



VIA ELECTRONIC FILING

January 24, 2023

New Jersey Board of Public Utilities  
Carmen Diaz Acting Secretary of the Board  
44 South Clinton Ave., 1st Floor  
PO Box 350  
Trenton, NJ 08625-0350

**Nuvve Holding Corporation Comments  
Docket No. QO21060946  
In The Matter of Medium and Heavy Duty Electric Vehicle Charging Ecosystem**

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 grid 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.

The aggregation of thousands of parked EVs plugged into bidirectional chargers turns an EV fleet into a virtual power plant using Nuvve's GIVe platform. This allows Nuvve to provide EV drivers and fleet owners with additional value through earning grid services revenues similar to how customer-sited stationary storage systems operate today.

Using our proprietary vehicle-to-grid ("V2G") technology, Nuvve's GIVe platform produces real benefits to society by reducing the cost of electric infrastructure to support transportation electrification. In addition, V2G helps to reduce harmful emissions beyond those associated with switching from liquid fuels to electricity for transportation. V2G-enabled fleets can provide grid flexibility services needed to integrate variable sources of generation including solar. These benefits can be realized across all types of EVs including light-duty vehicles (both battery-only and plug-in hybrids) and medium-to heavy-duty ("MHD") vehicles, such as school buses and other short-haul fleets.

Nuvve appreciates the opportunity to submit the following comment to the New Jersey Board of Public Utilities ("BPU") on the staff's draft *Straw Proposal for the MHD Charging Ecosystem*.

**Introduction**

Nuvve commends the BPU staff for its draft *Straw Proposal for the MHD Charging Ecosystem* ("proposal"). Transportation electrification ("TE") is widely understood as essential to meeting a state's decarbonization goals. The proposal recognizes the important fact that, although MHD EVs are a relatively small fraction of the overall vehicle fleet, they are responsible for a disproportionate amount of total harmful emissions from the transportation sector. Furthermore, emissions from MHD vehicles tend to create harmful impacts disproportionately within disadvantaged communities.



Nuvve's comments below focus on two key topics: eligibility for make-ready funding and the importance of bidirectional infrastructure and V2G technology.

### **Expand Make-Ready Funding Eligibility**

Nuvve supports the proposal to have fleet charging depots located in or primarily operating in Overburdened Municipalities be eligible for make-ready funding. Limiting make-ready funding to certain groups, however, could result in failure to meet NJ's TE goals. The cost of make-ready infrastructure is typically one of the largest costs associated with installing EV charging facilities. Make-ready costs can therefore end up being a major barrier to charger installation and hamper EV adoption.

Nuvve recommends that the BPU approve expanding eligibility to all fleet charging depots regardless of location. Similar to what other jurisdictions have done, a tiered incentive program could be designed that provides a higher incentive to those private fleet depots specifically located in Overburdened Municipalities relative to those that are not located in these areas.

In New York State, ConEdison's POWERREADY Electric Vehicle Program provides a higher incentive for projects located in disadvantaged communities. Specifically, eligible applicants may receive an incentive for the installation of Level 2 or Level 3 direct current fast chargers ("DCFC") equal to 100% of the infrastructure costs. The program has incentive caps for program-eligible costs, including both customer and potential utility costs, for projects not located in disadvantaged communities.

### **The Importance of Bidirectional Charging Infrastructure & V2G Technology**

EVs can be viewed as not only providing transportation services but they can also be viewed as a significant grid resource. These "batteries on wheels" can provide many of the same services that stationary batteries can. NJ recognizes the important role that energy storage will play in meeting the state's clean energy goals with one of the nation's most ambitious energy storage mandates to achieve 2 GW of installed energy storage by 2030.<sup>1</sup> V2G can play an important role in meeting this aggressive energy storage target serving as a hedge against supply chain constraints and other factors that may impact the timing and scale of stationary storage deployments.

The anticipated fleet of EVs in the coming years will represent a significant grid resource. Governor Phil Murphy's stated goal of having 330,000 light-duty EVs registered in NJ by 2025 represents a sizable grid resource. Assuming 7 kW per EV charger and 50 kWh per vehicle, this 2025 target would have an aggregate power rating of 2.3 GW and a storage capacity of 16.5 GWh. Similarly, the MHD fleet as it electrifies will represent a significant grid resource. Each MHD EV will have much larger batteries than a light-duty EV and predictable use schedules, which is conducive to V2G operations.

---

<sup>1</sup> See New Jersey's Clean Energy Program, Energy Storage available at <https://www.njcleanenergy.com/storage>.



Electrification of the MHDV fleet with V2G creates unprecedented opportunities in the following areas:

- reduce the overall cost of ownership by unlocking the value that EV fleets provide as grid resources;
- extend the emissions benefits of transportation electrification to the electric sector by supporting the integration of variable sources of generation including wind and solar;
- displace the need for stationary storage resources and the associated raw materials needed for their manufacture;
- enhance grid flexibility by leveraging V2G as a grid resource during periods of extreme grid strain avoiding regional power outages; and
- providing resilience using MHD EV with V2G during grid outages meeting essential loads at critical facilities (e.g., first responders, hospitals, emergency shelters, etc.).

Managed charging or V1G plus V2G can provide valuable flexibility services to regional grids. An Electric Power Resources Institute (“EPRI”) study found that V2G can provide 2 – 3 times the value relative to V1G. EPRI estimates that V2G could generate \$1 billion in annual grid benefits to California ratepayers under an aggressive EV adoption scenario of 5 million EVs by 2030 with 50% of the vehicles being V2G-enabled.<sup>2</sup> Another study of light-duty bidirectional EVs in California estimated an annual V2G value of \$2,850 per vehicle as opposed to \$87 per year for managed charging only (V1G).<sup>3</sup>

Nuvve is currently focused on the school bus market. Electrified school bus fleets represent an excellent candidate for V2G given the large batteries and the long dwell times. School buses are often idle for months at a time during the summer when additional grid capacity is at a premium. The U.S. Environmental Protection Agency (“EPA”) acknowledges the potential of electrified school bus fleets to provide V2G services.<sup>4</sup> Furthermore, numerous utilities across the country are pursuing electric school bus V2G pilots.<sup>5</sup> This includes an early V2G school bus demonstration with ConEdison in collaboration with Nuvve and other partners. PSEG Long Island has an electric school bus V2G pilot project under development in collaboration with Suffolk Transportation Services using Nuvve’s bidirectional charging technology.<sup>6</sup>

Today V2G is based on DC bidirectional charger technology. Nuvve’s 60 kW and 125 kW bidirectional chargers are fully UL certified (UL 1741 SA) to meet IEEE 1547

---

<sup>2</sup> See Electric Power Research Institute R&D Quick Hits, Vehicle-to-Grid: \$1 Billion in Annual Grid Benefits? Available at <https://eprijournal.com/vehicle-to-grid-1-billion-in-annual-grid-benefits/>.

<sup>3</sup> See Tarraja and Hittenger. 2021. The value of consumer acceptance of controlled electric vehicle charging in a decarbonizing grid: The case of California in *Energy* available at <https://www.sciencedirect.com/science/article/pii/S0360544221009397>.

<sup>4</sup> See U.S. EPA, What if Electric School Buses Could be Used to Supply Power When Off Duty? Available at <https://www.epa.gov/greenvehicles/what-if-electric-school-buses-could-be-used-supply-power-when-duty>.

<sup>5</sup> See Word Resources Institute 3 Design Considerations for Electric School Bus Vehicle-to-Grid Programs, Map of Utility V2G Electric School Bus Pilot Programs available at <https://www.wri.org/insights/electric-school-bus-vehicle-grid-programs>.

<sup>6</sup> See PSEG Long Island Utility 2.0 Long Range Plan & Energy Efficiency and Demand Response Plan available at <https://www.lipower.org/wp-content/uploads/2021/07/2021-07-01-PSEG-Long-Island-Utility-2.0-2021-Annual-Update.pdf>.



interconnection standards and are commercially available today.<sup>7</sup> These devices have been approved for interconnection in several different jurisdictions. However, EV compatibility is not yet standardized and only a small number of proprietary V2G integrations with select original equipment manufacturers (“OEMs”) are available today. Nuvve’s V2G technology is integrated with Blue Bird’s electric school buses and is an option with Lion Electric’s commercial electric school bus offering. Nuvve continues to expand its list of OEM integrations.

Very few utilities offer compensation for grid exports from stationary energy storage and V2G. Most existing compensation mechanisms fall under the demand response (“DR”) umbrella. DR performance is based on load curtailment achieved relative to a baseline consumption level. DR programs do not provide an incentive to export power and thus leave additional capacity sitting idle once a customer’s load has been netted out to zero. Distribution utility make-ready configurations for EV charging infrastructure often require a separate service panel with a dedicated meter, dropped straight from the secondary distribution infrastructure. No other loads or resources are allowed on that new connection. We encourage the BPU to not put in place these limiting requirements.

We are beginning to see new DR programs and dynamic rates explicitly designed to accommodate V2G exports. For example, California’s Emergency Load Reduction Program (“ELRP”) explicitly accommodates exports including V2G. The program was revised for the 2022 season to include V2G charging and discharge to support the grid through an aggregator. Aggregations must be at least 25 kW and are guaranteed a minimum of 30 dispatches and no more than 60 during the ELRP season (May – October). ELRP participants are given advanced notice of an event with compensation for exports of \$2/kWh.<sup>8</sup> This is a best-effort program with no penalties for not responding to the DR events.

Massachusetts’ Connected Solutions DR program similarly provides compensation for grid exports. Devise-level export measurements are used to determine DR performance during an event. Resources are compensated at \$200/kW based on the average performance throughout the Connected Solutions season, which runs from June to September.<sup>9</sup> Connected Solutions is also a best-effort program with no penalties for not responding to the DR event. A non-response does impact a resource’s seasonal average performance reducing compensation.

New rate structures that explicitly provide compensation for exports are also starting to emerge. New York State offers compensation to resources that export power to the grid through the Value of Distributed Resources (“VDER”) tariff.<sup>10</sup> Pacific Gas & Electric

---

<sup>7</sup> See Nuvve DC 60 kW Heavy Duty Charging Station Specifications Sheet available at <https://nuvve.com/wp-content/uploads/2020/04/nuvve-dc-heavy-duty-spec-sheet-1.0.pdf> and Nuvve DC 125 kW Heavy Duty Charging Station Specifications Sheet available at [https://nuvve.com/wp-content/uploads/2022/01/nuvve-dcfc-125kw-rhombus-spec-sheet-jan2022\\_r2.pdf](https://nuvve.com/wp-content/uploads/2022/01/nuvve-dcfc-125kw-rhombus-spec-sheet-jan2022_r2.pdf).

<sup>8</sup> See California Public Utilities Commission Emergency Load Reduction Program website at <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/demand-response-dr/emergency-load-reduction-program>.

<sup>9</sup> See Mass. Saves Use your Battery Storage Device to Make the Grid More Sustainable available at <https://www.masssave.com/residential/rebates-and-incentives/connectedsolutions-batteries>.

<sup>10</sup> See New York State Energy Research and Development Authority VDER website at <https://www.nyserda.ny.gov/All-Programs/ny-sun/contractors/value-of-distributed-energy-resources>.



("PG&E") received final approval from the California Public Utility Commission for a new dynamic export rate pilot program that provides compensation for V2G exports.<sup>11</sup> PG&E will begin enrolling customers into the new rate in the third quarter of 2023.

## Conclusion

Again, Nuvve commends the BPU staff for producing a solid draft *Straw Proposal for the MHD Charging Ecosystem* emphasizing the need for a focused effort to support the electrification of the MHD segment. Expanding make-ready funding and providing technical support to fleets as they contemplate electrification are important steps. Nuvve encourages the BPU to not limit make-ready funding eligibility to disadvantaged communities but rather design a program that provides incentives to all private fleet depots. Higher incentive levels could be made available to private fleet depots located in or primarily operating in Overburdened Municipalities.

Bidirectional charging infrastructure allows EV fleets to become valuable grid assets. Nuvve encourages the BPU to provide enhanced funding for bidirectional infrastructure and require utilities to develop programs to encourage the interconnection of bidirectional chargers and compensation mechanisms for V2G exports.

The BPU staff proposal references the importance of minimizing the risk of ratepayers paying for stranded EV infrastructure. Without a focused effort, most charging infrastructure will be unidirectional thus eliminating the ability to capture the full value of EVs as grid resources. Energy storage and grid flexibility will become increasingly important as NJ implements its clean energy agenda.

Nuvve appreciates the opportunity to provide these comments to the BPU and looks forward to future collaboration on these critical issues.

/s/ Steve Letendre, PhD  
Vice President of Policy & Regulatory Affairs  
Nuvve Holding Corporation  
2488 Historic Decatur Road, Suite 200  
San Diego, CA  
92106  
[sletendre@nuvve.com](mailto:sletendre@nuvve.com)  
(802) 779-3480

January 24, 2023

---

<sup>11</sup> See Utility Dive PG&E launches vehicle-to-grid export rate for commercial electric fleets to help meet peak demand available at <https://www.utilitydive.com/news/pge-launches-dynamic-export-rate-for-commercial-electric-vehicle-fleets/635622/>.