

Docket No.: A.21-12-006 / A.21-12-008

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

Date: January 30, 2023

Witness: Ed Burgess

**REBUTTAL 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 a  
12           decarbonized transportation and electric sector by ensuring the value from EV  
13           deployments and flexible EV charging and discharging to customers and the grid is  
14           recognized and compensated to achieve a more reliable, affordable, and efficient electric  
15           grid.

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

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

1 EV Charging, FreeWire Technologies, Inc., GridWiz, Innovation Core SEI, IoTecha,  
2 Kaluza, Kitu Systems, NineDot Energy, Peak Power, Sunrun, Switch EV Ltd., The  
3 Mobility House, Utilidata, Veloce Energy, Inc., Wallbox USA Inc., WeaveGrid, and  
4 Hoosier Energy, Sacramento Municipal Utility District.<sup>1</sup>

5 **Q. Did you submit opening testimony in this proceeding?**

6 A. Yes.

7 **Q. Have you reviewed the opening testimonies of other parties in this proceeding that**  
8 **you wish to reply to?**

9 A. Yes.

10 **Q. What is the purpose of your rebuttal testimony?**

11 A. The purpose of my rebuttal testimony is to respond to the testimonies and proposals  
12 submitted by other parties, including Cal Advocates, on various issues related to San  
13 Diego Gas & Electric Company’s (“SDG&E”) proposal for Dynamic Pricing Pilots,  
14 including a two-stage Real-Time Pricing (“RTP”) Pilot and a two-stage Export  
15 Compensation Pilot, as filed in consolidated proceedings A.21-12-006 and A.21-12-008.  
16 Specifically, I will respond to testimony related to the treatment of EV High Power (“EV-  
17 HP”) customers in both of SDG&E’s proposed Dynamic Pricing Pilots as well as  
18 potential modifications to Critical Peak Pricing (“CPP”) event thresholds.

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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 **II. RESPONSE TO PARTY ANALYSIS OF SDG&E’S PROPOSED TREATMENT**  
2 **OF EV HIGH POWER (“EV-HP”) CUSTOMERS IN BOTH DYNAMIC PRICING**  
3 **PILOTS.**

4 **Q. Cal Advocates criticized SDG&E’s proposal for Export Compensation Pilot Stage 1.**  
5 **Specifically, they explained how the commodity export rate would be limited to EV**  
6 **customers whose imports (i.e., EV charging) occur on the EV-HP schedule and that**  
7 **this could lead to undesirable “rate arbitrage.” Do you agree with this critique?**

8 A. Yes. First, as Cal Advocates clearly explains, SDG&E’s proposal could lead to a “rate  
9 arbitrage” situation whereby EV customers are charging (importing) on one rate and  
10 discharging (exporting) on a different rate during the same time period. I agree that this  
11 could lead to some unintended consequences that the Commission should seek to avoid.  
12 However, it’s important to note that these unintended consequences only occur due to the  
13 potential to arbitrage *between* different rate schedules (i.e., rate arbitrage) not *within* a  
14 single rate schedule (i.e., energy arbitrage). In Cal Advocates’ hypothetical example, rate  
15 arbitrage would involve both charging and discharging during the same on-peak period  
16 while the charging occurs on one rate and the discharging occurs on another rate. This  
17 should be distinguished from energy arbitrage that might occur *within* a single time-  
18 varying rate schedule but over different time periods (i.e., charging *off-peak* and  
19 discharging *on-peak*). Such *energy arbitrage* within a single rate schedule should be seen  
20 as appropriate and desirable since it could minimize overall grid costs without leading to  
21 any cost shift. In other words, I believe a very desirable outcome from the RTP and  
22 export compensation constructs would be if a subset of EVs customers were incentivized  
23 to utilize a portion of their EV batteries to capture low-cost energy overnight or during

1 times of peak solar production and discharge it during peak afternoon/evening hours in  
2 the summer when demand is highest. If successful, this would leverage the existing  
3 battery capacity of EVs to yield some amount of permanent load shifting (or at least  
4 semi-regular load shifting), which can reduce overall energy costs on the grid.

5 **Q. What was Cal Advocates' recommendation for avoiding undesirable rate arbitrage**  
6 **through the EV-HP rate?**

7 A. Cal Advocates recommended that it should be required for "EV-HP customers who  
8 participate in the Pilot to enroll in both the commodity import and export rate."<sup>2</sup> This is  
9 consistent with my initial recommendation to include EV-HP in the RTP pilot eligibility  
10 list. I agree that this approach should be sufficient to avoid undesirable rate arbitrage by  
11 EV-HP customers, however I do have some remaining concerns over the ability to  
12 support beneficial energy arbitrage.

13 **Q. Do you think there will be meaningful opportunities for EV-HP customers to engage**  
14 **in beneficial energy arbitrage under Cal Advocate's proposal?**

15 A. Maybe, depending on how EV-HP customers participating in the Export Compensation  
16 pilot are credited for exporting and assessed for charging (i.e., imports) under the RTP  
17 pilot. Importantly, Cal Advocates' proposal (as well as SDG&E's original proposal)  
18 appears to include multiple flat volumetric rate components (i.e., the Commodity Base  
19 Rate and the EV-HP off-peak energy rate) that significantly inflate charging costs,  
20 without commensurate export compensation opportunities. This could eliminate any  
21 beneficial energy arbitrage opportunities outside of CPP event days.

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<sup>2</sup> Cal Advocates Direct at 2-6.

1 This problematic feature was also present in SDG&E’s original proposal though it has  
2 become more apparent to me after my review of Cal Advocates’ proposal. For example,  
3 under Cal Advocates’ proposal to allow EV-HP customers to participate in both the RTP  
4 and Export Compensation pilots, off-peak EV charging could potentially be subject to *all*  
5 of the following rate components for charging:

6 • *Commodity:*

- 7 ○ California Independent System Operator (“CAISO”) Day-Ahead Market  
8 (“DAM”) Hourly Price: varies by hour (off-peak hours typically in the \$0.03-  
9 0.04/kWh range during summer),
- 10 ○ CPP Commodity Capacity Adder: \$2.13/kWh (likely not applicable in off-peak  
11 charging hours),
- 12 ○ Commodity Base Rate: \$0.07/kWh, and

13 • *Delivery:*

- 14 ○ EV-HP Energy Rate, Off-peak Summer (UDC Total): \$0.08/kWh.

15 Thus, even assuming there is no CPP adder at the time of charging, total charging costs  
16 could still be on the order of \$0.18-19/kWh (or about \$180-190/MWh). These charging  
17 costs far exceed the typical on-peak CAISO DAM prices that would be offered as a credit  
18 under SDG&E’s proposed export compensation rate (outside of CPP hours). This is true  
19 even during summer peak hours. For example, according to analysis from PG&E,  
20 average CAISO DAM prices during the 4-9 pm window from 2017-2021 in summer  
21 months ranged from \$37-123/MWh (or about \$0.04-0.12/kWh).<sup>3</sup> This is far below the  
22 \$0.18-19/kWh charging costs mentioned above. While there may be some hours that the

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<sup>3</sup> PG&E Marginal Generation Capacity Cost RTP Rate Study, A.20-10-011 & A.19-11-019. March 15, 2022. Page 45.  
Figure 13. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M496/K429/496429610.PDF>

1 CAISO DAM prices become much higher, I expect this to be a very infrequent  
2 occurrence. As such, under SDG&E and Cal Advocates' proposals, there is little to no  
3 opportunity for EVs to participate in beneficial energy arbitrage since doing so would  
4 yield a net loss to participating EV customers. Under such a scenario, the CPP capacity  
5 adder credit would be the only potential source of value for Vehicle-to-Grid ("V2G")  
6 activities that benefit the grid.

7 **Q. Do you think an alternative rate design could encourage beneficial energy arbitrage**  
8 **from EVs outside of CPP event days?**

9 A. Potentially. From an energy arbitrage perspective, the fundamental problem with simply  
10 adding EV-HP onto the proposed RTP pilot is the inclusion of significant fixed costs  
11 within flat volumetric rates that are then applied to kWh consumed for charging (but not  
12 applied to kWh exported). If some of these fixed costs were recovered through other  
13 means, then there may be an opportunity to preserve the incentive for beneficial energy  
14 arbitrage via V2G.

15 **Q. What other means could recover these fixed costs?**

16 A. One possibility might be to include the fixed costs recovered by the RTP Base  
17 Commodity Rate and EV-HP Energy Rate in a subscription charge. While this would  
18 increase subscription costs for EV customers, it could also enable more VGI activities. I  
19 recommend that the Commission consider this as another option for customers to choose  
20 if they are interested in pursuing V2G. However, it should not replace the existing, lower  
21 subscription charge option.



1 **Q. Aside from energy arbitrage, are there other value streams that may make energy**  
2 **exports attractive to EV customers under either Cal Advocates or SDG&E’s**  
3 **proposals?**

4 A. Yes, but only one. Absent the rate design modifications described above, the CPP  
5 capacity adder export rate seems to represent the only viable value stream for V2G being  
6 offered to EV customers through Cal Advocates and SDG&E’s proposals. This may be a  
7 sensible first step since V2G activities compete with customers’ mobility needs meaning  
8 that presenting customers with a more limited number of high-value export hours makes  
9 a certain amount of sense. However, this also means it is imperative that the CPP export  
10 credit be well-designed and sufficient enough to attract customer participation and  
11 investment in V2G equipment. I believe that some of Cal Advocates’ recommendations  
12 on CPP event thresholds are beneficial in this regard as I will discuss later in my  
13 testimony. Additionally, I continue to strongly recommend that the Commission consider  
14 other value streams that the proposed CPP export credit does not address or may not fully  
15 capture.

16 **Q. Do you think the CPP export credit proposed by SDG&E or Cal Advocates captures**  
17 **the full value of EV exports during peak hours?**

18 A. No. Specifically, I believe the proposed CPP export credit does not fully capture the  
19 value to the transmission and distribution systems. This is consistent with the  
20 recommendations of several parties, including Cal Advocates, that the Commission  
21 should require SDG&E to seek to “develop a dynamic distribution component for the  
22 commodity import RTP rate.”<sup>4</sup> I believe the same principle should hold true for

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<sup>4</sup> Cal Advocates Direct at 1-24.

1 commodity export RTP rates. Environmental Defense Fund also detailed the need for  
2 dynamic distribution components in opening testimony, recommending the following:

3 “A locationally variegated, dynamic generation export rate to encourage  
4 carriers/shippers to sync charging with time- and location-variant grid conditions  
5 and leverage the smart charging potential and short-term needs of MHDV fleets  
6 should serve as one tariff element.”<sup>5</sup>

7 **Q. Are there any existing rates offered by SDG&E that are locationally variegated and**  
8 **reflect the value of reduced overall load on the distribution system during peak**  
9 **hours?**

10 A. Yes. SDG&E’s VGI rate includes a Distribution Critical Peak Pricing (D-CPP) Hourly  
11 Adder. Below is an excerpt from SDG&E’s VGI rate schedule describing this:

12 *Figure 1*  
13 *SDG&E Schedule VGI*

SCHEDULE VGI			Sheet 3
<u>ELECTRIC VEHICLE GRID INTEGRATION PILOT PROGRAM</u>			
<u>RATES (Continued)</u>			
<u>Distribution Rate:</u>			
The hourly Distribution Rate will be charged on a volumetric (per kWh) basis.			
<u>Distribution Rate</u>			
Distribution Base Rate	0.04940	I	
VGI day-ahead D-CPP Hourly Adder	0.79594	I	
The VGI Distribution Critical Peak Pricing (D-CPP) Hourly Adder is added to the top 200 annual hours of the circuit feeding the VGI charging stations on a day-ahead basis when the forecasted load exceeds a threshold level established based on historic load.			

14  
15 My understanding is that this adder reflects the cost of additional load on specific  
16 distribution circuits during peak hours that would be charged to EV customers on the

<sup>5</sup> Environmental Defense Fund Direct at Page 8, Line 23.

1 VGI rate. Conversely, this cost would be avoided if EV customers exported to those  
2 circuits during D-CPP event hours.

3 **Q. Do you wish to supplement any of your initial recommendations based on this?**

4 A. Yes. In my opening testimony, I recommended that SDG&E's pilots for export  
5 compensation move ahead largely as is, and that transmission and distribution credits be  
6 explored in the future. However, in light of this information, as well as a greater  
7 appreciation for challenges posed by flat volumetric charging rates as described above, I  
8 think it would be reasonable to include a dynamic distribution credit for exports sooner  
9 rather than later in the future. Specifically, I think it would be reasonable to include the  
10 \$0.79594/kWh VGI D-CPP Hourly Adder as an additional component of the Commodity  
11 Export Rate if such exports occurred on specific circuits when "forecasted load exceeds a  
12 threshold level" as defined by SDG&E in Figure 1 above.

13 **Q. Did Cal Advocates support the inclusion of the D-CPP in the RTP pilots?**

14 A. My understanding is that Cal Advocates was supportive of this in principle, but shared  
15 SDG&E's concerns that the inclusion of the D-CPP adder in the RTP import rate could  
16 be problematic from a customer fairness standpoint.

17 **Q. Do you think these same fairness concerns would be applicable in the case of EV  
18 exports?**

19 A. No. I think Cal Advocates' fairness concerns are valid but are much more salient in the  
20 context of costs that may be imposed on customer bills via a D-CPP adder through import  
21 rates. Conversely, to the extent that a D-CPP export credit could help reduce customer  
22 bills, I think there should be less overall concern. In the case of an export rate, customers

1 have an opportunity to save on their bills (while reducing overall grid costs for all  
2 customers) rather than simply be penalized based on their location. As such, I think the  
3 Commission should encourage such opportunistic behavior for customers who are in the  
4 right locations to benefit from a D-CPP export rate. This will also help to target future  
5 V2G investments in the locations where it is most beneficial to the grid.

6 **Q. Do you think the D-CPP adder should be included as a component of export**  
7 **compensation during Stage 1?**

8 A. Yes. I think it should be included at the current Schedule VGI rate of \$0.79594/kWh.

9 **Q. Are there other components that should be included in the export rate for EVs?**

10 A. Yes. I believe that a transmission component should be included. EVs are distributed  
11 resources generally located within the load pocket and can avoid significant load on the  
12 transmission system during peak hours. SDG&E's testimony has identified an "on-peak"  
13 transmission rate of \$0.06868/kWh.<sup>6</sup> While this could serve as an initial basis for an  
14 export credit rate, I believe more analysis may be needed to determine whether this  
15 reflects a marginal cost or not. As such, I believe a transmission-related export  
16 component should be developed as part of Stage 2.

17  
18 **III. RESPONSE TO CAL ADVOCATES RECOMMENDED MODIFICATIONS TO**  
19 **THE PROPOSED CRITICAL PEAK PRICING ("CPP") APPROACH.**

20 **Q. Cal Advocates recommends lifting certain restrictions on the proposed CPP**  
21 **approach to promote more contributions to net peak load. Does VGIC agree?**

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<sup>6</sup> Prepared Supplemental Direct Testimony of William G. Saxe. Attachment C.

1 A. Yes. VGIC generally supports lifting restrictions on CPP to unlock greater net peak load  
2 reduction from customers, including EV customers. Cal Advocates proposes to lift the 4-  
3 9pm constraint on CPP events and recommends using the top 150 hours of net peak load  
4 to inform CPP event triggers. This is especially important for encouraging beneficial  
5 V2G behavior. As explained above, under both Cal Advocates' and SDG&E's proposals  
6 the only viable value stream for V2G is through the CPP capacity adder. By removing  
7 restrictions and broadening the event triggers, Cal Advocates' proposal helps to ensure  
8 there are a meaningful number of CPP events that V2G customers can participate in to  
9 make it worthwhile. Without these important changes, along with the other changes  
10 described elsewhere in my testimony, I am concerned there could be no meaningful V2G  
11 participation at all.

12 **IV. CONCLUSION.**

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

14 A. Yes.

1

**Appendix A:**

Declaration of Ed Burgess in Support of Rebuttal 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 January 30, 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 flourish at the end.

Ed Burgess