

Docket No.: A.22-05-002, A.22-05-003, A.22-05-004 (Consolidated)

Exhibit No.: \_\_\_\_\_

Date: April 21, 2023

Witness: Ed Burgess

**TESTIMONY OF ED BURGESS  
ON BEHALF OF THE VEHICLE-GRID INTEGRATION COUNCIL**

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1     **I.     INTRODUCTION**

2     **Q.     Please state your name, title, and business address.**

3     A.     My name is Ed Burgess. I am a Senior Director at Strategen Consulting and the Senior  
4           Policy Director for the Vehicle-Grid Integration Council (“VGIC”). My business address  
5           is 10265 Rockingham Drive, Suite #100-4061, Sacramento, California 95827.

6     **Q.     On whose behalf are you testifying?**

7     A.     I am testifying on behalf of the Vehicle Grid-Integration Council.

8     **Q.     What is VGIC?**

9     A.     VGIC is a 501(c)6 membership-based trade association committed to advancing the role  
10           of electric vehicles (“EV”) and vehicle-grid integration (“VGI”) through policy  
11           development, education, outreach, and research. VGIC supports the transition to  
12           decarbonized transportation and power sectors by ensuring the value from flexible EV  
13           charging and discharging is unlocked to achieve a more reliable, affordable, and efficient  
14           electric grid.

15    **Q.     Who are VGIC’s current members?**

16    A.     VGIC’s members represent a broad range of transportation electrification industry  
17           leaders, including American Honda Motor Co., Inc., Enel X North America, Inc.,  
18           Fermata Energy, Ford Motor Company, General Motors, Nissan Group of North  
19           America, Nuvve Holding Corporation, Stellantis N.V., Toyota Motor North America,  
20           BorgWarner, bp pulse, Customized Energy Solutions, dcbel, FlexCharging, FLO EV  
21           Charging, FreeWire Technologies, Inc., GridWiz, Innovation Core SEI, IoTecha, Kaluza,

1 Kitu Systems, NineDot Energy, Peak Power, Qcells, Sunrun, The Mobility House,  
2 Utilidata, Veloce Energy, Inc., Wallbox USA Inc., WeaveGrid, Hoosier Energy, and  
3 Sacramento Municipal Utility District.<sup>1</sup>

4 **Q. Please summarize your professional background and qualifications.**

5 A. I am a partner within Strategen’s consulting practice where one of my primary  
6 responsibilities is managing the VGIC, which is one of Strategen’s primary clients. In  
7 addition to VGIC, I oversee much of the firm’s practice for governmental clients, non-  
8 governmental organizations, and trade associations. Strategen’s team is globally  
9 recognized for its expertise in the electric power sector on issues relating to resource  
10 planning, renewable energy, energy storage, EVs, utility rate design and program design,  
11 and utility business models and strategy. During my time at Strategen, I have managed or  
12 supported projects for numerous client engagements related to these issues. Before  
13 joining Strategen in 2015, I worked as an independent consultant in Arizona for several  
14 years and regularly appeared before the Arizona Corporation Commission. I also worked  
15 for Arizona State University where I helped launch their Utility of the Future initiative as  
16 well as the Energy Policy Innovation Council. I have a Professional Science Master’s  
17 degree in Solar Energy Engineering and Commercialization from Arizona State  
18 University as well as a Master of Science in Sustainability, also from Arizona State. I  
19 also have a Bachelor of Arts degree in Chemistry from Princeton University.

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<sup>1</sup> The opinions expressed in this testimony reflect those of VGIC, and do not necessarily reflect the views of all of the individual VGIC member companies.

1 **Q. Have you ever testified before the California Public Utilities Commission, or any**  
2 **other state regulatory body?**

3 A. Yes. I testified before the California Public Utilities Commission in Application (“A.”)  
4 19-08-002 and A.20-08-002 both of which pertain to PacifiCorp’s 2020 and 2021 Energy  
5 Cost Adjustment Clause, as well as Rulemaking (“R.”) 20-11-003 on Emergency  
6 Reliability, A.21-10-010 related to Pacific Gas and Electric Company’s (“PG&E”)  
7 Electric Vehicle Charge 2 proposal, A.20-10-011 related to PG&E’s Commercial EV  
8 Rate, and A.21-12-006/008 related to San Diego Gas & Electric Company’s (“SDG&E”)  
9 Real Time Pricing and EV Export Compensation pilots. I have also provided expert  
10 testimony before the Massachusetts Department of Public Utilities, the South Carolina  
11 Public Service Commission, the Indiana Utility Regulatory Commission, the Nevada  
12 Public Utilities Commission, the Oregon Public Utilities Commission, and the  
13 Washington Utilities and Transportation Commission.

14 **Q. What is the purpose of your testimony?**

15 A. The purpose of my testimony is to provide VGIC’s review of PG&E, SCE, and  
16 SDG&E’s 2023-2027 Demand Response Program Applications. In particular, I focus on  
17 the role that EVs can play as a demand response (“DR”) resource through the existing  
18 Emergency Load Reduction Program (“ELRP”) (especially via the A.5 customer  
19 subgroup) as well as other novel approaches to supporting EVs as DR resources. I  
20 provide a critique of some of the investor-owned utilities’ (“IOUs”) proposed changes to  
21 the ELRP A.5 subgroup and offer some recommendations to improve participation going  
22 forward. I also provide recommendations for increasing participation from EVs in DR

1 programs via telematics. I begin with a brief general overview of the grid benefits of  
2 VGI.

## 3 **II. GENERAL OVERVIEW OF THE GRID BENEFITS OF VGI**

4 **Q. Can you define some of the key terms related to using EVs as grid resources?**

5 A. Yes. The term vehicle-grid integration (“VGI”) encompasses the suite of approaches the  
6 leverage flexible EV charging and discharging to provide benefits to customers or the  
7 grid. Flexible unidirectional “V1G” charging, often called smart charging or managed  
8 charging, describes the shifting or modulating of charging load, especially to align with  
9 times of lower-cost or cleaner electricity generation, transmission, or distribution.

10 Bidirectional vehicle-to-everything (“V2X”) charging describes discharging energy from  
11 the vehicle battery. This could be for a non-exporting use case like backup power or  
12 demand charge management, referred to as vehicle-to-home (“V2H”) or vehicle-to-  
13 building (“V2B”). This could also be for an exporting use case, considered vehicle-to-  
14 grid (“V2G”). Lastly, EV charging can be co-located with other types of distributed  
15 energy resources (“DERs”) to provide benefits to the local distribution system, bulk  
16 power system, and customer. These storage-backed charging solutions are in use today at  
17 many DCFC sites.<sup>2</sup>

18 **Q. Do you think EVs and EV Supply Equipment (“EVSE”) could provide a meaningful**  
19 **contribution, in MW terms, to grid reliability through 2027?**

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<sup>2</sup> Electrify America. *Electrify America Unveils its First Application of Megawatt-Level Energy Storage to Enhance Customer Experience*. October 19, 2022. <https://media.electrifyamerica.com/en-us/releases/199>

1 A. There is no doubt that EVs on the road today, plus those that will be purchased through  
2 2027, have the technical capability to meaningfully reduce demand through both  
3 unidirectional “V1G” managed charging and bidirectional vehicle-to-everything (“V2X”)  
4 activities. However, programs intended to incentivize these behaviors have been slower  
5 to develop. If appropriate customer incentives are adopted, VGIC is confident that  
6 meaningful EV/EVSE contributions can become a reality during the 2023-2027  
7 timeframe. VGIC believes that the adoption of successful EV/VGI DR program designs  
8 in this proceeding is one important element to achieving this goal. Meanwhile, since this  
9 is a novel type of grid resource, any incremental participation (even if small at first) will  
10 be beneficial and is still worth pursuing as part of a comprehensive approach to  
11 addressing reliability concerns.

12 **Q. Is there a significant amount of EV/EVSE equipment deployed in California today**  
13 **that can already provide aggregated, unidirectional “V1G” load reduction**  
14 **capabilities?**

15 A. Yes. Aggregators of EVs and EVSEs in California have already demonstrated their  
16 ability to modify charging schedules. Examples include PG&E’s ChargeForward pilot  
17 with BMW,<sup>3</sup> SDG&E’s VGI Rate in the Power Your Drive program,<sup>4</sup> and PG&E’s  
18 evPulse offering with WeaveGrid.<sup>5</sup>

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<sup>3</sup> BMW. *BMW ChargeForward Report*. <https://www.bmwchargeforward.com/assets/pdfs/BMW-ChargeForward-Report.pdf>

<sup>4</sup> SDG&E. *Power Your Drive Research Report*. April 2021. <https://www.sdge.com/sites/default/files/regulatory/SDG%26E%20FINAL%20Power%20Your%20Drive%20Research%20Report%20April%202021.pdf>

<sup>5</sup> PG&E. *evPulse*. <https://join.pge.ev-pulse.com/>.

1 As of the end of 2022 there were approximately 1.4 million EVs registered in California.<sup>6</sup>  
2 If adoption continues at a similar pace through 2027, it is conceivable there could be 4  
3 million light, medium, and heavy-duty EVs on the road in California.<sup>7</sup> Assuming an  
4 average charging load of 5 kW per vehicle, this represents a total technical potential of  
5 20,000 MW in instantaneous load that could theoretically be reduced via VIG.<sup>8</sup>  
6 Obviously, the achievable potential is only a fraction of this since not all of those vehicles  
7 will be charging during the critical net peak load hours of 6-9pm, when either an  
8 economic or reliability demand response event is likely to be triggered, and not all EV  
9 owners will choose to participate in VIG activities. However, VGIC estimates that even  
10 under a more conservative participation rate of 5%, approximately 1,000 MW of net peak  
11 load reduction from VIG might be achievable.

12 Additionally, an increasingly popular configuration for public direct current fast charging  
13 (“DCFC”) and fleet depot sites involves leveraging stationary energy storage solutions to  
14 manage charging load, effectively providing a “buffer” between an uninterrupted EV  
15 charging experience and the grid during peak demand. For example, Electrify America  
16 has deployed stationary energy storage at over 100 DCFC sites in California,<sup>9</sup> and

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<sup>6</sup> California Energy Commission. *New EV Sales in California*. Date Accessed: April 20, 2023. <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales>

<sup>7</sup> California Energy Commission. *Final 2021 Integrated Energy Policy Report. Volume IV: California Energy Demand Forecast*. February 2022. <https://efiling.energy.ca.gov/GetDocument.aspx?tn=241581>. Page 66.

<sup>8</sup> VGIC recognizes that a significant share of EV-owners that use Level 2 (or greater) chargers that would likely exceed 5 kW per vehicle. However, many EV-owners (particularly owners of plug-in hybrid electric vehicles with smaller ranges) also primarily rely on Level 1 charging. VGIC believes that 5 kW is a reasonable estimate based on an assumed 50/50 split between Level 1 and Level 2 charging. This would be consistent with studies of home charging behavior, for example Tal, G., Lee, J., & Nicholas, M. A. (2018). *Observed Charging Rates in California*. UC Davis: Plug-In Hybrid & Electric Vehicle Research Center. Retrieved from <https://escholarship.org/uc/item/2038613r>

<sup>9</sup> Electrify America. *Electrify America Unveils its First Application of Megawatt-Level Energy Storage to Enhance Customer Experience*. October 19, 2022. <https://media.electrifyamerica.com/en-us/releases/199>



1 FreeWire Technologies recently installed a new charging location in Fremont, California  
2 with integrated energy storage.<sup>10</sup> These storage-backed charging solutions can provide an  
3 important source of load reduction at sites historically categorized as poor candidates for  
4 charging load management due to short dwell times.

5 **Q. Is there a significant amount of EV/EVSE equipment deployed today that can**  
6 **already provide aggregated bidirectional vehicle-to-building (“V2B”) or vehicle-to-**  
7 **grid (“V2G”) capabilities?**

8 A. Yes, although it is less widespread than V1G capabilities, a meaningful portion of EVs  
9 deployed today have bidirectional charging capabilities that would allow them to  
10 discharge to the grid, effectively doubling their ability to reduce net load peak. The most  
11 significant sources of V2X bidirectional charging potential today are in the form of the  
12 Nissan LEAF, Ford F-150 Lightning, and Blue Bird Electric School Buses. As of the end  
13 of 2022, over 30,000 Nissan LEAF vehicles sold in California were Model Year 2013 or  
14 later, equipped with V2X bidirectional charging capabilities.<sup>11</sup> Assuming each vehicle  
15 could be discharged at 20 kW using an off-board V2X EVSE, this equates to 600 MW in  
16 the total technical potential for incremental contributions to the net peak load.<sup>12</sup> As with  
17 V1G, it is unlikely that all vehicles will be plugged in at one time. However, VGIC  
18 estimates that under a participation rate of 5%, this would equate to approximately 30

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<sup>10</sup> PR Newswire. *Loop Neighborhood Market to Install New FreeWire EV Boost Chargers at Fremont Location*. April 14, 2023. <https://www.prnewswire.com/news-releases/loop-neighborhood-market-to-install-new-freewire-ev-boost-chargers-at-fremont-location-301797437.html>

<sup>11</sup> California Energy Commission. *New EV Sales in California*. Date Accessed: April 20, 2023. <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales>

<sup>12</sup> Fermata Energy. October 6, 2022. *Fermata Energy’s Newest V2X Bidirectional Charger – the FE-20 – Available Q1 2023*. <https://fermataenergy.com/article/fermata-energys-newest-v2x-bidirectional-charger->

1 MW of potential net peak contribution from today’s fleet of Nissan LEAFs located within  
2 California.

3 As of the end of 2022, VGIC estimates around 8,000 Ford F-150 Lightning Electrics have  
4 been sold in California.<sup>13</sup> While these vehicles are equipped with V2X bidirectional  
5 charging, the feature is designed and marketed as an emergency backup power source and  
6 is not configured for grid-parallel bidirectional charging. However, if the popular Ford F-  
7 150 Lightning and the upcoming Chevrolet Silverado EV and GMC Sierra EV models  
8 begin offering grid-parallel V2X capabilities, this would represent significant additional  
9 energy storage capacity that could soon be made available to support the grid.<sup>14</sup> In  
10 addition to Nissan, Ford, Chevrolet, GMC, and Blue Bird, the following automotive  
11 brands have publicly stated they will offer V2X bidirectional charging: Genesis,<sup>15</sup>

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<sup>13</sup> Ford reportedly sold 15,617 F-150 Lightning models in 2022. According to Veloz’s *Electric Vehicle Market Report*, California sales represent about half of U.S. EV sales. See CleanTechnica. *You Can’t Order A Ford F-150 Lightning Any Longer – Count This As A Fail*. January 11, 2023. <https://cleantechnica.com/2023/01/11/you-cant-order-a-ford-f-150-lightning-any-longer-count-this-as-a-fail/> and Veloz. *Electric Vehicle Market Report*. Posted February 2023. <https://www.veloz.org/ev-market-report/>.

<sup>14</sup> GM Energy (2022). *Ultium Products: Ultium Home*. <https://gmenergy.gm.com/ultium-products> ; GMC (2022). *Introducing the First Ever Sierra EV Denali Edition 1: Plug and Play*. <https://www.gmc.com/future-vehicles/sierra-ev-denali>

<sup>15</sup> Bengt Halvorson. Green Car Reports. *Electric car platform for Hyundai, Kia, Genesis: Bi-directional charging, robotaxi ready*. [https://www.greencarreports.com/news/1130487\\_ev-platform-hyundai-kia-genesis-bi-directional-charging-robotaxi-ready](https://www.greencarreports.com/news/1130487_ev-platform-hyundai-kia-genesis-bi-directional-charging-robotaxi-ready)

1 Hyundai,<sup>16</sup> Kia,<sup>17</sup> Volvo,<sup>18</sup> Volkswagen,<sup>19</sup> Lucid,<sup>20</sup> Rivian,<sup>21</sup> Polestar,<sup>22</sup> Thomas Built  
2 Buses,<sup>23</sup> Proterra,<sup>24</sup> and BYD.<sup>25</sup> Thus, it is reasonable to expect that several future EV  
3 models being launched before 2027 will be capable of V2X bidirectional charging.

4 **Q. Is the state of California making investments to advance the deployment of VGI-**  
5 **capable charging equipment?**

6 A. Yes. Senate Bill 676 (Bradford, 2019) resulted in a statutory definition for VGI and set  
7 California on a path toward addressing key barriers to VGI market development.<sup>26</sup> More  
8 recently, California announced several key funding opportunities for VGI, including the  
9 California Energy Commission’s (“CEC”) open Grant Funding Opportunity (“GFO”) for  
10 *Responsive, Easy Charging Products with Dynamic Signals* (“REDWDS”). REDWDS

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<sup>16</sup> Chris Randall. Electrive. *Hyundai to include V2G capabilities for their EVs*. April 12, 2022.

<https://www.electrive.com/2022/04/12/hyundai-to-include-v2g-capabilities-for-their-evs/>

<sup>17</sup> Bengt Halvorson. Green Car Reports. *Electric car platform for Hyundai, Kia, Genesis: Bi-directional charging, robotaxi ready*. [https://www.greencarreports.com/news/1130487\\_ev-platform-hyundai-kia-genesis-bi-directional-charging-robotaxi-ready](https://www.greencarreports.com/news/1130487_ev-platform-hyundai-kia-genesis-bi-directional-charging-robotaxi-ready)

<sup>18</sup> Yusuf Latief. Smart Energy. *Volvo’s first bi-directional EV brings the customer to the grid*. October 8, 2022.

<https://www.smart-energy.com/industry-sectors/electric-vehicles/volvos-first-bi-directional-ev-brings-the-customer-to-the-grid/>

<sup>19</sup> Charles Morris. *VW to enable bidirectional charging on all EVs on its MEB platform starting next year*. Charged Electric Vehicles Magazine. April 8, 2021. <https://chargedevs.com/newswire/vw-to-enable-bidirectional-charging-on-all-evs-on-its-meb-platform-starting-next-year/>. “The Volkswagen Group says it could produce as many as 300,000 bidirectional charging-enabled vehicles next year, including models from VW, Audi, Skoda, and Seat-Cupra

<sup>20</sup> Nick Flaherty. Emobility Engineering. Accessed December 22, 2022. <https://www.emobility-engineering.com/vehicle-to-grid-charging/>

<sup>21</sup> Charles Morris. Charged. *Rivian working on 800-volt architecture, bidirectional charging, in-house drive units and battery cells*. <https://chargedevs.com/newswire/rivian-working-on-800-volt-architecture-bidirectional-charging-in-house-drive-units-and-battery-cells/>

<sup>22</sup> Roberto Baldwin. TechCrunch. *Polestar CEO sees value in EVs, even when they’re parked*. August 21, 2022.

<https://techcrunch.com/2022/08/21/polestar-ceo-sees-value-in-evs-even-when-theyre-parked/>

<sup>23</sup> Thomas Built Buses / Daimler Trucks North America LLC (2021). *The Safe-T-Liner C2 Jouley Electric School Bus*. Retrieved September 1, 2021 from <https://thomasbuiltbuses.com/school-buses/saf-t-liner-c2-jouley/>

<sup>24</sup> Proterra (2022). *Proterra Industrial Charging System*. Retrieved December 23, 2022.

<https://www.proterra.com/products/charging-infrastructure/>

<sup>25</sup> BYD. *BYD Introduces Innovative and Safe Type A Battery Electric School Bus with V2G Technology*. January 26, 2022. <https://en.byd.com/news/byd-introduces-innovative-and-safe-type-a-battery-electric-school-bus-with-v2g-technology/>

<sup>26</sup> Public Utilities Code Section 740.16

1 makes up to \$309 million available to support the development and deployment of VGI  
2 solutions.<sup>27</sup> The CEC has also issued a GFO for *Electric School Bus Bi-Directional*  
3 *Infrastructure*, with up to \$15 million available to fund V2X school bus charging  
4 infrastructure.<sup>28</sup> Additionally, the CEC is launching the *V2G Equipment List*, which will  
5 facilitate the streamlined interconnection of V2X chargers in California.<sup>29</sup> Lastly, the  
6 CEC’s forthcoming Distributed Electricity Backup Asset (“DEBA”) program would, as  
7 proposed, include V2X equipment as eligible resources for the incentive program  
8 intended to offset the deployment and construction costs of resources that can bolster  
9 California’s strategic reliability reserve.<sup>30</sup>

10 **Q. Once these initial investments in VGI equipment have been made, is there a**  
11 **comprehensive set of offerings available to EV owners that would encourage them to**  
12 **leverage their VGI-capable equipment to support the grid?**

13 A. Not yet. I am concerned there is a risk that California’s significant investments in VGI  
14 infrastructure will be underutilized, due to the overall lack of reasonable offerings that  
15 would attract customers to fully leverage their VGI-capable equipment, either in V1G or  
16 V2X modes. For V2G in particular, the only available offering to date that would  
17 encourage V2G behavior is in the form of the ELRP A.5 subgroup. As I will explain

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<sup>27</sup> California Energy Commission. *GFO-22-609 – Responsive, Easy Charging Products with Dynamic Signals (REDWDS)*. March 10, 2023. <https://www.energy.ca.gov/solicitations/2023-03/gfo-22-609-responsive-easy-charging-products-dynamic-signals-redwds>

<sup>28</sup> California Energy Commission. *GFO 22-612 – Electric School Bus Bi-Directional Infrastructure*. April 3, 2023. <https://www.energy.ca.gov/solicitations/2023-04/gfo-22-612-electric-school-bus-bi-directional-infrastructure>

<sup>29</sup> California Energy Commission. *Vehicle-to-Grid Equipment List*. <https://www.energy.ca.gov/programs-and-topics/programs/vehicle-grid-integration/vehicle-grid-equipment-list>

<sup>30</sup> California Energy Commission. *Demand Side Grid Support and Distributed Electricity Backup Assets Program. Lead Commissioner Workshop*. January 27, 2023. Session 2. Slide 42. <https://efiling.energy.ca.gov/GetDocument.aspx?tn=248608>

1 further in the next section of my testimony, this sole existing offering in CA provides a  
2 relatively modest customer incentive for V2G compared to those offered in other states.

3 **III. VGIC’S REVIEW OF THE IOUs’ PROPOSALS FOR ELRP AND RELATED**  
4 **RECOMMENDATIONS.**

5 **Q. Do the IOUs generally support the continuation of ELRP and its various**  
6 **subgroups?**

7 A. Yes. VGIC is encouraged by this support and commends the IOUs for this. For example,  
8 SDG&E testifies that “it is prudent to keep all of the eligibility subgroups active. As the  
9 technology becomes more adapted and event experience is gained by SDG&E, especially  
10 in Subgroups such as A.4 -VPP and Subgroup A.5 -VGI, as well as the others, continuing  
11 the ELRP is important.”<sup>31</sup> VGIC generally agrees with this position and believes it is  
12 important to find ways to enhance participation to support grid reliability, particularly for  
13 the A.5 subgroup.

14 **Q. Do the IOUs’ applications propose any significant changes to ELRP in the coming**  
15 **years?**

16 A. Yes. Each of the IOUs proposes to extend the program for 2 additional years, beyond the  
17 2025 timeframe that is currently authorized (i.e., the programs would run through 2027).  
18 However, simultaneously, the IOUs also propose changes that would significantly reduce  
19 or eliminate key features of the ELRP for certain subgroups that would effectively  
20 throttle or deter participation. For example, PG&E proposes to “remove all minimum  
21 dispatch requirements for group A.2 and A.4/A.5.”<sup>32</sup> SCE also made a similar proposal

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<sup>31</sup> See Supplemental Testimony of SDG&E witness E Bradford Mantz, page EBM-46, lines 7-10.

<sup>32</sup> See Exhibit PG&E-2, at 4-30, lines 16-19.

1 to “reduc[e] minimum dispatch hours for two subgroups” starting in the 2023 ELRP  
2 season.<sup>33</sup> On January 17, 2023, all three IOUs also jointly filed an advice letter that  
3 detailed their proposed changes to the ELRP terms and conditions for 2023.<sup>34</sup> Notably,  
4 this included a recommended reduction in the minimum dispatch hours for the A.5  
5 subgroup from the current level of 30 hours to just 10 hours.

6 **Q. Does VGIC support these proposed changes?**

7 A. Yes and no. VGIC supports the proposed 2-year extension of the ELRP program since it  
8 would provide greater market certainty, especially to prospective A.5 subgroup  
9 participants who comprise an emerging technology (i.e., vehicle-to-grid, or “V2G”) with  
10 no alternative compensation options within California. However, VGIC strongly opposes  
11 the proposed reduction or elimination of minimum dispatch hours for the A.5 subgroup.  
12 The minimum dispatch hour requirement is an essential feature of the ELRP program for  
13 current and prospective A.5 participants. As I will explain further in my testimony, this  
14 proposed reduction is egregiously premature and counter-productive to the goals of the  
15 ELRP program (i.e., supporting grid reliability).

16 **Q. Did the ELRP A.5 subgroup successfully contribute to grid reliability in the summer  
17 of 2022?**

18 A. Yes. While A.5 participation levels were very modest, my understanding is that multiple  
19 electric school buses did successfully participate in the A.5 subgroup during the summer  
20 of 2022. During the Labor Day heat wave, these electric school buses exported power to

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<sup>33</sup> See Exhibit SCE-13, at page 4, lines 10-13.

<sup>34</sup> See Exhibit SCE-13, Attachment A

1 the grid via bidirectional, V2G charging systems installed in SDG&E's service territory.  
2 Such exports were compensated according to the terms of the ELRP program.

3 **Q. What do you conclude from this experience?**

4 A. I conclude that the ELRP A.5 subgroup can be a viable model for encouraging beneficial  
5 VGI behavior and contributing to grid reliability through V2G systems.

6 **Q. Why do you think A.5 subgroup participation in 2022 was limited to just a handful  
7 of school buses in SDG&E's service territory?**

8 A. From discussions with VGIC members and other industry stakeholders, I believe there  
9 was greater interest in the A.5 subgroup than the actual 2022 participation numbers  
10 would suggest. Furthermore, I believe the limited number of participants was not  
11 primarily due the program's design, nor prospective participants' technical capabilities,  
12 but rather due to numerous administrative barriers caused by the IOUs, the Commission  
13 itself, and the challenges that emerged from the expedited nature of proceedings in both  
14 phases of R.20-11-003, which ultimately delayed or discouraged participation in 2022 --  
15 the first year the A.5 group became available. Additionally, as I will explain further  
16 below, the compensation offered for V2G through ELRP is very modest compared to  
17 comparable V2G offerings other regions in the country (e.g., Connected Solutions in  
18 New England). Going forward, I expect A.5 participation levels will increase, presuming  
19 that 1) these administrative barriers can be addressed in a timely manner and 2)  
20 prospective participants can expect core features of the original A.5 program design to  
21 remain intact (such as the minimum number of dispatch hours), and 3) compensation

1 levels can be enhanced to make them more comparable to those in other regions of the  
2 country.

3 **Q. Do you agree with the IOUs’ rationale for reducing the number of dispatch hours**  
4 **for the A.5 subgroup?**

5 A. No. SCE testified that its proposed change to the minimum dispatch hours was “intended  
6 to make more effective use of the program’s incentive budget.”<sup>35</sup> However, this is non-  
7 sensical because SCE had *zero* A.5 participants in 2022 and thus the corresponding  
8 incentive costs/budget in 2022 would have been \$0.<sup>36</sup> It is difficult to understand how  
9 incentive costs of \$0 in 2022 could be seen as inefficient and thus requiring immediate  
10 reform shortly after A.5 became eligible. Moreover, it is difficult to understand why an  
11 incentive cost of \$0 would cause SCE to propose punitive changes to the A.5 subgroup  
12 that would undoubtedly throttle future participation. Overall, across all three IOUs, total  
13 incentive costs for A.5 in 2022 were only \$1,520,<sup>37</sup> which is hardly a cause for alarm  
14 from a cost efficiency perspective.

15 **Q. Do you think the IOUs’ proposed changes to throttle participation in the A.5**  
16 **subgroup were premature?**

17 A. Yes. First, as I mentioned, participation levels in the first year of the A.5 subgroup were  
18 relatively low and therefore any changes proposed should be geared toward increasing

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<sup>35</sup> Exhibit SCE-13, p 4, line 11.

<sup>36</sup> Administrative Law Judge’s Ruling Providing the ELRP Program Data for 2022 Summer Season. March 2, 2023.  
<https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M502/K977/502977248.PDF>. Attachment A, Part 5.

<sup>37</sup> Administrative Law Judge’s Ruling Providing the ELRP Program Data for 2022 Summer Season. March 2, 2023.  
<https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M502/K977/502977248.PDF>. Attachment A, Part 6, Page A.5.  
The overall Total Delivered kWh (interval positive performance) for subgroup A.5 over 32 hours in 2022 equaled  
760 kWh. Assuming the ELRP compensation rate of \$2/kWh, SDG&E would have paid out \$1,520 in ELRP  
compensation to these customers.



1 participation to support grid reliability rather than decreasing it. Second, based on  
2 conversations with VGIC members, my understanding is that significant pursuit of V2X  
3 projects in California has occurred over the last year with the expectation that the original  
4 ELRP A.5 structure would remain in place at least through 2025. Third, it is important to  
5 recognize that the ELRP A.5 subgroup is the *only* current option for V2G export  
6 compensation in California. Handicapping this program prematurely would cause an  
7 unnecessary and unhelpful hiatus on the development of the V2G industry in a state with  
8 one of the largest penetrations of EVs across the US. By way of contrast, some VGIC  
9 members have reported to me that they have successfully developed V2X projects in  
10 dozens of states around the US. These same members note that California has been a  
11 notoriously difficult environment to pursue V2X projects, in part due to the lack of  
12 existing V2X compensation rates or programs (with ELRP being the sole exception), as  
13 well as administrative barriers related to IOU implementation of ELRP.

14 **Q. What are some of the administrative barriers that prospective A.5 participants**  
15 **encountered in the 2022 ELRP season?**

16 A. To understand these barriers, it is worth examining the timeline of events in 2022 from a  
17 participant's perspective. First, it is worth noting that while the A.5 subgroup framework  
18 and details were established on December 6, 2021,<sup>38</sup> the Energy Division did not issue a  
19 Disposition on the proposed Terms and Conditions for the A.5 subgroup (including,  
20 crucially, the exemption from UL 1741 SA and subsequent smart inverter requirements)

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<sup>38</sup> *Phase 2 Decision Directing PG&E, SCE, and SDG&E to Take Actions to Prepare for Potential Extreme Weather in the Summers of 2022 and 2023*. D.21-12-015. Ordering Paragraph 24 and Attachment 2 at 6.

1 until June 17, 2022.<sup>39</sup> This was over a month *after* the start of the 2022 ELRP season.  
2 Once the final terms were established, several subsequent steps still needed to occur to  
3 achieve participation status, including 1) the utilities needed to finalize contracts with  
4 their program administrators (e.g., Olivine) and 2) prospective participants needed to  
5 complete an aggregator agreement with the program administrator, 3) aggregators were  
6 asked to complete technical integration with the utility/program administrator resource  
7 management platform. Given the number of subsequent steps required by the utilities, it  
8 was simply infeasible for some prospective participants to enroll in a timely manner to  
9 achieve participation status before the end of the ELRP season, let alone before the start  
10 of the season. In fact, the one A.5 participant who did successfully enroll with SDG&E  
11 was only able to practically do so more than halfway through the ELRP season.

12 Moreover, for at least some portion of the 2022 enrollment timeline, the IOUs (or their  
13 program administrators) may have been providing incorrect information about the terms  
14 and conditions applicable to ELRP A.5 participants. For example, I am aware of at least  
15 one instance where PG&E's program administrator informed a prospective participant  
16 that UL 1741 SA certification was required for interconnecting A.5 resources. This was  
17 in direct contradiction to D.21-12-015, which specifically provided an exemption from  
18 the SA requirement for ELRP A.5 participants, stating "DC V2G EVSE that have UL  
19 1741 certification, but not UL 1741 SA, may interconnect for the purposes of  
20 participating in the ELRP, subject to remaining Rule 21 interconnection requirements."<sup>40</sup>

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<sup>39</sup> *Emergency Load Reduction Program Pilot Terms and Conditions of PG&E, SCE, and SDG&E adopted by the CPUC*. June 17, 2022. [https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC\\_6485-E.pdf](https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_6485-E.pdf)

<sup>40</sup> *Phase 2 Decision Directing PG&E, SCE, and SDG&E to Take Actions to Prepare for Potential Extreme Weather in the Summers of 2022 and 2023*. D.21-12-015. Attachment 2 at 6.

1 VGIC assisted in getting this issue resolved through communications with Energy  
2 Division staff. However, there may have been other prospective participants that were  
3 deterred due to this misinformation.

4 Lastly, it was not initially clear to participants how to indicate to the IOUs that a DC V2G  
5 EVSE interconnection application was specific to ELRP participation and, therefore,  
6 eligible for the UL 1741 SA exemption. On July 20, 2022, PG&E did properly address  
7 this issue by updating their interconnection form to (1) ask whether a DC V2G EVSE  
8 was interconnecting for purposes of the ELRP pilot and (2) request the ELRP Application  
9 Number.<sup>41</sup>

10 **Q. Despite these challenges, do you think that there is a good chance that more A.5**  
11 **participation will occur in the near term?**

12 A. Yes. Based on conversations I've had with VGIC members, I believe there is a  
13 meaningful amount of V2X projects in the pipeline that could be operational for the next  
14 few years of ELRP, including over 1 MW of electric school bus V2G under various  
15 stages of development. However, realizing these projects likely depends upon both a) the  
16 Commission acting expeditiously to preserve or enhance the original terms of the A.5  
17 subgroup (including the minimum dispatch hours) and b) the IOUs working expeditiously  
18 to interconnect these projects and eliminate unnecessary barriers to participation.

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<sup>41</sup> PG&E. Advice 6609-E-A. *Supplemental: Modifications to PG&E's Form 79-1174-02 ("Rule 21 Generator Interconnection Application") Attachments to Incorporate an Exception Option to the Latest Smart Inverter Requirements for Interconnections Participating in the Emergency Load Reduction Program*. July 11, 2022. [https://www.pge.com/tariffs/assets/pdf/advicelatter/ELEC\\_6609-E-A.pdf](https://www.pge.com/tariffs/assets/pdf/advicelatter/ELEC_6609-E-A.pdf)

1 **Q. Are you concerned that prospective A.5 subgroup participants will face similar**  
2 **barriers and delays in the future ELRP seasons as they experienced in the 2022**  
3 **season?**

4 A. I am more confident that prospective participants will be able to navigate some of the  
5 barriers described above in future years. However, I'm concerned that there are also new  
6 barriers participants may need to contend with in the coming years. Chief among these  
7 barriers is the IOUs' proposed change to the terms and conditions of the A.5 subgroup –  
8 including the proposed reduction in minimum dispatch hours -- which was detailed in the  
9 January 17, 2023, Joint IOU Advice Letter<sup>42</sup> and in the testimony of both SCE and  
10 PG&E.<sup>43</sup> This proposed change has generated substantial market uncertainty for  
11 prospective A.5 participants who had previously been expecting the terms and conditions  
12 in 2023 and beyond to be largely similar to those in 2022. Moreover, much like in 2022,  
13 the Commission has not provided a final resolution to this matter, even just a few weeks  
14 before the start of the 2023 ELRP season. While a Draft Resolution was issued on April  
15 13, 2023 (which VGIC generally supports),<sup>44</sup> this leaves little time for a Final Resolution  
16 to be issued (optimistically by May 18, 2023, as noted in the Draft Resolution) and for  
17 participants to execute the necessary subsequent steps that I outlined above (i.e.,  
18 enrollment, integration with utility/program administrator). This is not meant as a critique  
19 of the Commission's process itself -- VGIC recognizes that the Commission must balance  
20 many competing priorities and is appreciative of the Staff's thoughtful consideration of

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<sup>42</sup> SCE, PG&E, SDG&E. *Joint Submittal of Proposed Modifications to the Emergency Load Reduction Program Pilot Pursuant to Decision 21-03-056, Decision 21-12-015, and Decision 21-12-069*. January 17, 2023.  
[https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC\\_6826-E.pdf](https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_6826-E.pdf)

<sup>43</sup> See Exhibit PG&E-2, at 4-30, lines 16-19 and Exhibit SCE-13, at page 4, lines 10-13.

<sup>44</sup> Resolution E-5276. *Approval, with modifications, of SCE's, PG&E's, and SDG&E's proposed modifications to the Emergency Load Reduction Program*.  
<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M506/K169/506169469.PDF>

1 these matters. However, it is worth noting that when the IOUs proposed these changes in  
2 January 2023 via an Advice Letter, the IOUs effectively “gummed up the works” for  
3 prospective A.5 participants who otherwise could have been preparing for the 2023  
4 ELRP season and future years under the original terms and conditions established last  
5 year. Moreover, as I discussed elsewhere in my testimony, it was unnecessary and  
6 premature for the IOUs to propose changes that would effectively throttle A.5  
7 participation levels, especially given that participation levels have been so minimal to  
8 date and were not even warranted on their merits.

9 **Q. Why do you think the IOUs’ proposed changes were not warranted on their merits?**

10 A. First, even though the subgroup A.5 dispatch minimum of 30 hours exceeds that other  
11 ELRP customer subgroups, these 30 hours are still inclusive of emergency hours, and  
12 would therefore still contribute to emergency reliability. Second, the additional hours  
13 relative to other subgroups are needed to help scale up VGI as a novel and underutilized  
14 reliability resource. As adopted in D.21-12-015, the Commission expressed its intent to  
15 provide “more certainty to aggregators regarding potential compensation.”<sup>45</sup> Moreover,  
16 D.21-12-015 acknowledged that the VGI market development, including bidirectional  
17 V2X charging equipment deployment, is in its nascency, and the Commission described  
18 this approach “as an opportunity to deploy and scale this resource.”<sup>46</sup> Reducing the  
19 dispatch hours to match other programs might mean that additional A.5 resources don't  
20 materialize at all, and thus reliability overall is harmed. Such an outcome would be a case

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<sup>45</sup> *Phase 2 Decision Directing PG&E, SCE, and SDG&E to Take Actions to Prepare for Potential Extreme Weather in the Summers of 2022 and 2023*. D.21-12-015. Page 33.

<sup>46</sup> *Phase 2 Decision Directing PG&E, SCE, and SDG&E to Take Actions to Prepare for Potential Extreme Weather in the Summers of 2022 and 2023*. D.21-12-015. Page 39.

1 of "throwing the baby out with the bathwater," so to speak. Third, if the nomenclature is  
2 problematic, VGIC would support continuation of the ELRP A.5 program structure under  
3 another name that doesn't include "emergency" in the title, and thereby eliminate any  
4 confusion about whether dispatch should be limited just to true emergency conditions.  
5 However, such changes shouldn't occur in a way that disrupts or meaningfully alters 2023  
6 or subsequent participation. Lastly, ELRP is currently California's *only* compensation  
7 mechanism for V2G exports. Thus it serves a purpose beyond emergency reliability - that  
8 is to help animate the market for a new distributed, clean-energy technology. VGIC and  
9 its members consider this absolutely essential for developing the V2G market in the state.  
10 For these reasons, additional dispatch hours relative to other ELRP subgroups are  
11 justified.

12 **Q. Based on your testimony above, do you have any recommendations for the**  
13 **Commission for the A.5 subgroup in future years?**

14 A. Yes, I have several recommendations:

- 15 • First, the Commission should reiterate in this proceeding the position it took in D.21-12-  
16 015 authorizing group A.5 and again in the Draft Resolution – specifically that the  
17 minimum dispatch hours for A.5 should not be reduced in future years of the ELRP  
18 program.
- 19 • Second, since updated or reaffirmed A.5 terms and conditions generally may not see final  
20 resolution until after the start of the ELRP season, the IOUs should be required to offer  
21 more flexible participation options that can reduce further barriers and delays. For  
22 example, PG&E and SCE's ELRP Frequently Asked Questions page states that

1 “aggregators and third-party demand response providers will be notified of events by  
2 email and/or text.”<sup>47</sup> However, I’ve been informed that in some cases aggregators were  
3 requested to complete a technical integration with the utility/program administrator’s  
4 resource management system. A more flexible approach would have been to clearly  
5 communicate to participants that they *may* complete a full technical integration but are  
6 not required to. While basic email or text notifications may not be an ideal scalable, long-  
7 term solution, it will allow for faster enrollment in the near-term so that aggregators can  
8 begin deploying VGI resources even before they’ve fully integrated with the  
9 utility/program administrator’s system.

- 10 • Third, the IOUs should be explicitly prohibited from proposing to implement  
11 fundamental ELRP program design changes that limit participation (such as lowering the  
12 minimum dispatch hours) outside of a formal proceeding. Such proposals cause  
13 significant uncertainty and disruption for participants who are attempting to bring novel  
14 technologies and services to market. Such technology and product development hinges  
15 upon reasonable expectations of market certainty, and as such there needs to be some  
16 level of consistency in ELRP terms and conditions across multiple seasons. In aid of this,  
17 the Commission should establish which terms and conditions for each sub group (e.g.,  
18 minimum dispatch) are “off-limits” for advice letter changes.
- 19 • Fourth, the Commission could require that future changes to A.5 be limited to those that  
20 are intended to expand participation rather than constrain it. This is particularly true

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<sup>47</sup> See PG&E and SCE. *ELRP: Aggregator / DRP FAQ*. Accessed April 21, 2023. <https://elrp.olivineinc.com/aggregator-drp-faq/> or <https://elrp.sce.com/aggregator-drp-faq/#events>. Under “How will I be notified of an ELRP event for my aggregation?”, PG&E states “Aggregators and third-party demand response providers will be notified of events by email and/or text.”

1 since A.5 is the only current option in CA for compensating V2G, an emerging  
2 technology, at least until dynamic export rate options become available. For example, one  
3 potential constructive future change might be to allow for participation via telematics  
4 which I discuss further in the following section of my testimony.

- 5 • Fifth, the Commission should move up the date after which utilities may submit Advice  
6 Letters from January 15 to November or December.

7 **Q. Is California currently viewed as a leader in leveraging V2X equipment to support**  
8 **the grid?**

9 A. No. Despite having the largest number of EVs, EV chargers, and electric school buses in  
10 the nation, California is not the largest market for V2G charging. In the northeast, the  
11 ConnectedSolutions Program in Massachusetts and Rhode Island, as well as Green  
12 Mountain Power's Bring You Own Device program, offers comparatively compelling  
13 opportunities for V2G school buses to earn as much as \$10,000 per year.<sup>48</sup> Note this does  
14 not include funding support for infrastructure investments, which would further reduce  
15 the total cost of ownership. By contrast, the two customer accounts in California that

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<sup>48</sup> National Grid Massachusetts' ConnectedSolutions program offers \$200/kW-Summer for 30-60 events per year at 2-3 hours per event. Rhode Island Energy's ConnectedSolutions program offers \$300/kW-Summer for 30-60 events per year at 2-3 hours per event.



1 enrolled in A.5 in summer 2022, each containing several V2G school buses,<sup>49</sup> made a  
2 combined \$1,520.<sup>50</sup>

3 **Q. Do you have any additional recommendations based on this?**

4 A. Yes. Since one of the goals of the A.5 subgroup is to advance the market for emerging  
5 VGI technologies, I think the Commission should consider bolstering the compensation  
6 rate for A.5 participants to make it more aligned with those in the northeastern US.

7 **Q. Can California overcome its relative disadvantage to other states who are**  
8 **proactively developing customer program offerings aimed at incentivizing beneficial**  
9 **V2X exports?**

10 A. Yes. California can already compete with other states on technology deployment  
11 incentives with announced and proposed CEC funding opportunities (i.e., REDWDS,  
12 V2G school bus infra GFO, and DEBA). However, if California wishes to unlock EVs as  
13 a grid resource, it must complement these deployment funds with customer programs that  
14 are attractive enough to V2G site developers – many of whom are now flocking to  
15 higher-opportunity markets in the northeast.

16 **IV. EXPANDING EV PARTICIPATION IN DR PROGRAMS**

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<sup>49</sup> See Nuvve Holding Corp. *SDG&E and Cajon Valley Union School District Flip the Switch on Region's First Vehicle-to-Grid Project Featuring Local Electric School Buses Capable of Sending Power to the Grid*. July 26, 2022. <https://nuvve.com/sdge-and-cajon-valley-union-school-district-flip-the-switch-on-regions-first-vehicle-to-grid-project-featuring-local-electric-school-buses-capable-of-sending-power-to-the-grid/>; and Nuvve Holding Corp. *San Diego County's Ramona Unified School District, Blue Bird and Nuvve Unveil 8 New V2G-Enabled and Qualified Electric School Buses*. October 11, 2022. <https://nuvve.com/ramona-unified-school-district-blue-bird-nuvve-unveil-new-v2g-electric-school-buses/>.

<sup>50</sup> Administrative Law Judge's Ruling Providing the ELRP Program Data for 2022 Summer Season. March 2, 2023. <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M502/K977/502977248.PDF>. Attachment A, Part 6, Page A.5. The overall Total Delivered kWh (interval positive performance) for subgroup A.5 over 32 hours in 2022 equaled 760 kWh. Assuming the ELRP compensation rate of \$2/kWh, SDG&E would have paid out \$1,520 in ELRP compensation to these customers.

1 **Q. Are networked EVSEs the only means through which EV drivers can participate as**  
2 **a demand response resource?**

3 A. No. EV drivers could also theoretically participate as a DR resource by utilizing their  
4 EV's onboard telematics data.

5 **Q. What are the benefits of promoting participation in DR programs using telematics**  
6 **rather than networked EVSE?**

7 A. Implementing onboard telematics as a pathway for participation in DR programs can  
8 support equity, customer choice, and access by extending program eligibility to EV  
9 customers with non-networked Level 2 EVSE, those who use non-networked Level 1  
10 plugs, and those who may simply prefer to participate via telematics rather than  
11 networked EVSE. From the customer perspective, unlocking vehicle-based VGI in  
12 addition to charger-based VGI can result in a larger list of eligible equipment. Utilities  
13 that offer both vehicle telematics and networked EVSE-based participation pathways will  
14 undoubtedly have the largest list of eligible equipment and, in turn, be able to offer the  
15 greatest amount of customer choice and access.

16 Many Californians live in old, multi-unit dwellings that may not be able to accommodate  
17 Level 2 charging due to electrical infrastructure or physical space constraints. Offering  
18 vehicle-based enrollment and participation in DR programs allows these customers  
19 access to programs that can (1) reduce their total cost of vehicle ownership, (2) lower  
20 their electricity bills, and (3) support the local and system grid reliability needs. It would  
21 be unjust to restrict EV DR participation for certain customers simply because they  
22 cannot access a networked Level 2 chargers.

1 **Q. Has the use of telematics been shown to shift EV charging off-peak?**

2 A. Yes. Using vehicle telematics represents an effective strategy to manage charging and  
3 can complement networked EVSE program participation.<sup>51</sup> Telematics-based managed  
4 charging is being implemented around the country and can result in up to 95% off-peak  
5 charging.<sup>52</sup> As part of a University of California, Berkely research effort funded by the  
6 California Energy Commission, researchers determined that telematics-based managed  
7 charging can provide viable grid services.<sup>53</sup>

8 **Q. Has the use of telematics for this purpose proliferated across the country?**

9 A. Yes. In California, PG&E currently offers a Low Carbon Fuel Standard-funded managed  
10 charging pilot with WeaveGrid called “evPulse.” PG&E has also partnered with BMW  
11 for several years on the telematics-based ChargeForward pilot. In Maryland, Baltimore  
12 Gas & Electric has also launched an “evPulse” offering with WeaveGrid.<sup>54</sup> Meanwhile,  
13 Xcel’s Charging Perks Pilot in Colorado leverages telematics to promote smart  
14 charging.<sup>55</sup> Other examples include: Sacramento Municipal Utility District’s Managed  
15 EV Charging pilot,<sup>56</sup> offerings from Silicon Valley Clean Energy,<sup>57</sup> Marin Clean

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<sup>51</sup> See Opinion Dynamics. *PG&E Electric Vehicle Automated Demand Response Study Report*. February 2022 <https://opiniondynamics.com/wp-content/uploads/2022/03/PGE-EV-ADR-Study-Report-3-16.pdf>; Smart Electric Power Alliance. *The State of Managed Charging in 2021*. November 2021. <https://sepapower.org/resource/the-state-of-managed-charging-in-2021/>, which finds that telematics and networked EVSEs can be complementary and are both effective strategies to manage charging.

<sup>52</sup> WeaveGrid. *Opening Comments on WeaveGrid, Inc.* DRIVE OIR. April 25, 2022. Page 4. <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M471/K485/471485327.PDF>

<sup>53</sup> California Energy Commission. *Total Charge Management of Electric Vehicles*. December 2021. <https://www.energy.ca.gov/sites/default/files/2021-12/CEC-500-2021-055.pdf>

<sup>54</sup> WeaveGrid. *Opening Comments on WeaveGrid, Inc.* DRIVE OIR. April 25, 2022. Page 4. <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M471/K485/471485327.PDF>

<sup>55</sup> Xcel Energy. *evPulse*. <https://chargingperks.xcelenergy.ev-pulse.com/>

<sup>56</sup> Sacramento Municipal Utility District. *Managed EV Charging*. <https://www.smud.org/en/Going-Green/Electric-Vehicles/Residential/Managed-EV-Charging>

<sup>57</sup> Silicon Valley Clean Energy. *GridShift: EV Charging*. <https://svcleanenergy.org/gridshift-ev/>

1 Energy,<sup>58</sup> and Peninsula Clean Energy,<sup>59</sup> National Grid’s Charge Smart MA,<sup>60</sup> Con  
2 Edison and Orange & Rockland’s SmartCharge New York Program,<sup>61</sup> the Connecticut  
3 EV Charging Program,<sup>62</sup> Portland General Electric’s Smart Charging evPulse,<sup>63</sup> Duke’s  
4 proposed telematics-based charging subscription pilot,<sup>64</sup> and ConEd and GM’s  
5 partnership on telematics.<sup>65</sup>

6 **Q. Besides the two limited offerings from PG&E that you described above, are**  
7 **customers of California’s IOUs currently able to use vehicle-based telematics to**  
8 **participate in DR programs?**

9 A. No. I am not aware of any other options for customers to leverage the capabilities  
10 embedded in the vehicle to participate in a DR program in California, including ELRP.

11 **Q. Do you support SDG&E’s proposed EV DR Pilot?**

12 A. Yes, I generally support SDG&E’s proposed EV DR Pilot. SDG&E’s proposed EV DR  
13 Pilot contemplates the use of third-party aggregators to tap into both vehicles and  
14 chargers to promote residential managed charging. Additionally, the pilot aims to align

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<sup>58</sup> Marin Clean Energy. *MCE Sync: EV Smart Charging App*. <https://www.mcecleanenergy.org/mce-sync/>

<sup>59</sup> Peninsula Clean Energy. *RFP Telematics-Based Electric Vehicle Managed Charging Pilot*. August 30, 2021. <https://www.peninsulacleanenergy.com/solicitation/rfp-telematics-based-electric-vehicle-managed-charging-pilot/>

<sup>60</sup> National Grid. *The EV Off-Peak Charging Program through Charge Smart MA*. <https://www.nationalgridus.com/Charge-Smart-MA>

<sup>61</sup> ConEdison and Orange & Rockland. *SmartCharge New York*. <https://scny.ev.energy/>

<sup>62</sup> Eversource and UI. *Connecticut Electric Vehicle Charging Program. 2023 Manual for Residential & Commercial Customers*. April 5, 2023. [https://www.eversource.com/content/docs/default-source/save-money-energy/ct-ev-comprehensive-program-manual.pdf?sfvrsn=9b958f62\\_6](https://www.eversource.com/content/docs/default-source/save-money-energy/ct-ev-comprehensive-program-manual.pdf?sfvrsn=9b958f62_6)

<sup>63</sup> Portland General Electric. *Earn money from your Tesla*. <https://portlandgeneral.com/ev-smart-charging-evpulse>

<sup>64</sup> Robert Walton. Utility Dive. *Duke may offer some EV customers ‘all you can charge’ for just \$19.99/month (restrictions apply)*. February 23, 2022. <https://www.utilitydive.com/news/duke-may-offer-some-ev-customers-all-you-can-charge-for-just-1999month/619210/>

<sup>65</sup> Con Edison. *Con Edison and General Motors Partner to Test Electric Vehicle Charging, Other Clean Energy Technologies*. October 12, 2022. <https://www.coned.com/en/about-us/media-center/news/2022/10-12/con-edison-and-general-motors-partner-to-test-electric-vehicle>

1 EV charging load with renewable energy generation, which could help reduce renewable  
2 curtailment, increase the efficiency of the grid, and significantly reduce greenhouse gas  
3 emissions.

4 **Q. Do you believe SDG&E’s proposed EV DR Pilot will sufficiently promote VIG**  
5 **managed charging?**

6 A. Not to the extent possible. I believe SDG&E’s proposed program design may increase  
7 participation from EVs in DR. However, the program budget and customer enrollment  
8 targets are not as ambitious as they should be to fully leverage the opportunity for EVs  
9 and EVSE to support the grid. As proposed, the pilot would be implemented by testing  
10 three incentive structures for pilot enrollment and participation, with a budget of \$3.3  
11 million over three years and the goal of enrolling 1,000 residential EVs. Meanwhile,  
12 SDG&E has approximately 50,000 residential EVs in its service territory.<sup>66</sup> As such,  
13 SDG&E’s proposed pilot budget and customer target should be significantly expanded.  
14 At a minimum, SDG&E’s proposed EV DR pilot should be expanded to \$9.6 million.

15 **Q. What is the basis for your proposed budget of \$9.6 million?**

16 A. D.20-12-029 or the “VGI Strategies Decision” authorized the three major IOUs to  
17 propose up to a combined \$35 million in VGI Pilots and SDG&E’s presumed allocation  
18 of these authorized funds totaled \$6.3 million.<sup>67</sup> Ultimately, SDG&E did not propose any  
19 VGI pilots per the July 15, 2021 advice letter deadline. VGIC believes SDG&E’s EV DR

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<sup>66</sup> SDG&E Ch 1B at p 66 line 3.

<sup>67</sup> D.20-12-029, Ordering Paragraph 14 states “The large electrical corporations shall identify any non-ratepayer potential funding sources and shall not request, in their combined applications, more than \$35 million.” In the March 16, 2021 and June 4, 2021 workshops, each IOU proposed VGI pilot budgets roughly proportionate to their load share. PG&E and SCE requested a combined \$28.7 million for VGI pilots. The remaining \$6.3 million in authorized funds was not ultimately requested by SDG&E.

1 Pilot proposal design is very closely aligned with the directives in the VGI Strategies  
2 Decision. SDG&E’s EV DR Pilot would meaningfully and uniquely advance VGI  
3 because it would leverage third-party aggregators to monitor and manage charging via  
4 both vehicle telematics and EVSE submetering, which has not yet been done in  
5 California and which represents a critical gap for the market. Moreover, SDG&E’s EV  
6 DR Pilot would present a very logical complement to the \$11.7 million PG&E VGI pilot  
7 focused on V2X bidirectional power flow recently approved in Resolution E-5192.<sup>68</sup> I  
8 believe it would be reasonable to add the \$6.3 million in pre-authorized funds that  
9 SDG&E could have requested in Summer 2021 to the present \$3.3 million EV DR Pilot  
10 request, such that the SDG&E’s EV DR Pilot budget is at least \$9.6 million and targets at  
11 least 3,000 customers.

12 **Q. Do PG&E’s evPulse pilot, PG&E’s BMW ChargeForward pilot, and SDG&E’s**  
13 **proposed EV DR pilot comprise a complete suite of telematics-based customer**  
14 **programs for all California IOU customers?**

15 A. No. California could unlock significantly more participation and, in turn, peak load  
16 reduction by establishing a more expansive, state-wide telematics-based managed  
17 charging program. This could take the shape of a new, large-scale telematics-based  
18 managed charging program, like the implementations in Colorado, Connecticut,  
19 Maryland, Massachusetts, New York, North Carolina, and Oregon I listed above.  
20 Alternatively, rather than creating a new program, telematics could be incorporated into  
21 ELRP (e.g., through subgroup A.5 eligibility), which offers an existing framework for  
22 measuring and compensating incremental load reduction (“ILR”) via VGI aggregations.

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<sup>68</sup> Resolution E-5192. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M474/K369/474369017.PDF>

1 In either case – (i.e., either a new, statewide telematics-based managed charging program  
2 *or* telematics eligibility for ELRP), I believe utilities could unlock far more DR potential  
3 from EVs than with the current slate of limited ad-hoc pilots.

4 **Q. Are telematics participation pathways in DR programs currently being considered**  
5 **in another Commission proceeding?**

6 A. No. It is worth noting that telematics was addressed by the Commission’s decision  
7 adopting a submetering protocol for EVs (D.22-08-024). As part of this decision, the  
8 Commission directed the three major IOUs to jointly host a workshop to discuss  
9 telematics by August 5, 2023. The decision further specified that following this  
10 workshop, “parties may file a proposal for a PEV telematics submetering protocol or  
11 amendments to the submetering protocol to include telematics.”<sup>69</sup> However, the  
12 Commission also clarified that D.22-08-024 applied specifically to customer billing and  
13 did not concern the utilities’ demand response programs.<sup>70</sup> In other words, while the  
14 forthcoming workshop will consider telematics for customer billing purposes, the  
15 Commission’s guidance seems to suggest that use of telematics for DR programs would  
16 be out of scope for the workshop. As such, I recommend that the Commission provide  
17 guidance in this proceeding regarding whether telematics for DR programs could be  
18 considered in the same workshop or a subsequent one.

19 **Q. Does ELRP currently allow for telematics-based participation?**

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<sup>69</sup> *Decision Adopting Plug-In Electric Vehicle Submetering Protocol and Electric Vehicle Supply Equipment Communication Protocols*. August 5, 2022. D.22-08-024. Page 36.

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M496/K419/496419890.PDF>

<sup>70</sup> *Decision Adopting Plug-In Electric Vehicle Submetering Protocol and Electric Vehicle Supply Equipment Communication Protocols*. August 5, 2022. D.22-08-024. Page 35.

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M496/K419/496419890.PDF>

1 A. No. While D.21-12-015 directed utilities to allow for EVSE submetering as a  
2 participation option, it did not specifically discuss the use of telematics for ELRP  
3 participation. Moreover, the submetering protocol that was recently adopted does not yet  
4 include a telematics component.

5 **Q. Do you anticipate that the submetering protocol might eventually be amended to**  
6 **include a telematics component?**

7 A. While this is entirely at the Commission’s discretion, it seems like a possibility, and  
8 appears to be contemplated by D.22-08-024 as described above. Whether and when such  
9 a change would occur is very uncertain though.

10 **Q. Could a telematics-based pathway be incorporated into ELRP on an interim basis**  
11 **until a permanent telematics protocol is adopted?**

12 A. Yes. This would be similar to the approach the Commission took to EVSE submetering,  
13 whereby it allowed for submetering to be used in ELRP on an interim basis until the final  
14 submetering protocol was adopted. As such, I recommend telematics be allowed in ELRP  
15 now on an interim basis until a new PEV telematics submetering protocol is adopted (or  
16 amendments to the existing PEV EVSE submetering protocol to incorporate telematics).

17 **Q. Has California established other policies that leverage vehicle telematics for**  
18 **program implementation purposes, as opposed to customer billing purposes?**

19 A. Yes. As noted above, PG&E leverages telematics-based VGI in its limited resilient  
20 charging pilot with WeaveGrid as well as its ChargeForward pilot with BMW.

21 Additionally, under California’s LCFS program, any charging within 110 meters of a  
22 home is attributed to that home account, and any charging within 220 meters of a non-



1 residential site is associated with that non-residential site.<sup>71</sup> This approach may be useful  
2 in determining load reduction within a given utility service territory and determining  
3 when load reductions may be ineligible for DR program compensation as a result (i.e., if  
4 charging outside of the utility territory in which the driver is enrolled in a DR program).

5 **V. SUMMARY OF RECOMMENDATIONS AND CONCLUSION**

6 **Q. Can you please provide a summary of your recommendations?**

7 A. Yes. I have broken these recommendations down into two general categories which are  
8 listed below:

9 *Recommendations to Enhance ELRP and the A.5 subgroup:*

- 10 • Accept the IOUs' proposal to extend ELRP for 2 years.
- 11 • Reject the IOUs' proposal to reduce the minimum dispatch hours for the A.5 subgroup.
- 12 • Require the IOUs to clearly offer more flexible near-term participation options that can  
13 reduce near-term barriers and delays (e.g., email notification versus full technical  
14 integration).
- 15 • Require that future Advice Letter changes be prohibited from proposing fundamental  
16 program design changes that would limit participation (e.g., reducing the minimum  
17 dispatch hours).
- 18 • Move up the date after which utilities may submit Advice Letter changes (e.g., to  
19 November versus January).
- 20 • Increase the compensation rate for the A.5 subgroup to make it comparable to V2G  
21 programs in the northeastern US.

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<sup>71</sup> California Air Resources Board. *Low Carbon Fuel Standard (LCFS) Guidance 19-03. Reporting for Incremental Credits for Residential EV Charging*. June 2019.  
[https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/guidance/lcfsguidance\\_19-03.pdf](https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/guidance/lcfsguidance_19-03.pdf)

1            Recommendations to Expand EV DR Participation via Telematics:

- 2        •        Increase the budget for SDG&E’s proposed EV DR Pilot from \$3.3 million to \$9.6  
3            million to reflect the additional amount previously authorized under D.20-12-029.
- 4        •        Allow telematics-based aggregations to be eligible to participate in ELRP on an interim  
5            basis, until a more permanent telematics protocol is adopted.
- 6        •        Expand the scope of the workshop required under D.22-08-024 to include telematics for  
7            DR programs (in addition to customer billing) or schedule a separate workshop.

8        **Q.        Does this conclude your testimony?**

9        A.        Yes.

1

**Appendix A:**

Declaration of Ed Burgess in Support of Testimony on Behalf of the Vehicle-Grid Integration Council

**DECLARATION OF ED BURGESS IN SUPPORT OF REBUTTAL TESTIMONY ON  
BEHALF OF THE VEHICLE GRID INTEGRATION COUNCIL**

I, Ed Burgess, am the Senior Policy Director for the Vehicle-Grid Integration Council (VGIC). Having worked for VGIC since its founding in 2020, I am currently managing policy and regulatory affairs for VGIC and its 33 members. My business address is 10265 Rockingham Drive, Suite #100-4061, Sacramento, CA 95827. I declare under penalty of perjury that the foregoing facts in this document are true and correct.

Executed on April 21, 2023 at Sacramento, California.

A handwritten signature in black ink that reads "Edward A. Burgess". The signature is written in a cursive style with a long, sweeping tail on the final letter.

Ed Burgess