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Additional submitted attachment is included below.

Comments of Nuvve Holding Corp on CEC Vehicle-Grid Integration Market Status and Funding Concepts: Docket # 19-AB-2127

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Introduction:

Nuvve is a San Diego-based company operating across the U.S. and internationally whose mission is to lower the cost of electric vehicle ("EV") ownership while supporting the integration of renewable energy sources, such as wind and solar. Nuvve's Grid Integrated Vehicle platform ("GIVe"), transforms EVs into vehicle-to-grid (V2G) assets when those vehicles are connected to a bidirectional charger while guaranteeing the expected level of charge at the time the owner or driver needs it for transportation. We appreciate the opportunity to comment.

Nuvve recommends that technical requirements for all funding concepts prioritize consistency with other state-funding schemes. While remaining technology agnostic as a company, Nuvve understands that the funding agencies hope to encourage and accelerate standardization and interoperability. In pursuit of that goal, coherent policy-making that acknowledges previous decisions, existing programs, and new requirements not-yet in effect under CEC, CPUC, CARB, and related legislation will assist industry's drive toward economies of scale by allowing manufacturers and service providers certainty for product design and related investment.

Concept 1: REDWDS

Nuvve supports the REDWDS concept: Real-time pricing mechanisms will benefit from the presence of third-party platforms to facilitate meaningful customer participation, but the potential revenue may not be sufficiently certain for companies to take the financial risk of developing the capabilities. This funding concept could prevent development of a "chicken-and-egg" dynamic in which customer uptake of the new rate is stunted by lack of third-party solicitation and enablement of participation, while third parties are unable to justify new platform development to meet requirements for rate participation for a market with seemingly limited customer willingness to participate.

1. Is $200k a reasonable amount to meaningfully support development?

The answer to this question depends on the capabilities of applicants' existing platforms and the hardware they propose to use. CEC could require applicants to confirm existing systems

meet minimum technical requirements to feasibly accomplish the tasks with the proposed dedicated funds. Staff could specify, for example, whether or not OCPP compliance and certification for EVSEs is a necessary prequalification for application or an outcome applicants may use funding to achieve. Additionally, minimum software platform functionality requirements as a prerequisite for applications may act as a filter to ensure companies can complete development with available funds.

2. Is $500k ($50k) a reasonable amount to meaningfully support customer outreach and **deployment** with (without) installation of new EVSE?

If Medium- and Heavy-duty use cases which may require DC charging (even at 50 kW) are eligible for funding, it is possible that $500k may be insufficient to service 50 customers when considering the cost of chargers and installation when considering potential line upgrades.

3. Should this solicitation target larger deployments (meaning: higher minimum customer deployment requirement and higher stage 2 funding amounts)?

Nuvve requests clarification on customer deployment requirement:

a) Will CEC require that applicants have the minimum required customers previously contracted (and displaying willingness to try a dynamic rate) to apply for funding? Or will CEC require applicants to show potential for customer acquisition and meet minimum customer count as a milestone in Stage 1?
b) When considering fleets with some variety in individual vehicle use profiles, each EV and EVSE will experience the rate differently and need to be controlled individually. Nuvve therefore recommends that applicants with fleet customers be allowed to register 50 individual chargers rather than 50 separate customer accounts to meet funding requirements.

Concept 2: Municipal EV fleets and Community Resilience

1. What provisions should be included to ensure that community needs are appropriately gathered and considered during blueprint development?

- A community-based organization as project lead
- A technical advisory committee including representatives of universities, labs, and engineering firms previously engaged with this topic
- A technology company in the team in some capacity
- A scenario or range of scenarios in which the resource will be activated and associated details, including but not limited to:
    - Type of outage (cause)
    - Estimated length of outage
    - Service expected (limited critical load panel? Full building service? How many kW is the project expecting to draw?)
    - Location of grid-forming inverter/EVSE. At normal EV charging location? At second location for community resilience?
    - Will back-up generation be necessary to recharge EVs?
    - Will EVs also be used for evacuation?

- Will there be a system to ensure EVs are charged in the event of a planned outage? An unplanned outage?
- Plan transfer switch procedure with local utility for islanding and reconnection to grid

Concept 3: Bidirectional Charging Equipment Rebates

1. Are applicants facing a cost barrier to using V2X-capable equipment that an "adder" would address?

Nuvve strongly supports this concept proposal. Though cost can certainly be a barrier to purchase of a V2G charger, availability of chargers to purchase may present the larger barrier that can also be addressed by this funding concept. Prior to customer purchase of a V2X-capable charger, manufacturers must first take the decision to produce the device. Increased costs of design and production force manufacturers to either pass on increased costs while competing for funding designed for less expensive models, or sell V2G chargers at economically unsustainable prices in order to compete while seeding the market. Estimated incremental cost of producing a V2G-capable DC EVSE is 30%, attributable to four things:

1. Cost of different architecture of the EVSE's power electronics (adding the inverter and different internal physical wiring), particularly for grid-forming (emergency back-up) systems
2. Additional metering
3. Higher duty cycle requiring larger design margin for reliability
4. Additional and more costly certification requirements (in terms of both time and money required)

These increased costs complicate product decisions for large companies. Small companies who may be normally be more likely to take chances on innovation may be unable to afford to take this financial risk, particularly as new ISO 15118 hardware readiness requirements already add hundreds of dollars to per unit cost of small volume product runs. Though value streams for V2G operation are beginning to appear across the country, neither EPA nor CARB has incorporated the potential for V2G into their vehicle emissions credit structures, resulting in a lack of regulatory signals to manufacturers that these devices are of value to the electric system and as facilitators of climate and air quality goals.[1] A V2X adder will not only assist customers in buying capable EVSEs, it will send a signal to manufacturers that funding agencies and regulators consider this an essential attribute. This proposal will both encourage and enable EVSE and inverter manufacturers to initiate of new V2X products.

2. Are there other equipment areas that we can address with "adders" in order to incentivize the installation of V2X-capable equipment?

Make-ready: When customers request interconnection of V2G DC devices, utilities may need to upgrade connections to allow three-phase power to the site. Existing program budgets generally do not contemplate the possibility of such an upgrade. This leaves schools with bus longer routes, for example, unable to electrify their school buses because make-ready programs assume such customers will merely need Level 2 charging. This restriction also therefore excludes DC V2G EVSEs by default. An adder enabling upgrades for V2G DC chargers will not only enable V2G, it will also expand the universe of schools that can electrify in the near-to-medium term in California.

[1] D.20-09-035 waives smart inverter standards

3. How can these “adders” be used to address equity issues? For example, should these adders be limited to (or award priority to) projects sited within rural communities, communities with a high likelihood of experiencing outages, disadvantaged communities, low-income communities, and/or Tribes?

Per our answer to question 2 above, an additional rebate to enable faster charging for rural and other schools with longer routes to electrify. This cohort is currently self-selecting to delay electrifying based on their inability to complete bus routes with current battery sizes and charging capacity. These schools are also seeing funding at the federal and state funding for the bus itself. Implementing this “Adder” concept and integrating with existing funding streams as soon as possible will enable more schools to take advantage of it as they receive their vehicle funding and choose their EVSEs.

Given that Concept 2 is proposing to investigate configurations and plans for emergency back-up in the same funding call, it may be challenging for projects funded by this same call to have devices designed for this purpose and also include such a resilience blueprint. While it is possible, this functionality and configuration should not be a requirement of funding.

Respectfully Submitted,

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