Floor Analysis, 2013.

⁸² Cal. Health & Safety Code § 44268.2(a)(2).

⁸³ PPIC, 2013.

or available to all drivers. Additionally, drivers who are borrowing or renting PEVs may not subscribe to EVSP networks with applications on their smartphones.

Most internal combustion engine vehicle drivers use credit cards for purchasing fuel at the over 8,000 gasoline stations in California⁸⁴. Three in four drivers in the United States pay for fuel with a credit card when fueling up according to results from the 2018 National Association of Convenience Stores Consumer Fuels Survey.⁸⁵ Total System Services completed a 2017 survey nationwide of consumers who have access to debit, credit cards and mobile transaction technology from which they concluded, “Consumers continue to prefer debit for daily purchases at the gas station, supermarket and discount store.”⁸⁶ By including credit card payment at EVSE, PEV drivers will be familiar with credit card payment methods as they learn how to use charging stations.

Requiring credit card readers on publically accessible EVSE will provide: (1) PEV drivers greater confidence for extending travel beyond daily use, (2) convenience for fleets to use PEVs throughout the state, and (3) allow PEV drivers the choice to not sign up for membership with the EVSP yet still pay for fueling.

The hardware required are EMV chip readers, which are non-locking and compliant with PCI-DSS Level 1 security standards. The language in subsection (d)(2) is common for parking meters.⁸⁷ In the event of a power failure or issue of any kind, drivers should have the ability to retrieve their card from the reader. Staff is proposing the requirement of PCI-DSS Level 1 compliance to ensure customer and EVSP security when processing credit card payments. Level 1 is the highest security requirement for processing payments because it is for companies that process over 6 million payments in a year or are a high security risk. Some of the EVSE are in unattended locations without monitoring mechanisms for public safety. Therefore, it is important that each of these units have strong security for processing payments. The proposed regulation requires that credit card reader and NFC reader payment systems must be PCI-DSS Level 1 compliant, to secure the payment transactions and protect PEV consumers’ personally identifiable information.⁸⁸ PCI-DSS Level 1 compliance requires a third party to inspect annually the EVSE, and requires the service provider or network operator to use data encryption from the EVSE to the EVSP and back. PCI-DSS Level 1 compliance is industry standard for curbside parking meters and most DCFCs that currently have credit card readers.⁸⁹ This will ensure that EVSPs are using the highest form of security for handling driver payment information. The benefit to this proposed requirement is to provide secure charging session payment transactions at public EVSE locations.

⁸⁴ ENERGY COMMISSION, 2019a.

⁸⁵ NACS, 2018.

⁸⁶ TSYS, 2017.

⁸⁷ City of Sacramento, 2013.

⁸⁸ Control Scan, 2018.

⁸⁹ City of Sacramento, 2013.

§ 2360.2(e) Purpose: Ensure the EVSE has the correct mobile payment hardware installed on the EVSE.

§ 2360.2(e) Rationale: Staff is proposing to implement Health and Safety Code 44268.2(a)(1) to allow a person desiring to use an EVSE to pay via mobile technology. It is in the best interest for PEV drivers to have multiple options for paying for a charging session. As new technologies come into the market for paying for charging, NFC is starting to proliferate the market. It should be up to the consumer how they chose to pay for their charging session.

§ 2360.2(f) Purpose: Require each EVSP to provide, display, and employ a toll-free number on each applicable EVSE or kiosk, to provide the user the option to initiate a charging session at any time, even when the credit card reader and/or NFC reader is not operational.

§ 2360.2(f) Rationale: Staff's proposal of requiring a toll-free number is a failsafe for consumers if other payment mechanisms fail. All EVSPs currently support a toll-free number for drivers that allows payment over the phone.

§ 2360.2(g) Purpose: Impose requirements on payment displays at EVSs or kiosks that will inform drivers of what they will pay for a charging session.

§ 2360.2(g) Rationale: There is confusion for drivers today in paying for charging. This proposed requirement will align with California Department of Food and Agriculture's Division of Measurement Standards proposed EVSE regulation as well as give customers confidence that all fees are displayed ahead of starting a charging session. The kilowatt-hour or megajoule unit pricing creates a uniform pricing structure for electricity as a transportation fuel.

§ 2360.2(h) Purpose: Prohibit the EVSP from requiring a subscription or membership in order to initiate a charging session for an EVSE subject to this section.

§ 2360.2(h) Rationale: This is to implement Health and Safety Code 44268.2(a)(1), which states, "Persons desiring to use an electric vehicle charging station that requires payment of a fee shall not be required to pay a subscription fee in order to use the station, and shall not be required to obtain membership in any club, association, or organization as a condition of using the station."

D. Section 2360.3 Facilitating Roaming Agreements

Purpose: Describe the specific standard the EVSP shall install, maintain, and operate in order to facilitate roaming agreements, and set a deadline for compliance.

Rationale: SB 454 permits CARB to impose standards to facilitate roaming agreements between EVSP networks. This section describes the specific standard the EVSP shall

install, maintain, and operate in order to facilitate roaming agreements. This section also indicates the responsible party to complete this task and the timeline in which they shall do it. The requirements of this section are a minimum requirement. The responsible party may install other standards as well if they so choose.

The provisions of § 2360.3 are specific to networked EVSE and communication with EVSPs. Of the 6,860 public Level 2⁹⁰ and 1,031 public DCFC, 87.5 percent are networked, which means they are connected back to the EVSP. Non-networked EVSE do not use network communication protocols; staff is not proposing to include them into this requirement.

Health and Safety Code 44268.2 permits CARB to adopt interoperability billing standards for network roaming payment methods,⁹¹ and the proposed regulation does so because national standards have not been established. Staff is proposing EVSPs install and operate, at a minimum, the interoperable billing standard Open Charge Point Interface (OCPI) 2.1.1, which is incorporated in this regulation as the “California Open Charge Point Interface Test Procedures for Networked Electric Vehicle Supply Equipment for Level 2 and Direct Current Fast Charge Classes” for each applicable EVSE, included as Appendix B to this Staff Report.

OCPI, an open-source platform for allowing billing between EVSP networks, was created through an industry collaborative process at the Netherlands Knowledge Platform for Charging Infrastructure (NKL) with ELaadNL, EV-Box, GreenFlux, Last Mile Solutions, and The New Motion. The objective of OCPI was to improve the exchange of information between EVSPs and EVSE operators.⁹² The OCPI standard creates the foundation for EVSPs to establish roaming agreements, which will allow consumers to use a membership with one EVSP at another EVSP charger location if the two EVSPs have an agreement in place for interoperability billing. Consumers would not have to sign up for memberships with each EVSP, while benefitting from a membership with one or more EVSPs.

Staff are proposing all EVSPs use OCPI so that there is at least one common platform for interoperable billing. EVSPs may use additional networking or payment standards in addition to OCPI, potentially providing additional benefits to consumers, auto manufacturers, EVSPs, or other parties. Staff is proposing to require only EVSPs operating networked EVSE to comply with the OCPI communication protocol, an industry-supported standard to allow communication and sharing of payment

⁹⁰ This number includes public networked, non-networked, free and paid Level 2 EVSE. This number does not include Tesla destination chargers.

⁹¹ Cal. Health & Safety Code § 44268.2(d).

⁹² NKL, 2017. Open Charge Point Interface OCPI. “Objective: Improving the exchange of information between service providers and charge point operators. Ensuring better information for EV drivers about the status (availability and location) of the charge points and insight into the associated costs prior to, during and after charging. Access to charge points is improved by means of developing and offering independent interface communication software between the charge point and the charge vendor – this is called Open Charge Point Interface, or OCPI for short. OCPI can have an enormous impact on the speed at which publically available charging infrastructure develops. Through its broad objective and independent position, the Netherlands Knowledge Platform for Charging Infrastructure plays a stimulating and crucial role.

information and data between EVSPs. Many EVSPs have announced roaming agreements utilizing OCPI.^{93,94,95}

CARB staff evaluated OCPI and OICP based a number of criteria, including the following: current market acceptance, future standardization, open usability, and features of the communication protocol. The features provided by OCPI and OICP are generally similar. At this point in time for the American market, OCPI has greater market acceptance domestically. Roaming agreement announcements have highlighted the use of OCPI as a common communication protocol for the roaming platform. Stakeholders stated in workshops and meetings that OCPI is the standard to use for facilitating driver roaming. The EVSPs have openly supported having CARB adopt OCPI as an interim test procedure. CARB's adoption of OCPI in this proposed rulemaking may assist industry in having OCPI formally adopted through a traditional standards process with an entity such as OASIS or SAE International. CARB staff is not aware of similar plans for OICP to be standardized. At this point in time, OCPI is the only protocol freely available for market use. In order to install and implement OICP, an EVSP would need to sign an agreement and make a payment to Hubject, Inc. Once these steps are completed then the EVSP can install and operate OICP. Finally, requiring EVSE to implement OCPI does not prevent them from also using OICP, or for that matter, any other additional communication protocols in addition to OCPI.

E. Section 2360.4 Reporting for Electric Vehicle Service Providers

This section describes the different reporting requirements the EVSP will need to complete. The reporting requirements serve two purposes: provide CARB with necessary information to implement and enforce the proposed regulation, and, as required by SB 454, ensure that EVSPs properly report EVSE data to NREL.

EVSPs are required, under the proposed regulation, initially to provide CARB with contact information and information on their existing inventory. In addition, EVSPs will report to CARB when they introduce a new model of EVSE into the California market, and will provide annual inventory updates. The proposed regulation also requires EVSPs to provide specific EVSE information to NREL. Each of these reporting points will ensure the regulated parties are following all the requirements of the proposed regulation before the EVSE goes in the ground, preventing the need to re-do infrastructure installation in the future.

§ 2360.4(a) Purpose: Identify the responsible reporting entity.

§ 2360.4(a) Rationale: The EVSP is the regulated party and therefore the entity responsible for transmitting information. For new EVSPs, 45 days is a reasonable timeframe to be brought under these reporting requirements, as most EVSPs will know

⁹³ Greenlots, 2018.

⁹⁴ Moran, 2018.

⁹⁵ ChargePoint, 2018.

many months in advance when and how many EVSE will be installed into the ground. There is a lot of planning involved to install an EVSE at any site and 45 days before the EVSE goes live is a good timeframe to contact CARB for reporting the new site as it can be treated as one of the final items to be done in order for the site to be energized and then used.

§ 2360.4(b) Purpose: Identify the deadline and reference information that existing EVSPs (as of the effective date of the regulation) must submit to CARB within a period of 45 days of the regulation becoming effective, in order to provide CARB with a baseline of information from the EVSPs about currently installed EVSE as well as EVSE models.

§ 2360.4(b) Rationale: For the purposes of reporting and enforcement, CARB is requiring the regulated party identify a singular contact from the company that will be responsible for transmitting all of the required reports. CARB is establishing a baseline of information for each EVSP. CARB staff will use the baseline to track EVSE retrofits for compliance checks under the regulation.

§ 2360.4(c) Purpose: Identify the deadline and reference information that new EVSPs (who enter the market following the effective date of the regulation) must submit to CARB prior to installing EVSE in California.

§ 2360.4(c) Rationale: Subsection (c) parallels subsection (b), but for new EVSPs versus existing EVSPs, respectively. For the purposes of reporting and enforcement, CARB is requiring the regulated party identify a singular contact from the company that will be responsible for transmitting all of the required reports. CARB is establishing a baseline of information for each EVSP. CARB staff will use the baseline to track EVSE retrofits for compliance checks under the regulation.

§ 2360.4(d) Purpose: Establish a reporting deadline and reference information to be submitted to CARB whenever an EVSP introduces a new EVSE model in California.

§ 2360.4(d) Rationale: The EVSP will need to type test a new EVSE model and finalize all paperwork for safety standards prior to installation. During that time, the EVSP shall send CARB information regarding the EVSE. The EVSP shall transmit the information no later than 45 days prior to the installation of the EVSE. These 45 days allows for back and forth between the EVSP and CARB to make sure the new EVSE is meeting the requirements properly.

§ 2360.4(e) Purpose: Establish an annual reporting deadline and reference information to be submitted to CARB.

§ 2360.4(e) Rationale: Staff proposes this requirement to ensure that regulated parties know the period of time in which they need to gather information for the annual report. March 1 is chosen to permit the EVSP adequate time to compile the prior year's data.

§ 2360.4(f) Purpose: If there is a change of contact information for the EVSP, require the EVSP to notify CARB within 45 days of the change.

§ 2360.4(f) Rationale: In order to maintain an open line of communication with the regulated parties, the EVSPs need to ensure that they update the single point of contact.

§ 2360.4(g) Purpose: Specify information EVSPs will report to CARB for the initial (45-day) report required by subsections (b) and (c).

§ 2360.4(g) Rationale: One person should be identified per EVSP to maintain consistent contact with CARB. This will minimize any issues during reporting periods and any ongoing reporting requirements. The information requested will allow for adequate record keeping to maintain an open line of communication with the regulated parties.

§ 2360.4(h): Specify the information that EVSPs will report to CARB for the EVSE model certification required by subsection (d).

§ 2360.4(h) Rationale: CARB needs to be able to clearly identify the EVSE at each installation site for the purposes of enforcement. This information will be used to ensure the information that is being reported to AFDC is correct and will be able to identify the correct EVSE that is required to comply with the regulation. Each of these pieces of information is pertinent to identifying the correct EVSE.

§ 2360.4(i) Purpose: Specify information that EVSPs will report to CARB for the annual report required by subsection (e).

§ 2360.4(i) Rationale: This information is needed to be able to uniquely identify the new EVSE installations and cross check it with the reporting to NREL's AFDC. Staff is proposing that EVSPs report the information that pertains to the hardware requirements in the proposed regulation. Each of the reporting items will be used to track the technologies that are being used by drivers. Staff is proposing that EVSPs report consumer pricing information. The information will be used to track technology acceptance and adoption, as well as compliance and future regulatory development.

§ 2360.4(j) Purpose: Require EVSPs to submit EVSE information to NREL and specify the information to be submitted as well as the minimum timeframe for submission.

§ 2360.4(j) Rationale: Staff is implementing Health and Safety Code 44268.2(b) by identifying specific information to be submitted to NREL. EVSPs, currently, optionally report the specific reporting fields to NREL.

§ 2360.4(k) Purpose: Explain how EVSPs may identify certain information as confidential when they submit such information to CARB.

§ 2360.4(k) Rationale: This requirement is in line with other CARB programs and the California Public Records Act, §§ 6250 et seq., to ensure that confidential information does not become subject to public disclosure.

§ 2360.4(l) Purpose: Identify how the EVSP shall submit information to CARB.

§ 2360.4(l) Rationale: For the amount and type of information to be transmitted, digital submission will be the best practice. CARB Staff has identified the specific email address that shall be used to send the information and communicate for the purposes of implementing the proposed regulation.

F. Section 2360.5 Civil Penalty Schedule

Purpose: Impose a schedule of penalties, to cover failure to label properly an EVSE, to install and maintain the required payment hardware options, to install and maintain an interoperable billing standard, and failure to report to the required information to CARB.

Rationale: This proposal contains enforcement provisions defining violations to provide clear notice of potential penalties, and to allow for penalties that are fair, consistent, and effective at deterring noncompliance. Where applicable, the cost of these penalties is double the anticipated cost of the hardware that is being required. The penalties are tailored in subsections (a) through (d) to the specific violation. Subsection (e) ensures that repeated infractions are discouraged. Subsection (f) allows CARB to seek penalties per EVSE or per kiosk, so that multiple violations by the same EVSP are deterred. Subsection (g) accounts for inflation in the penalty amount, to ensure that the proposed penalties continue to provide adequate deterrence in the future.

No penalty shall exceed CARB's statutory authority. CARB's authority to set these civil penalties is set forth in Health and Safety Code section 43016.

V. BENEFITS ANTICIPATED FROM THE REGULATORY ACTION, INCLUDING THE BENEFITS OR GOALS PROVIDED IN THE AUTHORIZING STATUTE

The proposed regulation is anticipated to increase driver access to EVSE and allow a more consistent and transparent experience. This increased access is anticipated to result in drivers having confidence to transition more of their driving miles to PEVs, which could increase electric vehicle miles traveled (eVMT) statewide. However, the emissions benefits from increased eVMT because of the proposed regulation are difficult to separate from the multitude of other factors such as regulations, incentives, and consumer behaviors that impact total VMT and eVMT.

A potential benefit to the regulated parties is increased utilization of the EVSE. As consumers feel they have easier access to EVSE, charging in public would have reduced barriers to enable driving farther distances. The proposed rulemaking will make it easier to use PEVs by allowing for credit card and mobile payments at EVSE without requiring membership. This could make it easier for PEV use in rental car fleets, public fleets, and private fleets where individual drivers are accustomed to paying by corporate or private credit card. Compliance with this proposed regulation would also enable EVSE owners/operators to be eligible for the new Low Carbon Fuel Standard amendments generating marketable credits for new EVSE installations.

Businesses have the opportunity to install and operate an EVSE on their property providing the opportunity to attract new visitors or retain current visitors longer as drivers wait for their car to charge. These businesses have the option to collect fees from the drivers for a charging session, or to provide freely the electricity. Current PEV models take anywhere from 2 to 10 hours to get a full charge on a Level 2 EVSE. Many EVSE are located in areas with shopping or restaurants available. The driver can fill a portion of the charging time conducting shopping activities, stopping for food on a road trip, or experiencing a new location. Additionally, open access makes use of these EVSE easier for drivers from out of town who may not be members of networks popular to the area.

CARB staff defines small businesses as independently owned, operated, and not dominant in the industry. Some small businesses in California chose to provide EVSE to attract PEV drivers to their businesses. Given the many ownership models for PEV charging infrastructure, EVSPs can own and operate EVSE while leasing the land from the site host. Alternatively, small business owners can choose to purchase an EVSE with network support from an EVSP.

Some electricians and contractors that install EVSE are small businesses. The proposed regulation requires all EVSE currently operational that require payment to be retrofitted or replaced for compliance. Site hosts owning EVSE may hire small business electricians or contractors to complete the work. However, CARB staff cannot estimate

benefits to electricians and contractors operating small businesses compared to a typical business.

The benefits that CARB staff expects to see for individuals relate to ease of EVSE access in public locations. Drivers seeking to fuel their PEV in public have many different methods (as defined earlier) to start a charging session depending on which EVSP is operating the networked EVSE. Using one of these ways to start a charging session is good for users whom have experience in charging their vehicle in public. As mainstream consumers adopt PEVs, public charging will need to utilize more familiar payment methods.

Implementation of the proposed regulation will benefit drivers by: (1) enabling drivers to more readily locate public EVSE, (2) providing drivers charging session pricing before use, (3) providing drivers convenient and simple payment methods for charging sessions, (4) providing standardized power information on each EVSE, and (5) facilitating EVSP roaming agreements.

VI. AIR QUALITY

The proposed regulation is anticipated to increase driver access to EVSE and allow a more consistent and transparent experience. This increased access is anticipated to result in drivers having confidence to transition more of their driving miles to PEVs, which could increase electric vehicle miles traveled (eVMT) statewide. However, the emissions benefits from increased eVMT because of the proposed regulation are difficult to separate from the multitude of other factors such as regulations, incentives, and consumer behaviors that impact total VMT and eVMT.

There is limited data available on the relationship between eVMT, consumer charging behavior, and EVSE per-station use. There is even less information about the relationship between increased access to EVSE and consumer choice for charging and substitution of conventional vehicle miles with eVMT. The proposed regulation is complimentary to, and supports realization of, the statewide emission benefits expected from the ZEV Regulation that increases in stringency to 2025.^{96,97}

An increase in the proportion of miles from electricity, as compared to gasoline, will decrease tailpipe emissions and emissions from production of fossil fuels resulting in decreased emissions of GHGs, particulate matter (PM), oxides of nitrogen (NOx) and other air pollutants. Reductions of these pollutants provide climate and health benefits. There are emissions from the production of electricity used to charge PEVs, but this impact is small as analyzed by CARB staff, and more than offset with the emission reductions from reduced fossil fuel usage. Electricity losses from transmission, distribution, and vehicle charging are also included to increase the accuracy of a

⁹⁶ CARB, 2011.

⁹⁷ CARB, 2018a.

comparison with a conventional vehicle. Further details of how CARB staff conducted this analysis, and the assumptions used, can be found in the model and documentation here.⁹⁸

Though data is not available to quantify the total statewide emissions benefits of the proposed regulation, CARB staff have quantified the marginal difference in emissions between driving a mile with a gasoline conventional vehicle compared to an electric drive vehicle. The figures below show the emissions per mile for a gasoline vehicle (GAS) compared to a PHEV and BEV in California. The data displays both the tailpipe emissions (“tank to wheel” or TTW) and upstream emissions associated with producing and delivering the fuel to the vehicles (“well to tank” or WTT). Combined, this is called a well-to-wheel emissions analysis comparing varying powertrain types.

In addition to comparing emissions between powertrain types, the analysis also compares new passenger vehicles in two different years to account for improved vehicle efficiency and fuel carbon content (both electricity and gasoline) over time. CARB staff estimated emissions from vehicles using the most current CARB on-road vehicle inventory, EMFAC 2017.⁹⁹ Emissions from producing gasoline in 2020 and 2030 accounts for the anticipated lower carbon ethanol fuel blends in reformulated gasoline due to the recently adopted Low Carbon Fuel Standard (LCFS) amendments. Emissions from producing electricity accounts for California’s power generation mix under the SB 100¹⁰⁰ renewable requirements (a 60 percent renewable portfolio standard by 2030) and the phase-out of coal generation. These assumptions consider the unique conditions in California and show that driving an electric vehicle produces significantly lower emissions than a conventional vehicle.

The results are presented below for GHG, NOx, PM2.5, and ROG emissions assuming a “passenger car” classification. The accompanying model includes further results for light duty trucks. Figure 15 shows that CARB staff project well-to-wheel GHG emissions from a new BEV to be about 76 percent lower than a new gasoline (GAS) vehicle in 2020, and increases to 86 percent lower in 2030. Figure 16 shows that CARB staff project the well-to-wheel NOx emissions for the BEV to be 83 percent lower in 2020 compared to a conventional vehicle, and increasing to 86 percent lower in 2030. For particulate matter (PM) pollutants, the difference is slightly smaller at approximately 50-percent-reduced emissions compared to a conventional vehicle in 2020 and 56 percent in 2030.

⁹⁸ CARB, 2019.

⁹⁹ CARB, 2017.

¹⁰⁰ Cal. Health & Safety Code § 399.11, 399.15, 399.30 and 454.53 to the Public Utilities Code

Figure 15 - Greenhouse gas emission factors (grams of CO₂e/mile) for three vehicle technology types in a passenger car, accounting for direct vehicle emissions (TTW) as well as fuel production and delivery emissions (WTT)¹⁰¹

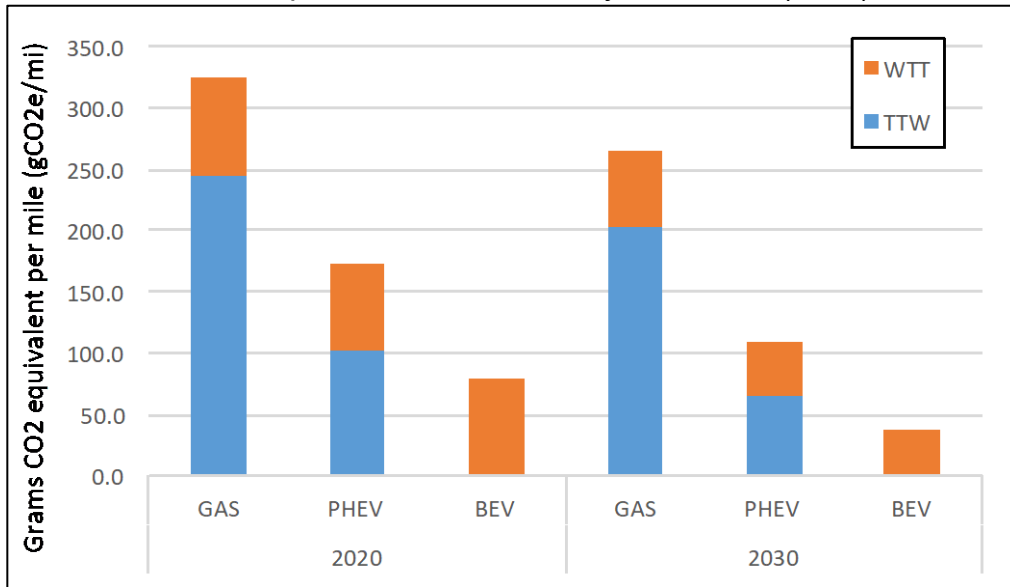
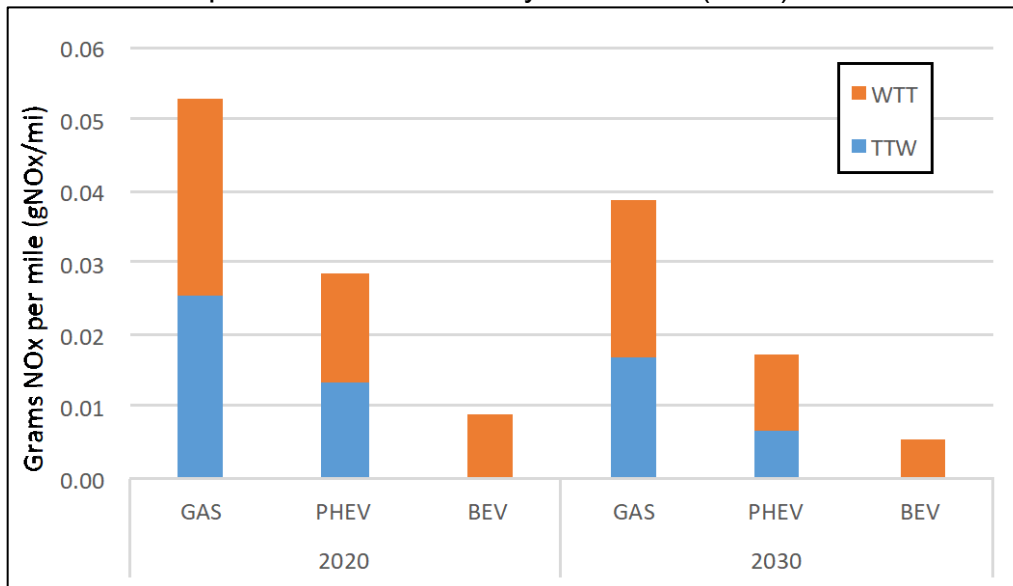


Figure 16 - NO_x emission factors (grams of NO_x/mile) for three vehicle technology types in a passenger car, accounting for direct vehicle emissions (TTW) as well as fuel production and delivery emissions (WTT)¹⁰²



¹⁰¹ CARB, 2019.

¹⁰² CARB, 2019.

Figure 17 - PM2.5 emission factors (grams of PM2.5/mile) for three vehicle technology types in a passenger car, accounting for direct vehicle emissions (TTW) as well as fuel production and delivery emissions (WTT)¹⁰³

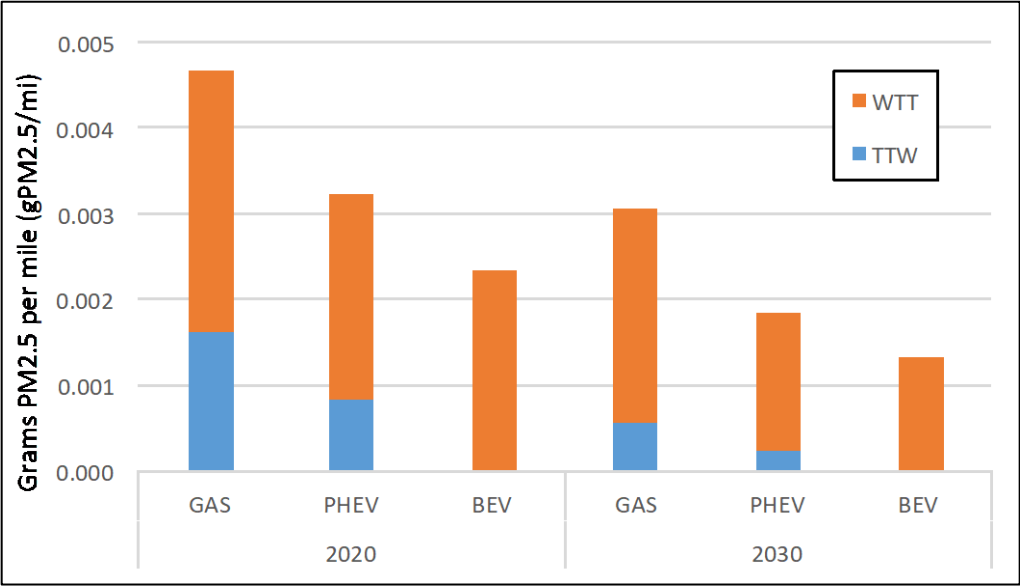
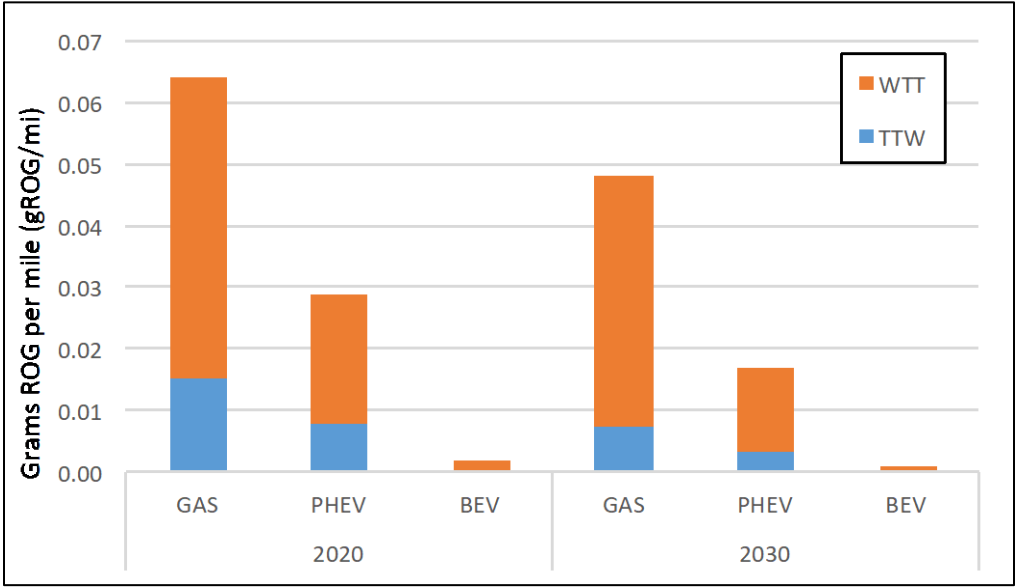


Figure 18 - ROG emission factors (grams of ROG/mile) for three vehicle technology types in a passenger car, accounting for direct vehicle emissions (TTW) as well as fuel production and delivery emissions (WTT)¹⁰⁴



¹⁰³ CARB, 2019.

¹⁰⁴ CARB, 2019.

VII. ENVIRONMENTAL ANALYSIS

A. Introduction

This chapter provides the basis for CARB's determination that the proposed regulation is exempt from the requirements of the California Environmental Quality Act (CEQA). Section B below provides a brief explanation of this determination.

CARB's regulatory program, which involves the adoption, approval, amendment, or repeal of standards, rules, regulations or plans for the protection and enhancement of the State's ambient air quality, has been certified by the California Secretary for Natural Resources under Public Resources Code section 21080.5 of CEQA (14 Cal. Code Regs. § 15251(d)). Public agencies with certified regulatory programs are exempt from certain CEQA requirements, including but not limited to, preparing environmental impact reports, negative declarations, and initial studies. CARB, as a lead agency, prepares a substitute environmental document (referred to as an "Environmental Analysis" or "EA") as part of the Staff Report prepared for a proposed action to comply with CEQA (17 Cal. Code Regs. §§ 60000-60008). If the regulation is finalized, a Notice of Exemption will be filed with the Office of the Secretary for the Natural Resources Agency and the State Clearinghouse for public inspection.

B. Analysis

The proposed regulation involves new requirements regulating certain aspects of EVSE design and signage, for both new and existing EVSE that are accessible to the public. From a physical-environment perspective, the proposed regulation's requirements are minor and involve only changes in design to the EVSE fee display, labelling, and payment hardware.

Notably, the proposed regulation does not require installation of any new EVSE. Rather, it would require retrofitting or replacement of existing EVSE, and incorporation of certain design features into new EVSE models; these new models would be installed regardless of the proposed regulation. CARB staff believes it is unlikely that any new ground disturbance would result from the proposed regulation. The affected EVSE are already installed in place or would be installed in the future for reasons independent of the proposed regulation. The proposed regulation includes a provision allowing EVSPs to install a kiosk instead of having a credit card reader and mobile payment hardware on each EVSE. If the EVSP does install a kiosk, there could be some ground disturbance and potentially tree removal depending on the site. However, staff does not expect EVSPs to install kiosks at any of the current sites because, based on informal stakeholder feedback, staff expects it to be cheaper to retrofit or replace an existing EVSE instead of installing a new kiosk. If a kiosk were to be installed, the size would not be larger than a standard gasoline pump.

While the proposed regulation is not anticipated to result in any new structures where none existed previously, CARB staff nevertheless provides estimated numbers of EVSE that are expected to be retrofitted or replaced in response to the proposed regulation, Table 1. CARB also provides an estimate of the number of new charging stations expected to be installed in coming years, Table 2. Again, these new future charging stations would be installed for reasons independent of the proposed regulation, as the proposed regulation does not require any new charging stations to be installed or otherwise incentivize their installation.

Retrofitting EVSE involves some amount of activity, including transporting equipment to and from the existing charging station site. This level of activity is comparable to routine equipment servicing, would be temporary in nature, and has no potential to cause any significant environmental impacts.

Table 1 – Estimated retrofit DCFC EVSE and replaced Level 2 EVSE counts

Year	DCFC	Level 2
2020	439	0
2021	284	0
2022	137	0
2023	805	10,554
2024	50	808
2025	0	1,046
2026	0	1,317
2027	0	1,596

Table 2 – Estimated number of new EVSE per year - Baseline population

Year	DCFC	Level 2
2020	66	1029
2021	87	1137
2022	90	1206
2023	93	1242
2024	87	1296
2025	79	1340
2026	60	1159
2027	40	1185
2028	22	913
2029	6	959
2030	0	646

CARB has determined that the proposed regulation is categorically exempt from CEQA under the “Class 1” exemption for the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures or facilities involving negligible or no expansion of use (14 Cal. Code Regs § 15301) because the

EVSE retrofits and replacements would involve minor alterations within existing charging stations. The changes would involve retrofits or replacement of charging equipment to update the payment mechanism to meet the EMV chip and NFC requirement, as well as installation of new signage for the fee display and the Title 16 Part 309 sticker. If an EVSP retrofitted an EVSE for the payment hardware requirement, it would require only a new hole to be cut into the exterior casing to accommodate the payment hardware. In the event an EVSP were to replace an EVSE, the current external units would be completely removed and a new one would be placed in the same location. Staff expects Level 2 EVSE to be slightly larger than the current sizing. The proposed regulation also does not require the EVSP to make any power upgrades to the site.

CARB has determined that the proposed regulation is also categorically exempt from CEQA under the “Class 2” exemption for replacement or reconstruction of existing structures and facilities (14 Cal. Code Regs. § 15302) because the EVSE will be replaced or reconstructed on the original site where existing charging stations already exist and will have substantially the same purpose and capacity. EVSP would install any new future charging stations (i.e., additional charging stations) for reasons independent of the proposed regulation.

CARB has determined that the proposed regulation is categorically exempt from CEQA under the “Class 3” exemption for new construction or conversion of small structures (14 Cal. Code Regs. § 15303) because the EVSE would involve limited new physical modifications to small structures, well under the maximums illustrated in the examples of section 15303. As noted above, the proposed regulation includes a provision allowing EVSPs to install a kiosk instead of having a credit card reader and mobile payment hardware on each EVSE, which could involve some ground disturbance and potentially tree removal depending on the site. However, if an EVSP were to install a kiosk (which CARB staff anticipates is unlikely, as staff expects it to be less expensive to retrofit or replace an existing EVSE), the size would not be larger than a standard gasoline pump.

CARB has determined that the proposed regulation is categorically exempt from CEQA under the “Class 4” exemption for minor public or private alterations in the condition of land, water, and/or vegetation. CARB staff does not expect healthy, mature, scenic trees to be removed. Staff expects no major site upgrades that require trenching or any ground disturbance of any kind. The proposed regulation does not require any power upgrades to sites; therefore, staff does not expect any major ground disturbances of any kind. The EVSP may at any time attempt site upgrades, but these would be independent from this proposed regulation. There is a provision in the proposed regulation that allows EVSPs to install a kiosk instead of having a credit card reader and mobile payment hardware on each EVSE. If the EVSP does install a kiosk, there could be some ground disturbance and potentially tree removal depending on the site.

However, staff does not expect EVSPs to install kiosks at any of the current sites because, based on informal stakeholder feedback, staff expects it to be less expensive to retrofit or replace an existing EVSE instead of installing a new kiosk. If an EVSP were to install a kiosk (which CARB staff believes is very unlikely), the size would not be larger than a standard gasoline pump. Additionally, the proposed regulation aligns with the Low Carbon Fuel Standard (LCFS), so EVSPs may choose to upgrade the site's power capacity in the event the EVSP wants to take advantage of the LCFS new fuel credit pathway.

Furthermore, none of the exceptions to the above-listed categorical exemptions apply. EVSPs would not retrofit charger equipment and signage in areas with a particularly sensitive or hazardous environment, or in areas with historic resources, because the EVSPs would be limited to installing as modifications to existing vehicle chargers. There would be no potential for significant cumulative impacts, since, as described above, the modifications would be similar in nature to routine equipment servicing. The project also would not result in damage to scenic resources, since it involves modifications to existing chargers already in place. None of the existing chargers is located on any designated hazardous waste site, and any future installations will be independent of this proposed regulation.

No unusual circumstances would prevent application of the above-described categorical exemptions, as the compliance responses described above involve retrofitting or replacement of existing charging equipment and would be in the nature of routine equipment servicing and replacement. Staff does not expect any negative impact to eVMT per vehicle. Staff does not expect any negative impact to PEV adoption.

CARB has also determined that the proposed regulation is exempt from CEQA under the "general rule" or "common sense" exemption (14 CCR § 15061(b)(3)). The common sense exemption states a project is exempt from CEQA if:

The activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

The proposed regulation's requirements have no potential to significantly adversely affect air quality or any other environmental resource area, given the minimal nature of the foreseeable activities carried out in response to the proposed regulation.

Based on CARB's review, there is no foreseeable possibility that the proposed regulation may result in a significant adverse impact on the environment; therefore, this activity is exempt from CEQA.

VIII. ENVIRONMENTAL JUSTICE

State law defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. (Government Code, section 65040.12, subdivision (c)). CARB is committed to making environmental justice an integral part of its activities. The Board approved its Environmental Justice Policies and Actions (Policies) on December 13, 2001, to establish a framework for incorporating environmental justice into CARB's programs consistent with the directives of State law (CARB 2001). These policies apply to all communities in California, but recognize that environmental justice issues have been raised more in the context of low-income and minority communities.

The proposed regulation aims to ensure all drivers of vehicles using the infrastructure can access the stations regardless of economic status or technology. CARB staff have identified no known negative environmental justice impacts with regard to the proposed regulation.

IX. STANDARDIZED REGULATORY IMPACT ANALYSIS

The full SRIA is available in Appendix C.

A. Response to DOF comments¹⁰⁵

Finance generally concurs with the methodology used to estimate impacts of proposed regulations, with one exception. The SRIA must include a quantitative analysis of increased purchase of electric vehicles and some quantification of statewide benefits from the regulations. Implementing common billing standards is a key unlocking mechanism for broad deployment of electric vehicles and for advancing towards the state goal of five million zero emission vehicles on the road by 2030. Electric vehicles are expected to be four million of the goal. One of the barriers to electric vehicle adoption is access to charging infrastructure, and lowering this barrier should provide higher benefits than the SRIA estimates. If there are other barriers to increased adoption that would prevent this regulation from having these benefits, the SRIA should discuss how this regulation fits in with future regulations to remove those other barriers.

1. CARB Response

CARB continues to conclude that the proposed regulation would not likely incentivize adoption of new electric vehicle sales, but instead will likely enable more use of electric

¹⁰⁵ DOF, 2019.

vehicles by expanding access to the charging infrastructure. The proposed regulation will not increase the number of chargers in the state and additional barriers exist, which will be addressed through other means to achieve the state's electric vehicle sales targets.

The proposed regulation implements the statutory mandates in Senate Bill (SB) 454 (Corbett, Chapter 418, Statutes of 2013) but is not designed to address all of the remaining barriers to adoption of electric vehicles necessary to meet the 2030 goals. As described in the SRIA, while CARB anticipates there will be emissions benefits because of the proposed regulation, the current data is insufficient to quantify the statewide benefits and quantification by CARB would be speculative and difficult to support. Specifically, CARB will be seeking data in the future to quantify whether electric vehicle users drive more miles because of increased access to charging infrastructure through expanded payment methods. The following sections describe this in further detail.

2. Remaining Barriers

CARB staff anticipate the proposed regulation to increase driver access to charging stations and allow for a more consistent and transparent charging experience. This increased access is anticipated to result in drivers having confidence to transition more of their driving miles to electric vehicles, which could increase electric vehicle miles traveled statewide and provide emissions benefits. There are multiple unquantified benefits of this access, which the SRIA describes in detail. While the proposed regulation lowers barriers, there are multiple remaining barriers to widespread adoption of electric vehicles, which must be addressed through other mechanisms including the number of chargers and the cost of electric vehicles.

While there are multiple actions in progress to resolve the remaining barriers, it is likely that additional actions or regulations will be needed to reach the 2030 goals. CARB staff anticipates that the benefits of the proposed regulation will be magnified once future actions or regulations address these barriers. Because these actions or regulations are not yet defined or adopted, CARB could not estimate the likely magnifying effects of the current proposal. CARB staff will quantify any emissions benefits that would result from interactions of this proposed regulation with future CARB regulations as part of those future rulemakings. Additional information on the remaining barriers and actions to address those barriers follows.

3. Infrastructure Needs

While the proposed regulation makes infrastructure easier to use, the number of chargers in California is still far too low to support widespread electric vehicle adoption. The California Energy Commission (Energy Commission) estimates California needs 229,000 to 279,000 connectors¹⁰⁶ to support 1.5 million ZEVs by 2025.¹⁰⁷ To date the

¹⁰⁶ Connectors, also known as ports, are the number of locations that an electric vehicle may charge at a given location. There are typically one or two ports at each distinct charging location.

¹⁰⁷ CEC 2018.

state has approximately 18,000 connectors installed, representing only 7 percent of the anticipated future need. The proposed regulation does not require installation of additional EVSE, and there is no evidence that the proposed regulation will indirectly incentivize providers to install more EVSE.

Additional electric vehicle infrastructure is being rolled out statewide with support from several funding programs, including the Energy Commission's Assembly Bill (AB) 118 (Núñez, Chapter 750, Statutes of 2007) program and the subsequent AB 8 (Perea, Chapter 401, Statutes of 2013) legislation. The Energy Commission has allocated or awarded more than \$80 million to support PEV infrastructure and has allocated an additional \$134.5 million through 2019 to help support the need for expanded EVSE by 2025. SB 350 (De León, Chapter 547, Statutes of 2015) authorizes electric utilities to undertake transportation electrification activities. In 2016, the California Public Utilities Commission (CPUC) approved charging infrastructure pilot programs to install up to 12,500 connectors for a combined budget of \$197 million, and have further approved the first round of investments pursuant to SB 350's authority.

In 2012, the State of California reached a settlement with Dynegy which provides over \$100 million for the installation of 200 public direct current fast charging "Freedom Stations" and the infrastructure to support 10,000 lower level charging stations. These projects, developed by EVgo Services, formerly, NRG EV Services LLC, and overseen by the CPUC, are nearing completion. Additionally, Volkswagen, through its subsidiary Electrify America, has agreed to invest \$800 million over a 10-year period for zero emission vehicle (ZEV) infrastructure, education, and access in California as part of a settlement with CARB.¹⁰⁸ In the first 30-month cycle of the settlement, Electrify America is expected to invest \$45 million in community chargers in major metropolitan areas and \$75 million in highway fast charging throughout California. In the second 30-month cycle of the settlement, recently approved by CARB, Electrify America is expected to invest up to \$145 million in community and highway charging infrastructure.

These investments are significant, but are still insufficient to meet the Energy Commission's estimated infrastructure needs. CARB staff conducted a high-level analysis of existing, in progress, and proposed charging infrastructure projects, and concluded that there remains an estimated infrastructure connector gap of 46 percent by 2025.¹⁰⁹ Additional actions will be needed to address this gap, and the State is working to do so. For example, the Governor's Office of Business and Economic Development (GO-Biz) is working with local governments and businesses to streamline the infrastructure permitting process and provide subject matter expertise, CARB has shepherded new California Green Building Code standards requiring greater percentages of charge-ready installations in new construction, and the California Department of Housing and Community Development is continuing to increase the number of PEV-capable parking spaces in new residential buildings and assessing strategies to increase PEV charging options in existing residential buildings.

¹⁰⁸ CARB, 2018b.

¹⁰⁹ CARB, 2018f.

4. Vehicle Cost

California's Advanced Clean Cars Midterm Review¹¹⁰ finds that "battery technology has improved and battery costs (as well as other component costs) have fallen dramatically (largely due to reduced material costs, manufacturing improvements, and higher manufacturing volumes), leading to an increase [in model availability] from 25 plug in hybrid electric vehicle and battery electric vehicle models offered today to manufacturer announcements of more than 70 unique models to be released over the next 5 model years."

Despite this cost reduction, advanced technology vehicles still cost more than comparable internal combustion engine vehicles, which represents a remaining barrier to adoption. CARB continues to develop future Advanced Clean Cars regulations, which will help transition the California light duty vehicle fleet towards zero emission technology. These planned regulations join actions by a host of other countries and jurisdictions and will help drive down zero emission technology costs in the future.

5. Quantification of Statewide Emissions Benefits

For the reasons described above, CARB does not anticipate the proposed regulation alone will incentivize significant additional ZEV adoption. As described in the SRIA the proposed regulation does lower some barriers, and for this reason, CARB anticipates some emissions benefits. CARB anticipates these emissions benefits will primarily take the form of increased electric vehicle miles traveled (eVMT) from the vehicles on the road.

However, quantification of statewide emissions benefits from the proposed regulation is complex and would require data, which is not currently available. CARB staff anticipate the proposed regulation will increase access to charging infrastructure, but may also slightly increase public charging prices. Consumers have many options for vehicle charging including charging at home, charging at work, free public charging, and paid public charging. There are no studies or data that CARB is aware of which quantifies increased consumer use in context of increased access, particularly in context of this complex set of variables that influence driver behavior in charging. Further, the consumer response to the competing effects of minor price increases versus enhanced access have not been studied. Some of this data will be collected as a result of the reporting required in the proposed regulation and may better constrain these effects. CARB recommends additional research in this area to inform future regulations and other actions.

Quantification of benefits is further complicated by the inability to predict what percentage of eVMT would be a substitution for other charging options or would be VMT that is a substitution for internal combustion miles. Substitution for other charging options means that an electric vehicle driver uses a public charger impacted by the

¹¹⁰ CARB, 2017. California's Advanced Clean Cars Midterm Review. https://www.arb.ca.gov/msprog/acc/mtr/acc_mtr_finalreport_full.pdf

proposed regulation rather than another charging option. The increased access provided by the proposed regulation would benefit the consumer by providing more charging options, but would not result in new eVMT or emissions benefits if it were simply substituting for another charger option.

It is only in the case that a consumer substitutes conventional vehicle VMT for eVMT that emissions benefits would occur. In this case, the consumer would drive their electric vehicle in place of their conventional vehicle, resulting in emissions benefits. The data necessary to estimate the substitution of eVMT with conventional VMT because of the increased access provided by the proposed regulation is not currently available.

B. Summary of SRIA

1. Total Number of Businesses

The types of businesses directly impacted include EVSPs and EVSE site hosts, including retail locations and workplaces that have publically accessible pay for service EVSE. Currently seven EVSPs operate in California and six out of the seven qualify as small businesses.¹¹¹

The proposed regulation may impact indirectly other types of businesses. The compliance costs incurred by the EVSPs for the installation, equipment, and other items will result in a corresponding increase in demand for industries supplying those goods and services. Businesses may contract out the installation and replacement of Level 2 EVSE to electrical contractors and other wiring installation contractors North American Industry Classification System (NAICS 23821). The credit card reader and mobile payment equipment, as well as PCI compliance will be provided by businesses best classified as monetary authorities, credit intermediation, and related activities (NAICS 522). The interoperability compatibility will likely be developed by contractors classified within the computer system design and related services industry (NAICS 5415). These businesses may be located in-state or outside of California.

2. Explanation of Businesses Created and Eliminated

Overall, staff expects the proposed regulation to have a small impact on business creation or elimination. Some EVSP businesses, including some small businesses, may struggle with the increased compliance costs and be eliminated.

The compliance costs incurred for the installation of equipment and other items may result in increases in demand for industries supplying those goods and services. Increases in demand for Level 2 replacements may result in an increase in the number of electrical contractors and other wiring installation contractors. A decrease in individual contractors offering their services to EVSPs may result due to EVSPs hiring

¹¹¹ AB 1033, Chapter 346 (2016).

larger electrician firms to help maintain the EVSE as a larger account versus individual work orders. Increased demand for maintenance on the EVSE may create new businesses in the EVSE maintenance industry.

3. Description of Jobs Created or Eliminated

CARB staff anticipates the proposed regulation will have a small impact on employment growth in California. Directly impacted industries such as EVSPs and site hosts may see negative impacts to employment due to increased costs of compliance. Because the EVSP industry is currently facing an expansion of the market and major shift in technology, employees of the EVSPs that may reduce jobs are likely to be hired by larger EVSPs looking for qualified employees.

Various indirectly impacted industries that supply goods and services to EVSPs, such as businesses that replace Level 2 EVSE and businesses that supply credit card readers, mobile payment, and interoperability compatibility, may see an increase in demand as a result of the proposed amendments and may also see some employment growth, particularly in years where many Level 2 EVSE need to be replaced. Based on the REMI analysis in the SRIA, the overall impact of the proposed regulation from 2020 to 2030 is a reduction in job growth of about 460 jobs by 2030. This change in employment is small relative to the California economy, corresponding to a change of less than -0.01 percent.

4. Explanation of California Business Competitiveness

EVSPs that support networked EVSE (Level 2 and DCFCs) that require fee-for-service are subject to the same proposed requirements. Businesses that predominately support Level 2 EVSE will have higher per EVSE compliance costs compared to those that primarily support DCFCs. The potential price impacts for Level 2 chargers is estimated to be larger than for DCFCs, however the business models for these charger types are often different. DCFCs are focused on providing a quick charging session for drivers, by having fast charging speeds. Level 2 chargers are slower and less desirable for public charging, but can benefit site hosts who install these chargers. Many site hosts provide Level 2 charging for free in order to attract customers, thus charging revenue is not always a primary goal for Level 2 EVSE. These varied business models may mitigate some of the impacts of differential compliance costs.

PEV owners primarily charge their vehicle within the range of their residence, thus CARB staff anticipates little competition for charging services across state lines. Compliance costs for California EVSE should not impact competitiveness with out of state businesses.

The proposed amendment would likely have small impacts on private investment growth, resulting in less than 0.01 of baseline private investment. The modeling results suggest a slight decrease of investment growth from 2020 to 2030, likely driven by cost of compliance for the proposed regulation.

The proposed regulation's primary objective is to address consumer access to publicly available EVSE. Access to an EVSE includes finding the location of an EVSE, identifying fees associated with use, and paying for a charging session.

Implementation of the proposed regulation will: (1) enable drivers to more readily locate public EVSE, (2) provide drivers charging session pricing before use, (3) provide drivers convenient and simple payment methods for charging sessions, (4) provide standardized power information on each EVSE, and (5) facilitate EVSP roaming agreements. Consumer benefits of the proposed regulation include familiar payment methods, clear pricing information, and uniform station location.

Timeline

This proposed regulation does not require EVSPs to install EVSE for public use; it establishes hardware and software requirements for new and existing EVSE. New DCFC installations shall be fully compliant starting July 1, 2020. Existing DCFC EVSE must meet necessary hardware and software requirements by July 1, 2024, depending on installation date. New Level 2 EVSE installations shall be fully compliant starting July 1, 2023. Existing Level 2 EVSE must meet necessary hardware and software requirements by July 1, 2027, depending on installation date.

Credit Card and Mobile Technology

The proposed regulation requires EVSPs to ensure that all EVSE have a physical credit card reader and a physical near field communications (NFC) reader (to accept mobile payment). EVSPs may install the credit card reader and NFC reader either on the EVSE itself or at a nearby kiosk that services one or more EVSE at the site. This provision is to comply with SB 454's requirement that an EVSE "shall allow a person desiring to use the station to pay via credit card or mobile technology, or both."¹¹² The objective of this proposed requirement is to ensure consumers convenient charging session payment access. The benefit of this proposed requirement is to provide public charging access for all consumers including those who may not have smart phones or may not be familiar with using public charging infrastructure.

Disclosure of Fees

The proposed regulation requires EVSPs to provide the user a complete listing of all fees that the user may incur at the time of a charging session. The fees may include, but are not limited to, the kilowatt-hour (kWh) or megajoule (MJ) cost of electricity, credit card fees, parking fees, non-membership plug-in fees, increased charges after plug-in

¹¹² Cal. Health & Safety Code § 44268.2(a)(1).

session ends, and any other fees chargeable to the PEV user. EVSPs must display fees at the point of sale to ensure the fee structure is transparent to the driver. Consumers paying for a charging session must be billed for electricity by the \$/kWh or \$/MJ. The Electric Power Research Institute completed a study of National Charging Costs¹¹³ that found over 350 unique charging cost structures. As a result, there is currently a fair amount of confusion for drivers today when paying for charging. This proposed requirement will align with California Department of Food and Agriculture Division of Measurement Standards¹¹⁴ proposed regulation for EVSE charging as well as give customers confidence that all fees will be displayed ahead of starting a charging session. The purpose of this proposed requirement is to ensure consumers know exactly what they will be paying at the time of starting a charging session. The benefits of this proposed section of the code is that drivers will be able to see clearly what they will be charged for a charging session.

Payment Card Industry Data Security Standard Level 1 Compliance

The proposed regulation requires that credit card reader and near field communications (NFC) reader payment systems must be Payment Card Industry Data Security Standard (PCI-DSS) Level 1 compliant, to secure the payment transactions and protect PEV consumers' personally identifiable information.¹¹⁵ PCI-DSS Level 1 compliance requires a third party to inspect annually the EVSE, and requires the service provider or network operator to use data encryption from the EVSE to the EVSP and back. PCI-DSS Level 1 compliance is industry standard for curbside parking meters and most DCFCs that currently have credit card readers. For example, this technology is commonly required as a minimum security measure on parking meters that use credit card readers or other payment technologies.¹¹⁶ The purpose of this proposed requirement is to ensure that EVSPs will protect users' information from disclosure. The second purpose of this proposed requirement is to ensure that EVSPs are using the highest form of security for handling driver payment information. The benefit to this proposed requirement is to provide secure charging session payment transactions at public EVSE locations.

Interoperable Billing Standard

SB 454 authorizes CARB to adopt interoperable billing standards for EVSE network roaming payment methods. Roaming enables a member of one EVSP to use that membership credential on a different EVSP. Upon completing the charging session, the two EVSPs send and receive billing information to complete the transaction. Drivers benefit from roaming by using one membership card or mobile device application (app) at other networked EVSE.

¹¹³ Dunckley, 2017.

¹¹⁴ DMS, 2018.

¹¹⁵ Control Scan, 2018.

¹¹⁶ City of Sacramento, 2013.

Open Charge Point Interface (OCPI), an open source communication protocol-enabling driver roaming, is used by many domestic and international charging infrastructure providers. A number of EVSPs announced roaming agreements using OCPI in 2018.^{117,118,119} As no national interoperability billing standards have been adopted, CARB is proposing the use of OCPI 2.1.1, as incorporated in “California Open Charge Point Interface Test Procedures for Networked Electric Vehicle Supply Equipment for Level 2 and Direct Current Fast Charge Classes.” CARB supports the use of open source communication protocols and acknowledges that other products are currently in development. Proposal of the OCPI standard ensures at least one common communications protocol is in use by all EVSE to facilitate roaming agreements, but does not preclude the use of additional communications protocols that would enable roaming. The proposed standard is being used widely in industry today. The benefit of this proposed requirement is that EVSPs should see increased EVSE use from non-members once a roaming agreement is in place. Another benefit of this proposed requirement is for drivers by providing confidence in quickly starting a charging session through a roaming agreement.

Labeling Requirement

The proposed regulation requires EVSPs to label each EVSE in accordance with Code of Federal Regulations (CFR) Title 16 Part 309 label. CFR Title 16 includes Commercial Practice rules and regulations set by federal agencies. Part 309.17 describes labeling requirements for electric vehicle fuel dispensing systems. The label must indicate the type of fuel (electricity), if the method of delivery is conductive or inductive, and the voltage, amperage and kilowatt (kW) capabilities of the EVSE. Section 309.17 was adopted April 23, 2013 by the Federal Trade Commission. The purpose of this proposed requirement is to implement proper signage on the EVSE in accordance with the CFR.

Data Reporting

The proposed regulation requires each EVSP to disclose to NREL the station’s geographic location, schedule of fees, accepted payment methods, and the amount of network roaming fees charged to non-members.¹²⁰ Through the AFDC website,¹²¹ NREL provides information and tools to help transportation decision-makers reduce

¹¹⁷ Greenlots, 2018.

¹¹⁸ Moran, 2018.

¹¹⁹ ChargePoint, 2018.

¹²⁰ NREL is a federally-affiliated organization that collects and distributes information on energy efficiency, sustainable transportation, and renewable power technologies. U.S. Department of Energy National Renewable Energy Laboratory, 2018. <https://www.nrel.gov/>. Accessed July 25, 2018.

¹²¹ AFDC, 2018b.

petroleum consumption through the use of alternative and renewable fuels, advanced vehicles, and other measures. The AFDC website also includes an Alternative Fueling Station Locator¹²². NREL gathers and verifies EVSE data, largely through collaboration with infrastructure service providers. The AFDC website and mobile applications disseminate information on EVSE location, fees, and other relevant data to PEV owners. Requiring a central resource of information for a PEV driver will help provide confidence that infrastructure is ready for drivers to use. The purpose and benefit of this proposed requirement is to provide consumers with uniform information on public charging infrastructure.

The proposed regulation could provide incentives to improve EVSE and network operations to reduce compliance costs. The proposed regulation requires use of certain technology; there may be technology innovation from multiple parties to ensure the hardware and software is properly integrated. Due to the proposed regulation, CARB staff anticipate growth in the monetary authorities, credit intermediation, and related activities industry, which will provide the credit card reader, mobile payment hardware, and PCI compliance. As EVSPs integrate the proposed interoperable billing standard, CARB staff expect innovation to streamline operations and reduce costs.

CARB staff do not expect quantifiable benefits relating to worker safety as a result of this regulation.

C. Cost to State Government and Local Agencies

1. Cost to Local Agencies

Local government agencies own 29 publically available Level 2 EVSE and do not own any DCFCs. CARB staff anticipate local government agencies will bear costs, these costs will not occur until January 1, 2023, when the deadline for retrofitting existing EVSE occurs. Thus, there is no fiscal impact on local government in the current or subsequent two fiscal years. For further explanation regarding costs to local government, please see Appendix C – EVSE SRIA, Chapter D.1, page C-33.

2. Cost to State Government

State agencies, specifically the Department of General Services and Caltrans, own and operate 1.1 percent of publicly available Level 2 EVSE. These costs will not occur until after January 1, 2023, thus there is no fiscal impact on state government in the current or subsequent two fiscal years. For further explanation regarding costs to local government, please see Appendix C – EVSE SRIA, Chapter D.1, page C-33.

¹²² AFDC, 2018b.

X. EVALUATION OF REGULATORY ALTERNATIVES

Government Code section 11346.2(b)(4) requires CARB to describe reasonable alternatives to the regulation and explain CARB's reasons for rejecting those alternatives. This section discusses alternatives evaluated and provides reasons why these alternatives were not included in the proposal. As explained below, CARB staff found no alternative proposal that would be less burdensome and equally effective in achieving the purposes of the regulation in a manner that ensures full compliance with the authorizing law. CARB has not identified any reasonable alternatives that would lessen any adverse impact on small business.

A. Alternative 1: Less strict compliance period

Alternative 1 would require EVSE to meet all of the requirements of the proposed regulation, but allows seven years for EVSE to come into compliance instead of five. Requirements for DCFC would go into effect in 2020 with all required to be fully compliant seven years later, and requirements for Level 2 EVSE would go into effect in 2023 with all required to be fully compliant seven years later. This additional time reduces the number of existing EVSE that are required to comply, because more equipment would reach the natural end of its useful life with two additional years. In addition, this alternative would spread compliance costs over a longer period, reducing the annual impact. This would reduce the compliance costs to industry but would also result in more time consumers would not have open access to public EV charging.

1. Costs

The cost analysis for Alternative 1 uses the same assumptions as the proposed regulation described in the SRIA. Under Alternative 1 the number of EVSE required to comply each year would be different from the proposed regulation, changing the distribution of compliance costs.

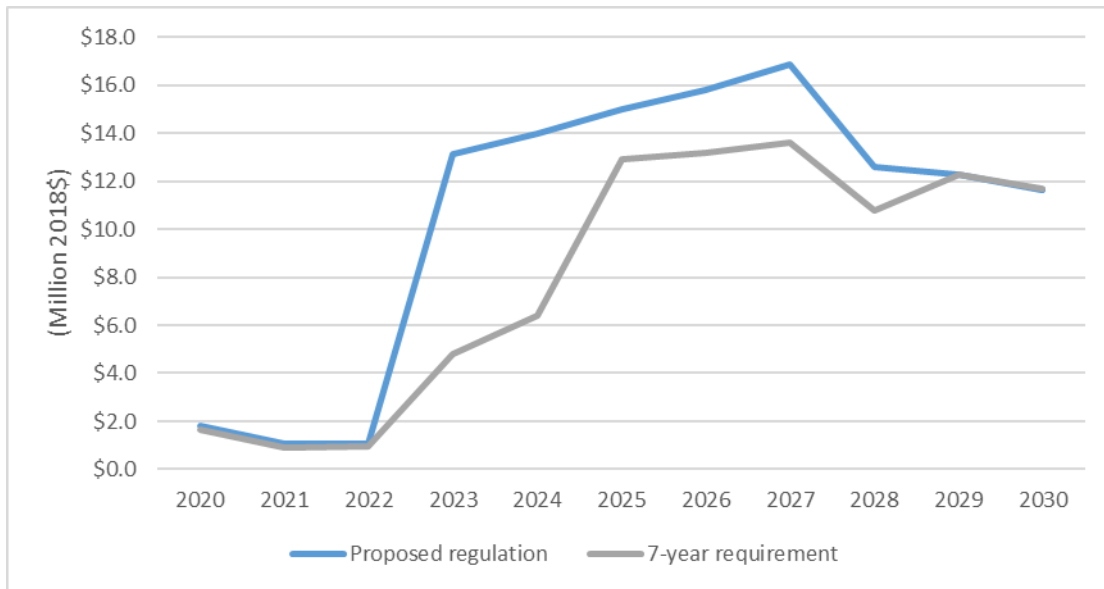
Table 3 shows the number of Level 2 and DCFC EVSE that would be required to comply under the proposed regulation and Alternative 1. Alternative 1 delays some compliance requirements, which spreads costs more evenly over time, but also reduces the benefits by delaying the number of EVSE that would be accessible and easy to use.

Table 3 -Compliant EVSE by Year in the Proposed Regulation and Alternative 1

Year	Proposed Regulation		Alternative 1	
	Total Compliant Public Level 2s	Total Compliant DCFC	Total Compliant Public Level 2s	Total Compliant DCFC
2020	0	767	0	406
2021	0	1,154	0	674
2022	0	1,393	0	973
2023	11,796	2,051	4,389	1,394
2024	13,900	2,138	7,170	1,782
2025	16,286	2,217	14,432	2,217
2026	18,762	2,277	16,398	2,277
2027	21,543	2,317	18,630	2,317
2028	22,456	2,339	20,860	2,339
2029	23,415	2,345	23,415	2,345
2030	24,062	2,336	24,062	2,336

Figure 19 shows the annual costs for Alternative 1 and the proposed regulation. Alternative 1 results in \$89 million in cumulative compliance costs over 2020 through 2030, which is 23 percent lower than the proposed regulation.

Figure 19 - Comparison of Compliance Cost for the Proposed Regulation vs. Alternative 1



2. Benefits

Alternative 1 results in the same ultimate benefits as the proposed regulation, but the delay in compliance requirements delays these benefits. Benefits include accessibility and ease of use of charging stations, and the resulting emissions benefits from increased eVMT. Though CARB staff have not quantified these benefits, the relative difference compared to the proposed regulation can be approximated by comparing the cumulative number of compliant chargers over time, as displayed in Table 4. This data shows that Alternative 1 would result in a significant delay in benefits relative to the proposed regulation.

Table 4 - Compliant EVSE in the Proposed Regulation and Alternative 1

	Proposed Regulation		Alternative 1	
	Level 2	DCFC	Level 2	DCFC
2020	0%	43%	0%	23%
2021	0%	62%	0%	36%
2022	0%	71%	0%	50%
2023	71%	100%	26%	68%
2024	78%	100%	40%	83%
2025	85%	100%	75%	100%
2026	92%	100%	81%	100%
2027	100%	100%	86%	100%
2028	100%	100%	93%	100%
2029	100%	100%	100%	100%
2030	100%	100%	100%	100%

3. Economic Impacts

By allowing for a longer period for EVSE to comply, Alternative 1 reduces compliance costs incurred between 2020 and 2030. Figure 19 displays the trend in compliance costs compared to the proposed regulation. As a result of lower compliance costs, macroeconomic impacts of Alternative 1 are slightly smaller than the proposed regulation.

4. Reason for Rejecting

Allowing additional time to comply would create more time in which the consumer does not have publicly available open access EVSE. As the PEV market continues to expand, it is vital that EVSE are ready and easy to use for these consumers. Requiring a simple and uniform way to pay for charging will increase driver confidence of using EVSE in public. Delay in this standardization could discourage the use of electric vehicle technology.

Alternative 1 would result in significantly fewer compliant Level 2 and DCFC EVSE in the early years of implementation (Table 4). In 2023, there would be less than half the number of compliant Level 2 EVSE under Alternative 1. It is important to have as many compliant EVSE in the ground and operational as possible. The PEV market is

changing monthly and adoption rates are steadily increasing in California. It is imperative that drivers have confidence that charging infrastructure is available and easy to use. Having a robust infrastructure will provide driver and regulatory confidence for future ZEV regulation development. CARB staff rejected Alternative 1 because it does not provide the maximal benefits that can be achieved through the proposed regulation.

B. Alternative 2: Stricter compliance period

Alternative 2 proposes less time to retrofit or replace EVSE resulting in public open-access EVSE faster than the proposed regulation (three years instead of five). The proposed requirements would go into effect for DCFC EVSE in 2020 with all EVSE to be fully compliant three years from 2020. Level 2 EVSE requirements would go into effect in 2022 with all EVSE to be fully compliant three years from 2022.

1. Costs

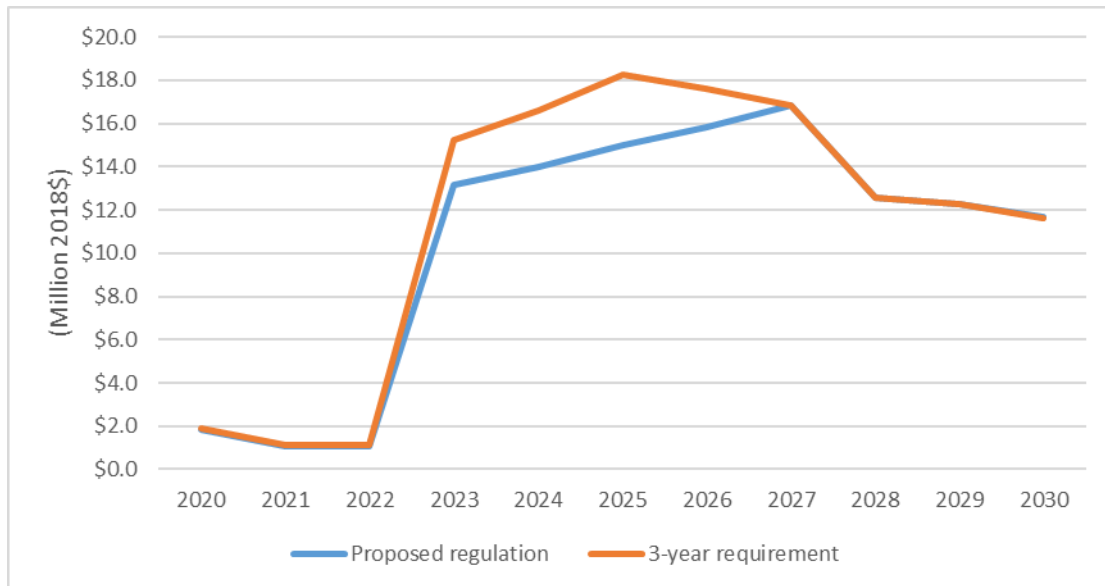
The cost analysis for Alternative 2 uses the same assumptions as the proposed regulation. Thus, under Alternative 2 the number of EVSE required to comply each year, and the distribution of compliance costs are different from for the proposed regulation. Table 5 shows the number of compliant Level 2 and DCFC EVSE under Alternative 2 compared to the proposed regulation. Alternative 2 concentrates compliance costs in early years, but also hastens the benefits by increasing the number of EVSE that would be accessible and easy to use.

Table 5 - Compliant EVSE by Year for the Proposed Regulation and Alternative 2

Year	Proposed Regulation		Alternative 2	
	Total Compliant Public Level 2s	Total Compliant DCFC	Total Compliant Public Level 2s	Total Compliant DCFC
2020	0	767	0	1,188
2021	0	1,154	0	1,869
2022	0	1,393	0	1,958
2023	11,796	2,051	13,650	2,051
2024	13,900	2,138	16,263	2,138
2025	16,286	2,217	19,199	2,217
2026	18,762	2,277	20,358	2,277
2027	21,543	2,317	21,543	2,317
2028	22,456	2,339	22,456	2,339
2029	23,415	2,345	23,415	2,345
2030	24,062	2,336	24,062	2,336

Figure 20 shows the annual costs for Alternative 2 versus the proposed regulation. Alternative 2 results in \$125 million in cumulative compliance costs over 2020 through 2030, which is 8.7 percent higher than the proposed regulation.

Figure 20 - Comparison of Compliance Cost for the Proposed Regulation vs. Alternative 2



2. Benefits

Alternative 2 results in the same benefits as the proposed regulation, but some benefits accrue earlier. These benefits include accessibility and ease of use of charging stations, and the resulting emissions benefits from increased eVMT. Though CARB staff have not quantified these benefits, the relative difference compared to the proposed regulation can be approximated by comparing the cumulative number of compliant chargers over time. This data shows that Alternative 2 would result in approximately a six percent increase in benefits compared to the proposed regulation.

3. Economic Impacts

By requiring a shorter period for EVSE to comply with the requirements, Alternative 2 increases costs compared to the proposed regulation and shifts these costs to earlier years. As a result, the macroeconomic impacts of Alternative 2 are slightly larger than the proposed regulation (Table 6).

Table 6: Summary of Macroeconomic Impacts of Alternative 2

		2020	2022	2024	2026	2028	2030
GSP	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	-3	-5	-51	-81	-109	-71
Personal Income	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	-5	-5	-64	-73	-84	-59
Employment	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in Jobs	-31	-41	-397	-628	-857	-462
Output	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	-6	-9	-84	-137	-187	-121
Private Investment	% Change	0.00%	0.00%	0.00%	-0.01%	-0.01%	0.00%
	Change (2018M\$)	-2	-2	-17	-29	-31	-18

4. Reason for Rejecting

Compared to the proposed regulation, Alternative 2 results in a nine percent increase in costs, but only approximately a six percent increase in EVSE being accessible. These differences are small, but indicate that Alternative 2 is likely less cost effective than the proposed regulation.

In addition, Alternative 2 may not be feasible for all regulated parties. There are thousands of EVSE locations and it will take time to coordinate the effort to bring the non-compliant EVSE into compliance. Implementing the retrofit or replace requirement earlier could place a strain on the hardware supply chain and there is already a shortage of fundamental hardware components for EVSE. Contracting companies that will help complete these tasks may be in short supply if the compliance deadline is earlier.

CARB staff calculated the costs for compliance by EVSE. Many sites have single EVSE; the rest of the sites have multiple EVSE. The sites that have more EVSE installed could take longer to become compliant depending on sizing and resources. If the EVSPs do not meet the timeline for compliance CARB would need to take enforcement actions.

While the goal is to get open access EVSE into the market as quickly as possible, forcing the EVSE to be compliant in three years may not be feasible. Alternative 2 could lead to non-compliance issues and place strain on enforcement activities. By speeding up the compliance time requirement, consumers will have publicly available open access EVSE more quickly. Open access more quickly for consumers is vital, but industry needs sufficient time to retrofit or replace existing EVSE or there will likely be non-compliance requiring enforcement action. CARB staff rejected Alternative 2 because it is less cost effective, and its implementation timeline may not be feasible for all regulated parties.

C. Alternative 3: Small business

The Board has not identified any reasonable alternatives that would lessen any adverse impact on small business.

D. Alternative 4: Adopting no amendments

Compared to the economic baseline, this alternative would result in neither costs to manufacturers nor an increase in EVSE purchase price for California businesses and individuals who own or operate EVSE. Compared to the proposed regulation, this alternative would result in a costs savings to businesses and individuals who own or operate EVSE in California of \$115.49 million over 5 years.

However, this alternative would prevent California from realizing the open access for drivers and emissions benefits. This would result in higher than anticipated emissions from drivers not charging PHEVs as much or drivers not switching to a BEV from traditional ICE vehicles. It would also make it more difficult for the State of California to meet state greenhouse gas emission requirements and federal ambient air quality standards. Staff rejected the no-action alternative because of the potential for adverse emissions impacts and lack of open access for current PEV drivers.

E. Performance standards in place of prescriptive standards

The proposed regulation is a performance standard. To the extent the proposed regulation imposes prescriptive standards, CARB staff has considered alternatives to the proposal and has determined that the proposal is necessary for reasons further discussed in this attachment and staff's Initial Statement of Reasons.

In particular, the proposed regulation has several elements with prescriptive-like elements worth further discussion here. First, the proposed regulation requires EVSPs to label each EVSE in accordance with Part 309 of Title 16 of the Code of Federal Regulations. SB 454 explicitly requires this element; the proposed regulation further imposes a compliance deadline and penalties for noncompliance. In addition, the label provides drivers with a clear indication of what each EVSE is capable of for charging their vehicle. Second, the proposed regulation requires all publically available EVSE to

have a physical credit card reader and a physical NFC reader. The proposed regulation does not mandate specific placement of the reader, or require a specific reader type, so long as it meets the proposed regulatory standards. This requirement is necessary so that consumers can easily understand, in advance, what payment methods they can use at EVSE throughout California. Third, the proposed regulation requires EVSPs to implement PCI-DSS Level 1 security for the credit card readers at EVSE. Stakeholders have consistently stated that they want to protect customer data with the highest form of security possible. Level 1 is known to be highest form of security protocol for payment processing. It is commonly used in applications that are remote and do not have constant attendant watchful eyes, such as in parking meters. Fourth, the proposed regulation requires EVSPs to disclose certain fees at the EVSE at the time of payment, and requires electricity to be billed in \$/kWh or \$/MJ. The proposed requirement does not otherwise mandate how EVPS must display fees, and does not limit the type of fees that may be charged. This proposed requirement will align with California Department of Food and Agriculture Division of Measurement Standard's proposed regulation for EVSE charging as well as give customers confidence that all fees will be displayed ahead of starting a charging session. Fifth, the proposed regulation requires, at a minimum, that EVSPs implement OCPI as an interoperability billing standard. In order to promote interoperability, CARB staff had to select a standard to avoid market bifurcation. EVSPs are not limited to only installing OCPI and are not required to enter into interoperability agreements. Interoperability will create a more even playing field for EVSPs, and will provide drivers with the ability to roam easily between different EVSPs.

F. Health and Safety Code section 57005 Major Regulation

CARB estimates the proposed regulation will have an economic impact on the state's business enterprises of more than \$10 million in one or more years of implementation. CARB has evaluated alternatives submitted to CARB and considered whether there was a less costly alternative or combination of alternatives that would be equally as effective in achieving increments of environmental protection in full compliance with statutory mandates within the same amount of time as the proposed regulatory requirements, as required by Health and Safety Code section 57005.

XI. JUSTIFICATION FOR ADOPTION OF REGULATIONS DIFFERENT FROM FEDERAL REGULATIONS CONTAINED IN THE CODE OF FEDERAL REGULATIONS

CARB is implementing SB 454, which was created and signed into law in 2013. SB 454 requires EVSE to be labeled in accordance with Part 309 of Title 16 of the Code of Regulations. The proposed regulation affects that requirement. With that exception, there are no other federal regulations at this time that address the same issues as the proposed regulation.

XII. PUBLIC PROCESS FOR DEVELOPMENT OF THE PROPOSED ACTION

CARB staff has engaged with stakeholders via forums and public processes from the onset of the proposed rulemaking. Initially, outreach and input focused on stakeholder forum settings to define potential actions by CARB on SB 454. On December 8, 2017, CARB staff hosted the first forum with industry stakeholders to discuss requirements as stipulated by the legislation and to introduce other regulatory considerations CARB was investigating. During the forum, CARB staff sought input on factors for developing open access charging infrastructure requirements for PEVs, including payment for use, data reporting, network roaming and interoperable billing, and that pose barriers for electric vehicle consumer adoption. On March 30, 2018, CARB staff hosted a second forum to further discuss and seek input on the regulatory framework, definitions, proposed data format, and proposed compliance timelines. At this time, CARB staff solicited stakeholders for alternatives to the proposed regulation.

CARB staff also gathered public feedback on the proposed regulation through public workshops and a webinar. Staff distributed notice of the May 30, 2018 workshop through a public listserv that includes 5,000+ recipients and posted notice of the public meeting.¹²³ CARB staff posted, on the CARB SB 454 website, information regarding the workshop and associated materials.¹²⁴ This public workshop, which was webcast, solicited stakeholder feedback on the proposed regulation and the regulatory process. CARB staff also sought public input regarding alternatives to the proposed regulation. Subsequent to this workshop, CARB staff hosted a public webinar on June 21, 2018, to present proposed definitions for regulated parties and to discuss reporting requirements. CARB staff held a second public workshop¹²⁵ on November 7, 2018, during which CARB staff presented draft regulatory language and requested feedback from stakeholders. CARB staff hosted a second public webinar on April 2, 2019 to present draft regulatory text modified based on stakeholder feedback from the November 7, 2018 workshop.

¹²³ CARB, 2018c.

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XIV. APPENDICES

Appendix A Proposed Regulation Order

Appendix B California Open Charge Point Interface Test Procedures for Networked Electric Vehicle Supply Equipment for Level 2 and Direct Current Fast Charge Classes

Appendix C SRIA for EVSE Standards

Appendix D Department of General Services Comment Letter

Appendix E Payment Card Industry Data Security Standard Version 3.2.1 May 2018

Appendix F Alternative Fuels Data Center Data Template