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Additional submitted attachment is included below.



August 15, 2022

CEC Commissioners and Staff
California Energy Commission
Research and Development Division
1516 Ninth Street
Sacramento, CA 95814

Via: CEC Docket #19-AB-2127

Re: Comments of Fermata Energy LLC on CEC Workshop on VGI Market Status and Funding Concepts

Dear California Energy Commission,

Fermata Energy LLC, d/ba/ Fermata Energy, is pleased to submit comments on the California Energy Commission's (CEC) July 28th Workshop on VGI Market Status and Funding Concepts in CEC Docket #19-AB-2127.

Fermata Energy is a leading provider of vehicle-to-everything (V2X) technology that enables vehicle-to-grid (V2G), vehicle-to-building (V2B), and vehicle-to-load (V2L) services. Our V2X technology benefits our users, transforming EV charging from a cost center to a revenue-generating, grid-supporting asset. Fermata Energy is the only company today providing commercial V2X services at multiple sites across the US using light duty vehicles. On average, the monthly electricity bill savings from these deployments are equivalent to the monthly EV lease payment. We have active V2X systems with the City of Boulder (Colorado), Green Mountain Power (Vermont), Roanoke Electric Cooperative (North Carolina), Verizon Newlab 5G Studio (New York), Burrillville Wastewater Treatment Facility (Rhode Island), and the Alliance Center (Colorado). Other customers include unannounced utility customers in Texas, Florida, and California, and several commercial V2B demand charge management, utility demand response, and V2B car share pilots with private partners. Fermata Energy has the first commercially available, UL-certified offboard V2G direct current (DC) electric vehicle (EV) charger for light-duty EVs.

California is a recognized leader on V2G and vehicle grid integration (VGI) technology, with numerous initiatives led by the CEC (e.g., GFO-21-303 - Vehicle-to-Building Technologies for Resilient Backup Power), the investor owned utilities (e.g., PG&E's and SCE's proposed VGI pilots, the new Emergency Load Reduction Program, the proposed emerging market and technology VGI program, and the utilities' proposed dynamic or export rates that help VGI), and the work of the Smart Inverter Operationalizing Working Group (SIOWG) on standards and interconnection.

V2X technology in California has significant potential to provide mobile, dispatchable capacity. V2X presents a growing yet currently untapped resource to help support grid resilience and reliability. V2X technology at scale can deliver the following benefits:

1. Clean, affordable, and reliable transportation
2. Lower the cost of electricity bills
3. Free backup power solutions that would normally cost tens of thousands
4. of dollars.
5. Enables EV owners to earn revenue from demand response and other services that help integrate and grow renewable energy on the grid

As PG&E's CEO Patti Poppe noted in an October 2021 interview with the *Los Angeles Times*:

*"The electric vehicles on the road in PG&E's service area today have 6,700 megawatts of capacity... But imagine a Flex Alert being averted because we actually leverage the supply that's available in vehicles to power homes and business. Sixty-seven hundred megawatts — that's three Diablo Canyon nuclear power plants. It's on the road today, and we are not using it as a power source. We're only using it as a power draw."*¹

As Patti Poppe remarked, during PSPS events, V2X technology can provide mobile assets that can be flexibly deployed to provide power for a range of resilience scenarios impacting areas and communities most at risk. V2B and V2G technology can also be very cost-effective for ratepayers compared to stationary storage systems, since the cost of the energy storage is included in the cost of the vehicle. Assuming there are 80,000 LEAFs on the road in California in the next few years, the total dispatchable capacity of those LEAFs, assuming a participation rate of 25%, could equate to ~1 GWh.²

Based on our experience as a hardware and software provider that has deployed multiple V2X projects across the country with utility and commercial partners, we are pleased to provide our comments on the CEC's proposed VGI funding concepts. Fermata Energy appreciates the CEC's continued commitment to supporting VGI and the recognition of its critical importance to California's transportation electrification and grid reliability frameworks. We also commend the CEC for its participation in the V2X MOU Workshop and for signing onto the MOU on advancing

¹<https://www.latimes.com/environment/newsletter/2021-10-14/as-california-fires-burn-pge-ceo-promises-fixes-boiling-point>

² Nissan LEAF: Max battery capacity of LEAF Plus is 62 kWh. We estimate the average capacity to be 50 kWh. The LEAF S/SV/SL = 40 kWh, LEAF+ S/SV/SL = 62kWh. Both the 40 and 62 kWh battery capacities are currently available.

V2X with the United States Department of Energy.³⁴

We strongly support Funding Concept 3's proposed bidirectional charging equipment rebates, in addition to other proposed funding concepts. Since V2X systems do not currently receive direct incentives or support for their incremental cost and because many V2X installations are excluded from SGIP and many do not qualify for utility Make Ready programs or CALeVIP incentives, this bidirectional charging rebate has the potential to address a major funding barrier and help create a fairer playing field between V2X technology and stationary storage. Moreover, we encourage the CEC, in its design of these bidirectional charging equipment rebates, to focus on subsidizing desired outcomes, instead of directing subsidies to any one V2X technology type. In subsidizing desired outcomes, such as more V2X deployed in low-income communities, greater access to dispatchable capacity, improved grid reliability and resilience, and overall benefits to ratepayers, the CEC can avoid picking V2X technology winners and losers. The V2X industry, compared to the unidirectional charging industry, is nascent and still evolving. Different technology implementations, use cases, and integrations between the customer and utilities are currently being developed and tested. The V2X industry will continue to evolve and may converge around certain technology types, but in the meantime, given California's critical need for dispatchable capacity during its summer peak hours (ELRP, for example), we recommend the CEC incentivize all existing V2X technologies that can provide grid benefits today.

To ensure that Concept 3 is as successful as possible, we recommend the following be included in the Bidirectional Charging Equipment Rebates Program Guidelines:

- **Rebate Amounts & Adders:** Fermata Energy supports the concept of allowing both grid and non-grid tied solutions to qualify, and the concept of including rebates for the funding of the incremental cost of the charger and other related costs, such as panel upgrades, transfer switches, and other Make Ready costs. We support the rebate being offered statewide for customers in publicly owned utilities, investor owned utilities, and microgrids. Furthermore, we recommend the rebate be based on a \$ per kW amount for discharging (nameplate capacity of the system) so that larger chargers would receive

³ <https://www.energy.gov/sites/default/files/2022-04/OTT%20V2X%20MOU%20Final%20%281%29.pdf>

⁴ The California Public Utilities Commission, the California Energy Commission, several offices within the US Department of Energy, the International Brotherhood of Electrical Workers - Chapter 11, National Electrical Contractors Association - Los Angeles, the Joint IOUs, several V2X services providers (including Fermata Energy, Nuvve Holding Corporation, Rhombus,), automotive OEMs (Nissan Group of the Americas, Phoenix, Zeem Solutions, General Motors LLC, Ford Motor Company, Lucid Group, Inc., First Student, Inc., Lion Electric Company) and several California municipal utilities (Los Angeles Department of Water and Power, Sacramento Municipal Utility District), The City of Lancaster and the City of Lancaster Community Choice Aggregator, the City of Los Angeles, in April 2022 signed an MOU on advancing V2X with the United States Department of Energy.[#] Other participants who did not sign onto the MOU, such as the California Air Resources Board, California Independent System Operator, and California Transportation Commission, also attended the V2X MOU workshop.

proportionally more, but we do not have a specific amount to recommend at this time. We welcome a discussion with Commission staff to offer a more detailed proposal soon. Fermata Energy also recommends that the rebate be structured in three tiers:

1. the first rebate is for non-export V2X
 2. the second rebate provides an adder for export V2X (a rebate three or four times larger than the base rebate amount in #1)
 3. and a third rebate, which provides an adder on top of the second rebate amount, for government fleets and low-income individuals who buy export-capable V2X.
- We believe the above concept is relatively simple for both customers and program administrators. To provide additional certainty that bidirectional chargers are being used as grid-tied devices, we recommend that the rebate for export-capable V2X chargers should only be awarded after an interconnection agreement is approved. Also see our comments on verification below.
 - Fermata Energy recommends that the bidirectional charging equipment incentive is a standalone incentive and is decoupled from other rebate and make-ready programs. Since most bidirectional charging systems, including those at many school bus sites, are ineligible for CEC rebates and utility Make Ready funding, the standalone bidirectional charging equipment incentive should provide a high level of Make Ready support that is on par with utility-or CEC-funded Make Ready programs. We also agree with the Vehicle Grid Integration Council (VGIC) that qualifying for this V2X rebate should not prevent eligibility for other existing Commission programs or vouchers (e.g., CALeVIP or electric school bus funding). Double counting of incentives for the same equipment should be avoided.

Technology Neutrality: In the spirit of technology neutrality, allow all bidirectional charging technologies, EVSE connector types, and communications protocols, including CCS (based on ISO 15118-20 or DIN 70121 or IEEE 2030.5 or other communications methods), CHAdeMO, or other EV-to-EVSE interconnection methods to qualify for rebates, and do not restrict eligibility to any one technology type for all IOU and POU customers. In addition, ISO-15118 functionality should not be a requirement for EVSE participating in this program, but ISO-15118 ready is acceptable for CCS unidirectional chargers. Per Public Utilities Code 740.16 (b)(2) (enacted with SB 676 in 2019): “Electric vehicle grid integration strategies shall not require the use of any specific technology,” which effectively limits the types of vehicle-to-grid integration requirements that the Commission can adopt. This limitation has not been examined or debated enough, as many vehicle grid integration strategies have multiple technological solutions. From a utility consumer, equity, and EV consumer point of view, multiple solutions could be needed because competition could lead to lower prices. Examples of competing technologies include V2X (V2G, V2B, V2H) vs managed charging, 2) communication

pathways involving the EV and the grid with EV based telematics or communication pathways involving the EV, the EV supply equipment and the grid, and 3) CHAdeMO vs CCS-1 vs CCS-2 connectors.

Bidirectional charging, both AC and DC is in a very different place than unidirectional charging and is at the beginning stage of deployment, and both technology neutrality and exemptions (see below) are needed. For example, while EVs using CHAdeMO connectors (IEEE 2030.1.1 open standard) have been doing bidirectional charging for many years, CCS connectors require bespoke solutions for communications for every application, may have cybersecurity issues, and do not have third party certifications.⁵ New technologies for higher power V2X are still emerging.⁶

If the Commission decides to make requirements on this topic, we request that CCS not be required for public access workplace and multi-unit dwelling DC fast charging or that for every four EVSE installed that one EVSE with dual-ports (CCS and CHAdeMO) be installed.

- **Follow ELRP in creating an Interconnection Exemption for UL 1741-Certified Devices:** In recognizing that the state of technology development for bidirectional charging is not the same as it is for unidirectional charging, the CEC should follow the ELRP and create an exemption allowing UL 1741-certified inverter-based devices to interconnect and participate in the program. In an effort to enroll as much dispatchable capacity as possible, the CEC should not limit participation to devices certified to 1741-SA or require compliance with UL 1741-SB in Q1 of 2023 as currently scheduled per Rule 21.
- **Use Cases:** Allow both front of the meter and behind the meter installations to qualify for rebates. Certain forms of V2X, such as V2B, which can provide critical services such as backup power/resiliency, cannot qualify for the CA IOU Make Ready programs. Many utility infrastructure programs fund front-of-the-meter equipment, requiring chargers to use a separate service drop and to be individually metered on an EV rate. Because V2B systems are designed to power buildings during outage events and to provide customer bill management for grid-tied operation, they require a direct connection to a building's electrical panel and are considered behind-the-meter. As a result, they do not qualify for many Make Ready programs. While the site preparation/installation costs for a bidirectional charger are comparable to that of V1G EVSE, without access to Make Ready funding, bidirectional EVSE are at a major disadvantage. We strongly believe that certain V2B use cases, such as demand charge management, demand response, and backup power, must be eligible for this rebate program. If funding is not made available to V2B

⁵ CHAdeMO Association letter to CARB, May 31, 2022 at 3.

<https://www.arb.ca.gov/lists/com-attach/490-accii2022-UTxRNIQsBQIRZVNk.pdf>

⁶ Ibid at 4.

use cases, it will create a significant market barrier for the growth and adoption of V2B technologies that can provide cost effective solutions to outages, peak reduction, and the transition to renewable energy in California.

- **Power Ratings:** Allow bidirectional chargers of all power ratings to qualify, including low power DC chargers, which are currently disqualified from CALeVIP and other IOU and POU equipment rebates. The unique electrical configuration of Fermata Energy's EVSE (480V/3-Phase, 15 kW or 20 kW, offboard, DC output, CHAdeMO interconnection) disqualifies it from the current CALeVIP rebate program. Fermata Energy's bidirectional charging equipment fits into neither the Level 2 (AC EVSE) nor DC Fast Charger (DCFC, DC charger) Eligible Equipment categories, which include chargers that are 50kW and up. Because Fermata Energy's charger utilizes the bidirectional CHAdeMO EV charging standard, and does not use an SAE J1772 charging connector, it is automatically disqualified from Level 2 AC EVSE incentives. The requirement that DC Fast Chargers must have a minimum 50 kW power output, whether CHAdeMO or CCS connected, disqualifies our lower-powered (DC Level 1) 15 kW DC charger from CALeVIP incentives. In addition, future residential DC Level 1 V2X chargers are expected on the market with power output as low as 5 kW. We would ask the Commission to expand these rebates to include all bidirectional chargers regardless of power rating, including equipment that is classified as DC Level 1 per SAE J1772 (up to 80ADC@ 500VDC – 40kW) and CHAdeMO or other technologies at all power levels.
- **Data on V2X Activities:** Require customers accessing this rebate to enroll their bidirectional charging device into an IOU or POU demand response, managed charging, automated load management, dynamic pricing program, or ELRP, to ensure that data on V2X activities can be shared with program administrators and utilities, via vehicle telematics, charger telemetry, customer submetering, or utility metering. While data sharing can be made a requirement, a pay-for-performance requirement would create too onerous an administrative burden at this point.
- **Application Form:** To encourage rebate uptake and reduce the compliance burden for customers and program administrators, ensure that the rebate application forms are designed to be as user-friendly as possible and can be easily and quickly completed.
- **Scalability:** More important than scalability is the emergency need for dispatchable capacity and the need to help low income consumers have access to V2X technology. The Governor's recent executive order to the Commission and the PUC demonstrates this. The Commission needs a best-of-both worlds solution - one that helps accelerate dispatchable capacity and EV adoption. Funding CHAdeMO chargers will not result in stranded assets. Nissan LEAFs using the CHAdeMO charging standard will continue to be sold until at least 2025. CHAdeMO chargers last at least ten years, so even in 2035, there will be a significant number of usable chargers with CHAdeMO connectors, so remaining

technology neutral will enable those existing chargers to be used. For example, there are over 40,000 Nissan LEAFs in California today; that number could easily double in the next few years.⁷ These more affordable EVs, such as the Nissan LEAF, are becoming even more affordable as used EVs for low-income consumers. One solution for public settings, especially with long-dwell charging, is to have chargers with both CCS and CHAdeMO connectors to enable V2X to scale much faster while also helping low-income drivers who need unidirectional charging with CHAdeMO.

- **Verification:** For verification purposes, we believe that a two tiered rebate where the second rebate requires an interconnection agreement should be enough. We recognize that more sophisticated verification systems for V2G or V2B, while possible to implement, are not realistic for the initial program rollout and would create too much of an administrative burden for program administrators. The financial incentives to use grid services or back-up power are very motivating. Perhaps, in the future, there may be third-party administrative capacity to implement a pay-for-performance mechanism.

In closing, Fermata Energy greatly appreciates the work of the Commission and staff in organizing and leading this workshop and appreciates the opportunity to provide feedback to the CEC on their efforts to support transportation electrification and grid reliability through these VGI funding concepts. As discussions on these topics continue, Fermata Energy would be happy to provide staff with additional feedback on these and other issues related to V2X adoption in California. As a V2X services provider with projects in California and nationwide, Fermata Energy has years of expertise monetizing and studying V2X use cases and technology implementations, and we look forward to sharing our resources and knowledge on this subject with staff to help develop these programs. We look forward to opening a dialogue with the CEC on this topic. Please do not hesitate to reach out to Fermata Energy if you would like to discuss these topics further. You may reach me at john@fermataenergy.com.

Sincerely,



John Wheeler
CFO & Co-Founder, Fermata Energy
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⁷ <https://www.arb.ca.gov/lists/com-attach/490-accii2022-UTxRNIQsBQIRZVnk.pdf>