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FreeWire Comments on AB 2127 Staff Report

Additional submitted attachment is included below.

February 26, 2021
California Energy Commission
1516 Ninth Street
Sacramento CA 95814-5512

Re: FreeWire Technologies, Inc. Comments on the Staff Report: Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment

On behalf of FreeWire Technologies, thank you for the opportunity to provide comments regarding the California Energy Commission's (CEC) AB 2127 Staff Report: Electric Vehicle Charging Infrastructure Assessment (the Report). FreeWire appreciates the CEC's dedication to advancing transportation electrification across the state. Our comments here, which are focused on the above-mentioned report, are intended to reflect recommendations focused on EV programs and policies in general and specifically, Chapters 5 and 6 of the Report. FreeWire believes there is a great opportunity to accelerate the roll-out and lower the total costs of EVSE programs in California. Our recommendations are intended to address four critical areas of opportunity to improve current programs. California can optimize state and private resources to meet the electrification challenge by adopting policies which emphasize the following:

- Innovative business models that include flexible solutions that allow for faster deployment at a lower cost,
- Ensure that discussions over connector and communication protocols do not slow deployment of technology,
- Expansive definitions of customer-side make ready to include battery storage integrated into stations, and
- Building codes that do are inclusive of alternative technology.

FreeWire Technology Overview

FreeWire is dedicated to accelerating the deployment of EVSE by reducing the barriers to installation and the high energy cost of operating chargers. FreeWire accomplishes this by integrating battery storage technology into its Boost Charger, which reduces the need for make-ready infrastructure and reduces the grid impact of charging vehicles. Boost Charger provides a charge to the vehicle directly from the FreeWire battery using a low power input, as opposed to conventional chargers, which pull power directly from the grid at high power. This enables Boost Charger to deliver high power output to vehicles while dramatically lowering the energy costs of charging - a significant benefit to site hosts, grid operators, and ratepayers alike.

FreeWire is a California Small Business that manufactures in a DAC community and received a CEC Advanced Manufacturing grant in 2019. Well known market players such as BP, ABB, Volvo cars have invested in FreeWire. Boost Chargers have been deployed in California, Tennessee, and Oklahoma and will soon be deployed in Nevada, Utah, and Massachusetts. The Boost Charger has undergone testing at EPRI that has verified the performance and cost reduction benefits of the technology.

FreeWire's mission is not just to electrify but to create sustainable electrification. FreeWire and other innovative providers are addressing electrification holistically to reduce the overall costs of electrification, not just for vehicle owners but for businesses and the energy system. By siting batteries at the grid edge, and utilizing existing infrastructure to repower them, FreeWire's products can store low-cost power that can be used during on peak without negative consequences and without the need for any smart charging or reduction in charging output. In future iterations, that same battery will be able to provide back-up power to critical facilities or grid services, providing customers a lower cost charger and reducing their electrical costs overall. In this way FreeWire is developing the next evolution of charging assets that are also grid resources, providing back-up power and integrating renewable generation to harden the grid.

FreeWire Comments

Innovative and Tailored Business Models

FreeWire agrees with the CEC's assessment that more vehicle-grid integration is necessary to support the charging needs of the large number of electric vehicles expected in the State over the next decade. Chapter 5 focuses on the three benefits of vehicle-grid integration: minimizing driver costs, aligning charging with renewable energy generation, and bidirectional charging. FreeWire encourages the CEC and other stakeholders to also consider innovative technology that will address all three of these benefits while accelerating deployment. Unfortunately, current program designs don't consider such technologies, which also have the additional benefit of increased speed to market.

Battery-integrated charging solves many of the issues faced in deploying infrastructure, particularly with fast charging stations. FreeWire's station is designed so that the battery is charges from the grid at up to 27 kW, while providing high power directly from the battery to the vehicle. The battery provides many of the same benefits accomplished with "smart charging" with the capability to fill the battery during the peak of solar generation and dispensing that energy during peak usage periods at a lower cost to drivers and site hosts. Traditional smart charging that attempts to shift or reduce load during peak usage periods does not work for fast charging, wherein drivers often need to charge in a short period of time. Using the battery to shift energy consumption aligns charging with renewable energy generation without affecting the driver experience or increasing costs to the driver.

FreeWire's battery-integrated charging design also allows for connection to the grid on a low input connection, substantially reducing or eliminating infrastructure upgrades and allowing for faster deployment. It also means that many sites that would otherwise not be viable for an incentive program due to high make ready costs would be ideal locations for a battery-integrated charging solution. Take for example the PG&E EV Fast Charge Program, which illustrates the difficulty of finding suitable sites for make ready programs. As of December 2020, PG&E had received applications for 156 sites, of which just 6 were viable. The CPUC's narrow definition of "future proof" has resulted in a very limited set of potential

charging solutions. FreeWire's low input, high output solution would accelerate deployment of public funds and open up more sites for fast charging. This is particularly true in hard-to-reach locations such as MUDs, dense urban areas, parking garages, and rural locations, where bringing in 480V and/or 3-phase power is cost-prohibitive. FreeWire recently qualified for the PG&E program and we look forward to providing a solution that could make some of these locations viable.

Mobile battery-integrated solutions are another way to address site locations that cannot accommodate a conventional charging station. FreeWire agrees with the assessment in Chapter 6 that there is no one-size-fits-all charging solution. We encourage programs to include a variety of solutions that can be tailored to a specific site. Mobile charging is ideal for locations where the infrastructure won't support grid-tied charging, the property owner will not permit an installation, there are space or parking constraints, or the owner wants the ability to move the equipment between locations. FreeWire has a number of customers with large campuses that deploy our mobile charging station without constraining their parking lots or investing in high sunk costs for the installation of a conventional charging station. This solution often does not fit neatly within existing program specifications and FreeWire is encouraged that the CEC is exploring funding approaches that will include other technologies and account for avoided cost benefits.[1]

Finally, with respect to bidirectional charging aspect of VGI, FreeWire encourages the CEC to consider the bidirectional charging capabilities of the station battery itself, rather than just the vehicle battery. While there may be some applications in the future for using the vehicle battery, FreeWire believes that drivers using DCFC would not be willing to stop at a DCFC to put power back on the grid. Battery-integrated fast charging, however, can simultaneously provide charging to a vehicle and discharge from its battery to the grid. In addition, the battery can be used to power essential services at a site. For instance, a station located at a gas station or a convenience store can be configured to power the gas stations, point of sale systems, and lights in the event of a grid outage, keeping the business operational.

Prioritize Standardization While Accelerating Deployment

FreeWire agrees that standardized connectors and communication protocols are essential to the widespread adoption of EV driving. It is imperative that public funding is utilized to reach the maximum amount of EV drivers and site hosts and encourages further standardization. Allowing multiple connector standards to proliferate will increase the number of charging stations needed and increase costs. While we recognize standardization as an important initiative, FreeWire strongly encourages that deployment of public funds is not decelerated by the effort. EV charging programs should focus incentives and grants on standards that will be used by the maximum number of EV drivers and not on closed networks available to a select group. We agree that this will reduce complexity of deployments and align with current market trends.

[1] Staff Report, Chapter 6, pg 61.

Make Ready Definitions Should Be Expanded

FreeWire strongly supports the CEC's position that EVSE projects should be evaluated on the basis of avoided cost. FreeWire believes that such an approach will reward EVSE technologies that reduce the amount of public investment needed to support DCFC deployments and will rewarding technologies that can be deployed quickly. The current policy approach has focused on traditional charging solutions such as make-ready programs that narrowly define the customer-side make-ready infrastructure. To address the high costs of operating chargers in low utilization scenarios, utilities and the CPUC have proposed and approved demand charge reduction programs that merely shift costs from one rate class to another, instead of focusing on technological solutions that reduce the overall cost. Unfortunately, these costs, while hidden from the owner, do not disappear. They are born by ratepayers, many of whom are low income, and add to the systemic costs of electrification reducing the very value of electrification.

FreeWire strongly advocates that programs reconsider how make-ready is defined. Traditional make ready programs define customer-side make ready as the infrastructure as up to the stub or concrete pad. FreeWire believes that the battery storage system of its Boost Charger and other similar technology should be included. The battery storage systems integrated into a DCFC station negate the need for complicated rate structures that may require placing artificial caps on charging capacity to avoid punitive demand charges. Consider the proposal in Connecticut by United Illuminating:

> "A new generation of DCFC charger is being developed and deployed that has the potential to radically alter traditional views of DCFC infrastructure requirements. The next generation of DCFC integrates battery storage and all DCFC components into a single consolidated device. The primary benefit of this design is a significantly reduced load requirement that further reduces infrastructure requirements. This type of "hybrid" storage and DCFC unit reduces load requirements to those equivalent to a LII charger but delivers high power DC outputs of 120 kW.
>
> Hybrid storage/DCFC designs provide opportunities for siting in potentially capacity constrained areas without significant distribution system upgrades, but also reduce the possibility of creating new capacity constraints. Hybrid storage/DCFC is more expensive than the current generation of DCFC, however the infrastructure to support them would be significantly less. Since the infrastructure cost related to these units is comparable with LII but provide the benefit of DCFC, and due to the ability to these units to reduce strain on the distribution system, the Company proposes to allow the battery components related to hybrid storage/DCFC units qualify as customer-side make ready and be eligible for DCFC make ready incentives."[2]

[2] United Illuminating comments in DOCKET NO. 17-12-03RE04, RESPONSE TO REQUEST FOR PROGRAM DESIGN OF THE UNITED ILLUMINATING COMPANY, page 23-24

Building Codes Should Reflect Alternative Technologies

FreeWire strongly agrees with the CEC that "building codes are often a cost-effective tool to support state policy, ensure equitable outcomes, and reduce barriers to adoption.[3] However, FreeWire supports building codes that recognize that battery-integrated technologies can reduce or eliminate some of the distribution level grid upgrades that would be needed in new construction. "Ev-ready" should defined in a way that allows owners or builders to design infrastructure that achieves building code goals without requiring infrastructure that may be unnecessary.

Conclusion

FreeWire appreciates the CEC's efforts in authoring the AB 2127 Staff Report and its efforts to highlight innovative technologies that should be available for public funding opportunities. FreeWire recognizes that early policies and programs worked with then-existing technologies to drive EV adoption, but these programs designs, particularly around DCFC, are not sustainable. Programs should evolve to encourage innovation in DCFC and mobile charging technology.

FreeWire's Boost Charger substantially reduces or eliminates much of the expensive utility-side and customer-side make ready infrastructure, allowing for a less expensive solution that is faster to deploy. Overall costs should be considered and technology such as Boost Charger should not be put at a competitive disadvantage because site hosts don't see the benefit of make ready incentives.

FreeWire appreciates the opportunity to comment on the AB 2127 Staff Report and hopes that our comments will help shape future programs and policies to accelerate deployment and lower overall costs to the public.

Sincerely,

Renee Samson

Renee Samson
Director of Regulatory Affairs

[3] Staff Report, Chapter 6, pg. 64.