

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to
Modernize the Electric Grid for a High
Distributed Energy Resources Future.

Rulemaking 21-06-017
(Filed June 24, 2021)

**COMMENTS OF THE VEHICLE-GRID INTEGRATION COUNCIL ON
ADMINISTRATIVE LAW JUDGES' RULING SETTING A WORKSHOP, ADMITTING
INTO THE RECORD PART 1 OF THE ELECTRIFICATION IMPACTS STUDY AND
RESEARCH PLAN, AND SEEKING COMMENTS**

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In accordance with the Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”), the Vehicle-Grid Integration Council (“VGIC”) hereby submits these comments on the *Administrative Law Judges’ Ruling Setting a Workshop, Admitting into the Record Part 1 of the Electrification Impacts Study and Research Plan, and Seeking Comments* (“EIS Part 1 Ruling”), issued by Administrative Law Judge (“ALJ”) Manisha Lakhanpal and Kelly A. Hymes on May 9, 2023.

I. INTRODUCTION.

VGIC is a 501(c)6 membership-based advocacy group 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 a decarbonized transportation and electric sector by ensuring the value from EV deployments and flexible EV charging and discharging is recognized and compensated in support of a more reliable, affordable, and efficient electric grid.

VGIC commends the Commission for commissioning the two-part Electrification Impacts Study (“EIS”) series in an effort to determine the scope and scale of potential electric

grid impacts to support Rulemaking (R.) 21-06-017: the *Order Instituting Rulemaking (OIR) to Modernize the Electric Grid for a High Distributed Energy Resources Future*¹ and California’s electrification goals. VGIC also appreciates the work and effort by the Kevala, Inc. (“Kevala”) team in developing the comprehensive Part 1 Electrification Impacts Study (“Part 1 Study”) which helps stakeholders understand the potential impacts of a high distributed energy resource (“DER”) future. Importantly, VGIC appreciates the Commission’s diligent efforts in convening stakeholders to participate and offer input on the EIS, and specifically, for facilitating the discussions around transportation electrification (“TE”) load impacts and the vital role grid integration technologies (e.g., advanced DER solutions and flexible load management) can play in mitigating those impacts. To that end, VGIC believes deploying VGI technologies will be key in preparing for potential TE load impacts and a high DER future. With this in mind, VGIC generally supports Kevala’s approach, results, and insights for the Part 1 Study and offers comments on the Part 1 Study and recommendations for the EIS Part 2 Study, summarized below.

- Recommendations for EIS Part 2 Study:
 - VGIC recommends that the EIS Part 2 Study consider several sensitivities for EV load management to accurately reflect the value of VGI solutions.
 - The Commission should consider contracting an independent evaluator to ensure the IOUs provide consistent data quality and transparency for the Part 2 Study.
 - The EIS Part 2 Study should ensure a wide set of non-wires solutions and load mitigation strategies are considered.

- Comments on EIS Part 1 Study:

¹ CPUC R.21-06-017, *Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future*.

- VGIC supports EIS’s recommendation to increase the investor-owned utilities’ (“IOU”) Distribution Planning Process (“DPP”) planning horizon and integrate policy-based demand scenarios into the annual DPP and Grid Needs Assessment (“GNA”)/ Distribution Deferral Opportunity Reports (“DDOR”).
- VGIC supports EIS’s recommendation to estimate secondary infrastructure upgrades needed to support California’s electrification policy goals.
- VGIC supports EIS’s recommendation to provide additional information about transmission and sub-transmission constraints and identify where higher voltage upgrades will be triggered due to distribution demand.

II. RECOMMENDATIONS FOR EIS PART 2 STUDY

A. The EIS Part 2 Study should consider several sensitivities for EV load management to accurately reflect the value of VGI solutions.

As explained by Kevala, the Part 1 Study developed and analyzed a base case, calibrated to the 2021 Integrated Energy Policy Report’s (“IEPR”) system-level forecasts to ensure consistency with the IOUs’ GNAs.² For Part 2, VGIC respectfully requests that the Kevala team conduct several TE load scenarios based on different levels of managed charging:

- Baseline EV Load Management, based on 2021 IEPR Forecast used in Part 1. This assessment has already been completed in Part 1.
- Mid EV Load Management, based on updated 2022 IEPR assumptions, which reflect higher TOU rate participation from EVs.

² EIS Part 1 Study, pg. ES-4.

- High EV Load Management, based on the inputs and assumptions for high EV load management used in the June 2023 Updated Integrated Resource Planning Inputs and Assumptions document.³
- High EV Load Management + EV Charger Export, based on the inputs and assumptions used in the June 2023 Updated Integrated Resource Planning Inputs and Assumptions document.⁴

VGIC believes that these scenarios will help to understand the value of VGI on the distribution grid and provide critical policy guidance for the Commission moving forward. We urge the Commission and Kevala to seize this opportunity to conduct a first-of-its-kind robust analysis of the distribution value of VGI (i.e., EV load management, bidirectional charging, and storage-backed charging). This will ultimately bolster the key findings related to TE impacts on the grid and provide a dynamic, accurate picture of the available tools in the high DER toolkit.

B. The Commission should consider contracting an independent evaluator to ensure the IOUs provide consistent data quality and transparency for the Part 2 Study.

VGIC reiterates its appreciation for the work done by the Commission and Kevala staff on the Part 1 Study. Notwithstanding the data quality issues, VGIC believes that the work performed on the Part 1 Study is of the highest quality possible. While VGIC believes the IOUs made their best efforts in providing quality and complete data to Kevala for the Part 1 Study, it's evident that Kevala encountered multiple issues with missing, and inconsistent data while conducting their analysis. As identified by Kevala in the EIS Part 1 Study report, the challenges

³ *Inputs & Assumptions, 2022-2023 Integrated Resource Planning (IRP), June 2023.* https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2023-irp-cycle-events-and-materials/draft_2023_i_and_a.pdf

⁴ *Id.*

related to missing or inconsistent data ranged from Advanced Metering Infrastructure (AMI) data, which helps to provide a “detailed picture of energy demand over time for a location,” to interconnection data, which helps model “existing PV and BESS systems.”⁵ Most notably, with the interconnection dataset, “about 80% of the records were missing the energy rating.”⁶

It is of the utmost importance that the quality and completeness of the data used for the Part 1 Study improves to the extent feasible before commencing the Part 2 Study. While VGIC understands the difficulties regarding the logistics of gathering substantial data, the inputs used in the Part 2 Study must be of higher quality and completeness in order to yield the most meaningful findings. Given that the result of any analysis is highly dependent on the input data quality, addressing the key issues Kevala encountered in the first part of the study will be a key factor in the value and usefulness of the Part 2 Study. This being said, VGIC urges the Commission to consider contracting an independent evaluator to ensure the IOUs provide consistent data quality and transparency for the Part 2 Study. VGIC believes this will not only provide better insight as to where deficiencies exist in regard to data availability but will also ensure a more accurate, useful, and prudent Part 2 Study.

C. The EIS Part 2 Study should ensure a wide set of non-wires solutions and load mitigation strategies are considered.

VGIC believes that deploying non-wires solutions and load mitigation strategies will be key in preparing California’s grid for a high DER future. Moreover, given the increasing number of EVs on the road, California’s ambitious TE goals, and the rapidly emerging managed charging technologies for EVs (i.e., software- and hardware-based solutions), it is a must that these

⁵ EIS Part 1 Study, pg. 142-144.

⁶ *Ibid.*

mitigation strategies are accounted for in the Part 2 Study and when planning for infrastructure investments. Without considering an adequate diversity of VGI technologies, the Part 1 Study found that the “system-level peak load increase from 2025 to 2035 is 56%, on average, across the three IOUs and High Transportation Electrification scenarios”⁷ and the significant increase in peak demand was mainly due to TE impacts. Thus, it is pivotal that, at a minimum, software- and hardware-based solutions to manage EV charging load specifically for local grid constraints (i.e., as opposed to system-level needs), including:

- Platforms to manage EV charging load on the distribution system, including at the secondary / transformer level.
- Site-level EV load management utilizing power-sharing software across several chargers at a single customer site.
- Storage-backed EV charging and DER-paired EV charging.

D. The EIS Part 2 Study should include specific recommendations to help advance pilots and programs that can mitigate the cost impacts determined in EIS Part 1 Study.

EIS Part 1 indicated the severe costs to inaction when building out the distribution grid to meet California’s policy goals, and VGIC posits these costs are intolerable to ratepayers. The EIS Part 2 Study offers an opportunity to quantify the potential cost mitigation opportunity through load management solutions and, critically, to detail specific policy recommendations to advance and operationalize these solutions. Specifically, VGIC urges the Kevala team to analyze recommendations for enhancements to California’s existing demand response and EV load management frameworks. For example, the Commission has not detailed the process for utilities to propose new VGI programs, and the utilities have not proposed large-scale EV load

⁷ EIS Part 1 Study, pg. ES-6

management programs that leverage VGI solutions. While VGIC welcomes additional and refined distribution planning process recommendations, as provided in EIS Part 1, we believe these are of limited value without directly-linked, actionable recommendations to enhance or add programs and pilots offering infrastructure cost mitigation opportunities. We recognize the Commission has invested time in a unified, dynamic rate design vision and has principally committed to seeking precise load flexibility in response to real-time system needs through rates. However, capturing the benefits of avoiding investments and operations and maintenance costs for the downstream distribution infrastructure identified by the Kevala team, including secondary service and transformer upgrades, is challenging for rate design on its own. VGIC urges the continued assessment and pursuit of programmatic solutions to ensure high load flexibility and customer resource response with low complexity and administrative burden. The EIS Part 2 study offers a critical opportunity to assess and recommend next steps related to the portfolio of programs and pilots to mitigate the cost impacts determined in EIS Part 1.

III. COMMENTS ON EIS PART 1 STUDY.

A. The IOUs should increase their DPP planning horizon.

The Part 1 Study recommended that Pacific Gas and Electric (“PG&E”), Southern California Edison Company (“SCE”), and San Diego Gas and Electric (“SDG&E”) should increase the planning horizon for their distribution planning filings to better align with the California Energy Commission’s (“CEC”) IEPR planning horizon (i.e., 15 years) and the California Independent System Operator’s (“CAISO”) transmission planning horizons (i.e., 10

years for annual planning and 20 years for transmission outlook).⁸ VGIC agrees with Kevala's recommendation to increase the IOUs' DPP planning horizon to better align with other state planning initiatives, such as the CEC's IEPR.

As identified in the Part 1 Study, the "system-level peak load increase from 2025 to 2035 is 56%, on average, across the three IOUs and High Transportation Electrification scenarios".⁹ This significant increase in system-level peak load was estimated in the study by looking further out than the current IOUs' DPP planning horizon (i.e., 15 years instead of 10 years), and given that the state has set course to end sales of internal combustion passenger vehicles by 2035,¹⁰ and the main purpose of R.21-06-017 being to "prepare the electric grid for a high number of distributed energy resources, including those specific to transportation electrification,"¹¹ it's evident that there is a disconnect between the timing of the current DPP planning horizon and the potential grid investments needed over the longer term to prepare the grid for a high number of DERs.

Moreover, in order to cost-effectively mitigate the impacts associated with the high electrification scenarios, distribution investment deferrals (e.g., DERs as an alternative to infrastructure capital investments) need to be effectively identified and utilized. However, the current DER planning processes "result in minimal-to-no deferral opportunities being implemented."¹² For example, a recent evaluation of the IOUs' DIDF filings found that 2,082 grid needs were identified between the three IOUs in the three DIDF cycles spanning from 2020-2022. Of those 2,082 grid needs identified, 1,457 were planned investments, and of those, only

⁸ EIS Part 1 Study, pg. 121.

⁹ EIS Part 1 Study, pg. ES-6.

¹⁰ Executive Order N-79-20

¹¹ CPUC R.21-06-017, pg. 2.

¹² EIS Part 1 Study, pg. 121.

140 were identified as distribution investment deferral candidates, while only a mere 5 were actually procured and interconnected through DIDF.¹³ Furthermore, the evaluation also determined that the primary driver of the significant reduction in candidate deferrals between the planned investments stage (i.e., 1,457 identified) and the candidate deferral stage (i.e., 140 identified), “is the mismatch in distribution grid needs planning and DER eligibility time horizons.”¹⁴ This timing mismatch hinders the ability to consider and procure distribution investment deferrals properly, and increasing the DPP planning horizon could help mitigate this mismatch.

For the aforementioned reasons, VGIC supports EIS’s recommendation that the IOUs should increase the planning horizon for their distribution planning filings to align with the CEC’s IEPR planning horizon and the CAISO’s transmission planning horizons.

B. The IOUs should integrate policy-based demand scenarios into annual DPP and GNA/DDOR filings.

Based on the Part 1 Study results, it was recommended that the IOUs incorporate additional policy-based demand scenarios into their DPPs and annual GNA/DDOR filings. VGIC believes that the recommendation made by the Part 1 Study is appropriate for several reasons. Firstly, considering that the Part 1 Study estimated that the increase in system-level peak load is mainly a result of TE, it’s important to fully consider and incorporate EV deployment and EV load management into the IOU planning processes. This can be achieved by incorporating policy-based demand scenarios (e.g., EV Time-of-Use rate and managed charging program

¹³ Distribution Investment Deferral Framework: *Evaluation and Recommendations* Kevala, Inc., November 2022. pg. 2-3.

¹⁴ Distribution Investment Deferral Framework: *Evaluation and Recommendations* Kevala, Inc., pg. 2. “grid needs and planned investments are mostly identified in the short term by the IOUs (year 3 or before), while candidate DER deferrals are only eligible to defer grid needs that are four or more years out in the planning horizon.”

participation) into the IOUs' planning processes to help right-size grid infrastructure in preparation for a high DER future. California's state policy goals include fostering EV adoption and EV load management and bidirectional charging deployment, which must all be considered in the IOUs' DPPs and annual GNA/DDOR filings. With this in mind, VGIC agrees with the recommendation made in the Part 1 Study that additional policy-based demand scenarios should be integrated into the IOUs' DPPs and GNA/DDOR filings in an effort to avoid underbuilding and overbuilding when planning for distribution system infrastructure needs.

C. VGIC supports EIS's recommendation that the IOUs should estimate secondary distribution infrastructure grid needs in the GNA/DDOR filings.

In the Part 1 Study, AMI consumption data was leveraged to perform premise-level modeling of load. As explained in the EIS Part 1 Study report, this modeling was able to estimate upgrades needed at the service transformer level for all three IOUs based on the different TE scenarios. However, the Part 1 Study notes that the IOUs should estimate secondary distribution infrastructure grid needs in their GNA/DDOR filings to avoid any potential bottlenecks associated with secondary distribution infrastructure upgrades. VGIC agrees that the secondary distribution infrastructure grid needs must be accounted for when prudently planning for electrification in the future. To this end, VGIC supports the Part 1 Study recommendation that the IOUs should estimate secondary distribution infrastructure grid needs in their GNA/DDOR filings.

D. VGIC supports EIS's recommendation to provide additional information about transmission and sub-transmission constraints and identify where higher voltage upgrades will be triggered due to distribution demand.

According to the Part 1 Study, the scope of the study focused on "understanding the impact on the unmitigated load and DER growth in the scenario considered," but this stopped at

the distribution substation level.¹⁵ Yet the Part 1 Study highlights the increasing importance of also understanding the impacts on the transmission and sub-transmission infrastructure when planning for a high DER future. Moreover, given the current scarcity in transmission capacity throughout the U.S. electric grid, which has resulted in unworkable interconnection queues for supply-side resources, and the ambitious TE goals set by the state, it is of the utmost importance to ensure that a similar situation does not unfold with EV deployment in the future.¹⁶ Granted, transmission interconnection and DER interconnection are different with respect to how each resource can impact the grid infrastructure at their respective level (i.e., DERs at the distribution level and wholesale market resources at the transmission level). However, it's critical to identify and understand any challenges early on that could negatively impact meeting the state's TE goals.

While the distribution system will undoubtedly endure the bulk of the upgrades needed to accommodate a high DER future, it is equally important to identify and map any transmission and distribution nodes that will need large infrastructure upgrades and plan accordingly. With this in mind, VGIC agrees with the Part 1 Study recommendation that the IOUs “should provide information in the GNA regarding distribution planning areas located in transmission- and sub-transmission-constrained nodes.”¹⁷

¹⁵ EIS Part 1 Study, pg. ES-11.

¹⁶ FERC NOPR 2022-13470, *Improvements to Generator Interconnection Procedures and Agreements*. July 2022. pg. 39934.

¹⁷ EIS Part 1 Study, pg. ES-11.

IV. CONCLUSION.

VGIC appreciates the opportunity to submit these comments on the EIS Part 1 Study. We look forward to further collaboration with the Commission and stakeholders on this initiative.

Respectfully submitted,

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