

Docket: : A.15-02-009  
Exhibit Number : \_\_\_\_\_  
Commissioner : Carla. J. Peterman  
Admin. Law Judge : Darwin Farrar  
ORA Project Mgr. : Rajan Mutialu  
ORA Witnesses : Anand Durvasula  
                          : Jose Aliaga-Caro  
                          : Rajan Mutialu



**OFFICE OF RATEPAYER ADVOCATES  
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**PREPARED TESTIMONY  
ON THE APPLICATION AND  
SUPPLEMENTAL APPLICATION  
OF PACIFIC GAS & ELECTRIC COMPANY (U 902-E)  
FOR AUTHORITY TO IMPLEMENT  
THE ELECTRIC VEHICLE INFRASTRUCTURE AND  
EDUCATION PROGRAM**

San Francisco, California  
November 30, 2015

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**List of ORA Witnesses and Sponsored Chapters**

| <b>Chapter Number</b> | <b>Description</b>   | <b>Witness</b>   |
|-----------------------|--|------------------|
| 1                     | Executive Summary  | Rajan Mutialu    |
| 2                     | PG&E Phase 1 EV Infrastructure Program Size And Length                         | Jose Aliaga-Caro |
| 3                     | PG&E Phase 1 EV Infrastructure Program Anti-Competitive Impacts                | Anand Durvasula  |
| 4                     | PG&E Phase 1 EV Infrastructure Program Marketing Education And Outreach (ME&O) | Rajan Mutialu    |
| 5                     | PG&E Phase 1 EV Infrastructure Program Costs And Siting                        | Rajan Mutialu    |

1 **CHAPTER 1**

2 **(Witness - Rajan Mutialu)**

3 **I. EXECUTIVE SUMMARY**

4 In its Electric Vehicle (EV) Infrastructure Program (EV Program) application, Pacific  
5 Gas and Electric Company (PG&E) proposed to deploy 25,000 Level 2 Alternating Current (L2)  
6 EV chargers and 100 Direct Current Fast Chargers (DCFCs) at approximately 2,600 sites in its  
7 service territory.<sup>1</sup>

8 In September 2015, the Assigned Commissioner and Administrative Law Judges (ALJs)  
9 issued a scoping memo and ruling (Ruling) directing PG&E to restructure its EV Program into  
10 two phases – Phase 1 as a pilot program and Phase 2 as the full-scale program – and file a  
11 Supplemental Application to only address Phase 1. This testimony addresses Phase 1 of PG&E’s  
12 EV Program.<sup>2</sup> In response to the Ruling, PG&E proposed two programs for Phase 1: (1) a  
13 “compliant” proposal that plans to install 2,510 charging stations over 24 months from the date  
14 of initial deployment and including 18 months of data collection.<sup>3</sup> PG&E estimates the capital  
15 costs and expenses of the Compliant Proposal to be \$70 million and \$17 million, respectively<sup>4</sup>;  
16 and (2) an “Enhanced” Proposal that would install, collect and analyze data from 7,530 charging  
17 stations over a 36 month period from the date of initial deployment, including 30 months of data  
18 collection.<sup>5</sup> PG&E estimates the capital costs and expenses of the Enhanced Proposal to be \$187  
19 million and \$35 million, respectively.<sup>6</sup>

20 Both proposals raise significant issues regarding ownership and competition; EV siting  
21 and marketing; education and outreach (ME&O); and EV infrastructure performance and  
22 reporting. ORA recommends the Commission reject the Enhanced Proposal because its scale

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<sup>1</sup> PG&E Testimony, Chapter 2, pp. 2-4, 2-5.

<sup>2</sup> Joint Assigned Commissioner and Administrative Law Judges’ Scoping Memo and Ruling, p. 9.

<sup>3</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p. 1.

<sup>4</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p. 4.

<sup>5</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p. 1.

<sup>6</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p. 4.

1 and ratepayer funded infrastructure may discourage competition in the EV charging market.  
2 ORA recommends the Commission (1) adopt PG&E’s Compliant Proposal with ORA’s  
3 modifications listed below and (2) clarify issues raised in both the Compliant and Enhanced  
4 Proposals to reduce uncertainty and potentially anti-competitive effects.

5 ORA’s Proposal for PG&E’s Phase 1 EV Infrastructure Program includes the following  
6 elements:

7 **Size, Ratepayer Funding, Ownership and Competition**

- 8 • PG&E should deploy no more than 2,500 EV charging stations;
- 9 • Ratepayer funding will be limited to the make-ready portion of the EV  
10 infrastructure;
- 11 • PG&E shareholders should pay for PG&E-owned charging stations. PG&E  
12 should be limited to owning 20% of the EV charging stations that are  
13 deployed during Phase 1; and
- 14 • If the Commission authorizes PG&E to own EV charging stations, then the  
15 Commission should conduct a study to examine the impact of PG&E’s Phase  
16 1 EV Program on electric vehicle service provider (EVSP) market share and  
17 competition.

18 The Commission should clarify the following issues raised in PG&E’s Compliant and  
19 Enhanced Proposals:

20 **EV Infrastructure Siting and Marketing Education and Outreach (ME&O)**

21 ORA recommends the Commission:

- 22 • Define the role of PG&E and electric vehicle service providers (EVSPs) in  
23 ME&O efforts (i.e. contacting customers, arranging site visits, utilizing  
24 communication channels for outreach, etc.); and
- 25 • Define specific marketing, education and outreach guidelines to prevent  
26 PG&E from unfairly competing in the EV charging marketplace.

27 **Charging Station Siting**

28 ORA recommends the Commission:

- 29 • Set guidelines for PG&E, EVSP and site host engagement in  
30 controlling access to EV charging stations as a prerequisite for  
31 enrollment in the Phase 1 program;
- 32 • Require that site hosts submit a load management plan, including  
33 defining a process for PG&E and EVSP promotion of off-peak  
34 charging behavior;

- 1 • Set guidelines for PG&E to ensure that an adequate number of EV  
2 charging stations are deployed in each service locations (i.e. multi-  
3 unit dwellings (MuDs), workplaces, disadvantaged communities); and
- 4 • Set guidelines for how PG&E will address the issue of free ridership  
5 (i.e. minimizing the potential for PG&E to install charging stations at  
6 sites where EVSPs had targeted charging station deployment) and  
7 additionality (i.e. maximizing the number of charging stations that  
8 PG&E installs that is above and beyond those installed by EVSPs).

9 **Performance Measurement**

10 ORA recommends the Commission:

- 11 • Require PG&E to develop a load management plan, including defining  
12 a process for PG&E and EVSP promotion of off-peak charging  
13 behavior.

14

15 **Regulatory Process for Transition from Phase 1 to Phase 2 and Cost Recovery**

16

17 ORA recommends the Commission:

- 18 • After a six to eight month period required for contract negotiation with  
19 site hosts, permit PG&E to deploy 2,500 EV charging stations for  
20 approximately 20 months and collect, analyze and evaluate EV  
21 Program data for an additional 16 months.
- 22 • If PG&E does not install a minimum 1,500 charging stations within 18  
23 months, the Commission and stakeholders should pause PG&E's  
24 charging station deployment and review the program's cost, design  
25 and implementation assumptions.
- 26 • If PG&E has installed the minimum 1,500 charging stations during  
27 the 18 months period, the Commission should permit PG&E to install  
28 the remainder of charging stations up to the Phase 1 cap of 2,500 EVs.
- 29 • The Commission should then authorize PG&E to collect, analyze, and  
30 evaluate data until 36 months has expired from the time of initial  
31 charging station deployment; and
- 32 • Utilize a Balancing Account to account for Phase 1 costs that are at or  
33 below the Phase 1 budget cap and a Memorandum Account to record  
34 and track any costs that exceed the Phase 1 cost cap. The Commission  
35 approval of these excess costs would be subject to a reasonableness  
36 review.

1                   **CHAPTER 2 - PG&E PHASE 1 EV INFRASTRUCTURE AND EDUCATION**  
2   **PROGRAM SIZE AND LENGTH**

3   **(Witness - Jose Aliaga-Caro)**  
4

5                   ORA recommends that the Commission:

- 6                   • Reject PG&E’s Enhanced Proposal;
- 7                   • After a six to eight month period required for contract negotiation with site  
8                   hosts, permit PG&E to deploy 2,500 EV charging stations for approximately  
9                   20 months and collect, analyze and evaluate EV Program data for an  
10                  additional 16 months. If PG&E does not install a minimum 1,500 charging  
11                  stations within 18 months the Commission and stakeholders should pause  
12                  charging station deployment and review the program’s cost, design and  
13                  implementation assumptions. If PG&E has installed the required number of  
14                  stations at this time, the Commission should permit PG&E to install the  
15                  remainder of charging stations up to the Phase 1 cap. The Commission should  
16                  then authorize PG&E to collect, analyze, and evaluate data until 36 months  
17                  has expired from the time of initial charging station deployment; and
- 18                  • Utilize a balancing account mechanism to account for Phase 1 costs that are at  
19                  or below the Phase 1 budget cap and a memorandum account to record and  
20                  track costs that exceed the budget cap by 10% and subject to reasonableness  
21                  review. If the costs exceed 10% of the Phase 1 cap, PG&E should file an  
22                  application. The Commission approval of these excess costs would be subject  
23                  to a reasonableness review.

24  
25   **II. THE SCALE OF PG&E’S PHASE 1 ENHANCED PROPOSAL IS NOT**  
26   **REQUIRED TO TEST THE EV PROGRAM’S COST AND DESIGN**  
27   **ASSUMPTIONS**

28                  As stated earlier, PG&E submitted two EV infrastructure deployment options, the  
29   Compliant and Enhanced Proposals, in filed Supplemental Testimony. Table 1 below compares  
30   the size of the program, deployment period, length of data collection and cost. Both proposals  
31   include a “bridge funding” transition mechanism<sup>7</sup> “to minimize market uncertainty and  
32   discontinuity during the Phase 2 commission review period.”<sup>8</sup>

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<sup>7</sup> PG&E proposes a “bridge funding” mechanism to fund EV Program activities between the termination of Phase 1 and the initiation of Phase 2, if the Commission has not rendered a Phase 2 decision before the end of Phase 1. PG&E claims it will file a Tier 2 Advice Letter at least three months before the end of Phase 1 and request to “continue deployment of charging stations at a deployment and expenditure rate that is no faster and no greater than the average monthly rate of deployment and costs recorded during the six months preceding the end of Phase 1.” PG&E Supplemental Testimony, p. 6.

<sup>8</sup> PG&E Supplemental Testimony, p. 1.

1

**Table 1. PG&E Phase 1 EV Program Compliant and Enhanced Proposals**

|  | Phase 1 Compliant Proposal   | Phase 1 Enhanced Proposal  |
|--|--|--|
| Number of Charging Stations <sup>9</sup>             | 2510<br>(2460 L2 and 50 DCFC)  | 7530<br>(7430 L2 and 100 DCFC)   |
| Deployment Period <sup>10</sup>                      | 24 months from the date of first construction  | 36 months from the date of first construction  |
| Length of Data Collection and Analysis <sup>11</sup> | 18 months  | 30 months  |
| Data Collection <sup>12</sup>                        | Quarterly. In line with requirements in SCE's Charge Ready and Market Education SDG&E's Vehicle Grid Integration Pilot Settlement Agreements | Quarterly. In line with requirements in SCE's Charge Ready and Market Education SDG&E's Vehicle Grid Integration Pilot Settlement Agreements |
| Capital Cost   | \$70 million   | \$187 million  |
| Expenses   | \$17 million   | \$35 million   |
| Transition Mechanism from Phase 1 to Phase 2         | Bridge funding   | Bridge funding   |

2

3 PG&E’s Enhanced Proposal is not the most cost-effective and efficient means to test the  
4 hypothesis that an increase in charging stations will increase EV ownership. Instead, PG&E  
5 should use a pilot scale program. Generally, 10% of the number of items to be deployed in a  
6 full-scale program is the recommended size for a pilot.<sup>13</sup> The Assigned Commissioner and ALJs  
7 supported this view when they ruled that PG&E should file a Supplemental Application with a  
8 plan to deploy 10% (or 2,510 charging stations) of the number of charging stations as proposed

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<sup>9</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p.1.

<sup>10</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p.1.

<sup>11</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p.1.

<sup>12</sup> Pacific Gas and Electric Company’s Supplement to Application Pursuant to Joint Assigned Commissioner and Administrative Law Judge’s Scoping Memo and Ruling p.33.

<sup>13</sup> Conducting Pilot Studies. Excerpts adapted from: Simon, M.K. (2011). Dissertation and scholarly research: Recipes for success (2011 Ed.) Seattle, WA: Dissertation Success, LLC.

1 in PG&E’s original application. Instead of being responsive to the Assigned Commissioner and  
2 ALJ, PG&E filed both a Compliant Proposal and what it calls an “Enhanced Proposal.” The  
3 Compliant Proposal was responsive to the criterion set forth for a Phase 1 pilot size in the  
4 Scoping Memo and Ruling. ORA supports the scale of PG&E’s Compliant Proposal since it is  
5 resembles a pilot scale EV infrastructure program and meets the Commission’s mandate as  
6 specified in the ALJ Scoping Memo and ruling.

7 In contrast, PG&E’s Enhanced Proposal targets the deployment of 30% (or 7,530  
8 charging stations) of the charging stations in PG&E’s original application. The scale of this  
9 Phase 1 proposal does not mirror that of other EV infrastructure pilots designed to increase EV  
10 adoption while minimizing the time and cost required to obtain lessons learned to inform a full-  
11 scale deployment of charging stations.<sup>14</sup> For example, SCE’s Charge Ready and Market  
12 Education Program pilot intends to deploy only 1,500 charging stations in Phase 1 and utilize  
13 lessons learned for the potential deployment of 28,500 charging stations in Phase 2.<sup>15</sup> The ratio  
14 of SCE’s Phase 1 to Phase 2 charging stations is 5%. Kansas City Power and Light Co.  
15 (KCPLC)<sup>16</sup> plans to build three to five charging stations at 225 locations.<sup>17</sup> At most, this would  
16 amount to 1,125 charging stations, which is approximately 5% of the total build out. Pilot scale  
17 sizing of PG&E’s Phase 1 EV Program will test the mantra “if you build it they will come” while  
18 minimizing the risk of investment in large-scale ratepayer programs that may yield stranded or  
19 underutilized assets. In addition, PG&E’s Compliant Proposal, which aims to deploy a limited  
20 but sufficient number of EV charging stations to test Phase 1 cost and design assumptions, can  
21 (1) test customer recruitment and siting methodologies, among other parameters to increase the  
22 likelihood of Phase 2 success and (2) yield solutions to deployment barriers, including the cost or  
23 aesthetic appeal of EVs in comparison to internal combustion vehicles or non-cost siting barriers  
24 including the ability to sign easements with site hosts. Without identifying how to address cost  
25 and design concerns and surmount barriers, EV charging station deployment projections will not

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<sup>14</sup> 30% = 7,530 L2 chargers and DCFCs targeted for deployment in the Enhanced Proposal/25,100 L2  
chargers and DCFCs targeted for deployment in PG&E’s original application. citation

<sup>15</sup> A.14-10-014.

<sup>16</sup> KCPLC is a unit of Great Plains Energy Inc. with more than 800,000 customers in western Missouri  
and eastern Kansas.

<sup>17</sup> “In Kansas City, utility bets big on EV charging network.” Energy Wire. January 29, 2015.

<http://www.midwestenergynews.com/2015/01/29/in-kansas-city-utility-bets-big-on-ev-charging-network/>

1 be met and GHG reduction targets will not be reached.

2 Commission approval of PG&E's Compliant Proposal with ORA's modifications would  
3 also permit the Commission to obtain a preliminary assessment of the potential effect of PG&E's  
4 program on competition in the EV charging market, without destroying or severely impeding  
5 competition. If the Commission were to adopt PG&E's Enhanced Proposal, PG&E would install  
6 three times the number of charging stations that would have been deployed in the Compliant  
7 Proposal scenario required by the Ruling.

8 The scale of PG&E's Enhanced Proposal may have a higher potential for anti-  
9 competitive impacts, free ridership<sup>18</sup>, and lack of additionality.<sup>19</sup> For example, as the number of  
10 ratepayer funded EV Program charging stations increases, there is a greater potential for EVSP  
11 market share to be decreased, thereby decreasing competition. In addition, there will be an  
12 increased number of ratepayer funded charging stations for additional customers that would have  
13 signed contracts with EVSPs in the absence of PG&E's EV Program. In essence, the EV  
14 Program would result in deployment of charging stations at locations where there is current  
15 demand that would be met by EVSPs. This would lead to an increased degree of free ridership.

16 While ORA agrees with PG&E that it is important to collect and analyze data related to  
17 charging behavior during different seasonal periods, PG&E has not demonstrated the necessity  
18 of gathering data over a period of two spring and summer periods. Findings from this effort  
19 should illuminate how moderation of EV charging can beneficially impact the grid and  
20 potentially aid as a strategy in mitigating overgeneration. If PG&E applies the EV charging  
21 station deployment rate in the Enhanced Proposal, twice the rate of charging station deployment  
22 in the Compliant Program, PG&E could deploy approximately 2,500 charging stations in 20  
23 months.<sup>20</sup> A 36-month Phase 1 pilot (including periods required to deploy EV charging stations  
24 and collect and analyze data) would permit PG&E to collect data from 2,500 charging stations  
25 for 16 months (one year and one quarter). If this scheduled rate of EV charging station  
26 deployment occurs, PG&E can gather two years' worth of data from approximately 1,000

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<sup>18</sup> Free ridership in the EV charging market would occur if site hosts would have opted to install EV charging stations regardless of the availability of a ratepayer funded EV infrastructure program.

<sup>19</sup> Additionality is established when a new EV infrastructure program results in site host enrollment that is above and beyond what would have occurred in the presence of current EV market providers.

<sup>20</sup> Figure 2 EV Infrastructure Deployment Plan – Enhanced Proposal - PG&E Supplemental Testimony p.11

1 charging stations, given that 1000 charging stations are expected to be installed within 12  
2 months.

3 PG&E suggests that deployment of more charging stations and for a longer period of time  
4 would naturally lead to robust data. However, increasing the size and duration of Phase 1 would  
5 not necessarily lead to this result if there are no specific requirements to specify that a minimum  
6 number of charging stations should be deployed in each location type. In addition, a larger pilot  
7 could potentially lead to a greater degree of stranded costs if charging station utilization is not  
8 high. Therefore, ORA recommends that the Commission adopt the Compliant Proposal with  
9 minor modifications, as detailed herein by ORA, and reject the Enhanced Proposal.

10 With respect to collection of data from two summers and two winters based on the Phase  
11 1 results, ORA suggests that this could be a question posed and answered during Phase 2. The  
12 primary questions to be posed during Phase 1 should be:

- 13 • What are the barriers that prevent charging station installation in each location  
14 type?
- 15 • What are the solutions that must be implemented to surmount these barriers?
- 16 • What ME&O tactics should be employed to maximize enrollment in the EV  
17 Program?
- 18 • How will PG&E and the EVSPs work in concert to maximize utilization of  
19 charging stations?
- 20 • How will data be collected and reported to permit the Commission and  
21 stakeholders to accurately evaluate the effectiveness of the EV Program?

22 Finally, ORA does not support PG&E's Enhanced Program assertion that the  
23 Commission's adoption of the Compliant Proposal would impair the ability to meet the  
24 Governor's goal to place 1.5 million vehicles on California roads by 2020 and the mandates of  
25 SB 350. Conversely, if the Compliant Proposal is implemented correctly with adherence to  
26 specific requirements (i.e. ensuring that an adequate number of charging stations are deployed  
27 within specific location types: workplaces, MuDs, and public sites) the lessons learned will  
28 inform the deployment of a potential Phase 2. Since the purpose of Phase 2 will be to install the  
29 remainder of the charging stations that comprise the entire EV Program (i.e. 25,000 charging  
30 stations), the details of the cost and design assumptions need to be as clear as possible. Installing  
31 additional ratepayer-funded charging stations beyond the number required to obtain information  
32 to modify Phase 2 design assumptions could result in stranded costs an impair competition in the

1 EV market. The absence of competition could further prevent the EV Program from meeting the  
2 policy goals outlined in SB 350.

3 **III. PG&E SHOULD NOT BE PERMITTED TO UTILIZE A BRIDGE**  
4 **FUNDING MECHANISM TO FUND CHARGING STATION**  
5 **DEPLOYMENT DURING THE INTERIM PERIOD BETWEEN THE**  
6 **TERMINATION OF PHASE 1 AND THE INITIATION OF PHASE 2**

7 The Commission should deny PG&E’s proposal to use a bridge funding mechanism. If  
8 the Commission authorizes PG&E to continue to receive ratepayer funds to deploy charging  
9 stations during the interim period between the termination of Phase 1 and the initiation of Phase  
10 2 without a decision providing guidance on Phase 2, then EV charging station deployment may  
11 not be effective during this interim period.

12 ORA recommends that instead of employing the bridge funding mechanism, the  
13 Commission should order PG&E to submit Supplemental Testimony that includes lessons  
14 learned from the Phase 1 pilot. The Commission could then render a decision that will include  
15 guidelines for a Phase 2 roll out of charging stations. PG&E would not begin Phase 2 until the  
16 Commission issues its decision. This structure would provide stakeholders an opportunity to  
17 learn about deploying EV charging infrastructure before making a larger investment of ratepayer  
18 funds. Furthermore, this approach will permit the Commission to set the standards for Phase 2  
19 based on Phase 1 results and prior to their implementation in Phase 2 and ensure that PG&E’s  
20 EV Program will not have a chilling effect on the EV charging market

21 **IV. THE COMMISSION SHOULD ESTABLISH A BALANCING ACCOUNT**  
22 **MECHANISM TO ACCOUNT FOR PHASE 1 RECORDED COSTS**  
23 **BELOW THE BUDGET CAP AND A MEMORANDUM ACCOUNT FOR**  
24 **COSTS THAT ARE ABOVE THE BUDGET CAP SUBJECT TO**  
25 **REASONABLENESS REVIEW AND COSTS IN EXCESS OF THE 10%**  
26 **CAP SHOULD BE IN AN APPLICATION FILED WITH THE**  
27 **COMMISSION**

28 In order to record and track all capital costs and expenses during Phase 1, ORA  
29 recommends the Commission require PG&E to establish and utilize a balancing account  
30 mechanism to account for Phase 1 costs that are at or below the Phase 1 budget cap.  
31 Furthermore, the Commission should require PG&E to establish a memorandum account to  
32 record and track any Phase 1 costs that exceed the budget for Phase 1. In the event that PG&E’s  
33 recorded costs in the memorandum account are above 10% of the budget cap, the Commission

- 1 should require PG&E to file an application to recover these costs. This process will ensure that
- 2 the Commission adequately reviews this excess cost for reasonableness before approval.

1                   **CHAPTER 3 - PG&E PHASE 1 EV INFRASTRUCTURE AND EDUCATION**  
2                                   **PROGRAM ANTI-COMPETITIVE IMPACTS**

3   **(Witness - Anand Durvasula)**

4  
5                   The Commission should adopt the following provisions:

- 6                   • Ratepayer funds should be utilized to fund only the “make-ready” portion of  
7                                   the EV infrastructure.
- 8                   • PG&E should only be allowed to own no more than 20% of the EV charging  
9                                   stations deployed in Phase 1. PG&E should use shareholder funding if they  
10                                  opt to own charging stations.
- 11                  • If the Commission authorizes PG&E to own EV charging stations, then the  
12                                  Commission should initiate a study examining the impact of PG&E’s Phase 1  
13                                  EV Program on electric vehicle service provider (EVSP) market share and  
14                                  competition.

15   **I.        INTRODUCTION**

16                  Decision (D.) 14-12-079<sup>21</sup> states that the Commission will examine the potential  
17                  competitive impacts of any proposed utility program as part of a balancing test intended to weigh  
18                  the benefits of utility ownership of PEV fueling infrastructure against the potential competitive  
19                  limitation associated with that ownership.<sup>22</sup> ORA recommends that the Commission reject the  
20                  ownership structure proposed in PG&E’s Phase 1 EV Program because the ownership structure  
21                  proposed by PG&E, coupled with the inherent utility advantages that PG&E possess, are likely  
22                  to have a significant anti-competitive impact on the nascent EVSE market.

23   **II.        RATEPAYER FINANCING OF PG&E’S EV PROGRAM GRANTS PG&E**  
24                                   **AN UNFAIR ADVANTAGE IN THE EVSP MARKET THAT MAY LEAD**  
25                                   **TO AN ANTI-COMPETITIVE MARKET**

26                  Ratepayer financing of its charging stations gives PG&E an unfair advantage in the  
27                  EVSP business market because. Unlike other privately owned businesses, PG&E does not have  
28                  to take the same degree of financial risk or pay for financing. PG&E takes little to no financial  
29                  risk when it uses ratepayer funds to start a large scale EVSP business such as PG&E’s Enhanced

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<sup>21</sup> D.14-12-079, Phase 1 Decision Establishing Policy to Expand the Utilities’ Role in Development of Electric Vehicle Infrastructure.

<sup>22</sup> D.14-12-079, pp. 5-8.

1 Proposal to install 7,530 charging stations.<sup>23</sup> This advantage will operate to drive away potential  
2 market players.

3 In M. Lee (Radio Paging Co.), the Commission stated “(t)here can be no doubt that  
4 competition is a relevant factor in weighing the public interest.”<sup>24</sup> Therefore, the Commission  
5 must consider the anti-competitive aspects of PG&E’s application on the market for electric  
6 vehicle supply equipment. Public Utilities (Pub. Util.) Code Section 240.3 requires that the  
7 Commission “ensure that the utilities do not unfairly compete with nonutility enterprises”; while  
8 this provision does not prevent the utilities from competing at all, it does require a standard of  
9 fair competition in the relevant market.<sup>25</sup> PG&E could more fairly compete with other EVSPs by  
10 investing shareholder dollars into the EV Program to recover charging station (kiosk, pedestal  
11 and charger) costs.

12 An article on EVSP Markets distortions states that “in pursuit of market dominance,  
13 EVSP networks have created subscriber services and have vertically integrated and branded  
14 charging stations with network services.”<sup>26</sup> According to this description, PG&E is placing itself  
15 in a position of market dominance as it plans to own the entire infrastructure necessary to  
16 provide EV charging stations under this proposal.

17 PG&E claims that it will not directly compete with EVSE market participants since it will  
18 be procuring products and services from them.<sup>27</sup> According to PG&E, these EVSE market  
19 participants are in direct competition with each other in the EVSE/EVSP market.<sup>28</sup> PG&E also  
20 claims that it will not be directly operating EV charging stations or network facilities to support  
21 them.<sup>29</sup>

22 Since PG&E’s role is to own the EV charging stations and the EVSP’s role is to sell  
23 electricity directly to EV drivers, PG&E states that it facilitates competition in the EV charging

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<sup>23</sup> PG&E Supplement p. 2.

<sup>24</sup> M. Lee (Radio Paging Co.) (1966) 65 Cal. P.U.C. 635, 640 and fn. 1.

<sup>25</sup> California Pub. Util. Code Section 240.3

<sup>26</sup> Matute, J. and Peterson, D. “Electric Vehicle Service Provider Networks and Market Distortions.”  
EVS26 International Battery, Hybrid and Fuel Cell Electric Vehicle Symposium. Los Angeles, California,  
May 6-9, 2012.

<sup>27</sup> PG&E Supplemental Testimony, p. 22.

<sup>28</sup> PG&E Supplemental Testimony, p. 23.

<sup>29</sup> PG&E Supplemental Testimony, p. 23.

1 services market.<sup>30</sup> In addition, since EVSPs sell products and services throughout the United  
2 States and the world, PG&E states that the national and global marketplace should be the scope  
3 for analyzing potential anti-competitive impacts.<sup>31</sup>

4 In order to address anti-competitive impacts, ORA recommends that ratepayers should  
5 only fund the “make-ready” portion of the EV infrastructure (i.e. transformer-related costs,  
6 dedicated service drops, line extensions, electrical panels, construction related costs to install line  
7 extensions and electrical panels). If the Commission authorizes PG&E to own charging stations,  
8 then ORA further recommends that shareholder funds be utilized for the deployment of no more  
9 than 20% of the charging stations deployed during Phase 1. If PG&E owns only 20% of the  
10 charging stations, it would minimize the anti-competitive impact on the ability of EVSPs to  
11 negotiate contracts with potential EV Program customers.

12 **III. PG&E’S INHERENT ADVANTAGES AS AN INCUMBENT**  
13 **UTILITY COULD STIFLE THE DEVELOPMENT OF THE EVSE**  
14 **MARKET**

15 Given their historic role in producing and distributing electricity, utilities possess a  
16 number of inherent advantages over third-party companies in providing EV charging  
17 infrastructure. PG&E controls the location of the infrastructure that comprises the distribution  
18 system in its service territory and therefore will likely have access to information on prime  
19 charging locations. This existing knowledge of grid load and site load conditions gives PG&E a  
20 significant advantage in time and site assessment over nonutility enterprises, which in turn  
21 manifests itself as a cost advantage with regards to interconnection time.

22 PG&E possesses another inherent utility advantage: its pre-existing relationship with  
23 millions of captive customers, which endows PG&E with superior name and brand recognition  
24 that can be leveraged to advertise new services through website and bill insert capabilities, the  
25 cost of which would be covered by ratepayers. Furthermore, PG&E’s role in interconnecting EV  
26 charging stations to the distribution system coupled with access to customer billing ensures that  
27 PG&E would be the first point of contact for all customers interested in EV services. Beyond  
28 being the first point of contact for interested EV customers, PG&E’s role in interconnecting EV  
29 charging stations to the distribution system would also provide PG&E with greater access to

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<sup>30</sup> PG&E Supplemental Testimony, p. 23.

<sup>31</sup> PG&E Supplemental Testimony, p. 23.

1 confidential customer information that could be useful in proposing EVSE installation to current  
2 and potential EV customers.

3 Finally, and perhaps most important among the inherent advantages PG&E possess as an  
4 incumbent utility, is the ability to attain cost recovery from ratepayers for investments in EVSE  
5 infrastructure, thereby eliminating risk. Conversely, non-utility EVSPs will not have the ability  
6 to offer potential clients the cost savings resulting from participation in the EV Program. This  
7 ability coupled with guaranteed revenues from other electricity sales and embedded costs  
8 authorized in general rates could be leveraged to provide an anti-competitive advantage, as  
9 PG&E could rely on resources funded in rates such as customer outreach, contract development,  
10 engineering and cost estimation, engineering, procurement and construction oversight, and  
11 operations and servicing.

12 D.14-12-079 states that “[i]f the potential for the utility to unfairly compete is identified,  
13 the commission will determine if rules, conditions or regulatory protections are needed to  
14 effectively mitigate the anti-competitive impacts.”<sup>32</sup> PG&E’s use of ratepayer dollars to recover  
15 costs of investments in the EVSE market constitutes an anti-competitive advantage that cannot  
16 be effectively mitigated by a combination of rules, conditions or regulatory protections because  
17 third-party EVSE firms would have difficulty competing with a publicly subsidized entity.<sup>33</sup>  
18 Many third-party providers believe they could provide cheaper and more efficient EVSE  
19 services. These firms stress that a competitive marketplace will foster innovation and high-  
20 quality service.<sup>34</sup> For these reasons, the ownership model that PG&E presents in its EV Program  
21 is anti-competitive and may ultimately frustrate the innovation that private, independent third-  
22 party EVSE firms could bring to the nascent EVSE marketplace.

23 **IV. PG&E’S OWNERSHIP OF EVSE INFRASTRUCTURE COULD RESULT**  
24 **IN LIMITS ON CUSTOMER CHOICE OF EVSE PRODUCTS AND**  
25 **SERVICES**

26 The ownership structure in PG&E’s EV Program has the potential to crowd out third-  
27 party EVSE firms, limiting customer choice in EVSE products and services. Under this model,

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<sup>32</sup> D.14-12-079, p. 9.

<sup>33</sup> Jones, Kevin, and Zoppo David. A Smarter, Greener Grid. Santa Barbara: Praeger, 2014. Print. (115).

<sup>34</sup>

[http://www.fhwa.dot.gov/environment/climate\\_change/mitigation/publications\\_and\\_tools/pev\\_action\\_plan/page03.cfm#ednref30](http://www.fhwa.dot.gov/environment/climate_change/mitigation/publications_and_tools/pev_action_plan/page03.cfm#ednref30)

1 PG&E’s EV charging stations will be completely financed by ratepayers. Third party EVSE  
2 firms, on the other hand, must raise funds to compete. If these funds are not available, third-  
3 party EVSE firms may not be able to compete in locations in PG&E’s service territory where  
4 they may have previously contemplated operating. In such locations, PG&E could conceivably  
5 become the sole EVSE provider, which could potentially limit consumer choice and reduce the  
6 likelihood that new business models and innovations -- that could ultimately lower the total cost  
7 of PEV ownership and hasten adoption -- would be introduced.<sup>35</sup> PG&E ownership of either  
8 2,510 charging stations or 7,530 charging stations in the PG&E service territory area would  
9 create a formidable barrier to third parties who wish to enter the EVSE business that could be  
10 anti-competitive. Not only does utility ownership at this scale create a major disincentive for  
11 third parties to provide EVSE charging stations infrastructure in PG&E’s service territory, but  
12 also could discourage prospective customers from purchasing EVs by eliminating more  
13 competitive supply of EVSEs to the market. The Commission has stated “there can be no doubt  
14 that competition is a relevant factor in weighing the public interest,”<sup>36</sup> and customer choice is an  
15 essential component of competition.<sup>37</sup>

16 The Commission should reject PG&E’s Enhanced Program because the size of the  
17 program coupled with ratepayer financing of the program create unfair advantages, beyond the  
18 inherent advantages that PG&E possesses as an incumbent utility, that are likely to lead to an  
19 anti-competitive market.

20 **V. THE SIZE OF PG&E’S ENHANCED PROGRAM GRANTS PG&E AN**  
21 **UNFAIR ADVANTAGE IN THE EVSP MARKET THAT MAY LEAD TO**  
22 **AN ANTI-COMPETITIVE MARKET**

23 The size of the EV Enhanced Proposal may give PG&E an unfair advantage in the EVSP  
24 market, rendering the market anti-competitive. If the Commission approves PG&E’s Enhanced  
25 Proposal to own 7,500 charging stations, then PG&E may become the dominant EVSP in its  
26 service territory in what is still a nascent PEV charging station market. Three elements of the  
27 proposed EV Program —size, funding source, and ownership and rates—will give PG&E an

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<sup>35</sup> Jones, Kevin, and Zoppo David. *A Smarter, Greener Grid*. Santa Barbara: Praeger, 2014. Print. (115).

<sup>36</sup> M. Lee (Radio Paging Co.) (1966) 65 Cal. P.U.Code 635, 640 and fn.1.

<sup>37</sup> Giulietti, Monica, Catherine Waddams Price, and Michael Waterson. "Consumer Choice and Competition Policy: A Study of UK Energy Markets." *The Economic Journal* 115.506 (2005): 949-968.

1 unfair advantage over third-party EVSPs. These EV Program features may allow PG&E to  
2 overwhelm the market with PG&E owned charging stations.

3 PG&E referenced data from PlugShare Data® indicating that at least 15 different entities  
4 operate charging stations and/or provide EV charging services to EV drivers and site hosts in  
5 California as of 2014.<sup>38</sup> Based upon this data, PG&E’s program would be entering a competitive  
6 market.

7 Based upon projections of EVSE requirements in the San Francisco Bay Area, PG&E’s  
8 Program would represent a significant portion of the EV market share in its service territory.  
9 According to PG&E estimates, 3,100 EV charging stations were present when its original  
10 Application was filed in February 2015.<sup>39</sup> If PG&E were to install 2,510-7,530 additional EV  
11 charging stations by 2020, as outlined in the Compliant and Enhanced Proposals, PG&E’s  
12 Program could represent a significant portion of the EV charging market depending upon the  
13 growth rate of non-IOU owned EV chargers.

14 PG&E states that the Enhanced Proposal it has put forward is justified in order for the  
15 state to achieve the Governor’s goal for EV infrastructure deployment.<sup>40</sup> However, if the  
16 Commission approves PG&E’s EV Program, then PG&E will likely be the dominant EVSP in its  
17 service territory, crowding out third-party EVSPs. PG&E attempts to calculate the potential  
18 market concentration effect of their program by utilizing the Herfindahl-Hirschman Index  
19 (HHI)<sup>41</sup> however, this computation fails to consider the effect that PG&E’s ratepayer funded  
20 model would have on the market. By merely relying on PlugShare Data, PG&E fails to take into  
21 consideration the impact that their proposed ratepayer funded model would have on the third-  
22 party market for EVSPS, namely an inability to compete for the aforementioned reasons.  
23 Therefore, this argument that PG&E’s EV Program would not constitute an unfair advantage in  
24 the EVSE market has no merit.

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<sup>38</sup> PG&E Supplemental Testimony p. 22.

<sup>39</sup> PG&E Testimony, Chapter 1, pp. 1-9.

<sup>40</sup> PG&E Supplement p. 24.

<sup>41</sup> Id.

1                   **CHAPTER 4 - PG&E PHASE 1 EV INFRASTRUCTURE AND EDUCATION**  
2                   **PROGRAM MARKETING EDUCATION AND OUTREACH (ME&O)**

3                   **(Witness - Rajan Mutialu)**

4                   The Commission should adopt the following provisions:

- 5                   • Define the role of PG&E and EVSPs in contacting customers,  
6                   arranging site visits with site hosts, and utilizing communication  
7                   channels for outreach.
- 8                   • Define specific marketing, education and outreach guidelines to  
9                   prevent PG&E from unfairly competing in the EV charging  
10                  marketplace.

11 **I. PG&E SHOULD WORK WITH EV DEALERS AND EV**  
12 **COORDINATING COUNCILS TO ACCESS NEW AND POTENTIAL EV**  
13 **DRIVERS**

14                  PG&E asserts that it will engage in targeted outreach to areas that have high EV adoption  
15 rates, large population centers, and property management firms that manage a portfolio of  
16 workplace or MUD properties and businesses with multiple workplace sites.”<sup>42</sup>

17                  According to PG&E, its Energy Solutions and Services (ES&S) team will focus its  
18 outreach efforts initially on regions and governments that have developed Plug-in Electric  
19 Vehicle (PEV) Readiness Plans and formed local Plug-in Electric Vehicle Coordinating Councils  
20 (PEVCCs), previously funded by the California Energy Commission (CEC)<sup>43</sup>. PG&E claims  
21 that although these entities have conducted extensive planning for EV infrastructure, they  
22 frequently do not have dedicated funding to install EV charging stations. PG&E concludes that  
23 these regions are to participate in PG&E’s EV Program.<sup>44</sup>

24                  ORA supports PG&E’s strategy to focus its EV charging station deployment outreach  
25 activities in areas of high EV adoption rates, large population centers, and property management  
26 firms. However, if PG&E’s EV program is intended to provide EV charging infrastructure to  
27 new EV drivers or inspire potential EV drivers to purchase an EV, then PG&E must augment its  
28 current outreach strategy. ORA recommends that PG&E cooperates with the EV auto industry  
29 and EV dealers to provide training and information about the impact the PG&E EV Program

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<sup>42</sup> PG&E Testimony, Chapter 5, p. 5-4.

<sup>43</sup> PG&E Testimony, Chapter 5, p. 5-5.

<sup>44</sup> PG&E Testimony, Chapter 5, p. 5-5.

1 may have on the total cost of ownership. In addition, ORA further recommends that PG&E also  
2 work with the PEV Collaborative and PEVCCs to determine where future areas of EV ownership  
3 are likely to occur. Given the lag between the termination of Phase 1 and potential Commission  
4 approval of Phase 2 of the PG&E's EV Program, ORA strongly suggests forging this partnership  
5 in advance of a Phase 2 decision to enable PG&E to forecast where future EV demand may  
6 occur.

7 **II. THE COMMISSION SHOULD RESOLVE THE ROLE OF PG&E AND**  
8 **EVSPs IN MARKETING, EDUCATION AND OUTREACH ACTIVITIES**

9 According to PG&E, its Program Management Office (PMO) will work with PG&E's  
10 Energy ES&S team to identify potential MuD or workplaces site hosts. PG&E claims that ES&S  
11 teams are poised to support the EV Program, because they have:

- 12 • Provided advice and technical support on energy efficiency and demand side  
13 management programs for several years.
- 14 • Experience and strong relationships with non-residential customers to educate  
15 potential site hosts about (1) EV Program objectives and requirements (2)  
16 utilizing charging stations to attract and retain employees or tenants (3) costs  
17 and benefits of owning and driving EVs and (4) how EVs help California  
18 meet GHG emission reduction goals.<sup>45</sup>

19 PG&E will also partner with EV services partners to identify and attract interested and  
20 qualified site hosts.<sup>46</sup> The ES&S team will also target governments that have or are in the  
21 process of developing Climate Action Plans. Further, PG&E believes that governments will be  
22 eager to host EV charging stations as many governments have shown interest in deploying them,  
23 but lack the resources to install and operate charging stations.

24 PG&E claims that it will utilize its internal resources to conduct outreach to potential EV  
25 Program enrollees. PG&E also claims that it will work in conjunction with EVSPs in this  
26 process. Given that EVSPs may have already developed relationships with potential customers,  
27 this may result in conflicting business goals. For example, EVSPs will be partnering with PG&E  
28 to locate site host for enrollment in the EV Program while also attempting to recruit customers  
29 for its own service offerings. In addition, PG&E's EV Program may target areas where there are

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<sup>45</sup> PG&E Testimony, Chapter 5, p. 5-4.

<sup>46</sup> PG&E Testimony, Chapter 5, p. 5-5.

1 minimal cost burdens (i.e. urban, suburban, or rural areas and not super-urban or congested  
2 areas)<sup>47</sup>. This strategy could result in an unintended consequence. Customers in geographic  
3 locations where cost burdens are high will not benefit from a ratepayer funded EV Program. It is  
4 also conceivable that super-urban areas have demographic statistics that indicate a high interest  
5 in EV ownership if charging stations were available.

6 Based upon the potential consequences of PG&E and EVSPs engaging in ME&O efforts,  
7 ORA recommends that the Commission schedule a workshop prior to the initiation of the EV  
8 Program to permit PG&E and all interested stakeholders to define specific roles in these efforts.  
9 If this is not accomplished, then there is the potential for EVSP market share to be impacted and  
10 for specific customers (e.g. super urban customers) to not have access to charging stations.

11 **III. THE COMMISSION SHOULD REQUIRE PG&E TO UTILIZE METRICS**  
12 **TO DETERMINE THE EFFECTIVENESS OF TARGETED AND BROAD**  
13 **MARKETING EFFORTS**

14 PG&E suggests a two pronged approach to provide messaging to potential EV Program  
15 enrollees. One element of this approach is targeted marketing to site hosts that will include  
16 direct mail, e-mail and bill inserts.<sup>48</sup> In addition, PG&E claims that it will utilize newsletters,  
17 pay statement inserts and e-mail templates for site hosts to inform EV drivers regarding the  
18 benefits of owning an EV.<sup>49</sup> The targeted market outreach may also include developing  
19 relationships with EV manufactures and local manufacturers.<sup>50</sup>

20 PG&E also plans to engage in broad outreach to encourage EV drivers to identify site  
21 hosts and attract new EV drivers into the market.<sup>51</sup> PG&E states it will utilize print  
22 advertisements in business and trade publications and in business related blogs, use search  
23 engine optimization to drive web advertisements in high traffic areas, and run radio  
24 advertisements that will include information on the EV Program and the benefits of EVs.<sup>52</sup>

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<sup>47</sup> PG&E Testimony, Chapter 3, p. 3-6.

<sup>48</sup> PG&E Testimony, Chapter 5, pp. 5-8, 5-9.

<sup>49</sup> PG&E Testimony, Chapter 5, p. 5-9.

<sup>50</sup> PG&E Testimony, Chapter 5, p. 5-9.

<sup>51</sup> PG&E Testimony, Chapter 5, p. 5-9.

<sup>52</sup> PG&E Testimony, Chapter 5, p. 5-9.

1 PG&E's EV Program will also include education and outreach (E&O) customer support  
2 tools that will augment or supplement those that currently exist. These tools will include on-line  
3 applications and additional webpages that are dedicated to workplace, MuD, public charging  
4 station hosts, EV fleet operators and potential EV drivers.<sup>53</sup> In addition, PG&E will also utilize  
5 the results of a 2014 pilot to develop an EV Ownership Comparison Tool Set that includes total  
6 cost of ownership, EV incentive, rate comparison, and range confidence tools.<sup>54</sup> Other E&O  
7 offerings include a call center that will provide information to site hosts and EV drivers  
8 regarding rate plans, the EV charger site installation process, among other EV Program  
9 activities.<sup>55</sup>

10 PG&E states that its E&O efforts will aim to meet site host-related objectives including:

- 11 • Identify and acquire sites to host EV charging stations;
- 12 • Conduct targeted outreach to educate businesses and encourage EV Program  
13 participation as a site host;
- 14 • Work with participating site hosts to maximize EV charger asset utilization by  
15 helping them attract employees and tenants who will use the EV charging  
16 stations at their workplace or homes through a variety of education and  
17 information programs;
- 18 • Provide online resources to educate site hosts about the best practices of  
19 installing and using EV charging stations; and
- 20 • Provide dedicated call center support for EV Program participants and for  
21 general questions about EV services.<sup>56</sup>

22 PG&E has also set E&O program objectives for drivers and the public that include the  
23 following:

- 24 • Provide online resources for drivers and the public to educate them about the  
25 best practices for using electricity as a transportation fuel.
- 26 • Develop interactive online tools that compare the cost of EV ownership to a  
27 traditional gasoline vehicle, identify available EV incentives, and map the  
28 location of EV charging stations.
- 29 • Provide dedicated call center support for EV drivers and for general questions

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<sup>53</sup> PG&E Testimony, Chapter 5, p. 5-11.

<sup>54</sup> PG&E Testimony, Chapter 5, pp. 5-12, 5-13.

<sup>55</sup> PG&E Testimony, Chapter 5, p. 5-14.

<sup>56</sup> PG&E Testimony, Chapter 2, pp. 2-9, 2-10.

1 about EV services.

- 2 • Conduct traditional targeted outreach such as search engine optimization,  
3 social media, and localized print ads to educate potential EV drivers  
4 throughout PG&E's service territory about the benefits of EV ownership and  
5 to inform them about the expanded EV charging infrastructure.
- 6 • Leverage PG&E's position as the trusted energy advisor for its large customer  
7 base to provide information and education about the benefits of using  
8 electricity as a transportation fuel and California's efforts to reduce GHG  
9 emissions by accelerating EV adoption.<sup>57</sup>

10 Given that ME&O programs are critical to the success of a potential Phase 2 EV  
11 Program, ORA recommends that the Commission set metrics to measure the success of its  
12 elements. For example, recording the number of website visits and identify areas customers  
13 researched, customers that contact call centers and reasons customers contacted the call center  
14 would provide the Commission and stakeholders with information regarding the effectiveness of  
15 PG&E and/or EVSP ME&O efforts.

16 In addition, ORA recommends the Commission require PG&E to conduct surveys to  
17 determine if the EV Program ME&O content that is communicated to customers via various  
18 marketing channels is effective. The metrics to measure effectiveness could be quantitative and  
19 qualitative in nature in order to obtain basic statistics (e.g. satisfaction with the program rated on  
20 a scale from 1 to 5) but also to obtain more detailed description of scenarios that could assist in  
21 the planning of future ME&O strategies. For example, PG&E should develop survey questions  
22 that identify if potential customers who were contacted actually enrolled in the EV Program or  
23 not. These surveys should highlight the reasons that led customers to either enroll or not enroll  
24 in the program and solicit feedback for improving ME&O efforts. The results should be shared  
25 with the ME&O working group, interveners, and the Commission in order to foster transparency.

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<sup>57</sup> PG&E Testimony, Chapter 2, p. 2-10.



1 increasing EV adoption. According to PG&E, 89 percent of respondents identified regular  
2 access to public charging and 71 percent of respondents indicated access to workplace charging  
3 as important for their EV purchase decision.<sup>59</sup> While PG&E’s study results may provide some  
4 insight into the need for public and workplace charging, PG&E does not make reference to the  
5 study’s sample size. Therefore, it is difficult to infer just from these study results the relative  
6 importance of public and workplace charging in relationship to home charging. As discussed  
7 later in this chapter, ORA emphasizes that home charging is a major factor in EV adoption.

## 8 **B. Geographic Factors**

9 Based upon results from a cost study, PG&E further suggested that charging stations  
10 would most likely be deployed in urban, suburban and rural neighborhoods versus in congested  
11 or super-urban sites. PG&E supports this contention based upon the variability in the cost to  
12 deploy charging stations in these areas. For example, PG&E points to historic cost data  
13 indicating that it is more expensive to install services in downtown San Francisco, a super-  
14 urban<sup>60</sup> location with approximately 17,000 people per square mile, than in a less-populated  
15 suburban neighborhood. PG&E also claims that working in super-urban environments often  
16 entails “longer construction duration, additional traffic management, increased coordination with  
17 other utilities and other agencies, costlier permitting conditions, increased site restoration costs,  
18 and restrictive construction time windows with increased mobilization and de-mobilization costs  
19 than in suburban or rural settings.”<sup>61</sup> PG&E estimates that 99% of charging stations will be  
20 deployed in urban, suburban, or rural locations (Table 2).

21 While ORA agrees with PG&E that super-urban neighborhoods may not be prime  
22 locations for charging station deployment, there is evidence that could refute PG&E’s  
23 assumption. For example, a MuD EV charging demonstration project has been deployed in a  
24 high-rise condominium complex in downtown San Francisco.<sup>62</sup> This project has been jointly  
25 managed by ChargePoint, the City of San Francisco, and REJ Electric. Therefore, it is

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<sup>59</sup> PG&E Testimony, Chapter 5, p. 5-3.

<sup>60</sup> For the purposes of this testimony, PG&E describes the term “super-urban” to designate heavily congested downtown environments. Examples of super-urban locations include downtown San Francisco and Oakland. PG&E Testimony, Chapter 3, p. 3-5.

<sup>61</sup> PG&E Testimony, Chapter 3, p. 3-6.

<sup>62</sup> Plug In Vehicle Charging Infrastructure Guidelines for Multi-Unit Dwellings, California Plug-In Electric Vehicle Collaborative, November 2013, p. 26.

1 conceivable that EV Program charging station deployment could be considered in super-urban  
 2 neighborhoods. PG&E’s assumptions regarding siting should not be taken at face value and ORA  
 3 recommends that geographic siting factors should be discussed in a Commission led workshop  
 4 prior to the initiation of the Phase 1 EV Program.

5 **Table 2. PG&E EV Program Geographic Siting Factors<sup>63</sup>**

6

7 **TABLE 3-1**

8 **PACIFIC GAS AND ELECTRIC COMPANY**

9 **EV PROGRAM GEOGRAPHIC FACTORS**

| Line No. | Geographic Factor by Pop. Density | Estimated % of EV Sites |
|----------|-----------------------------------|-------------------------|
| 1        | Super-Urban                       | 1%                      |
| 2        | Other (Urban/Sub-Urban/Rural)     | 99                      |
| 3        | Total                             | 100%                    |

10

11

12

13

14

15 **C. Physical Factors**

16 PG&E also asserts that it will utilize physical location factors to inform cost estimates for  
 17 siting of EV charging stations including:

- 18 • Ease of siting, permitting, construction, and restoration in  
 19 congested zones;
- 20 • Length of conductor for service drops from pole or riser to  
 21 transformer, and length of conduit to EV chargers based upon  
 22 technical requirements or customer needs;
- 23 • Site host requirements for additional parking spaces or chargers at  
 24 each site that can increase construction costs as well as incremental  
 25 electrical infrastructure to serve additional loads; and <sup>64</sup>
- 26 • Load estimates to determine if new or upgraded transformers will be needed to  
 27 support load at each site.<sup>65</sup>

<sup>63</sup> PG&E Testimony, Chapter 3, p. 3-6.

<sup>64</sup> PG&E Testimony, Chapter 3, p 3-6, 3-7.

<sup>65</sup> PG&E acknowledges that cost variability associated with meeting load conditions may necessitate an upgrade or replacement of the transformer. PG&E forecasts that approximately 40 percent of the transformers impacted by the EV Program may have to be replaced in order to accommodate the site load of the EV chargers.

1            Tables 3 and 4 show PG&E’s estimate that 80% of the charging stations will be deployed  
 2 at workplace or public sites and 40% of site installation will require a transformer upgrade or a  
 3 new transformer.

4  
 5            **Table 3. PG&E EV Program Physical Location Siting Factors – Location Type<sup>66</sup>**

| TABLE 3-2<br>PACIFIC GAS AND ELECTRIC COMPANY<br>EV STATION PHYSICAL LOCATION FACTORS |                                      |                            |                              |
|---|--------------------------------------|----------------------------|------------------------------|
| Line<br>No.   | Physical Location                    | Estimated % of<br>L2 Sites | Estimated % of<br>DCFC Sites |
| 1   | Outdoor Lot (MUD)                    | 16%                        | –                            |
| 2   | Parking Structure (MUD)              | 4                          | –                            |
| 3   | Outdoor Lot (workplace/public)       | 64                         | 100%                         |
| 4   | Parking Structure (workplace/public) | 16                         | –                            |
| 5   | Total                                | 100%                       | 100%                         |

15

<sup>66</sup> PG&E Testimony, Chapter 3, p.3-7.

1 **Table 4. PG&E EV Program Physical Location Siting Factors – Transformer Factors<sup>67</sup>**

| Line No. | Transformer Factors          | Estimated % of EV Sites |
|----------|------------------------------|-------------------------|
| 1        | New Transformer              | 1.0%                    |
| 2        | Upgrade Existing Transformer | 39.6                    |
| 3        | Use of Existing Transformer  | 59.4                    |
| 4        | Total                        | 100.0%                  |

(a) Transformer percentage allocations are based on projected load scenarios and a review of PG&E data on current service transformer loading percentages.

10 In order to enroll customers in the EV Program, PG&E states that it will identify and  
 11 contract with site hosts through the following process:

- 12 • Obtain easements to install, operate, and maintain EV infrastructure on their  
 13 property. Identify potential EV charger site hosts through customer outreach  
 14 initiatives and service channels;
- 15 • Educate interested communities and site hosts to help them determine if they  
 16 are good EV Program candidate; and
- 17 • Assist in the completion of a site host application to start the site host  
 18 validation process.<sup>68</sup>

19  
 20 ORA agrees with PG&E that the aforementioned physical factors may impact siting  
 21 costs. Earlier study findings have indicated that the labor required to install electrical wiring to  
 22 the EVSE can cost as much as the EVSE itself.<sup>69</sup> This finding has been echoed by the California  
 23 PEV Collaborative.<sup>70</sup> If an EV owner’s assigned parking space is located far from the electric  
 24 service access point siting costs will also increase.<sup>71</sup> In addition, since workplaces are expected  
 25 to have more capacity to host a higher number of EV charging spaces deployment costs may be  
 26 reduced in these locations.<sup>72</sup> Based upon the potential variability in siting costs associated with

<sup>67</sup> PG&E Testimony, Chapter 3, p. 3-9.

<sup>68</sup> PG&E Testimony, Chapter 2, p. 2-6.

<sup>69</sup> SF Bay Area Air Quality Management District (BAQMD) (2013). SF BAAQMD EV Readiness Plan.

<sup>70</sup> California Plug-In Electric Vehicle Collaborative, Plug-In Electric Vehicle Infrastructure Guidelines for Multi-Unit Dwellings November 2013, p.14.

<sup>71</sup> California Plug-In Electric Vehicle Collaborative, Plug-In Electric Vehicle Infrastructure Guidelines for Multi-Unit Dwellings November 2013, p.11.

<sup>72</sup> “Southern California Plug-In Electric Vehicle Readiness Plan” Pg. 50 UCLA Luskin Center.

1 these physical factors, ORA recommends these issues be addressed in a Commission led  
2 workshop prior to the initiation of the EV Program.

3 **II. SITE HOST SELECTION AND ENROLLMENT**

4 PG&E explains that once site hosts are selected, reviewed, and approved by the PMO, the  
5 EV service connection and supply infrastructure at each site will be designed and based on  
6 electric load, site-specific access, and other technical requirements. PG&E will then partner with  
7 prospective EV charging site hosts to acquire land use easements to house EV supply equipment  
8 and the required number of parking spaces for EVs.<sup>73</sup>

9 Although PG&E has estimated where EV Program charging stations are most likely to be  
10 deployed based upon location type and geographic and physical factors, PG&E claims that actual  
11 site locations where EV infrastructure and charging stations will be deployed will be determined  
12 as the EV Program continues.<sup>74</sup> While ORA recognizes that empirical data should be obtained  
13 from the EV Program regarding how and where charging stations are deployed, it is imperative  
14 that PG&E work with EVSPs to minimize free-ridership (i.e. scenarios where EV Program  
15 charging stations are deployed at locations where site hosts have indicated they would have  
16 signed contracts with EVSPs in the absence of the EV Program) and maximize additionality (i.e.  
17 scenarios where charging station deployment in the EV Program is incremental to the charging  
18 stations deployed by the EV charging services market.) Therefore, ORA recommends that the  
19 Advisory Committee develop strategies to address site selection methods in the context of these  
20 two important issues.

21 **III. PG&E SHOULD EMPHASIZE DEPLOYMENT OF CHARGING**  
22 **STATIONS IN MUDs**

23 According to Table 3, PG&E estimates that 80% of L2 chargers would be deployed in  
24 workplace or public locations. However, emphasizing the deployment of workplace charging  
25 stations may not be the most effective way to increase EV adoption because drivers may prefer  
26 to charge their vehicles at home. For example, a report by the EV Project states that 87% of  
27 charging events initiated by Chevrolet Volt drivers were at home while 13% occurred away from

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[http://www.scag.ca.gov/Documents/SCAG\\_PEV\\_Plan-Buildings\\_and\\_Retail\\_Owners.pdf](http://www.scag.ca.gov/Documents/SCAG_PEV_Plan-Buildings_and_Retail_Owners.pdf).

<sup>73</sup> PG&E Testimony, Chapter 3, p 3-3.

<sup>74</sup> PG&E Testimony, Chapter 3, p 3-6, Footnote 4.

1 home during the course of a 15-month study.<sup>75</sup> Another report by the EV Project that included  
2 participants with access to both work and home charging found only “14% of vehicles needed  
3 workplace charging to complete their daily commutes most of the time, 43% of vehicles needed  
4 it some of the time”.<sup>76</sup> This finding implies that away-from-home (including workplace)  
5 charging may not be as crucial as at-home charging as a charging resource.

6 In the Charge Ready and Market Education Settlement Agreement with SCE, TURN and  
7 ORA advocated that Multi-Unit Dwellings (“MuDs”) should be the focus of utility-run EV  
8 infrastructure programs like Charge Ready.<sup>77</sup> SCE states that TURN cited studies that emphasize  
9 the importance of home charging while ORA cited studies that highlight the possibility of  
10 increased battery range.<sup>78</sup> As a result of ORA’s and TURN’s input, the Settlement Agreement  
11 provides greater rebates to MuD site hosts. This policy direction recognizes the importance of  
12 charging station deployment in MuDs.

13 PG&E proposes to deploy DCFCs for EV drivers that live in MuDs that do not have  
14 access to charging stations. ORA supports a limited deployment of DCFCs that reflects a 10%  
15 of the total number proposed in PG&E’s original EV application (i.e. 10 DCFCs). Data obtained  
16 from these charging stations should show if DCFCs will alleviate charging barriers in specific  
17 geographic areas (e.g. super urban residential sites). This program should only supplement and  
18 not supplant PG&E’s effort to deploy L2 charging stations in MuDs. ORA would like to  
19 reemphasize the point that PG&E should seriously consider the importance of at-home charging  
20 as a key factor during Phase 1 EV Program EV charging station deployment. If EV Program  
21 report findings highlight that home charging is found to be essential then the Commission should  
22 direct PG&E in a Phase 2 decision to reconfigure the proportion of charging stations deployed in  
23 residential locations accordingly.

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<sup>75</sup> “What Kind of Charging Infrastructure Do Chevrolet Volt Drivers in the EV Project Use and When Do They Use It?” October 2014. Idaho National Laboratory. EV project.

<sup>76</sup> “Charging and Driving Behavior of Nissan Leaf Drivers in the EV Project with Access to Workplace Charging” (November 2014) <http://avt.inl.gov/pdf/EVProj/WorkplaceChargingandDriving-Leaf.pdf>

<sup>77</sup> Charge Ready and Market Education Settlement Agreement p. 5.

<sup>78</sup> Charge Ready and Market Education Settlement Agreement p. 5.

1 **IV. PG&E SHOULD REQUIRE SITE HOSTS TO SUBMIT LOAD**  
2 **MANAGEMENT PLANS TO MINIMIZE THE POTENTIAL FOR**  
3 **TRANSFORMER OVERLOADING**

4 Table 4 indicates that 40% of the site locations where EV Program charging stations are  
5 deployed may require transformer upgrades. PG&E claims this estimate is based upon projected  
6 load scenarios and current transformer loading percentages.

7 Based upon the potential to reduce overloading of transformers at EV Program site  
8 locations, ORA recommends that PG&E educate site hosts regarding time of use rates and  
9 evaluate the effectiveness of various load management strategies that are employed in the EV  
10 Program. This provision would parallel SCE’s intent to monitor load management during Phase  
11 1 of its Charge Ready and Market Education program. SCE’s Charge Ready and Market  
12 Education Settlement Agreement describe the process:

13 “SCE will educate site hosts about time-of-use rates and other programs that  
14 encourage EV charging in a way that supports the electrical grid and will evaluate  
15 and compare different site host load management strategies, including whether  
16 price signals are being passed to the driver. If there is evidence that load is not  
17 being adequately managed to avoid adverse grid impacts from EV charging by  
18 Customer Participants, or that EV drivers who charge in a manner that avoids  
19 adverse grid impacts are not provided with the opportunity to realize fuel cost  
20 savings, or if charging is not leveraging available opportunities to integrate  
21 renewable energy, then SCE will consider program modifications, such as a more  
22 dynamic price signal seen by EV drivers, or other load management strategies, to  
23 be incorporated in Phase 2”<sup>79</sup>

24 Given the potential for overloading of transformers, ORA recommends that either site  
25 hosts or EVSPs that manage charging station utilization should submit the intended method for  
26 managing site load to PG&E as a condition for enrollment in the EV Program. The load  
27 management plan can be developed and updated with the participation of PG&E, EVSPs, and  
28 site hosts. ORA suggests that monitoring of load management practices will complement (1)  
29 PG&E’s intent to require smart charging capabilities as a part of its technical specifications for

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<sup>79</sup> Motion For Approval Of Phase 1 Settlement Agreement Between And Among Southern California Edison Company and American Honda Motor Co., Inc., CALSTART, The California Energy Storage Alliance, ChargePoint Inc, Coalition of California Utilities Employees, Environmental Defense Fund, General Motors LLC, Greenlining Institute, Natural Resources Defense Council, NRG Energy, Inc., The Office of Ratepayer Advocates, Plug In America, Sierra Club, The Utility Reform Network, and Vote Solar, p. 34.

- 1 L2 charging stations, to determine if excess load can be used in energy management programs
- 2 and (2) PG&E's exploration of two demand response pilots to leverage EV load.<sup>80</sup>

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<sup>80</sup> PG&E Testimony, Chapter 1, p. 1-13.

**APPENDIX A**

**WITNESS QUALIFICATIONS**

1 **QUALIFICATIONS AND PREPARED TESTIMONY**  
2 **OF**  
3 **ANAND DURVASULA**  
4

5 Q.1. Please state your name and business address.

6 A.1. My name is Anand Durvasula. My business address is 505 Van Ness Avenue, San  
7 Francisco, CA 94102.  
8

9 Q.2. By whom are you employed and in what capacity?

10 A.2. I am employed by the California Public Utilities Commission (CPUC) as a Public  
11 Utilities Regulatory Analyst in the Electricity Policy and Planning Branch of the Office  
12 of Ratepayer Advocates (ORA).  
13

14 Q.3. Please describe your educational background and professional experience.

15 A.3. I hold a Bachelor of Science degree in Economics from the Carnegie Mellon University. I  
16 hold a Juris Doctorate (J.D.) from Santa Clara University. I have been employed with  
17 the California Public Utilities Commission, Office of Ratepayer Advocates since  
18 September 2014 and have been worked on energy policy related to Electric Vehicles,  
19 Energy Markets, Transmission Planning and Distribution Planning.  
20

21 Q.4. What is your area of responsibility in this proceeding?

22 A.4. I am sponsoring the following sections of ORA's Testimony: Chapter 3: PG&E PHASE 1  
23 EV INFRASTRUCTURE PROGRAM ANTI-COMPETITIVE IMPACTS.  
24

25 Q.5. Does this complete your testimony at this time?

26 A.5. Yes.  
27

1 **QUALIFICATIONS AND PREPARED TESTIMONY**  
2 **OF**  
3 **JOSE F. ALIAGA-CARO**  
4

5 Q.1 Please state your name and business address.

6 A.1 My name is Jose Aliaga-Caro. My business address is 505 Van Ness Avenue, San  
7 Francisco, CA 94102.  
8

9 Q.2 By whom are you employed and in what capacity?

10 A.2 I am employed by the California Public Utilities Commission (CPUC) as an Utilities  
11 Engineer in the Office of Ratepayer Advocates' (ORA) Electricity Planning and Policy  
12 Branch (EPP).  
13

14 Q.3 Please describe your education and professional experience.

15 A.3 I received a Bachelor of Arts degree in Film Studies from the University of California at  
16 Berkeley in 1996. I received a Bachelor of Science degree in Engineering Physics from  
17 the University of California at Berkeley in 2007. I received a Master of Science in  
18 Mechanical Engineering from the University of California at Davis in 2009. I worked as  
19 an engineer for the National Aeronautics and Space Administration (NASA) Ames  
20 Research Center, in Mountain View, CA, from August 2010 to December 2013. I  
21 became employed with the California Public Utilities Commission, Office of Ratepayer  
22 Advocates, in December 2013.  
23

24 Q.4. What is your area of responsibility in this proceeding?

25 A.4 I am sponsoring the following sections of ORA's Testimony: Chapter 2:  
26 DETERMINATION OF SIZE.  
27

28 Q.5 Does this complete your testimony at this time?

29 A.5 Yes.  
30  
31

1 **QUALIFICATIONS AND PREPARED TESTIMONY**  
2 **OF**  
3 **RAJAN MUTIALU**

4  
5 Q.1 Please state your name and business address.

6 A.1 My name is Rajan Mutialu. My business address is 505 Van Ness Avenue, San  
7 Francisco, CA 94102.

8  
9 Q.2 By whom are you employed and in what capacity?

10 A.2 I am employed by the California Public Utilities Commission (CPUC) as an Public  
11 Utility Regulatory Analyst (PURA) in the Office of Ratepayer Advocates' (ORA)  
12 Electricity Planning and Policy Branch (EPP).

13  
14 Q.3 Please describe your education and professional experience.

15 A.3 I received a Bachelor of Science degree in Biology from the University of California at  
16 Los Angeles. I received a Master of Public Health degree in Environmental Health from  
17 the University of California at Berkeley. I worked as a PURA in Energy Division at the  
18 CPUC in the Retail Rate Design Section from 2012-14. I have been employed with the  
19 California Public Utilities Commission, Office of Ratepayer Advocates since September  
20 2014 and have been worked on energy policy related issues in the following programs:  
21 Renewables Portfolio Standard, Energy Storage, Electric Vehicles, and Distributed  
22 Resources Planning.

23  
24 Q.4. What is your area of responsibility in this proceeding?

25 A.4 I am sponsoring the following sections of ORA's Testimony: Chapter 1: EXECUTIVE  
26 SUMMARY, Chapter 4: MARKETING, EDUCATION AND OUTREACH, Chapter 5:  
27 COSTS AND SITING.

28  
29 Q.5 Does this complete your testimony at this time?

30 A.5 Yes.