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VGIC Comments on 2024 Draft Zero-Emission Vehicle Infrastructure Plan

Additional submitted attachment is included below.

February 7, 2025

Email to: docket@energy.ca.gov
Docket Number: 24-TRAN-03
Subject: 2024 Draft Zero-Emission Vehicle Infrastructure Plan

RE: Comments of the Vehicle Grid Integration Council on the 2024 Draft Zero-Emission Vehicle Infrastructure Plan

Dear Sir or Madam:

The Vehicle-Grid Integration Council (VGIC) appreciates the opportunity to provide comments on the 2024 Draft Zero-Emission Vehicle Infrastructure Plan (ZIP) published by the California Energy Commission (CEC) on January 15, 2025.

VGIC submits the following comments:

- Clean Transportation funding plans should target incentives for charging site developments that utilize VGI solutions.
- Level 2 and DC Fast Charging (DCFC) will both be needed to ensure optimal customer experience and costs.
- Modifications should be made to some assumptions in the CEC's Business Case for Light-Duty EV Charging.

CLEAN TRANSPORTATION FUNDING PLANS SHOULD TARGET INCENTIVES FOR CHARGING SITE DEVELOPMENTS THAT UTILIZE VGI SOLUTIONS.

As California electrifies its transportation sector, significant new electrical load will be added to California's grid, creating opportunities to leverage EVs to not only decarbonize transportation, but also support the evolving electric power sector, apply downward pressure on electric utility rates through reduced infrastructure costs, ensure community resilience, and foster economic activity. However, without an intentional focus on unlocking these benefits, the EV transition may only serve to increase the net peak load on the grid as a whole and, notably, trigger significant distribution infrastructure upgrades in locally constrained areas of the grid.

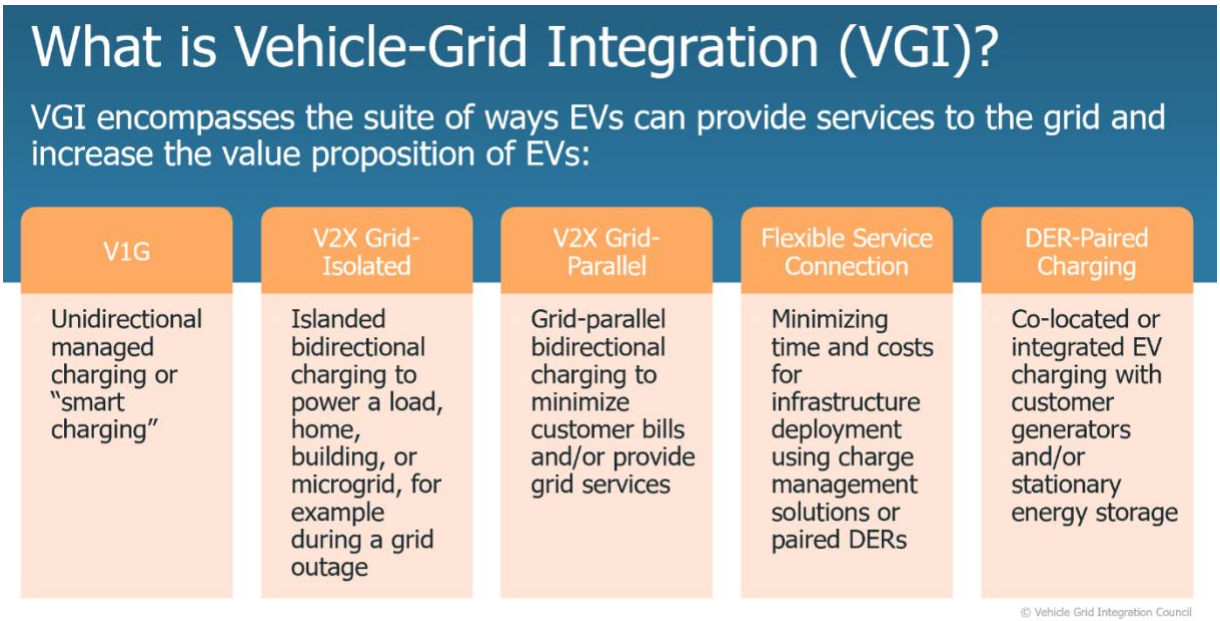
To mitigate these challenges, it is critical that California leverage vehicle-grid integration (VGI) strategies, which the CEC defines as "technologies and strategies that alter the time, charging level, or location of charging in a manner that benefits the grid while ensuring driver needs are met."[1]

[1] CEC, *Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles in 2030 and 2035* (Second AB 2127 Report) at p.88.

The formal California VGI definition, as adopted by the California Public Utilities Commission in Decision 20-12-029 pursuant to Senate Bill 676, includes *discharging*:

> "Electric vehicle grid integration" means any method of altering the time, charging level, or location at which grid-connected light-duty electric vehicles, medium-duty electric vehicles, heavy-duty electric vehicles, off-road electric vehicles, or off-road electric equipment charge or discharge, in a manner that optimizes plug-in electric vehicle or equipment interaction with the electrical grid and provides net benefits to ratepayers by doing any of the following:
>
> (A) Increasing electrical grid asset utilization and operational flexibility.
>
> (B) Avoiding otherwise necessary distribution infrastructure upgrades and supporting resiliency.
>
> (C) Integrating renewable energy resources.
>
> (D) Reducing the cost of electricity supply.
>
> (E) Offering reliability services consistent with the resource adequacy requirements established by Section 380 or the Independent System Operator tariff.

To further simplify references to VGI solutions throughout these comments, we offer the following graphic:



As has already been detailed by the CEC, "VGI could provide significant benefits to the electrical grid and customers,"[2] and "[w]idespread VGI (and load flexibility generally) will help achieve

[2] Ibid at p.89.

California's climate and decarbonization goals."[3] In addition to minimizing long-term distribution upgrade costs, VGI can help accelerate charger deployment in the near term, allowing the state to meet its climate and air quality mandates more quickly.

Despite the importance of VGI strategies in reaching California's charging infrastructure deployment goals, the ZIP offers little discussion of the topic beyond a high-level acknowledgment that it could make charging more profitable and benefit both customers and the grid. The final ZIP should address this gap by outlining specific opportunities to target Clean Transportation Program funding to accelerate VGI solution deployment. Incremental funding for VGI solutions would also help offset the high $800 interconnection fee required for bidirectional charging projects in investor-owned utility territories, which is further discussed below.

One key area of opportunity to support VGI solutions in the ZIP is providing incremental funding for managed charging and bidirectional charging systems, which individually require additional software and hardware investments upfront but can significantly reduce the overall costs of integrating EVs into California's electric grid in the long-term.

Regarding flexible service connection and DER-paired charging, the CEC has offered support to some extent, but it has been inconsistent, which creates uncertainty and mixed regulatory signals for solution providers. For example, demand management software is an eligible cost in Communities in Charge, but costs for co-located energy generation, such as battery energy storage or solar are explicitly ineligible.[4] EnergIIZE for medium and heavy-duty vehicles has a similar treatment of including "charge management software" as an eligible cost but not physical DERs.[5] On the other hand, CALeVIP's Golden State Priority Project did allow solar and storage systems to be included as eligible project costs, although these projects were still subject to the same per port incentive cap as projects that did not leverage DERs.[6] To maximize the benefits of VGI, the CEC should ensure that flexible service connection technologies, including charge management systems and/or paired DERs are eligible for funding across all Clean Transportation Program initiatives and consider providing incremental incentives for projects that integrate grid-supportive VGI solutions.

Bidirectional charging systems remain in the early stages of deployment and face relatively high installation costs, including more expensive hardware and the highest DER interconnection fees

[3] Ibid.
[4] *Communities in Charge Project Implementation Manual Funding Wave 3* at p.23. Available at: https://thecommunitiesincharge.org/wp-content/uploads/2024/11/Communities-in-Charge-Implementation-Manual-Funding-Wave-3-ADA.pdf
[5] See the EnerGIIZE eligible equipment here: https://www.energiize.org/infrastructure
[6] Center for Sustainable Energy, *Implementation Manual for Golden State Priority Project* at p.10. Available at: https://calevip.org/sites/default/files/docs/golden-state-priority-project-north-south/gspp2-implementation-manual.pdf

in the nation, $800 per interconnection application for California's investor-owned utilities. This fee is roughly ten times the national average. While the CEC has made progress in supporting bidirectional charging through the Demand Side Grid Support (DSGS) program, these programs alone are insufficient to cover the high upfront costs of bidirectional charging equipment. To accelerate adoption, VGIC recommends that additional incentives be provided to offset the higher upfront costs of bidirectional charging systems. Increased funding will be crucial in unlocking the full potential of bidirectional EV resources, including the opportunity to reduce ratepayer costs through deferring and avoiding generation and distribution capacity upgrades, integrate renewable energy, and reduce the total cost of EV ownership for customers. These incremental incentives are especially critical in these early years of market development.

Specifically, the CEC can encourage customer adoption of these solutions by supporting incremental incentives for bidirectional charging systems through Clean Transportation Program block grants and scalable rebate application programs. While the Zero-Emission School Bus and Infrastructure Program (ZESBI) currently offers incrementally higher incentives for bidirectional DCFC equipment, several key funding gaps remain. First, ZESBI does not offer incremental incentives for non-DCFC bidirectional charging equipment. Several existing, UL-certified bidirectional DC chargers operate at lower power levels (i.e., non-DCFC) and can meet the needs of certain school bus fleets. Second, no other CEC funding program offers incremental incentives for bidirectional charging systems. In fact, VGIC is only aware of one other opportunity in California for bidirectional chargers to receive an incremental incentive for the bidirectional capability.[7] Incentivizing the deployment of this equipment through block grants and scalable rebate application programs is preferred to *ad hoc* funding opportunities, which the CEC has primarily used to support VGI solutions in the past. These funding opportunities are administratively burdensome for solution providers, many of which are small companies and startups that have limited resources but earnestly desire to support California's grid through bidirectional charging technologies.

LEVEL 2 AND DCFC WILL BOTH BE NEEDED FOR OPTIMAL CUSTOMER EXPERIENCE AND COSTS.

In the Draft ZIP, the CEC asks for stakeholder feedback on whether to use a charger deployment scenario that includes funding for both Level 2 and DCFC or a scenario that is DCFC-focused. VGIC sees a need to support both Level 2 and DCFC charger deployment at this time, as both charging types serve distinct needs and face unique deployment challenges.

[7] PG&E's V2X Pilots include an upfront incentive to achieve several goals, including helping offset the incremental bidirectional charging equipment costs, partially mitigating the $800 interconnection application fees, and incenting initial customer enrollment.

There is an important role for the "gas station model," wherein infrastructure deployment centers on EV drivers requiring faster charging speeds at public locations to meet mobility needs. However, one of the largest benefits of deploying more DCFC is improving customer sentiment about EVs generally and increasing the likelihood of consumers adopting EVs. Many drivers are concerned about EV charging speeds and want to be able to fully charge their vehicle in 30 minutes or less when needed.[8] Adding additional DCFC throughout California with high charging speeds will allow consumers to meet these charging needs during public outings or other scenarios such as road trips. Widely available fast charging can also alleviate concerns around EV range, which consumers have consistently raised.[9] The CEC should consider the qualitative benefits of deploying additional DCFC to improve the customer experience of EV ownership and address concerns from customers who would switch to an EV if charging was more convenient.

Without broad customer acceptance of EVs, California will face difficulties meeting its EV adoption goals. The CEC is currently planning for 7.1 million passenger EVs in 2030 and 15.2 million passenger EVs in 2035, greatly expanding charging demand.[10] Meeting EV adoption targets is critical to meeting California's air quality and climate goals, including the mandate from AB 32 that California be carbon neutral by 2045.

Additionally, significant amounts of federal funding have been allocated to deploy DCFC in California through the National Electric Vehicle Infrastructure (NEVI) Formula Program and Charging and Fueling Infrastructure (CFI) Grant Program. It is currently unclear whether all the expected federal funding will be distributed to states and charging projects. If federal funding is not available for DCFC as expected, the CEC should evaluate whether additional state funding for DCFC is appropriate to fill this gap.

Level 2 charger deployment also remains critical in the next phase of EV adoption, as Level 2 charging continues to be less expensive to deploy than DCFC but provides significantly faster charging than Level 1 outlets. The infrastructure required for Level 2 chargers often avoids extensive distribution grid upgrades and associated costs that would be triggered by DCFC deployment. This allows Level 2 charger deployment to be both less expensive and quicker to install than DCFC.

Moreover, Level 2 chargers allow for the expansion of the "charge where you are model." Implementing Level 2 chargers in multifamily housing and workplaces addresses critical charging needs, making EV ownership more practical and appealing for a broader range of individuals. The

[8] *See e.g.*, McKinsey, "Exploring consumer sentiment on electric-vehicle charging", January 9, 2024. Available at: https://www.mckinsey.com/features/mckinsey-center-for-future-mobility/our-insights/exploring-consumer-sentiment-on-electric-vehicle-charging
[9] Ibid.
[10] Second AB 2127 Report at ii.

CEC has acknowledged this in the ZIP[11] and VGIC supports utilizing funding to support deployment of EV chargers at these sites. Critically, in these two charging locations, EVs are likely to remain parked and plugged in for extended periods of time. This setup facilitates effective EV load management and allows for the deployment of VGI technologies and more widespread participation in VGI offerings (i.e., utility dynamic rates and programs like DSGS). Managed charging programs can optimize EV charging to periods of low energy demand, high renewable energy production, or other selected policy goals, in turn enhancing grid affordability, stability, and efficiency while ensuring customer charging needs are met by the end of their time plugged in. Furthermore, there is growing recognition of the importance of workplace charging to allow EVs to capture excess solar generation during the daytime and shift that power to the early evening when it can be injected back to the grid to reduce the net peak load.[12]

MODIFICATIONS SHOULD BE MADE TO SOME ASSUMPTIONS IN THE CEC'S BUSINESS CASE FOR LIGHT-DUTY EV CHARGING.

In the Draft ZIP, the CEC provides an overview of the "Business Case for Light-Duty Charging," which includes modeled installation costs and the cost of service for public light-duty charging. The report presents cost estimates for both Level 2 and DC fast chargers (DCFC).

Overall, VGIC finds that many of the CEC's cost estimates are reasonable for planning purposes. However, we offer the following high-level considerations regarding the Draft ZIP key assumptions:

- **Extending DCFC lifetimes:** The Draft ZIP assumes a 10-year lifespan for Level 2 chargers but only a 7-year lifespan for DCFC. Based on discussions with VGIC members regarding available warranties and EVSE specifications, VGIC anticipates that DCFC equipment lifetimes will be greater than 7 years. In general, EVSE equipment lifespans are increasing, and as the industry matures, longevity is expected to improve further. We recommend that the CEC consider extending the assumed useful life of DCFC equipment in its analysis.

- **Increasing energy costs:** VGIC urges the CEC to reevaluate its energy cost estimates, particularly in light of rate variability and anticipated increases in electricity prices. The Draft ZIP categorizes energy costs into fixed costs, demand charges, and volumetric energy charges, but it is unclear how the CEC derived the specific figures used in the

[11] Draft ZIP at p.36.
[12] Aligning electric vehicle charging with the sun: An opportunity for daytime charging?, The Electricity Journal, February 2025 at: https://www.sciencedirect.com/science/article/pii/S1040619025000028/pdfft?md5=188b066bae60f1e557ef1f92c04fd4be&pid=1-s2.0-S1040619025000028-main.pdf

report. VGIC believes that these estimates may underestimate the actual energy costs that many customers face and do not fully account for projected rate increases. For example, PG&E's Business EV High Use Rate (BEV-2) has a fixed monthly fee of $286.68 for just 150 kW of service—equivalent to only one port in the CEC's primary inputs table.[13] At a larger site, such as a 12-port DCFC installation, peak demand charges would significantly increase this fixed fee. Similarly, SCE customers on the EV rate for demand above 500 kW (TOU-EV-9) face a fixed monthly fee of $470.69 for 2-50 kV of service.[14] While PG&E's BEV-2 rate has an average volumetric charge of $0.24/kWh, more closely aligned with the CEC's estimate, SCE's TOU-EV-9 has a much higher average rate of $0.31/kWh.[15] Given these variations, VGIC recommends that the CEC account for differences in electricity rates across utilities and incorporate future expected rate increases into its cost modeling.

- **Potential to include multiple ports on one power control system:** The CEC should consider scenarios in which multiple charging ports or plugs are supported by a single circuit or power control system. This applies to both Level 2 and DCFC installations. Such configurations can help distribute fixed hardware costs across more charging ports, improving cost efficiency.

CONCLUSION.

VGIC appreciates the opportunity to provide these comments and looks forward to collaborating with the CEC and other stakeholders in this docket.

Respectfully submitted,
/s/ Zach Woogen
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[13] See PG&E's current commercial EV BEV rates here: https://view.officeapps.live.com/op/view.aspx?src=https://www.pge.com/assets/rates/tariffs/CommlElecVehicle_Current.xlsx
[14] See SCE's Rate Schedule TOU-EV-9. Accessible at: https://edisonintl.sharepoint.com/:f:/t/Public/TM2/El6HQ0Elcq9Lia7wVwVniMoBlqPZDN0gthTXPa2JS_FxkQ?e=52kWEU
[15] Note: Both volumetric rates are bundled delivery and energy costs.