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Decision **PROPOSED DECISION OF ALJS GOLDBERG AND COOKE**
(Mailed 3/30/2018)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of San Diego Gas & Electric Company (U 902E) for Approval of SB 350 Transportation Electrification Proposals.	Application 17-01-020
And Related Matters.	Application 17-01-021 Application 17-01-022

DECISION ON THE TRANSPORTATION ELECTRIFICATION STANDARD REVIEW PROJECTS

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DECISION ON THE TRANSPORTATION ELECTRIFICATION STANDARD REVIEW PROJECTS

Summary

Today's decision approves, with modifications, transportation electrification projects proposed by California's three largest electric utilities and approves budgets totaling approximately $738 million. This decision further sets aside $29.5million for evaluation of the projects. The approval and implementation of these transportation electrification projects continues the California Public Utilities Commission's efforts to meet the clean energy and widespread transportation electrification goals of Senate Bill 350. This decision is another step forward in ensuring California meets its clean air and greenhouse gas reduction goals for 2030 and beyond. These proceedings are closed.

1. Background

Senate Bill (SB) 350, the *Clean Energy and Pollution Reduction Act* (Chapter 547, Statutes of 2015), established new clean energy, clean air, and greenhouse gas reduction goals for California for 2030 and beyond. Among other things, SB 350 requires the California Public Utilities Commission, in consultation with the California Air Resources Board (CARB) and the California Energy Commission (CEC), to direct the utilities under our regulatory oversight to undertake transportation electrification activities consistent with Public Utilities Code Sections (Pub. Util. Code §§) 237.5 and 740.12.[1]

Decision (D.) 16-11-005 affirmed the direction to Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison Company (SCE) to file their first round of applications by

[1] Unless otherwise stated, all code section references are to the Public Utilities Code.

January 20, 2017. The utilities met this obligation by filing applications and supporting testimony for approval of proposed programs and investments to accelerate widespread transportation electrification on January 20, 2017.[2] Following protests, responses, and a prehearing conference, a Scoping Ruling was issued on April 13, 2017. Among other things, the Scoping Ruling consolidated the three applications, established separate procedural schedules for the processing of the proposed priority[3] and standard review projects, and identified the scope of issues.

The overarching issues within the scope of the standard review phase of this proceeding include (1) Are the proposed standard review projects reasonable and in the ratepayers' interests;[4] and (2) Should the proposed revenue requirement, cost recovery (including balancing account proposal) standard of review, and rate designs associated with the standard review programs be approved.

Opening testimony by non-utility parties on fast charging infrastructure and rates was served on July 25, 2017. Opening testimony on medium/heavy duty and fleet charging infrastructure and commercial Electric Vehicle (EV) rates was served on August 1, 2017. Opening testimony on residential charging infrastructure and rates was served on August 7, 2017. Concurrent rebuttal testimony of all parties was served on September 5, 2017.

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[2] D.18-01-024 sets forth the extensive procedural background leading to these applications, which we do not reiterate here.

[3] D.18-01-024 approved 15 of the priority review projects proposed by SDG&E, SCE, and PG&E totaling approximately $41 million.

[4] Sections 740.3 and 740.8.

Eleven days of evidentiary hearings were held from September 25 to October 12 of 2017. Following evidentiary hearings, a ruling was issued on October 12, 2017 modifying the post-hearing briefing schedule. Opening Briefs were filed on November 21, 2017 by: California Transit Association (CTA); CALSTART; ChargePoint, Inc. (ChargePoint); Clean Energy Fuels Corp (Clean Energy Fuels); Environmental Defense Fund (EDF); East Yard Communities For Environmental Justice, Center for Community Action and Environmental Justice, and Union of Concerned Scientists (UCS) (jointly, EJ parties); Green Power Institute (GPI); Greenlining Institute (Greenlining); National Diversity Coalition (NDC); Natural Resources Defense Council (NRDC), the Greenlining Institute, Plug-In America, the Coalition of California Utility Employees (CCUE), Sierra Club, EDF, UCS, Greenlots, Siemens, and eMotorwerks (jointly, NRDC et al.); Office of Ratepayer Advocates (ORA); PG&E; Small Business Utility Advocates (SBUA); SCE; Santa Clara Valley Transportation Authority (VTA); San Diego Airport Parking (SDAP); SDG&E; Southern California Gas Company (SoCalGas); Tesla; The Utility Reform Network (TURN); and Utility Consumers' Action Network (UCAN).

Concurrent reply briefs were filed on December 21, 2017 by: SDAP; Alliance of Automobile Manufacturers; CALSTART; ChargePoint; Clean Energy Fuels; CCUE; EJ Parties; EDF; GPI; eMeter, a Siemens Business, Greenlots, and Electric Motor Werks (jointly, eMeter); Greenlining; NDC; NRDC; ORA; PG&E; SBUA; SDG&E; SoCalGas; Tesla; TURN; UCAN; and VTA.

In September 2017, the Commission held community meetings in Richmond, Los Angeles, and Chula Vista, CA. Another community meeting was held in Fresno in December 2017. Almost 200 members of the public attended these meetings and provided comments on a range of issues included in the

Priority and Standard Review Projects of the utilities' Transportation Electrification (TE) applications. In these meetings, many members of the public expressed support for some or many of the proposed TE projects, especially in the medium-duty/heavy-duty (MD/HD) vehicle space. Members of the public were especially interested in pollution abatement and any health benefits available from TE in disadvantaged communities (DACs). Many members of the public also expressed concern about the bill impacts of the utility investments and how those would be connected to benefits, including economic, seen in their communities.

On December 14, 2017, CARB unanimously approved its Proposed Fiscal Year 2017-18 Funding Plan for Low Carbon Transportation Incentives, which includes $663 million in incentives for financing zero-emission and plug-in passenger cars, clean trucks and buses, and advanced technology freight projects, of which $398 million is targeted at heavy-duty and off-road vehicle sectors.[5]

This matter was submitted on December 21, 2017, upon the filing of concurrent reply briefs.[6]

A proposed decision on the Standard Review Projects mailed for comment on March 30, 2018. Parties filed opening comments on April 19, 2018, and reply comments on April 24, 2018. The assigned commissioner convened an All Party Meeting at the Commission's San Francisco office on May 16, 2018. Notice of the All Party Meeting appeared on the Commission's Daily Calendar on May 4, 2018. Parties were provided an agenda and call-in number to participate in the All

[5] PG&E Reply Brief at 6, referencing Exhibit PGE-6.

[6] California Public Utilities Rule of Practice and Procedure 13.13(a).

Party Meeting on May 11, 2018. The All Party Meeting was highly attended, with over 60 people in-person and 90 participants via phone.

1.1. Technical Definitions

Given the technical nature of the utilities' proposals, we have defined a few terms upfront, in addition to the acronym glossary provided in Appendix A.

- **Make-ready:** Service connection and supply infrastructure to support EV charging comprised of the electrical infrastructure from the distribution circuit to the stub of the Electric Vehicle Supply Equipment (EVSE). It can include equipment on the utility-side (e.g. transformer) and customer-side (e.g. electrical panel, conduit, wiring) of the meter.
- **EV Supply Equipment (EVSE):** (1) the equipment that interconnects the AC electricity grid at a site to the EV. 2) Sometimes used more broadly to mean charging station, whether AC or DC, but not including the make-ready infrastructure or other charging infrastructure. Also see charging station/device. May include multiple connectors (called multi-port) to charge several EVs or to serve EVs with different types of connectors (e.g. SAE Combo and CHAdeMO).
- **Level 1 (L1) Charging:** AC Level 1 provides 1 to 5 miles of range per 1 hour of charging using a 120-volt (V) alternating current (AC) plug.
- **Level 2 (L2) Charging:** AC Level 2 provides 10 to 20 miles of range per 1 hour of charging using 240 V or 208 V electrical service.
- **DC Fast Charging:** Charging at 20 kW and higher using direct current. Direct-current (DC) fast charging provides 50 to 70 miles of range per 20 minutes of charging with an electrical output ranging between 50-120 kW. A charging station that rapidly charges a car battery by connecting it directly to a higher power, direct current source.

- **Charge Port:** Generally, refers to the location where the EVSE connector attaches to the vehicle. Not to be confused with port or connector. One EVSE may have multiple charge ports.
- **Site:** the location at which charging infrastructure (EVSE or make-ready) is installed.
- **CHAdeMo:** A connector and communication protocol for vehicle DC charging initially developed in Japan during 2005-2009. It was first adopted into international standards IEC 61851-23/24 and IEC 62196-3 in 2014 and then into USA standard IEEE 2030.1.1 in 2015. Further updates to the protocol are managed by the CHAdeMO Association.
- **Combined Charging System (or Combo/CCS) Connector:** A connector that supports both AC J1772 and DC Charging and created by the Society of Automobile Engineers, which is a standards development organization for vehicle technology.
- **Transportation Electrification:** the use of electricity from external sources of electrical power, including the electrical grid, for all or part of vehicles, vessels, trains, boats, or other equipment that are mobile sources of air pollution and greenhouse gases (GHG) and the related programs and charging and propulsion infrastructure investments to enable and encourage this use of electricity.[7]

2. Statutory and Commission Guidance

In § 740.12(a)(1), the Legislature found, among other things, that widespread TE is needed to achieve the goals set forth in the Charge Ahead California Initiative,[8] and to reduce emissions of GHG "to 40 percent below

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[7] Section 237.5.

[8] The goals of the Charge Ahead California Initiative "are to place in service at least 1,000,000 zero-emission and near-zero-emission vehicles by January 1, 2023, to establish a self-sustaining California market for zero-emission and near-zero-emission vehicles in which zero-emission and near-zero-emission vehicles are a viable mainstream option for individual vehicle purchasers, businesses, and public fleets, to increase access for disadvantaged, low-income, and

Footnote continued on next page

1990 levels by 2030 and to 80 percent below 1990 levels by 2050…."[9] The Legislature also found that "[a]dvanced clean vehicles and fuels are needed to reduce petroleum use, to meet air quality standards, to improve public health, and to achieve greenhouse gas emissions reductions goals," and that widespread TE "requires electrical corporations to increase access to the use of electricity as a transportation fuel."

The Legislature recognized the impact of TE, and found at § 740.12(a)(1), in part:

> (C) Widespread transportation electrification requires increased access for disadvantaged communities, low- and moderate-income communities, and other consumers of zero-emission and near-zero-emission vehicles, and increased use of those vehicles in those communities and by other consumers to enhance air quality, lower greenhouse gases emissions, and promote overall benefits to those communities and other consumers.
>
> (F) Widespread transportation electrification should stimulate innovation and competition, enable consumer options in charging equipment and services, attract private capital investments, and create high-quality jobs for Californians, where technologically feasible.
>
> (G) Deploying electric vehicles should assist in grid management, integrating generation from eligible renewable energy resources, and reducing fuel costs for vehicle drivers

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moderate-income communities and consumers to zero-emission and near-zero-emission vehicles, and to increase the placement of those vehicles in those communities and with those consumers to enhance the air quality, lower greenhouse gases, and promote overall benefits for those communities and consumers." (Health and Safety Code § 44258.4.)

[9] The 2030 reductions are mandated in Health and Safety Code § 38566, and the 2050 reductions are set forth in Governor Schwarzenegger's Executive Order S-3-05.

> who charge in a manner consistent with electrical grid conditions.
>
> (H) Deploying electric vehicle charging infrastructure should facilitate increased sales of electric vehicles by making charging easily accessible and should provide the opportunity to access electricity as a fuel that is cleaner and less costly than gasoline or other fossil fuels in public and private locations.

The Legislature directed the Commission to consider those findings, among others, set forth by § 740.12(a)(1) when "designing and implementing regulations, guidelines, plans, and funding programs to reduce greenhouse gas emissions."

Pursuant to § 740.12(b):

- The proposed TE programs shall seek to minimize overall costs and maximize overall benefits.
- The Commission shall approve, or modify and approve, TE programs and investments, including those that deploy charging infrastructure, through a reasonable cost recovery mechanism.
- The approval, or modification and approval, of the programs and investments must be consistent with § 740.12, not unfairly compete with nonutility enterprises as required by § 740.3(c), include performance accountability measures, and be in the interests of ratepayers as defined in § 740.8.

Section 740.8 defines the interests of ratepayers as follows:

> As used in Section 740.3 or 740.12, "interests" of ratepayers, short- or long-term, mean direct benefits that are specific to ratepayers, consistent with both of the following:
>
> (a) Safer, more reliable, or less costly gas or electrical service, consistent with Section 451, including electrical service that is safer, more reliable, or less costly due to either improved use of the electric system or improved integration of renewable energy generation.

(b) Any one of the following:

(1) Improvement in energy efficiency of travel;

(2) Reduction of health and environmental impacts from air pollution;

(3) Reduction of greenhouse gas emissions related to electricity and natural gas production and use;

(4) Increased use of alternative fuels; and

(5) Creating high-quality jobs or other economic benefits, including in disadvantaged communities identified pursuant to Section 39711 of the Health and Safety Code.

In addition, § 740.3(c) requires the "costs and expenses of those programs are not passed through electric or gas ratepayers unless the commission finds and determines that those programs are in the ratepayers' interest." Furthermore, § 740.12(c) requires that before the Commission can authorize "an electrical corporation to collect new program costs related to transportation electrification in customer rates," the Commission "shall review data concerning current and future electric transportation adoption and charging infrastructure utilization…."[10]

The September 14, 2016 Assigned Commissioner's Ruling in Rulemaking (R.) 13-11-007 (ACR) established a complementary set of principles that guide our review and analysis of the Standard Review Projects. In the ACR, the assigned Commissioner set forth the guidelines on what the TE applications

[10] Section 740.12(c) also states: "If market barriers unrelated to the investment made by an electric corporation prevent electric transportation from adequately utilizing available charging infrastructure, the commission shall not permit additional investments in transportation electrification without a reasonable showing that the investments would not result in long-term stranded costs recoverable from ratepayers."

should contain, and the criteria the applications would have to meet. In particular, the ACR encouraged projects that:

- Fit with the California Public Utilities Commission (CPUC or Commission) and utility core competencies and capabilities;
- Address the multiple goals of widespread TE;
- Consider Commissioner-identified priority projects;
- Align with Local, Regional and Broader State Policies;
- Promote driver, customer and worker safety;
- Leverage non-utility funding;
- Identify a Vehicle Grid Integration (VGI) Communication Standard;[11]
- Consider utility incentives or other regulatory mechanisms;
- Provide anonymous and aggregated data for evaluation.

The ACR provides guidance about the applications as follows:

- The TE application shall explain how the proposed projects or investments will accelerate the adoption of TE.
- The TE application needs to demonstrate, with specific monitoring and evaluation criteria, how the projects and investments will align with the findings set forth in § 740.12(a)(1).
- The TE application shall describe how each project and investment will minimize overall costs and maximize overall benefits.

[11] The utilities were directed to address whether they intended to adopt standard VGI communications protocols in their applications. Consistent with §§ 740.2, 740.3(a) and 8362, the Commission is cooperating with the CEC, CARB and California Independent System Operator (CAISO) in conducting a working group to determine whether the state should adopt a specific VGI communications protocol. No recommendation has been issued from this working group, so any Commission rulemaking on whether to adopt any specific protocol or protocols or similar requirements will be addressed in a future decision.

- The TE application shall describe the cost recovery mechanism the utility is seeking.
- The TE application shall describe how each proposed project and investment does not unfairly compete with nonutility enterprises.
- Each of the proposed TE projects and investments shall include performance accountability measures.
- The TE application shall describe how each proposed project and investment is in the interests of ratepayers.
- The TE application shall provide testimony about the following: Current and future electric transportation adoption and charging infrastructure utilization; any market barriers that prevent electric transportation from adequately utilizing available charging infrastructure, and a reasonable showing that the investment will not result in long-term stranded costs recoverable from ratepayers.

3. SDG&E's Residential Charging Program

SDG&E's originally filed application presented a Residential Charging Program (RCP) in which SDG&E would own, install, maintain, and operate 90,000 L2 charging stations, including the EVSE and make-ready infrastructure at SDG&E's customers' residences, limited to single-family homes and customers in multi-unit dwellings (MUDs) with four units or less.[12] As defined above, the make-ready infrastructure refers to the service connection and supply infrastructure to support EV charging (i.e. 240-volt outlet) including any distribution system upgrades on the utility side of the meter and panel upgrades (if needed), conduit, and wiring on the customer side of meter. SDG&E designed its RCP to accelerate widespread TE in the light-duty passenger vehicle market.[13]

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[12] Exhibit SDGE-04 at RS-2.

[13] Exhibit SDGE-11 at RS-1.

However, due in large part to recommendations of the NRDC, Plug-In America, The Greenlining Institute, CCUE, Sierra Club, and the EDF (collectively, Joint Parties) SDG&E modified its proposal in its rebuttal testimony.[14] SDG&E's modified RCP for which it seeks approval includes:

- Allowing customer choice of either utility-owned or customer-owned EVSE;[15]
- A new allowance cap structure for the EVSE ($500 for single and multi-unit dwellings and $600 for single and multi-family dwellings in DACs) and installation costs ($1425 for single and multi-family dwellings and $1500 for California Alternate Rates for Energy (CARE) and Family Electric Rate Assistance (FERA) Program customers), as well as customers located in DACs (regardless of which ownership model is selected);[16]
- Increasing the number of EVSEs reserved for DACs from 20 percent to 25 percent;[17]
- Replacing the mandatory whole-house grid integrated rate (GIR) with an EV-Only GIR, and allowing customers to choose from two existing electric vehicle time-of-use rates (EV-TOU and EV-TOU-2);[18]
- Requiring networked EVSE;[19]
- Authority to spend $241.8 million, an increase of $16 million from SDG&E's original proposal;[20]

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[14] ORA Opening Brief at 55.

[15] Exhibit SDGE-09 at LB-3.

[16] Exhibit SDGE-09 at LB-3.

[17] Exhibit SDGE-11 at RS-3.

[18] Exhibit SDGE-12 at CF-3.

[19] Exhibit SDGE-11 at RS-5.

[20] Exhibit SDGE-13 at MAC-1.

- Incorporate a goal of at least 40 percent of overall program costs to be spent with Diverse Business Enterprise (DBE) firms;[21]
- Use sub-meters for billing purposes at a scale that could be transformative for the electric industry nationwide;[22]
- Set aside $5.5 million for panel upgrades in DACs;[23]
- Adopt measures to ensure both utility-owned and customer-owned EVSE remain in service;[24] and
- Report on relevant metrics for an additional five years.[25]

The Joint Parties suggest the Commission need not rely solely upon the judgement of SDG&E, but can rely upon the collective judgement of a diverse group of stakeholders and experts with deep knowledge of the EV market in concluding that SDG&E's modified program will accelerate transportation electrification consistent with § 740.12.[26]

The chart below outlines SDG&E's RCP as proposed in its rebuttal testimony:[27]

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[21] Exhibit SDGE-11 at RS-8 to RS-9.

[22] Exhibit SDGE-11 at RS-5.

[23] Exhibit SDGE-11 at RS-3.

[24] Exhibit SDGE-11 at RS-7 to RS-8.

[25] Exhibit SDGE-11 at RS-8.

[26] NRDC et al. Opening Brief at 5.

[27] *See* generally, Exhibit SDGE-11.

Table 1. SDG&E Proposed Residential Charging Program

• Install up to 90,000 EVSE in residential customers' homes, with the option of utility or customer EVSE ownership. SDG&E will own all additional infrastructure in both ownership scenarios. The projected budget for 100-percent utility ownership is $241.8 and $239.9 million for 50-percent customer ownership.
• SDG&E would conduct an open Request for Proposals (RFP) to identify eligible EVSE, with a goal of 40 percent spent with diverse businesses. Customer chooses EVSE and Electric Vehicle Service Provider (EVSP); SDG&E installed EVSE in all participants' homes.
• SDG&E would offer an additional $175 in EVSE and installation allowance to customers in DACs or CARE/FERA customers, relative to what other customers would receive. Up to 25 percent of the program funds would be reserved for DACs
• Customers will utilize a "web based portal" to select and purchase an eligible EVSE.
• SDG&E would qualify only networked L2 EVSE that are certified by a Nationally Recognized Testing Laboratory (NRTL) and can connect to SDG&E for billing and receive dynamic pricing signals.
• SDG&E would provide customers with "upfront allowances" toward the cost of the charger through the on-line enrollment process.
• SDG&E will qualify and contract with specific installers through an RFP process.
• SDG&E would require all installers to be IBEW signatory contractors certified through the Electric Vehicle Infrastructure Training Program (EVITP).
• SDG&E would allow any residential customer with an EV to participate.
• Participants must enroll in the proposed Residential GIR or other EV TOU rates.

3.1. Impact on Competition

Sections 740.3(c) and 740.12(b) require the Commission to ensure that the TE programs it approves do not allow the utilities to unfairly compete with nonutility enterprises.[28] In D.11-07-029 and D.14-12-079, the Commission established a "balancing test" that evaluates the benefits of utility ownership of EV charging infrastructure against the competitive limitation that may result

[28] TURN Opening Brief at 123.

from that ownership.[29] Three of the four EVSPs that are parties to this proceeding agree customers should have the option of a utility-owned make-ready infrastructure and EVSE,[30] and SDG&E believes these opinions show that utility involvement will help grow the market and facilitate healthy competition.[31] However, many intervening parties raise anti-competitive concerns with allowing SDG&E to have the potential to own, install and operate up to 90,000 L2 Networked EVSE in SDG&E's service territory. Therefore, it is essential to evaluate the competitive impacts of SDG&E's modified RCP on the EV charging market.

3.1.1. RCP Size

SDG&E sized its RCP based on the assumption that SDG&E would serve 75 percent of the zero-emission vehicles (ZEVs) needed within its service territory to meet the Governor's goal of having 1.5 million ZEVs in California by 2025.[32] To calculate program size, SDG&E assumed that its service territory makes up approximately 10 percent of California's 1.5 million-vehicle goal, narrowing SDG&E's target to 150,000 ZEVs.[33] SDG&E subtracted the projected number of ZEVs in its territory in 2020 (29,691) from 150,000 vehicles to get a remaining market of 120,309 additional ZEVs that need to be on the road in SDG&E's territory by 2025.[34] SDG&E has set the goal of obtaining 75 percent

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[29] TURN Opening Brief at 123, citing D.14-12-079 at 5.

[30] SDG&E Opening Brief at 26 referencing Exhibit SDGE-10 at PP-9.

[31] SDG&E Opening Brief at 26, referencing Exhibit SDGE-10 at PP-9.

[32] Exhibit SDGE-04 at RS-6.

[33] Exhibit SDGE-04 at RS-6 to RS-7.

[34] Exhibit SDGE-04 at RS-6 to RS-7.

participation rate through the RCP, which leads to a target of 90,000 customers participating. This implies that drivers who do not participate in SDG&E's RCP will account for the remaining 25 percent of adoption (about 30,000 EVs) within its territory from 2020 to 2025.

ORA is one of the several parties who feel SDG&E's 90,000 deployment goal could create anti-competitive issues within the EVSE and EVSP markets. ORA contends SDG&E's estimate is misleading because the utility ignores the natural progression of EV adoption that would occur from 2020 to 2025 without its proposed RCP.[35] ORA notes the 90,000 figure excludes the 3,000 to 3,500 utility-owned EVSE that were already approved in D.16-01-045.[36] The 90,000 figure additionally omits 14,000 current SDG&E EV drivers not enrolled in EV TOU rates.[37] ORA estimates that by 2025, San Diego's ZEV population, without the RCP, would be approximately 46,000.[38] ORA uses this figure to illustrate that SDG&E's 90,000 L2 EVSE deployment goal actually constitutes 87 percent of the projected vehicles needed to meet the Governor's ZEV goals in SDG&E's territory. ORA opines that SDG&E's potential ownership of 90,000 L2 EVSE, constituting 75 percent of the market share of L2 EVSE in SDG&E's service territory could have significant anti-competitive impacts on the market.[39]

ChargePoint believes that regardless of who "owns" the EVSE, SDG&E's plan to procure and install up to 90,000 EVSE will dominate the market for both

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[35] ORA Opening Brief at 56.

[36] ORA Opening Brief at 57, citing D.16-01-045 at 181.

[37] ORA Opening Brief at 57, citing Exhibit SDGE-15 at JCM-5.

[38] ORA Opening Brief at 57.

[39] ORA Opening Brief at 57.

home L2 EVSE and installation servicers, inalterably changing both markets.[40] This scenario has the potential to provide other charging station providers with little or no opportunity to compete in the EVSE and EVSP markets outside of SDG&E's program.[41]

Electrifying the transportation sector is a critical component to meeting the state's environmental goals, including greenhouse gas emissions reductions and air quality improvements. While we agree with SDG&E's rationale to target the residential market, we also agree with comments from ratepayer advocacy groups that the structure of SDG&E's RCP does not prevent the potential anti-competitive impacts of utility ownership of EV infrastructure.[42] We also find that there are varying methods for calculating the natural adoption of EVs in SDG&E territory and this can impact the overall market penetration of SDG&E's proposed program. Furthermore, as discussed more in Sections 3.2.1 and 3.5, it is unclear if the costs of the program are minimized while maximizing the benefit to all ratepayers.

In that regard, we limit the size of SDG&E's program to an initial, maximum deployment of 60,000[43] EVSE through the RCP, with an option to seek Commission approval to increase the deployment target three years into program implementation (as detailed in Section 3.5). A target of 60,000 participants will enable SDG&E to meet 50 percent of the projected EV adoption need in its service territory, and strikes a balance between the costs to ratepayers

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[40] ChargePoint Opening Brief at 59.

[41] ChargePoint Opening Brief at 59-60.

[42] ORA Opening Brief at 85.

[43] Exhibit ORA-3 at 1-11; Exhibit TURN-01 at 1-2.

and the overall benefits of the RCP, in addition to competitive concerns. Furthermore, we make the following supportive modifications:

(1) RCP participants should be limited to new EV drivers[44] (Section 3.2.2);

(2) SDG&E should not own the EVSE or any of the make-ready infrastructure on the customer side of the meter (Section 3.1.2);

(3) any rebates for infrastructure on the customer side of the meter should be treated as an expense (Sections 3.2.1 and 8.1); and

(4) SDG&E should maintain a turn-key offering to the customer by providing rebates for the EVSE and EVSE installation, facilitated through SDG&E's existing Marketplace website (Section 3.5).

These modifications are within the scope of this proceeding, and provide SDG&E the opportunity to provide a turnkey solution to accelerating TE in the light-duty passenger vehicle market while minimizing anti-competitive impacts.

3.1.2. Ownership Structure

SDG&E believes the utility ownership model is reasonable and can maximize benefits and minimize costs. However, in response to recommendations made by the Joint Parties, SDG&E's modified RCP offers customers the choice between the utility owning and maintaining the EVSE or the customer owning and maintaining the EVSE themselves. In either instance, SDG&E still proposes to install, own, and maintain any distribution system upgrades on the utility side of the meter, and the 240-volt circuit from the customer's electric panel to the EVSE, as well as manage the installation of the

[44] TURN Opening Brief at 115.

EVSE by skilled and trained contractors.[45] Regardless of the ownership model, customers will utilize a web-based portal to choose and purchase an EVSE from a predetermined list of qualified EVSE. SDG&E plans to pre-qualify EVSE through an RFP process. During the EVSE purchase process, a monetary allowance will be applied upfront to the transaction. SDG&E requests authority for up to 100 percent utility ownership because SDG&E has no way of accurately predicting which ownership model customers will choose.

Many parties believe SDG&E's proposed EVSE ownership structure does not meet the Commission's "balancing test" that evaluates the benefits of utility ownership and EV charging infrastructure against the competitive limitation that may result from that ownership. ChargePoint acknowledges that although SDG&E amended its original filed application to allow some customers to own the EVSE, the modified RCP fails the anti-competitive balancing test.[46]

In a joint filing, three other EVSE Providers - Siemens, Greenlots, and Electric Motor Werks - contend utility ownership of charging infrastructure will drive the nascent TE market and provide benefits to ratepayers and DACs.[47] Given the evolution of the TE market, these three EVSE providers believe there is an active role for all participants in the TE ecosystem, including utility ownership of EVSE.[48] Siemens, Greenlots and Electric Motor Werks believe in a diverse business model to identify and address different market barriers to enable

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[45] Exhibit SDGE-11 at RS-5.

[46] ChargePoint Opening Brief at 59.

[47] Reply Brief of EVSE Providers at 5.

[48] Reply Brief of EVSE Providers at 5.

widespread TE.[49] To ensure customer exposure to choice and grow the overall EV market, the three EVSE providers support testing various business models.[50]

EDF urges the Commission to maintain SDG&E's ownership option, despite arguments that this may cause anti-competitive concerns.[51] EDF contends even if SDG&E owned all the EVSE in the proposed RCP, the 90,000 figure only represents a fraction of the needed EVs in SDG&E's service territory, diminishing anti-competitive concerns.[52]

Tesla recommends allowing consumers to choose their preferred connection at their residence based on the EV they lease or purchase.[53] Tesla believes mandating any one EVSE connector standard for customer participation in the proposed RCP is unnecessary and restricts customer choice. Tesla contends that customer choice is necessary for EV adoption, a primary goal of SB 350.[54]

Although SDG&E's modified RCP, as described in its rebuttal testimony, presents the options of customer-owned or utility owned EVSE, we agree with ORA that SDG&E fails to establish the benefits under the utility ownership model outweigh the anti-competitive impacts or justify the increased costs to ratepayers.[55] Installing a L2 EVSE at a residential home is not as complicated as the installation of EVSE in other sectors. As ChargePoint notes, "installation of a

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[49] Reply Brief of EVSE Providers at 5.

[50] Reply Brief of EVSE Providers at 6.

[51] EDF Opening Brief at 4.

[52] EDF Opening Brief at 4 to 5.

[53] Tesla Opening Brief at 11.

[54] Tesla Opening Brief at 11.

[55] ORA Opening Brief at 59 to 60.

home charging station is comparable to installation of other home appliances" and further estimates that about 80 percent of home installations are relatively simple and inexpensive and do not require electrical upgrades.[56] As detailed below (Section 3.2.1), TURN argues that utility ownership of the charging infrastructure results in higher, long-term costs to ratepayers, compared to alternative models that can still incentivize EV adoption and L2 EVSE installation in the residential sector. Further, SDG&E did not provide specific rationale or evidence for the need for full utility ownership specific to the single-family residential sector, which currently accounts for the vast majority of EV owners.[57] Given the relative success of EV adoption in the single-family residential sector and the lack of specific rationale from SDG&E on why full utility ownership is necessary for this sector, we question utility ownership in this instance. SDG&E has not presented a convincing case as to why utility ownership of the EVSE and make-ready infrastructure is necessary to improve the delivery of the RCP's objectives in proportion to the higher costs associated with utility ownership.

To test various business models, the Commission has previously authorized SDG&E to install, own, and operate more than $60 million in EV charging infrastructure, including the EVSE, across a variety of sectors.[58] SDG&E stated that in developing its proposed RCP, it did not consider any alternatives

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[56] ChargePoint Opening Brief at 40.

[57] TURN cites several studies that show the majority of EV adoption occurs in single family housing, including information from the Center for Sustainable Energy, which shows that 81 percent of early EV adopters live in single-family homes. TURN Opening Brief at 87.

[58] D.16-01-045 authorizes SDG&E to spend $45 million to install, own, and operate up to 3,500 charging stations at workplaces and multiunit dwellings. D.18-01-024 authorizes SDG&E to spend $16 million to install, own, and operate charging equipment in five separate pilot programs.

to full utility ownership.[59] We believe the residential sector provides an opportunity to encourage customer investment in TE, and may not require as much utility intervention on the customer's property to encourage the adoption of EVs.

Denying SDG&E the ability to own any of the charging infrastructure (make-ready or EVSE) on the customer's side of the meter should not hinder SDG&E's ability to offer customers incentives for installing L2 charging stations, encourage the adoption of time-variant rates, and provide the Commission with valuable data to help shape future TE policy. To complement SDG&E's pilots that test full utility ownership of charging infrastructure, t the RCP, as modified by this decision, will test whether a broadly available rebate program that facilitates customer choice of prequalified products and installers is an appropriate use of ratepayer funds to support TE. Moreover, this modification will ensure that SDG&E's share of the EV charging market does not unfairly compete with nonutility enterprises consistent with §§ 740.3(c) and 740.12(b), while still supporting the accelerated adoption of EVs in the residential sector. As discussed further below, SDG&E is encouraged to draw upon the learnings from the RCP to expand on it, or develop other programs that align with the customer and market needs identified during the course of this program.

3.2. Program Specifics

SDG&E designed its RCP to provide consumers a turnkey solution for successful EV adoption amongst the light-duty passenger vehicle sector.[60]

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[59] Reporter's Transcript (RT) at 944 to 945.

[60] ORA Opening Brief, citing Exhibit JP-3 at 11.

Although straightforward in theory, SDG&E's modified RCP raises many issues amongst parties, which are addressed below.

3.2.1. Allowance vs. Rebate

SDG&E believes its RCP will achieve California's policy goals by removing one of the key barriers to implementing TE: upfront installation costs.[61] As such, SDG&E provides for allowance(s) for its participants in its RCP. Participants in SDG&E's RCP will receive an allowance toward both the equipment cost and installation of their EVSE.[62]

Table 2. SDG&E RCP Proposed Allowances[63]

Allowance	Networked L2 EVSE	Installation	Total Allowance
Single-Family/MUD (non-DAC)	$500	$1,425	$1,925
Single-Family/MUD (DAC)	$600	$1500*	$2,100

*$1,500 installation allowance also available for CARE and FERA customers.

As reflected above, customers in SDG&E's service territory will receive $500 toward their purchase of a Networked L2 EVSE for single-family and MUDs, and $600 per single-family or MUDs for those individuals living in a DAC. SDG&E supports the use of Networked EVSE to help improve SDG&E's load factor through managed charging.[64] Networked EVSE prices range from

[61] Exhibit SDGE-11 at RS-9, Exhibit SDGE-02 at LB-28.

[62] Exhibit SDGE-11 at RS-3.

[63] Exhibit SDGE-11 at RS-5.

[64] Exhibit SDGE-11 at RS-5.

approximately $600 to $750, depending on cord lengths and power output, making participants responsible for a balance of $100 to $250.[65]

SDG&E proposes to provide an installation allowance up-to and not-to-exceed $1,425 for single-family and MUD customers, based on actual cost.[66] SDG&E suggests this allowance is in alignment with documented historical EV Project residential installation cost data for the San Diego region.[67] SDG&E proposes to offer an allowance of $1,500 for participants living in a DAC or CARE and FERA customers for installation costs.[68] Similar to the EVSE allowance, participants would be responsible for any installation balance.

SDG&E also proposes to include $5.5 million in its RCP budget for those DAC customers that are required to do an electrical panel upgrade before installing their selected Networked L2 EVSE.[69] SDG&E estimates panel upgrades to cost $1,500 to $3,000.[70] SDG&E's proposed installation allowance does not cover panel upgrades for typical residential customers, but these additional funds would help mitigate any excess costs associated with panel upgrades for participants in DACs, who may be living in older buildings with lower panel capacity.

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[65] Exhibit SDGE-11 at RS-5 citing to https://www.amazon/Best-Sellers-Automotive-Electric-Vehicle-Charging-Stations/zgbs/automotive/7427415011.

[66] Exhibit SDGE-11 at RS-6.

[67] Exhibit SDGE-11 at RS-6 referencing https://avt.inl.gov/sites/default/files/pdf/EVProj/HowDoResidentialChargingInstallationCostsVaryByGeographicLocations.pdf.

[68] Exhibit SDGE-11 at RS-6 to RS-7.

[69] SDG&E Opening Brief at 18, referencing Exhibit SDGE-11 at RS-8.

[70] SDG&E Opening Brief at 18.

Joint Parties support the allowance model because it addresses the significant up-front costs (both financial and behavioral) associated with purchasing and installing residential charging equipment, and will lower operational costs by encouraging charging during off-peak and super-off-peak periods when the grid is underutilized.[71] Joint Parties claim, "[e]xisting rebate programs appear to only deliver very modest results, far short of the transformative changes called for by SB 350."[72]

ORA and TURN believe SDG&E can achieve the same goals in its RCP through a straightforward rebate program.[73] TURN and ORA advocate for a rebate model to minimize costs to ratepayers.[74] TURN contends SDG&E's modified RCP will cost between $677 to $750 million (depending on what percentage of customers choose to own their own EVSE); meaning ratepayers would be paying over $7,500 to $8,300 per L2 EVSE installed over the life of the assets.[75] TURN contends these costs are astronomical even when compared to SDG&E's average EVSE allowance ($500) and installation cost estimates ($1,425).[76] TURN suggests "the main reason the cost to ratepayers of this program are approximately four times the actual costs of charging station equipment and installation allowance proposed stem from the fact that SDG&E

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[71] NRDC Opening Brief at 44 to 45.

[72] Exhibit JP-3 at 14.

[73] TURN Opening Brief at 89; ORA Opening Brief at 60 to 61, referencing RT at 1832-1836.

[74] TURN Opening Brief at 89; § 740.12(b).

[75] TURN Opening Brief at 89, citing Exhibit SDGE-13 at MAC-A-1 and MAC-A-2.

[76] TURN Opening Brief at 89.

seeks to capitalize and rate base the installation [of make-ready] infrastructure, installation of labor costs, and the [EVSE] itself."[77]

As noted in UCAN's opening brief and reiterated during hearings, SDG&E requested nearly $100 million in overhead to operate its proposed program. SDG&E contends it would charge a 48.9 percent overhead for the capitalized L2 chargers installed through its RCP.[78]"[T]he 48.9 percent will be charged multiplied times the direct cost of the charger."[79]

TURN acknowledges the upfront costs of purchasing and installing a L2 EVSE may be a barrier for some residential customers, but points to the upfront rebate provided to customers in Sonoma Clean Power's L2 rebate program.[80] Under the Sonoma Clean Power program, customers can go to Sonoma Clean Power's website to order an eligible L2 station; customers are then required to pay the sales tax and a $50 handling fee.[81] TURN suggests SDG&E implement a similar process, whereby eligible customers receive a coupon code to use on SDG&E's Marketplace website to order an eligible L2 charger.[82] The rebate amount would be upfront to reduce the cost of the L2 networked EVSE and any remaining rebate could be sent to the customer via check to cover any installation costs.[83] TURN suggests applying a L2 EVSE and/or installation rebate upfront to

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[77] TURN Opening Brief at 89, citing Exhibit SDGE-06 at MAC-4, Table MAC-2.

[78] UCAN Opening Brief at 10, citing Exhibit UCAN-12.

[79] RT at 1151-1152.

[80] TURN Opening Brief at 105.

[81] TURN Opening Brief at 105, referencing Exhibit TURN-04 at Appendix 2.

[82] TURN Opening Brief at 105.

[83] TURN Opening Brief at 105-106.

participants utilizing the Marketplace website, thus reducing the actual upfront purchase cost for customers.[84]

According to SDG&E, "[t]he marketplace is a one-stop-shop for an array of smart appliances, including technology that can respond to price signals and incentivize customers to run the appliances during times of day when electricity is at its lowest price. The SDG&E Marketplace also provides customers information on rebates and energy efficiency scores for products listed throughout the site."[85]

SDG&E believes a rebate approach is flawed, because a rebate model does not promote safety, and has no proven track record for success. SDG&E suggests its allowance model is a more customer-friendly way of managing the program.[86] SDG&E claims installation under its proposed RCP will be safe because "trained and qualified contractors will perform the installation of [EVSE] that will be qualified through a competitive RFP process" and "the installation will be done to SDG&E's electric and safety specifications and managed by SDG&E, so the installations will be high quality and safe."[87] As TURN opines, SDG&E employees will not do any of the actual work associated with EVSE installations, and those same trained and qualified contractors will still perform installations under TURN's rebate proposal, providing the same safety benefits highlighted by SDG&E.[88]

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[84] TURN Opening Brief at 106.

[85] Exhibit SDG&E-4 at RS-26.

[86] TURN Opening Brief at 106.

[87] TURN Opening Brief at 106, citing Exhibit SDGE-11 at RS-13 to RS-14.

[88] TURN Opening Brief at 106, referencing RT at 956.

We agree with TURN that "allowance" or "rebate" is primarily an issue of semantics – the act of providing the credit to customers can be accomplished in the same way under either proposal.[89] We believe a straightforward, upfront-rebate program for the costs of the EVSE and customer-side make-ready infrastructure will work to meet the objectives of SB 350, and SDG&E's deployment goals. Moreover, we require SDG&E to treat the costs of the rebates as expenses, rather than as assets. SDG&E should utilize its current Marketplace website to allow customers to compare prices and read customer reviews when deciding which EVSE they would like to purchase.[90] Moreover, a rebate program that allows the residential customer to select EVSE from any qualified provider creates a good environment for market growth, technical innovation and competition on price, product features and service.[91]

In sum, SDG&E should work with its PAC to design a customer experience that includes an upfront rebate through an enhanced Marketplace site. Once a customer has chosen an EVSE, SDG&E should manage the third-party EVSE installation, as originally proposed by SDG&E, including solicitation and selection of installers and the oversight and verification of the installation. Once the installation is complete, SDG&E should bill the customer directly for any balance above the rebate amount for EVSE and above the rebate amount for the costs of the installation.

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[89] TURN Opening Brief at 106.

[90] TURN Opening Brief at 106, citing Exhibit TURN-21.

[91] TURN Opening Brief at 124, citing Exhibit CP-1 at 11.

3.2.2. Participant Criteria

SDG&E designed its RCP to be open to both current and new EV drivers, a point of contention amongst parties. TURN and ORA advocate limiting RCP participation to only new EV drivers in order to eliminate the scenario of free-riders.[92] Free-riders are those who already own an EV, and any such allowances to those drivers would not result in additional EV adoption.[93] SDG&E does not believe there will be an issue with free-riders participating in the RCP, because of the requirement for participants to enroll in one of SDG&E's EV-TOU rates or its new dynamic rate.[94] SDG&E feels that limiting the RCP to new EV drivers will result in missing the opportunity to incentivize existing EV drivers to switch to a new rate designed to produce managed charging benefits.[95]

TURN recommends the Commission limit RCP participation to recent EV purchasers or lessees.[96] SDG&E claims that even with its proposed allowances participants will still "have skin in the game" because they will be required to either purchase or lease an EV. TURN, however does not feel that this is not enough to avoid free-riders.[97] TURN suggests under the current RCP there is no guarantee that a participant with three months left on their EV-lease will not enroll in the RCP, receive the proposed allowance, and then get an Internal Combustion Engine (ICE) vehicle when their EV lease term ends.[98] Under this

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[92] TURN Opening Brief at 95.

[93] Exhibit SDGE-15 at JCM-5.

[94] Exhibit SDGE-11 at RS-9 to RS-10.

[95] Exhibit SDGE-15 at JCM-5.

[96] TURN Opening Brief at 115.

[97] TURN Opening Brief at 115.

[98] TURN Opening Brief at 115.

scenario, ratepayers would continue to pay for the costs of the EVSE and installation and pay SDG&E an annual rate of return.[99] ORA makes a similar showing, saying if a customer enrolled in the RCP moves residences, the EVSE and circuit would stay at the original residence.[100] ORA contends that even if SDG&E knew the RCP customer moved out and the new resident did not have an EV, the original RCP EVSE and circuit would remain in rate base.[101] Similarly, if the same EVSE were relocated to another residence, SDG&E's proposal did not have the utility earning a rate of return on the EVSE itself, but the costs of re-installing the EVSE in a new location would be rate based.[102] To help avoid these scenarios, TURN recommends that lessee participants have a minimum of eighteen months remaining on their lease term to reduce the number of free-riders and risks of stranded costs.[103]

TURN, ORA and NDC additionally question the RCP's openness to customers of all income levels, while SDG&E believes its RCP targets DACs and low-income customers.[104] TURN contends the RCP's failure to have income caps will enable wealthier households to become overwhelming recipients of allowances funded by ratepayer subsidies.[105] A recent survey revealed the majority of EV drivers in California are relatively wealthy, with 76 percent of

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[99] TURN Opening Brief at 115.

[100] ORA Opening Brief at 61.

[101] ORA Opening Brief at 61.

[102] ORA Opening Brief at 16 referencing RT at 1834.

[103] TURN Opening Brief 115-116.

[104] TURN Opening Brief at 116; ORA Opening Brief at 71 citing RT at 865; NDC Opening Brief at 16; Exhibit SDGE-11 at RS-9.

[105] Exhibit TURN-04 at 3.

surveyed drivers having a household income of more than $100,000 per year, compared to California's average household income of $65,000.[106] TURN contends these segments will be predominately free-riders who would have bought or leased an EV regardless of the ratepayer subsidy.[107] Alternatively, if the RCP calls for income caps on participation, SDG&E contends the program would not be as effective at accelerating TE in San Diego and at integrating EV charging with the grid.[108] SDG&E believes the addition of an income cap would add an administrative burden and reduce the number of willing EV drivers who would qualify as RCP participants, contrary to the goals of SB 350.[109] SDG&E trusts the RCP will proactively prevent free-ridership from occurring because participants must enroll in an EV rate, in addition to being responsible for any costs over the EVSE and installation allowance.[110] TURN suggests the Commission not accept SDG&E's claims that an income eligibility requirement is unnecessary because residential customers should already be incented to move to a TOU or GIR rate when they acquire an EV.[111] In the alternative, TURN supports enhanced education and outreach or even financial incentives to encourage existing EV drivers to switch to a TOU rate, allowing SDG&E to

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[106] Exhibit TURN-04 at 3, citing CVRP Summary Documentation of the Electric Vehicle Consumer Survey, 2013-2015, at 49. Department of Numbers: http://www.deptofnumbers.com/income/california/.

[107] Exhibit TURN-04 at 3.

[108] Exhibit SDGE-11 at RS-9.

[109] Exhibit SDGE-11 at RS-9.

[110] Exhibit SDGE-11 at RS-9 to RS-10.

[111] TURN Opening Brief at 115.

capture the proposed load management benefits for a fraction of its proposed costs.[112]

TURN also questions SDG&E's focus on single-family residences.[113] TURN contends that 96 percent of proposed RCP funds will benefit what is already the most successful consumer market for EV adoption, single-family residences.[114] A recent report specially commissioned to determine EV adoption found that 81percent of early EV adopters reside in single-family detached homes, while an additional 9 percent are in an attached home (e.g., townhouse).[115] TURN suggests these numbers demonstrate that SDG&E's RCP targets the most successful market for EV adoption, as such, we should ensure any program costs are a reasonable and prudent use of ratepayer funds.[116]

We agree with TURN that RCP participation should be limited to recent EV purchasers or lessees. At the time of program implementation, SDG&E may offer its RCP to those customers who can provide proof of purchase or lease of their EV within 6-months from the time SDG&E implements its RCP. Any lease must have at least eighteen months remaining on the lease term.[117] Modifying SDG&E's RCP to focus on new EV adopters will help achieve one of the primary

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[112] TURN Opening Brief at 115.

[113] TURN Opening Brief at 87.

[114] TURN Opening Brief at 87.

[115] TURN Opening Brief at 87, citing Exhibit TURN-04 at 3, referencing Center for Sustainable Energy, Infographic: What Drives California's Plug-in Electric Vehicle Owners, September, 2016.

[116] TURN Opening Brief at 87.

[117] TURN Opening Brief at 115 to 116.

objectives of SB 350, widespread TE, and facilitate the broader ratepayer benefits associated with widespread TE.

We decline to implement TURN, ORA, and the NDC's recommendation for income caps at this time. We agree with SDG&E that income caps may not be necessary for RCP success, and can result in an additional administrative burden that has yet to be justified. The overall goals of the RCP address several transaction costs, including choosing an EVSE, finding a certified electrician, and coordinating EVSE installation. These barriers persist, albeit to different degrees, across all income classes. Moreover, there is not an immediate concern that less wealthy homeowners will not be able to access SDG&E's proposed incentives. The 60,000 target is scaled to meet a significant portion of residential EV charging need in SDG&E's service territory through 2025. To the extent stakeholders or the Commission identify a need to further target SDG&E's RCP to certain income classes, beyond the 25 percent DAC set-aside,[118] that will be addressed as part of consideration of program expansion via the Advice Letter (AL) process detailed in Section 3.5.

The modifications adopted for RCP participant criteria aim to incentivize drivers to adopt driving an EV. To achieve the state's goal of reducing GHG emissions to 40 percent below 1990 levels by 2030, more customers need to switch from fossil fuel vehicles to EVs; simply incentivizing current EV drivers to upgrade to a L2 charger and enroll in one of SDG&E's proposed rates will not achieve those necessary, incremental EV adoptions.[119]

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[118] Exhibit SDGE-11 at RS-3.

[119] Section 740.12(D).

3.2.3. Networked L2 EVSE

SDG&E unequivocally disagrees with parties' contention that L1 charging is sufficient to meet the objectives of SB 350.[120] SDG&E advises L1 charging will not generate the same opportunities for managed charging associated with L2 charging, such as improving SDG&E's load factor, integrating renewables and reducing fuel costs.[121] ORA and TURN do not believe L2 EVSE is required for residential charging, while SDG&E's expert testified that L1 EVSE is simply too slow to meet driving needs while providing load-shifting and managed charging benefits.[122]

SDG&E suggests successfully implementing managed charging requires the increased use of L2 EVSE.[123] Managed charging in the context of this program refers to L2 customers that are incentivized to manage the time and duration of their charge based on their enrollment in a time-variable rate that better reflects grid conditions.[124] Unmanaged charging refers to L1 customers on the standard domestic residential rate that do not receive any incentives to manage their charging.[125] SDG&E's expert testified that unmanaged charging can increase peak net load, potentially leading to the need for additional generation resources and capacity investments.[126] The increased peak net load

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[120] Exhibit SDGE-15 at JCM-2.

[121] Exhibit SDGE-15 at JCM-2.

[122] Exhibit SDGE-15 at JCM-2 to JCM-3.

[123] Exhibit SDGE-08 at JCM-19.

[124] Exhibit SDGE-08 at JCM-19.

[125] Exhibit SDGE-08 at JCM-19.

[126] Exhibit SDGE-08 at JCM-19.

can create a steeper afternoon ramp,[127] which may increase the need for additional flexible ramping resources (e.g., gas-fired generation or storage).[128] Managed charging, however, encourages EV charging when net load is lower and discourages EV charging when net load is higher.[129] SDG&E identifies four main benefits of improved net load factor: (1) lower wholesale electricity costs for SDG&E ratepayers; (2) deferral of new generation capacity investments; (3) deferral of distribution infrastructure investments; and (4) spreading fixed costs over more sales, reducing average cost per kilowatt hour (kWh) [130] SDG&E believes its proposed RCP and GIR provides pricing to encourage flexible EV loads to charge at low price hours corresponding to low net load hours.[131] In other words, managed charging has load shifting and load shaping benefits that can reduce upward pressure on rates for all ratepayers.[132] [133]

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[127] In California, solar generation tends to peak midday and wanes in the late afternoon, just as many customers are arriving home and turning on lights and appliances. If residential EV charging also starts at this same time, the difference between available generation and electricity demand will be even larger. *See* https://www.caiso.com/documents/flexibleresourceshelprenewables_fastfacts.pdf for more information.

[128] Exhibit SDGE-08 at JCM-19.

[129] Exhibit SDGE-08 at JCM-19.

[130] Exhibit SDGE-08 at JCM-21 to JCM-22.

[131] Exhibit SDGE-08 at JCM-21.

[132] Managing residential EV charging to occur during times of renewable overgeneration midday or late at night when energy demand is low, it can help prevent transmission and distribution system upgrades that might otherwise be needed to meet increased power demand during times of already high demand.

[133] ORA Opening Brief at 59, citing RT at 1048-1049.

ORA claims the projected grid benefits do not outweigh SDG&E's proposed program costs.[134] ORA highlights that SDG&E did not conduct a load shifting analysis for its modified RCP.[135] ORA does note that under SDG&E's original proposed RCP, SDG&E estimated the load shifting benefits from now to 2039 would be approximately $112 million, significantly less than the original program proposal's $279 million revenue requirement over the same period of time.[136] ORA contends that SDG&E does not opine on whether changing the rate structure in SDG&E's modified RCP will result in greater or less load shifting benefits.[137]

SDG&E suggests that because L1 customers require longer charging durations than L2, L1 charging limits the flexibility to shift charging times to be more beneficial to the grid.[138] Because L2 charging is faster than L1, L2 charging allows EV drivers to get a full charge during super off-peak hours (midnight to 6:00 a.m.).[139] Since L1 charging is slower, EV drivers run the risk of not being able to get a full charge during the super off-peak hours, resulting in possible range anxiety and higher fuel costs due to the inability to fully charge at the lowest electricity prices.[140]

SDG&E designed its RCP with networked L2 EVSE to achieve maximum grid integration benefits. These "smart" or Wi-Fi enabled L2 chargers provide

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[134] ORA Opening Brief at 59.

[135] ORA Opening Brief at 59.

[136] ORA Opening Brief at 50.

[137] ORA Opening Brief at 59 to 60, referencing RT at 1053.

[138] Exhibit SDGE-15 at JCM-3.

[139] Exhibit SDGE-15 at JCM-4.

[140] Exhibit SDGE-15 at JCM-4.

customers with the flexibility to participate in Demand Response programs.[141] Networked L2 EVSE can record interval consumption data enabling drivers to more easily respond to "real time signals" and "EV-only TOU rates."[142]

SDG&E argues the deployment of L2 EVSE is needed to meet the residential charging needs as car manufacturers release more EV models with larger batteries.[143] According to CARB "battery pack capabilities have increased in both battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV), and will likely continue based on manufacturer concerns."[144] SDG&E infers that with larger EV battery capacities comes the capability to accommodate longer travel distances, resulting in the need for greater charging durations.[145] TURN cites to an Applied Energy study that indicates home L1 charging is sufficient for 89 percent of normal daily travel needs on weekdays and 85 percent on weekends.[146] TURN suggests these figures are unsurprising given most drivers travel between 30 to 40 miles per day and park their vehicle overnight.[147] Charging an EV to travel 40 miles per day would take around 8 to 10 hours on a L1 charging port.[148] The Applied Energy study does not address the implications of L1 or L2 charging with larger battery capacities in both current and future EV

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[141] Exhibit SDGE-15 at JCM-4

[142] Exhibit SDGE-15 at JCM-4.

[143] Exhibit SDGE-15 at JCM-4.

[144] Exhibit SDGE-15 at JCM-4.

[145] Exhibit SDGE-15 at JCM-4 to JCM-5.

[146] Exhibit SDGE-15 at JCM-5, referencing Exhibit TURN-04 at 5, footnote 15.

[147] Exhibit TURN-04 at 5.

[148] Exhibit TURN-04 at 5, footnote 16 referencing the National Academy of Sciences, *Overcoming Barriers to Deployment of Plug-in Electric Vehicles* at 2.

models.[149] However, with a 200-mile range vehicle, the EV may not need to be fully recharged each night.[150]

TURN takes issue with the utilization of L2 EVSE stating that SDG&E has not provided any evidence that this will result in EV adoption. In a study cited to in SDG&E's application, 3,881 ZEV respondents (60 percent) responded they were "very influenced" by the subsidy to move to L2 EVSE.[151] TURN suggests these results only show the importance of a subsidy to install a L2 charger, but does not show how this subsidy influences new EV adoption.[152]

In evaluating the positions focused on the use of networked L2 EVSE, the potential benefits of managed charging outweigh TURN and ORA's concerns. Deploying 60,000 L2 EVSE should assist in grid management, a primary objective of SB 350,[153] by encouraging charging during off-peak and super off-peak periods when the grid is underutilized.[154] As NRDC et al. suggest, the L2 charging stations installed through SDG&E's RCP will "allow drivers to take full advantage of the longer ranges of second generation EVs, displacing more petroleum, improving air quality, and reducing emissions of GHGs."[155] We agree with the Joint Parties that qualifying networked L2 EVSE should have

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[149] Exhibit SDGE-15 at JCM-5.

[150] Exhibit TURN-04 at 5, footnote 16, referencing the National Academy of Sciences, *Overcoming Barriers to Deployment of Plug-in Electric Vehicles* at 2.

[151] TURN Opening Brief at 87, citing Exhibit SDGE-04 at RS-9.

[152] TURN Opening Brief at 87-88, citing Exhibit TURN-04 at 3, Referencing CVRP, https://cleanvehiclerebate.org/eng/sites/default/files/attachments/California_PEV_Owner_Survey_3.pdf.

[153] Section 740.12(1)(a)(G).

[154] NRDC et al Opening Brief at 45.

[155] NRDC et al Opening Brief at 45.

common communication capabilities through WiFi or cellular and be capable of responding to price signals, recording interval energy consumption, allow for accurate billing of EV-only tariffs, and be certified by UL or another Nationally Recognized Testing Laboratory.[156] Networked L2 EVSE will also provide SDG&E and the Commission with valuable data concerning the current and future trends of EV charging patterns and their effect on grid reliability, a necessity in evaluating the success and scalability of SDG&E's RCP.[157]

3.2.4. Proposed Residential Rate

SDG&E proposes to offer a Residential EV-only Grid Integration Rate, in place of its originally proposed whole-house residential GIR.[158] This Residential EV-Only GIR will be applicable only to separately metered residential EV charging, and will consist of: (1) an Hourly Base Rate, which includes the CAISO Day-ahead hourly price; and (2) System and Circuit Hourly Dynamic Adders.[159] The new Residential EV-only GIR includes a two-period hourly base rate, differentiating the super-off peak from all other hours,[160] similar to the current Residential EV TOU rate option, which includes a super off-peak period.[161] The Residential EV-Only GIR will not include a Grid Integration Charge (GIC).[162]

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[156] Exhibit JP-3 at 28.

[157] Pub. Util. Code Section 740.12(2) (c).

[158] Exhibit SDGE-12 at CF-2 to CF-3.

[159] Exhibit SDGE-12 at CF-2 to CF-3.

[160] Exhibit SDGE-12 footnote 5: The super off-peak Hourly Base Rate does not include recovery of the Generation Capacity costs not recovered in the C-CPP hourly adder. These will be recovered through the base rate during all other hours.

[161] Exhibit SDGE-12 at CF-3.

[162] Exhibit SDGE-12 at CF-3.

The recovery of distribution costs originally recovered through the GIC are now recovered through the Hourly Base Rate, as recommended by ORA,[163] resulting in higher hourly energy rates.[164] SDG&E proposes that the new Residential EV-Only GIR be optionally available to RCP participants.[165] As such, the following rate options would be available to RCP participants:

- For separately metered EV charging, the Residential EV-only GIR and for their home, any applicable residential rate option;
- For separately metered EV charging, Schedule EV-TOU (SDG&E's existing residential EV schedule for separately metered EV charging) and for their home, an applicable residential rate option; and
- For combined EV charging and home service, Schedule EV-TOU-2 (SDG&E's existing residential whole-house EV schedule).[166]

[163] Exhibit ORA-3 at 2-10.

[164] Exhibit SDGE-12 at CF-3.

[165] Exhibit SDGE-12 at CF-3.

[166] Exhibit SDGE-12 at CF-3.

Figure 1. SDG&E's Proposed Residential Grid Integration Rate

Hourly Base Rate	
	¢/kWh
Super Off Peak	19.051
Other Times	21.752
+	
CAISO Day Ahead Hourly Price	

+

Dynamic Adders	
	¢/kWh
System Top 150 Hours	69.348
Circuit Top 200 Hours	18.780

SDG&E withdrew its original proposal to make its Residential GIR available more broadly, and now proposes to limit the applicability of its Residential EV-Only GIR to RCP.[167] ORA expressed concerns that including the CAISO day-ahead hourly rate in the hourly base rate is "highly experimental with uncertain outcomes that could hinder customers' acceptance and responsiveness."[168] By withdrawing the requirement that residential participants

[167] Exhibit SDGE-12 at CF-5.

[168] Exhibit SDGE-12 at CF-6, citing Exhibit ORA-3 at 2-11.

must take service on the GIR, SDG&E feels that concerns about including CAISO day-ahead pricing are addressed.[169]

In response to SDG&E's proposed rates, TURN suggests: (1) utilize the submeters embedded in residential EVSE to provide separate meter service to EVs; or (2) add to the baseline allowance of EV users so that reasonable EV charging will not be charged at second tier rates and to redesign SDG&E's existing EV TOU rates so that they contain both a baseline credit and super-off-peak period that is more affordable after the baseline credit.[170] SDG&E suggests its decision to replace the whole-house GIR with an EV-Only GIR, in addition to limiting GIR applicability to program participants, should address TURN's concerns on this issue.[171]

NRDC et al state that while they appreciate SDG&E's amendments to its GIR, its existing EV TOU rates do not encourage customers to charge during off-peak hours because the delivery component is not time variant.[172] "Unfortunately, SDG&E's existing TOU rates fail to account for the fact delivery charges vary by time-of-use period, and SDG&E's super-off-peak rates are higher than either SCE or PG&E's."[173]

We agree with NRDC et al that to "comply with … § 740.12(a)(1)(G) and § 740.12(a)(1)(H), SDG&E's existing TOU EV rates should be redesigned to

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[169] Exhibit SDGE-11 at CF-6.

[170] Exhibit TURN-06 at 3.

[171] Exhibit SDGE-12 at CF-6.

[172] NRDC et al Joint Party Opening Brief at 50.

[173] NRDC et al Joint Party Opening Brief at 5.

account for the time-differentiated nature of delivery costs."[174] TURN and ORA recommend the super-off-peak pricing should be 12¢-15¢/kWh,[175] which is similar to SCE and PG&E's current off-peak EV TOU rates. We direct SDG&E to submit a Tier 3 Advice Letter updating its existing EV-TOU and EV-TOU-2 rates to ensure the distribution component of the rates is time-differentiated to better incentivize drivers to charge at times when the grid is not constrained. SDG&E's EV-TOU and EV-TOU-2 rates should have super-off peak prices that are substantially lower than prices during other times of the day, to ensure charging during those hours provide cost savings compared to charging at higher-demand hours.

As discussed in more detail in Section 3.5, we approve SDG&E's EV-Only GIR as an optional EV-only tariff in which RCP program participants may choose to enroll.

3.2.5. Customer Marketing Education and Outreach

SDG&E believes education and outreach is important to the success of its RCP. SDG&E intends to leverage SDG&E's Clean Transportation Department's customer engagement efforts to target current and future EV drivers, as well as partner with stakeholders to share information about the RCP.[176]

SDG&E plans to leverage its own market research and existing customer communication channels to reach potential participants to its RCP.[177] SDG&E plans to utilize email campaigns, social media, advertising, non-paid media, its

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[174] NRDC et al Joint Party Opening Brief at 5.

[175] Exhibit TURN-06 at 21; Exhibit ORA-03 at 2-16.

[176] Exhibit SDGE-04 at RS-25.

[177] Exhibit SDGE-04 at RS-25.

company website, and car dealer partnerships in order to market the RCP. SDG&E also proposes to provide education materials on EVSE installation and how customers can effectively use their EV-only GIR.[178]

SDG&E's marketing and outreach plans aim to increase awareness of electric vehicle options for consumers in the light-duty residential vehicle market. SDG&E should work with its PAC to develop program marketing materials that are geared toward both DAC and non-DAC communities.

3.2.6. Data Collection and Program Advisory Council

SDG&E designed its monitoring and evaluation plan to align with the commitment to customer service by focusing on evaluating participants' energy usage in conjunction with its approved rates.[179] SDG&E proposes to align its reporting pursuant to the PAC framework outlined in D.16-01-045.[180] SDG&E plans to report on a semi-annual basis on:

- Actual operating costs (i.e., the cost of running the RCP);
- Actual installation costs (total and average per site);
- Actual growth in ZEV by type (i.e., BEV, PHEV); and
- Annual growth of the RCP (by region, including DACs and non-DAC communities).[181]

SDG&E plans to report on these metrics, along with any proposed RCP modifications to the PAC and to monitor its RCP to identify scalability and enhancements to respond to customer needs.[182]

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[178] Exhibit SDGE-04 at RS-25.

[179] Exhibit SDGE-04 at RS-20.

[180] Exhibit SDGE-04 at RS-20, citing D.16-01-045 at 145.

[181] Exhibit SDGE-04 at RS-20 to RS-21.

[182] Exhibit SDGE-04 at RS-21.

In addition to the reporting requirements above, SDG&E agrees to incorporate the Joint Parties' recommendation to report on relevant program metrics for five years after the last EVSE supported by the program is operational.[183] SDG&E believes this additional reporting information will provide valuable information on charging load profiles and EVSE utilization, which complies with § 740.12(c).[184]

We find tremendous value in SDG&E's data collection plans and their work with their PAC. In light of the modifications described in Section 3.5, SDG&E should work with its PAC to ensure it can deliver information on actual RCP operating costs, annual installation costs, growth by vehicle type, and RCP growth in DACs and non-DAC communities. We further address data gathering requirements in Section 10.

3.3. Impact on Transportation Electrification and Emissions Reduction

SDG&E's RCP aims to provide improved air quality and increased use of alternative fuel, while improving the efficient use of the electric grid and increasing integration of renewable energy resources.[185]

SDG&E estimates 90,000 electric vehicles charging on the residential GIR in its service territory will result in the following emissions reductions:

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[183] Exhibit SDGE-11 at RS-8.

[184] Exhibit SDGE-11 at RS-8.

[185] SDG&E Opening Brief at 9, referencing Exhibit SDGE-09 at LB-7, and Exhibit SDGE-10 at PP-8 to PP-11.

Table 3. Air Quality Improvements - Lifetime Impact Estimates[186]

Net Emission Reductions (Metric Tons)			
	CO_2	**NOx**	**VOC[187]**
Program Case[188]	1,673,699	217.18	455.47
Reference Case[189]	332,060	43.99	116.86
Net Residential Program Impacts[190]	1,341,609	173.19	338.61
TOTAL:	**1,399,55**	**346.07**	**426.49**

[186] Exhibit SDGE-08 at JCM-5, Table 8-1A.

[187] Exhibit SDGE-08 at JCM-10, VOC stands for Volatile Organic Compounds.

[188] Exhibit SDGE-08 at JCM-2: The Program Case represents the RCP as described in Exhibit SDGE-04 with 90,000 EVs charging on the residential grid-integrated rate using L2 (240-volt) chargers.

[189] Exhibit SDGE-08 at JCM-2: The Reference Case is intended to represent residential charging growth in the absence of the RCP, or the SDG&E service territory EV adoption absent SDG&E's RCP.

[190] Exhibit SDGE-08 at JCM-2: Net Impacts are estimated by subtracting the Reference Case from the Program Case.

Table 4. Air Quality Improvements - 2025 Annual Impact Estimates[191]

Net Emission Reductions (Metric Tons)			
	CO_2	NOx	VOC
Program Case[192]	154,331	20.05	41.83
Reference Case[193]	31,305	4.14	10.87
Net Residential Program Impacts[194]	123,226	15.90	30.96
TOTAL:	**126,445**	**25.25**	**35.18**

SDG&E believes the net air quality benefits of SDG&E's proposed RCP are in line with the goals of SB 350.[195]

In SDG&E's service territory, transportation accounts for approximately 50 percent of all GHG emissions.[196] Light-duty vehicles comprise 97 percent[197] of all registered vehicles in San Diego County and are responsible for approximately 80 percent[198] of combined on-road and off-road GHG emissions.

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[191] Exhibit SDGE-08 at JCM-6, Table 8-1B.

[192] Exhibit SDGE-08 at JCM-2: The Program Case represents the RCP as described in Exhibit SDGE-04 with 90,000 EVs charging on the residential grid-integrated rate using L2 (240-volt) chargers.

[193] Exhibit SDGE-08 at JCM-2: The Reference Case is intended to represent residential charging growth in the absence of the RCP, or the SDG&D service territory EV adoption absent SDG&E's RCP.

[194] Exhibit SDGE-08 at JCM-2: Net Impacts are estimated by subtracting the Reference Case from the Program Case.

[195] Exhibit SDGE-08 at JCM-6.

[196] Exhibit SDGE-09 at LB-6, citing San Diego County Updated Greenhouse Gas Inventory at 3, Energy Policy Initiatives Center, available at http://catcher.sandiego.edu/items/usdlaw/EPIC-GHG-2013.pdf (March 2013).

[197] Exhibit SDGE-09 at LB-6, citing Proprietary IHS/Polk Data (April 2016).

[198] Exhibit SDGE-09 at LB-6, citing EPIC San Diego County Updated GHG Emissions Inventory at 8 (March 2013), *available at*: http://catcher.sandiego.edu/items/usdlaw/EPIC-GHG-2013.pdf.

Recent studies have shown the degradation of air quality in San Diego County, culminating with the American Lung Association's grade of "F" in air quality for San Diego County in the organization's last two-year's "State of the Air" report.[199] For these reasons, SDG&E believes its residential transportation sector represents a prime target for GHG emissions reductions.[200]

SDG&E's focus in residential charging aims to achieve a key goal of SB 350, reducing emissions of greenhouse gases by 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050.[201] Our modified approval of SDG&E's investment into the single-family and small MUD residential sector will still provide increased access to EV charging infrastructure in addition to stimulating innovation and competition in the TE market.[202] Furthermore, we are allowing SDG&E to seek to increase the target after there has been some demonstration of the success of the RCP. In addition to achieving substantial environmental benefits, SDG&E's RCP aims to produce data concerning the current and future utilization of residential charging infrastructure.[203] SDG&E should report the actual emission reduction benefits associated with its RCP as described in Section 10 on Data Collection and Reporting.[204]

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[199] Exhibit SDGE-09 at LB-6, citing Report Card California, American Lung Association, *available at*: http://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/states/california/(2017); *see also* State of the Air 2017: San Diego/Imperial County Regional Summary, *available at*: http://www.lung.org/local-content/california/documents/state-of-the-air/2017/sota-2017_ca_san-diego.pdf.

[200] Exhibit SDGE-09 at LB-6.

[201] Section 740.12(a)(1)(D).

[202] Section740.12(1)(a)(F).

[203] Section740.12(c).

[204] Exhibit SDGE-11 at RS-4.

3.4. Impact on Disadvantaged Communities

SDG&E's RCP aims to provide benefits to both DAC customers as well as those of lower-income.[205] SDG&E and the Joint Parties support the suggestion to deploy 25 percent of the total number of EVSE stations in DACs, an increase from the 20 percent originally proposed.[206] SDG&E's proposal to provide higher allowances for EVSE and installation costs in DACs will provide economic benefits to DACs consistent with § 740.12.[207] SDG&E's commitment to allocate $5.5 million in total direct costs for fund electric panel upgrades for DAC customers and a goal of at least 40 percent of overall program costs be spent with DBE firms, aims to facilitate access by DACs to TE infrastructure.

EDF contends one of the most important deliverables of SDG&E's RCP is delivery of air quality and other benefits to DACs, those communities hit the hardest by emissions from the transportation sector.[208] EDF is encouraged by the dedication of the individual utilities to setting minimum targets in DACs, and encourages the Commission to accept SDG&E's minimum deployment goal of 25 percent.[209]

SDG&E's commitment to tracking and reporting on DAC and non-DAC annual EVSE growth aims to provide the Commission with valuable data about the future EV markets to ensure widespread TE.[210]

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[205] NRDC Reply Brief at 10, SB 350 and SB 1275 Charge Ahead California Initiative.

[206] Exhibit SDGE-11 at RS-4; DAC in this context "is per the Cal-Enviroscreen Tool 3.0, using the SDG&E service territory definition."

[207] NRDC Reply Brief at 10 to 11, referencing Exhibit SDGE-11 at RS-4to RS-8.

[208] EDF Opening Brief at 6.

[209] EDF Opening Brief at 6, citing Exhibit SDGE-11 at RS-3 and Exhibit Joint-11 at 3.

[210] Exhibit SDGE-11 at RS-4.

We agree with SDG&E that its proposed RFPs to select EVSE models and installation contractors create opportunities for all EVSE market participants, including those who may be too small to compete against the dominant EVSE providers. Moreover, we see the potential for the proposed RFP for installation contractors to create economic opportunities in DACs, including the potential for job growth within DACs.

3.5. Summary of Program Modifications

While there is disagreement over program design, it is important to note that parties share a similar goal of encouraging the deployment of smart EV infrastructure at residential locations, particularly in DACs.[211] One of the crucial questions surrounding SDG&E's RCP is how best to design a residential charging program which seeks to minimize overall costs and maximize overall benefits.[212] Because of this, careful consideration and thought has been given to the record and scope of this proceeding.[213] Moreover, we have modified[214] SDG&E's RCP to ensure the goals of SB 350 are achieved without placing a burden on ratepayers.

As addressed in Sections 3.1.1 and 3.1.2 in more detail, we eliminate any utility ownership of the charging infrastructure (either make-ready or EVSE) on the customer side of the meter. This change results in saving both in regards to the total capitalized costs and savings in utility operation and maintenance

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[211] Exhibit CP-4 at 7.

[212] Section 740.12(b).

[213] Exhibit CP-4 at 7; § 740.12(b).

[214] Section 740.12(b): "The commission shall approve, or modify and approve, programs and investments of transportation electrification, including those that deploy charging infrastructure, via a reasonable cost recovery mechanism…"

(O&M) of the equipment on a going forward basis. As discussed throughout Section 3.1, SDG&E's claimed benefits for utility ownership do not exceed the ongoing costs associated with SDG&E owning the customer-side infrastructure, including the proposed 48.9 percent overhead that would be applied to the direct costs of the L2 chargers installed through the program. A properly structured up-front rebate program that gives customers a choice of qualified infrastructure and installation vendors will achieve the same benefits SDG&E associates with its utility ownership model. This modification aligns with the goals of SB 350, and ensures SDG&E will not usurp the EVSE and EVSP markets.[215]

Turning next to the debate of allowance versus rebate, the distinction is one of semantics. Parties agree on the importance of providing up-front monetary incentives to participants in the RCP in order to reduce barriers to EV charging infrastructure and adoption. We agree with ChargePoint that the residential sector offers a good opportunity to test an upfront rebate method. We agree that SDG&E should build on its own prior experience administering robust energy efficiency and customer generation rebate programs to implement a program that can be not only a model for other utilities in California, but for the rest of the country. As such, SDG&E should work with its PAC to identify the most effective way to provide customers with an up-front rebate for both the EVSE and EVSE installation. Once the EVSE and associated customer-side infrastructure is installed, the customer will own and maintain it.

Although discussed in more detail in Section 8, we have modified SDG&E's budget to eliminate the line item for EVSE maintenance costs, since

[215] Section 740.12(a)(1)(F).

SDG&E will not own this equipment. SDG&E's modified budget in its rebuttal testimony did not reflect any ratepayer cost savings associated with reduced ongoing maintenance for the percentage of customers that could elect to own and operate their own EVSE.[216] Instead, SDG&E proposed to cover an extended warranty on the EVSE for any customers that elected to own the EVSE.[217] SDG&E should ensure the EVSPs it qualifies to participate in the program offer appropriate warranties, and should not need to provide monetary support for those warranties. The EVSE installed through SDG&E's RCP is the property of the participating customers, who will be responsible for the maintenance of the charging stations in their homes. SDG&E's $22.5 million budget for EVSE maintenance and service-calls is therefore eliminated from the adopted RCP budget.

SDG&E should file an implementation plan via a Tier 3 AL reflecting the above-authorized budget for a five-year rebate program not to exceed 60,000 EVSE installations for unique customers, to be open for customer-enrollment by mid-2019. This implementation plan should carefully identify the adopted program modifications discussed throughout this section. The implementation plan should include the following:

1. Planned upgrades to the Marketplace website
    a. Methods to inform customers of available rebates on qualified EVSE
    b. Outreach and education plans to direct customers to the rebate program on the Marketplace website

[216] Exhibit SDGE-11 at RS-15 and RS-16.

[217] Exhibit SDGE-11 at RS-7.

   c. Step-by-step process for customers to participate in the RCP

2. Terms and conditions for SDG&E's qualified installers that ensure customer protections
3. Description of how SDG&E will communication with customers on the installation process and subsequent billing of balance above EVSE and installation rebate amounts.
4. Participant eligibility requirements
   a. Proof of recent lease or purchase
   b. Methods to encourage low- and middle-income customer participation
5. Timeline for program launch and implementation
6. The resolution of any outstanding concerns SDG&E has raised regarding liability by identifying contractual protections that define the customers' responsibility through clear participation requirements

Although modified, SDG&E's approved RCP should still create a seamless experience for participating customers, just as the utility proposed in its rebuttal testimony. A customer visiting SDG&E's Marketplace website to enroll in the RCP program should first be prompted with a list of qualified equipment options (EVSE). After selecting, the authorized rebate amount should automatically be applied to the total cost of the EVSE to show customers their respective cost for the EVSE (i.e. any costs over the rebate amount).

In consultation with its PAC, SDG&E should develop a process for procuring the EVSE, soliciting and contracting with qualified installers, and ensure installers are compensated after the installer provides proof of the EVSE installation. SDG&E should ensure customers fully understand that they will be responsible for the balance of installation costs, above the established rebate amount for the installation service. SDG&E should bill the customers directly for the balance of

any costs associated with the purchase and installation of their EVSE. Both the list of EVSEs and qualified installers will be managed by SDG&E. SDG&E would be in charge of testing the EVSE to ensure it meets the requisite metering requirements and work with the EVSE installer to ensure its installation and deployment are completed safely and efficiently.

While we find tremendous value in testing and learning from the approved RCP, it is unclear whether SDG&E and other parties also find value in this program. Accordingly, while we authorize SDG&E to implement the RCP as modified by this decision, SDG&E may file an Advice Letter withdrawing the RCP.[218] If SDG&E chooses to implement the RCP as approved in this decision, SDG&E may also explore the option of a companion incentive mechanism. As discussed in Section 16, and referenced in Ordering Paragraphs 4 and 5, we allow SDG&E to meet and confer with parties to consider what additional incentive mechanism is appropriate in relation to the deployment of SDG&E's RCP. Appendix B to this decision provides guidance to SDG&E and parties in developing the framework for an incentive, that will be submitted via a Tier 3 Advice Letter to the Commission's Energy Division.

If SDG&E chooses to implement the RCP as modified herein, it may file a Tier 3 AL by the end of third year of program implementation to request to scale-up the RCP above 60,000 unique customers based on RCP success and market conditions. The Tier 3 AL should include at a minimum:

1. Results of the initial RCP program to date, including:
    a. Total number of EVSE installed

[218] Ordering Paragraph 4.

b. Comparison of estimated versus actual costs of infrastructure installation

c. Comparison of estimated versus actual cost of eligible EVSE

d. Evidence that small, locally-owned, and diverse businesses are providing EVSE and installation services through the program;

e. Any barriers that prevented customers from being able to participate in the rebate program

f. Methods identified to address any barriers to customer participation

g. Evidence that low- and moderate-income customers are participating in the program

2. Current estimate of EVs in its territory;
3. Current breakdown of make, model, and model year of EVs adopted by program participants;
4. Evidence that L2 residential rebates drive incremental EV adoption; and
5. Updated modeling showing that offering more rebates will continue to support incremental EV adoption.

To provide customer choice, SDG&E should conduct an ongoing Request for Qualifications (RFQ) to qualify L2 EVSE and corresponding network services from which customers can choose. SDG&E should leverage its existing Marketplace website so residential customers can research the qualified EVSE, compare prices and capabilities, and read customer reviews. Aligning with the goal of providing safe and reliable service to its customers,[219] all qualified L2 EVSE should be networked, include metering capabilities, and be certified by a

[219] Section 740.8.

nationally recognized testing laboratory (NRTL). Vendors should provide SDG&E with their EVSE pricing to include on the Marketplace website.

To ensure customers are provided with safe and reliable service,[220] SDG&E should use the RFP process to select qualified contractors that meet pre-defined requirements to install the EVSE and any make-ready infrastructure on the customer side of the meter. Customers can then choose one of the qualified installers through SDG&E's Marketplace website. SDG&E would not own any installed infrastructure on the customer's side of the meter, nor would SDG&E rate base this investment. SDG&E should ensure that all participating installers meet safety requirements, provide proof they are licensed, insured, bonded, and provide a minimum warranty for their work.

The ACR requested parties to this proceeding to provide information opposing or supporting the adoption of a standard VGI communications protocol to ensure utility-supported infrastructure does not become obsolete when the state has a viable, economic vehicle-to-grid market established.[221] SDG&E did not propose to adopt a standard communication protocol for its RCP.

As directed by the ACR and § 740.2, § 740.3(e), and § 8362, the CPUC worked with CEC, CARB, CAISO, and the Governor's Office of Business and Economic Development, to convene a working group in 2017 to evaluate the existing communication protocols for VGI. The working group, comprised of more than 150 international stakeholders, considered all communications protocols currently in use to communicate pricing signals and responses to

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[220] Section 740.8.

[221] ACR at 28-29.

pricing signals between the utility or other energy provider and the EV.[222] Based on the deliverables created by the working group, Energy Division staff determined it is premature to require the ratepayer-supported infrastructure include a specific protocol, but recommended a set of minimum hardware requirements be considered for certain applications of EVSE.[223] Those minimum hardware requirements were developed with working group feedback, and to be considered by the Commission for inclusion in future proceedings.

Along with the draft Energy Division staff report issued on February 23, 2018 in R.13-11-007, we issued a ruling soliciting feedback on whether the minimum hardware requirements be included in L2 EVSE installed in residences. If the final report establishes that the minimum hardware requirements should apply to residential EVSEs, SDG&E should ensure the EVSEs it qualifies for its RCP program meets those requirements if it is feasible for the timing of the RCP program implementation.

SDG&E should establish measures to avoid free-ridership scenarios and stranded assets. SDG&E should work with its PAC to ensure its program outreach materials reach customers considering EV adoption. Such outreach efforts should encourage incremental EV sales.[224] SDG&E should also work with its PAC to identify strategies to ensure ratepayer subsidized infrastructure

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[222] All documentation associated with the VGI Communications Protocol Working Group is available at www.cpuc.ca.gov/vgi.

[223] Details about the working groups' process and deliverables are available in the draft Vehicle Grid Integration Communication Protocol Working Group Energy Division Staff Report available at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M211/K654/211654688.PDF.

[224] Section 740.12(a)(1)(H).

remains in use after it is installed.[225] SDG&E should also require RCP participants to enroll in one of SDG&E's EV TOU rates, in order to achieve the maximum grid benefits of managed charging.[226] These modifications should not deter RCP participation, but should create a clearer path toward EV adoption and maximum GHG emission reduction benefits.[227]

In order to achieve SB 350's goals of increased TE access in DACs and low-and-moderate income communities,[228] SDG&E should reserve 25 percent of its approved RCP funds for customers in DACs. SDG&E should target its data collection and reporting to identify challenges and successes to growth of the EV adoption and L2 infrastructure DACs.[229]

Finally, SDG&E should provide participating customers the choice between its existing EV-only and whole-house TOU rates and its proposed Residential GIR, if implemented. SDG&E should identify measures that most effectively communicate pricing to residential customers and collect data on customer responsiveness to dynamic price signals. SDG&E should evaluate customer responsiveness to its Residential GIR and its two ongoing dynamic rate pilots to identify which methods of communicating price signals to customers are most effective.[230]

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[225] Section 740.12(c).

[226] Section 740.12(a)(1)(G).

[227] *See* generally, § 740.12.

[228] Section 740.12(a)(1)(C).

[229] Exhibit SDGE-04 at RS-21.

[230] SDG&E SCHEDULE TOU-DR-E3 is a pilot dynamic rate available to residential customers participating in the residential TOU opt-in program, available at http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_TOU-DR-E3.pdf. SDG&E's Power Your Drive program as approved in D.16-01-045 includes a dynamic rate for EV charging

Footnote continued on next page

We direct SDG&E to review its existing EV TOU rates and revise them to include time-differentiated distribution charges to provide stronger price signals to encourage customers to charge during off peak hours. As discussed in Section 3.2.4. SDG&E proposed revisions to its EV TOU rates should be filed via a Tier 3 Advice Letter within six months of this decision.

All of the below charted program modifications still aim to provide customers with a turn-key solution that addresses both financial and logistical barriers faced new and future EV drivers.[231]

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at workplaces and multi-unit dwellings, available at http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_VGI.pdf.

[231] Exhibit SDGE-10 at PP-11, citing Exhibit SDGE-11 at RS-10 to RS-11.

Table 5. SDG&E's Residential Charging Program Approved with Modifications

• SDG&E should file an implementation plan for a 5-year rebate program not to exceed 60,000 rebates for EVSE, to be open for customer enrollment no later than mid-2019.
• SDG&E will conduct an ongoing Request for Qualifications (RFQ) process to qualify EVSE for customers to choose from.
• SDG&E will provide additional incentives to DACs and CARE/FERA customers; 25 percent of program funds will be reserved for DACs.
• Leverage SDG&E's existing Marketplace website so residential customers can research qualified EVSE, compare prices and capabilities, and read customer reviews.
• All eligible EVSE should be networked, have metering capabilities, and be certified by a NRTL.
• In consultation with its PAC, SDG&E should develop a process for procuring the EVSE, soliciting and contracting with qualified installers, and ensure installers are compensated after the installer provides proof of the EVSE installation.
• SDG&E will identify qualified installers that meet pre-defined requirements and allow customers to select from qualified installers through the SDG&E marketplace.
• All participating installers must meet safety requirements, and prove they are licensed, insured, bonded, and provide a minimum warranty for their work.
• Participants should provide proof of EV purchase or lease with six months of SDG&E's program implementation. Qualifying lessees should have a minimum of eighteen-months left on their lease term.
• Participants should be required to enroll in the Residential GIR or one of SDG&E's existing EV TOU rates.
• SDG&E should meet and confer with parties to consider what additional incentive mechanism is appropriate in relation to the deployment of SDG&E's RCP within the framework outlined in Appendix B.

4. SDG&E's Commercial Grid Integration Rate

SDG&E proposed three rates in its application, designed to "ensure that charging occurs in a manner consistent with electric grid conditions and provides customers with price signals to incent behavior which minimizes

incremental system and local capacity needs."[232] SDG&E intended all three rates to be considered as part of the priority review process. The Commission approved SDG&E's Public Grid GIR in D.18-01-024 for limited use at the public charging stations SDG&E owns and operates in its Green Shuttle Priority Review Project pilot.[233] However, due to the substantive modifications SDG&E made to its Commercial and Residential GIR proposals, the Commission did not address these two rates in the priority review phase of this proceeding.[234]

In its rebuttal testimony, SDG&E modified its Commercial GIR to apply only to SDG&E's Fleet Delivery Services priority review project.[235] We do not believe SDG&E needs to implement a new rate solely to apply to the participating fleets in the approved pilot program, particularly as the utility is still testing its dynamic Power Your Drive rate for commercial business accounts. SDG&E's Commercial GIR is denied. As stated in D.18-01-024, SDG&E should work with the participating fleets to determine which of its existing commercial TOU rates is most suitable for their charging needs at the time of program implementation.[236]

5. PG&E's DC Fast Charging Make-Ready Program

PG&E requests authority to spend up to $22.4 million for its Direct Current Fast Charger Make-Ready Program (Fast Charge) over five years. As proposed, the program is designed to: (1) help meet a portion of PG&E's estimated need

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[232] Exhibit SDGE-5 at CF-2.

[233] D.18-01-024 at 111.

[234] D.18-01-024 at 43.

[235] D.18-01-02 4 at 43.

[236] D.18-01-024 at 111.

for up to 916 fast chargers in its service area by 2025, (2) reduce driver range anxiety, and (3) increase access to charging for customers, especially those lacking ready access to home charging, needing charging stations in transportation corridors for longer trips, or for access to ridesharing.[237] PG&E proposes to provide PG&E-owned make-ready infrastructure at approximately 52 sites in its service area, to support installation of an estimated 234 DCFC stations, at locations that encourage transportation electrification and minimize grid impacts.[238] As proposed, all Fast Charge sites must be publicly accessible, and all chargers must use either CHAdeMo and/or CCS charging connector standards, with at least one of each connector per site to maximize usefulness to drivers, and be capable of charging at power levels of 50 kilowatts (kW) or greater.[239] To enable multiple business models and provide flexibility for site hosts and operators, PG&E's customer of record at Fast Charge sites may be the site host, an EVSP, or another third party.[240]

In stipulations with NRDC, CUE, Plug-In America, Greenlining Institute, Sierra Club, UCS, and the Alliance of Automobile Manufacturers, PG&E agreed to:

- Extend reporting requirements for an additional five years, which will ensure the Commission and stakeholders benefit from data associated with stations installed toward the end of the program;[241]

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[237] Exhibit PGE-1 at 4-6.

[238] Exhibit PGE-1 at 2-1.

[239] Exhibit PGE-1 at 4-10 to 4-11.

[240] Exhibit PGE-1 at 4-10 to 4-11.

[241] Exhibit Joint-2 at 2.

- Propose rates optimized for DC Fast Charging applications within 6-12 months of a decision in A.17-01-020 et al.;[242]
- Take on-site load management technologies into account when scoring potential DC Fast Charging sites;[243] and
- Adopt rate signals or other load management techniques to ensure EV load facilitates the integration of renewable energy.[244]

5.1. Impact on Transportation Electrification and Emissions Reduction

D.16-12-065 rejected PG&E's prior fast charging proposal as not sufficiently targeted at demonstrated EV market needs. PG&E's current Fast Charge request takes into account other fast charging station installations and relies on "the empirical results of an expert market analysis of [direct current fast charging] DCFC needs" and potential locations in PG&E's service area to establish a scaled-down program for utility installation of a limited amount of make-ready infrastructure[245] to support fast charging stations at high priority locations which support both high-need and reliable coverage across PG&E's service territory.[246] PG&E indicates its goal is to "make a significant contribution to the needs of PG&E customers and EV owners and drivers by providing

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[242] Exhibit Joint-2 at 1.

[243] Exhibit Joint-2 at 1-2.

[244] Exhibit Joint-2 at 2.

[245] The utility-owned make-ready infrastructure will include the distribution circuit, transformer, service drop, conductor, connectors, conduit, electric meter, and circuit breaker panel up to the charger stub. In addition, PG&E will install appropriate safety equipment at the site (e.g., lighting, parking lot painting, and bollards) and ensure the site meets relevant state and local ADA requirements. (Exhibit PGE-1 at 4-9)

[246] PG&E Opening Brief at 6, citing Exhibit PGE-1 at 4-6 to 4-8.

make-ready infrastructure for access to fast charging stations where home and office charging is unavailable, thereby accelerating adoption of EVs."[247]

TURN recommends PG&E's Fast Charge program be reduced by more than 60 percent, to $7.6 million, to support 90 fast charging stations compared to PG&E's requested 234 charging stations.[248] ORA recommends PG&E's Fast Charge program should be reduced by over 80 percent, to $3.9 million for five dual-port, 150 kW DCFC stations.[249]

TURN argues that the estimates in the Electric Program Investment Charge (EPIC) 1.25 study[250] that PG&E relied on to determine DCFC availability in its territory are too conservative.[251] TURN also argues that PG&E's claims that fast charging is needed to serve apartment dwellers and that drivers prefer fast charging should be tested before full-scale deployment.[252] Because fast charging technology is not as developed or standardized as other charger types and DCFC infrastructure is not compatible with all EVs, TURN claims Fast Charge poses increased risks for stranding ratepayer investment.[253] ORA similarly argues that Fast Charge is too big because, among other things, PG&E 1) fails to consider

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[247] PG&E Opening Brief at 6-7.

[248] TURN Opening Brief at 1.

[249] ORA Opening Brief at 2.

[250] Exhibit PGE-1 at 4-6, footnote 8, citing PG&E (2016) EPIC 1.25 – Develop a Tool to Map the Preferred Locations for DC Fast Charging, Based on Traffic Patterns and PG&E's Distribution System, to Address EV Drivers' Needs While Reducing the Impact of PG&E's Distribution Grid – Final Report. Available at https://www.pge.com/pge_global/common/pdfs/about-pge/environment/what-we-are-doing/electric-program-investment-charge/EPIC-1.25.pdf.

[251] TURN Opening Brief at 9-14.

[252] TURN Opening Brief at 18-19.

[253] TURN Opening Brief at 4-7.

that Tesla may open its fast charging network to other EVs, 2) fails to consider fast chargers likely to be deployed under the VW settlement,[254] 3) does not account for EVs that are incompatible with fast charging, 4) does not account for other uncertainties that could reduce demand for fast charging, and 5) includes 350 kW fast chargers that are not technologically feasible.[255]

We find that Fast Charge's program scale is based on credible research and forecasting from electric transportation research experts at UC Davis, Ricardo and E3 in the form of the EPIC 1.25 study, and TURN and ORA have offered no qualified expert opinion that contradicts this research. The EPIC 1.25 research identified 300 prioritized areas of expected high-demand for fast charging and estimated that between 574 and 916 additional fast chargers are needed to meet expected vehicle charging demand in those areas above and beyond the approximately 300 DCFCs already operational in PG&E's service territory.[256] Using the mid-range forecast provided by the research, 754 new fast chargers in PG&E's service territory are needed to meet 2025 fast charging demand, of which PG&E proposes to provide ratepayer funded make-ready infrastructure to support approximately 234 fast chargers.

Consistent with PG&E's assertion that additional fast charging infrastructure is needed to electrify the ridesharing industry, General Motors,

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[254] Appendix C of *United States of America v. Volkswagen AG et al.*, Case No. 16-cv-295 (N.D. Cal.) requires Volkswagen to invest $2 billion in zero-emissions vehicle infrastructure, including $800 million in California, over a 10-year period. VW has indicated some of its initial investments will include fast-charging stations for light-duty electric vehicles along transportation corridors. More information is available at https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/vw-zevinvest.htm.

[255] ORA Opening Brief at 10-16.

[256] Exhibit PGE-1 at 4-6.

based on data generated by its work on ride-sharing programs, has concluded that "the most significant learning has been the need for more DCFCs, with drivers often experiencing queuing at urban locations."[257]

We do not find merit in TURN's arguments against PG&E's assumption that fast charging could be used by apartment and MUDs that may have no other charging options. TURN essentially claims that, since the majority of EV charging is currently residential, fast charging is unnecessary at locations outside the home.[258]

PG&E provided factual testimony regarding the number of California residents who live in apartments and other MUDs.[259] TURN has not refuted those figures, and the logical conclusion that follows is that if we want the significant portion of the population that uses vehicles and lives in apartments and other MUDs, to switch to electric vehicles, they will need alternative charging options, including fast-charging stations that are near their residences or paths of travel. Likewise, as EV range increases and EV drivers take longer trips away from their homes in their EVs, the need for fast charging increases.[260] We agree with PG&E that accelerating the adoption of EVs in California, as mandated by SB 350, requires charging access for those without access to home charging. PG&E's Fast Charge program will collect data to help assess whether the barriers to adopting electric vehicles for MUD residents can be adequately addressed by providing nearby fast-charging options.

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[257] Reply Brief of General Motors, LLC, on the Priority Review Proposals at 3- 4.

[258] TURN Opening Brief at 14.

[259] Exhibit PGE-2 at 2-2.

[260] Exhibit PGE-1 at 4-4 to 4-5.

5.2. Impact on Disadvantaged Communities

PG&E will conduct marketing, education and outreach to encourage participation in the program and will target participation in DACs by providing up to $25,000 per DCFC in rebates to cover a portion of the charger cost for sites located in DACs.[261] PG&E proposes to target a minimum of 25 percent of make-ready infrastructure investments to support fast charging in DACs.[262] With the exception of TURN, who recommends reducing the proposed rebate available for fast charging stations to Fast Charge site hosts located in DACs, all other parties support PG&E's rebate proposal for site hosts in DACs to encourage greater deployment of EVs in DACs.[263]

TURN argues that PG&E has not demonstrated the need for its proposed $25,000 rebate to site hosts located in DACs. Instead TURN proposes a $10,000 rebate for site hosts in DACs, which TURN says "balances costs with the intent to provide greater financial incentive to DACs in order to comply with the goal of SB 350 to increase access to transportation electrification in DACs."[264] TURN does not provide evidence of why a $10,000 rebate is more appropriate than a $25,000 rebate for Fast Charge site hosts located in DACs.

We find that the evidence supports a $25,000 rebate, rather than the $10,000 suggested by TURN. "DCFC installation costs vary widely. For example, the cost to install about 100 DCFCs in numerous cities across the United States

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[261] Exhibit PGE-1 at 4-9, 4-12.

[262] Exhibit PGE-2 at 1-12: 26.

[263] *See* ORA Opening Brief at 17, ChargePoint Opening Brief at 8, EDF Opening Brief at 6-7, Greenlining Opening Brief at 9, NRDC et al Opening Brief at 14, SBUA Opening Brief at 5-6.

[264] TURN Opening Brief at 22.

varied from $8,500 to over $50,000, with a median cost of $22,626."[265] Additional evidence was provided that while the basic cost of a DC fast-charging station is about $10,000 to $15,000, the total equipment cost, in a study of Washington state stations, averaged $58,000, reflecting the auxiliary services and features needed for a publicly accessible unit, including warranty, maintenance, customer authentication, and networking with point-of-sale capabilities to collect payment from customers. Installation costs can also vary because of other enhanced safety and security measures that are often required by local permitting authorities, such as lighting and revenue-grade meters. Those options can add up to $90,000 to the basic cost of the fast-charging equipment itself. Additional costs might also be incurred if multiple plugs are required for compatibility.[266] For these reasons, we adopt a maximum rebate of $25,000 not to exceed the full cost of the EVSE and installation costs.

Various parties proposed specific approaches to marketing Fast Charge to potential site hosts or geographic areas.[267] Rather than prescribe in this decision how PG&E should market this program, we direct PG&E to ensure that its Program Advisory Council includes representatives from disadvantaged communities, small and diverse business enterprises to ensure that these perspectives are represented during implementation.

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[265] Exhibit JP-1 at 17 citing Idaho National Lab Report: Consideration for Corridor and Community DC Fast Charging Complex System Design, Idaho National Lab, May 2017, at 11. https://avt.inl.gov/sites/default/files/pdf/reports/DCFCChargingComplexSystemDesign.pdf

[266] *See* National Academy of Sciences: Overcoming Barriers to Deployment of Plug-in Electric Vehicles, chapter 5 at 92, as cited in TURN-01 at 3. https://www.nap.edu/download/21725.

[267] ChargePoint Opening Brief at 8, SBUA Opening Brief at 4-6, Greenlining Opening Brief at 3 and 9.

One of the most important deliverables of these proposals is to see delivery of air quality and other benefits to disadvantaged communities, often hardest hit by emissions from the transportation sector.[268] Moving forward, prioritization of transportation electrification investments—along with targeted marketing, outreach, and education that is relatable and accessible to disadvantaged communities will be critical to moving the plug-in electric vehicle (PEV) market beyond the early-adopter segment.[269] Greenlining notes "[r]esearch suggests that DC fast chargers are best sited at locations where EV drivers can consume additional goods and services (e.g. restaurant, grocery store, etc.) while waiting for their cars to charge, this, in turn can likely provide economic co-benefits to businesses.[270]

We agree with PG&E that greater access to faster chargers in DACs can make EV ownership in those communities more attainable and can bring other economic benefits to those communities as well.[271] SBUA notes that this "would be especially valuable for small businesses located in disadvantaged communities facing poor air quality because these businesses would be significantly benefiting their own surrounding neighborhoods by helping them move toward EV adoption and a cleaner environment."[272] For these reasons,

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[268] EDF Opening Brief at 6.

[269] Greenlining Opening Brief at 7.

[270] Greenlining Opening Brief at 9. See similar comments in NRDC et al Opening Brief at 14.

[271] *See* for example, Exhibit TURN-01 at 27:8-10.

[272] SBUA Opening Brief at 6.

PG&E should select at least 25 percent of the site hosts to be located in or adjacent to DACs.[273]

5.3. Impact on Competition

No party raises concerns about PG&E's proposed Fast Charge program having an adverse impact on non-utility competition. Fast Charge conforms to the September 14, 2016 ACR instructions to leverage non-utility funding by requiring the site host at all sites located outside of disadvantaged communities to cover the entire cost of the DCFC equipment, network services, operation and maintenance. Lowering up-front installation costs through utility investment in and ownership of make-ready infrastructure improves the business case for investment in DCFCs. As PG&E states, "[u]tility make-ready investments will amplify the scale of future charger deployments by allowing public and private funding to be repurposed toward more chargers instead of make-ready costs, providing for even greater access for drivers." As described by GPI/CEC, by subsidizing only the make-ready infrastructure, PG&E's program will allow third parties and site owners to rapidly build out DCFCs where it makes the most sense to do so.

That said, we want to ensure that the program is facilitating participation from multiple EVSPs. As currently designed, there is nothing to prevent one EVSP from dominating the partnership with PG&E early on in the program implementation by providing the EVSE and services at the majority of make-ready sites. To ensure that the program is maximizing participation from

[273] PG&E agrees that 25 percent would be an appropriate stretch goal in Exhibit PGE-2 at 1-12:26-28.

multiple EVSPs, PG&E should review site selection with its PAC and include updates on diversity in EVSP participation in its program reporting.

5.4. Summary of Program Modifications

TURN argues that Fast Charge does not achieve the goals of SB 350 because it would not minimize costs and maximize benefits as required by SB 350 and would likely result in stranded costs.[274] ORA argues that, given the uncertainty in market demand for fast charging and rapid changes in charging station and car technologies, PG&E should not be allowed to invest such a large amount of ratepayer funds ($22.4 million) for full deployment.[275]

We disagree with TURN and ORA. As the Joint Parties note, "It is essential for the EV market to move beyond single family detached homes to scale up to meet long-term climate and air quality goals… Access to DC Fast Charging stations can provide those consumers in market segments who cannot charge at home, such as those who live in multi-unit dwellings, with the ability to purchase or lease EVs."[276] We agree with PG&E that many of the 45 percent (as of the year 2000) of Californians who rent, live in apartment or condo buildings, and use street parking have more limited options for EV charging and access to faster charging can eliminate a barrier to EV adoption.[277]

Because different types of chargers result in different power draws, which impacts the type of make-ready infrastructure that is needed, for site cost estimation purposes, PG&E developed three models of Fast Charge site

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[274] TURN Opening Brief at 3 to 5.

[275] ORA Opening Brief, p. 9.

[276] Exhibit JP-1 at 16.

[277] PG&E Opening Brief at 8.

deployments: 5 DCFCs at 50 kW each; 5 DCFCs at 150 kW; or 3 DCFCs at 350 kW.[278] The three deployment types assume different levels of power requirements to account for current charging standards (50-150 kW) and expected developments for high-powered fast charging of up to 350 kW, which automakers and equipment manufacturers are actively working toward.[279]

PG&E emphasizes that the site types were developed to guide cost estimation and that PG&E does not anticipate all sites will fit within the defined site types. "Instead this program aims to be flexible to meet the needs of site hosts and charging network developers, and adapt with fast charging technology standards and driver preferences."[280]

We agree that PG&E's program should provide site hosts with the flexibility to choose the power level of EVSE most appropriate for their sites with 50 kW the minimum charging capability of the selected EVSE. While we support the choice of the site host to select their EVSE power level, given the current trends of increasing battery size and higher powered charging stations, it is prudent for PG&E to install the customer-side electric infrastructure necessary to support EVSE of 150kW or larger at each DCFC site that supports corridor charging in the Fast Charge program to account for the possibility that the site host may wish to upgrade to higher-powered EVSE in the future. This will prevent stranded utility assets and the potential for expensive infrastructure upgrades if the customer decides to install a higher power level EVSE in the

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[278] Exhibit PGE-1 at 4-8, 4-8 to 4-12.

[279] Exhibit PGE-1 at 4-11, citing Car and Driver (2016), First U.S. 350-kW Charging Station Will Allow Speedy L.A.–Vegas EV Road Trips, http://blog.caranddriver.com/first-u-s-350-kw-charging-station-will-allow-speedy-l-a-vegas-ev-road-trips/.

[280] PG&E Opening Brief at 12.

future. As TURN notes, "[t]his reflects the industry trend and consumer preference of moving towards faster charging (along with improving battery technology) and the related ratepayer risk of stranded or underutilized assets."[281] TURN notes that VW's investment in DCFC will be at power levels ranging from 150-350kW.[282] Though more expensive on a per site basis today, establishing higher capacity infrastructure mitigates the inevitable future cost of upgrading supporting distribution infrastructure to higher power levels.[283]

TURN suggests PG&E should ensure all make-ready infrastructure installed through the Fast Charge program can support 120 kW or higher powered EVSE, citing a study of Tesla superchargers.[284] As ChargePoint notes, 150 kW better aligns with current trends in DCFC design,[285] so while we support TURN's recommendation to install infrastructure capable of higher power levels, we recommend PG&E install make-ready infrastructure to support 150 kW or higher power level EVSE for sites that support corridor charging. Corridor charging, where customers stop to charge during a trip, is the most likely to use higher charging levels in the future, as minimizing charging time during a trip will be important to driver experience.

Site hosts should not be required to install an EVSE of 150 kW or higher, but as ChargePoint notes, "there is no risk of 'stranding' make-ready infrastructure built to support higher power DCFC technologies, and there is

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[281] TURN Opening Brief at 22.

[282] Exhibit TURN-01 at 4, footnote 11.

[283] Exhibit TURN-01 at 5.

[284] Exhibit TURN-01 at 4.

[285] ChargePoint Opening Brief at 6.

value for ratepayers in considering emerging trends in EVs and EV charging technologies."[286] Even if the site host chooses a higher capacity EVSE, "[a] charger's ability to deliver power exceeding the on-board capacity of the vehicle using the charger does not mean that the EV cannot use the charger."[287]

PG&E states that a cost contingency of 25 percent is needed to account for unforeseen costs associated with the significant site variation that may arise in implementing its program.[288] At the same time, PG&E argues its program budget is right-sized because it will only be driven by customer need.[289] ORA cites prior Commission decisions lowering requested contingency levels to 5-to-10 percent in D.10-04-028, citing D.06-11-048.[290] While PG&E intends to base its investments on customer demand, we recommend the utility focus on installing make-ready infrastructure to support at least 150 kW power level EVSE, which has a higher cost than the 50kW EVSE included in its budget estimates.[291] Due to the higher costs associated with our recommended implementation of the program (specifically installation of 150 kW make-ready and above), we approve PG&E's budget with the 25 percent contingency as proposed.

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[286] ChargePoint Opening Brief at 5-6.

[287] ChargePoint Opening Brief at 5-6.

[288] PG&E Reply Brief at 19.

[289] PG&E Reply Brief at 7. "*Actual fast charging demand and customer need, not PG&E's forecast, will control Fast Charge make-ready infrastructure deployment and costs, within the overall budget cap*." (Emphasis in original)

[290] Exhibit ORA-1 at 12.

[291] Exhibit PGE-3 Tab 2.

For these reasons we adopt a program similar in scope and scale to that proposed by PG&E with a target to install make-ready to serve 52 sites, as modified by PG&E's rebuttal testimony and stipulations, and a requirement that all customer-side make-ready infrastructure installed for corridor charging support a minimum of 150 kW charging equipment unless cost-prohibitive. Site hosts located in DACs will be eligible for a maximum rebate of $25,000, not to exceed the full cost of the EVSE and installation costs, to be applied to each EVSE purchase and 25 percent of the site hosts should be located in or adjacent to DACs. We do not adopt TURN's proposed Performance Accountability Metric that focuses on site utilization statistics to drive site selection as this approach would likely make it harder to site DCFC make-ready investments in DACs. We direct PG&E to work with its PAC and the program evaluator to develop and implement a survey to determine whether the DCFC stations installed through the Fast Charge program are serving the needs of customers in MUDs that have no other charging options. Program funding is summarized in Table 10 in Section 8.

6. Medium- and Heavy-Duty Vehicle Charging Programs

Because PG&E and SCE both propose programs that focus on medium- and heavy-duty vehicle electrification, we consider them together. First we describe each program as proposed, then identify common or similar changes that the utilities have made to the programs over the course of this proceeding. Then we discuss the programs' expected impacts on transportation electrification and emissions reductions, disadvantaged communities, and competition. This is followed by a discussion of our proposed program modifications and a summary of the adopted programs.

6.1. Proposed Programs Described

6.1.1. PG&E's Fleet Ready Program

With a proposed budget of $210 million,[292] this program targets make-ready infrastructure to support fleets of medium- and heavy-duty vehicles at, for example, municipal bus transit depots, warehouses and seaports. Over a five-year period from the date of first installation, PG&E plans to provide (1) utility-owned make-ready infrastructure at 700 sites for up to 8,800 charging points,[293] (2) operation and maintenance of installed infrastructure, and (3) education and outreach to customers regarding the benefits of EVs. PG&E also proposes to offer rebates to disadvantaged communities and "beach head" sectors.[294] PG&E selected sectors where it expects that utility ownership of make-ready infrastructure will accelerate adoption of TE and vehicles are commercially available or vehicle retrofits are possible. PG&E does not propose to include Class 2 or 3 forklifts, for example, because it asserts that there are few, if any, viable non-electric options for such applications.

PG&E proposes to provide make-ready infrastructure for non-light-duty electric vehicles[295] for customers who commit to purchasing electric vehicles.

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[292] $184 million in capital and $26 million in expense.

[293] Exhibit PGE-1 at 3-45. PG&E notes that the actual number of installations may vary, and may be more or less than the amount included in its reference case, depending on many factors, including, but not limited to, demand, location, and actual costs, all of which are highly uncertain due to the nascent state of the non-light-duty EV market. PG&E's actual program costs will not exceed its authorized costs and resulting revenue requirements. Exhibit PGE-1 at 3-4.

[294] Beach head sectors are sectors where developments are likely to promulgate EV innovation and accelerated deployment.

[295] PG&E defines non-light-duty electric vehicles as: Medium Duty: Light-heavy-duty trucks and Medium-duty trucks (EMFAC Categories LHD1, LHD2, and MDV); Heavy Duty: Trucks, Medium-heavy-duty trucks, Heavy-heavy-duty trucks, Buses, Commuter Bus, School and

Footnote continued on next page

PG&E would own, operate and maintain the make-ready infrastructure, but not the charging equipment (EVSE). The make-ready includes every component from the distribution circuit up to the stub for the EVSE or idle-reduction equipment. PG&E will provide a new service connection with meters and panels exclusively for the make-ready installation. PG&E proposes that ongoing operation and maintenance costs following the five-year program window would be captured in subsequent general rate cases.

PG&E believes because FleetReady will support make-ready electric infrastructure, it will minimize costs that can be a significant deterrent to deployment of EVs for customers such as transit agencies, delivery service providers, and other trucking and fleet companies. On the other hand, to ensure that costs are reasonable, FleetReady is limited to make-ready infrastructure and thus leverages other funding sources by requiring significant cost sharing and "skin in the game by EV owners and operators who will be responsible for the purchase costs of the vehicles and the charging stations to supply the vehicles."[296]

To forecast the number of sites in PG&E's service territory that would participate in the program, PG&E first developed a reference case EV adoption forecast for the non-light-duty sector by: developing a state-wide forecast;[297] estimating PG&E's share of each sector;[298] and determining the number of sites

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Other Bus (EMFAC Categories MHDT, HHDT, SBUS, UBUS, and OBUS); and Off-Road: Airport Ground Support Equipment, Port cargo handling equipment, Transport refrigeration units, Truck stop electrification, Forklifts (class 1), and Other non-light-duty vehicles. See Exhibit PGE-1, Table 3-2.

[296] PG&E Opening Brief at 5.

[297] Exhibit PGE-1, Tables 3-3 and 3-4.

[298] Exhibit PGE-1, Table 3-5.

based on sector-specific data on attach rate and charge points per site.[299] PG&E developed forecasts for high, low, and reference vehicle adoption levels. Its reference case represented about 35-40 percent of the high adoption scenario for its service territory during the FleetReady program period.[300] The reference case suggests 788 sites will require charging infrastructure and PG&E requested cost recovery to provide make-readies for up to 700 of those sites, or up to 8,800 charging ports, over its limited five-year program.[301] Based on site characteristics, PG&E developed load impacts per site and sector for the purposes of estimating program costs.[302]

PG&E emphasizes that the actual number and type of sites that will participate in the program will vary from its forecasted estimates and actual costs per site may vary from the expected costs due in part to the nascent state of the non-light-duty EV market.[303] PG&E states that its program will remain within its approved budget, and "to the extent PG&E's actual costs are lower than anticipated, PG&E will return in rates any uncommitted and unspent funds at the end of the five-year program."[304]

Customers must meet the following eligibility requirements for PG&E to preapprove the customer for participation:

- Demonstrate commitment to near-term procurement of eligible vehicles, EVSE, and associated safety equipment.

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[299] Exhibit PGE-1, Table 3-7.

[300] Exhibit PGE-1 at 3-23.

[301] Exhibit PGE-1 at 3-45 and 3-6.

[302] Exhibit PGE-1 at 3-27 and Table 3-9.

[303] Exhibit PGE-1 at 3-4.

[304] Exhibit PGE-1 at 3-4.

- Provide data related to vehicle and EVSE usage.
- Maintain the equipment for the expected useful life of the vehicle and/or EVSE.
- Demonstrate a long-term electrification plan for any requests to upsize infrastructure to accommodate future TE growth.[305]

To assure significant penetration in disadvantaged communities, PG&E proposes to provide $16 million in financial incentives for disadvantaged communities and beach head sectors. PG&E estimates that 25 percent of program participants will be in DACs. PG&E is proposing to offer a 75 percent rebate on EVSE costs to DACs for a total of up to $10 million in incentives. PG&E identifies public transit buses and school buses as beach head sectors. PG&E proposes to provide eligible projects $15,000 towards the cost of an EVSE. $15,000 is approximately 20 percent of the cost for a transit bus sized charging point,[306] so $6 million in beach head incentives translates to 400 charging points for transit.[307]

PG&E will also conduct outreach and education to: promote awareness by owners and operators of non-light-duty fleets and their potential EVSE suppliers of the benefits of electricity as a fuel; ensure fleet owners, utility customers, and EVSE suppliers are aware of the FleetReady program; and inform fleet owners, customers, and site hosts about additional support PG&E can provide to assist customers in conversion to electric vehicles.[308]

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[305] Exhibit PGE-1 at 3-10 to 3-11.

[306] Exhibit PGE-1 at 3-35.

[307] Exhibit PGE-1 at 3-36.

[308] Exhibit PGE-1 at 3-3.

PG&E proposes to submit an annual report with data on program deployment, site operation, and descriptive program information.[309]

The ratemaking for FleetReady is based on a traditional one-way balancing account in which any over-collection of costs is returned to customers at the end of the program or disposed of by Commission decision, and any under-collection may not be recovered from customers unless the Commission expressly approves.[310] PG&E expects to spend $9.9 million, or 4 percent of its budget, for an education and outreach effort that takes advantage of its Business Energy Solutions representatives, which have existing relationships with its commercial customer-base and the marketing, education and outreach materials developed as part of its light-duty EV infrastructure program to avoid duplication of resources.[311] Both the representatives' expertise and the outreach materials will need to be adapted to focus on medium- and heavy-duty TE.

PG&E proposes to convene a program advisory council to provide advice on program implementation,[312] and to issue an annual report on data collection and monitoring that will include metrics like number of sites deployed, number of vehicles supported by the deployed infrastructure, utilization rates, and costs. Its annual reports will also include any identified barriers it is facing in the program and strategies it is using to overcome those barriers.[313]

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[309] Exhibit PGE-1, Table 3-15.

[310] Exhibit PGE-1 at 6-2.

[311] Exhibit PGE-1 at 3-39.

[312] PG&E Opening Brief at 35.

[313] Exhibit PGE-1 Table 3-15.

6.1.2. SCE's Medium- and Heavy-Duty Vehicle Charging Infrastructure Program

In its $554 million budget,[314] SCE proposes to install, own, and operate the electric infrastructure, up to and including the make-ready stub, to serve charging equipment for medium- and heavy-duty vehicles.[315] SCE also proposes to provide a rebate to cover the costs of the charging equipment and its installation at participating sites.[316] SCE models several aspects of the program after its Charge Ready Pilot for light-duty infrastructure, but notes that charging the non-light-duty segment may require significantly higher levels of kW demand that are in turn more expensive. While SCE did not establish a minimum number of vehicles or sites supported by the proposed program, their cost estimates assumed 18,234 vehicles at 930 sites with 10,491 charge points.[317]

To participate in SCE's program, non-residential customers must own or lease, or be the customer on record for, the participating site; agree to provide SCE continuous access to the site; agree to participate in data collection and surveys; take service on an eligible TOU rate; and agree to maintain the charging equipment for at least five years.[318] Sites must also include an appropriate location to deploy charging equipment for eligible vehicle types in a cost-effective manner, as determined by SCE.[319]

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[314] $532 million in capital and $22 million in expense.

[315] Class 2-8 trucks as well as non-road cargo handling equipment and buses are eligible, as detailed in Appendix C of the Testimony.

[316] Exhibit SCE-1 at 51.

[317] Exhibit TURN-02 at Appendix 3 page 20.

[318] Exhibit SCE-1 at 53-54.

[319] Exhibit SCE-1 at 54.

Eligible vehicles include Class 2-8 trucks, ranging from delivery vehicles and refuse trucks to semi-trucks; non-road cargo handling equipment such as forklifts and port equipment; transportation refrigeration units for semi-truck trailers; and buses used for public transit or schools.[320]

Although participating customers will purchase the EVSE and be responsible for installing and maintaining it, as well as acquiring and maintaining eligible electric vehicles, SCE proposes to provide a rebate to cover 100 percent of the base cost of the charging equipment and installation for eligible customers. SCE proposes to capitalize and recover the rebates over a 10-year period.[321] To qualify for the program and rebate, charging equipment must meet certain technical standards and energy efficiency recommendations and be listed by a nationally recognized testing laboratory.[322] For segments without standardized charging equipment, SCE will work with the customer to determine if it can provide the make-ready infrastructure, but will not provide a rebate on charging equipment.[323] Customers must agree to take service on an eligible TOU rate and participate in the pilot for five years.[324] These customers would be eligible for new, optional rates that are described in Section 7 below.

SCE proposes to use its Business Customer Division to target non-residential customers that may meet the program requirements, leverage its Transportation Electrification Program Management organization to manage site

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[320] Exhibit SCE-E at C-1.

[321] Exhibit SCE-5 and 6, at 2.

[322] Exhibit SCE-1 at 55.

[323] Exhibit SCE-1 at 55.

[324] Exhibit SCE-1 at 55.

evaluation and construction,[325] and utilize its broader market education campaign funded through SCE's Charge Ready proceeding to inform customers about the program's details.[326] SCE states that non-solicited customers may also apply to the program, which will be promoted on the utility's website.[327]

SCE intends to form an advisory board to provide guidance on program implementation, provide quarterly status reports and information in its annual SB 350 portfolio report and in a project close out report.[328] SCE proposes to provide quarterly status reports to the CPUC and its program advisory board that include information about customer interest and satisfaction; procedural updates on processes such as procurement, time, and cost management; post-deployment impacts; and lessons learned executing the program. The status reports may also include recommendations to modify or improve the program from the program advisory board.[329]

6.1.3. Common Program Modifications Based on Joint Testimony and Stipulations

In rebuttal testimony and in stipulations with multiple parties, PG&E and SCE agreed to make a number of modifications to their proposed programs. As summarized in the NRDC et al. Opening Brief, consistent with recommendations made by NRDC, CUE, Plug-In America, The Greenlining Institute, Sierra Club, EDF, the East Yard Communities for Environmental

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[325] Exhibit SCE-1 at 55.

[326] Exhibit SCE-2 at 10-11.

[327] Exhibit SCE-1 at 55.

[328] Exhibit SCE-1 at 98.

[329] Exhibit SCE-1 at 56.

Justice, the Center for Community Action and Environmental Justice (represented by Earthjustice), UCS, Siemens, Tesla, CALSTART, and Office of Ratepayer Advocates (ORA), PG&E and SCE will:

- Extend reporting requirements for an additional five years, which will ensure the Commission and stakeholders benefit from data associated with stations installed toward the end of the program;[330]
- Make specific commitments to deployments in DACs (PG&E will reserve 15 percent of its capital budget for installations benefiting DACs, with a stretch goal of 25 percent, while SCE will reserve 40 percent of its budget for investments in DACs and in charging infrastructure to support electric transit buses, with a provision in place to release unused funds if there is insufficient demand at the halfway mark of the program);[331]
- Conduct proactive outreach to encourage representatives from DACs to participate in Program Advisory Councils;[332]
- Target marketing, education, and outreach efforts at DACs and account for barriers to adoption that are specific to DACs;[333]
- Support Women-, Minority- and Service-Disabled-Veteran-Owned Businesses spending goals;[334]
- Commit to new rate proposals and make rate design modifications (PG&E will file rate proposals optimized for commercial charging applications within 6-12 months of a decision in A.17-01-020 et al, while SCE will make extensive

[330] Exhibit Joint-2 at 2; Exhibit Joint-11 at 2.

[331] Exhibit PGE-2 at 1-12; Exhibit Joint-11 at 3.

[332] Exhibit Joint-13 at 1; Exhibit Joint-11 at 2.

[333] Exhibit PGE-2 at 1-12; Exhibit SCE-2 at 11.

[334] Exhibit Joint-13 at 1; Exhibit Joint-11 at 2.

modifications to its current rate proposals discussed in Section 7 below);[335]

- Take on-site load management technologies into account when scoring potential site hosts;[336]
- Adopt price signals or other load management techniques to help ensure EV charging facilitates the integration of renewable generation;[337]
- Target "customers who operate various vehicle types, including but not limited to transit buses, school buses, delivery and service trucks, on and off-road port and railyard trucks (including, but not limited to, truck stop electrification and transport refrigeration units), forklifts, power take-off units, airport shuttles, and off-road equipment;"[338] and
- Allow customers to participate using existing service connections when there is sufficient unused capacity, which should improve program cost-effectiveness and avoid the assessment of potentially duplicative demand charges.[339]

6.2. Impact on Transportation Electrification and Emissions Reduction

FleetReady and SCE's Medium- and Heavy-Duty Vehicle Charging Infrastructure Program target the non-light duty vehicle sector which is the source of significant GHG, nitrogen oxide (NOx) and other emissions, but which is seriously lagging behind the light-duty vehicle sector in the adoption and deployment of zero-emission vehicles. PG&E provided illustrative CO_2 and NO_x

[335] Exhibit Joint-2 at 1; Exhibit Joint-12.

[336] Exhibit Joint-2 at 1-2; Exhibit Joint-11 at 1.

[337] Exhibit Joint-2 at 2; Exhibit Joint-11 at 1-12.

[338] Exhibit Joint-13 at 1; Exhibit Joint-11 at 2-3.

[339] Exhibit Joint-2 at 1; Exhibit Joint-11 at 1.

benefits of its program if the EV adoption in its 2025 reference case occurs.[340] In its 2025 reference case, about 34,725 medium- and heavy-duty on-road and off-road vehicles are adopted in its service territory. The estimated emissions reductions associated with both existing and new deployments of non-light-duty electric vehicles in PG&E's service territory would be about 341,622 tons of CO_2, and NO_x emissions or 1.90 tons/day in 2026, if the adoption rate of the reference case is achieved.[341]

SCE used modeling from the CARB and independent consultants to develop a reference case scenario of light-, medium-, and heavy-duty vehicle adoption supported by its full TE portfolio proposed in A.17-01-022. It forecasts that in 2030, electric sector greenhouse gas emissions would increase by approximately 1.6 million metric tons, and the replacement of conventional vehicles with electric vehicles would reduce greenhouse gas emissions by about 26.2 million metric tons, resulting in a net 24.6 million metric tons reduced.[342]

Several parties supported phased projects, rather than allowing the utility to move forward with multi-year projects. For example, Clean Energy Fuels states "given the diversity of the MD/HD vocations and the varying levels of commercial maturity of MD/HD vehicles, Clean Energy proposes smaller, phased SRPs with a mechanism to avoid gaps in funding beneficial projects."[343] ORA asks the Commission to split the medium- and heavy-duty programs into two phases with the first phase limited to 10 percent of the originally proposed

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[340] Exhibit PGE-1 at 3-47.

[341] Exhibit PGE-1 at 3-7.

[342] Exhibit SCE-1 at D-9.

[343] Clean Energy Fuels Opening Brief at 5.

size and scope for each utility: $21 million for PG&E and $55.4 million for SCE.[344] Utilities would have the option of filing a separate Phase 2 application.[345] Clean Energy Fuels and ORA point to the nascent nature of the technologies eligible for the program, and the fear that ratepayer funds will be spent on stranded assets.[346] According to TURN, PG&E's and SCE's programs should be reduced to $81 million over four years, with $15 million of the budget reserved exclusively for electric buses; and subject to sector-specific cost caps so that funds may not be shifted among sectors.[347]

EDF believes a phased approach will result in a substantial gap between phases and that "[s]uch a gap will cause uncertainty about the longevity of the program – and, likely, an unwillingness on the part of prospective program participants to engage in significant numbers. This is for the simple reason that monetary and temporal investments by the customer seem far less attractive if it is not clear that the program will continue, or that the utility will be able to continue to provide services in the gap between Phases."[348] This problem is exacerbated in the medium- and heavy-duty market, where vehicle acquisition and operational changes require long lead times.[349] "A shorter program, or a program with a significantly reduced budget, will not provide customers with the certainty they need to invest in electrification," and could "jeopardize

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[344] Exhibit ORA-2 at 6.

[345] ORA Opening Brief at 1-2.

[346] ORA Opening Brief at 33; Clean Energy Fuels Opening Brief at 4.

[347] TURN Opening Brief at 34-35.

[348] EDF Reply Brief at 2-3.

[349] Exhibit SCE-2 at 3-4.

customers' ability to leverage incentive programs for vehicle acquisition." [350] ORA witness Gariffo agreed "[t]hat a time gap could result in changing the EV purchasing decision of a potential participant"[351] considering fleet electrification and that availability of an infrastructure program could affect customers' purchasing decisions for electric vehicles.[352]

The EJ Parties sum up another major flaw with the phased approach and narrow budgets proposed by ORA and TURN.

> [I]t is clear … [they] would prefer that utilities stick to traditional investments, and that they are not convinced investing in widespread transportation is sensible policy. The problem with many of their arguments, however, is that these are policy objections that are not theirs to make. The legislature, after its own consideration and debate, concluded that "[i]t is the policy of the state and the intent of the legislature to encourage transportation electrification as a means to achieve ambient air quality and the state's climate goals."
>
> Indeed, the legislature took the additional step of expressly directing agencies to take the legislature's specific findings into account – meaning that the debate on these policy choices has ended. Specifically, the legislature found that "reducing emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050 will require widespread transportation electrification" and such "widespread transportation electrification requires electrical corporations to increase access to the use of electricity as a transportation fuel." These findings, moreover, are based on a long list of analyses from ARB and others. ORA's and TURN's

[350] SCE Reply Brief at 5, citing Exhibit SCE-2 at 3-4.

[351] RT 1357.

[352] RT 1359.

> generalized complaints that the SCE and PG&E have failed to demonstrate how investment in electric vehicle make-ready infrastructure will provide benefits ask the Commission to reject the legislature's findings and policy recommendations, and ignore the multiple findings of various agencies that electrification of nearly all transportation sources is necessary to meet our environmental and health goals and that utility investment in charging infrastructure is key.[353]

In addition, ORA and TURN argue that the utilities have not demonstrated that the proposed programs are in the interest of ratepayers, necessary, or the most effective means of accelerating transportation electrification, citing Pub. Util. Code § 740.12(b) for these "requirements." The EJ Parties point out that no such requirements are found in the statute, only that "[p]rograms proposed by electrical corporations shall seek to minimize overall costs and maximize overall benefits" and that "SB 350 sets no thresholds for assessing cost-effectiveness, and does not require a quantitative cost-benefit analysis to show that the costs are outweighed by the benefits."[354]

The EJ Parties suggest, and we agree, that the utility medium- and heavy-duty programs generally propose to provide make-ready infrastructure to an appropriate number of sites, striving to "maximize the benefits of transportation electrification by targeting medium- and heavy-duty vehicles and equipment. These vehicles and equipment create significant levels of pollution, disproportionately impact disadvantaged communities, are ripe for electrification, are the targets of other public investment for electrification, provide platforms for technology development that will promote transfer to

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[353] EJ Parties Reply Brief at 8-9, citations omitted.

[354] EJ Parties Reply Brief at 11.

other categories, and are primed for acceleration from utility infrastructure investment."[355] We agree with the "utilities, transit agencies, and technology providers…that the time is now to invest in the success of transportation electrification." [356]

"While the Commission should, of course, ensure that these programs are well-designed and maximize benefits, approaching these proposals with too much trepidation will not enable the sort of growth in electrified transport needed to facilitate achievement of critical clean energy and climate goals."[357]

However, we do agree with TURN that there is a major disparity in the cost estimates for different types of installations by PG&E and SCE. SCE's total proposed budget is more than double what PG&E has proposed, even though its costs are based on only 32 percent more site installations.[358] While SCE does forecast more medium-duty vehicles using each medium-duty site than PG&E, SCE's cost estimates assume ten fewer medium-duty sites than PG&E.[359] The number of sites is the main driver of infrastructure costs. TURN calculates that SCE's per site costs are around $400,000 per site versus $150,000 for PG&E, not including contingency costs,[360] and TURN was not able to identify what planning assumption is driving the higher costs for SCE. SCE's site cost estimates are

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[355] EJ Parties Reply Brief at 11.

[356] EJ parties Reply Brief at 6.

[357] EDF Reply Brief at 3.

[358] Exhibit PGE-3 at Tab 12 page 10; Exhibit TURN-02 at Appendix 2. We note that more than half of SCE's proposed sites are forklift sites.

[359] Exhibit TURN-02, Appendix 2.

[360] TURN Opening Brief at 42.

generally 2 to 4 times higher than PG&E's.[361] [362] First, like TURN, we prefer PG&E's approach to selectively target rebates, because it is most likely to influence GHG emission reductions where they are needed most.[363] We also agree SCE's proposal to provide rebates to cover 100 percent of the base cost of EVSE for all of the sites participating in its program is excessive.[364]

We agree with PG&E that its forecast unit costs and site-specific costs for make-ready electric infrastructure are also based on unit cost forecast methods routinely used and approved in the Commission's General Rate Cases (GRCs) for comparable electric infrastructure costs, as well as in the Commission's recent Phase I EV decisions.[365] For these reasons, our adopted budget relies on PG&E's cost estimates as described below.

6.3. Impact on Disadvantaged Communities

As acknowledged by PG&E, "California's disadvantaged communities (DAC) are often the most affected by the harmful environmental impacts associated with the transportation sector."[366] PG&E proposes that 15 percent of the approved capital budget be reserved for medium- and heavy-duty

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[361] Exhibit TURN-02, Appendix 2; Exhibit PGE-3.

[362] As noted in Section 16, SCE identified a significant budget modeling error after filing its opening and reply comments to the proposed decision. SCE was directed to file amended opening and reply comments in a May 17, 2018 Email Ruling addressing this mathematical error. SCE's budget modeling and cost estimates introduced as part of the evidentiary record to this proceeding were not relied upon in reaching this decision. Moreover, SCE's amended comments clarifying its mathematical error did not influence the substantive changes to the proposed decision.

[363] TURN Opening Brief at 43.

[364] Exhibit TURN-02 at 15.

[365] PG&E Reply Brief at 22.

[366] Exhibit PGE-1 at 1-19:5-6.

applications located in DACs, in line with D.16-12-065, which established PG&E's light-duty vehicle infrastructure pilot.[367] ORA states that it "supports PG&E's general approach, but recommends a hard target of 25 percent because this percentage is representative of PG&E's customer base."[368] PG&E agreed with ORA that 25 percent would be an appropriate "stretch goal."[369]

SCE has committed to reserve 40 percent of its total program funding for deployment in DACs.[370] TURN recommends that a minimum of 40 percent of sites in both PG&E and SCE's programs be located in disadvantaged communities defined as the top 25 percent statewide census tracts as identified by the CalEnviroScreen 3.0 tool. TURN also recommends that rebates be provided only for charging stations at sites located in DACs and to transit agencies, consistent with PG&E's proposal. "TURN supports PG&E's proposal to cap the amount of the rebates for sites in DACs at 75 percent of the estimated charger cost for the specified vehicle sector."[371] TURN argues that SCE's proposal to provide a rebate for 100 percent of the base cost is excessive, "given the significant level of subsidy already proposed by the utilities," including "available incentives for vehicle purchases."[372] TURN suggests that providing rebates for charging stations at DAC sites ensures the 40 percent target is achievable.

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[367] D.16-12-065 at 33-34.

[368] ORA Opening Brief at 30, citations omitted.

[369] Exhibit PGE-2 at 1-12.

[370] Exhibit JP-11 at 3.

[371] TURN Opening Brief at 56. Recheck this citation- did TURN use % or percent.

[372] Exhibit TURN-02 at 15.

TURN suggests that if "this requirement proves unachievable then the utility could submit an advice letter to the Commission seeking a modification to the requirement, detailing why the utilities' efforts failed to produce the required deployment. However, TURN believes the 40 percent minimum requirement is reasonable as a minimum requirement."[373]

Under cross-examination, SCE witness Renger testified that the majority of sites in its program are expected to be located in DACs.[374] In addition, 30 percent of SCE's population lives in DACs[375] and SCE's service territory includes substantial land in DACs, especially in urban areas and freight corridors.[376] Through May 2017, 47 percent of the charge ports requested for SCE's light-duty Charge Ready program are located in DACs.[377] In addition, SCE's service territory has approximately 45 percent of the disadvantaged communities in California.[378]

Based on this evidence, a 40 percent target for SCE appears easily achievable. PG&E's service territory has significantly fewer DACs in it. In prior decisions, the Commission granted PG&E the discretion to target the top 25 percent of census tracts identified by CalEnviroScreen in its service territory, rather than on a statewide basis, to increase the number of eligible DAC sites for

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[373] TURN Opening Brief at 56.

[374] RT 381:21-24.

[375] RT 472:8-13.

[376] Exhibit SCE-1 at 14, Figure II4.

[377] Exhibit TURN-02 at 7.

[378] Exhibit SCE-1 at 13, footnote 25.

program participation.[379] Based on the differences in PG&E's service territory, we adopt 25 percent as its DAC target using the top 25 percent in its service territory.

We find it reasonable for PG&E and SCE to offer rebates on EVSE for sites supporting transit and school buses. Each utility should set the rebate levels for transit and school bus EVSE in consultation with its PAC, not to exceed 50 percent of the cost of the EVSE. The rebate should not exceed the cost the site host pays for the EVSE after accounting for any other funding sources used for EVSE procurement. Regarding DACs, TURN notes it is not clear these site hosts require additional subsidy. "As TURN has pointed out in the past, the fact that a site is located in a 'disadvantaged community' does not mean the commercial customer itself is financially disadvantaged. TURN expects that large corporations will be a large recipient of the subsidies at hand; many likely may have distribution centers, warehouses, etc. in disadvantaged communities."[380]

To address these concerns, we direct PG&E and SCE to develop a rebate amount in consultation with its PAC, not to exceed 50 percent of EVSE costs, to apply to participants in DACs so long as the customer is not on the Fortune 1000 list. We expect the utilities to work with their PACs to develop further requirements for participants located in DACs to be eligible for a partial EVSE rebate. Although providing relatively small rebates (the average cost of chargers for sectors other than transit is between $5,000 and $15,000)[381] to large commercial customers that happen to be located in a DAC may be unlikely to

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[380] TURN Opening Brief at 56, footnote 199.

[380] TURN Opening Brief at 56, footnote 199.

[381] Exhibit PGE-1 at 3-34, Table 3-13.

influence their decision to pursue transportation electrification, we find the potential for air quality benefits to DACs worth the additional incentive. The emissions reductions benefits would be broad, and could encourage program participation by sites in DACs even above the DAC targets we establish for each utility.

SCE proposes reserving the funds for 2.5 years for DACs at which time any unused funds could be used for other sites interested in participating,[382] whereas TURN suggests reserving funds for a four-year, phase 1 period.[383] We will allow 50 percent of the uncommitted but reserved DAC funds to be released at the beginning of year 4 of a five-year program, if the utility has not achieved 60 percent of its target in DAC locations and it has exceeded 80 percent of its non-DAC targets by the end of year 3. Any remaining funds that are unallocated after year 4 may be spent in any location. This will ensure that the environmental and public health benefits of electrifying the MD/HD sector are realized, which would also benefit residents of DACs.

6.4. Impact on Competition

Sections 740.3(c) and 740.12(b) require the Commission to ensure that the transportation electrification programs it approves do not allow the utilities to unfairly compete with nonutility enterprises.

In both PG&E and SCE's medium- and heavy-duty programs, the utilities propose to only own make-ready infrastructure, but not to own the EVSE. The utilities will allow customers to choose their own EVSE models, EVSE

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[382] Exhibit JP-11 at 3.

[383] TURN Opening Brief at 45.

installation vendors, and any network services providers.[384] For example, as part of FleetReady, PG&E will coordinate and collaborate with non-utility EVSPs and station owners and operators who will be providing the EV chargers and retail charging services for the program; for that reason PG&E believes it will not be competing with non-utilities to provide chargers or retail charging services.[385] Likewise, SCE's proposed programs will follow "the same market-neutral approach demonstrated in its Charge Ready Pilot Program. This approach consists of deploying electric infrastructure that the utility owns and maintains while participating customers (i.e., site hosts) select, own, operate, and maintain qualified charging equipment."[386]

The make-ready infrastructure will be designed and installed at participating sites by the contractors selected by the utilities' Program Management Office, which will coordinate "execution among vendors and contractors hired for the program."[387] SCE will use a request for proposal process to select contractors.[388] Similarly, "the customer would have to commit to the use of qualified and certified union labor for make-ready installation," to be eligible for PG&E's FleetReady infrastructure rebate for make-ready infrastructure on a customer's existing service connection.[389] It is clear that there will be ample opportunity for non-utility entities to participate in the market to

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[384] Exhibit SCE-1 at 54; Exhibit PGE-1 at 3-12.

[385] PG&E Opening Brief at 44.

[386] SCE Opening Brief at 22.

[387] Exhibit SCE-1 at 56; Exhibit PGE-1 at 3-36.

[388] Exhibit SCE-1 at 97.

[389] Exhibit PGE-2 at 1-21.

install make-ready infrastructure to support charging stations. Additionally, we direct the utilities to conduct a competitive process to identify electrical contractors that are qualified to perform make-ready installations. This will ensure the market continues to grow for all qualified installers.

No party expresses concerns about the impact of these programs on the market for charging equipment. When qualifying charging equipment, SCE plans to rely on adopted efficiency and safety standards to define its requirements and accept a large number of vendors and charging equipment models, as SCE has done for its Charge Ready Pilot Program.[390] Participating customers, not SCE, ultimately select the qualified charging equipment they need for their operations.[391] SCE suggests, and we agree, that "[t]his approach allows customers to select equipment that works best for their charging needs, and encourages third-party market participants to provide a variety of established and innovative technologies to meet customer demand."[392]

PG&E states its cost estimates are designed only to support the installation of the make-ready infrastructure, and that it "has not endeavored to estimate the cost of EV chargers and network operations equipment, which will be borne by customers and/or third parties."[393]

For these reasons, we find that the PG&E and SCE medium- and heavy-duty transportation electrification programs do not allow unfair

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[390] SCE Opening Brief at 22.

[391] Exhibit SCE-1 at 97.

[392] SCE Opening Brief at 22.

[393] PG&E Opening Brief at 29.

competition with non-utility enterprises for the provision of electrical charging equipment.

The primary concerns around unfair competition with non-utility enterprises revolve around whether the utility will compete unfairly with non-utility enterprises by installing make-ready infrastructure on the customer side of the meter. TURN argues that PG&E and SCE propose to serve 100 percent of the market for make-ready infrastructure for electric MD-HD and off-road vehicles.[394] Clean Energy Fuels posits that the utility proposals make the utilities "the only game in town for the installation of the infrastructure between the customer meter and the make-ready stub"[395] with much of the costs for the programs being spent on customer-side (behind the meter) infrastructure. TURN argues that behind the meter investment is "not the traditional domain of regulated utilities and is more appropriately, in most cases, best served by private contractors and paid for by the sites themselves to deter anti-competitive effects due to utility involvement. The fact that the utilities are able to fully recover the costs of this infrastructure, plus a rate of return, from ratepayers allows them to provide the infrastructure at no cost to the site host which further exacerbates the negative competitive impacts of the programs."[396] According to Clean Energy Fuels, "expansion of the utility reach narrows the ability of others to compete in providing TE infrastructure other than the charger itself. If the utility is able to provide incentives paid for with ratepayer funds for the installation of infrastructure on the customer side of the meter that are not

[394] TURN Opening Brief at 82.

[395] Exhibit CEF-1 at 18: 2-4.

[396] TURN Opening Brief at 82.

available to other competitors, these incentives will always leave the utility with the lowest priced offering. If others are unable to compete on price, simple economics are likely to drive customers to opt for utility programs."[397]

We disagree with TURN's analysis that the proposed programs represent 100 percent of the market for make-ready infrastructure for electric medium- and heavy-duty and off-road vehicles. PG&E's reference case, for example, represented approximately 35-40 percent of the high adoption scenario for its service territory, not 100 percent.[398] The record shows that PG&E's 2025 projection of 34,000 medium- and heavy-duty vehicles added as a result of its proposed program, using ORA's methodology, is substantially below the 2025 adoption rate in the Phase 3 ICF International Transportation Electrification Assessment (TEA) Report, which provides a projection of 50,350 medium- and heavy-duty vehicles in 2025.[399] Because the utilities will qualify third party contractors to perform much of the make-ready installation work, we disagree with Clean Energy Fuels that utility support of make-ready installation on the customer side of the meter will limit competition.

In light of the objectives of SB 350 to accelerate the movement to an electrified transportation sector, we find that the modified programs will not unfairly compete with non-utility enterprises by allowing utility involvement in the installation of make-ready infrastructure both on the utility side and the customer side of the meter. However, as further described below, we will

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[397] Clean Energy Fuels Opening Brief at 29.

[398] Exhibit PGE-1 at 3-21.

[399] Exhibit Joint-8 at 3.

modify the programs to allow the customer the choice of ownership for the behind-the-meter infrastructure.

6.5. Program Modifications and Summary of Adopted Program

PG&E's FleetReady forecast costs are based on publicly available scenarios for EV adoption and technology site-specific data for non-light duty vehicle sectors,[400] and are dependent on actual customer demand and customer deployment of non-light duty EVs, creating a direct link between projects funded by the program and accelerated adoption of EVs.[401] Consistent with the Commission's guidance in its Phase I EV decision, D.16-12-065, we find that PG&E has focused FleetReady on make-ready infrastructure that include cost-sharing and collaboration with non-utility EV service equipment providers.

As Clean Energy Fuels points out, the proposed program and vehicle mix, for both PG&E and SCE's programs, is based on a number of studies "including the ICF International Transportation Electrification Assessment (TEA) study and studies prepared by the CARB and California Energy Commission. These forecasts are then scaled by PG&E's roughly estimated share of each sector."[402] Clean Energy Fuels argues that this approach makes the forecasts highly generalized, and aggregated across sectors with very different cost estimates.

We agree that the proposed programs do not include the normal level of detail that provides us comfort that an upfront reasonableness determination, for the scale of the programs proposed, is appropriate. Because the utilities have not

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[400] Exhibit PGE-1 at 3-13 to 3-21.

[401] Exhibit PGE-1 at 3-4, 3-21.

[402] Clean Energy Fuels Opening Brief at 7, citations omitted. Clean Energy Fuels makes the same point with respect to SCE at 10.

surveyed customers for market interest or provided utility specific forecasts for uptake in particular sectors or vehicle vocations, we adopt substantial modifications to the proposed programs to ensure value to ratepayers while simultaneously accelerating investment in transportation electrification. However, in consideration of the longer MD/HD EV procurement cycles, we do not find the short term program approaches proposed by TURN and ORA will result in substantial transportation electrification, so we establish a five-year program for both utilities.

Appendix C details the assumptions and calculations we use to establish program budgets for PG&E and SCE.

The calculations assume a certain number of sites in each sector to reflect our sector priorities; however we do not require the utility to adhere to this specific sector mix, we use it only for purposes of developing the adopted budget. We agree with TURN that "[i]deally, investments would be selected that maximize emissions reductions for each ratepayer dollar, with particular emphasis on how to accelerate emissions reductions in disadvantaged communities"[403] which is why we have increased the assumed adoption rate in three vehicle sectors that have particular impact on disadvantaged communities. For example, VTA suggests that the vehicle forecasts on which PG&E's proposed budget is based greatly underestimates the expected vehicle adoption ranges for transit buses.[404] In addition, the electric transit bus sector is poised for expansion, given the number of electric bus options available to fleet operators. The high upfront cost of infrastructure remains a key barrier for fleets choosing to

[403] TURN Opening Brief at 30.

[404] VTA Opening Brief at 7.

electrify. Focusing support initially on bus electrification could support more rapid EV adoption than other sectors where fewer vehicle options are currently available.[405] Therefore, we also support PG&E's proposal to offer $15,000 rebates to sites installing electric public transit or school bus charging infrastructure, or about 50 percent of the total charger cost.[406] We direct PG&E and SCE to annually evaluate the rebate level with its PAC to ensure it is appropriate.

We conclude, consistent with ORA and TURN's recommendations, that a 35 percent contingency is not necessary for the make-ready installations because it is distribution infrastructure that the investor-owned utilities (IOUs) have decades of experience installing and upgrading to accommodate new or increased loads.[407] We instead assume a 10 percent contingency to establish the budget. We adopt PG&E's proposal to use 4 percent of its budget for education.[408]

Table 7. CPUC Approved Budget Assumptions for FleetReady Program

Infrastructure Subtotal	***$148,546,450***
Program Management	$14,854,645
Contingency	$14,854,645
PG&E Education	$5,941,858
Transit and School Bus Rebates	$37,350,000
DAC Rebates	$14,777,063
Non Infrastructure Subtotal	***$87,778,211***
Program Total - PG&E	**$236,324,661**

[405] Exhibit PG&E-1 at 3-34.

[406] Exhibit PGE-1 at 3-35.

[407] ORA Opening Brief at 49; Exhibit TURN-01 at 15.

[408] Exhibit PGE-1 at 3-39.

Table 8. CPUC Approved Budget Assumptions for SCE's Medium/Heavy Duty Charging Infrastructure Program

Infrastructure Subtotal	***$201,754,185***
Program Management	$20,175,419
Contingency	$20,175,419
Transit and School Bus Rebates	$64,620,000
DAC Rebates	$35,931,200
Non Infrastructure Subtotal	***$140,902,037***
Program Total - SCE	**$342,656,222**

Utility investments in make-ready infrastructure to serve the medium- and heavy-duty transportation sector within the adopted budget will be considered *per se* reasonable provided:

- For PG&E, a minimum of 700 make-ready installations are fully contracted for by 2024 and 6,500 additional vehicles are electrified that are directly attributable to the authorized program achieved by site hosts procuring at least two EVs or converting at least two diesel fueled vehicles to electric;
- For SCE, a minimum of 870 make-ready installations are fully contracted for by 2024 and 8,490 additional vehicles are electrified that are directly attributable to the authorized program achieved by site hosts procuring at least two EVs or converting at least two diesel fueled vehicles to electric;
- a minimum of 15 percent of the infrastructure budget serves transit agencies (in each service territory);
- a maximum of 10 percent of the infrastructure budget serves forklifts (in each service territory);
- a minimum of 25 percent of the infrastructure budget serves vehicles operating at ports and warehouses in SCE's territory;
- a minimum of 40 percent of the infrastructure budget results in installations in DACs in SCE's territory;
- a minimum of 25 percent of the infrastructure budget results in installations in DACs in PG&E's territory;

- rebate levels for transit and school bus EVSE are established in consultation with the utility's respective PAC. Rebate levels should not exceed 50 percent of the charger cost;
- rebate levels for EVSE installed at sites in DACs are established in consultation with the utility's respective PAC. Rebate levels should not exceed 50 percent of the charger cost; and
- a maximum of 10 percent of the infrastructure budget is spent on program administration (by each utility).

A vehicle-only target could be met through a focus on sites able to deploy a large electric fleet, while a site-only target could encourage a focus on customers that intend to deploy only one or two electric vehicles. By establishing both a vehicle and site minimum target, we are encouraging the utilities to strike a balance between sites with limited resources or a small number of total vehicles necessary and sites adopting a large number of electric vehicles in the near-term.

If the utility program meets all of these criteria with the full budget expenditure, we consider the program costs to be *per se* reasonable, meaning utility spending on these activities would only be subject to review of the utility's prudent administration of the approved program not on whether the program itself was reasonable to pursue. If the utility program does not meet all of these criteria, the utility must include its program costs in its subsequent General Rate Case for the Commission to review the reasonableness of costs. Under this approach, utilities would record and recover program costs in rates prior to review for reasonableness, and the Commission would only conduct a reasonableness review of costs after the fact if program performance does not meet the criteria described above and are therefore not *per se* reasonable. Given the limited experience of the utilities in supporting electrification of the medium- and heavy-duty sectors, we understand that actual site costs may differ from

forecasts. We allow PG&E and SCE, if necessary and after consultation with Energy Division staff and its PAC, to file a Tier 3 Advice Letter after at least two years of program implementation to request to adjust the program budget and metrics used to determine *per se* reasonableness. The Advice Letter must include:

1. A summary of program status to date;
2. A breakdown of utility-side, customer-side, and other costs, by sector;
3. A description of the major cost drivers for utility-side and customer-side infrastructure; and
4. An explanation of any site cost caps the utility used to determine customer eligibility for the program or other metrics the utility used to control program costs.

This approach limits the risk of ratepayer funds being stranded, as technology for the MD/HD sector is changing rapidly. TURN and ORA both argue that the charging options that exist today may not be compatible with the next generation of EVs as rationale to substantially scale back both PG&E and SCE's programs, however, while we agree that particular EVSE might become obsolete, if properly sized, it is hard to find that make-ready infrastructure investments would become similarly obsolete. We agree with NRDC that the "risk of stranded assets is minimized by the fact both SCE and PG&E's medium and heavy-duty programs are designed such that investments will generally only be made when there are willing partners in the form of site-hosts, fleet managers, and others who will be making matching investments, especially in the vehicles themselves."[409] As PG&E notes, if demand for their standard review projects "is

[409] NRDC Reply Brief at 7.

less than the approved revenue requirements during the five-year period of the respective program, PG&E will return in rates any unspent funds to customers pursuant to guidance from the Commission."[410]

For market sectors where there is no standard charging equipment, SCE proposes that customers could participate in the program, but would be responsible for the full cost of buying and installing the proprietary or made-to-order EVSE.[411] SCE suggests it would help such customers evaluate what equipment the customer may need. This is an appropriate safeguard of ratepayer funds because proprietary or made-to-order technologies are generally not scalable and may result in stranded assets if the company that manufactures them goes out of business or decides to change their technology significantly. We adopt this participation approach for both utilities, and encourage SCE and PG&E to explore options for standard EVSE connectors wherever possible.

We agree with TURN that ratepayers should not fund charging infrastructure that supports the adoption of only one electric vehicle,[412] as proposed by SCE[413] and PG&E,[414] however we will allow the utilities to commit funds for that site host's participation contingent upon the site host's commitment for procurement of at least two new EVs or electrification of at least 2 existing vehicles. TURN suggests that host sites that commit to adopting a higher number of EVs in the near- and medium-term should be prioritized for

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[410] Exhibit PGE-01 at 1-3.

[411] Exhibit SCE-1 at 55.

[412] Exhibit TURN-1 at 8.

[413] Exhibit TURN-02, Appendix 3, TURN-SCE-02, Question 12.

[414] Exhibit PGE-2 at 1-17.

program participation, and we agree.[415] Participating customers should be required to fully participate in the program, including financially, as much as they are able to, and those that are able and willing to transition to electric vehicles in the near-term should be given a priority for participation.

Rebates to support EVSE purchases will be treated as an expense, not capital assets, and would only be available to sites that support electric transit or school buses or are located in DACs. Ratepayer-supported infrastructure in these sectors is more likely to result in broader benefits because the vehicles traverse through entire neighborhoods that will benefit from reduced emissions, are used by the general public, and may help stimulate the development of drivetrains for other medium- and heavy-duty sectors

Tesla and TURN indicated that rather than assuming that a new separately-metered circuit would be needed, there may be opportunities for some customers to use their existing service connections to participate in the medium- and heavy-duty programs.[416] "PG&E does not believe that it is feasible for PG&E to maintain partially owned make-ready infrastructure because it would be impossible to identify which components of the make-ready are PG&E's and which are the customers'."[417] If the Commission decides that customers with existing capacity at their sites should have the ability to use their existing service connection within the FleetReady Program, PG&E requests that up to 20 percent of the FleetReady capital budget be made available to customers who "demonstrate that their site has existing capacity for the proposed EV

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[415] TURN Opening Brief at 54.

[416] Exhibit Tesla-1 at 1-2; Exhibit TURN-07 at 9.

[417] PG&E Opening Brief at 44-45.

charger installation in the form of rebates treated as a capitalized utility regulatory asset with return on rate base, in the amount of up to 80 percent of the site installation cost. To be eligible for such rebates, the customer would have to commit to the use of qualified and certified union labor for make-ready installation, and the customer would be subject to all other FleetReady participation criteria."[418]

We agree with Tesla and TURN that if using a customer's existing service connection is the lowest-cost option for a specific site, and the customer would prefer to use its existing service connection, that is the option PG&E and SCE should support. There should not be a cap limiting the amount of the two utilities' budgets that would support a rebate of up to 80 percent of the customer-side infrastructure installation cost to support the EVSE. Any rebates provided to customers for make-ready installation on their existing service connections should be treated as expenses.

VTA suggests that "the program design be flexible enough to include only the utility side of the meter instead of requiring that the work include both sides of the meter up to the stub for the EV Charger."[419] Participating customers should be allowed the choice of whether to own, operate, and maintain the make-ready infrastructure installed behind the customer meter; if the customer chooses customer ownership, the customer must manage and pay for the installation of the customer-side infrastructure and use state licensed labor to perform the installation. The customer must submit to PG&E its site plans and estimated site construction costs and state its commitment to operate and

[418] Exhibit PGE-2 at 1-21.

[419] VTA Opening Brief at 5.

maintain the facilities consistent with relevant national, state, and local electrical standards for their site.[420] The utility shall provide a rebate to the customer for customer-side infrastructure the customer installs. The rebate should be the lesser of: (a) 80 percent of customer's actual installation costs or (b) 80 percent of the average utility direct cost for installing the customer-side make-ready infrastructure in the relevant sector.[421] The rebate should be treated as an expense.

It is reasonable to require program participants to maintain and operate the EVSE for the vehicles they are purchasing for program participation for at least 10 years[422] and require site hosts to provide the utility with data for at least five years after the EVSE is installed.

As modified, PG&E and SCE's proposed Medium and Heavy-Duty Vehicle Charging Programs satisfy Pub. Util. Code § 740.3, § 740.8, and § 740.12 and should be approved.

7. SCE Commercial Rates

In its application, SCE proposed commercial EV rates to apply to new and existing EV customers of three different sizes.[423] SCE also proposes to modify its Rule 1 definition of electric vehicles, to be consistent with the broader definition

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[420] Including but not limited to: National Fire Protection Association (NFPA) 70 § 625-626, NFPA 70B Chapter 34, and any additional local requirements.

[421] Referencing Exhibit PGE-2 at 1-21.

[422] California Transit Association states that the useful life of a heave-duty transit bus is at least 12 years or 500,000 miles. (California Transit Association Opening Brief at 6.) *See* also Exhibit SCE-1 at 54.

[423] TOU-EV-7: Monthly maximum demand ≤ 20 kW; TOU-EV-8: Monthly maximum demand ≥ 21 kW, ≤ 500 kW; TOU-EV-9: Monthly maximum demand > 500 kW. See Exhibit SCE-1 at 60-82.

of transportation electrification established in SB 350, such that the new rates would be applicable to electric vehicles, vessels, trains, boats, or other equipment that are mobile sources of air pollution and GHG emissions. The proposed rates are consistent with SCE's proposed TOU periods in its 2016 Rate Design Window, A.16-09-003, which is pending a Commission decision. These TOU periods include a winter super-off-peak period from 8am to 4pm every day and a summer off-peak period from 9:00 p.m. – 4:00 p.m. every day.[424]

For a defined five-year implementation period, the proposed rates would not include a demand charge, and SCE would recover costs primarily through energy charges. For TOU-EV-7, which applies to customers of lower demand, SCE would provide Option A, a volumetric TOU rate without a demand charge, and Option B, which phases in a demand charge.[425] For rates that include a demand charge, the demand charge would be introduced in year six, annually increasing to full cost by year 11.[426] At least 40 percent of distribution costs will be recovered through volumetric TOU rates in year 11 and beyond, so the time at which the demand occurs will have some impact on how much the customer pays for distribution costs.[427]

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[424] Exhibit SCE-1 at 70.

[425] Exhibit SCE-1 at 67:16 to 68:2.

[426] Exhibit SCE-1 at 64.

[427] Exhibit SCE-1 at 76-77 and Exhibit Joint-12. Under the Stipulation, the distribution grid component for the new EV rates should be the lower of the percentage of design demand distribution costs related to the grid component adopted in the Phase 2 decision, or 60 percent of the design demand distribution marginal costs.

Table 9. Summary of SCE's Proposed Commercial EV Rates

Tariff	Monthly Maximum Demand	Application of Demand Charges
TOU-EV-7	20 kW	Option A: No Demand Charges Option B: Phased in, beginning year 6
TOU-EV-8	21-500 kW	Phased in, beginning year 6
TOU-EV-9	500 kW	Phased in, beginning year 6

ORA served testimony supporting TOU-EV-7 Option A while recommending that some peak-related transmission costs (50 percent until a full study can be completed) be removed from the Option B demand charge.[428] As described in Exhibit JP-5, other parties raised similar concerns about transmission cost recovery and challenged the manner by which SCE would implement the demand charge.

Shortly after testimony was served, parties entered into settlement discussions. Following the close of evidentiary hearings, a group representing the diverse interests of ratepayers, environmental organizations, manufacturers, and union finalized a stipulation that outlined an agreed upon methodology for SCE's rate design.[429] These parties recommend that the Commission use the stipulation as the basis for determining commercial EV rates because it includes modifications to SCE's original proposal that will aid in accelerating EV adoption including:

1. For distribution costs, a maximum of 60 percent of costs that can be recovered through the demand charge;

[428] ORA Opening Brief at 50.

[429] Exhibit Joint-12.

2. Creates Option A and Option B for TOU-EV-7;
3. For TOU-EV-7, the final line transformer (FLT) 50 kVA or above costs will not be included in the demand charge, but will instead be recovered through energy rates and/or the customer charge;[430]
4. SCE will assess the demand charge on the difference between the EV meter demand and host site meter demand on the condition that the EV's monthly peak demand exceeds the site host's peak demand for co-located accounts;[431]
5. Allocates 30 percent of transmission costs to volumetric rates and 70 percent to demand charges, and will update this allocation once SCE completes a transmission marginal cost study during SCE's Phase 2 General Rate Case (GRC); and
6. SCE will propose a DCFC rate and an event-based rate no later than its 2021 GRC Phase 2 proceeding.

On brief, ORA commends the treatment of transmission costs as an improvement from SCE's initial proposal to recover 100 percent of transmission costs through the demand charge. It will enable customers to appropriately see a portion of transmission costs in the TOU rates which will provide customers further incentive to charge during the off-peak or super off-peak instead of the on-peak period. This demand charge mitigation will facilitate customers to focus more on the TOU rates, which offer a better proxy of conditions on the transmission, generation and distribution systems."[432] However, we are

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[430] FLT costs are currently recovered through the customer charge for small commercial customers.

[431] As described in ORA Opening Brief, footnote 302, "[c]o-located accounts refers to any customer that has at least two meters. This is the case for all customers on the new EV rates, because they will have at least one "host site" meter (i.e. main business meter) that is billed on their otherwise applicable tariff plus one separate EV meter that is billed on the new EV rates."

[432] ORA Opening Brief at 51.

concerned that it may be inappropriate to set transmission rate design through a stipulation rather than through a general rate case (GRC) and subsequent filing with the Federal Energy Regulatory Commission (FERC). In light of state policy encouraging TE, we will adopt the transmission related proposals in the SCE Stipulation on a temporary 3-year basis, provided SCE files a Single Issue 205 filing with the FERC for approval of the 70/30 proxy temporary rates. Therefore, we accept the proposal to use a proxy allocation of 30 percent of transmission costs allocated to volumetric rates and 70 percent allocated to demand charges pending FERC approval. The proxy transmission rates may not take effect until SCE receives FERC approval for its proposed 70/30 split. SCE should also take the appropriate steps of completing a transmission cost causation study[433] in its GRC phase 2 or Rate Design Window and then filing this request with the FERC before applying this transmission rate design on a more permanent basis. Further, any introduction of time-dependent transmission rates should not be limited to EV rates but should encompass non-residential transmission rates generally.

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[433] The stipulation calls for a "complete transmission marginal cost study." Such a study would fall under the rubric of a cost causation study. However, transmission marginal cost studies are uncommon, possibly because transmission projects are large and infrequent, making them unconducive to a marginal cost analysis. A cost-causation study of transmission must recognize that transmission facilities must be sized to accommodate maximum expected power flow, and will help ensure that, even in cases where peak demand is not the primary driver, analysis of the investments will have a peak demand-related component. Finally, because FERC does not use marginal costs in its rate filings, it may be best to avoid marginal cost terminology and simply characterize the transmission study as a "transmission cost causation study."

In the event FERC does not approve the 70/30 proxy split proposed in Joint-12, SCE should implement its proposed commercial EV rates using the transmission cost allocation currently approved by FERC.

ORA describes its position that the "the proposed billing provision with respect to [demand] charges is a significant improvement over SCE's original proposal."[434] ORA argues that "SCE's original proposal was to simply assess the demand charge based on the high non-coincident demand of the EV meter. However, this would have overestimated customers' demands, because it ignores the fact that the highest demand the grid sees is the combined (i.e. concurrent) demand of the host site meter and the EV meter."[435] As modified by the Joint Stipulation, the new billing provision accounts for the coincidence of the EV meter's and the main business meter's combined maximum demands resulting in a rate design that significantly reduces the financial impacts from demand charges. Tesla is supportive of this modification but recommends clarification to confirm that this structure would only apply to a customer's delivered load. Tesla suggests, for instance, "if a customer installs storage that reduces the EV peak, there should be no penalty. … Tesla encourages resolution on this question within the final approved program rate design."[436] The issue Tesla raises would occur if the customer's storage system were behind the meter that measures the facility load, but not the EV load, thereby reducing the facility's metered demand, and potentially increasing the incremental EV demand to which a demand charge is applied. While we recognize the challenge

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[434] ORA Opening Brief at 51.

[435] ORA Opening Brief at footnote 304.

[436] Tesla Opening Brief at 9 to 10.

this could pose to customers with existing storage, the customer would still have the opportunity to reduce their facilities-related demand charge by curtailing their EV charging during peak periods. Developing new technology or algorithms to net out the storage on one meter from the EV load on a separate meter is out of scope of this proceeding. Additionally, this would not be an issue if the storage were behind the same meter as the EV load. Therefore, for the purposes of SCE's rates, the facilities-related demand charge should apply to the metered load as stated in the stipulation.

Finally, ORA strongly supports the Joint Stipulation's recommendation to recover the 50 kVA and above FLT costs through the customer charge and/or energy rates "because it accounts for small commercial customers' lower sophistication and lack of experience regarding demand charges, and it will not deter them from using higher level chargers (which draw more power) and/or generally increasing their EV demand. By reducing the impact of demand charges, these terms will encourage more EV load and allow customers to focus on the TOU price signals."[437]

Some of the benefits of proposed rates (as modified) to EV owners or operators are reduced distribution-related demand charges relative to current EV and non-EV rates, attractive volumetric rates during daytime super-off-peak periods and overnight, and lower summer season charges to mitigate seasonal bill volatility. After the phase-in period is complete, SCE states that its "rate schedules will reflect stable demand charges that will be lower than what new EV customers would pay on their otherwise applicable (non-EV) commercial

[437] ORA Opening Brief at 52.

rates today."[438] SCE also expects the availability of the new rates to put "downward pressure on non-participating customers' rates," because the new rates will attract new load, and the incremental load will contribute to the recovery of fixed system costs.[439]

For these reasons, we adopt SCE's Commercial Electric Vehicle Rate proposal as modified by the Joint Stipulation set forth in Exhibit Joint-12, excluding the proposed treatment of transmission costs, which should be addressed in SCE's GRC Phase 2. We approve the requirement that SCE propose a DCFC rate, or adjustment to a then-existing rate, targeted to the DCFC segment, no later than its 2021 GRC Phase 2 proceeding.[440] We authorize SCE to file a Tier 2 Advice Letter within 90 days of the adoption of this decision to revise its Rule 1 definition of electric vehicle and establish three new tariff schedules: TOU-EV-7, TOU-EV-8, and TOU-EV-9. Because the Commission has not issued a decision in SCE's Rate Design Window application, A.16-09-003, which in part addresses updated TOU periods, SCE should revise its TOU periods, if necessary, pending the outcome of a decision in that proceeding. SCE should also update its tariffs, as necessary, pending the results of the transmission cost study in its next GRC Phase 2.

8. Authorized Project Funding and Cost Recovery

Section 740.12(b) allows the TE programs and investments proposed by the utility to be recovered through a reasonable cost recovery mechanism if they are consistent with § 740.12, do not unfairly compete with nonutility enterprises as

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[438] SCE Opening Brief at 5.

[439] Exhibit SCE-1 at 78.

[440] Exhibit Joint-12 at 3.

required under § 740.3, include performance accountability measures, and are in the interests of ratepayers as defined in § 740.8.

Table 10 summarizes the funding approved by utility and cost category based on the modified programs described above.

Table 10. Funding Approved for Authorized Transportation Electrification Standard Review Projects

Transportation Electrification Project	Capital	Expense	Total
San Diego Gas & Electric Company			
Residential Charging Program	$16,230,000	$120,675,000	$136,905,000
Evaluation		$5,476,200	$5,476,200
Total	**$16,230,000**	**$126,151,200**	**$142,381,200**
Southern California Edison Company			
Medium/Heavy Duty Infrastructure Program	$241,610,552	$101,045,670	$342,656,222
Commercial EV Rate Design	-	-	-
Evaluation		$13,706,249	$ 13,706,249
Total	**$241,610,552**	**$114,751,919**	**$356,362,471**
Pacific Gas and Electric Company			
FleetReady Program	$177,859,849	$58,464,812	$236,324,660
Fast Charge Program	$20,070,177	$2,323,864	$22,394,041
Evaluation		$10,348,748	$10,348,748
Total	**$197,930,026**	**$71,137,424**	**$269,067,449**

Budgets reflect modifications approved in this decision based on the utilities' proposed budgets provided in: Exhibit PG&E-1, Attachment 2, Exhibit SDG&E-3, Appendix A – Detailed Project Costs, Exhibit SCE-01 at 51

This decision addresses the appropriate ratemaking treatment for recovery of the costs for the authorized transportation electrification projects. As described below, each utility plans to create a new balancing account to record approved project costs and revenues and use existing regulatory accounts to ensure that under- or over-collections are amortized annually in distribution rates.

8.1. SDG&E Proposed Ratemaking for Authorized RCP

In its rebuttal testimony, SDG&E proposed to establish a one-way, interest bearing balancing account to record revenues associated with the authorized revenue requirement and operating and maintenance incremental costs for the RCP.[441] SDG&E proposes to maintain a rolling balance through the installation period (2019-2025, with some carry over into 2026 for late customer enrollments).[442] After the program installation period is complete, SDG&E would annually return any over-collected balance through the amortization process that is part of the Tier 2 Advice Letter SDG&E files each October in its electric regulatory account update. The annual true-up process would occur until any undepreciated balances are included in SDG&E General Rate Case.[443]

SDG&E seeks approval of the revenue requirement calculated on the approved capital and O&M costs for 2018-2019 and the years until the projects' associated assets can be rolled into the next appropriate GRC. SDG&E would roll forward any undepreciated book value of plant balances associated with its RCP for recovery in its post-2019 GRC.[444] SDG&E proposes the TE revenue requirement be recovered through distribution rates. Final disposition and closure of the balancing account would be addressed in SDG&E's post-2019 GRC, which SDG&E expects to file in 2020, covering 2022-2024.

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[441] Exhibit SDGE-14 at NGJ-1.

[442] Exhibit SDGE-14 at NGJ-2.

[443] Exhibit SDGE-14 at NGJ-2.

[444] Exhibit SDGE-7 at NGJ-2.

8.2. SCE Proposed Ratemaking for Authorized Project Costs

SCE proposes a Transportation Electrification Portfolio Balancing Account (TEPBA) to "record the actual O&M expenses, payroll taxes, and capital revenue requirement (i.e., depreciation, return on rate base, property taxes, and income taxes) in the TEPBA associated with the activities as approved by the Commission for the TE Portfolio pilot projects and standard review programs."[445]

> SCE proposes to include in distribution rates a forecast annual revenue requirement effective January 1 of each year, for at least five years, or until the TEPBA-related costs are included in a future general rate case (GRC). To help ensure that customers only pay the actual TE Portfolio revenue requirements, SCE proposes to transfer the revenue requirement recorded in the TEPBA to the distribution sub-account of the BRRBA [Base Revenue Requirement Balancing Account] on an annual basis. Using this approach, any difference between the forecast TE Portfolio revenue requirements included in rate levels and the actual recorded TE Portfolio revenue requirements will be trued up in the BRRBA. This proposed ratemaking provides that no more and no less than the reasonable revenue requirements associated with the TE Portfolio activities will ultimately be collected from customers. Any over-collection recorded in the BRRBA at the end of each year will be refunded to customers in the subsequent year. Similarly, any undercollection recorded in the BRRBA at the end of each year will be recovered from customers in the subsequent year.[446]

SCE also requests the Commission preemptively deem as reasonable "any actual incurred costs, as long as consistent with the adopted scope of activities

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[445] Exhibit SCE-1 at 101.

[446] Exhibit SCE-1 at 101.

and within cost levels adopted by the Commission."[447] It proposes that if costs exceed the approved budgets, SCE would file an application or use some other regulatory mechanism to request approval to recover the additional costs.[448]

8.3. PG&E Proposed Ratemaking for Authorized Project Costs

PG&E proposes a Transportation Electrification Balancing Account (TEBA) with separate subaccounts for its FleetReady and Fast Charge programs.[449] Recording the "forecast cost for each … will allow PG&E to recover the actual revenue requirements up to the level of the forecast total capital and expense expenditures"[450] for the term of the SB 350 TE program. On an annual basis the revenue requirements recorded in the TEBA subaccounts "would be trued-up by transferring the subaccount balance in the TEBA to the [Distribution Revenue Adjustment Mechanism] DRAM as part of the Annual Electric True-up [AET] process at the end of the year for rates effective January 1 of the following year."[451] This would then result in either an over- or under-collection, which would then be amortized in rates up to the authorized forecast costs. PG&E requests an upfront finding that spending for the proposed TE projects at or below the forecast cost is reasonable.

8.4. Analysis

TURN suggests that the utilities recover all costs not directly related to distribution hardware through the Public Purpose Program (PPP) charge, rather

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[447] Exhibit SCE-1 at 101.

[448] Exhibit SCE-1 at 101.

[449] Exhibit PGE-1 at 6-1.

[450] Exhibit PGE-1 at 4 to 5.

[451] Exhibit PGE-1 at 8.

than through distribution costs, as the utilities collect the PPP charge on an equal cents per kWh basis, whereas they recover distribution costs based on their respective marginal cost revenues.[452] TURN provides examples of specific infrastructure and activities that should be included in the PPP charge, including any behind-the-transformer equipment, rebates, and program implementation costs. TURN suggests that its proposal is appropriate because the program is in the public interest and provides benefits to all ratepayers, like the Electric Program Investment Charge (EPIC) and Self-Generation Incentive Program (SGIP) which are funded through the PPP. TURN asserts that using the PPP for cost recovery would lessen the bill impacts for residential customers.[453] ORA supports TURN's recommendation to recover SDG&E's RCP costs through its PPP rather than through distribution costs.[454]

PG&E opposes TURN's proposal to recover program costs through the PPP rates, stating that "Infrastructure costs should be based on the function they perform."[455] PG&E implies that while it is true that the SB 350 TE programs help meet public policy goals, the same could be said "for a large majority of electric investment in distribution and generation infrastructure over the last 15 years where the bulk of infrastructure investment has at its premise support of a clean energy future."[456]

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[452] TURN Opening Brief at 72 and 121.

[453] TURN Opening Brief at 73.

[454] ORA Opening Brief at 75.

[455] Exhibit PGE-2 at 3-5.

[456] Exhibit PGE-2 at 3-5.

PG&E also notes that recovering the SB 350 TE programs' distribution infrastructure costs through the PPP would be contrary to the cost recovery process approved for similar infrastructure costs in D.16-12-065 for PG&E's EV Infrastructure and Education Program.[457]

SCE also opposes the proposal to recover costs through PPP rates, because its "revenue allocation is conducted at the functionalized system level prior to the rate design process."[458] SCE states that it "will not specify that specific expenditures are made on behalf of specific customer groups."[459] SCE argues that EPIC and SGIP are recovered through the PPP because they do not involve traditional distribution assets, while its proposed TE programs do.[460]

SDG&E recommends recovery of costs through distribution rates, since they believe the costs are distribution-related; but they are amenable to "adopting TURN's and ORA's proposal to use a PPP allocation factor to determine the allocation of SB 350 costs to customer classes, and would specifically suggest the Electric Program Investment Charge ("EPIC") allocation factor proposed in Assembly Bill 628."[461]

We agree with the utilities that the costs associated with their SRPs are related to the distribution system and are appropriately recovered through distribution rates. SB 350 found that "deploying electric vehicles should assist in grid management, integrating generation from eligible renewable energy

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[457] Exhibit PGE-2 at 3-6; D.16-12-045, Ordering Paragraph 4.

[458] Exhibit SCE-2 at 34.

[459] Exhibit SCE-2 at 34.

[460] SCE Reply Brief at 20-21.

[461] SDG&E Reply Brief at 29.

resources, and reducing fuel costs for vehicle drivers who charge in a manner consistent with electrical grid conditions."[462] Electric vehicles provide opportunities for grid integration and enhanced distribution system management.

TURN also recommends the Commission reject PG&E and SCE's proposals to be allowed to request recovery of additional costs if "demand outstrips the overall budget,"[463] stating that the Commission should set a firm cap on spending for the programs' approved scope of activities, and make clear that "there will be no opportunity for recovery of within-scope activities that exceed the budget or for out of scope activities."[464] ORA also opposes the utilities' request to seek recovery of costs over the approved budgets or an after-the-fact review of out-of-scope activities.[465] We agree.

Each utility is authorized to file a Tier 1 Advice Letter updating its existing transportation electrification one-way balancing account[466] to include the programs approved today either as a new subaccount in the case of PG&E and SCE or within the balancing account for SDG&E. The utilities should record the revenue requirement associated with the SRPs on a monthly basis, and the balances of each balancing account should be transferred annually to a distribution account for amortization in distribution rates. Each utility may use its existing regulatory accounts and Advice Letter procedures for this annual

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[462] Section 740.12.(a)(1)(G).

[463] TURN Opening Brief at 75, Exhibit PGE-2 at 1-4.

[464] TURN Opening Brief at 75.

[465] Exhibit ORA-2 at 2-8.

[466] Established through SDG&E Advice Letter 3178-E, SCE Advice Letter 3734-E, and PG&E Advice Letter 5222-E.

amortization. The next year's forecast revenue requirement should be included in rates as follows:

- SDG&E should use its Annual Electric Regulatory Account Update, filed as a Tier 2 Advice Letter in October and its consolidated end-of-year Tier 1 Advice Letter in late December.
- SCE should use the existing, annual Tier 2 Advice Letter process for its ChargeReady light-duty EV program.
- PG&E, as proposed in its testimony, should include this as part of its AET, filed as a Tier 2 Advice Letter by September 1, and a supplemental Tier 1 Advice Letter in late December.

This decision approves a budget, as detailed in Table 10, associated with the direct costs for each SRP. The utility may record the revenue requirements up to the authorized direct costs for each project. The approved budgets are not fungible across priority review or standard review projects. At the end of the projects, any forecasted costs that were included in rates but were not spent should be returned to customers through rates.

SDG&E's and SCE's proposals for transferring ongoing costs into their GRC are approved. PG&E's proposal to phase operations and maintenance costs into its 2020 GRC, before including capital costs in its 2023 GRC, is denied. PG&E should continue recording all costs associated with the SRPs in its new balancing account until its 2023 GRC.

Given the annual Advice Letter process and Commission oversight over project implementation, we will not require any after-the-fact cost reasonableness reviews. The SRP costs will be deemed reasonable and approved for recovery through the Advice Letter process if they are within the project-specific budget limits approved in Table 10, and consistent with the approved project scope. Costs incurred for each project up to the authorized level will be considered per

se reasonable subject only to the utility's prudent administration of the project; costs above authorized level will be borne by shareholders.

9. Program Advisory Councils

Each utility has an existing Program Advisory Council (PAC)[467]to provide them guidance during implementation of their ongoing light-duty infrastructure pilots.[468] D.18-01-024 extended the applicability of each of these PACs to the approved priority review projects. We further direct the utilities to use these PACs to provide feedback and guidance during implementation of the standard review projects. The utilities should finalize implementation details for the approved projects based on feedback from its PAC. The utilities may determine how to best structure and segment their PAC meetings given the broad range of programs included in each. Each utility's PAC should meet quarterly following the Commission's approval of the projects and throughout the implementation and design phase of the projects. Utilities can continue the PAC meetings at their discretion once project construction or implementation has begun. The PACs shall include a diverse set of stakeholders with expertise relevant to the priority review projects, including CCAs. Each utility shall, at a minimum, solicit participation through the service list for this proceeding.[469]

PAC participants are generally responsible for attending all meetings or phone calls, providing feedback on program implementation based on their specific expertise, providing relevant data and lessons learned from the field, and

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[467] SCE calls its PAC an Advisory Board but for simplicity here, we use the term PAC.

[468] SDG&E's Power Your Drive pilot as approved in D.16-01-045, SCE's Charge Ready pilot as approved in D.16-01-023, and PG&E's EV Charge Network as approved in D.16-12-065.

[469] D.16-01-045, Attachment 2, Appendix A includes details on the composition and activities of the PAC.

providing input on any programmatic changes necessary to improve program efficacy.

If a utility identifies any modifications necessary to effectively implement the programs approved in this decision, it should propose those modifications via a Tier 2 Advice Letter after reviewing the changes with their PAC.

10. Data Gathering Requirements

The Commission will review the results of the SRPs along with information collected from the utilities' already approved infrastructure programs to determine the effectiveness of utility investments in transportation electrification. To facilitate this evaluation, we adopt the same data collection and reporting requirements that D.18-01-024 required for the PRPs to ensure standardization in reporting.

Each utility is required to submit an annual report and a final report for each of their approved projects, and serve this to the service list for this proceeding. The reports should use the report template and data collection template available on the CPUC website (http://www.cpuc.ca.gov/sb350te/) under the "reporting requirements" section of this page.

The templates include:

- A final report template in Microsoft Word format that includes report headings and descriptions of the information that should be included in the report. This reporting information is common across all projects. Additional, project specific information is included as an appendix to this template.
- A data reporting template in Microsoft Excel that has several tabs for the utilities to report various quantitative data. The first tab of the file contains instructions on how to complete the files. Each utility should complete this file and submit it in Excel format along with its annual and final reports.

- Additionally, each utility must ensure that it reports, or helps a site host to report, all publicly-accessible charging stations to the US Department of Energy's Electric Vehicle Charging Station Locations mapping tool.[470]

11. Evaluation

Section 740.12(c) requires the Commission to review data concerning current and future TE adoption and charging infrastructure utilization prior to authorizing the utilities to collect new TE program costs. The evaluation process should, at a minimum, investigate and identify the following:

(1) Whether the utilities' TE investments meet the stated purposes of accelerating widespread transportation electrification, reducing dependence on petroleum, meet air quality standards, achieve the goals of the Charge Ahead California Initiative, and reduce greenhouse gas emissions.

(2) Whether the TE investments maximized benefits and minimized costs.

(3) Learnings from analysis of data collected during program implementation including:

a. Infrastructure utilization data;

b. Number of incremental electric vehicles adopted;

c. Actual costs associated with the electrification of various sectors;

d. Actual emissions reductions associated with TE investments; and

e. Actual grid impacts associated with TE investments.

D.18-01-024 directed the utilities to collectively fund a budget equal to four percent of their total approved project budgets from all ratepayers, to

[470] Available at: https://www.afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC.

conduct an RFP to hire an evaluator that will review the results of the priority review projects approved in that decision.[471] The decision further directed PG&E, SDG&E, and SCE to coordinate evaluation efforts with PacifiCorp, Liberty Utilities, and Golden State Water Company (Bear Valley Electric Service Division) to capture economies of scale for purposes of evaluating the PRPs. In this decision, we direct the utilities to again contribute four percent of their total approved SRP budgets to support this evaluation effort and extend it to the standard review projects' results.

As directed in D.18-01-024, the utilities must submit a joint Tier 1 AL providing a status update on implementation of and data available from the programs authorized in this decision within two years of the date of this decision. Based on the progress of the projects at that time, the Commission will determine whether one evaluation can capture all of the approved projects' results or whether separate evaluations will be needed due to timing or other differences in the data available from the programs. The expectation is for the evaluation efforts specific to the SRPs to commence by early- or mid-2021.

12. Safety Considerations

The Commission's focus on ensuring utilities provide safe and reliable service is an overarching focus in the emerging TE industry. Section 740.8 defines the "interests" of ratepayers to mean: direct benefits that are specific to ratepayers consistent with safer, more reliable or less costly gas or electrical service consistent with § 451. The ACR directed that TE Applications should

[471] D.18-01-024 at 97.

promote driver, customer and worker safety.[472] Safety and Enforcement Division (SED) staff issued a data request to better understand how the utilities are addressing these objectives. Based on the responses, SED staff developed a draft Safety Requirements Checklist for the TE programs, available on www.cpuc.ca.gov/sb350te under the "SB 350 TE Reporting Requirements" section of this page.

The Safety Requirements Checklist is intended to consolidate current standards and requirements in one place and to ensure the utility infrastructure is installed and operated safely and does not adversely affect reliability of electrical service.

The Safety Requirements Checklist will be revised and circulated to the service list of this proceeding after it is finalized. While the Commission may later amend and update the Safety Requirements Checklist for future proceedings, the final version that circulated to this proceeding's service list will be applicable to the programs approved in this decision through the duration of their implementation.

No later than 18 months after today's decision is approved, the sponsoring utility for each project must file a Tier 1 Advice Letter describing their compliance efforts with the safety requirements included in the checklist. Utilities' safety efforts should include all safety precautions the utility and its PAC determine are necessary for the specific program being implemented including or beyond those listed in the Safety Requirements Checklist. The Advice Letter must contain an attestation signed by the Project Manager. Each

[472] ACR, Section 3.8.

utility should file a final safety attestation, using the same template developed for the PRPs, along with their final report for each SRP.

The Commission will review utility compliance with the Safety Requirements Checklist and may conduct inspections or audits to confirm compliance. The sponsoring utility must have all compliance documentation available should the Commission determine an inspection or audit is necessary.

13. Categorization and Need for Hearing

In Resolution ALJ 176-3392, the Commission preliminarily categorized this proceeding as ratesetting, and preliminarily determined that hearings were necessary. Evidentiary hearings were held September 25-28, 2017 and October 2-5 and 9-11, 2017 for the Standard Review Project portion of this proceeding. The April 13, 2017 Scoping Ruling confirmed the categorization as ratesetting.

14. Outstanding Procedural Matters

The CPUC affirms all rulings made by the assigned Commissioner and assigned Administrative Law Judge (ALJ). All motions not previously ruled on are deemed denied.

15. Assignment of Proceeding

Carla J. Peterman is the assigned Commissioner. ALJs Michelle Cooke and Sasha Goldberg are the Presiding Officers.

16. Comments on Proposed Decision

The proposed decision of ALJs in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Opening Comments were filed on April 19, 2018 by: SDG&E, PG&E, SCE, ORA, TURN, SBUA, Coalition of California Utility Employees, CALSTART, Clean

Energy Fuels Corp., NDC, Joint Parties, Tesla, EDF, ChargePoint, Siemens, GPI and CEC, UCAN, CCA Parties[473], California Transit Association, CCAEJ and EYCEJ, Greenlots, SDAP, and Greenlining. Reply comments were filed on April 24, 2018 by: SDG&E, PG&E, SCE, ORA, TURN, EDF, SBUA, City of Long Beach California, Siemens, NDC, Tesla, UCAN, ChargePoint, Joint Parties, SDAP, Clean Energy Fuels Corp., CCAEJ and EYCEJ and Greenlots.

In response to comments, changes have been made throughout the decision to improve clarity. A few changes however, we feel necessary to discuss and highlight below.

In response to comments on SDG&E's RCP, we have revised the decision to make the implementation of the RCP optional.[474] While the Commission finds there is tremendous value in testing SDG&E's RCP and evaluating the purported environmental benefits, it is unclear whether SDG&E and other parties do. Several parties provided comments on the proposed decision's treatment of rebates as expenses and/or the modification to shift SDG&E's method of delivery for its RCP to a rebate program.[475] These parties expressed concern that this decision removes *incentives* for SDG&E to invest in TE, because rebates are treated as expenses. The ACR explicitly directed the utilities to file the instant applications and specified that "to meet SB 350 goals, the utilities must also invest in non-infrastructure program on which they may not earn a rate of return on investment under the traditional ratemaking approach" and that "the electric

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[473] The CCA Parties consist of: Marin Clean Energy, Sonoma Clean Power, City of Lancaster, and Silicon Valley Clean Energy.

[474] Ordering Paragraph 3.

[475] *See Generally*, Opening Comments of SDG&E; Reply Comments of EMeter, a Siemens Business; Reply Comments of Greenlots.

utilities may propose…how the utility can be incentivized for undertaking TE projects and investments…" using performance-based ratemaking or other incentive structures.[476] Rather than exploring other program delivery models or solutions that do not require complete utility ownership and ratebasing of behind-the-meter infrastructure, SDG&E designed its RCP with traditional ratemaking principles.[477] While the Commission supports a role for the IOUs in accelerating TE, the Commission does not believe that capitalizing all EV charging infrastructure is always necessary to remove barriers to widespread electrification. Furthermore, the Commission expects additional applications from IOUs to support widespread TE and it is unclear if persistent capitalization of TE infrastructure will lead to unaffordable rates for all ratepayers if done at scale to meet the State's TE goals.

However, in response to comments and consistent with the goals of SB 350, the scope and record of this proceeding,[478] and Commission authority, we

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[476] ACR at 30 to 31.

[477] Consistent with previous transportation electrification decisions, we allow the utilities to rate base customer-side and utility-side infrastructure that the utility owns and operates consistent with the following rationale: a utility's rate base represents the value of its property that is used and useful in rendering utility public service. Because rate base is the foundation upon which the company's earnings, or rate of return is based, elements included in rate base are of special concern in the ratemaking process and subject to additional scrutiny by regulatory authorities. Including only utility property prudently incurred and devoted to providing utility service ensures that present utility customers pay only for the costs associated with the benefits received and prevents current ratepayers from subsidizing service to future customers. Operating expense are generally the ordinary non-capital expenses that are reasonable and necessary for the utility's operation. (*See* D.16-12-065 at 62).

[478] Exhibit TURN-04 at 20 to 22; Reply Comments of ORA referencing Exhibit ORA-3; Opening Comments of Natural Resources Defense Council, Plug-In America, The Coalition of Utility Employees, Sierra Club, Environmental Defense Fund, UCS, Greenlots, Siemens, and EMotorWerks at 15.

will allow SDG&E to meet and confer with parties to develop a companion incentive mechanism within the parameters outlined in Appendix B.

In response to comments on SCE's Medium/Heavy Duty Charging Infrastructure program, we have increased the budget and program goals to reflect a higher number of sites in several sectors, as detailed in Appendix C, with a focus on vehicles that will be deployed at ports and warehouses.[479] We recognize that SCE's service territory has a higher number of sites served by port equipment and warehouse operations than PG&E's service territory, and have adjusted SCE's program budget to reflect those differences. These substantive changes were made regardless of the mathematical modeling error identified in SCE's Amended Opening and Reply Comments that resulted in a decrease of $142 million to SCE's requested budget.[480] We base our modifications on the evidentiary record, and non-utility parties' comments.

Given the evolving TE market, alternative approaches to ratemaking may make sense in the future proposals and proceedings. In addition to seeing the goals of SB 350 achieved, the Commission wants to learn from this decision's authorized investments and how best to incentivize both utilities, ratepayers, and customers in the future. Because California stands at the forefront of TE investment and planning, we want to encourage our investor-owned-utilities to think differently and creatively about how to deliver TE investments.

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[479] *See*, generally, opening comments from the Joint Parties, Tesla, CUE, CTA, CalSTART, Greenlining, and the EJ Parties.

[480] SCE Amended Filing on May 17, 2018.

Findings of Fact

1. Light-duty vehicles comprise 97 percent of all registered vehicles in San Diego County and are responsible for approximately 80 percent of combined on-road and off-road GHG emissions.

2. Recent studies show the degradation of air quality in San Diego County, culminating with the American Lung Association's grade of "F" in air quality for San Diego County in the organization's last two-year's "State of the Air" report.

3. To calculate program size, SDG&E assumed that its service territory makes up approximately 10 percent of California's 1.5 million-vehicle goal, narrowing SDG&E's target to 150,000 ZEVs. SDG&E subtracted the projected number of ZEVs in its territory in 2020 (29,691) from 150,000 vehicles to get a remaining market of 120,309 additional ZEVs that need to be on the road in SDG&E's territory by 2025.

4. SDG&E's 90,000 figure ignores the natural progression of EV adoption that will occur from 2020 to 2025 in SDG&E's service territory.

5. SDG&E's 90,000 figure excludes the 3,000 to 3,500 utility-owned EVSE that were already approved in D.16-01-045.

6. SDG&E's 90,000 figure omits 14,000 current SDG&E EV drivers not enrolled in EV TOU Rates.

7. As proposed, SDG&E's 90,000 L2 EVSE deployment goal actually constitutes 87 percent of the projected vehicles needed to meet the Governor's ZEV goals.

8. SDG&E's RCP will encourage adoption of EVs by making L2 charging stations more accessible by daily commuters.

9. Installing L2 EVSE at a residential home is not as complicated as the installation of EVSE in other sectors.

10. Utility ownership of the charging infrastructure dramatically drives up costs, in comparison to alternative ownership models.

11. A key barrier to EV adoption is upfront installation costs.

12. Qualifying networked L2 EVSE should have common communication capabilities through WiFi or cellular and be capable of responding to price signals, recording interval energy consumption, and allow for accurate billing of EV-only tariffs.

13. TURN estimates SDG&E's modified RCP will cost between $677 to $750 million; which translates to ratepayers paying over $7,500 to $8,300 per L2 EVSE installed.

14. SDG&E's average EVSE allowance ($500) and installation allowance ($1,425) are reasonable.

15. Under the Sonoma Clean Power program, customers can go to Sonoma Clean Power's website to order an eligible L2 station; customers are then required to pay the sales tax and a $50 handling fee.

16. SDG&E's current Marketplace website allows customers to compare prices and read customer reviews when deciding what EVSE they would like to purchase.

17. A rebate program that allows the residential customer to select EVSE from pre-qualified providers creates a good environment for market growth, technical innovation and competition on price, product features and service.

18. Free-riders are those who already own an EV, and providing rebates to those drivers would not result in additional EV adoption.

19. A recent survey revealed majority of EV drivers in California are relatively wealthy with 76 percent of surveyed drivers having a household income of more

than $100,000 per year, compared to California's average household income of $65,000.

20. 96 percent of proposed RCP funds will benefit what is already the most successful consumer market for EV adoption, single-family residences.

21. L1 charging will not generate the same opportunities for managed charging associated with L2 charging, such as improving SDG&E's load factor, integrating renewables, and reducing fuel costs.

22. Managed charging has load shifting and load shaping benefits that can reduce upward pressure on rates for all ratepayers.

23. L2 charging can prevent range anxiety amongst EV drivers.

24. Networked L2 charging can provide customers with the flexibility to participate in Demand Response programs.

25. Networked L2 chargers have the potential to record interval consumption data enabling drivers to more easily respond to "real time signals" and EV-only TOU rates.

26. Charging capabilities need to align with the increase of EV battery ranges.

27. By withdrawing the requirement that residential participants must take service on the GIR, SDG&E feels that concerns about including CAISO day-ahead pricing are addressed.

28. SDG&E's existing EV TOU rates fail to account for the fact delivery charges vary by time-of-use period.

29. SDG&E should continue to leverage its Clean Transportation Department's customer engagement efforts to target current and future EV drivers, as well as partner with stakeholders to share information about the RCP.

30. SDG&E should work with its PAC to develop program marketing materials that are geared toward both DAC and non-DAC communities.

31. SB 350 has clear objectives to increase EV adoption and charging access in DACs.

32. PG&E's Fast Charge aims to: (1) help meet a portion of PG&E's estimated need for up to 916 fast chargers in its service area by 2025, (2) reduce driver range anxiety, and (3) increase access to charging for customers, especially those lacking ready access to home charging, needing charging stations in transportation corridors for longer trips, or for access to ridesharing.

33. PG&E's Fast Charge program size takes into account other fast charging station installations and relies on the empirical results of an expert market analysis of DCFC needs and potential locations in PG&E's service area.

34. TURN and ORA offer no qualified expert opinion that contradicts PG&E's EPIC 1.25 study.

35. The EPIC 1.25 research identified 300 prioritized areas of expected high-demand for fast charging in PG&E's territory and estimated that between 574 and 916 additional fast chargers are needed to meet expected vehicle charging demand in those areas above and beyond the approximately 300 DCFCs already operational in PG&E's service territory.

36. Using the mid-range forecast provided by the EPIC 1.25 study, 754 new fast chargers in PG&E's service territory are needed to meet 2025 fast charging demand, of which PG&E proposes to provide ratepayer funded make-ready infrastructure to support approximately 234 fast chargers.

37. Additional fast charging infrastructure is needed to electrify the ridesharing industry.

38. The most significant learning on ridesharing programs has been the need for more DCFCs, with drivers often experiencing queuing at urban locations.

39. DCFC installation costs vary widely. The cost to install DCFCs in numerous cities across the United States varied from $8,500 to over $50,000, with a median cost of $22,626.

40. In a Washington state study, DCFC stations averaged $58,000, reflecting the auxiliary services and features needed for a publicly accessible unit, including warranty, maintenance, customer authentication, and networking with point-of-sale capabilities to collect payment from customers.

41. DCFC installation costs can also vary because of other enhanced safety and security measures that are often required by local permitting authorities, such as lighting and revenue-grade meters.

42. One of the most important deliverables of PG&E's Fast Charge program is to see delivery of air quality and other benefits to disadvantaged communities, often the hardest hit by emissions from the transportation sector.

43. Prioritization of transportation electrification investments—along with targeted marketing, outreach, and education that is relatable and accessible to disadvantaged communities – will be critical to moving the PEV market beyond the early-adopter segment.

44. Greater access to faster chargers in DACs can make EV ownership in those communities more attainable and can bring other economic benefits to those communities as well.

45. No party raises concerns about PG&E's proposed Fast Charge program having an adverse impact on non-utility competition.

46. It is essential for the EV market to move beyond single-family detached homes to scale up to meet long-term climate and air quality goals. Access to DC fast charging stations can provide those consumers in market segments who

cannot charge at home, such as those who live in multi-unit dwellings, with the ability to purchase or lease EVs.

47. Many of the 45 percent (as of the year 2000) of Californians who rent, live in apartment or condo buildings, and use street parking have more limited options for EV charging and access to faster charging can eliminate a barrier to EV adoption.

48. It is prudent for PG&E to install the customer-side electric infrastructure necessary to support EVSE of 150 kW or larger at each DCFC site that supports corridor charging in the Fast Charge program to account for the possibility that the site host may wish to upgrade to higher-powered EVSE in the future.

49. Even if the site host chooses a higher capacity EVSE, a charger's ability to deliver power exceeding the on-board capacity of the vehicle using the charger does not mean that the EV cannot use the charger.

50. All customer-side make-ready infrastructure installed for corridor charging in PG&E's Fast Charge program should support a minimum of 150 kW charging equipment unless cost-prohibitive.

51. To forecast the number of sites in PG&E's service territory that would participate in the FleetReady Program, PG&E first developed a reference case EV adoption forecast for the non-light-duty sector by: developing a state-wide forecast; estimating PG&E's share of each sector; and determining the number of sites based on sector-specific data on attach rate and charge points per site.

52. PG&E emphasizes that the actual number and type of sites that will participate in the FleetReady program will vary from its forecasted estimates and actual costs per site may vary from the expected costs due in part to the nascent state of the non-light-duty EV market.

53. PG&E's FleetReady and SCE's Medium- and Heavy-Duty Vehicle Charging Infrastructure Program are targeted at the non-light duty vehicle sector which is the source of significant GHG, NOx and other emissions, but which is seriously lagging behind the light-duty vehicle sector in the adoption and deployment of zero-emission vehicles.

54. The estimated emissions reductions associated with both existing and new deployments of non-light-duty electric vehicles in PG&E's service territory would be about 341,622 tons of CO2, and NOx emissions or 1.90 tons/day in 2026, if the adoption rate of the reference case is achieved.

55. SCE forecasts that in 2030, electric sector greenhouse gas emissions would increase by approximately 1.6 million metric tons, and the replacement of conventional vehicles with electric vehicles would reduce greenhouse gas emissions by about 26.2 million metric tons, resulting in a net 24.6 million metric tons reduced.

56. SCE's total proposed budget was more than double what PG&E has proposed, even though its costs as proposed were based on only 32 percent more site installations.

57. In amended comments on the proposed decision, SCE identified a calculation error that reduced its proposed budget by $142 million.

58. We prefer PG&E's approach to selectively target rebates, because it is most likely to influence GHG emission reductions where they are needed most.

59. SCE's proposal to provide rebates to cover 100 percent of the base cost of EVSE for all of the sites participating in its program is excessive.

60. PG&E's forecast unit costs and site-specific costs for make-ready electric infrastructure are also based on unit cost forecast methods routinely used and

approved in the Commission's GRCs for comparable electric infrastructure costs, as well as in the Commission's recent EV decisions.

61. Providing rebates for publicly-accessible and residential charging equipment in DACs serves residents in those communities whose air quality and socioeconomic status determined the DAC designation.

62. Providing relatively small rebates (the average cost of chargers for sectors other than transit is between $5,000 and $15,000) to large commercial customers that happen to be located in a DAC is unlikely to influence their decision to pursue transportation electrification.

63. The make-ready infrastructure will be designed and installed at participating sites by the contractors selected by the utilities' Program Management Office, which will coordinate execution among vendors and contractors hired for the program.

64. When qualifying charging equipment, SCE plans to rely on adopted efficiency and safety standards to define its requirements and accept a large number of vendors and charging equipment models, as SCE has done for its Charge Ready Pilot Program.

65. The fact that the utilities are able to fully recover the costs of this infrastructure, plus a rate of return, from ratepayers allows them to provide the infrastructure at no cost to the site host.

66. Focusing support initially on bus electrification could support more rapid EV adoption than other sectors where fewer vehicle options are currently available.

67. SCE's proposed Commercial EV TOU periods include a winter super-off-peak period from 8am to 4pm every day and a summer off-peak period from 9:00 p.m. – 4:00 p.m. every day.

68. Some of the benefits of SCE's proposed rates to EV owners or operators are reduced distribution-related demand charges relative to current EV and non-EV rates, attractive volumetric rates during daytime super-off-peak periods and overnight, and lower summer season charges to mitigate seasonal bill volatility.

69. Reducing the impact of demand charges aims to encourage more EV load and allow customers to focus on the TOU price signals.

70. SCE expects the availability of the new rates to put downward pressure on non-participating customers' rates, because the new rates will attract new load, and the incremental load will contribute to the recovery of fixed system costs.

71. Any introduction of time-dependent transmission rates should not be limited to EV rates but should encompass non-residential transmission rates generally.

72. One of the objectives of deploying the standard review proposals is to gather information and share lessons learned in nascent sectors.

73. The purpose of standardized reporting is to ensure that each utility collects the necessary data to analyze each project upon its completion to show how well it has met the goals of SB 350.

74. Standardizing the data collection and reporting process will enable the greatest sharing of information across utilities and with interested stakeholders.

75. Ensuring utilities provides safe and reliable service is an overarching focus in the emerging TE industry.

Conclusions of Law

1. Increasing access for disadvantaged and low- and moderate-income communities to enhanced air quality and lower GHG emissions promotes the overall benefits of TE to these communities, consistent with § 740.12(a)(1).

2. SDG&E fails to establish how the benefits of its proposed RCP under the utility ownership model justify the increased costs to ratepayers.

3. SDG&E fails to prove why utility ownership of the charging infrastructure is necessary to improve the delivery of the Residential Charging Program's objectives in proportion to the higher costs associated with utility ownership. This is equally true for the EVSE and the make-ready infrastructure on the customer-side of the meter.

4. Denying SDG&E the ability to own any of the charging infrastructure on the customer side of the meter should not hinder SDG&E's ability to offer customers incentives for installing L2 charging stations, encourage the adoption of time-variant rates, and provide the Commission with valuable data to help shape future TE policy.

5. A target of 60,000 participants will enable SDG&E to meet 50 percent of the projected EV adoption need in its service territory, and strikes a balance between the costs to ratepayers and the overall benefits of the RCP, in addition to competitive concerns.

6. Deploying 60,000 L2 EVSE will assist in grid management, a primary objective of SB 350, by encouraging charging during off-peak and super off-peak periods when the grid is underutilized.

7. Networked L2 EVSE will provide SDG&E and the Commission with valuable data concerning the current and future trends of EV charging patterns and their effect on grid reliability, a necessity in evaluating the success and scalability of SDG&E's RCP.

8. SDG&E's planned reporting will provide valuable information on charging load profiles and EVSE utilization, complying with § 740.12(c).

9. The 60,000 EVSE deployment goal not only helps to ensure SDG&E does not dominate the EVSE and EVSP market, it also provides a more concentrated goal to base GHG emission reduction analyses on.

10. SDG&E's proposal to provide DACs higher allowances for EVSE and installation costs will provide economic benefits to DACs consistent with § 740.12.

11. SDG&E's commitment to allocate $5.5 million in total direct costs to fund electric panel upgrades for DAC customers and SDG&E's goal of at least 40 percent of overall program costs be spent with DBE firms, aims to facilitate access by DACs to TE infrastructure.

12. By providing rebates to offset the EVSE and permitting fees associated with installing electric vehicle chargers, SDG&E's RCP will incentivize EV ownership.

13. If SDG&E chooses to implement the RCP as approved in this decision, SDG&E may also explore the option of a companion incentive mechanism.

14. PG&E's Fast Charge program scale is based on credible research and forecasting from electric transportation research experts at UC Davis, Ricardo and E3 in the form of the EPIC 1.25 study.

15. Accelerating the adoption of EVs in California, as mandated by SB 350, requires charging access for those without access to home charging.

16. The record on PG&E's Fast Charge program supports a maximum rebate of $25,000 per DCFC in DACs not to exceed the full cost of the EVSE and installation costs.

17. PG&E should ensure that its Program Advisory Council includes representatives from disadvantaged communities, small and diverse business

enterprises to ensure that these perspectives are represented during implementation.

18. PG&E should select at least 25 percent of the site hosts to be located in DACs, consistent with its rebuttal testimony recommendation.

19. PG&E's Fast Charge conforms to the ACR instructions to leverage non-utility funding by requiring the site host at all sites located outside of disadvantaged communities to cover the entire cost of the DCFC equipment, network services, operation and maintenance.

20. PG&E should focus on installing make-ready infrastructure to support at least 150 kW power level EVSE for corridor charging, which has a higher cost than the 50 kW EVSE included in its budget estimates.

21. TURN's proposed Performance Accountability Metric that focuses on site utilization statistics to drive site selection would likely make it harder to site DCFC make-ready investments in DACs.

22. PG&E and SCE should continue to extend reporting requirements for an additional five years, which will ensure the Commission and stakeholders benefit from data associated with stations installed toward the end of the program.

23. A 40 percent target for SCE's MD/HD program in DACs appears easily achievable.

24. PG&E should target 25 percent of its MD/HD program in DACs using the top 25 percent in its service territory.

25. It is reasonable for PG&E and SCE to offer rebates on EVSE for sites supporting transit and school busses but not generally for commercial customers targeted by these programs that happen to be located in DACs.

26. To ensure the environmental and public health benefits of electrifying the MD/HD sector are achieved, any remaining funds that were reserved for DACs but remain unallocated after year 4 can be spent in any location in PG&E's and SCE's service territory.

27. There will be ample opportunity for non-utility entities to participate in the market to install make-ready infrastructure to support charging stations.

28. To ensure the market continues to grow for all qualified installers, PG&E and SCE should conduct a competitive process to identify electrical contractors that are qualified to perform make-ready installations.

29. In light of the objectives of SB 350 to accelerate the movement to an electrified transportation sector, PG&E and SCE's medium-and heavy-duty programs will not unfairly compete with non-utility enterprises by allowing utility involvement in the installation of make-ready infrastructure both on the utility side and the customer side of the meter.

30. Consistent with the Commission's guidance in its Phase I EV decisions, PG&E has focused FleetReady on make-ready infrastructure that include cost-sharing and collaboration with non-utility EV service equipment providers.

31. Because PG&E and SCE have not surveyed customers for market interest or provided utility specific forecasts for uptake in particular sectors or vehicle vocations, we should adopt substantial modifications to the proposed programs to ensure value to ratepayers while simultaneously accelerating investment in transportation electrification.

32. If demand for PG&E's standard review projects is less than the approved revenue requirements during the five-year period of the respective program, PG&E should return in rates any unspent funds to customers pursuant to guidance from the Commission.

33. Making participants responsible for the full cost of buying and installing the proprietary or made-to-order EVSE is an appropriate safeguard of ratepayer funds because proprietary or made-to-order technologies are generally not scalable and may result in stranded assets if the company that manufactures them goes out of business or decides to change their technology significantly.

34. Offering a 100 percent rebate for the EVSE purchase to all participants, as proposed by SCE, is not scalable, and it is unclear whether there would be any benefit for any ratepayers other than the participating customers that receive the rebates, and for that reason we limit rebates to the transit bus and school bus sectors.

35. Each utility should set the rebate levels for transit and school bus EVSE in consultation with its PAC, not to exceed 50 percent of the cost of the EVSE.

36. The rebate should not exceed the cost the site host pays for the EVSE after accounting for any other funding sources used for EVSE procurement.

37. The potential air quality benefits to DACs is worth the additional costs associated with an EVSE rebate.

38. The emissions reductions benefits associated with increased medium- and heavy-duty EV adoption should be broad, and providing a rebate for purchase of EVSE in DACs should encourage program participation by sites in DACs even above the DAC targets we establish for each utility.

39. A vehicle-only target could be met through a focus on sites able to deploy a large electric fleet, while a site-only target could encourage a focus on customers that intend to deploy only one or two electric vehicles. By establishing both a vehicle and site minimum target, we are encouraging the utilities to strike a balance between sites with limited resources or a small number of total vehicles necessary and sites adopting a large number of electric vehicles in the near-term.

40. Customers should be allowed the choice of whether to own, operate, and maintain infrastructure installed behind the meter; if the customer chooses ownership, the customer must manage and pay for the installation of the customer-side infrastructure and use qualified and state licensed labor for which the utility will provide a rebate of up to 80 percent of the installation costs, treating these costs as an expense for ratemaking purposes, and the customer must commit to operate and maintain the facilities consistent with relevant national, state, and local electrical standards for their site.

41. Rebates to support EVSE purchases should be treated as an expense, not capital assets, and should only be available to sites that support electric transit or school busses or are located in DACs.

42. It is reasonable to require program participants to maintain and operate the EVSE for the vehicles they are purchasing for program participation for at least 10 years and require site hosts to provide the utility with data for at least five years after the EVSE is installed.

43. SCE's proposed commercial EV rates are consistent with SCE's proposed TOU periods in its 2016 Rate Design Window, A.16-09-003.

44. In light of state policy encouraging TE, we should adopt the transmission related proposals in the SCE Stipulation on a temporary 3-year basis, provided SCE files a Single Issue 205 filing with the FERC for approval of the 70/30 proxy temporary rates.

45. SCE should take appropriate steps to complete a transmission cost causation study in its GRC phase 2 or Rate Design Window and then filing this request with the FERC before applying this transmission rate design on a more permanent basis.

46. In the event FERC does not approve the 70/30 proxy split proposed in JP-12, SCE should implement its proposed commercial EV rates using the transmission cost allocation currently approved by FERC.

47. Data gathered from these projects should be made available on an aggregated basis to parties, including Community Choice Aggregators, so that they may perform their own analyses.

48. Pub. Util. Code §740.12 requires the Commission to review data concerning current and future TE adoption and charging infrastructure utilization prior to authorizing the utilities to collect new TE program costs.

49. The utilities should ensure the approved projects comply with the Safety Requirements Checklist to meet their obligations under § 740.8 and § 451.

O R D E R

IT IS ORDERED that:

1. The funding for transportation electrification programs as summarized in Section 8, Table 10 is approved. Costs incurred for each program up to the authorized level will be considered *per se* reasonable subject only to the utility's prudent administration of the program. Costs above authorized level must be borne by shareholders.

2. After consultation with each respective Program Advisory Council Pacific Gas and Electric Company and Southern California Edison Company may file a Tier 3 Advice Letter after two years of program implementation to adjust the approved program budgets and metrics used to determine *per se* reasonableness. At a minimum the Advice Letter must include: (1) a summary of program status to date; (2) a breakdown of utility-side, customer-side, and other costs by sector; (3) a description of the major cost drivers for utility-side and customer-side infrastructure; and (4) an explanation of any site cost caps the utility used to determine customer eligibility for the program or other metrics the utility used to control program costs.

3. San Diego Gas & Electric Company Residential Charging Program is approved with the modifications outlined in Section 3.5, Table 5, and Ordering Paragraphs 4 through 18.

4. Within 14 days of the date of adoption of this decision, San Diego Gas and Electric Company (SDG&E) must file a Tier 1 Advice Letter (AL) with the Commission's Energy Division addressing (1) whether it accepts the modifications to the Residential Charging Program as approved by this decision and (2) whether or not it will pursue development of a companion incentive mechanism. SDG&E must copy the official service list to this proceeding when filing its Tier 1 AL.

5. If San Diego Gas and Electric Company (SDG&E) accepts the modifications to its approved Residential Charging Program and indicates intent to pursue a companion incentive mechanism as referenced in ordering paragraph 4, SDG&E must meet and confer with parties within 45 days of the date of adoption of this decision to develop a companion incentive mechanism. After the meet and confer, SDG&E must file a Tier 3 Advice Letter with the Commission's Energy Division addressing: (1) whether SDG&E and parties have reached a consensus on the incentive mechanism that conforms, at a minimum with the guidance in Appendix B; (2) a copy of the terms of the proposed incentive mechanism; and (3) signatories to the proposed incentive mechanism.

6. Any costs associated with an incentive mechanism for San Diego Gas & Electric Company's (SDG&E) Residential Charging Program will be considered *per se* reasonable provided: (1) the adopted performance incentive is no more than 10 percent of the total expense budget approved for SDG&E in Table 10; the incentive mechanism is agreed to by at least one of the ratepayer advocate groups with party status to this proceeding; and (3) does not go into effect until SDG&E provides evidence of at least 10,000 installations of Electric Vehicle Supply Equipment in relation to the Residential Charging Program.

7. Prior to implementation, San Diego Gas & Electric Company (SDG&E) must file a Tier 3 Advice Letter reflecting the authorized budget in Table 10, Section 8. The Tier 3 AL should include an implementation plan for a five year rebate program not to exceed 60,000 Electric Vehicle Supply Equipment (EVSE) installations for unique customers, to to be open for customer-enrollment by mid-2019. At a minimum, the implementation plan should include: (1) Planned upgrades to the Marketplace website; (a) methods to inform customers of available rebates on qualified EVSE, (b) outreach and education plans to direct customers to the rebate program on the Marketplace website, (c) step-by-step process for customers to participate in the program; (2) Terms and conditions for SDG&E's qualified installers that ensure customer protections; (3) Description of how SDG&E will communicate with customers on the installation process and subsequent billing of balance above EVSE and installation rebate amounts; (4) Participant eligibility requirements, (a) proof of recent lease or purchase, (b) methods to ensure low- and middle-income customer participation; (5) Timeline for program launch and implementation; (6) The resolution of any outstanding concerns SDG&E has raised regarding liability by identifying contractual protections that define the customers' responsibility through participation requirements.

8. San Diego Gas & Electric Company must ensure all participating Electric Vehicle Service Providers offer appropriate warranties for all qualified Electric Vehicle Supply Equipment for its Residential Charging Program.

9. San Diego Gas & Electric Company (SDG&E) may file a Tier 3 Advice Letter with the Commission's Energy Division by the end of the third year of the Residential Charging Program's implementation to request to scale-up the program from 60,000 customers. SDG&E must base this request on the

Residential Charging Program's success and market conditions. At a minimum the Tier 3 Advice Letter should include: (1) Results of the initial Residential Charging Program to date, including (a) total number of Electric Vehicle Supply Equipment installed; (b) comparison of estimated versus actual costs of infrastructure installation; (c) comparison of estimated versus actual costs of eligible Electric Vehicle Supply Equipment; (d) evidence that small, locally-owned and diverse businesses are providing EVSE and installation services through the program; (e) any barriers that prevented customers from being able to participate in the rebate program; (f) methods identified to address any barriers to customer participation; (g) evidence that low-and moderate-income customers are participating in the program; (2) Current estimate of electric vehicles in its territory; (3) breakdown of the current make, model, and year of the electric vehicles utilized in the program; (4) Evidence that Level 2 residential rebates drive incremental adoption; and (5) Updated modeling showing that offering more rebates will continue to support incremental electric vehicle adoption.

10. San Diego Gas & Electric Company must conduct an ongoing Request for Qualifications to qualify Level 2 Electric Vehicle Supply Equipment and corresponding network services from which participating customers can choose. SDG&E should ensure all qualified Level 2 Electric Vehicle Supply Equipment are networked, include metering capabilities, and are Nationally Recognized Testing Laboratory certified.

11. San Diego Gas & Electric Company must ensure all participating installers of Electric Vehicle Supply Equipment meet safety requirements, provide proof they are licensed, insured, bonded, and provide a minimum warranty for their work.

12. San Diego Gas & Electric Company (SDG&E) may only offer its Residential Charging Program to recent buyers or lessees of electric vehicles. At the time of program implementation, SDG&E shall offer its Residential Charging Program to those customers who can provide proof of purchase or lease of their electric vehicle within 6 months of the time SDG&E implements its program. Qualifying lessees should have a minimum lease-term of eighteen months left of their electric vehicle lease.

13. San Diego Gas & Electric Company must target 25 percent of its Residential Charging Program in Disadvantaged Communities.

14. San Diego Gas & Electric Company must incorporate a goal of at least 40 percent of overall program costs to be spent with Diverse Business Enterprise Firms.

15. San Diego Gas & Electric Company must treat any rebate monies associated with its Residential Charging Program as expenses rather than capital assets.

16. San Diego Gas & Electric Company shall not own any of the proposed Electric Vehicle Supply Equipment or the customer-side make-ready infrastructure in relation to its approved Residential Charging Program.

17. San Diego Gas & Electric Company must utilize its Marketplace website when deploying its Residential Charging Program.

18. San Diego Gas & Electric Company (SDG&E) must provide participating customers the choice between its existing electric-vehicle-only and whole-house time-of-use rates. SDG&E must review its existing electric-vehicle time-of-use rates and revise them to include time-differentiated distribution charges to provide stronger price signals to encourage customers to charge during off peak hours.

19. San Diego Gas & Electric Company must ensure any qualified Electric Vehicle Supply Equipment meets any relevant hardware requirements for residential charging adopted in the final Energy Division Staff report on the Vehicle-Grid Integration Working Group.

20. San Diego Gas & Electric Company may continue to work with participating fleets in its Fleet Delivery Service priority review project to determine which of its existing commercial time-of-use rates is most suitable for those commercial customers' charging needs.

21. San Diego Gas & Electric Company's (SDG&E) residential grid integration rate (GIR) is approved as an EV-only rate option available only to participants of the Residential Charging Program. SDG&E may offer its residential GIR along with SDG&E's existing EV-TOU rates. SDG&E's commercial grid integration rate is denied. As authorized in Decision 18-01-024, SDG&E should work with the participating fleets to determine which of its existing commercial time-of-use rates is most suitable for their charging needs at the time of implementing its approved Fleet Delivery Services priority review project.

22. Pacific Gas and Electric Company's Direct Current Fast Charger Make-Ready Program is approved with the modifications outlined in Section 5.4, and Ordering Paragraphs 22 through 26 with a target to install make-ready infrastructure to serve 52 sites in deploying its Direct Current Fast Charger Make-Ready Program.

23. Prior to implementation, Pacific Gas and Electric Company must file Tier 2 Advice Letter reflecting the authorized budget in Table 10, Section 8.

24. Pacific Gas and Electric Company must ensure all customer-side electric infrastructure necessary to support its Direct Current Fast Charger Make-Ready

Program supports Electric Vehicle Supply Equipment of 150 kW or larger for corridor charging.

25. Pacific Gas and Electric Company may offer site hosts located in Disadvantaged Communities a maximum rebate of $25,000, not to exceed the full cost of the Electric Vehicle Supply Equipment and installation costs to be applied to each Electric Vehicle Supply Equipment purchase.

26. Pacific Gas and Electric Company must target 25 percent of its Direct Current Fast Charger Make-Ready Program's site hosts in Disadvantaged Communities.

27. Pacific Gas and Electric Company's proposed budget for its Direct Current Fast Charger Make-Ready Program is approved with a 25 percent cost contingency.

28. Pacific Gas and Electric Company's Fleet Ready Program is approved with the modifications outlined in Section 6.5 and Ordering Paragraphs 30 and 32 through 46.

29. Southern California Edison Company's Medium-and Heavy-Duty Vehicle Charging Infrastructure Program is approved with the modifications outlined in Section 6.5 and Ordering Paragraphs 32 through 46.

30. Prior to implementation, Pacific Gas and Electric Company and Southern California Edison Company must file Tier 3 Advice Letters reflecting the authorized budget in Table 10, Section 8.

31. Pacific Gas and Electric Company's investments in make-ready infrastructure to serve the medium-and heavy-duty transportation sector within the adopted budgets in Section 6.5 will be considered *per se* reasonable provided: (1) a minimum of 700 make-ready installations are fully contracted for by 2024 (by each utility) and 6,500 additional vehicles are electrified that are directly

attributable to the authorized program (in each service territory) achieved by site hosts procuring at least two electric vehicles or converting at least two diesel fueled vehicles to electric; (2) a minimum of 15 percent of the infrastructure budget serves transit agencies (in each service territory); (3) a maximum of 10 percent of the infrastructure budget serves forklifts (in each service territory); (4) a minimum of 25 percent of the infrastructure budget results in installations in disadvantaged communities in Pacific Gas and Electric Company's territory; (5) rebate levels for beach head sectors and customers in disadvantaged communities should be established in consultation with each utility's respective Program Advisory Council; (6) rebate levels should not exceed 50 percent of the charger cost; and (7) a maximum of 10 percent of the infrastructure budget is spent on program administration by each utility.

32. Southern California Edison Company's investments in make-ready infrastructure to serve the medium-and heavy-duty transportation sector within the adopted budgets in Section 6.5 will be considered *per se* reasonable provided: (1) a minimum of 870 make-ready installations are fully contracted for by 2024 (by each utility) and 8,490 additional vehicles are electrified that are directly attributable to the authorized program (in each service territory) achieved by site hosts procuring at least two electric vehicles or converting at least two diesel fueled vehicles to electric; (2) a minimum of 15 percent of the infrastructure budget serves transit agencies (in each service territory); (3) a maximum of 10 percent of the infrastructure budget serves forklifts (in each service territory); (4) a minimum of 40 percent of the infrastructure budget results in installations in disadvantaged communities in Southern California Edison Company's service territory; (5) a minimum of 25 percent of the infrastructure budget serves vehicles operating at ports and warehouses in SCE's territory; (6) rebate levels for

beach head sectors and customers in disadvantaged communities should be established in consultation with each utility's respective Program Advisory Council; (7) rebate levels should not exceed 50 percent of the charger cost; and (8) a maximum of 10 percent of the infrastructure budget is spent on program administration by each utility.

33. Pacific Gas and Electric Company and Southern California Edison Company shall conduct a competitive process to identify electrical contractors that are qualified to perform make-ready installations for their respective medium-and heavy-duty programs.

34. Pacific Gas and Electric Company and Southern California Edison Company must annually evaluate any medium-duty and heavy-duty rebate levels with their respective Program Advisory Councils to ensure the amount is appropriate.

35. Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (SCE) must set rebate levels for transit and school bus electric vehicle supply equipment (EVSE) in consultation with its Program Advisory Councils (PACs). These rebates must not exceed 50 percent of the cost of the EVSE. These rebates must only be offered to participants: (1) who are located in disadvantaged communities (DACs); and (2) not on the Fortune 1000 list. PG&E and SCE should work with their respective PAC to develop further requirements for participants located in DACs to be eligible for a partial EVSE rebate. PG&E and SCE must ensure the rebates do not exceed the cost the site host pays for the EVSE after accounting for any other funding sources used for EVSE procurement.

36. Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (SCE) must treat any rebate monies to support Electric Vehicle Supply

Equipment as an expense rather than capital assets. PG&E and SCE may only offer these rebates in sites that support electric transit or school buses.

37. Pacific Gas and Electric Company and Southern California Edison Company must prioritize those site hosts that commit to adopting a higher number of electric vehicles in the near- and medium-term for participation in either the FleetReady or Medium-and Heavy-Duty Vehicle Charging Infrastructure Programs.

38. Pacific Gas and Electric Company and Southern California Edison Company must ensure participating customers in either the Fleet Ready or Medium- and Heavy-Duty Vehicle Charging Infrastructure Programs be financially fit to participate.

39. Pacific Gas and Electric Company and Southern California Edison Company must allow customers the choice of whether to own, operate, and maintain infrastructure installed behind the customer's meter. If the customer chooses ownership, the customer must manage and pay for the installation of the customer-side infrastructure and use state licensed labor for which the utility will provide a rebate of up to 80 percent of the installation costs, treating these costs as an expense for ratemaking purposes, and the customer must commit to operate and maintain the facilities consistent with relevant national, state, and local electrical standards for their site. The customer must submit its site plans and estimated site construction costs to the utility and state its commitment to operate and maintain the facilities consistent with relevant national, state, and local electrical standards for their site. The utility shall provide a rebate to the customer for customer-side infrastructure the customer installs that is the lesser of: (a) 80 percent of customer's actual installation costs or (b) 80 percent of the average utility direct cost for installing the customer-side make-ready

infrastructure in the relevant sector. The rebate shall be treated as an expense for ratemaking purposes.

40. Pacific Gas and Electric Company and Southern California Edison Company must support customers who prefer to use an existing service connection participating in either the FleetReady or Medium-and Heavy-Duty Vehicle Charging Infrastructure Programs.

41. At the beginning of the fourth year of operation, 50 percent of the uncommitted but reserved Disadvantage Community (DAC) funds may be released if Pacific Gas and Electric Company and/or Southern California Edison company has not achieved 60 percent of its target in DAC locations and 80 percent of its non-DAC targets by the end of the third year. Any remaining funds that are unallocated after year 4 may be spent in any location.

42. Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (SCE) must ensure participants in either the Fleet Ready or Medium- and Heavy-Duty Vehicle Charging Infrastructure Programs maintain and operate their purchased Electric Vehicle Supply Equipment for at least 10 years. PG&E and SCE must require site hosts to provide the utility with data for at least five years after the EVSE is installed.

43. Southern California Edison Company (SCE) may offer its Commercial Electric Vehicle Rate proposal as modified by the Joint Stipulation set forth in Exhibit Joint-12. SCE may offer the transmission related proposals in Exhibit Joint-12 on a temporary three-year basis, provided SCE files a Single Issue 205 filing with the Federal Energy Regulatory Commission (FERC) for approval of the 70/30 proxy temporary rates and takes the appropriate steps to complete a transmission marginal cost study in its General Rate Case phase 2. In the event FERC does not approve the 70/30 proxy split, SCE may implement its proposed

commercial rate EV rates using the transmission cost allocation currently approved by FERC.

44. Southern California Edison Company must propose a Direct Current Fast Charge (DCFC) rate, or adjustment to a then-existing rate, targeted to the DCFC segment, no later than its 2021 General Rate Case Phase 2 proceeding.

45. Within 90 days of the adoption of this decision, Southern California Edison Company must file a Tier 2 Advice Letter with the Commission's Energy Division to revise its Rule 1 definition of electric vehicle and establish three new tariff schedules: TOU-EV-7, TOU-EV-8, and TOU-EV-9. SCE should revise its TOU periods, if necessary, pending the outcome of a decision in A.16-09-003. SCE should also revise its tariffs pending the results of the transmission cost study in its next General Rate Case Phase 2.

46. Pacific Gas and Electric Company and Southern California Edison Company must treat rebates to support the purchase of Electric Vehicle Supply Equipment in their respective FleetReady and Medium-and Heavy-Duty Vehicle Charging Infrastructure Programs as expenses. These rebates shall only be available to sites that support electric transit or school buses.

47. Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (SCE) should consult with their respective Program Advisory Council to identify any modifications necessary to effectively implement their respective programs adopted in this decision. After consultation with their Program Advisory Council, PG&E, and SCE may propose program modifications via a Tier 2 Advice Letter.

48. Within 15 days of the effective date of this decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company must each file a Tier 1 Advice Letter to modify existing one-way

balancing accounts approved in Decision 18-01-024, Ordering Paragraphs 30, 15, and 23 respectively.

49. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company must utilize the current template available on the Commissions' website (http://www.cpuc.ca.gov/sb350te/) under the "reporting requirements" section of this page.

50. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company must ensure that it reports, or helps a site host to report, all publicly-accessible charging stations to the United States Department of Energy's Electric Vehicle Charging Station Locations mapping tool.

51. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company must coordinate evaluation efforts with PacifiCorp, Liberty Utilities, and Golden State Water Company (Bear Valley Electric Service Division) to capture economies of scale for purposes of evaluating the approved Standard Review Projects.

52. After coordinating evaluation efforts, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company must submit a joint Tier 1 Advice Letter to the Commission's Energy Division providing a status update on implementation of and data available from the authorized standard review projects within one year of the date of this decision.

53. No later than 18 months after the effective date of today's decision, the sponsoring utility for each standard review project must file a Tier 1 Advice Letter containing an attestation signed by the Project Manager describing their efforts to comply with the Safety Requirements Checklist applicable to standard review programs approved in this decision made available at

http://www.cpuc.ca.gov/sb350te/. The sponsoring utility must maintain all compliance documentation available should the Commission determine an inspection or audit is necessary.

54. Application 17-01-020 et al. is closed.

This order is effective today.

Dated _____, at San Francisco, California.

APPENDIX A: Glossary

ACR	September 14, 2016 Assigned Commissioner's Ruling in R.13-11-007
AET	Annual Electric True-up
AL	Advice Letter
Amended Scoping Memo	R.13-11-007 March 30, 2016 Amended Scoping Memo
BEV	Battery Electric Vehicle
BRRBA	Base Revenue Requirement Balancing Account
CARB	California Air Resources Board
CARE	California Alternate Rates for Energy
CCUE	California Coalition of Utility Employees
CEC	California Energy Commission
CHAdeMo and/or CCS charging connector standards:	Direct Current Fast Charging connector standards that are not compatible with each other. Most DCFC currently deployed in California include at least one plug that meets each standard
ChargePoint	ChargePoint Inc.
Charger, or Charging Port	plug on an EVSE capable of plugging into a vehicle for charging it. Each port corresponds to its own parking space, but multiple ports can be served by one EVSE
CO2	Carbon Dioxide
CPUC or Commission	California Public Utilities Commission
D.	Commission Decision
DAC	Disadvantaged Communities
DBE	Diverse Business Enterprise
DC	Direct Current
DCFC	a charging station that rapidly charges a car battery by connecting it directly to a higher power source
DRAM	Distribution Revenue Adjustment Mechanism
EJ Parties	East Yard Communities For Environmental Justice, Center for Community Action and Environmental Justice, and Union of Concerned Scientists
EPIC	Electric Program Investment Charge
EV	Electric Vehicle
EV TOU	Electric Vehicle-Time-Of-Use
EVITP	Electric Vehicle Infrastructure Training Program

EVSE	Electric vehicle supply equipment used to charge electric vehicles (i.e. Level 2 Charger)
EVSP	Electric Vehicle Service Provider
FERA	Family Electric Rate Assistance
FERC	Federal Energy Regulatory Commission
Free-Riders	those who already own an EV, and any such allowances to those drivers would not result in additional EV adoption
GHG	greenhouse gas
GIC	grid integration charge
GIR	grid integrated rate
GM	General Motors
GRC	General Rate Case
Greenlining	Greenlining Institute
HD	Heavy-Duty
ICE	Internal Combustion Engine
IOU	Investor Owned Utility
kW	Kilowatt
kWh	Kilowatt Hour
L1	Level 1
L1 Charging	plugging an electric vehicle (EV) into a standard wall outlet to recharge its battery
L2	Level 2
L2 Charging	plugging an EV into a 240-volt outlet that has been fitted with a charging station. L2 charging is faster than L1 because it delivers a higher power level to the battery through the EVSE.
Make-Ready	Service connection and supply infrastructure to support EV charging (i.e. 240-volt outlet)
MD	Medium-Duty
MD/HD	medium-duty/heavy-duty
MT	Metric Tons
MUD	multi-unit dwelling
NDC	National Diversity Coalition
Networked L2 Charger	qualifying networked L2 EVSE should be have common communication capabilities through WiFi or cellular and be capable of responding to price signals, recording interval energy consumption, allow for accurate billing

	of EV-only tariffs, and be certified by UL or another Nationally Recognized Testing Laboratory.
NOx	Nitrogen Oxide
NRDC	Natural Resources Defense Council
NRTL	Nationally Recognized Testing Laboratory
O&M	operation and maintenance
ORA	Office of Ratepayer Advocates
PAC	Program Advisory Council (SCE calls this an Advisory Board)
PEV	Plug-in Electric Vehicle
PG&E	Pacific Gas and Electric Company
PHEV	plug-in hybrid electric vehicle
PIA	Plug-In America
PPP	Public Purpose Program
PRP	Priority Review Project
Pub. Util. Code	Public Utilities Code
R.	Rulemaking
RCP	Residential Charging Program
RFP	Request for Proposals
RFQ	Request for Qualifications
SB	Senate Bill
SBUA	Small Business Utility Advocates
SCE	Southern California Edison Company
Scoping Ruling	April 13, 2017 Scoping Memo and Ruling in A.17-01-020, et al.
SDAP	San Diego Airport Parking
SDG&E	San Diego Gas & Electric Company
SED	Safety and Enforcement Division
SGIP	Self-Generation Incentive Program
Site	the location at which charging infrastructure (EVSE or make ready) is installed
SoCalGas	Southern California Gas Company
SRP	Standard Review Project
TE	Transportation Electrification
TEA	Transportation Electrification Assessment
TEBA	Transportation Electrification Balancing Account

TEPBA	Transportation Electrification Portfolio Balancing Account
TOU	Time of Use
TURN	The Utility Reform Network
UCAN	Utility Consumers' Action Network
VOC	Volatile Organic Compounds
VTA	Santa Clara Valley Transportation Authority
ZEV	Zero-Emission Vehicle

APPENDIX B: San Diego Gas and Electric Company's Residential Charging Program Incentive Mechanism Guidance

General Guidance

We outline the following guidance to SDG&E and parties if SDG&E chooses to develop an incentive mechanism in relation to the deployment of SDG&E's approved Residential Charging Program:

1. Pursuant to § 740.12(b):
    a. The Commission shall approve, or modify and approve, TE programs and investments, including those that deploy charging infrastructure, through a reasonable cost recovery mechanism.
2. Reasonable Cost Recovery Mechanism
    a. Incentive Mechanism must seek to:
        i. Account for ratepayer interest as defined in § 740.8
            1. Provide evidence of at least 10,000 EVSE installed prior to the incentive mechanism taking effect
            2. Be supported by at least one of the ratepayer advocate groups with party status in A.17-01-020, et al.
        ii. Minimize costs and maximize benefit (§ 740.12(b))
            1. Be no more than 10 percent of the of the total authorized Expense Budget approved in Table 10 of this decision
3. The proposed Incentive Mechanism should be presented in a Tier 3 Advice Letter to the Commission's Energy Division
    a. The Advice Letter should at a minimum include the agreed-upon incentive mechanism and all of the signatories to such agreement.

(End of Appendix B)

Appendix C

Detailed Budget Calculations for PG&E Fleet Ready and SCE Medium- and Heavy-Duty Charging Infrastructure Programs

17. Budget Assumptions

First, we calculated the estimated cost per site based on PG&E's budget, rather than SCE's, as discussed in Section 6.2.

Using the imputed infrastructure cost per site, we developed the sector mix assumptions shown in Table 1 below to develop a budget for the infrastructure. The sector mix starts with the assumptions of sector mix underlying PG&E's proposed budget adjusted to reflect a substantial increase in adoption in the transit, school bus, and heavy-duty vehicle sectors.

We then adjusted SCE's budget as detailed in Table 2 to account for a higher number of sites located at port and warehouse facilities within its service territory.

The rebate budgets are calculated using the same sector mix assumptions for each utility.

18. Table 6. CPUC Budget Assumptions for PG&E FleetReady Program

Sector	Estimated Cost per site - Capital	Estimated Cost per site - Expense	Estimated Cost per site - total	# of Sites	# of Vehicles	Capital Budget	Expense Budget	Total Budget
Forklifts	$131,897	$716	$132,613	100	1,919	$13,189,716	$71,580	$13,261,296
TSE	$98,771	$267	$99,038	5	100	$493,853	$1,336	$495,189
TRU	$184,930	$609	$185,539	89	1,691	$16,458,802	$54,186	$16,512,988
Port Cargo Trucks	$333,972	$593	$334,565	6	68	$2,003,832	$3,556	$2,007,388
Transit Bus	$340,651	$419	$341,071	80	960	$27,252,087	$33,557	$27,285,644
School Bus	$146,227	$502	$146,730	45	540	$6,580,237	$22,593	$6,602,830
Airport GSE	$133,427	$487	$133,913	20	400	$2,668,534	$9,735	$2,678,269
Medium-Duty Vehicles	$147,661	$435	$148,097	400	4,800	$59,064,433	$174,180	$59,238,613
Other Heavy-Duty Vehicles	$340,651	$419	$341,071	60	2,334	$20,439,065	$25,167	$20,464,233
Infrastructure Subtotal				**805**	**12,812**	**$148,150,559**	**$395,891**	**$148,546,450**
Program Management						$14,854,645	$0	$14,854,645
Contingency						$14,854,645	$0	$14,854,645
Education						0	$5,941,858	$5,941,858
DAC Rebates							$14,777,063	$14,777,063
Transit & School Bus Rebates						0	$37,350,000	$37,350,000
Non Infrastructure Subtotal						**$29,709,290**	**$58,068,920**	**$87,778,210**
Program Total						**$177,859,849**	**$58,464,812**	**$236,324,660**

19. **Table 2. CPUC Budget Assumptions for SCE Medium- and Heavy-Duty Infrastructure Program**

Sector	Estimated Cost per site - Capital	Estimated Cost per site - Expense	Estimated Cost Per Site - total	# of Sites	# of Vehicles	Capital Budget	Expense Budget	Total Budget
Forklifts	$131,897	$716	$132,613	100	1,919	$13,189,716	$71,580	$13,261,296
TSE	$98,771	$267	$99,038	8	160	$790,164	$2,138	$792,302
TRU	$184,930	$609	$185,539	156	2,964	$28,849,136	$94,977	$28,944,113
Port Cargo Trucks	$333,972	$593	$334,565	12	136	$4,007,664	$7,113	$4,014,776
Transit Bus	$340,651	$419	$341,071	140	1,680	$47,691,152	$58,724	$47,749,877
School Bus	$146,227	$502	$146,730	54	648	$7,896,284	$27,112	$7,923,396
Airport GSE	$133,427	$487	$133,913	30	600	$4,002,801	$14,603	$4,017,404
Medium-Duty Vehicles	$147,661	$435	$148,097	400	4,800	$59,064,433	$174,180	$59,238,613
Other Heavy-Duty Vehicles	$340,651	$419	$341,071	105	4,084	$35,768,364	$44,043	$35,812,407
Infrastructure Subtotal				**1,005**	**16,991**	**$201,259,715**	**$494,470**	**$201,754,185**
Program Management						$20,175,419		$20,175,419
Contingency						$20,175,419		$20,175,419
DAC Rebates SCE							$35,931,200	$35,931,200
Transit & School Bus Rebates							$64,620,000	$64,620,000
Non Infrastructure Subtotal						**$40,350,837**	**$100,551,200**	**$140,902,037**
Program Total						**$241,610,552**	**$101,045,670**	**$342,656,222**