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**PG&E Comments on the Inaugural Assembly Bill (AB) 2127 Electric Vehicle Charging Infrastructure Assessment – Staff Report**

*Additional submitted attachment is included below.*



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California Energy Commission  
Fuels and Transportation Division, Transportation Policy and Analysis Office  
1516 9th Street  
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**Re: Pacific Gas and Electric Company Comments on the Inaugural Assembly Bill (AB) 2127 Electric Vehicle Charging Infrastructure Assessment – Staff Report (Docket Number 19-AB-2127)**

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide feedback on the inaugural Assembly Bill (AB) 2127 electric vehicle charging infrastructure assessment – staff report, released in January 2021.

PG&E supports the statewide assessment of the charging infrastructure needed to achieve the goal of five million zero-emission vehicles (ZEVs) on the road by 2030. PG&E also supports the California Energy Commission's (CEC) efforts to achieve the goal in the Executive Order (EO) N-79-20 and its direction to expand this assessment to support the levels of electric vehicle adoption required by the order.

PG&E appreciates and commends the CEC's efforts to take stock of existing public and shared private level 2 (L2) and DC fast charging (DCFC) sites and ports throughout the state of California. This effort sets an appropriate baseline to judge current progress and future needs to hit state goals, such as 250,000 chargers by 2025. Furthermore, PG&E commends the CEC for undertaking the complicated modeling efforts to determine how much charging infrastructure may be needed to meet various policy targets as well as the number and types of chargers required to meet the needs of distinct sectors, such as light-duty (both local and road trip travel), transportation network companies (TNC), and medium and heavy-duty (MHD).

PG&E offers the following comments in sections of the AB 2127 assessment related to transportation electrification (TE) programs, increasing private sector investment, vehicle adoption forecasting, distribution grid planning, smart charging and vehicle-grid integration (VGI), and the geographic distribution of chargers through the Senate Bill (SB 1000).

**1- Timely approval of necessary funding for charging infrastructure will help ensure California meets its 2030 charging goals**

The AB 2127 assessment estimates the state will fall approximately 62,000 public and shared chargers short of the 2025 goal of 250,000 shared L2 and DCFC chargers.<sup>1</sup> The report further

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<sup>1</sup> Draft AB 2127 Assessment, page. 2

estimates that nearly one million chargers will be needed to meet the previous executive order goal of five million ZEVs by 2030. Furthermore, the report estimates a need of approximately 1.5 million chargers to support the eight million ZEVs the California Air Resources Board (CARB) suggests will be needed to meet Governor Newsom’s 2020 executive order goals.

PG&E agrees with the conclusion drawn by the assessment that “the state must continue to invest in charging infrastructure in order to achieve its ZEV goals. The immediate need is great, as demonstrated by the sheer number of chargers needed by 2030.”<sup>2</sup> The assessment highlights how the CEC’s California Electric Vehicle Incentive Project (CALeVIP) has been unable to fulfill demand created by all the applicants who have applied for incentive funding, stating that the program is oversubscribed by hundreds of millions of dollars. PG&E believes the final assessment should highlight the success California’s utilities have had in deploying ratepayer funded charging infrastructure programs and that these programs have also seen more customer interest than available funding. For example, PG&E’s EV Charge Network Program (EVCN), which installs L2 chargers at multi-unit dwellings (MUDs) and workplaces, has a waitlist of more than 150 customers seeking installation of more than 1,800 EV charging ports that cannot currently be served due to program budget limitations. The assessment further concludes that “while public investment will fall as PEV numbers increase and the private market becomes financially viable, significant public investment is needed now.”<sup>3</sup> PG&E agrees and urges state policy makers and regulators to approve the funding necessary for timely rollout of charging infrastructure programs, including utility ratepayer funded programs, that are vital to helping California meet ZEV policy goals during this nascent stage of TE market development.

## **2- Tools offered by PG&E provide a “One-Stop Shop” for residential and fleet customers interested in transportation electrification**

Chapter 7 of the assessment (“Financing California’s Charging Infrastructure Needs”) contains highlights of feedback obtained from stakeholder interviews, including “how potential improvements could ease transactions to access funding and therefore complete projects while increasing funds from the private sector.” One of the items highlighted is “program navigability” and is described in part as “displaying incentives for both vehicle and infrastructure in a ‘one-stop shop’ could help applicants to identify appropriate funds from federal, state, local, and utility programs.”<sup>4</sup> PG&E wishes to highlight the tools available on its website that help its customers learn more about transportation electrification. Specifically, PG&E hosts tools dedicated to both residential<sup>5</sup> and non-residential customers<sup>6</sup> that help these customers evaluate available vehicle models, estimate savings compared to gas or diesel transportation alternatives, locate charging stations, and learn of available programs and incentives offered by PG&E as well as by other entities such as the federal or state government, air quality management district, or community choice aggregators. Since launching in December 2018, through February 2021, the residential focused EV Savings Calculator has received 371,000 unique visitors and logged over 490,000 sessions, resulting in more than 16,800 hours of total platform engagement. The Net Promoter Score in Q4, 2020 was 33, with 614 respondents, which is considered “great.”

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<sup>2</sup> Ibid., pp. 2-3

<sup>3</sup> Ibid., p. 3

<sup>4</sup> Ibid., p. 85

<sup>5</sup> Tools for PG&E’s residential customers can be found at: [ev.pge.com](http://ev.pge.com)

<sup>6</sup> Tools for PG&E’s non-residential customers can be found at: [fleets.pge.com](http://fleets.pge.com)

### **3- Complex infrastructure financing mechanisms could risk hindering, rather than helping, EV transition**

Chapter 7 of the assessment also describes a CEC staff presentation discussing “preliminary concepts for a unified policy and economic model to accelerate widespread transportation electrification while leveraging limited public funds with private capital. This concept would create a holistic way to assess the market for charging infrastructure, invest in charging infrastructure, and deliver projects across the state.”<sup>7</sup> This section includes a “cost of enabled charging” equation that would be utilized under this concept and states “the principles of the model have the potential to leverage existing public, ratepayer, and other funding sources in a way that can open private investment channels.”<sup>8</sup> This idea is very complex and needs further explanation and exploration with the investor-owned utilities (IOUs) and other relevant stakeholders before being considered. While PG&E is open to exploring new methods to aid the installation of the charging infrastructure necessary for ZEV adoption to flourish, PG&E cautions that overcomplicating the process of future infrastructure deployment could risk slowing the transition to electric vehicles.

### **4- More aggressive policy interventions will ensure California meets ZEV adoption goals**

For both light-duty vehicles (LDV) and medium-and heavy-duty vehicles (MHDVs), PG&E agrees with the conclusion that meeting California’s ZEV vehicle adoption goals will likely require policy interventions more aggressive than those currently in place.

PG&E agrees that the impact of COVID-19 on EV sales is uncertain. PG&E also encourages the CEC to consider the potential impacts of COVID-19 on vehicle-miles-travelled (VMT) and, by extension, ZEV energy demand. As the CEC notes in the assessment, “a sustained shift toward remote work may reduce sales of LDV, including ZEVs.”<sup>9</sup> Such a shift could also reduce VMT and, consequently, energy demand for light-duty ZEVs.

In the section titled, “growing electrification of the medium-and heavy-duty sectors,” PG&E recommends the CEC include a discussion comparing the CEC forecast and CARB mobile source strategy (MSS) for medium-and heavy-duty sectors, similar to the comparison and discussion found on pages 20-21 of the assessment for LDV. It would be useful to understand how the CEC's forecast compares to CARB's air quality and climate policy goals. In particular, it would be helpful to understand if the CEC expects a potential shortfall in medium-and heavy-duty vehicle electrification relative to CARB’s goals.

### **5- More temporal and geographical granularity in the modeling will assist with more accurate distribution planning**

PG&E highlights that forecasts of ZEV adoption and energy needs would be most helpful with increased temporal and geographical granularity. Since the CEC simulation models EVI-Pro 2 and HEVI-LOAD provide results at the county-level rather than site-specific locations, their forecast

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<sup>7</sup> Draft AB 2127 Assessment., pp. 86-87

<sup>8</sup> Ibid., p. 88

<sup>9</sup> Ibid., p. 22

granularity will be insufficient for distribution planning purposes. It is unclear what the resolution is for the EV deployment and grid evaluation (EDGE) tool, but PG&E similarly stresses that increased granularity would be most helpful for the distribution planning process.

The EVI-Road Trip simulation model appears to provide site-specific locations for charging stations, making this model ideal for the electric distribution planning process. PG&E disagrees, however, with the EVI-Road Trip modeling results' implication that "road trip charging demand may be accommodated by current grid infrastructure."<sup>10</sup> Taking "current grid infrastructure" to mean the electric system as it stands today, this assertion is certainly incorrect and not borne out by PG&E's actual experience. Added grid capacity has been necessary to accommodate fast charging stations along the Highway 5 and Highway 101 corridors as well as other commercial locations. The ability to serve additional charging with existing capacity at requested locations has been, and will continue to be, site-specific. In addition to potential primary distribution system impacts, secondary system impacts may require replacement of the secondary conductor and/or the service transformer.

PG&E agrees with the EDGE Evaluation model conclusion that "an 'early warning system' to help pinpoint the needs for upgrades" is valuable to distribution planners. PG&E cautions, however, that the EDGE model uses the Integration Capacity Analysis (ICA) maps which do not include the impact of future load growth or known new applications for service, so the areas with little or no excess capacity may be larger than shown by this model.

Furthermore, none of the models take into consideration the local upgrades or service facilities that are required to interconnect additional EV load to the network. New or upgraded service facilities may consist of (a) primary or secondary underground or overhead service conductors, (b) poles to support overhead service conductors, (c) service transformers, (d) utility-owned metering equipment, and (e) other utility-owned service-related equipment. To physically connect to the existing system may require additional equipment, such as a switch interrupter or junction box. Furthermore, local network reconfigurations (primary or secondary) may be required to tie in this new equipment and could include re-routing conduit and/or conductor.

#### **6- Price signals alone may not be enough to influence charging behavior across segments**

PG&E agrees with CEC's conclusion that electricity rates alone may not be sufficient to realize a preferred outcome regarding charging management.<sup>11</sup> Given that EV-charging is a potentially complex decision-making process for customers, it is unclear to what extent price signals alone (through electricity rates) influence charging behavior. For example, certain charging types, such as DC fast charging, may not be as responsive to time-of-use (TOU) rates as others, such as those with longer dwell times like overnight home charging or workplace charging.

PG&E requests further discussion on Figure 19 "Projected on-road medium-and heavy-duty charging load." In particular, the figure appears to show vehicle charging peaks in hours beginning 17-19, and it would be helpful to understand the assumptions and analysis that led to

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<sup>10</sup> Ibid., p. 38

<sup>11</sup> Ibid., p. 33

that result. Hours beginning 17-19 seem likely to include peak rate hours, so it would seem reasonable to expect commercial customers to avoid charging during that time.

**7- Continued efforts to determine and test VGI use cases (including incentives and control infrastructure) will ensure the delivery of reliable and clean energy. As for a single VGI communication protocol, requiring ISO 15118 as the only option risks slowing adoption of ZEVs**

PG&E agrees and supports the CEC's assertion that "widespread vehicle-grid integration is necessary to preserve grid reliability and ensure vehicles are charged with the cleanest and cheapest electricity possible."<sup>12</sup> PG&E appreciates the assessment's reference to prior vehicle-to-grid integration (VGI) work the utility has undertaken<sup>13</sup> and looks forward to continuing critical VGI research. Following the California Public Utilities Commission (CPUC)'s VGI Strategy Decision (D. 20-12-029), PG&E is working with other utilities, community choice aggregators (CCAs), load-serving entities (LSEs) and other stakeholders to determine the VGI use cases that will be part of the VGI pilot program, VGI emerging technology program and interim studies mandated by the decision. PG&E aims to further explore the technical feasibility and cost-effectiveness of high-value use-cases identified by the VGI working group report.<sup>14</sup>

PG&E suggests alignment in the use of VGI vocabulary. PG&E also suggests replacement of the term "smart charging" with use of terms and definitions established in other public proceedings such as the VGI working group final report or CPUC proposed decision concerning SB 676.

PG&E agrees with the assessment's assertion that smart charging can and should be used to mitigate negative and promote positive impacts of electric vehicle charging. While PG&E agrees that smart charging can help mitigate "timer spikes"<sup>15</sup> by enabling vehicles to automatically shift or reduce charging based on capacity constraints or preferred charge time (e.g., during solar curtailment), significant further research and effort is needed to define the specific applications and use cases for this technology, including the incentives (programs, rates, price signals) and potential added control infrastructure necessary to orchestrate such integrated behavior at the appropriate spatial and temporal resolutions.

The assessment notes that "while TOU rates can shift load to more beneficial times, additional smart charging protocols beyond TOU rates will be needed to optimally manage EV charging load and protect distribution grid infrastructure."<sup>16</sup> As a threshold matter related to smart charging and distribution grid infrastructure, PG&E notes that, at the present time, smart charging has only been used effectively to defer investments on customers' secondary systems and service transformers. Because smart charging functions to reduce available power at certain times of the day, it is unlikely to emerge as a solution for certain types of EV charging needs, such as fast charging stations where the goal is to mimic the convenience and speed of a

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<sup>12</sup> Ibid., p. 50

<sup>13</sup> Ibid., p. 51. Footnote 66 includes a reference to the BMW/PG&E "i Charge Forward" smart charging pilot

<sup>14</sup> <https://gridworks.org/wp-content/uploads/2020/07/VGI-Working-Group-Final-Report-6.30.20.pdf>

<sup>15</sup> Draft AB 2127 Assessment., p. 51

<sup>16</sup> Ibid., p. 33

gas filling station as closely as possible. As the report states on page 26, “continued growth in the PEV market will depend on driver confidence in charging infrastructure.”

The assessment recommends that “where possible, state agencies and policy makers should leverage procurement requirements, funding opportunities, or other market signals to accelerate market unification around interoperable connectors and communication protocols.”<sup>17</sup> Specifically, the assessment highlights the International Organization for Standardization (ISO) 15118 as well as Open Charge Point Protocol (OCPP) standards and recommends that “the CEC should prioritize deploying chargers that support both standards.”<sup>18</sup> PG&E cautions against premature mandates on either standard at this time. PG&E highlights and agrees with the California Electric Transportation Coalition’s (CaETC) position on this matter as submitted during the VGI working group process in 2020: “CaETC recommends that a single VGI communication protocol not be mandated through regulation. The EV market is still in its nascent stage where mandating a single communication protocol could have an adverse effect on EV adoption by increasing the costs of vehicles or networking fees, and have a chilling effect on the development or adoption of different communication protocols that would be better suited in a given use case. This is especially the case given the trend toward increasing use of vehicle telematics. With respect to ISO 15118, CaETC does not oppose it being a standard, but we do not support it being mandated as the only standard. Currently, it is premature to make a recommendation for any VGI communication standard on the charging network or automaker. Communication protocols need to be vetted in the marketplace, which has been the successful approach of the IOUs with smart thermostats and the current approach of the smart inverter working group, which uses cloud aggregators that translate and pass through many different communication protocols.”<sup>19</sup>

In addition to charger connector and communication protocol standardization, heightened attention to security and safety protocols should be prioritized to enable grid integrated charging at scale.

**8- Considering all the factors that impact the deployment of electric vehicle supply equipment will help enable future charging deployment that is more equitable and cost effective**

PG&E supports the statewide efforts to electrify the transportation sector and the goal of increasing access to electric vehicle infrastructure for all Californians, including low-income households.

PG&E agrees with the data the CEC presented on charger deployment and strongly supports a focus on equity as charger deployment ramps up to meet California’s goals.

PG&E also wants to highlight that there are several factors that impact the deployment of electric vehicle supply equipment (EVSE) across geographies and income levels. These factors could include availability of eligible sites in densely populated regions, impacts to costs based on location and

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<sup>17</sup> Ibid., p. 53

<sup>18</sup> Ibid., p. 59

<sup>19</sup> CaETC comments to the VGI Working Group on March 11, 2020

project complexity, and the need for EVSEs based on commute patterns and plug-in electric vehicle (PEV) propensity.

PG&E recommends that the CEC incorporate these considerations in developing a strategic approach to charger deployment that is equitable, cost-effective, and results in high utilization of PEVs.

PG&E appreciates the time and effort that the CEC took to organize the workshops and prepare this AB 2127 Infrastructure Needs Assessment Draft Report, and the opportunity to comment on this draft. Please do not hesitate to contact me if you have any questions.

Sincerely,

Licha Lopez