



Ultrafast EV Charging and Energy Solutions

Wyoming DOT RFI

January 31, 2024





Dear CUSTOMER,

Company Contacts

Renee Samson, Director of Public Policy

rsamson@freewiretech.com

(415) 297-4360

FreeWire Technologies, Inc.

7200 Gateway Blvd, Newark CA 94560

(415) 484-9590

Technical Response

1. GENERAL

a. Which site(s) along the Interstates would your organization be interested in developing? These can be identified in the NEVI plan or other sites along the interstates. • If there are any additional sites throughout the state that your organization would be interested in developing please state where those locations would be.

Although FreeWire has not yet identified specific locations, we are working with our customers with locations in Wyoming to identify the ideal locations.

b. What do you perceive as the biggest challenges or barriers to implementing NEVI sites in Wyoming?

FreeWire anticipates that grid constraints and utility upgrade timelines will be the biggest barriers to implementation. FreeWire often overcomes these barriers with its unique technology that allows a grid connection at low voltage. This substantially reduces installation costs and eliminates the need to run high voltage power to a site.

c. Do you have experience in deploying charging infrastructure in rural, remote, and underserved regions and communities? If yes, please summarize any current or planned experience.

FreeWire has deployed stations in remote and rural locations. FreeWire is able to connect to the grid at single phase, allowing installations in remote locations that lack three-phase power. Some examples of more remote locations are our deployments in Alaska, Colorado, the Upper Peninsula of Michigan, and Canada. In addition, FreeWire's California deployments are over 60% in low-income and disadvantaged communities.

d. How does your organization identify optimal locations for charging? Please provide all factors used for consideration and how your organization evaluates these factors for considered locations.

FreeWire looks at customer needs and site specifics in evaluating and recommending solutions. For any proposed installation, we would work with our customer to evaluate vehicle needs at the site, such as type of vehicles, range needed, and timing of charging, in order to recommend the correct number of chargers for efficient utilization. We also collect site-specific information with



regard to electrical input voltage, existing service capacity, location of service and desired charger location.

FreeWire's unique battery-integrated solution can reduce the complexity of installations because it requires less space (40" X 43") and lower input power (27 kWh) than a traditional DCFC. Additionally, we can look at site load and electricity rates, including demand charges, to help the customer understand the operating costs of charging vehicles using our technology vs. other solutions. We have a site checklist that can be used to initially evaluate sites, and we have both in-house expertise and external partners who can provide a variety of services in terms of walking sites, advising on design, providing cost estimates, or providing full design and engineering services.

e. If you are an existing EVSE operator along an AFC, would your organization be interested in the potential to upgrade existing DCFC charging stations to meet NEVI requirements? • If yes, please tell us the location your organization would be interested in upgrading.

We are not looking to upgrade at this time but would consider it in future rounds.

PARTNERSHIPS AND BUSINESS MODELS

f. Is there a business model or procurement contracting method that would prevent you from participating in the WYDOT NEVI plan? If so, what is it?

No, FreeWire does not foresee any issues participating in the WYDOT NEVI plan. FreeWire has already been awarded NEVI funding in Colorado, Utah, and Texas.

g. Please provide your organization's viewpoints on contracting methods for DCFC infrastructure, including leasing and/or revenue sharing agreements. Have you implemented any cost/revenue sharing models for the operation of DCFC EVSE? If yes, please share what you can about the terms of those partnerships.

FreeWire sells its hardware, software, and warranty to the customer. FreeWire also maintains a nationwide network of installers and can work with installers to provide a turnkey solution for the site host. FreeWire does not lease its equipment and has not entered into any revenue sharing agreements.

h. WYDOT may require validation that the charging station operator has site control, such as a lease, option to lease, letter of intent, or other similar agreement between the operator and the property owner (if different entities) that confirms the charging station operator has permission to locate the charging infrastructure on the property for at least five (5) years. Provide an overview of your organization's approach to installing and operating EVSE on private land. Will you be leasing land or owning?

FreeWire does not own its charging stations. If our customer is a lessee of the proposed site, FreeWire typically works with the customer to obtain a signed letter from the land owner that proves that there is permission to install EVSE.



i. What information about electrical service at a proposed site can you provide during the application process? How do you plan to coordinate with utility providers to evaluate electrical service at a proposed site in advance of an application?

See response to d, above. If utility upgrades are needed, FreeWire will assist the customer in working with the utility prior to the application.

TECHNICAL REQUIREMENTS


j. Please describe the EV charging equipment you would propose to deploy in Wyoming.

Boost Charger 200 is a 160 kWh battery-integrated DCFC with 200 kW output capacity. The Boost Charger 200 is capable of charging one (1) EV at 200 kW or two (2) EVs, simultaneously, at up to 100 kW each via dual ports. Standard input power for the Boost DCFC is 3-phase 208V/80A or single-phase/split-phase 240V/120A service and does not exceed 27 kW, which is 1/8th of the power needed for a traditional DCFC. Boost Charger can operate at a lower input power (ex. 40 amps) for both voltages and still provide its maximum kW output. In addition, the Boost Charger 200 allows charging at an expanded voltage range, from 200-950 Vdc. This makes the Boost Charger 200 compatible with the latest ultrafast charging EVs at 800 Vdc, such as the Porsche Taycan, Hyundai Ioniq 5, and the Hummer EV. Boost Charger charges Light Duty EVs through class 8 Heavy Duty ZEVs.


FreeWire’s next generation product, the Boost Pro Series, will allow a grid connection of 50 kW, further ensuring that customers can schedule when the Boost will recharge its battery and

FreeWire’s Battery-Integrated Boost Charger Solution

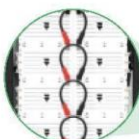
Proprietary Hardware Design Architecture




Next-Gen Power Converter



Asset Management Software to Optimize Energy













160 kWh Adaptive, Proprietary Battery Pack
Envision AESC



Retail Integration & Loyalty Program Enablement

Competitive Moat

-  9 years of proven operating experience
-  Robust patent portfolio
-  Battery-integrated hardware regulation & certification
-  Deep & strategic relationships with blue-chip customers
-  Compatible with all major vehicles
-  Retail integration capabilities with loyalty programs and promotion
-  Energy management software platform
-  Insights driven from 30k+ charging sessions to date to serve stakeholders
-  Optimal location siting software
-  Solutions support & project management
-  \$250M of capital raised to date funding R&D and scale



k. Are there any facets of the NEVI guidelines that your EVSE cannot meet?

No. FreeWire proposes to install four chargers at each location to ensure that 150 kW of power is available at all times for four of the ports. The additional four ports are “bonus” ports that cannot be accessed until the first vehicle drops down to 100 kw or less. The first four vehicles will always have access to 150 kW. FreeWire has also had discussions with a number of states after the FHWA issued clarification that battery chargers are NEVI eligible.

l. What functional site design elements (beyond those required by the NEVI Program rules) should WYDOT consider in developing its minimum technical requirements and evaluation criteria for sites? Examples would be the capacity per site, installing more than (four) 4 chargers per site, views on spacing of chargers, traveler amenities, technology solutions, ability to expand locations, etc.

As the State seeks to meet its objectives of facilitating market transformation, increasing the number of electric vehicle miles traveled (eVMTs), and expediting the displacement of high carbon emitting sources of transportation, FreeWire recommends awarding projects that can demonstrate the ability to achieve commissioning within six to nine months of award or in the quickest time practicable. Wyoming will be able to ensure immediate progress under NEVI, pull forward private investment, and deliver fast charging to drivers sooner. FreeWire believes that a competitive solicitation for grant funding that prioritizes shovel ready projects is the quickest and most efficient method of ensuring deployment of infrastructure.







FreeWire suggests that the State require site plans, site host agreements, and utility coordination occur in advance of the application to reduce attrition after the application period. An example of this is California's CALeVIP program, which recently announced changes for the next round of funding that includes requiring a site verification form and evidence of permit/utility application at the time of the funding application. These changes aim to reduce the program's 40% cancellation rate by applicants after funds were reserved. Texas has also changed its VW grant funding application from a first-come, first-served model to a competitive solicitation, recognizing that the former process also resulted in a substantial attrition rate.

As utilities face long lead times to procure transformers and additional infrastructure required to install DC fast charging, WDOT's NEVI program should prioritize projects that utilize technologies that do not require additional utility infrastructure and that can demonstrate the ability to achieve commissioning within six to nine months of award.

In addition, FreeWire encourages prioritizing projects that utilize energy storage technologies. As noted in the Federal Guidance, co-locating energy storage technologies with DCFC can reduce the installation and operational challenges associated with EV fast charging, including:

- Reducing grid impacts
- Long project development cycles
- Construction costs
- Energy Costs (Demand charges)
- Designing for future EV charging demand

Pairing DCFC with energy storage reduces grid impacts by shifting the peak load created by fast charging to off-peak hours. In addition to reducing grid impacts, technologies such as FreeWire's Boost Charger, which integrates battery storage into the DCFC hardware, enables the installation of fast charging using lower input power (240-volt or 208-volt input power), allowing the installation of DCFC in scenarios where bringing in a 480 V transformer and additional utility infrastructure and power service is too costly. Not only does this innovation expand charging locations, but it reduces construction costs by requiring less utility infrastructure and expedites the installation process.



Lastly, pairing energy storage with DCFC reduces the demand charges and operational costs associated with fast charging. Unlike conventional charging configurations that pull high power from the grid to provide a fast charge, battery integrated DCFC, such as Boost Charger, pulls at low and steady demand from the grid to recharge the integrated battery unit. As a result, the Boost Charger avoids the high and often unpredictable peak demand spikes that conventional chargers do and accordingly, can minimize or avoid demand charges, which often erode the economics of operating a conventional DCFC system in cases of low utilization.

FreeWire recommends integrating energy storage in program design by:

- Prioritizing the selection of DCFC + storage projects where grid upgrades would be avoided and / or project timelines would be expedited
- Providing additional incentives for projects that incorporate energy storage technologies
- Designing specific solicitations for grid constrained areas of the State where energy storage technologies would reduce the infrastructure costs required to install DCFC and expedite project timelines

FUNDING

m. What financial structure is most feasible for your organization, and will you provide the non-federal match required by NEVI Program of 20% or possibly more? • Please describe the percentage of participation in construction costs would you desire or expect from public, federal, or private partners?

FreeWire's customers will provide the required match and in some cases, more than the minimum 20%.

n. How do you believe the implementation approach could be structured to maximize private sector funding as the match required by FHWA for use of NEVI funds and to reduce the amount needed for a federal subsidy? Insight is welcomed on whether this could vary based on specific site conditions or locations.

Maximize the Use of Public Funding and Ensure Prudent Investment

As the State develops and implements its DCFC program, applicants for the program should be required to specify all cost components related to the installation and operation of the EV charging station, including EVSE hardware, make-ready infrastructure, installation and commissioning, and operations and maintenance. Many EV charging programs utilize dollars requested (as opposed to total project costs) per kW of station output as the cost-effectiveness criteria to evaluate applications. However, as the State develops its program design, applicants should be required to disclose public funding sources outside of NEVI funding and total project costs.

As stipulated in the draft regulations released by the Federal Highway Administration and as part of the NEVI program, states will be required to report on costs related to property acquisition, charging equipment and installation, distributed energy resources and installation, and grid connection and upgrades. For example, more and more utilities are approved to offer incentives and funding to help cover make-ready and installation costs of an EV charging



project. In the instance where the NEVI funding is helping to cover EVSE hardware costs and a utility program is covering make-ready and installation using ratepayer funding, administrators of the NEVI funding have an obligation to select projects that offer the biggest bang-for-the-buck overall. In other words, cost-effectiveness based on total project costs is a primary consideration when evaluating and selecting projects to receive NEVI funding.

OPERATION AND MAINTENANCE

o. Would the lack of Operations and Maintenance funding be a barrier to your participation?

Charging station reliability is a pressing concern as some of the first and second generation chargers are aging out of warranty. Some owners are reluctant to fix chargers that are out of warranty. Several states are currently considering legislation that would strengthen reliability requirements and impose penalties on station owners who have received public funding but have not met uptime requirements. FreeWire strongly recommends that operations and maintenance costs are included in eligible funding costs.

p. How will your organization support continued operation of the EV network deployed beyond the five (5)-year agreement under the NEVI Program?

FreeWire offers a parts and labor service to customers once the warranty period has expired. FreeWire also proactively monitors the chargers and is aware when a charger is in need of a repair.

q. Please offer thoughts on the level and types of effort related to staffing requirements, monitoring systems, partnership arrangements, etc., to meet the 97% uptime requirement in the NEVI Program rules. What factors will influence the cost of meeting that 97% uptime requirement, and is there anything you view as within WYDOT's discretion or influence that can aid in achieving 97% uptime?

FreeWire has scaled a service organization to support >400 chargers deployed across the entire US, Canada, Australia, Japan, the UK, and several EU countries. This requires thoughtful planning, investment in talent, massive focus on logistics, and training and support from FreeWire HQ. In 2023 we achieved 97% uptime, as defined according to the NEVI standards published by FHWA.

Some methods used to achieve 97% uptime include: A robust warranty and on-site maintenance program which includes remote monitoring, preventative maintenance (annual inspection and replacement of parts), and reactive maintenance. We are committed to "Mean Time To Respond (MTTR)" within 15 hours and "Mean Time To Repair" within 21 hours of a service call and are on track to achieve that milestone in 2023. For critical issues, FreeWire responds to the site within 4 hours of notice (for diagnosis & safe shut off if needed). FreeWire then performs additional service during available business hours in line with the MTTR metrics. FreeWire will provide its customer with a service email and phone number that reaches on-call staff. FreeWire also maintains a stock of spare parts for all deployed units to ensure FreeWire meets its commitments.

ADDITIONAL INFORMATION



r. Please provide any additional information that would be beneficial for WYDOT to consider when developing a Request for Proposal for the deployment of its NEVI plan. Respondents are requested to not provide proposals or marketing material and should instead provide detailed answers to the RFI questions.



F R E E W I R E