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Date: January 16, 2026

Witness: Zach Woogen

DIRECT TESTIMONY OF ZACH WOOGEN
ON BEHALF OF THE VEHICLE-GRID INTEGRATION COUNCIL

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I. INTRODUCTION

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

A. My name is Zach Woogen. I am the Executive Director for the Vehicle-Grid Integration Council ("VGIC"). My business address is 1401 21st St, Suite 5409, Sacramento, California 95811.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of VGIC.

Q. What is VGIC?

A. VGIC is a 501(c)6 membership-based trade association committed to advancing the role of electric vehicles ("EV") 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 flexible EV charging and discharging is recognized and compensated in support of a more reliable, affordable, and efficient electric grid.

Q. Who are VGIC's current members?

A. VGIC's members include Ford Motor Company, General Motors, American Honda Motor Company, Nissan Group of North America, Bidirectional Energy, BMW, BodeEV, ChargePoint, ChargeScape, Codibly, Critical Loop, dcbel, Eaton, Emporia, EnergyHub, ev.energy, Fermata Energy, Gravity, Kaluza, LG Innotek, Mercedes-Benz, Orange Charger, Rivian, Sunrun, SWTCH, Tesla, The Mobility House, Toyota Motors North America, UL Solutions, WeaveGrid, Clean Power Alliance, Los Angeles

Department of Water & Power, MCE, San Diego Community Power, and Sacramento Municipal Utility District.[1]

Q. Please summarize your professional background and qualifications.

A. I am the Executive Director of VGIC, where my primary responsibilities include managing policy advocacy and regulatory engagement, directing research and education initiatives, and overseeing the day-to-day functions of the organization. VGIC's team is globally recognized for its expertise on VGI topics, including issues related to managed EV charging platforms, bidirectional EV charging solutions, and EV charging technologies deployed alongside other distributed energy resources. Before joining VGIC in 2024, I was a Senior Manager within Strategen's consulting practice, where my responsibilities included managing the VGIC, which, at the time, was one of the firm's clients. I also led Strategen's other projects within its VGI practice and managed or supported projects for numerous client engagements related to utility integrated resource planning, renewable energy project development, energy storage technology assessment, utility rate design and program design, and utility business model innovation. I have a Bachelor of Science degree in Environmental Economics and Policy from the University of California, Berkeley.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to respond to Southern California Edison's ("SCE") proposal for a dynamic rate compliant with the California Energy Commission's ("CEC") Load Management Standards ("LMS"). Specifically, I detail the immense potential of EV

[1] 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.

customers to support the grid through VGI solutions and illustrate options for SCE to enhance its current proposal to more fully unlock the grid value of EVs.

II. BACKGROUND ON CURRENT AND FUTURE POTENTIAL FOR FLEXIBLE EV CUSTOMERS TO SUPPORT RATEPAYER AFFORDABILITY GOALS AS WELL AS GRID RELIABILITY DURING NET PEAK LOAD HOURS.

Q. How can EVs contribute to supporting California's electricity grid and meet the state's near and long-term goals?

A. EVs are currently underutilized as a battery energy storage resource and represent untapped potential to support the integration of renewable energy and mitigate upward rate pressure for all customers. As such, VGI efforts broadly represent a significant opportunity to both advance the VGI industry and deliver much-needed grid benefits. There is no doubt that EVs on the road today, plus those that will be in SCE service territory by the CEC LMS-specified 2027 implementation date, have the technical capability to meaningfully support the needs of SCE and its ratepayers through thoughtful integration with the grid. EVs are already providing meaningful support to the grid by shifting charging to off-peak times or times of high solar supply through dynamic grid signals that are in place today.[2]

Q. How can EVs support affordability for all ratepayers – not just EV drivers – and support system reliability?

[2] *See* ev.energy, *Dynamic Pricing Outperforms Time-of-Use in California EV Charging Pilot with 98% Energy Delivered Off-Peak,* June 02, 2025. https://www.ev.energy/en-us/blog/dynamic-pricing-outperforms-time-of-use-in-california-ev-charging-pilot-with-98-energy-delivered-off-peak. Customers also respond to dynamic signals via managed charging programs, *see* Smart Electric Power Alliance, *The State of Managed Charging in 2024,* September 2024 at p.31. https://sepapower.org/wp-content/uploads/2024/08/SEPA-State-of-Managed-Charging-2024-Report_print.pdf

A. EVs, if provided with appropriate price or dispatch signals, can reduce costs to all ratepayers, including EV owners and non-EV customers. By supporting the more efficient use of existing grid infrastructure and accelerating transportation electrification (and the resulting kWh sales), average rates for all customers can be lower than they would be without effective VGI strategies. Furthermore, EVs can meaningfully reduce net peak load through both managed charging and bidirectional charging. This is a critical benefit of VGI, considering California faces increasingly common extreme weather events and the resulting emergency reliability conditions.

Regarding affordability, in SCE's Draft Electrification Impact Study ("EIS") Part 2, it is estimated that $1.38 billion in ratepayer savings can be unlocked through demand flexibility.[3] A significant portion of this flexibility is expected to come from EVs. Other studies in California corroborate the benefits of EVs. Pacific Gas and Electric ("PG&E") provides more specific impacts from VGI in its EIS Part 2, showing that EVs provide two-thirds of all load flexibility in its Enhanced Demand Flexibility scenario, including 30% from bidirectional EV discharge.[4] Additionally, outside the EIS Part 2 studies, Public Advocates Office at the California Public Utilities Commission ("Cal Advocates") released its Distribution Grid Electrification Model 2025 report, which further emphasizes the benefits of leveraging EVs as a load flexibility tool. Cal Advocates finds

[3] SCE Draft EIS Part 2 at p.5, filed October 31, 2025 in Rulemaking ("R.") 21-06-017. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M585/K820/585820156.PDF

[4] PG&E Draft EIS Part 2 at p.32, filed October 31, 2025 in Rulemaking ("R.") 21-06-017. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M585/K834/585834115.PDF

that shifting EV charging to manage load on distribution circuits can provide between $5 billion and $18 billion in cost savings by 2040 across investor-owned utility territories.[5]

Regarding reliability, EVs have immense potential to support the grid during peak periods. The Commission's Integrated Resource Planning ("IRP") Draft Inputs and Assumptions ("I&A") considers the reliability contributions of EVs. The Commission assumes that a modest 9 – 20% of residential EV customers and 9.4% of commercial EV customers are using unidirectional managed charging strategies, including but not limited to, dynamic rates.[6] Even at these levels of enrollment, over 10,000 MW of unidirectional managed charging capacity can be unlocked by 2030 and 45,500 MW of capacity can be unlocked by 2045.[7] While bidirectional charging capabilities are modeled to have a slower uptake, due in part to the limited opportunities for these systems to receive export credits under current Commission-authorized rates and programs, the Commission estimates that over 13,500 MW of additional capacity, beyond what would be offered by managed charging, could be provided by bidirectional charging systems in 2045.[8]

These studies demonstrate significant value from VGI strategies and investments in California. Offering optional dynamic rates is a critical lever for unlocking widespread grid support from EVs, and SCE should have a sufficiently compelling yet

[5] Cal Advocates, Distribution Grid Electrification Model 2025 at p.83. https://www.publicadvocates.cpuc.ca.gov/press-room/reports-and-analyses/distribution-grid-electrification-model-2025

[6] California Public Utilities Commission ("CPUC"), Draft Inputs & Assumptions, 2024 – 2026 Integrated Resource Planning (IRP) at p.108-109. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/2025_draft_inputs_and_assumptions_doc_20250220.pdf

[7] *Ibid* at p.111.

[8] *Ibid.*

comprehensible rate design that encourages customer participation and attracts sufficient investment from vendors and service providers devoted to ensuring customer success.

Q. Can EVs provide a meaningful contribution to the grid not only by shifting charging load, but also by using bidirectional charging systems to draw power from the vehicle battery?

A. Yes. VGIC is confident that widespread EV exports can become a reality alongside optimized load-only charging. Sophisticated customers and qualified automation service providers ("ASPs") could contribute EV exports to the grid in a manner responsive to near-real-time grid conditions, delivered through dynamic grid signals.[9] We are encouraged by SCE's 2023 customer surveys, detailed in its 2023 General Rate Case Phase 2, which provide empirical evidence of customer acceptance and appetite for "V2G energy exports," with 81% of SCE's surveyed customers expressing at least "a little interested."[10]

We are also encouraged by the June 2025 study *Harnessing the Power of Electric Vehicles: Vehicle-Grid Integration for a Cleaner, Cheaper, More Reliable California Electricity System*, demonstrating that unidirectional managed charging can save $4.2 billion of system costs by 2045, with bidirectional charging capability unlocking an

[9] For example, PG&E offers a *Vehicle-to-Everything Pilot* that specifically targets bidirectional EV customers and encourages them to enroll in PG&E's Hourly Flex Pricing dynamic rate pilot. See more information at: https://www.pge.com/en/clean-energy/electric-vehicles/getting-started-with-electric-vehicles/vehicle-to-everything-v2x-pilot-programs.html#hourly-flex-pricing
The New Hampshire Electric Cooperative has also piloted a transactive energy rate with hourly day-ahead prices that were communicated to customers. See more information at: https://s3.us-east-1.amazonaws.com/fonteva-customer-media/00Do0000000Yi66EAC/qmhhIjxG_SEPA_Case_Study_Plymouth_SU_NHEC_State_of_Bidirectional_Charging_pdf

[10] SCE, *Phase 2 of 2025 General Rate Case Amended Rate Design Proposals* (SCE-04A) at p. 125, lines 10-16, served to A.24-03-019 on August 26, 2024.
https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A2403019/7663/538693971.pdf

additional $3.5 billion even at a modest 12.5% participation rate in bidirectional charging activities (and a 50% participation rate in unidirectional charging activities). Increasing bidirectional charging activities to 25% enrollment yields a 60% increase in benefits compared to exclusively unidirectional charging future.[11]

Notably, unlike power plants with a singular function, the primary role of EVs is to support customers' transportation needs, not to improve grid affordability, reliability, or decarbonization metrics. As such, to be successful, any efforts to unlock bidirectional charging systems for grid support should be designed with the customer's perspective first and foremost. VGIC believes this can and should be achieved. Practically, this requires rates or programs that (1) fairly and transparently credit customers for net exports to the grid, (2) provide a reasonable payback period on the upfront investments needed to purchase, install, and interconnect bidirectional charging systems to the grid, and (3) signal a degree of certainty about the existence of the rate or program so customers can make investments without fear of a value proposition suddenly disappearing.

Since this is a novel type of grid resource, any incremental grid participation from bidirectional charging systems (even if small relative to load-only EV customers) will yield meaningful lessons learned to inform future scaling efforts envisioned by stakeholders, for example in the IRP I&A. Additionally, efforts to advance the beneficial use of bidirectional charging systems are fundamentally consistent with and supportive of

[11] Samantha Houston, David Reichmuth, and Mark Specht. *Harnessing the Power of Electric Vehicles: Vehicle-Grid Integration for a Cleaner, Cheaper, More Reliable California Electricity System.* June 2025. Union of Concerned Scientists. https://doi.org/10.47923/2025.15888. Accessed January 13, 2026.

Senate Bill 676 (Bradford, 2020), which aims to maximize feasible and cost-effective VGI by 2030.[12]

Q. Is there a significant amount of EV and EV supply equipment ("EVSE") available today that can already support bidirectional charging?

A. Yes, although it is less widespread than unidirectional managed charging capabilities, a meaningful portion of EVs deployed today are accompanied by active marketing of bidirectional charging features. The most significant sources of EV export potential today are light-duty passenger EVs and electric school buses. As of the end of 2025, the bidirectional EV and EVSE solutions detailed in *Table 1* below are available for customers and site developers.[13]

Table 1. EV and EVSE on California's roads that can be enabled to operate in bidirectional mode, and forthcoming bidirectional charging EV and EVSE:

Product	**Notes**	**Estimated Amount Already Deployed in California**
Nissan LEAF	- MY 2013 or later. - Bidirectional charging enabled with dcbel Ara.[14]	54,304 total registered from 2013 through Q3 2025.[15]

[12] SB 676 Transportation electrification: electric vehicles: grid integration. Bradford (S). October 2, 2019. https://leginfo.legislature.ca.gov/faces/billStatusClient.xhtml?bill_id=201920200SB676

[13] Product capabilities, certifications, and model-year availability are subject to change; table reflects publicly available information as of January 13, 2026.

[14] dcbel, California Energy Commission. *California Connected Home Rebate.* Accessed January 13, 2026. https://redwds.dcbel.energy/

[15] California Energy Commission (2026). *New_ZEV_Sales_updated_10-13-2025_ada.xlsx.* ZEV and Infrastructure Stats Data. Data last updated October 13, 2025. Retrieved January 16, 2026 from https://www.energy.ca.gov/files/zev-and-infrastructure-stats-data.

Ford F-150 Lightning Electric	- Bidirectional charging enabled with Ford Charge Station Pro.[16]	Estimated 35,877 total delivered through Q4 2025.[17]
Chevrolet Bolt EV	- MY 2027. - Bidirectional charging enabled with GM Energy PowerShift.[18]	Estimated 0 delivered through 2025.[19]
Chevrolet Silverado EV	- MY 2024, 2025, and 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 6,865 total delivered through Q4 2025.[20]
Chevrolet Equinox EV	- MY 2024, 2025, and 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 31,098 total delivered through Q4 2025.[21]

[16] Bill Crider. *Your Next Side Hustle Might Come from Your Parked Electric Vehicle.* Ford From the Road. October 28, 2025. https://www.fromtheroad.ford.com/us/en/articles/2025/introducing-ford-home-power-management

[17] Ford. *Q4 2025 Sales Release*. https://s205.q4cdn.com/882619693/files/doc_news/2026/Jan/06/Ford-U-S-Q4-2025-Sales-Release.pdf. *Q4 2024 Sales Release* https://s205.q4cdn.com/882619693/files/doc_news/2025/Jan/03/Ford-U-S-Q4-2024-Sales-Release.pdf. *Q4 2023 Sales Release*. https://s205.q4cdn.com/882619693/files/doc_news/2024/Jan/04/q4-2023-sales-final.pdf. YTD 2022, 2023, 2024, and 2025 Ford F-150 Lightning deliveries total 100,149. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[18] GM Energy. *V2H-Capable GM EVs.* Accessed January 13, 2026. https://gmenergy.gm.com/

[19] Jameson Dow. *The new $29k 2027 Chevy Bolt is now in dealerships, get it before it's gone again.* January 9, 2026. https://electrek.co/2026/01/09/the-refreshed-2027-chevy-bolt-is-hitting-dealerships-get-it-before-its-gone-again/

[20] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[21] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

Chevrolet Blazer EV	- MY 2024, 2025, and 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 16,561 total delivered through Q4 2025.[22]
GMC Hummer EV SUT	- MY 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 5,655 total delivered through Q4 2025.[23]
GMC Sierra EV	- MY 2024, 2025, and 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 3,505 total delivered through Q4 2025.[24]
Cadillac CELESTIQ	- MY 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated very few. CELESTIQ first delivered in mid-2025.[25]
Cadillac VISTIQ	- MY 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 2,822 total delivered through Q4 2025.[26]

[22] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[23] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[24] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[25] GM News. *First Cadillac CELESTIQ delivered, marking a new era for the Standard of the World.* June 24, 2025. https://news.gm.com/home.detail.html/Pages/topic/us/en/2025/jun/0624-First-Cadillac-CELESTIQ-delivered.html

[26] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

Cadillac ESCALADE IQ	- MY 2025 and 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 3,146 total delivered through Q4 2025.[27]
Cadillac OPTIQ	- MY 2025 and 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 4,365 total delivered through Q4 2025.[28]
Cadillac LYRIQ	- MY 2024, 2025, and 2026. - Bidirectional charging enabled with GM Energy PowerShift.	Estimated 20,964 total delivered through Q4 2025.[29]
Tesla Cybertruck	- Bidirectional charging enabled with Tesla Universal Wall Connector.[30]	14,360 total registered through Q3 2025.[31]
Kia EV9	- Bidirectional charging enabled with Wallbox Quasar 2.[32]	Estimated 13,277 total delivered through Q4 2025.[33]

[27] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[28] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[29] General Motors. *GM U.S. Deliveries for Quarter 4 2025.* https://investor.gm.com/static-files/23adce96-ea26-4a6e-82dd-68a0042df51c. *GM U.S. Deliveries for Quarter 4 2024.* https://investor.gm.com/static-files/e1bb38a4-aaf9-4141-b44a-4c61c1f2ec54. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[30] Tesla. *Powershare.* Accessed January 13, 2026. https://www.tesla.com/powershare

[31] California Energy Commission (2026). *New_ZEV_Sales_updated_10-13-2025_ada.xlsx.* ZEV and Infrastructure Stats Data. Data last updated October 13, 2025. Retrieved January 16, 2026 from https://www.energy.ca.gov/files/zev-and-infrastructure-stats-data.

[32] Kia EV9 x Wallbox Quasar 2. Accessed January 13, 2026. https://wallbox.com/en_us/kia-ev9-quasar-2

[33] Best-Selling Cars. *2025 (Full Year) USA: Kia America US Car Sales by Model.* https://www.best-selling-cars.com/usa/2025-full-year-usa-kia-america-us-car-sales-by-model/. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

Volvo EX90	- Bidirectional charging enabled with dcbel Ara.[34]	Estimated 1,708 total delivered through Q4 2025.[35]
Polestar 3	- Bidirectional charging enabled with dcbel Ara.[36]	958 total registered through Q3 2025.[37]
BlueBird	- 155 kWh or 196 kWh school buses[38]	915 through Q4 2024.[39]
BYD / RIDE	- 156 kWh, 230 kWh, or 288 kWh school buses[40]	127 through Q4 2024.[41]
IC Bus	- 210 kWh or 315 kWh school buses[42]	731 through Q4 2024.[43]

[34] dcbel, California Energy Commission. *California Connected Home Rebate.* Accessed January 13, 2026. https://redwds.dcbel.energy/

[35] Volvo Cars. *Sales Volumes: United States – Retail Sales by Car Model – December 2025.* Accessed January 16, 2026. https://www.volvocars.com/us/media/corporate/sales-volumes/. Assumes California comprises 35.82% of all vehicle deliveries, based on Veloz's *California EV Market Report*, accessed January 16, 2026, listing 2,468,158 CA EV sales and 6,889,728 U.S. EV Sales. https://www.veloz.org/ev-market-report/

[36] dcbel, California Energy Commission. *California Connected Home Rebate.* Accessed January 13, 2026. https://redwds.dcbel.energy/

[37] California Energy Commission (2026). *New_ZEV_Sales_updated_10-13-2025_ada.xlsx.* ZEV and Infrastructure Stats Data. Data last updated October 13, 2025. Retrieved January 16, 2026 from https://www.energy.ca.gov/files/zev-and-infrastructure-stats-data.

[38] BusinessWire. *Blue Bird Receives Record Order of 180 Electric School Buses.* January 16, 2024. https://www.businesswire.com/news/home/20240116715215/en/Blue-Bird-Receives-Record-Order-of-180-Electric-School-Buses

[39] California Energy Commission (2026). *Medium_Heavy_Duty_Vehicle_Population_Last_updated_04-30-2025_ada.xlsx.* ZEV and Infrastructure Stats Data. Data last updated April 30, 2025. Retrieved January 16, 2026 from https://www.energy.ca.gov/files/zev-and-infrastructure-stats-data.

[40] PG&E. *Vehicle-to-Everything (V2X) pilot program: Eligible Product List for the V2X Commercial Pilot.* https://www.pge.com/en/clean-energy/electric-vehicles/getting-started-with-electric-vehicles/vehicle-to-everything-v2x-pilot-programs.html. Retrieved January 13, 2026.

[41] California Energy Commission (2026). *Medium_Heavy_Duty_Vehicle_Population_Last_updated_04-30-2025_ada.xlsx.* ZEV and Infrastructure Stats Data. Data last updated April 30, 2025. Retrieved January 16, 2026 from https://www.energy.ca.gov/files/zev-and-infrastructure-stats-data.

[42] IC Bus. *Electric CE Series School Bus.* https://www.icbus.com/-/media/Project/Navistar/ICBus/ICBus/electric_ce_series_brochure_spread_format.pdf. Retrieved January 7, 2025.

[43] California Energy Commission (2026). *Medium_Heavy_Duty_Vehicle_Population_Last_updated_04-30-2025_ada.xlsx.* ZEV and Infrastructure Stats Data. Data last updated April 30, 2025. Retrieved January 16, 2026 from https://www.energy.ca.gov/files/zev-and-infrastructure-stats-data.

Green Power Motors	- 118 kWh or 193 kWh school buses[44]	117 through Q4 2024.[45]
Tellus Power Green	- 20, 30, 40, or 60 kW EVSE[46]	Unknown
InCharge	- 22, 44, or 66 kW EVSE[47]	Unknown
Heliox	- 60 kW EVSE[48]	Unknown

In total, this list indicates that there are an estimated 215,465 light-duty vehicles and 1,890 electric school buses in California that offer bidirectional charging features. Assuming SCE contains 33% of the state's EVs, an estimated 71,727 such vehicles may already be in SCE's service territory.[49]

Notably, nearly every bidirectional charging system currently listed in the light-duty segment is certified to UL 1741 SB.[50] In the medium- and heavy-duty segment, all listed bidirectional charging systems are certified to UL 1741 SB. This certification ensures compliance with IEEE 1547-2018 and facilitates interconnection under Rule 21. Nearly all of the bidirectional charging systems listed above have been enabled for bidirectional operation in parallel with the grid under certain California programs, including the Emergency Load Reduction Program, Demand Side Grid Support Program, CEC's

[44] California HVIP. *School Bus: Vehicle Type – ZESBI $ Eligible.* https://californiahvip.org/vehicle-category/school-bus/?type=655. Retrieved January 7, 2025.
[45] California Energy Commission (2026). *Medium_Heavy_Duty_Vehicle_Population_Last_updated_04-30-2025_ada.xlsx.* ZEV and Infrastructure Stats Data. Data last updated April 30, 2025. Retrieved January 16, 2026 from https://www.energy.ca.gov/files/zev-and-infrastructure-stats-data.
[46] PG&E. *Vehicle-to-Everything (V2X) pilot program: Eligible Product List for the V2X Commercial Pilot.* https://www.pge.com/en/clean-energy/electric-vehicles/getting-started-with-electric-vehicles/vehicle-to-everything-v2x-pilot-programs.html. Retrieved January 7, 2025.
[47] InCharge. *Chargers & Hardware.* https://inchargeus.com/chargers/. Retrieved January 7, 2025.
[48] Heliox. *Heliox 60 kW*. https://www.heliox-energy.com/us-products/60-kw-dc-charger. Retrieved January 7, 2025.
[49] *Prepared Testimony of Sylvie Ashford Addressing Southern California Edison's Test Year 2025 General Rate Case Load Growth Investments.* A.23-05-010. TURN-07. Page 11-13. https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A2305010/7090/526146968.pdf
[50] The Tesla Powershare system, currently available for Cybertruck drivers, is not certified to UL 1741 SB.

REDWDS initiative, and PG&E's Hourly Flex Pricing (via PG&E's Vehicle-to-Everything Pilot).

In addition to the above-listed currently available solutions, the following EVs have received announced, but not yet available, bidirectional charging features: Hyundai Ioniq 9,[51] Kia EV6,[52] Acura RSX,[53] and Rivian R2.[54] EVSE manufacturers that have announced but not yet released bidirectional charging solutions include: Emporia,[55] ChargePoint,[56] and Enphase.[57]

III. DYNAMIC EXPORT CREDITS.

Q. How might export rates impact EV customers and broader EV adoption?

A. Efforts to credit EV customers for grid exports can deepen the value proposition of EVs. These export credits can help to offset other costs of EV adoption, lowering the total cost of ownership, making the transition to electrified transportation more compelling and, in turn, accelerating the Commission's broader electrification goals. For fleets considering electrification, total cost of ownership is a significant driver of EV adoption. Strategies that reduce the total cost of ownership, including bill savings from export credits, are

[51] Hyundai. *Hyundai Motor Group Expands EV Energy Services with Vehicle to Grid and Vehicle to Home*. November 28, 2025. https://www.hyundainews.com/releases/4634
[52] *Ibid.*
[53] Honda. *Honda Highlights Home and Vehicle Energy Management Technologies at RE+ 25*. September 3, 2025. https://hondanews.com/en-US/releases/honda-highlights-home-and-vehicle-energy-management-technologies-at-re-25
[54] EV.com. *$45,000 Rivian R2 Will Power Homes With New Bidirectional Charging Technology.* November 6, 2025. https://ev.com/news/45000-rivian-r2-will-power-homes-with-new-bidirectional-charging-technology
[55] Emporia. *Coming Soon: V2X Bi-Directional Charger.* Accessed January 13, 2026. https://www.emporiaenergy.com/how-the-emporia-v2x-charger-works/
[56] ChargePoint. *ChargePoint and Eaton launch breakthrough ultrafast DC V2G chargers and power infrastructure to accelerate the future of EV charging*. August 28, 2025. https://www.chargepoint.com/about/news/chargepoint-and-eaton-launch-breakthrough-ultrafast-dc-v2g-chargers-and-power
[57] Enphase. *IQ Bidirectional EV Charger.* Accessed January 13, 2026. https://enphase.com/ev-chargers/bidirectional

therefore critical to advancing electrification and, in turn, helping spread grid costs across a greater number of kWh sales, thereby placing downward pressure on rates.

Q. How might export rates impact equity goals, broad customer access, and customer protection?

A. If designed thoughtfully, export compensation can advance equity and customer protection by expanding access to bill savings opportunities and supporting wider EV adoption beyond early adopters, who may have differing sensitivities to EV operational costs. VGIC emphasizes that any approach to unlock EV exports should be customer-centric, protecting customers' underlying transportation and mobility needs and providing sufficient certainty to enable customers to make informed investments.

Any export rate available to EV customers should also include clear and simple customer disclosures, bill communications, and opt-out provisions to promote customer protection and ensure the long-term success of the rate.

Lastly, as detailed below, the specific components included in an export credit are central to ensuring fairness across customers.

Q. Should export price signals reflect only marginal costs?

A. Yes. Export price signals should reflect only marginal costs to ensure that export credits reward only the incremental system value provided in the export period, and do not offset non-marginal (i.e., fixed) costs that must be recovered through other rate elements. Limiting export credits to marginal costs, therefore, helps avoid unintended cost shifts and preserve fairness, as customers continue paying their appropriate share of non-marginal costs. This is consistent with the Commission’s broader guidance that rates to

advance demand flexibility be rooted in marginal costs while separately addressing non-marginal cost recovery to prevent hidden subsidies.[58] Additionally, all non-bypassable charges must apply to customers as otherwise applicable.

Q. Should any export rate offered to customers offer a reasonable degree of certainty, such that customers can justify the necessary upfront investments over a reasonable payback period?

A. Yes. Export rates should be designed with a reasonable degree of certainty to enable customers to make informed investment decisions. Customers considering bidirectional charging systems often face higher upfront costs for equipment, installation, and interconnection than with unidirectional charging systems. Without confidence in the longevity and predictability of export credits, these customers cannot accurately calculate payback periods, which creates a barrier to adoption. Certainty in export price signals provides the assurance needed for customers and fleets to invest in technologies that deliver grid benefits, such as bidirectional charging solutions that reduce peak demand and enhance reliability. This stability also signals to vendors and service providers that the market is viable, encouraging innovation and competition that further benefits all customers.

Q. Does SCE propose a dynamic export rate or other form of export compensation in this application?

A. SCE does not propose to create a new dynamic export rate in this application. Instead, SCE proposes to maintain export compensation under different tariffs that are otherwise

[58] D.23-04-040. *Decision Adopting Electric Rate Design Principles and Demand Flexibility Design Principles.* Issued May 3, 2023 in R.22-07-005. Ordering Paragraphs 1 and 2. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M507/K837/507837776.PDF

available to customers. SCE proposes to keep Net Energy Metering ("NEM") and Net Billing Tariff ("NBT") compensation for customers on those tariffs.[59] For bidirectional EV customers, SCE proposes to allow enrollment in the Vehicle-to-Grid Resource Proposal ("VGRP"), which is currently pending in SCE's 2025 Phase 2 General Rate Case, Application ("A.") 24-03-019.[60]

Q. What is the structure of the Vehicle-to-Grid Resource Proposal ("VGRP")?

A. VGRP, as detailed in the pending settlement agreement filed in A.24-03-019, would provide a time-varying export compensation to customers using values generated by the Commission's Avoided Cost Calculator. SCE's original testimony in this proceeding (SCE-01) discussed the creation of two VGRP rates: (1) the original VGRP as SCE proposed in A.24-03-019, which was a time-of-use peak/off-peak structure and called "VGRP Time-of-Use ("TOU")", and (2) an hourly export rate called "VGRP Hourly" which would include hourly values for dynamic rate participants specifically.[61] Since the filing of SCE-01 in December 2024, parties in A.24-03-019 have come to a Settlement Agreement for the structure of VGRP, which expands the hourly structure to all customers.[62] Therefore, the distinction between VGRP-Hourly and VGRP-TOU is no longer needed.

Q. Does VGIC support VGRP?

[59] SCE-01 at p.21, lines 11-16.
[60] SCE-01 at p.21, lines 17-25.
[61] SCE-01 at p.22, lines 1-11.
[62] *Motion of Southern California Edison Company (U 338-E) and Settling Parties for Adoption of the Vehicle to Grid Rate Proposal Settlement Agreement,* filed in A.24-03-019 on September 5, 2025. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M579/K066/579066253.PDF

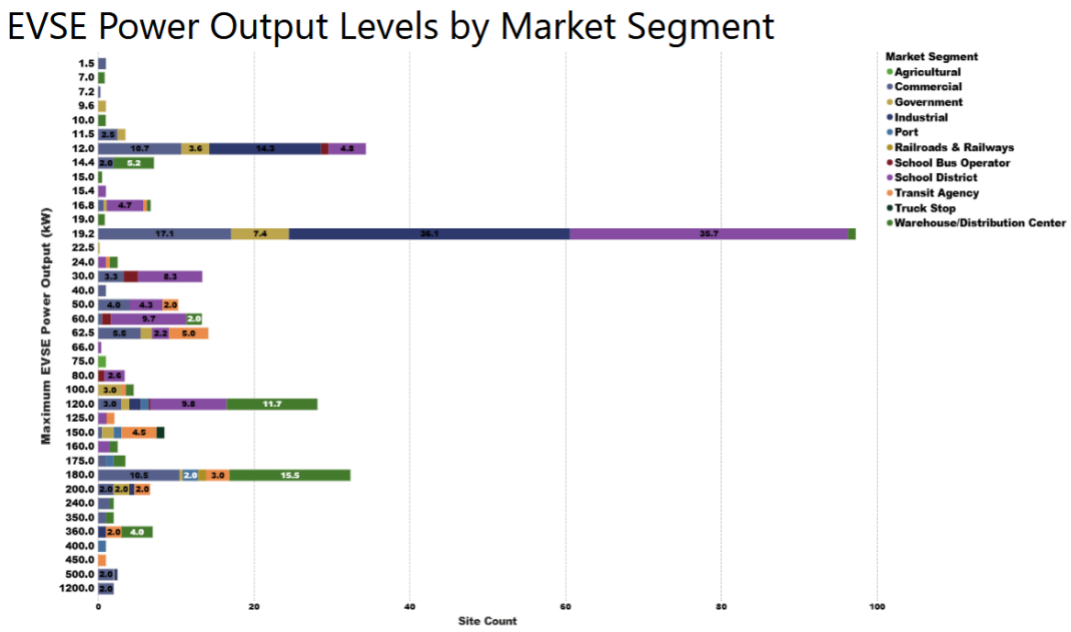
A. Yes, VGIC is supportive of VGRP and is one of the parties that has signed onto the VGRP Settlement Agreement.[63] VGIC believes that, if adopted, VGRP has the potential to support relatively widespread enrollment of customers with bidirectional charging systems. VGRP is designed to be broadly available to both residential and non-residential customers, as well as customers with other DERs that are currently participating in Net Energy Metering ("NEM") or the Net Billing Tariff ("NBT").[64] Given the diverse nature of EV drivers, VGIC believes that VGRP as an optional and more predictable export rate rider will serve an important segment of customers.

Q. Should EV customers be offered only one export credit option?

A. No. EV customers should be offered a menu of export price signals, including through both rates and non-rate program offerings, as no single design is likely to be sufficiently compelling for a broad enough range of EV customers and use cases that could feasibly support the grid. EV customers exhibit incredibly diverse preferences for interacting with the grid. First, EV charging site types span workplace charging, multifamily housing, public DC fast charging, private fleet, share fleet, single-family home, rideshare, and dozens of other market segments and operational contexts. Second, the resulting duty cycles, equipment availability, charging constraints, and price sensitivity vary even further among each charging site type. For example, *Figure 1* below demonstrates some of the variation found in SCE's Charge Ready Transport program:

[63] *Ibid.*
[64] *Ibid.*

Figure 1: SCE Charge Ready Transport – EVSE Power Output Levels by Market Segment[65]



Meanwhile, the 2019-2020 Commission-led VGI Working Group detailed a rich tapestry of plausible VGI "use cases," capturing not just the variation in site type and resulting duty cycles, but also in alignment, unification, and technical capability. The Working Group, of which both SCE and VGIC were active participants, alongside about 100 other representatives from utilities, state and federal agencies, ISO/RTO, automakers, charging manufacturers, charge point operators, transit agencies, research institutions, industry associations, environmental nonprofits, consumer groups, ratepayer advocates, and standards development organizations, defined, sorted, assessed value, and ranked 2,500 distinct VGI use cases.[66] Figure 2 below illustrates the various "dimensions" of the use case assessment.

[65] SCE Transportation Electrification Program Advisory Council. Q4 2025 Meeting. December 12, 2025. Slide 12.
[66] Gridworks. *Final Report of the California Joint Agencies Vehicle Grid Integration (VGI) Working Group.* June 30, 2020. https://gridworks.org/wp-content/uploads/2020/09/GW_VehicleGrid-Integration-Working-Group.pdf

Figure 2: Joint CPUC-CEC VGI Working Group Dimensions of Use Case Assessment Framework[67]

TABLE 2. *Dimensions of the Use Case Assessment Framework and Use-Case-Definition Options*

SECTOR	APPLICATION	TYPE	APPROACH	RESOURCE ALIGNMENT
Residential-Single-Family Home	Customer-Bill Management	V1G	Indirect (passive)	Unified and Aligned
Residential-Single-Family Home, Rideshare	Customer-Upgrade Deferral	V2G	Direct (active)	Fragmented and Aligned
Residential-Multi-Unit Dwelling	Customer-Backup, Resiliency			Fragmented and Misaligned
Residential-Multi-Unit Dwelling Rideshare	Customer-Renewable Self-Consumption			
Commercial-Workplace	System-Grid Upgrade Deferral			
Commercial-Public, Destination	System-Backup, Resiliency			
Commercial-Public, Destination Rideshare	System-Voltage Support			
Commercial-Public, Commute	System-Day-Ahead Energy			
Commercial-Public, Commute Rideshare	System-Real-Time Energy			
Commercial-Fleet, Transit Bus	System-Renewable Integration			
Commercial-Fleet, School Bus	System-GHG Reduction			
Commercial-Fleet, Small Truck (class 3-5)	System-RA, System Capacity			
Commercial-Fleet, Large Truck (class 6-8)	System-RA, Flex Capacity			
	System-RA, Local Capacity			
	System-Frequency Regulation Up/Down			
	System-Spinning Reserve			
	System-Non-Spinning Reserve			

One of several key takeaways from the effort was a recommendation emphasizing that different use cases may require different policies or, in other words, that there may not be a single "silver bullet" rate design for all VGI use cases.

The use case diversity evident in SCE's Charge Ready program and the 2019-2020 VGI WG is likely to be even further exacerbated as bidirectional charging solution adoption matures beyond early adopters, who tend to exhibit similar characteristics (i.e., namely, openness to new, complex offerings), to mass-market customers, who may be more operationally constrained and exhibit limited interest in experimental rate designs, instead preferring simpler, more predictable export credit offerings. In this way, offering a menu of export rate options accommodates diverse customer needs and supports broader

[67] *Ibid.*

participation over time, offering a more equitable approach than limiting customers to a single available export credit option.

With this in mind, it is premature to assume a single export credit construct will unlock participation across a meaningful set of customers, and certainly unlikely that VGI will be "maximized" by 2030, per Senate Bill 676. VGIC strongly recommends that the Commission advance a portfolio approach that includes, at a minimum, the pending VGRP settlement and a new dynamic export rate. This portfolio approach *maximizes* VGI while also yielding critical learnings to inform the future development of a VGI portfolio (i.e., of rates and non-rate programs).

Q. With this in mind, should SCE offer a dynamic export rate?

A. Yes, SCE should put forward a dynamic export rate that complements the pending VGRP and serves as an important mechanism for unlocking grid value. SCE should put forward a dynamic export rate in line with D.25-08-049 based on the unscaled marginal costs SCE has already identified in this application: Marginal Energy Costs, Marginal Cost of Energy Losses in the Transmission and Distribution System, Marginal Generation Capacity Cost, Marginal Distribution Capacity Costs, and Marginal Transmission Capacity Costs.

Q. Why should SCE put forward a dynamic export rate?

A. SCE can unlock far greater value from EV customers and fleets by providing customers with the needed price signal to not only shift load but also export energy during peak times. By crediting customers for exporting energy during periods of high system

demand, these rates can enhance grid reliability, reduce the need for costly peak-period procurement, and increase other grid services provided by EVs.

While dynamic rates can align EV charging load with real-time grid conditions, the maximum EV charging load reduction is fundamentally limited by a customer's initial plan to charge during a given period. However, dynamic export rates can elicit exports from EVs that may not have otherwise planned to charge at all during that period. In other words, the maximum EV charging export capability is not limited by a customer's initial plan to charge during a given period, enabling deeper peak system load reductions.

To provide a more specific example, consider an EV charging at 4 kW during a local or system peak period. High dynamic price signals during that window could induce the EV to reduce charging to 0 kW. This achieves a corresponding reduction of 4 kW at the local and system level. If exports were encouraged through compelling dynamic export price signals during that same period, the EV could stop charging and export power back to the grid at, for example, 10 kW. Through the addition of an export price signal, this EV provides a total peak load reduction of 14 kW (i.e., 4 kW load reduction + 10 kW grid export). This demonstrates the critical importance of export price signals for EVs in particular.

Notably, whether or not VGRP is adopted, the Commission should require SCE to implement a dynamic export rate derived from marginal cost components. In the event VGRP is not adopted, bidirectional charging customers in SCE service territory will have no other opportunities to receive recognition and bill credits for exports.[68]

[68] Note that the Emergency Load Reduction Program ("ELRP") is authorized through 2027 and Demand Side Grid Support ("DSGS") funding will likely expire in 2026.

Q. Are other California utilities providing dynamic export compensation for customers?

A. Notably, California has already shown the potential for dynamic rates to unlock significant export capacity from EVs. One of the largest grid-parallel bidirectional charging sites in North America is located at the Oakland Unified School District and participating in PG&E's Vehicle-to-Everything Pilot and Hourly Flex Pricing pilot with dynamic export credits, providing 2.1 GWh of energy back to the grid each year.[69] Meanwhile, the CEC's REDWDS initiative includes support for several bidirectional charging system vendors and aggregators specifically capable of responding to dynamic export price signals.[70] Similar projects could be deployed across fleets and EVs statewide, multiplying the reliability and cost-saving benefits for the grid.

Q. Is PG&E proposing a dynamic export rate in its dynamic rate application for LMS compliance?

A. Yes, PG&E is proposing a dynamic export rate in its dynamic rate application for LMS compliance, which is very similar to the structure of the dynamic export rate currently offered in its Hourly Flex Pricing pilot. In its dynamic rate application, PG&E outlines that the export rate will be equal to the sum of the following components: Marginal Energy Component plus line losses, Marginal Generation Capacity Component, Marginal Distribution Capacity Costs, and Marginal Transmission Capacity Costs when available.[71] This is in alignment with D.25-08-049 and will help to unlock the benefits of

[69] See "Zum Launches Nation's First School District with 100% Electric, Bidirectional V2G School Bus Fleet in Oakland" https://www.ridezum.com/press-release/zum-launches-nations-first-school-district-with-100-electric-bidirectional-v2g-school-bus-fleet-in-oakland/

[70] See, for example, https://redwds.dcbel.energy/ and https://www.bidirectional.energy/learn/california.

[71] PG&E, *Pacific Gas and Electric Company 2023 General Rate Case Phase II Supplemental Testimony Exhibit (PG&E-5) Real-Time Pricing Proposal,* served to A.24-09-014 on October 29,2025, at p.2-41, lines 1-7.

providing export compensation described above. Additionally, PG&E proposes to offer the subscription element to customers on an optional basis, allowing greater flexibility for customers with an appetite for greater volatility exposure.

Q. Do other jurisdictions offer export rates for EV customers?

A. Yes. The Value of Distributed Energy Resources ("VDER") tariff design used in New York offers export credits to standalone and solar-paired bidirectional charging systems, across both residential and non-residential customer segments.[72] Specifically, the New York Public Service Commission ("NY PSC") established an avoided cost-based VDER in a March 2017 order ("VDER Transition Order").[73] In the March 2017 VDER Transition Order, the Commission states, "VDER tariffs will be expanded beyond NEM-eligible [Distributed Generation (DG)] technologies to all DER in a technologically-neutral, value-focused manner as soon as practicable."[74] In addition, the VDER Transition Order directed that stand-alone energy storage projects, including bidirectional charging systems, be eligible under the VDER tariff "as expeditiously as possible."[75] Critically, the NY DPS staff whitepaper proposed that standalone energy storage, including storage paired with consumption load, be eligible for VDER tariff for any hourly injections to the grid.[76]The NY PSC Order then states, in no uncertain terms, that "The Staff Proposal provides a rational and appropriate framework for the eligibility of

[72] VGIC Comments on Track B Working Group Report at 9; *Opening Comments of the Vehicle-Grid Integration Council on the Proposed Decision Adopting Guidelines for Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company on Demand Flexibility Rate Design Proposals* at 6-9 https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M576/K160/576160750.PDF

[73] Case 15-E-0751, et al., Order on Net Energy Metering Transition, Phase One of Value of Distributed Energy Resources, and Related Matters (issued March 9, 2017) (Phase One VDER Order)

[74] *Ibid.*

[75] *Ibid.*

[76] Case 15-E-0751, Staff Proposal on Value Stack Eligibility Expansion (filed May 22, 2018).

standalone storage and it is therefore adopted."[77] Lastly, the Order explicitly deems vehicle-to-grid ("V2G") systems as eligible. In 2023, the NY DPS expanded on the eligibility finding for V2G systems by further explicitly directing each utility to ensure V2G systems are eligible.[78]

Additionally, on January 8, 2026, Illinois enacted the Clean and Reliable Grid Affordability Act, allowing bidirectional charging systems to be credited under the state's current net billing tariff structure, effective June 1, 2026.[79]

Q. Can you provide illustrative options for a dynamic export rate design that SCE can implement?

A. Yes. One option could be to replicate PG&E's Hourly Flex Pricing implementation and related LMS-compliant design as proposed in its GRC Phase 2. As described above, PG&E has proposed to include a dynamic export rate with four marginal cost components. These export credits would be aligned with, but asymmetric to, import prices, as PG&E would recover additional non-marginal costs through a Revenue Neutral Adder ("RNA").[80] The RNA approach was adopted in D.22-10-024 for use in PG&E's Day-Ahead Hourly Real-Time Pricing export compensation rate.[81] The RNA works by

[77] NY PSC Case 15-E-0751 – In the Matter of the Value of Distributed Energy Resources and NY PSC Case 15-E-0082 – Proceeding on Motion of the Commission as to the Policies, Requirements and Conditions for Implementing a Community Net Metering Program. *Order on Value Stack Eligibility Expansion and Other Matters.* September 12, 2018. Page 16.
[78] NY PSC, CASE 18-E-0138 - Proceeding on Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure. *Order Approving Midpoint Review Whitepaper's Recommendations with Modifications*. November 16, 2023. https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b6057D98B-0000-C912-9B64-A2D769C4790D%7d
[79] Gov. Pritzker Signs Historic Clean and Reliable Grid Affordability Act, January 8, 2026. https://gov-pritzker-newsroom.prezly.com/gov-pritzker-signs-historic-clean-and-reliable-grid-affordability-act
[80] PG&E, *Pacific Gas and Electric Company 2023 General Rate Case Phase II Supplemental Testimony Exhibit (PG&E-5) Real-Time Pricing Proposal,* served to A.24-09-014 on October 29,2025 at p.1-4, lines 15-17.
[81] D.22-10-024. *Decision Adopting Settlement on Export Compensation for Certain Pacific Gas and Electric Company Customers*. Issued October 26, 2022, in A.20-10-011.

adding a flat or TOU-differentiated $/kWh charge to the import rate that would not be credited for exports. Because PG&E would recover non-marginal costs through the RNA, PG&E is proposing to offer a dynamic rate subscription as an option for customers to use but it will not be required. [82] Subscriptions would also not be applicable to exports. [83]

SCE has previously stated that they have not implemented dynamic export rates in their dynamic rate pilot because they have used a scalar on the dynamic rate components to recover non-marginal costs.[84] VGIC believes that SCE could extract the un-scaled marginal cost components to provide an appropriate export rate. Another option, if SCE cannot remove the scaled factors, is to recover non-marginal costs via a revenue neutral adder ("RNA"), expressed as a separate time-of-use component, to ensure cost recovery. SCE has also cited the need for an Otherwise Applicable Tariff ("OAT") to provide export compensation in their dynamic rate pilot. [85] This is not necessary in the full-scale dynamic rate, since there is no explicit research goal. Subscription components are also not needed for exports, since there is no need for customer bill protection for export credits. To the extent SCE may need the subscription to recover non-marginal costs, an alternative RNA should be considered. PG&E has shown that the RNA approach allows for the subscription component to be optional, which can generally simplify the rate implementation and adoption. This would also help to create consistency between PG&E and SCE, making it easier for customers, ASPs, equipment providers, and all stakeholders to understand these rates.

[82] PG&E, *Pacific Gas and Electric Company 2023 General Rate Case Phase II Supplemental Testimony Exhibit (PG&E-5) Real-Time Pricing Proposal,* served to A.24-09-014 on October 29,2025, at p.1-4, lines 18-22.
[83] *Ibid* at p.2-41, lines 1-7.
[84] SCE, *Southern California Edison Company's Reply to the Vehicle Grid Integration Council's Protest of Advice 5596-E*, August 28, 2025.
[85] *Ibid*.

Q. Are you concerned about customers' ability to respond to dynamic export rates?

A. Yes and no. Although dynamic price signals appear more complex than the rate options currently available to customers, VGIC anticipates that many participating customers may be interested in partnering with a third-party service provider to optimize device response to dynamic price signals. For example, both PG&E and SCE dynamic rate pilots have established the role of *automation service provider* ("ASP") to support customers in responding to the dynamic price signals. SCE states that they expect ASPs to form contractual relationships with customers to provide load management services and anticipates having to provide support resources and information for ASPs.[86] Yet, SCE does not describe in its marketing or outreach plans how it would engage ASPs to encourage them to bring dynamic rates to their own customers. VGIC recommends that SCE consider additional support for ASPs, given the critical role they play in facilitating customer engagement.

Additionally, the attractiveness of a market to ASPs is fundamentally driven by the total value provided by SCE, which would be shared between the customer and ASP. Without a sufficiently compelling dynamic rate design, and especially without a dynamic export rate, ASPs may not enter the market to support customers. VGIC therefore reiterates its recommendation that SCE implement a dynamic export rate, as without it, the total value may be too limited to attract ASPs to the market. We also recommend the role of these third-party service providers more generally be considered in establishing and implementing the dynamic export rate, including how to attract investment and ensure a positive customer experience.

[86] SCE-02 at p.21, lines 22-24.

Q. Should a dynamic export rate be limited to EV customers with bidirectional charging systems as the only distributed energy resource ("DER") on the premises?

A. No. SCE should extend the dynamic export rate offering to EV customers with bidirectional charging systems that are co-located and/or integrated with other DERs. For example, bidirectional EV charging customers with rooftop solar systems, stationary energy storage systems, both, or other DER(s) should be eligible to participate in the dynamic export rate. Grid-responsive orchestration among multiple DERs likely provides a compelling pathway to realizing the full grid benefits of these technologies.

Q. Does the implementation timeline of a dynamic export rate demand additional considerations from the Commission?

A. Currently, this proceeding is on an expedited schedule for resolution, with a final decision before the end of 2026, so that SCE can meet the requirement to offer Load Management Standard-compliant rates by 2027. This timeline is extremely ambitious, given the relative complexity of the rate proposals in SCE's application.

Even if dynamic rates are designed and approved before 2027, it will likely take time for SCE to offer them to customers. In testimony, SCE describes many tools and systems that will need to be implemented, including billing system upgrades, tools to communicate the dynamic rate, rate comparison tools and materials, alongside other marketing efforts and coordination with Community Choice Aggregators ("CCAs").[87] VGIC encourages SCE to act expeditiously, but the Commission should also consider the likelihood and implications of delays in the full rollout of the rates to be approved in this proceeding.

Q. How long is SCE planning to run its current dynamic rate pilot?

[87] SCE-02 at p.4-28.

A. Currently, SCE and PG&E are authorized to operate their dynamic rate pilots through May 2027.[88] D.24-01-032 authorized this timeline but did not include a mechanism to consider the extension of the dynamic rate pilots beyond May 2027.

Q. Is there a risk that the dynamic rate pilot might end before SCE can fully implement the rates authorized in this proceeding?

A. VGIC sees significant risk that SCE will not be able to fully implement an LMS-compliant rate by May 2027. Therefore, this proceeding should authorize SCE to continue its dynamic rate pilot beyond May 2027, until the dynamic rate is fully implemented.

It is critical that customers engaged in the pilot continue to access dynamic rates until they can be transitioned onto a long-term rate. Having a gap in offerings risks poor customer experience and a loss of customers that never re-enter the rate after being dropped.

Moreover, SCE's dynamic rate pilot does not offer to recognize and credit exports for bidirectional charging systems.[89] This means there are two implementation deficiencies that the Commission and SCE should work to cure: (1) the lack of export credit available to bidirectional charging systems in SCE's current dynamic rate pilot, limiting investment from ASPs and participation from customers, and (2) the timing gap between the current dynamic rate pilot, even if corrected to credit EV exports, and any forthcoming dynamic rates.

[88] D.24-01-032 at p.52.
[89] SCE has previously explained that they do not offer export credits to customers that are not on NEM or NBT. See Cal Advocates, *Prepared Testimony of Additional Rate Design Proposals in Southern California Edison's 2025 General Rate Case Phase 2*, served to A.24-03-019 on November 22, 2024 at p.B-14. https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A2403019/7847/546561478.pdf

Q. If SCE fails to offer a dynamic export rate, should dual participation with any existing demand response programs be permitted for EV customers participating in the dynamic import rate?

A. Yes. If SCE does not offer a dynamic export rate in this application, then EV customers should be permitted to charge EVs under the dynamic import rate and participate in demand response programs, including those that reward EV battery discharge.

SCE does propose allowing limited dual-participation between dynamic rates and demand response programs. Specifically, customers would be allowed to be enrolled in day-of-supply-side demand response program.[90] However, no supply side programs integrated into the wholesale market currently allow for customer exports to be compensated.

As discussed above, exports from bidirectional EVs can provide significant incremental capacity and the Commission currently estimates that bidirectional EVs could provide 13,500 MW of additional capacity by 2045. If the dynamic rates are unable to capture this value, then the Commission should ensure that there are other programs for customers to provide this incremental capacity. For example, if the Emergency Load Reduction Program ("ELRP") is still available to EV customers past 2027, or another pilot or program offering rewards EV battery discharge, the provisions of the dynamic import rate should not prohibit customers from participating in such a pilot or program.

IV. CONCLUSION

[90] SCE-01 at p.12, line 21.

Q. Does this conclude your testimony?

A. Yes

Attachment A

CV of Zach Woogen

Zach Woogen

Executive Director

VGIC
VEHICLE-GRID INTEGRATION COUNCIL

Zach leads VGIC's regulatory, policy, and market development efforts related to utility rate and program design, interconnection rules and regulations, technical standards and communications protocols, and funding for VGI investments. He previously worked in energy strategy consulting, focusing on distributed energy resource market design, energy storage market development, integrated resource planning, and renewable energy project development.

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+ Sierra Club, Training for Movement Trainers, 2015

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Work Experience

Executive Director

VGIC / Sacramento, CA / 2020 – Present

+ Advocates and educates stakeholders on the capabilities and value proposition of vehicle-grid integration, focusing on regulators, technology providers, grid planners, utilities, and customers.
+ Supports assessment of vehicle-grid integration markets, identifying best practices, and developing market scaling strategies.
+ Fostering the market ecosystems necessary to scale VGI for the benefit of all electric customers.

Senior Manager

Strategen / Sacramento, CA / 2017 – 2024

+ Support clients in the vehicle-grid integration, distributed energy resources, and clean energy space, focusing on energy markets, policy, and technologies.

Senior Project Manager

Bay Area Environmentally Aware Consulting Network / Berkeley, CA / 2016 – 2019

+ Advised and informed consulting project managers and associates on effective project management techniques as well as energy markets, policy, and technologies.

Research Associate

Energy and Environmental Policy Lab / Berkeley, CA / 2017

+ Conducted a detailed analysis of the effectiveness of green growth policy recommendations from the Organization for Economic Co-operation and Development (OECD)

Zach Woogen

Executive Director

VGIC
VEHICLE-GRID INTEGRATION COUNCIL

Vehicle Grid Integration Expertise

Technologies

Light, medium, and heavy-duty electric vehicles

Managed charging and bidirectional vehicle-to-everything (V2X) charging

Flexible service connection

Backup power and microgrids

R&D scoping and advisory

Topic Areas

TE and EV infrastructure programs, rules, and tariffs

EV rate, DR program, and DER market design

DER interconnection policies

V2X standards and communications protocols

Submetering and vehicle telematics

Distribution system planning and investment deferral frameworks

State and federal roadmaps

Equity and environmental justice

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Relevant Project Experience

Vehicle-Grid Integration Council / 2020-Present

+ **Core VGI Policy and Education Activities, 2020-Present:** Drive policy advocacy for the Vehicle Grid Integration Council and serves as a VGI subject matter expert. Authored over 180 VGI-related comments and testimony since 2020 in CA, CO, IL, MD, MA, MI, NH, NY, and TX, as well as the US DOE, EPA, and IRS on topics ranging from EV rates, DR program design, DER interconnection, and VGI road-mapping.
+ **V2X Interconnection Special Initiative, 2022-2023:** Originate and execute VGIC's V2X Interconnection Best Practices and Recommendations Special Initiative. This included working closely with industry representatives, utility engineers, non-profits, and government officials to identify and advance best practices for the interconnection of bidirectional EVs.
+ **Australia National Roadmap for Bidirectional Charging, 2024:** enX Consulting contracted VGIC to undertake a (1) desktop review of current directions for bidirectional charging in the U.S. and (2) supply chain stakeholder engagement to identify critical paths, enablers, and barriers.

Confidential Legacy Global Automotive Manufacturer / 2023

+ **Vehicle-to-Everything Product Development and Market Entry Strategy:** Developed comprehensive V2X bidirectional charging product development and market entry strategy for leading global auto OEM. Leveraged proprietary insights to inform analysis and actionable recommendations.

Confidential Electric Vehicle Service Provider Client / 2024

+ **Vehicle Grid Integration Pilot Assistance and Market Assessment:** Developed market assessment and informed implementation of several VGI pilots with leading multinational EVSP and a southeast U.S. utility. Research and analysis included use case mapping and developing utility program structure and requirements.

Confidential Electric Vehicle Service Provider Client / 2019 – 2020

+ **Vehicle Grid Integration Market Development and Regulatory Barriers Reports:** Investigated market for client's EV charge management and V2X services and recommended actions for how to further develop the market. Conducted research and analysis on current regulatory policy landscape, including barriers and potential solutions.