



October 5, 2021

Filed Via Email

Aida Camacho-Welch
Secretary of the Board
New Jersey Board of Public Utilities
44 South Clinton Ave., 9th Floor
P.O. Box 350
Trenton, New Jersey 08625-0350

Re: Comments of FreeWire Technologies on New Jersey Electric Vehicles Infrastructure
Ecosystem 2021 – Medium and Heavy Duty Straw Proposal, Docket No. QO21060946

Dear Aida Camacho-Welsh,

On behalf of FreeWire Technologies, thank you for the opportunity to submit comments on the Medium and Heavy Duty Straw Proposal in the above-referenced proceeding. We appreciate the time and effort that the Board of Public Utilities and Staff have devoted to this issue along with the efforts to support greater adoption of electric vehicles in New Jersey.

Please find our comments enclosed. Thank you for your attention to this matter.

Sincerely,

/s/ Peter Olmsted
Peter Olmsted
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FreeWire Technologies, Inc.
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**STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES**

In The Matter of Medium and Heavy	)	Docket No. QO21060946
Duty Electric Vehicle Charging	)	
Ecosystem	)	October 5, 2021

**COMMENTS OF FREEWIRE TECHNOLOGIES ON
MEDIUM AND HEAVY DUTY STRAW PROPOSAL**

On behalf of FreeWire Technologies, Inc. (“FreeWire”), thank you for the opportunity to comment on the New Jersey Electric Vehicles Infrastructure Ecosystem 2021 – Medium and Heavy Duty Straw Proposal (“Straw Proposal”), which was issued in the above-referenced docket on June 30, 2021. FreeWire appreciates the attention that the New Jersey Board of Public Utilities (“BPU”) is devoting to this matter, and further appreciates the efforts of the BPU Staff to develop the Straw Proposal and solicit feedback. Over the past two months, BPU Staff has successfully engaged interested stakeholders as well as the New Jersey’s electric distribution companies (“EDCs”) on this timely topic through several virtual stakeholder meetings. As the leading manufacturer of battery-integrated electric vehicle supply equipment (“EVSE”) in the U.S., FreeWire was invited to present during the meeting that was focused on renewables, storage and charging, and is grateful for this opportunity to follow up on its remarks with written comments. Given FreeWire’s innovative technology solution, our comments will provide unique perspectives regarding electric vehicle (“EV”) charging infrastructure in the medium and heavy duty vehicle (“MHDV”) sector. It is important to note, however, that our feedback on the Straw Proposal is not just relevant to the MHDV sector, but is also broadly applicable to aspects related to the installation and operation of Direct Current Fast Charging (“DCFC”) solutions for light-duty vehicles and public charging. We therefore encourage BPU and Staff to not only consider the pairing of energy storage and EVSE in the context of this docket, but also in the context of

EVSE programs that it has already authorized or may be deliberating.

FreeWire's innovation delivers EV charging solutions in a manner that helps to overcome barriers, including cost and grid related barriers, that stand in the way of building out an EV charging ecosystem in a timely and cost-effective way. By integrating energy storage technologies with EVSE, FreeWire is delivering solutions that help to minimize electrical infrastructure requirements associated with DCFC and MHDV charging equipment thereby reducing strain on the grid as well as installation and operational costs. FreeWire's comments focus on how energy storage technologies can be incorporated into the framework that the BPU envisions for the buildout of a comprehensive MHDV ecosystem in New Jersey. Specifically, we recommend two alternative approaches by which energy storage configurations can be encouraged and supported through EDC MHDV programs in a manner that will help to directly address challenges related to the deployment and operation of EV charging in the MHDV sector. Moreover, FreeWire believes that by supporting the strategic deployment of battery integrated EVSE that overall program costs can be reduced thereby delivering the greatest quantity of electric miles at the lowest cost to the state's ratepayers. As discussed in further detail below, FreeWire offers the following recommendation for the Straw Proposal.

1. Establish dedicated funding to support the deployment of energy storage technologies paired with EVSE, which are capable of reducing the need for investment in wiring and backbone infrastructure as well as helping to manage energy costs and peak demand related to MHDV charging.
2. As an alternative to establishing a dedicated program, FreeWire recommends that energy storage technologies be included under the definition of Make-Ready given that this technology can minimize or avoid the need for traditional Make-Ready infrastructure.

FreeWire appreciates the specific nature of the Straw Proposal and will address the various items and questions for which the BPU Staff has requested specific feedback in the discussion below.

Thank you for your time and attention on this matter. We are available to answer any questions, provide additional information, or discuss our comments with you at your convenience.

I. INTRODUCTION

Founded in 2014, FreeWire is a fast-growing, clean energy company that manufactures and provides EVSE hardware for fast and flexible deployment. FreeWire's hardware and software solutions are premised upon integrating battery storage technologies to address lack of sufficient grid power or grid constraints and to reduce energy costs related to operating high power EV charging. While FreeWire has been operating for seven years, primarily manufacturing mobile Level 2 chargers and electric generators, its ultrafast battery-integrated EV charger, the Boost Charger, was introduced in 2020 and has been deployed in over twelve states in the U.S. as well as the United Kingdom. By the end of 2021, the Boost Charger will be deployed in other parts of North America (U.S. states & Canada), as well as internationally. Both the Boost Charger and its integrated battery unit are UL certified and have undergone testing at the Electric Power Research Institute ("EPRI"), which has verified the performance and cost reduction benefits of FreeWire's technology innovation.¹ Having recently completed its Series C funding round of \$50 million, FreeWire's "infrastructure-light" DCFC approach has come to market at a time when demand for high-powered, fast charging is on the rise and innovative solutions are increasingly needed to overcome total cost of ownership challenges and to enhance the EV charging experience.

FreeWire is dedicated to accelerating the deployment of EVSE and energy storage by reducing the barriers to installation and managing costs associated with operating these clean

¹ <https://freewiretech.com/news/freewires-boost-charger-reduces-installation-and-operational-costs-for-electric-vehicle-charging-according-to-electric-power-research-institute-study/>

energy technologies. FreeWire accomplishes this by integrating battery storage technology into its Boost Charger, which reduces the need for customer and utility-side electrical infrastructure (i.e., Make-Ready) and reduces the grid impact of charging vehicles. The Boost Charger provides a charge to the vehicle directly from the FreeWire battery using a low power input, as compared to conventional chargers that pull power directly from the grid at high power. This enables the Boost Charger to deliver high power output to vehicles while lowering the total cost of ownership related to electric vehicle charging - a significant benefit to site hosts, grid operators, ratepayers, and electric vehicle drivers alike.

The promise of battery integrated EVSE offers a step-change improvement in reducing DCFC installation and operating costs, while still providing drivers fast, high power charging. In the case of FreeWire's innovation, the Boost Charger is a stationary DCFC unit that utilizes an integrated 160 kWh battery system to deliver up to 150 kW to one, or 75 kW two EVs simultaneously, while only drawing up to 27 kW from the grid using low voltage and widely available 240-volt or 208-volt input power.² In essence, this innovation reduces the load requirements to those equal to a Level 2 EVSE system but with the ability to charge EVs at DCFC output levels. With this configuration, the battery serves as a buffer, enabling fast charging assets to be deployed at most commercial locations without grid upgrades. The energy storage system inherently reduces costs on an ongoing operational basis by limiting peak energy consumption and associated demand charges. With this configuration, the Boost Charger can satisfy current and projected utilization scenarios for light-duty EV charging at most sites in the northeast U.S. and is also equipped to provide strong utilization within the MHDV sector.

Battery-backed EVSE systems offer several core benefits when it comes to building out a

² FreeWire is aware of at least 6 other companies that are currently in the process of bringing a similar battery integrated DCFC unit to market. In addition, numerous other EVSE companies and developers are also pairing energy storage devices and DCFC on-site given the grid and operational benefits that result.

fast-charging network including expanding the universe of sites, reducing deployment time, and reducing total cost of ownership. As a result of avoiding make-ready upgrades, which can result in deployment periods of twelve months or longer, battery-backed systems offer the benefit of speedy deployment and increased opportunity for EV drivers to charge at high speeds sooner. Battery-backed DCFC systems also enable owners and operators to reduce operational costs associated with traditional fast charging at high levels of power demand, most notably demand charges. Unlike conventional chargers that pull high power from the grid to provide a fast charge, the 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.

While FreeWire does not suggest that battery integrated EVSE systems are the only or always the best solution for every application, we instead urge policy makers and program administrators to design EVSE deployment programs in a manner that ensures an inclusive opportunity for emerging technologies. To date, the majority of DCFC deployment strategies have focused on Make-Ready programs or demand charge alternative rate designs to address the installation and operational barriers associated with fast charging. While FreeWire does not dispute that these programs are useful as part of an overall deployment strategy, we believe that they are limiting and not adequately equipped to spur innovative solutions to overcome time and cost intensive challenges associated with build out of a fast-charging network. Given the benefits associated with battery-backed or battery-integrated EVSE, FreeWire believes that encouraging greater deployment of these innovative approaches will help to increase the speed of deployment, reduce unpredictable demand for high power at the edge of the grid, and will result

in more cost-effective deployment overall.

II. FREEWIRE COMMENTS ON THE MHDV STRAW PROPOSAL

The Straw Proposal offers a strong and important foundation for deploying EVSE in New Jersey to support the electrification of MHDV, and FreeWire appreciates the time and attention that the BPU and Staff have dedicated to its development. In considering refinement of the Straw Proposal and its ultimate presentation to the BPU for consideration, FreeWire offers the following comments and recommendations to ensure a robust and competitive market for EVSE, support for technology innovation, and to accelerate the prudent use of public funds for charging infrastructure. In general, FreeWire submits that encouraging and supporting the deployment of energy storage paired with EVSE will serve as a cost mitigation strategy for aspects of the Straw Proposal related to Make-Ready, grid upgrades, and rate reform. In these instances, the Straw Proposal envisions programs or policies, which would be implemented by the EDCs, that would help to overcome cost barriers associated with installing and operating EVSE. As discussed above, FreeWire's experience is that energy storage technologies can offer benefits in both the Make-Rate, grid and rate reform contexts, and it is in this regard that FreeWire offers its specific recommendations.

A. Encourage deployment of energy storage technologies through dedicated funding

Given the benefits offered by pairing energy storage with EVSE, FreeWire recommends that the Straw Proposal include a dedicated program to incentivize the deployment of this technology configuration. Without dedicated incentives, there will be no impetus for the market to pursue these non-wires solutions as compared to traditional Make-Ready and grid investments. Of note, BPU Staff specifically requests comments on concepts including, "microgrids containing

some local generation that may provide cost mitigation on the distribution system upgrade.”³ In addition, the Straw Proposal envisions the development of hosting maps that identify where to prioritize Make-Ready as well as locations where charging infrastructure can be located in a manner that avoids lengthy and costly distribution upgrades.⁴ Indeed, this is precisely the focus of FreeWire’s technology innovation and the premise upon which we have come to market with a battery integrated DCFC configuration.

The Straw Proposal envisions incentives up to 100% of the costs of Make-Ready for certain MHDV charging infrastructure, and further contemplates granting cost recovery to the EDCs for Make-Ready as well as upgrades on the utility-side of the meter. Given that the Straw Proposal contemplates recovery of costs from other ratepayers for Make-Ready and grid upgrades, we are encouraged that the Straw Proposal seeks ways to mitigate these costs, including through the incorporation of energy storage, renewable energy and charging strategies. Included in the Straw Proposal are several prompting questions around when energy storage should be incorporated or prioritized. For example, BPU Staff asks if there is a certain threshold for which these technologies should be incorporated as a condition of Make-Ready or whether they should be coupled with EV charging infrastructure wherever possible. FreeWire does not believe that requiring the incorporation of energy storage technologies as a condition of Make-Ready would be prudent, but we do, however, believe that prioritizing these non-wires solutions as part of the state’s EVSE ecosystem is critical.

As a threshold matter, we believe that incorporating energy storage technologies wherever possible would be an effective strategy to incorporate into program design. We believe this would be a particularly advantageous approach in instances where doing so would explicitly avoid

³ New Jersey Electric Vehicles Infrastructure Ecosystem 2021 – Medium and Heavy Duty Straw Proposal, In the Matter of Medium and Heavy Duty Electric Vehicle Charging Ecosystem, Docket No. QO21060946, June 30, 2021, at pg. 12.

⁴ *Ibid.*

Make-Ready or distribution upgrade costs associated with the installation of EVSE. The EDC hosting maps that are contemplated as part of the Straw Proposal will be useful for determining where energy storage solutions can open up new locations for EV charging infrastructure or otherwise avoid lengthy and costly Make-Ready and distribution grid upgrades. We believe, however, that creating dedicated funding or eligibility for these energy storage EVSE configurations would be even more successful for stimulating market activity.

As grid constraints and challenges with deploying conventional EVSE solutions become more pronounced as easier and less costly sites are developed, FreeWire believes that non-wires solutions will become increasingly looked to. In Massachusetts, for instance, National Grid is already requesting authorization to establish a DCFC and energy storage program for just this purpose.

The Company is proposing to offer incentives to support DCFC and energy storage integrated technologies. This proposal will incentivize energy storage integrated with DCFC to reduce short to medium term barriers to the installation of high powered DCFCs in areas which provide considerable value to EV drivers due to their proximity to major thoroughfares but where current distribution system capacity may be insufficient to support DCFC sites without a system upgrade. Where the traditional wires solutions to alleviate these capacity constraints present both high system modification costs and multi-year implementation timeframes, the Company proposes offering additional incentives to support rapid deployment of DCFC through the installation of commercially available DCFC and energy storage combination products. These products effectively reduce the capacity required from the grid while maintaining the customer delivered charging rate through the direct coupling of charging ports

with dedicated energy storage. In evaluating suitable locations for this small-scale program, the Company will consider the costs and implementation timeframes for infrastructure upgrades at a given location as a part of the Company's overall capital improvement plan to ensure that the incentive provides sufficient value versus a traditional wires solution. While the addition of such combination products at select locations is not expected to eliminate the need for infrastructure investment in a given area, it will play a key role in enabling the Company to accelerate the deployment of DCFCs in high value areas in the near term.⁵

FreeWire believes that by leveraging market forces and industry innovation through inclusive program design, regulators and policymakers can deliver optimal outcomes for the benefit of site hosts, EV drivers, the grid and society at large.

As we suggested in our presentation during the stakeholder meeting on renewables, storage and charging, establishing a per kWh rebate for integrated energy storage would offer an effective incentive structure to encourage the deployment of these configurations. Rebate levels could be set based on an investigation into or estimation of the costs associated with deploying this technology and/or could also be based on an avoided cost methodology that accounts for the costs being avoided related to Make-Ready and grid upgrades. As to whether such incentives should be on par with energy storage at non-EVSE sites, as asked in the Straw Proposal, FreeWire does not believe that they need to be established at the exact same level so long as there would be explicit and distinct funding mechanism to support pairing energy storage with EVSE.

An additional justification for establishing distinct funding to support energy storage and EVSE relates to the ability of this configuration to mitigate peaking impacts on the grid resulting

⁵ Direct Pre-filed Testimony of the Electric Vehicle program Panel, Massachusetts Electric Company and Nantucket Electric Company each D/B/A National Grid. Massachusetts Department of Public Utilities, docket 21-91, Exhibit Ng-evpp-1, July 14, 2021, at pg. 51. <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/13758106>

from high-power charging. Under typical configurations, energy storage devices recharge using grid power at lower and more predictable power levels lower than traditional high-powered charging, and in turn are then able to provide high output power to charge EVs. As a result, the unpredictable and high-power spikes experienced with more traditional high-power charging arrangements are mitigated thereby reducing strain and impact on the distribution system. From a cost perspective, this capability can also help to mitigate and manage the cost of energy associated with operating EV charging, specifically demand charges. Several of the presenters during the stakeholder meeting on renewable energy, energy storage and charging, including FreeWire, offered useful information on the potential of energy storage to reduce peak demand and manage demand charges.⁶

The Straw Proposal recognizes that demand charges can present an obstacle to investment in EV charging equipment for the MHDV sector, and accordingly, contemplates the adoption of a mechanism to mitigate demand charges, especially in the earlier years of EV adoption during which low rates of utilization may be insufficient for covering these operational costs. While FreeWire is not opposed to demand charge relief mechanisms, we believe that technology solutions that mitigate demand charges should also be prioritized and supported through program design. We therefore recommend that energy storage be included in the Straw Proposal as a technology solution for overcoming this barrier, and accordingly, as an additional rationale for establishing a dedicated funding program for this solution. Similar to the overall costs savings that could result by avoiding Make-Ready and grid upgrades by installing energy storage, by utilizing energy storage to manage demand charges, there would presumably also be an overall cost savings that would result from not having to socialize costs associated with demand charge

⁶ Mark Warner, Gabel Associates, The Synergy Between Vehicle Charging and Renewable Energy and Storage, at pg. 4. Pamela MacDougall, Environmental Defense Fund, Renewable Energy, Storage, and Vehicles as a Grid Asset, at pgs. 3-4. Mark Valori, Clean Energy Ventures, Medium and Heavy Duty Straw Proposal: Renewables Storage and Charging, at pgs. 3-4. Peter Olmsted, FreeWire Technologies, Medium and Heavy Duty Straw Proposal: Renewables Storage and Charging, at pg. 5.

relief.

B. Include battery-storage in definition of Make-Ready

As an alternative to establishing a dedicated incentive program to encourage the deployment of EVSE paired with energy storage, FreeWire recommends that the definition of Make-Ready be modified to include energy storage as an eligible measure for the easy and cost-efficient installation of EVSE. Given that the incorporation of energy storage technology can supplant conventional grid and customer-sited electrical infrastructure that is necessary to support EVSE, including energy storage technologies in the definition of Make Ready will help to enhance the ease and cost-efficient deployment of this infrastructure and help to ensure that the full suite of EV charging solutions is competitive in the New Jersey market. If Make Ready and grid upgrades are 100% covered, owners and operators of EVSE will be insensitive to them and as a result there will be little motivation or incentive for considering alternative solutions.

Several stakeholders that presented during the meeting on renewable energy, energy storage and charging, including FreeWire, voiced support for such a modification to the Straw Proposal, and we reiterate the recommendation again here as an alternative to establishing a dedicated incentive program as discussed above.⁷ We would like to draw your attention to the response of The United Illuminating Company (“UI”) to the Connecticut Public Utilities Regulatory Authority’s Request for Program Design (“RFPD”). UI specifically refers to a new generation of energy storage and DCFC system that provides opportunities for siting in potentially capacity constrained areas without significant distribution system upgrades and suggests that the energy storage components be eligible for customer-side Make Ready

⁷ Mark Warner, Gabel Associates, The Synergy Between Vehicle Charging and Renewable Energy and Storage, at pg. 4. Pamela MacDougall, Environmental Defense Fund, Renewable Energy, Storage, and Vehicles as a Grid Asset, at pg. 9. Peter Olmsted, FreeWire Technologies, Medium and Heavy Duty Straw Proposal: Renewables Storage and Charging, at pg. 8.

incentives in the state.

Hybrid storage/DCFC [CapEx] 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.⁸

Broadening inclusion and supporting all commercially viable technology solutions is critical to advancing deployment and fostering the innovation necessary to meet New Jersey's ambitious transportation electrification goals. As an alternative approach for encouraging and incentivizing energy storage as part of New Jersey's EV charging ecosystem, FreeWire recommends that the definition of Make-Ready in the Straw Proposal is modified to expressly include expenses related to stand-alone or integrated battery-storage technologies that are specifically configured to accommodate EVSE.

III. CONCLUSION

When analyzing the feasibility of EV charging infrastructure to support MHDV, it is critical to consider available electrical capacity, expected utilization, operational costs, property limitations, and other site-specific factors to determine the most cost effective and deployable charging technology solution and configuration. FreeWire believes that its recommendations to the Straw Proposal will help to support a market that delivers the best fit charging solution that

⁸ Docket No. 17-12-03RE04, Response to Request for Program Design of the United Illuminating Company, PURA Investigation into Distribution System Planning of the Electric Distribution Companies – Zero Emissions Vehicles, dated July 31, 2020, at 24.

maximizes the electric miles enabled at the lowest overall cost while reflecting local needs and constraints of the electric grid.

Thank you for the opportunity to submit these comments. FreeWire looks forward to continuing its engagement in this proceeding as is available to answer any questions and provided additional information as requested.

/s/ Peter A. Olmsted

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