Comments of the Vehicle Grid Integration Council (VGIC) on the California Energy Commission (CEC) Electric School Bus Bidirectional Infrastructure Funding Concept Workshop

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Medium- and Heavy-Duty Zero-Emission Vehicles and Infrastructure

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I. Introduction

The Vehicle Grid Integration Council ("VGIC")[1], a 501(c)6 membership-based advocacy group, is pleased to provide comments in response to the California Energy Commission ("CEC") Workshop on Electric School Bus Bidirectional Infrastructure Funding Concept hosted on September 13, 2022.

VGIC is committed to advancing the role of electric vehicles ("EVs") and vehicle-grid integration ("VGI") through policy development, education, outreach, and research. VGIC supports the transition to decarbonized transportation and electric sectors by ensuring the value from EV deployments and flexible EV charging and discharging is recognized and compensated to achieve a more reliable, affordable, and efficient electric grid.

II. Recommended enhancements to the Electric School Bus Bidirectional Infrastructure Funding Concept.

VGIC greatly appreciates the CEC staff's focus and thoughtful development of the funding concept presented during the September 13th workshop. VGIC generally supports the funding concept but recommends targeted modifications and enhancements to address critical gaps in the VGI market, detailed below.

A. Funding Level

VGIC supports the CEC staff's funding concept but recommends that a higher level of funding is provided. Bidirectional charging equipment can unlock:

- Customer and community resilience by providing clean, low-cost backup power solutions

[1] VGIC member companies and supporters include American Honda Motor Co., Inc., Customized Energy Solutions, dcbel, Enel X North America, Inc., ENGIE NA, Fermata Energy, FlexCharging, FLO EV Charging, Ford Motor Company, FreeWire Technologies, Inc., General Motors, Kaluza, Nissan Group of North America, Nuvve Holding Corporation, Sacramento Municipal Utility District, Stellantis N.V., Sunrun, Switch EV Ltd, The Mobility House, Toyota Motor North America, Inc., Veloce Energy, Inc., Wallbox USA Inc., and WeaveGrid. **The views expressed in these Comments are those of VGIC, and do not necessarily reflect the views of all individual VGIC member companies or supporters. (https://www.vgicouncil.org/)**

- Customer bill management opportunities by discharging from a vehicle to meet site load, performing energy arbitrage or demand charge management through vehicle-to-building ("V2B") discharge
- Revenue generation for customers and support for grid reliability and renewable energy integration through vehicle-to-grid ("V2G") exports. Customers can currently participate in the ELRP EV/VGI Aggregation pathway and PG&E's V2G Pilots. Additionally, VGIC expects PG&E's pending Day-Ahead Hourly Real Time Pricing ("DAHRTP") V2G export compensation mechanism settlement will be approved by the CPUC on October 20th, which would provide the first compelling year-round V2G export opportunity for customers as early as October 2023.[2] Lastly, SDG&E's anticipated Export Compensation Pilot[3] and the CPUC staff's proposed CalFUSE concept[4] will likely provide additional opportunities for export compensation soon.

Despite the customer and grid benefits of bidirectional charging, deployment numbers and product offerings remain relatively nascent. The incremental costs of installing bidirectional chargers instead of unidirectional charging remain high – prohibitive in many cases. The CEC's proposed funding concept will provide much-needed support to reduce the costs of purchasing and installing bidirectional chargers and associated electrical equipment, including traditional make-ready infrastructure and automatic transfer switches for backup power use cases. Bidirectional charging equipment is not currently given incrementally higher funding under other CEC rebates or make-ready programs. Although it is a type of energy storage, bidirectional charging equipment is not deemed eligible for California's Self-Generation Incentive Program. There exists an uneven level of access to funding for bidirectional charging equipment compared to other charging equipment and other energy storage systems. To level the playing field, the proposed funding concept would provide $2-3 million per project for an expected 3-5 projects through a one-time grant funding

[2] *Proposed Decision Adopting Settlement on Export Compensation for Certain Pacific Gas and Electric Company Customers.* September 14, 2022. http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=496924142

[3] *Prepared Supplemental Direct Testimony of Jeff DeTuri (Chapter 1) on Behalf of San Diego Gas & Electric Company*. August 15, 2022. https://www.sdge.com/sites/default/files/regulatory/A2212016%20and%20RM_SDGE%20RTP%20Supplemental%20JDTuri%20Chpt%201%20-%20Policy.pdf

[4] *Advanced Strategies for Demand Flexibility Management and Customer DER Compensation.* June 22, 2022. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/demand-response/demand-response-workshops/advanced-der---demand-flexibility-management/ed-white-paper---advanced-strategies-for-demand-flexibility-management.pdf

opportunity ("GFO"). VGIC believes successful execution of the proposed funding concept will yield significant benefits, including:

- **Accelerate the electric school bus transition** by lowering the total cost of ownership for school bus fleets and, in turn, mitigating harmful pollution for society's most vulnerable and, in turn, reducing adverse health impacts for students
- **Support the decarbonizing power grid** by utilizing batteries that reduce the need for natural gas peaker plants and facilitate additional deployment of renewable energy resources
- **Improve customer and community resiliency**, for example, during public safety power shutoffs
- **Aid the grid when reliability is most threatened**, for example, during increasingly common extreme heat events
- **Increase affordability of electricity** by deferring or avoiding local distribution grid infrastructure upgrades
- **Fostering economic activity** for California-based VGI companies and their employees

Given the broad scope of these benefits, VGIC urges the CEC to think expansively and take bold action to support bidirectional charging infrastructure deployment and accelerate the deployment of electric school buses broadly. For local education agencies, the decision to electrify their fleet may initially seem obvious but is often abandoned once the total costs of doing so are made clear. An essential tool to overcome this "sticker shock" is to unlock additional value propositions through V2G export revenue opportunities and V2B backup power. Over time, VGIC expects economies of scale and increased product offerings to reduce the costs of bidirectional charging infrastructure. Meanwhile, California's load-serving entities, the California Public Utilities Commission, and CAISO will continue collaborating to expand access to V2G export options. However, *today's* V2G market remains relatively nascent.

VGIC recommends allocating significantly more funding for this GFO. Additionally, the CEC should consider conducting a series of GFOs or establishing an ongoing bidirectional charging infrastructure rebate program specifically marketed to school buses, rather than a single, one-off $10 million GFO. VGIC notes the CEC has recently issued a proposed V2G equipment adder funding concept and believes the two concepts could be merged into one much larger rebate

program, perhaps with carveouts for certain use cases (e.g., school bus vs non-school bus). The CEC could maintain flexibility to modify those carveouts at regular intervals (e.g., every two years) based on the remaining budget and deployment levels for each use case. This would ensure the critical benefits of V2G are realized much sooner.

B. Project Location Eligibility

VGIC appreciates the CEC's focus on supporting resiliency in high fire threat districts ("HFTD") and agrees that bidirectional charging infrastructure is a critical part of the resiliency toolkit. VGIC supports requiring the infrastructure to be "for either V2B or V2G utilization."[5] However, VGIC is concerned that limiting eligible projects to HFTD will impose a *de facto* prioritization of V2B. This will result in missed opportunities to support the grid through V2G in other locations, for example, congested areas of the grid where V2G exports may be especially valuable in meeting local demand. Moreover, selecting sites and partnering with local education agencies can be challenging in this early stage of market development. VGIC is concerned that the proposed location requirements may make it more challenging to deploy bidirectional charging infrastructure. Additionally, CEC staff presented a map of CAPCOA Small and Medium Air Districts overlaid on a map of Tier 2 and Tier 3 HFTD. VGIC is unsure whether CEC is proposing to further limit siting eligibility to locations that fall within both maps, and if so, the justification for doing so is unclear.

VGIC encourages the CEC to avoid unnecessary siting restrictions that may only limit the benefits and total deployment of bidirectional charging infrastructure. While we understand there may be intent to prioritize the most vulnerable communities, this should be accomplished through a scoring mechanism rather than explicitly excluding certain areas. VGIC strongly recommends that the CEC not limit project eligibility to Tier 2 or Tier 3 HFTD or the CAPCOA Map of Small and Medium Air Districts.

C. Minimum Bus Quantity

[5] Funding Concept Slide 12.

During the workshop, CEC staff proposed requiring local education agencies to "own and operate a minimum of 10 bi-directional-capable electric school buses."[6] VGIC understands the CEC's intent to tap into significant energy storage capacity through this funding concept. However, many school districts want to electrify their fleets incrementally over time. Finding a local education agency that is planning to start out with 10 buses from the outset maybe challenging. Therefore, VGIC believes the 10-bus minimum requirement may make it more difficult to find sites and effectively achieve the funding concept's goals.

D. Charging Equipment Capacity

Not all available bidirectional chargers – of which there is only a handful on the market – would meet the proposed 60 kW minimum charging requirement. While some school buses have large batteries and range, others operate on shorter routes and may use low-power DC. However, these smaller battery buses and low-power bidirectional chargers can still provide V2B and V2G services and should be considered eligible under this funding concept. Notably, these smaller vehicles and chargers need similar electrical infrastructure upgrade costs. VGIC respectfully requests that the CEC not impose any minimum charging requirement. Alternatively, VGIC believes that the CEC could set a minimum charging requirement based on an analysis of commercially available and upcoming bidirectional charging equipment to ensure the funding requirements do not inadvertently pick market winners.

E. Charging Equipment UL Certification

The proposed funding concept would require that bidirectional chargers be certified to UL 1741 SB. Meanwhile, in the case of the investor-owned utility's Emergency Load Reduction Programs ("ELRP"), sites interconnecting to bidirectional DC chargers need to be certified to UL 1741, but *not* UL 1741 SA, UL 1741 SB, or any updated smart inverter standards established by the Smart Inverter Working Group.[7] Moreover, V2X DC sites interconnecting with investor-owned utilities for purposes other than ELRP would need to have EVSE certified to UL 1741 SA,

[6] Funding Concept Slide 14.

[7] *Phase 2 Decision Directing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company to Take Actions to Prepare for Potential Extreme Weather in the Summers of 2022 and 2023.* December 6, 2021. Attachment 1 at page 6.
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K821/428821668.PDF

but not necessarily SB, due to the 5-year grace period extended to V2X DC to meet applicable standards.[89] To remain consistent with the CPUC's findings regarding the applicability of UL 1741 SB to bidirectional charging equipment, VGIC believes that the defining eligibility requirement for the bidirectional charger rebate should instead be based on whether a bidirectional charger can seek interconnection with a utility for its intended use case. This approach recognizes the CPUC's authority over the interconnection process and works to reference the existing interconnection requirements. As such, VGIC strongly urges the CEC to remove the proposed UL 1741 SB requirement and instead provide funding to sites that meet the relevant interconnection rule for that distribution utility, which may or may not require certification to UL 1741 SB.

F. ELRP Capability Requirement

During the workshop, CEC staff detailed the proposed requirement that eligible equipment must be "capable of responding to ELRP events." [10] VGIC questions this requirement, given that any individual site with a charger connected to the grid is "capable of responding" to an ELRP event and may do so if enrolled in an ELRP Group A.5 Aggregation. ELRP does not impose specific technology or minimum size requirements on individual sites. ELRP does require that aggregations be capable of providing 25 kW of incremental load reduction ("ILR") for at least one hour. Still, this requirement applies to the entire aggregation rather than individual sites.

Moreover, VGIC advises against requiring sites to participate in ELRP, specifically. Notably, PG&E's commercial dynamic export compensation mechanism, expected to be adopted on October 20th and offered in Q4 2023, prohibits participation in ELRP but provides significant opportunities for V2G grid support.[11] Additionally, more export compensation options may be made available through new rates, programs, or direct wholesale market integration, and V2G school buses should be able to switch to another option once it is available in the future. With this

[8] Resolution E-5165. *Approval, with Modifications, of Vehicle-to-Grid Implementation Plans and Technical Requirements in Compliance with Decision 20-09-035.* Page 6. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M420/K860/420860657.PDF

[9] Resolution E-5165. *Approval, with Modifications, of Vehicle-to-Grid Implementation Plans and Technical Requirements in Compliance with Decision 20-09-035.* https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M420/K860/420860657.PDF

[10] Funding Concept Slide 15.

[11] *Proposed Decision Adopting Settlement on Export Compensation for Certain Pacific Gas and Electric Company Customers.* September 14, 2022. http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=496924142

in mind, VGIC recommends that the CEC not require that sites enroll in ELRP specifically, but rather that sites must enroll in either an existing or anticipated export compensation rate or program. The CEC should also specify that sites may switch to another export compensation rate or program in the future. Alternatively, the CEC should consider allowing sites to submit an attestation confirming they will enroll in an export rate or program within the next three years and, in the interim, will use the device for V2B discharging to manage their utility bill or provide backup power. This ensures that deployed V2X chargers are ultimately used to support the grid while recognizing that there are limited near-term V2G export options.

G. Co-Located and Integrated Renewable Generation and other Distributed Energy Resources

VGIC supports the proposed provision that the procurement and installation of renewable generation and other distributed energy resources be deemed eligible under this funding concept. Stationary energy storage integrated or co-located with EVSE can, in many cases, facilitate a lower cost and faster installation of EVSE. For example, integrated or co-located storage can allow new EVSE to be placed on an existing service and avoid or defer transformer upgrades. In the case of V2G EVSE, the benefits of integrated or co-located storage may be particularly high when on-site renewable generation is also present, as both the EV and stationary storage can self-consume the renewable generation and then export significant amounts of energy to meet local or system needs during peak hours.

III. Conclusion

VGIC appreciates the leadership of the CEC in hosting the September 13th workshop and developing the funding concept. We look forward to further collaboration with the CEC and other stakeholders on this critical initiative.

Respectfully submitted,
ED BURGESS