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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Consider
Alternative-Fueled Vehicle Programs, Tariffs,
and Policies.

Rulemaking 13-11-007
(Filed November 14, 2013)

**ASSIGNED COMMISSIONER'S RULING REGARDING THE FILING OF THE
TRANSPORTATION ELECTRIFICATION APPLICATIONS PURSUANT TO
SENATE BILL 350**

Table of Contents

Title	Page
ASSIGNED COMMISSIONER’S RULING REGARDING THE FILING OF THE TRANSPORTATION ELECTRIFICATION APPLICATIONS PURSUANT TO SENATE BILL 350	1
Summary	2
1. Background.....	2
2. TE Provisions of SB 350.....	4
3. Guidance for the TE Applications.....	8
3.1. Introduction	8
3.2. Who Can File TE Applications	8
3.3. Timing of TE Applications.....	11
3.4. Minimum Requirements for TE Applications	13
3.4.1. Statutory Requirements	13
3.4.2. Regulatory Requirements.....	15
3.5. Addressing the Multiple Goals of Widespread TE	16
3.6. Priority TE Projects and Programs	20
3.6.1. Rate Design.....	20
3.6.2. Sector Focus	21
3.6.3. Education and Outreach.....	24
3.6.4. Leveraging Results of Previous Pilots	24
3.7. Align with Local, Regional, and State TE Efforts	25
3.8. Promote Safety	26
3.9. Leverage Other Funding Sources	27
3.10. VGI Communication Standards.....	28
3.11. Utility Incentives or Other Regulatory Mechanisms.....	29
3.12. Regulatory Review of TE Applications.....	31
Appendix A: SB 350 Transportation Electrification Application Guidance	
Appendix B: Enabling Vehicle-Grid Integration Through a Communications Standard	

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Summary

Today's ruling addresses the transportation electrification (TE) applications that were directed to be filed pursuant to Senate Bill (SB) 350. This ruling sets forth the guidance on what these TE applications should contain and a process for TE planning going forward. The basis for this guidance is from the "SB 350 Transportation Electrification Application Guidance Straw Proposal" that was attached to the March 30, 2016 Amended Scoping Memo and Ruling of the Assigned Commissioner and Administrative Law Judge (Amended Scoping Ruling), and the comments to the Amended Scoping Ruling.

This ruling directs the three large electrical corporations, consisting of Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison Company (SCE) to file their first TE applications by January 20, 2017. PG&E, SDG&E, and SCE may be directed in a future decision to file additional TE applications no later than January of 2020, in consideration of additional results from the first phase of applications.

The smaller electrical corporations, consisting of Liberty Utilities (CalPeco Electric) LLC, Bear Valley Electric (a division of Golden State Water), and PacifiCorp will be made respondents to this proceeding through a decision to be issued, and shall be required to file their TE applications by June 30, 2017.

1. Background

This ruling is a result of the Amended Scoping Ruling issued in this proceeding on March 30, 2016, and the TE issues contained in SB 350 (Chapter 547, Statutes of 2015). Among other things, the Amended Scoping

Ruling added the TE issues contained in SB 350 to this proceeding, and set forth a schedule for addressing the TE issues.

As described in the Amended Scoping Ruling, and as directed in SB 350, the Commission, through the assigned Commissioner, consulted with the California Air Resources Board (CARB) and the California Energy Commission (CEC) about the TE issues. Also, as noted in the Amended Scoping Ruling, the CARB held a workgroup meeting on April 8, 2016 to discuss the TE of transit fleets. On April 29, 2016, the Commission in coordination with CARB and CEC and the California Independent System Operator (CAISO), held a workshop to educate stakeholders about TE environmental and grid impacts, existing State policies encouraging TE, and the goals of potential utility programs implementing SB 350.

Appendix A to the Amended Scoping Ruling contains the “SB 350 Transportation Electrification Application Guidance Straw Proposal” (Straw Proposal). The purpose of the Straw Proposal was to provide draft guidance on what the TE applications should contain, and the criteria the applications would have to meet. Appendix B of the Amended Scoping Ruling described some of the questions that were to be addressed in the two April 2016 workshops.

The Amended Scoping Ruling allowed the parties to this Rulemaking to file opening and reply comments on the questions contained in Appendix B of the Amended Scoping Ruling. The “Workshop Questions” set forth in Appendix B of the Amended Scoping Ruling posed the following four questions:

1. In what ways should the Application Guidance Straw Proposal in Appendix A of this Scoping Memo be modified to better align with the mandates of SB 350?
2. In light of current industry development and technology availability, should the Commission focus on particular

- transportation sectors or market barriers (e.g., light, medium or heavy duty vehicles, fuel types, or specific applications), and why?
3. What needs for standards development, research and development, or pilot projects exist that should be addressed by the Commission? What ongoing initiatives may be ready for increased scale?
 4. What should the application guidance ruling consider about the issues raised in the CARB workgroup meeting of April 8, 2016, and the issues raised at the April 29, 2016 workshop?

A number of parties to this proceeding filed opening and reply comments in response to the Amended Scoping Ruling. Those opening and reply comments have been reviewed and considered, and have shaped today's guidance on what the TE applications should address.

The sections below set forth background information about the TE provisions of SB 350. Following that, the ruling sets forth the guidance for the filing of the TE applications.

2. TE Provisions of SB 350

SB 350 modified Public Utilities Code Section (Pub. Util. Code §) 701.1(a)(1) to declare that the principal goals of the electric and natural gas utilities' resource planning and investments, in addition to other ratepayer protections, includes "widespread transportation electrification." Transportation electrification is stated along with two core means of reducing the social costs of the utilities' energy services: energy efficiency and the development of renewable energy.

TE is defined in Pub. Util. Code § 237.5 as follows:

Transportation electrification' means 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 and the related programs and charging and propulsion infrastructure investments to enable and encourage this use of electricity.

As added by SB 350, Pub. Util. Code § 740.12(a)(2) states:

It is the policy of the state and the intent of the Legislature to encourage transportation electrification as a means to achieve ambient air quality standards and the state's climate goals. Agencies designing and implementing regulations, guidelines, plans, and funding programs to reduce greenhouse gas emissions shall take the findings described in paragraph [(a)(1)] into account.

In Pub. Util. Code § 740.12(a)(1), the Legislature made the following findings and declarations:

- Advanced 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;
- Widespread TE is needed to achieve the goals of the Charge Ahead California Initiative;
- Widespread TE 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 gas emissions, and promote overall benefits to those communities and other consumers;
- 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 TE;
- Widespread TE requires electrical corporations to increase access to the use of electricity as a transportation fuel;
- Widespread TE 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;
- Deploying electric vehicles should assist in grid management, integrating generation from eligible renewable energy resources, and reducing fuel costs for vehicle drivers who charge in a manner consistent with electrical grid conditions;
 - 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; and
 - According to the State Alternative Fuels Plan analysis by the CEC and the CARB, light-, medium-; and heavy-duty vehicle electrification results in approximately 70 percent fewer greenhouse gases emitted, over 85 percent fewer ozone forming air pollutants emitted, and 100 percent fewer petroleum used. These reductions will become larger as renewable generation increases.

Finally, today's guidance ruling is mandated by Pub. Util. Code §740.12(b), which provides:

The commission, in consultation with the [CARB] and the [CEC], shall direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification to reduce dependence on petroleum, meet air quality standards, achieve the goals set forth in the Charge Ahead California Initiative ..., and reduce emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050. Programs proposed by electrical corporations shall seek to minimize overall costs and maximize overall benefits. The commission shall approve, or modify and approve, programs and investments in transportation electrification, including those that deploy charging infrastructure, via a reasonable cost recovery mechanism, if they are consistent with this section, do not unfairly compete with nonutility enterprises as required under Section 740.3, include performance accountability

measures, and are in the interests of ratepayers as defined in Section 740.8.

The other code sections applicable to the TE applications are Pub. Util. Code § 740.3 and § 740.8, which define ratepayer interest. Pub. Util. Code § 740.3(c) states:

The commission's policies authorizing utilities to develop equipment or infrastructure needed for electric-powered and natural gas-fueled low-emission vehicles shall ensure that the costs and expenses of those programs are not passed through to electric or gas ratepayers unless the commission finds and determines that those programs are in the ratepayers' interest. The commission's policies shall also ensure that utilities do not unfairly compete with nonutility enterprises.

The interests of ratepayers are further defined in Pub. Util. Code § 740.8, which states:

As used in Section 740.3 or 740.12, "interests" or 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.

- (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 the following section, this guidance ruling directs the electrical corporations as to what kind of TE applications should be filed, and the criteria that these applications must meet.

3. Guidance for the TE Applications

3.1. Introduction

The provisions of Pub. Util. Code §§ 237.5, 740.8, 740.12, as added by SB 350, and Pub. Util. Code § 740.3, highlight a number of different issues that need to be addressed in the TE applications and considered by the Commission before approving such applications. Many of those issues were highlighted in the Straw Proposal that was attached to the Amended Scoping Ruling as Appendix A. Guidance on these various issues are provided below, and are summarized in full in the “SB 350 Transportation Electrification Application Guidance,” which is attached to this ruling as Appendix A.

3.2. Who Can File TE Applications

At the April 29, 2016 workshop, and in the comments of the parties, some of the parties commented that community choice aggregators (CCAs) should be allowed to file TE applications with the Commission. Today’s guidance ruling makes clear that only “electrical corporations,” as defined in Pub. Util. Code § 218, can file a TE application with the Commission. This is clear from a reading of Pub. Util. Code § 740.12(b), which specifically states that “The commission, in consultation with the [CARB and the CEC], shall direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification....” As defined in Pub. Util. Code § 218, an “electrical corporation” is “every corporation or person owning, controlling,

operating, or managing an electric plant for compensation with this state....”

The term “electric plant” is defined in Pub. Util. Code § 217 to include “all real estate, fixtures and personal property owned, controlled, operated, or managed in connection with or to facilitate the production, generation, transmission, delivery, or furnishing of electricity for light, heat, or power, and all conduits, ducts, or other devices, materials, apparatus, or property for containing, holding, or carrying conductors used or to be used for the transmission of electricity for light, heat, or power.”

CCAs are not electrical corporations because they do not own, control, operate, or manage real estate or personal property to facilitate the production, generation, transmission, delivery, or furnishing of electricity for light, heat, or power. In addition, CCAs are not subject to price regulation by the Commission, and there are various Pub. Util. Code sections that distinguish CCAs from an electrical corporation. (*See* Pub. Util. Code §§ 331.1, 366, 366.1(f), 366.2, 366.3, 366.5, 381.1, 394.25(e), 396.5, and 707.)

Similarly, other parties who are not electrical corporations, and are not subject to rate regulation by this Commission, cannot file TE applications with the Commission.¹

Accordingly, only the public utilities in California who are electrical corporations, and whose rates are subject to the jurisdiction of this Commission, can file the TE applications referenced in Pub. Util. Code § 740.12. We note, however, that CCAs, publicly-owned electric utilities, and other parties may be

¹ It is noted that the Legislature has not authorized the Commission to use a separately authorized source of monies to fund the TE projects and investments contemplated in Pub. Util. Code § 740.12. Instead, the monies to fund these TE projects and investments are to come from the ratepayers of the electrical corporations, or from other funding sources that may exist.

able to apply to the CEC or the CARB for monies earmarked for TE projects and investments, particularly any funding that may be made available under the CEC's oversight of the Integrated Resource Plan processes for publicly-owned utilities (POUs) per Pub. Util. Code § 9621(c)(1)(c), and Pub. Util. Code § 9622. We encourage the electric utilities to consult with any CCAs in their territory to both determine how independently-funded CCA TE programs can be leveraged and incorporated into their applications and how utilities can ensure their proposed TE programs will serve CCA customers.

The next issue raised by Pub. Util. Code § 740.12 is whether all electrical corporations in California need to file TE applications. Pub. Util. Code § 740.12(b) states that the Commission "shall direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification...." This code section does not exclude the smaller electrical corporations from filing such applications. Thus, all electrical corporations subject to the jurisdiction of this Commission are required to file TE applications.

When the Commission initiated this Order Instituting Rulemaking (OIR) on November 14, 2013, only PG&E, SDG&E, and SCE were made respondents to this OIR. Due to the language of Pub. Util. Code § 740.12(b), the smaller electrical corporations should also be made respondents to this OIR. These smaller electrical corporations consist of the following: Liberty Utilities (CalPeco Electric) LLC, Bear Valley Electric, and PacifiCorp. To accomplish that, a decision making the small electrical corporations respondents in this OIR will be necessary. To that end, a proposed decision will be prepared for the Commission's adoption in the coming months making these smaller electrical corporations respondents to this OIR.

3.3. Timing of TE Applications

Due to the size and service territory of the large electrical corporations, as compared to the smaller electrical corporations, I will stagger the time period in which the three large electrical corporations (PG&E, SDG&E, and SCE) shall file their TE applications, and when the small electrical corporations (Liberty Utilities (CalPeco Electric) LLC, Bear Valley Electric, and PacifiCorp) shall file their applications.

In addition, Pub. Util. Code § 740.12(b) appears to contemplate that each electrical corporation can file more than one TE application. Therefore, to provide additional clarity on the process for ongoing consideration of investor owned utility (IOU) involvement in this sector, the large electrical corporations may be directed to file additional TE applications at a later time. With multiple phases of TE applications, we anticipate that the IOUs will prioritize projects for the first round of applications and consider longer-term planning for TE both in terms of investments in charging and propulsion infrastructure and non-infrastructure programs to meet the goals of Pub. Util. Code § 740.12. As described further below, we expect the TE applications to rationally develop the IOUs' role in supporting an emerging market with evolving technology.

PG&E, SDG&E, and SCE shall file their first round of TE applications by January 20, 2017. Pub. Util. Code § 740.12 contemplates that the applications will accelerate widespread TE in order to achieve the findings set forth in Pub. Util. Code § 740.12(a)(1). In order to do so, the large electrical corporations will need to file their applications proposing TE programs and investments as soon as possible. Following the filing of those applications, the Commission will need to review and authorize appropriate programs and investments in a timely manner. The January 20, 2017 filing date should provide the large electric utilities

opportunities to design and propose TE programs and investments to fulfill the SB 350 requirements.

In recognition that accelerating widespread TE in the coming years will be necessary to meet the long term greenhouse gas (GHG) reduction goals established in Pub. Util. Code § 740.12(b), the three large electric utilities may be required to file a second phase of TE applications, in consideration of available results from the first set of applications, no later than January of 2020.

Additional phases of TE applications will also consider the Commission's progress in implementing the Integrated Resource Planning process ordered by SB 350 in Pub. Util. Code § 454.52. Because the Commission recognizes the need for continuity in utility policy directing TE, we anticipate there to be some overlap between the implementation of programs from the first phase of TE applications and the Commission's consideration of the second phase. The exact date for the filing of the second set of TE applications will be set forth in a future decision.

As for the smaller electric corporations, which consist of Liberty Utilities (CalPeco Electric) LLC, Bear Valley Electric, and PacifiCorp, they are put on notice that they shall file their first TE applications by June 30, 2017. This first phase of TE applications is justified since these smaller electric corporations are located primarily in rural areas of the state, and may have less experience implementing TE programs. These smaller electric corporations may associate with the adjacent large electric utilities to propose joint TE programs and projects that are the same as or similar to the large electric utilities' proposals. This

coordination between IOUs² may be necessary if there are specific regional infrastructure needs based on geography or travel patterns and to ensure that vehicles operate harmoniously across service territories per Pub. Util. Code § 740.2(e).

In addition, the smaller utilities can propose their own TE programs and projects and investments. The smaller electric corporations may submit a second phase of applications upon consideration of the results from their first phase of applications and in furtherance of meeting the requirements of Pub. Util. Code § 740.12. The Commission's Process Office is directed to serve a copy of this ruling on the smaller electrical corporations, which consist of Liberty Utilities (CalPeco Electric) LLC, Bear Valley Electric, and PacifiCorp.

3.4. Minimum Requirements for TE Applications

Below we outline the minimum content necessary to be included in the TE applications in response to the statutes and to enable the Commission's review. Many of the points raised below are elaborated upon further in the following sections.

3.4.1. Statutory Requirements

At the April 20, 2016 workshop, and in comments, several parties recommended that projects and investments that use natural gas or hydrogen to fuel transportation should be included in the TE applications. However, Pub. Util. Code § 740.12(b) provides for the filing of "applications for programs and investments to accelerate widespread transportation electrification...." As noted earlier, TE "means the use of electricity from external sources of electrical

² We encourage the IOUs to also coordinate with POUs as needed to achieve these goals.

power..., and the related programs and charging and propulsion infrastructure investments to enable and encourage this use of electricity.” (Pub. Util. Code § 237.5.) Clearly, vehicles that are unable to use grid electricity and rely exclusively on natural gas or hydrogen do not fit the TE definition. Accordingly, the SB 350 TE applications shall not propose these kinds of projects and investments.

Furthermore, TE applications must meet the objectives, and legislative findings and declarations as defined by SB 350 and related Pub. Util. Code §§ 740.12, 740.3, and 740.8. The utilities should clearly indicate how each proposed project or program addresses the following code sections. This information should be summarized in a table or similar graphic and expanded upon in the narrative portion of the application. While not every project may address every criterion included in following code sections, the portfolio on a whole should represent a diversity of objectives. The specific statutory requirements include:

- (i) The TE applications must propose projects or investments that will accelerate widespread TE, consistent with Pub. Util. Code §§ 740.12(b) and 701.1(a)(1). The TE applications shall explain how the proposed projects or investments will accelerate the adoption of TE.
- (ii) Consistent with Pub. Util. Code § 740.12(a)(2) and (b), the TE applications shall describe how each project and investment will fulfill one or more of the findings and declarations set forth in Pub. Util. Code § 740.12(a)(1). The TE applications need to demonstrate, with specific monitoring and evaluation criteria, how the projects and investments will align with the findings set forth in this code section.
- (iii) Consistent with Pub. Util. Code § 740.12(b), the TE applications shall describe how each project and investment will minimize overall costs and maximize overall benefits.

- (iv) Consistent with Pub. Util. Code § 740.12(b), the TE applications shall describe for each proposed project and investment the cost recovery mechanism that the utility is seeking.
- (v) Consistent with Pub. Util. Code §§ 740.12(b) and 740.3, the TE applications shall describe how each proposed project and investment does not unfairly compete with nonutility enterprises.
- (vi) Consistent with Pub. Util. Code § 740.12(b), each of the proposed TE projects and investments shall include performance accountability measures. Such measures are needed in order to track the progress of the proposed projects and investments in order to ensure that they are timely contributing to the adoption of TE.
- (vii) Consistent with Pub. Util. Code §§ 740.12(b), 740.8, and 740.3, the TE applications shall describe how each proposed project and investment are in the interests of ratepayers as described in Pub. Util. Code § 740.8.
- (viii) Consistent with Pub. Util. Code § 740.12(c), the TE applications 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 investments would not result in long-term stranded costs recoverable from ratepayers.”

3.4.2. Regulatory Requirements

In addition to requirements defined by statute and consistent with the Straw Proposal, TE Applications should also seek to conform to the following guidelines detailed in the following sections below:

- Fit with the CPUC and IOU core competencies and capabilities.
- Address the multiple goals of widespread TE. (Section 3.5.)
- Consider Commissioner-identified priority projects. (Section 3.6.)

- Align with Local, Regional and Broader State Policies. (Section 3.7.)
- Promote driver, customer and worker safety. (Section 3.8.)
- Seek to leverage non-utility funding. (Section 3.9.)
- Identify a Vehicle Grid Integration Communication Standard. (Section 3.10.)
- Consider utility incentives or other regulatory mechanisms. (Section 3.11.)
- Propose 2-5 year pilots and programs with a selection of 1-year pilots for priority review. (Section 3.12.)
- Provide anonymous and aggregated data for evaluation.

3.5. Addressing the Multiple Goals of Widespread TE

The electric utilities will need to think outside of the box on how they can provide electricity to fuel vehicles, integrate and maximize the use of renewable energy, and accelerate the adoption of TE in order to achieve the multiple objectives outlined by SB 350, namely: reduce dependence on petroleum, meet air quality standards, lower GHG emissions, and achieve the goals set forth in the Charge Ahead California Initiative in the Health and Safety Code. At the same time, the electric utilities will need to balance proposed projects and programs with the activities of the private market and the interests of ratepayers as set forth in Pub. Util. Code § 740.8.

A foundational part of the utilities' TE applications is a common, clear understanding of the statutory and regulatory requirements, as listed in the previous section. However, some framing of the scale and scope of the projects and programs and how to balancing competing objectives is also warranted.

As mentioned above, SB 350 declares widespread TE as one of three core means to reducing the social costs of the utilities' energy services. In order to

provide guidance on the scale of the investment necessary in this area, we can refer to two State mandates. First, California Executive Order B-16-2012 set a target for 1.5 million zero-emission vehicles (ZEVs) on the roads in California by 2025. This Executive Order established an interim milestone to deploy infrastructure to support 1 million ZEVs by 2020. As a complement to this mandate, during the United Nations Framework Convention on Climate Change in December 2015, the State signed an international agreement to strive to make all passenger vehicles sold in California ZEVs by no later than 2050. Second, in August 2016, the State legislature passed SB 32 which requires CARB to ensure that statewide GHG emissions are reduced to 40% below the 1990 level by 2030. (Chapter 249, Statutes of 2016.) Pursuant to Pub. Util. Code § 740.12, as enacted by SB 350, widespread deployment of TE is required to meet this GHG emissions reduction target and a longer-term target of reducing GHG emissions 80% below the 1990 level by 2050.

Utility applications should describe and provide measurable indicators, where possible, on how their TE proposals will contribute towards meeting the goals of supporting the ZEV Executive Order and GHG emissions reduction targets pursuant to SB 32 and SB 350 as limits to the size of their programs. IOUs should consider their proportional share of these statewide goals and statutory limits regarding the transportation technology that is eligible under Pub. Util. Code § 237.5. The utilities will also need to take into consideration several ongoing initiatives, including:

- (i) Integrated Resource Planning (IRP): Utility-specific IRP applications, pursuant to Pub. Util. Code § 454.52, are required to meet load-serving entity-specific electric sector GHG

emissions reductions targets,³ which can additionally account for the new load subject to the fuel-switching programs identified in the TE applications. The utilities should ensure that the programs that comprise their TE portfolio can be flexible to adjust according to the finalized Integrated Resource Plan processes.

- (ii) CARB Scoping Plan and Mobile Source Strategy: CARB is currently developing an update to the 2030 Climate Change Scoping Plan that will establish a framework for meeting GHG emission reduction targets consistent with SB 32. In addition, CARB's Cleaner Technologies and Fuels Scenario within its Mobile Source Strategy closely aligns with the air pollutant reduction goals of SB 350. The utilities should ensure that CARB-established climate change and clean air goals are incorporated into their projects and programs.

The two critical aspects of the GHG and air pollution reduction goals enumerated in SB 350 and SB 32 are the total volumes of transportation source emissions abated and the implementation timeframe. In combination, these will establish an emission reduction trajectory. We highly encourage the utilities to work with the Commission, CARB, the CEC and other parties to establish a consistent inputs and attribution method to align the scope of their individual TE programs to meet the multiple emission reduction trajectories envisioned by SB 350 and SB 32.

- (iii) Demand forecasting: Forecasts of electric transportation adoption and charging and propulsion equipment are necessary to determine load growth and emissions reductions, plan for demand flexibility any potentially necessary generation, transmission, and distribution infrastructure, and assess the competitiveness of markets. In their applications, the utilities should explain the methods behind their forecasts of adoption for all mobile sources. For comparison and consistent with Pub. Util. Code § 740.12(c), the utilities should explain any

³ *Id.* at 27.

deviations from official estimates from the latest CEC California Energy Demand/Integrated Energy Policy Report and CARB Mobile Source Strategy.

Our intent here is to provide the utilities flexibility to maximize benefits and consider innovative program designs, while establishing a market signal toward widespread TE. It is critical to note that the evaluation of IOU TE applications will be both quantitative and qualitative in nature. At this point in time, a strictly quantitative “optimal solution” may be difficult to determine with high degrees of certainty, because: (1) the State is in the beginning stages of TE investments and do not yet know the universe of potential TE programs or future technologies that can be evaluated, and; (2) although other proceedings are defining common cost and benefit evaluation protocols (Rulemaking (R.) 14-10-003), incorporating electric vehicles as Distributed Energy Resources into distribution planning (R.14-08-013), and defining integrated planning processes that will set emissions targets for the electric sector (R.16-02-007), those processes are not yet completed. The utilities should describe how they attempt to align their applications with the outputs of those proceedings to the greatest extent possible.

Each utility should use the guidance provided herein to select the appropriate types, size, and deployment schedule of programs to strive toward attaining the cost minimization and benefit maximization, efficient grid management and industrial development objectives. We encourage the utilities to target pilots and experiments in diverse market segments to gain experience to inform the eventual design of scaled programs that will be crucial to address substantial reductions in criteria air and GHG pollutants from the on-road light, medium and heavy-duty, off-road, maritime, aviation, and rail sectors in the near term.

3.6. Priority TE Projects and Programs

Further guidance is provided here on the types of projects and programs the utilities may want to consider. This description is not exhaustive of potential utility proposals, however it is indicative of my interest based on the workshops and party comments.

3.6.1. Rate Design

At the workshops and in their comments, some of the parties indicated that rate design tools, such as demand charges, may result in a disincentive to use electricity as a transportation fuel. The initiating OIR in this proceeding noted at page 9 that “A long-term solution is needed to resolve the issues related to the elements of tariffs applicable to the operations of electric transit fleets throughout the state.” Since the TE findings in Pub. Util. Code § 740.12(a)(1) include, “reducing fuel costs for vehicle drivers who charge in a manner consistent with electrical grid conditions,” the TE applications may propose projects to change the rate structures, including demand charges, that are currently in effect for electric vehicles used in commercial applications. However, the utilities should keep in mind that simply shifting costs to other ratepayer classes does not comport with cost causation rate design principles and may not be a viable solution. In addition, a proposed change in the rate structure may need to be coordinated in the rate design phase of the general rate cases for the large electric utilities.

Rate design proposals should encourage TE charging to maximize the use of renewable energy or to charge at times that resolve conflicting capacity constraints at the transmission and distribution levels, which is described in the Energy Division’s Vehicle-Grid Integration (VGI) Whitepaper as attached to the Order Instituting Rulemaking 13-11-007. The utilities are encouraged to leverage

submetering technologies ordered in Decision (D.) 13-11-002 and as discussed in the Energy Division's April 12, 2016 Workshop in consideration of the higher levels of flexibility a vehicle can provide relative to other loads. Utilities should also consider the benefits of vehicle-specific submetering including the accrual of Low Carbon Fuel Standard Credits and its use in validating potential grid services as a Distributed Energy Resource pursuant to Assembly Bill (AB) 327. Rate design proposals included in the TE applications can include proposals to facilitate the use of complementary technologies that assist customers in their efficient integration of vehicles with the grid.

In addition, the utilities should modify the definition of eligible types of customer loads for existing electric vehicle-specific rates to comport with the definition of TE to allow all types of electric "vehicles, vessels, rains, boats, or other equipment" (e.g. aircraft) that are mobile sources of air pollution and GHG emissions.

3.6.2. Sector Focus

At both workshops and in parties' comments, the issue was raised as to whether the TE applications should focus on particular transportation sectors. Some of the parties emphasized the need to continue proposing projects and investments that focus on light duty vehicles since they are major emitters of GHG emissions. Others suggested that the primary focus should be on medium and heavy duty vehicles since they are large contributors of criteria pollutants, and many of these vehicles are located in or pass through disadvantaged communities. Other areas of focus include freight and train yards that are in close proximity to disadvantaged communities, maritime port facilities, and truck stops. I see value in proposals that focus on all of these sectors given the diversity in emissions reduction opportunities, needs, and costs.

Focusing on light duty vehicles is a logical place to start since that vehicle category is a major source of mobile emissions, the large electric utilities have been authorized to implement projects targeting this sector, and this transportation sector affects most Californians on a daily basis. However, any immediate project and investment in this sector needs to be different from the previous pilots that the Commission has already authorized. As discussed later, projects and investments similar to the light duty infrastructure pilot projects that the Commission has already authorized⁴ should not be scaled up until the Commission has reviewed the results of those pilot programs.

Furthermore, the electric utilities should consider proposing projects and investments that provide the biggest impact for the amount of money spent, i.e., “minimize overall costs and maximize overall benefits” per Pub. Util. Code § 740.12(b). For example, TE of transit buses, drayage, vocational, or short haul fleets has the potential to affect a large number of vehicles owned by a single entity. In addition, since these fleet routes travel across disadvantaged communities, and low and moderate income communities, TE of transit fleets will “enhance air quality, lower greenhouse gases emissions, and promote overall benefits to those communities and other consumers.” (Pub. Util. Code § 740.12(a)(1)(C).) In addition, transit fleets have the potential of using other funding sources (e.g., mass transit revenues and federal loans) to help the transit agency lower its cost of acquiring transit vehicles that use electricity, and the infrastructure needed to operate and maintain the vehicles.

⁴ SDG&E’s Power Your Drive program authorized in D.16-01-045, SCE’s Charge Ready program authorized in D.16-01-023, and PG&E’s pending application in Application (A.) 15-02-009.

Another example of projects or investments that may have significant benefits is to electrify ports with shore power for maritime vessels, ground equipment supporting goods movement, and ground support equipment at airports, and long haul truck stops to minimize idling of diesel engines. Mobile emission sources at ports and truck stops located in the service territories of the large three electric utilities are a concentrated source of emissions that could be well served with targeted programs. If proposing investments in this sector, electric utilities should think of creative ways of encouraging port managers and truck stop owners to use electricity for their mobile end uses. Creative solutions could involve incentives or subsidies to fund the building of the electric infrastructure, and rate design structures and the use of other funding sources to minimize the burden of providing the electricity to the ships and trucks. A similar project or investment, as suggested by some of the parties, is to electrify all or part of the routes that medium and heavy duty vehicles, and off-road vehicles use at freight terminals. All of these kinds of efforts are consistent with the California Sustainable Freight Action Plan issued in July 2016, which include these two guiding principles:

Support local and regional efforts to improve trade facilities and corridors that achieve regional environmental, public health, transportation, and economic objectives consistent with statewide policy goals;

Reduce or eliminate health, safety, and quality of life impacts on communities that are disproportionately affected by operations at major freight corridors and facilities. This includes reducing toxic hot spots from freight sources and facilities, and ensuring continued net reductions in regional freight pollution. (California Sustainable Freight Action Plan, at 9.)

3.6.3. Education and Outreach

Finally, as described in the March 30, 2016 Amended Scoping Ruling at 20, “There is no need in this Rulemaking to establish a separate track for education and outreach on EV issues.” However, as noted in the Amended Scoping Ruling at 21, the TE applications of the electric utilities will be permitted to include “education and outreach activities as part of the proposed programs and investments that the electric utilities are planning to make.” Utility outreach and education of TE programs is fundamental to ensuring program uptake and customer satisfaction with the program and their experience with TE, both of which are necessary to ensure long term TE growth. The utilities do not need to propose a standalone education and outreach program, especially where those programs already exist (e.g., the California Plug-In Electric Vehicle Collaborative conducts outreach and education to accelerate the adoption of light-duty plug-in electric vehicles (PEVs); CARB’s and CEC’s programs fund a variety of planning and educational programs under AB 8).

If proposed programs within the TE application contain an education and outreach component, the electric utility shall provide a logic model in its application why such an intervention is needed: i.e. what existing resources the utility will leverage to avoid duplication, the audience that the utility is trying to target, what types of messaging will be provided to customers, intended outcomes of education and outreach, and means to measure efficacy of the education/outreach activities.

3.6.4. Leveraging Results of Previous Pilots

In order to accelerate the widespread adoption of TE, it is imperative to encourage proposals for projects and investments that can be implemented quickly in the near term, and scaled up if they prove successful. The electric

utilities need to consider what kinds of projects and investments can be rapidly deployed in order to accelerate the widespread adoption of TE. In proposing new TE projects and investments, the electric utilities should consider and leverage the results of past projects completed within CPUC, CEC and/or CARB-funded programs, and those completed by other entities (including those outside of California). We encourage the utilities to incorporate the lessons learned from these past experiences, including those documented within the CPUC's EV Survey linked in Appendix.

In that regard, the large IOUs, in consultation with the Commission's Energy Division, the CEC, CARB, and CAISO, shall jointly organize and hold a workshop by December 1, 2016 to review the results of TE pilots and programs already completed or near completion. This workshop should help inform IOU TE proposals.

3.7. Align with Local, Regional, and State TE Efforts

Pursuant to Pub. Util. Code § 740.12 the Commission staff consulted with the CEC and CARB in developing this guidance. In consideration of the many complementary efforts led by those agencies and the transportation-focused agencies (including the State Transportation Authority (STA) and California Department of Transportation (Caltrans)), I encourage the utilities to make concerted efforts to bring their TE programs in alignment with California's state, regional, and local ZEV initiatives. While the initiatives listed above in this ruling are not exhaustive of all Commission or State policy goals, they provide key milestones. For a comprehensive view, the utilities should refer to the 2016 ZEV Action Plan as an additional guiding document to identify actions across thematic directives, lead implementing agencies, and to align deployment

timing. The utilities should strive to provide supporting roles to these other initiatives as part of the ZEV Action Plan. Of particular relevance are the following state programs, regulations, and other initiatives:

CARB	CEC	STA, Caltrans, etc.
<ul style="list-style-type: none"> • 2016 Mobile Source Strategy • Draft Scoping Plan (Concept 3) • Low Carbon Fuel Standard • Advanced Clean Transit • Advanced Clean Cars • SB 375 Sustainable Communities Strategy 	<ul style="list-style-type: none"> • Electric Program Investment Charge • Applied Research & Development and Technology Demonstration & Deployment Projects • Alternative and Renewable Fuel Vehicle Technology Program Investments • POU TE Initiatives 	<ul style="list-style-type: none"> • Sustainable Freight Action Plan • Fixing America’s Surface Transportation (FAST) Act - Designation of Alternative Fuel Corridors • Sustainable Transportation Planning Grants

In addition, many ongoing regional and local efforts to address TE are already underway. Utilities should consult with the Metropolitan Planning Organizations and Regional Transportation Planning Agencies within their service territories to understand the local priorities and differences in transportation needs and design infrastructure programs accordingly. Furthermore, the utilities should consider and describe how their TE application can best complement and provide enhancements to the existing emissions abatement strategies of their local Air Pollution Control or Air Quality Management Districts.

3.8. Promote Safety

The projects and investments proposed in the TE applications of the electric utilities must also meet the safety concerns expressed in the interests of ratepayers’ section of Pub. Util. Code §§ 740.12(b) and 740.8, and in Pub. Util.

Code § 451. These safety-related concerns include the construction, interconnection, and operation of such projects and investments, and the impact on utility workers, the electricity customer, and the driver of the electric vehicle. In particular, VGI programs that schedule the recharging or discharge of a driver's vehicle batteries must specifically be designed with technologies that treat the preservation of customer's mobility preferences as a paramount safety concern. The TE applications shall address any safety-related issues with the proposed projects and investments in the TE applications, including conforming their Electric Rule 21 to accommodate Society of Automotive Engineers Standards for certifying the safety of grid-connected electric vehicles in order to reduce barriers that prevent electric transportation from acting as storage devices.

3.9. Leverage Other Funding Sources

In order to alleviate some of the financial burden on ratepayers, the electric utilities in conjunction with potential TE hosts, should explore and propose how the proposed TE projects and investments can utilize and leverage other sources of potential funding. Potential funding for these projects and investments could come from private, federal, state or local sources for such eligible programs and initiatives like mass transit, highway funding, TE, or to mitigate air pollutant emissions or greenhouse gases.⁵ For example, the White House recently announced Federal and Private Sector Actions to Accelerate Electric Vehicle Adoption in the United States, with the State and several California utilities as signatories. The U.S. Department of Energy provided clarification on the

⁵ See California Sustainable Freight Action Plan at 11-16.

eligibility of EV deployments to receive funding support through the Renewable Energy and Efficient Energy's Loan Program Office. Leveraging other funding sources will enable more projects and investments to be authorized, while alleviating the financial burden on ratepayers.

3.10. VGI Communication Standards

At the workshop and in the comments, some of the parties advocated for the Commission's adoption of certain communication standards for VGI, while other parties opposed such action. The record as developed by party comments to this question is currently insufficient on whether the Commission needs to adopt one or more standards. The arguments for adopting a standard include avoiding stranded investment in the future if the investment is not compatible with other standards; and to ensure that charging can be achieved in concert with a variety of grid and customer requirements. The arguments against adopting a standard include letting the marketplace decide the outcome and ensuring that the already-deployed fleet of vehicles that are not designed to a certain standard have the ability to participate in VGI market programs.

In comments, two approaches are discussed by parties: the International Organization for Standardization and International Electrotechnical Commission's (ISO/IEC) 15118: Vehicle-to-Grid Communication Interface, and; the Electric Power Research Institute's Open VGI Platform. The Commission, in conjunction with the other agencies, has the clear responsibility under Pub. Util. Code § 740.2, § 740.3, and § 8362 to overcome barriers that prevent expeditious actions toward effective VGI, particularly as the utilities prepare applications for widespread TE. In that regard, I believe we should take steps here to accelerate an outcome that is driver/customer-oriented, ensures grid reliability, and recognizes global progress on the technologies that assist with this issue.

The Commission's Energy Division recommends that the utilities' VGI programs, including those associated with electric vehicle supply equipment deployed through utility applications, conform to the ISO/IEC 15118 Standard (details of this recommendation are provided in Appendix B to this ruling). In order to develop the record further on this issue, the electric utilities shall address in their applications how their programs will comply with the ISO/IEC 15118 Standard or must provide justification on why alternative approaches sufficiently meet code requirements and policy objectives provided in Appendix B. In order for the Commission to decide whether statewide standards need to be adopted, the parties to these TE applications should be prepared to provide testimony to support or oppose adopting such a standard. Consistent with Pub. Util. Code § 740.2, § 740.3(a), and § 8362 the Commission is to cooperate with the CEC, CARB, CAISO and other key stakeholders, in deciding whether such a standard should be adopted or not.

3.11. Utility Incentives or Other Regulatory Mechanisms

Another issue raised by the TE applications is whether alternative forms of utility incentives or other regulatory mechanisms can be used to encourage TE projects and investments by the utilities, while stimulating competition and innovation in the TE marketplace. As added by SB 350, the Legislature recognizes in Pub. Util. Code § 740.12 that the electric utilities have a lead role in promoting widespread TE. At the same time, as expressed in Pub. Util. Code § 740.12(a)(1)F and (b), the Legislature is concerned that nonutility competitors should not be precluded from participating in the TE marketplace.

In traditional utility ratemaking, utilities earn a rate of return on capital investments. In the context of TE, these could include the electric transmission

and distribution infrastructure necessary to support vehicle charging. There are at least three reasons that this current utility incentive structure may not be appropriate in the TE context:

- (1) To accelerate TE at the scale necessary to meet SB 350 goals, the utilities must also invest in non-infrastructure programs on which they may not earn a return on investment under the traditional ratemaking approach;
- (2) To address concerns about competition, utilities should not over-invest in utility-owned TE infrastructure if instead they could support the private sector or individuals in making these investments, while still receiving adequate compensation for their contributions to TE; and,
- (3) To have electric vehicles assist with grid management per Pub. Util. Code § 740.12(a)(1)(G), may postpone investments in transmission and distribution infrastructure. Upgrades may eventually be necessary to meet the scale of widespread electrification of all mobile transportation uses, but the duration of such upgrade deferrals and the point at which upgrades are warranted and efficient is unknown.

Consistent with other ongoing Commission rulemakings and party comments, we note the evolving nature of the utility role and the possible need to explore new utility business models. As the April 4, 2016 Assigned Commissioner Ruling in the Integrated Distributed Energy Resources proceeding (R.14-10-003) points out, asking the utilities to identify opportunities for third party investment instead of utility-owned investments “sets up a potential conflict with the company’s fundamental financial objectives” to maximize shareholders returns.⁶

⁶ Ruling in R.14-10-003 at 3.

To help address this potential conflict, the electric utilities may propose in their TE applications creative solutions to how the utility can be incentivized for undertaking TE projects and investments, in conjunction with maximizing the use of renewable sources of energy, while at the same time minimizing the financial impact on utility ratepayers and encouraging competition in the TE marketplace. For example, the utility might consider criteria for performance-based ratemaking or whether certain TE projects or investments could be sold off in the future, and to propose a revenue sharing mechanism for that type of situation. If proposing an incentive mechanism, the utility should clearly identify all existing incentives the utility has to invest in TE. Although Pub. Util. Code § 740.12(b) provides for a reasonable cost recovery mechanism if certain conditions are met, utility ratepayers will not be able to bear all of the costs of accelerating TE in California.

3.12. Regulatory Review of TE Applications

SCE and SDG&E proposed that the processing of the TE applications provide for a fast track to expedite projects and investments that are not controversial. I agree that a fast track review, or what I refer to instead as “priority review,” could help expedite the authorization of certain non-controversial projects and investments to accelerate the adoption of TE and to meet the goals of SB 350. Other programs and projects could be considered under the standard review process that a typical utility application undergoes. The Commission will need to approve this approach to reviewing the TE applications through an interim decision after the applications are filed.

In order to expedite the priority review projects and investments, these should be non-controversial in nature, and limited to no more than \$4 million in costs per project, with a total funding limit of \$20 million for each utility. The

priority review projects and investments can be of a short duration (up to one year), as opposed to other projects and investments proposed which should be two to five years in duration.

If future Commission orders establish specific criteria for priority review projects and investments, subsequent TE projects and investments could conceivably be authorized through advice letter filing until the total priority review funding limit is reached. The advice letter process would incorporate a protest procedure to the advice letter in case of disagreements concerning the proposed project or investment.

All other proposed projects and investments that do not meet the above criteria for priority review, will be reviewed using the normal timeline for the review of an application filed with the Commission.

It is important to note here that projects and programs that scale up or expand charging infrastructure-based projects as proposed or authorized under A.14-04-014 (SDG&E Power Your Drive), A.14-10-014 (SCE Charge Ready) and A.15-02-009 (PG&E Charge Smart and Save), should be considered and reviewed pursuant to provisions in their authorizing decisions. Before such projects and investments are authorized, the Commission needs to review and evaluate the progress and results of the previously authorized projects and investments, and to analyze the data that the prior decisions required the utilities to collect. After the pilot project's results and data have been analyzed, the Commission can then decide whether the scaled up project or investment should be authorized or not. Phase 2 proposals related to these programs may be submitted in separate applications on the timetable and under the conditions described in Commission decisions in those separate proceedings.

Therefore, consistent with this regulatory review guidance, in the TE applications, each utility should propose which programs they request for priority review and which will require standard Commission review. During the Prehearing Conference for each application, parties can provide input on the utility's proposed categorization, and the scoping memo will identify whether certain projects should be able to use a priority review process. In the processing of these TE applications, the first phase of the proceeding for each TE application should address the authorization of a priority review process or similar approach for the processing of the TE applications, and to decide whether any of the proposed priority review projects and investments should be authorized. Concurrent or subsequent phases of the TE applications can then address the approval of projects and investments that fall outside of priority review.

IT IS RULED that:

1. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company, are directed to file their first round of transportation electrification applications by January 20, 2017.
2. The Commission's Process Office is directed to serve a copy of this ruling on the smaller electrical corporations, which consist of Liberty Utilities (CalPeco Electric) LLC, Bear Valley Electric, a division of Golden State Water, and PacifiCorp.
3. A decision will be prepared for the Commission's adoption making the smaller electrical corporations respondents to this Order Instituting Rulemaking, and directing them to file their transportation electrification applications by June 30, 2017.
4. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company, in consultation with the Commission's

Energy Division, shall jointly organize and hold a workshop by December 1, 2016 to review the results of Transportation Electrification pilots and programs already completed or near completion.

5. The transportation electrification applications to be filed in this proceeding shall conform to the guidance set forth in this ruling and in Appendices A and B.

Dated September 14, 2016, at San Francisco, California.

/s/ CARLA J. PETERMAN

Carla J. Peterman
Assigned Commissioner

Appendix A: SB 350 Transportation Electrification Application Guidance

All sections (§) referenced below are to the California Public Utilities Code.

- ***Transportation Electrification (TE)***. As defined in §237.5, TE is a principal means of the utilities' resource planning and investment to reduce the social costs of energy services (§701.1). The State intends to encourage TE to achieve ambient air quality standards and climate goals and to meet the findings and declarations in §740.12(a)(1).
 - Ambient Air Quality Standards and related regulatory measures are referenced in CARB's Mobile Source Strategy.
 - Greenhouse Gas Reduction Targets are defined in §740.12(a)(1)(D) and SB 32

- ***Required for Investor-Owned Utilities (IOUs)***. IOUs shall file applications per 740.12(b).
 - Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric shall file their first TE applications by January 20, 2017. A future decision may direct these utilities to file additional applications by no later than January 2020 in consideration of results from the first phase of applications and progress made in implementing the Integrated Resource Planning process per §454.52.
 - Liberty Utilities, Bear Valley Electric, and Pacificorp shall file their first applications by June 30, 2017. Subsequent applications may be submitted upon consideration of the results from the first phase of applications.
 - Adjacent large and small IOUs may propose joint TE programs to meet specific regional infrastructural needs and to ensure harmonious intra-territory operation of electric transportation per §740.2.

- ***Narrative of Application***. IOUs shall describe, tabulate, and/or graphically demonstrate how their TE portfolio, on the whole, meets the requirements of §740.12. Specifically, this includes:
 - Accelerate widespread TE
 - Fulfill the legislature's findings and declarations of §740.12(a)(1)
 - Be measurable with monitoring and evaluation criteria
 - Minimize costs and maximize benefits
 - Be subject to a specified cost recovery mechanism
 - Fairly compete with non-utility enterprises
 - Be trackable with performance accountability measures
 - Be in the interests of ratepayers
 - Demonstrate the avoidance of long-term stranded costs.

- ***Scale and Scope***. A utility's TE programs should support the ZEV Executive Order and SB 32 with the consideration of the utility's proportional share of these statewide goals and limits regarding the eligible technologies under §237.5. The IOUs shall also consider:
 - Their Integrated Resource Plans developed pursuant to §454.51

- Emissions Reduction Trajectories compliant with the volume of emissions reductions within the timeframes set by the 2030 Scoping Plan and Mobile Source Strategy developed by the California Air Resources Board.
- Demand Forecasts to determine deferred or necessary infrastructure upgrades
- **Portfolio Design.** The Commission intends to provide the utilities flexibility and encourages innovation in the design of their portfolio of TE programs and projects.
 - **Policy Context.** Given that the State is in the beginning stages of TE and other Commission distributed energy resources and integrated planning proceedings may also influence TE policy, the IOUs should describe how their TE applications align with R.14-10-003, R.14-08-013, and R.16-02-007.
 - **Objectives.** The IOUs should select program types, sizes and deployment schedules to strive toward attaining the cost minimization and benefits maximization, efficient grid management, and industrial development objectives of §740.12.
 - **Priority Projects & Programs.** We encourage the utilities to target non-infrastructure as well as infrastructure pilots and programs. Proposal should experiment in diverse market segments to inform the eventual design of scaled programs that will be crucial to address substantial reductions in criteria air and GHG pollutants from the on-road light, medium and heavy duty, off-road, maritime, aviation, and rail sectors in the near term. The utilities should consider the CPUC's EV Survey at: <http://tiny.cc/evreports/>.
 - **Alignment with Local, Regional, and State TE.** The IOUs should leverage the State's coordination across its energy and transportation agencies and use the 2016 ZEV Action Plan as a resource that documents the State's strategy across regulations, policies, and programs. Within their service territories, the IOUs should consult with regional or local planning and air management agencies to complement existing transportation infrastructure and pollution abatement initiatives.
 - **Promote Safety.** The IOUs shall ensure that the construction, interconnection, and operation of projects in their TE portfolio are account for the safety of utility workers, the electricity customer, and the drivers of the TE technology.
 - **Leverage Non-Ratepayer Funding.** The IOUs should alleviate the burden on ratepayers by seeking private, federal, state, or local sources for programs.
 - **Incorporate Vehicle Grid Integration Communication Standards.** See Appendix B.
- **Regulatory Review.**
 - TE Applications should designate for each proposed program the mechanism for the Commission's review, given the characteristics of the program:
 1. Priority Review – Non-controversial, short term (e.g. 1 year) investments
Budget is limited to no more than \$4 million in costs per project, with a total funding limit of \$20 million for each utility.
 2. Standard Review – Programs that do not meet the above criteria (e.g. 2-5 years or greater budget)
 - Minimum Project Descriptions: All applications should identify at least the following for every project or program proposed:

- Market segment and vehicles targeted (On-Road Heavy Duty Short Haul Trucking Fleets)
- Implementation Timeframe
- CA Agency regulations supported by program (CARB's Last Mile Delivery Regulation)
- CPUC regulations supported by program (Low Carbon Fuel Standard, Submetering)
- Vehicle Goals (Support 10,000 customers' fleet electrification)
- Objectives (Reduce the cost of EVSE by providing rebates)
- Monitoring and Evaluation Plan (Consistent with requirements of D.16-01-023)
- Cost (itemized, Total, and as % of annual average bill of applicable customer class)
- Leveraged Funding (federal, state, local, private)
- Grid Impacts (Avoided generation costs via load shaping, renewable energy procured simultaneously, improved load factor)
- Project Partners (Service Providers, Community Organizations)
- Emissions Benefits and accounting methodology (tons of GHG, tons per day of criteria pollutants, BBLs of petroleum reduced)
- Stranded Asset Risk Mitigation (Strategy for technology flexibility or incorporation of standards)

(End of Appendix A)

Appendix B: Enabling Vehicle-Grid Integration Through a Communications Standard

Purpose and Objective

A Vehicle-Grid Integration (VGI) communications standard can be an accelerant for widespread transportation electrification. The purpose of this appendix is threefold, to provide:

- 1) **Policy Background.** To identify Public Utilities Code, Legislation, Executive Order, and other efforts that authorize the Commission, in consultation with others, to adopt such a standard; and
- 2) **Exemplary Criteria.** To recommend measures by which to evaluate options to ensure that standardization is in the public interest; and
- 3) **Compliance Mechanism.** To identify a standard for communicating between customers' electric vehicles and electric vehicle supply equipment that are deployed through utility programs, and a procedural mechanism to ensure that such programs comply with orders identified in (1).

1. Policy Background

Pub. Util. Code § 740.3, adopted in association with CARB's implementation of the 1990 Zero Emission Vehicles mandate, provides that the California Public Utilities Commission, in cooperation with other entities, is to "evaluate and implement policies to promote the development of equipment and infrastructure needed to facilitate the use of electric power and natural gas to fuel low-emission vehicles." Among the policies to be considered are, "the development of statewide standards for electric vehicle charger connections [...], including installation procedures and technical assistance to installers." Prior to evaluating and implementing the policy of whether standards should be adopted

or not, Pub. Util. Code § 740.3(b) requires the Commission to hold public hearings.

Pub. Util. Code § 740.2, which was adopted in association with the Initial Climate Change Scoping Plan and SB 626, launched the previous Alternative Fuel Vehicle proceeding (R.09-08-009). Under § 740.2, the Commission is required to ensure that PEV technologies work in a harmonious manner across utility service territories, minimize grid impacts, and integrate renewable energy. Specifically, in the Phase 1 Decision (D.) 10-07-044 at 29, the Commission affirmed, pursuant to SB 17 and P.U. Code 8362(a), its authority to adopt interoperability standards and protocols developed by public and private entities to ensure functionalities necessary for the smooth integration of PEVs into the electric grid. Toward these ends, D.10-07-044 also identified the Commission's interest in developing smart charging and intra- and inter-utility billing policies.

In D.11-07-029, the Commission recognized the "vital importance of national standardization in keeping equipment costs down."⁷ However, it deferred the issue of interoperability between EVs and charging equipment to other parts of the electric system to the Smart Grid Rulemaking R.08-12-009. While R.08-12-009 did not resolve the interoperability and standardization issue prior to its closure, the issue remains relevant. The Commission is tasked with resolving this issue by B-16-2012, which ordered that "Electric vehicle charging will be integrated into the electricity grid" by 2020, and the subsequent ZEV Action Plans and companion Interagency VGI Roadmap. This issue relates to the achievement of several technology development and system reliability objectives

⁷ D.11-07-029 at 35 with reference to D.10-06-047 Conclusion of Law 5.

enumerated in the Energy Division's VGI Whitepaper. Most recently, Pub. Util. Code § 740.12(a)(1)(G) pursuant to SB 350 describes the potential economic and system effects from charging electric vehicles "in a manner consistent with electrical grid conditions." Communications standardization could accelerate the accrual of these cost reductions and renewable integration benefits for the State.

It may be important to align the Commission's considerations of VGI communication standards with recent transportation electrification (TE) initiatives as doing so may hasten the effects of those efforts. For example:

- The Energy Commission's (CEC) investments from the Electric Program Investment Charge (EPIC) Program have or will fund several projects related plug-in electric vehicle charging controls and optimization, and fleet management, including the approaches discussed by parties in responses to the March 30, 2016 Scoping Memo. Furthermore, standardization has been discussed in detail during several CEC workshops.⁸
- The California Air Resources Board (CARB) is implementing the Electric Vehicle Charging Stations Open Access Act, whose implementation and requirements could be affected by the capabilities of communications onboard the vehicle and EVSE.
- The California Independent System Operator's (CAISO) Energy Storage and Distributed Energy Resources (ESDER) Initiative's model enhancements discussed at the April 29, 2016 Workshop were

⁸ CEC 2014 Integrated Energy Policy Report (IEPR) at 133-134 referencing June 23, 2014 IEPR Workshop, CEC VGI Research Review Workshop on November 19, 2014, and CEC VGI Research Review Workshop on December 14, 2015.

approved by the Federal Energy Regulatory Commission (FERC) and will become effective October 1.⁹ Metering requirements referenced in these modified CAISO tariffs adopted by the authority having jurisdiction may be impacted by standards.

- The Natural Resources Agency published action plans to “Safeguard California” that direct agencies to automate and modernize information that can be assessed across the transportation and electricity sectors to improve system reliability.¹⁰ This action plan requires agencies to assess the vulnerability of fuel and electricity networks and the resiliency of the electric utilities that will support transportation.¹¹

It is evident that through these policy directives and activities, the accelerated development of the electric transportation market at scale necessary to reduce climate change and air pollution will rely on harnessing technologies that enhance the capability of vehicles to establish communications with a variety of devices and entities, both proximal and distant, for many use cases.

2. Exemplary Criteria for Standards

The Commission’s Energy Division, in conjunction with staff at other agencies, has indicated interest in expeditious actions toward effective VGI. In particular, as the utilities prepare applications for widespread TE, the Energy

⁹ 156 FERC ¶ 61,110, Docket No. ER16-1735-000, August 16, 2016.

¹⁰ California Natural Resources Agency. Safeguarding California: Implementation Action Plans – Transportation Sector Plan at 186.

¹¹ Id at 188.

Division proposes that applications consider how to accelerate an outcome that is driver/customer-oriented, ensures grid reliability, and recognizes global progress on this issue. In this regard, utility applications should holistically consider the following principles in examining and adopting a VGI standard for the previous purposes. Exemplary criteria by which this standard could be evaluated include whether:

1. A driver's mobility, need for simplicity, and privacy is preeminent.
2. A vehicle's charging behaviors are consistent with the battery management system and mobility requirements are not externally curtailed by an entity without consulting the driver.
3. Functions enabled through the standard's implementation are fully scalable: a) In electrical system terms, from an individual vehicle, to an array of EVSE, to facility circuitry, to a campus/microgrid, to distribution, and to regional transmission systems, and b) In magnitude to accommodate millions of vehicles of different makes and models.
4. Reliability and functional requirements meet those of the California Public Utilities Commission's adoption of Utility Electric Rules, Federal Energy Regulatory Commission as implemented by the CAISO, or the best practices of the National Electric Reliability Corporation.
5. Technologies and equipment deployed through the standard's implementation are resilient to evolving use cases in the automotive, electricity, and communications industries including: high-power charging, wireless charging, vehicle-to-grid, autonomous, connected, electric and shared (ACES) vehicles, higher-speed wireless and wire-based communications.

6. Technologies and equipment deployed prior to the standard's implementation can voluntarily be re-equipped to increase functionality and compatibility to the adopted standard to the cost-effective extents possible.
7. Transportation Network-specific use cases and services will be leveraged and account for Geospatial Information System (GIS) data including charging infrastructure utilization, road infrastructure utilization, route navigation, demand sequencing and queueing, traffic flow, and trip dispatch.
8. The standard is adaptive to automakers' design and manufacturing requirements which are, ultimately, global in nature. Regulations incorporating standards should strive to recognize existing progress and avoid duplication.
9. Synchronize the timing of public and private investments in developing vehicle, infrastructure, and network or data management products with timelines established in California policy and regulations to efficiently meet climate change mitigation and adaptation goals.
10. Leverage the technical capability of the State agencies, and the research and interests of the national labs of the U.S. Department of Energy and independent research institutions and standards making organizations.
11. Guarantee and hasten opportunities for the return of ratepayer investments in research and development (R&D).

It is worth noting that these principles are not listed in an order of importance unless stated specifically (e.g. preeminence of driver mobility). Weights applied

to each principle can vary but any implementation of a standard must be designed or able to satisfy all criteria comprehensively.

3. Compliance Mechanism

The Energy Division recommends that in the Commission's review of utility applications implementing TE, the utilities should consider the use of standardized communications to comport with the policy objectives and principles above. VGI programs held to this requirement would include those that intend to provide time variant pricing, incentives, or equipment necessary for electric vehicles to act as a uni-directional or bi-directional Distributed Energy Resource for the grid. In addition, utility back-end software necessary to communicate grid conditions, pricing, or prevalence of renewable energy to electric vehicles and charging infrastructure should be designed to facilitate the achievement of these principles. In contrast, adopting a VGI standard may not be necessary for, but may complement, a DC Fast Charging program, which is subject to drivers' time constraints and provides a non-discretionary service for which drivers may have inelastic demand.

Energy Division recommends that the utilities' VGI programs conform to the ISO/IEC 15118 Standard. The utilities should conform their specific infrastructure, pricing, or incentive programs and supporting communications, metering, and billing system to the latest release of the ISO Standard based on the utilities' proposed deployment schedules.

(End of Appendix B)