June 5, 2023

Hon. Michelle L. Phillips
Secretary
New York Public Service Commission
3 Empire State Plaza
Albany, NY 12223-1350

RE: Case 23-E-0070: Proceeding on Motion of the Commission to Address Barriers to Medium- and Heavy-Duty Electric Vehicle Charging Infrastructure

Joint Comments of the Vehicle-Grid Integration Council (VGIC)
and New York Battery and Energy Storage Technology Consortium (NY-BEST)
on Medium- and Heavy-Duty Electric Vehicle Charging Infrastructure

Introduction

The Vehicle-Grid Integration Council (VGIC)[1] is a 501(c)(6) membership-based trade association committed to advancing the role of electric vehicles (EVs) and vehicle-grid integration (VGI) through policy development, education, outreach, and research. VGIC supports the transition to decarbonized transportation and electric sectors by ensuring the value from EV

[1] VGIC member companies and supporters include American Honda Motor Co., Inc., BorgWarner, bp pulse, Customized Energy Solutions, dcbel, Enel X North America, Inc., Enphase, Fermata Energy, FlexCharging, FLO EV Charging, Ford Motor Company, FreeWire Technologies, Inc., General Motors, GridWiz, Hoosier Energy, Innovation Core SEI, IoTecha, Kaluza, Kitu Systems, Ninedot Energy, Nissan Group of North America, Nuvve Holding Corporation, Peak Power, Qcells, Sacramento Municipal Utility District, Stellantis N.V., Sunrun, The Mobility House, Toyota Motor North America, Inc., Utilidata, Veloce Energy, Inc., Wallbox USA Inc., and WeaveGrid. The views expressed in these Comments are those of VGIC, and do not necessarily reflect the views of all individual VGIC member companies or supporters. (https://www.vgicouncil.org/)

deployments and flexible EV charging and discharging is recognized and compensated to achieve a more reliable, affordable, and efficient electric grid.

The New York Battery and Energy Storage Technology Consortium (NY-BEST) is a not-for-profit industry trade association with a mission to grow the energy storage industry in New York. We act as a voice of the energy storage industry for more than 180 member organizations on matters related to advanced batteries and energy storage technologies. NY-BEST has expanded its work into the transportation electrification space as we see the significant opportunity to integrate electric vehicles (EV) onto the grid through dynamic vehicle grid integration strategies. EVs will soon represent a large storage resource on New York's grid and, when connected to bi-directional chargers, can support the integration of wind and solar necessary to decarbonize the electricity sector and help meet the State's aggressive goals for GHG reductions. Our membership includes global corporations, start-ups, project developers, leading research institutions and universities, and numerous companies involved in the electricity and transportation sectors.[2]

VGIC and NY-BEST appreciate the opportunity to respond to the Commission's questions in the Order Instituting Proceeding and Soliciting Comments. Our comments will mainly address the Commission's questions 11 and 12, which are focused on VGI and energy storage issues, as well as discuss the intersection between VGI and the overarching themes of future-proofing and proactive planning.

NY-BEST and VGIC estimate that the electrification of transportation described in the New York Climate Action Council Scoping Plan will result in more than 600 GWh of energy storage capacity in New York State's vehicle population by 2050.[3] Without proper and proactive

[2] NY-BEST comments represent the interests of the organization as a whole and not the views of any one particular member. Our members have diverse interests and the organization's views are intended to be reflective of the energy storage industry collectively and to support the organization's goals to grow the energy storage industry in New York.

[3] Most of the scenarios analyzed have nearly full conversion of the vehicle fleet to electric. Using the CAC scoping plan input data of vehicle population of 9,519,878 light-duty and 176,774 medium- and heavy-duty vehicles and

utility planning processes, the EV market will face hurdles that will inhibit adoption of these technologies, and further, timely achievement of the State's Climate Leadership and Community Protection Act goals. The potential impacts are even more severe for medium- and heavy-duty (MHD) EVs due to the normally increased size of the individual load and the potential concentration of charging infrastructure to efficiently serve fleets and long-haul transport. Proper planning and managed charging will manage load to mitigate stress on the grid, make the most of limited grid capacity, and avoid or defer the need for significant transmission and distribution system upgrades and infrastructure investments with less impact to ratepayers than scenarios without managed charging. The benefits of managed charging for New York have been modeled and documented in several recent studies.[4]

The immense storage capacity onboard the batteries powering these vehicles presents an opportunity to provide critical grid functions to support a decarbonized electricity system. The flexibility of these resources, through managed charging, automated load management (ALM), and bidirectional charging can be leveraged to reduce renewable curtailment, provide power when renewable generation is insufficient, address the challenges being raised in the new Commission Order initiating a process regarding zero emissions target,[5] and provide many other grid services. Furthermore, incorporating stationary energy storage in combination with these assets provides additional optimization and efficiency benefits. A cost-effective transition to renewable energy requires that the energy storage capacity of fleet vehicles, along with stationary storage, are effectively integrated into the electricity system. This integration will contain costs by optimizing grid investments and providing critical grid services as well as—

assuming a battery size of 75kWh and 150kWh, respectively, results in a storage capacity of 741 GWh for full electrification.

[4] See NYSERDA. *Transportation Electrification Distribution System Impact Study.* 2022. https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Research/Transportation/22-13-Transportation-Electricification-Distribution-System-Impact-Study.pdf.
See also Synapse. *Distribution System Investments to Enable Medium- and Heavy-Duty Vehicle Electrification: A Case Study of New York.* 2023. https://www.synapse-energy.com/sites/default/files/Synapse%20MHDV%20Integration%20Costs%20Final%20Report.pdf

[55] See Case 15-E-0302.

particularly important for MHD fleets—providing additional value streams to enable the conversion to electrification and, in turn, accelerate the transition to electrified transportation.

Question 11: Discuss how battery energy storage systems and other DERs can be implemented in both short-term and long-term planning for EV charging needs across vehicle classes. Is VGI technology at a sufficient level of maturity to impact short-term planning considerations? If so, describe how; if not, describe why not.

a. Automated Load Management

Automated Load Management (ALM), also known as EV Energy Management Systems (EMS), refers to the use of behind-the-meter software (e.g., power sharing) or hardware (e.g., integrated or co-located battery storage) approaches to limit EV charging demand at the service connection to a predetermined level below the aggregated charging capacity of the EV Supply Equipment (EVSE). For example, a charging site with five 150 kW DCFCs can use ALM to limit its peak demand to 600 kW, compared to a peak demand of 750 kW without ALM. This can help avoid or defer the need to upgrade certain customer-side and utility-side make-ready infrastructure to accommodate the new charging load. The reduced need for infrastructure upgrades can generate savings for the customer installing EVSE and ratepayers at large and can accelerate the energization timeline for that site due to the lower overall engineering and construction needs. The potential cost and time savings from ALM can be considerable given the significant infrastructure needs of MHD EVs. Additionally, ALM can be used to overcome physical space constraints in locations where it is difficult to upgrade electrical equipment, also helping to accelerate installation and energization timelines. As examples of potential cost savings, Pacific Gas & Electric has worked with EV service providers to implement EV EMS solutions at multi-unit dwellings and workplace host sites as of Q4 2020 and saved between $30,000 and $200,000 per project.[6] Southern California Edison also implemented EV EMS to

[6] Pacific Gas & Electric. Presentation at CPUC ALM/EV EMS Workshop, Panel 2. 2021.

deploy 168 charging stations at $3,000 per port, significantly less than comparable deployments at $10,000-$15,000 per port without EV EMS.[7]

As one ALM approach, energy storage resources can be deployed with EVSE to provide numerous benefits. As discussed above, energy storage, either co-located at the site or integrated into EVSE, can reduce the peak load of the site, which both reduces the need for infrastructure investment and opens more sites to be available for EVSE installations. Further, energy storage can reduce operating cost and grid stress, particularly for lower-utilization sites or sites with high co-incident usage, by shifting load timing and reducing ramp rates. Co-located storage can also enhance reliability by providing emergency backup power for critical charging needs, by providing routine grid support services, and by creating additional revenue streams to accelerate the adoption of electrification.

ALM technologies, including those that incorporate energy storage, are mature and already being deployed today and therefore should be considered in all near-term activities related to MHD electrification. The Make-Ready Program Midpoint Review Staff Whitepaper in Docket 18-E-0138 recognized the benefits of ALM and proposed to extend make-ready incentives to these technologies.[8] Staff's recommendation was widely supported by stakeholders, including VGIC.[9] The Commission also recently directed the Joint Utilities to propose additional incentives for ALM technologies in Docket 22-E-0236. Given the significant infrastructure needs of MHD EVs, it would be a rational step to also provide ALM incentives to MHD charging sites.

Any analysis or evaluation of future infrastructure needs for EVs should include an assessment of opportunities for ALM. While we support proactive planning and investment in grid infrastructure to achieve the pace and scale of charging infrastructure deployment needed to achieve NY's transportation electrification goals, it is critical that ALM be rigorously evaluated relative to traditional infrastructure investments to minimize ratepayer impacts. Utilities should

[7] EPIC Policy + Innovation Coordination Group. *Transportation Electrification Workstream Report*. 2021. https://epicpartnership.org/resources/Transportation_Electrification_Workstream_Report_Final.pdf.
[8] Staff refers to the same suite of technologies as "cost-reducing advanced technologies."
[9] See VGIC's reply comments, pg. 2. Docket 18-E-0138.

engage in a transparent process to demonstrate that proactive investments are prudent and abide by least-cost planning principles.

b. Vehicle-to-everything (V2X)

Bidirectional charging use cases can leverage EVs' latent battery capacity to provide backup power to customers, manage customer bills, and support the grid through vehicle-to-grid (V2G) exports. Revenues from V2G exports may even be more important for some MHD EVs than light-duty EVs, helping offset the relatively higher upfront costs of MHD electric vehicles and associated charging infrastructure and improving the financial viability of electrification projects. Bidirectional vehicles and EVSE are commercially available for the MHD sector,[10] and several V2G projects currently participate in and receive compensation from utility programs around the country, such as Massachusetts' ConnectedSolutions Daily Dispatch program and California's Emergency Load Reduction Program.[11] The Make-Ready Program Midpoint Review Staff Whitepaper also recently recommended that the Joint Utilities update their VDER tariffs to specify eligibility for V2X applications.

At a minimum, bidirectional charging equipment should be eligible for the same BTM make-ready and charger rebates as unidirectional equipment. However, given the immense

[10] See, for example: Nuvve Corporation. *Blue Bird Delivers North America's First-Ever Commercial Application of Vehicle-to-Grid Technology in Electric School Bus Partnership with Nuvve and Illinois School Districts*. March 23, 2021. https://nuvve.com/blue-bird-v2g-electric-bus-with-nuvve-and-illinois-school-districts/; Thomas Built Buses / Daimler Trucks North America LLC (2021). *The Safe-T-Liner C2 Jouley Electric School Bus*. https://thomasbuiltbuses.com/school-buses/saf-t-liner-c2-jouley; Lion Electric. *Lion Electric Announces Successful Electric School Bus Vehicle-to-Grid Deployment with Con Edison in New York*. December 14, 2020. https://thelionelectric.com/img/medias/LION_Press_Release_White%20Plains%20EN%20FINAL.pdf; Nuvve Corporation (2020). *Nuvve DC Heavy Duty Charging Station Specifications Sheet*. https://nuvve.com/wpcontent/uploads/2020/04/nuvve-dc-heavy-duty-spec-sheet-1.0.pdf; Fermata Energy. *Proven Results and Cost Savings with V2G Technology*. October 14, 2020. https://www.fermataenergy.com/news-press/proven-results-andcost-savings-with-v2g-technology; Rhombus Energy Solutions. *V2G Charging, Control, and Management 50- 500kW: Bidirectional*. https://rhombusenergysolutions.com/products.

[11] See, for example, *SDG&E Unveils Region's First V2G Project* https://www.sdgenews.com/article/sdge-unveils-regions-first-v2g-project ; *Highland Electric Fleets Coordinates Electric School Buses' Summer Job – Supporting Local Grid with Vehicle-to-Grid Technology* https://www.prnewswire.com/news-releases/highland-electric-fleets-coordinates-electric-school-buses-summer-job--supporting-local-grid-with-vehicle-to-grid-technology-301611928.html

potential of V2X to support customer needs, bolster grid reliability, and lower system costs – and the higher cost of V2X-capable equipment relative to unidirectional-only equipment – VGIC and NY-BEST believe it is reasonable to offer an incremental rebate to V2X customers to partially offset the higher upfront costs of purchasing and interconnecting V2X EVSE and the associated equipment. Based on our discussions with industry participants, there is an approximately 30% cost premium for a bidirectional DCFC compared to a unidirectional DCFC. VGIC and NY-BEST believe an incremental V2X rebate is critical to spurring the nascent bidirectional charging market in New York. We offer ourselves as a resource and hope to collaborate closely with stakeholders to determine the appropriate incentive level for bidirectional charging equipment.

In addition, while V2X solutions have demonstrated clear benefits to both customers and the grid, the technology is new and unfamiliar to most customers. To overcome this gap, VGIC and NY-BEST recommend that the utilities' marketing, education, and outreach and technical assistance teams work to educate customers on the benefits of V2X use cases, capable chargers, vehicles and associated equipment, appropriate interconnection pathways, applicable rates and programs, and any technical considerations, including opportunities to co-locate and integrate other types of distributed energy resources. Given the potential complexity of interconnecting large V2X sites, the utilities' technical assistance teams should – in a technology-neutral manner – actively support individual customers and fleets through the design and interconnection process and ensure a streamlined customer experience.

The Make-Ready Program Midpoint Review Staff Whitepaper also recommended addressing interconnection and other barriers to VGI through a stakeholder process. As discussed in VGIC's reply comments in that proceeding, interconnection issues should be addressed by the Interconnection Technical Working Group for both the light-duty and MHD sectors. However, the Commission should adopt a UL 1741 SB waiver for V2G DC EVSE. As discussed in VGIC and NY-BEST's recent comments in Docket 18-E-0138, the Joint Utilities began requiring interconnecting DERs to be certified to UL 1741 SB on January 1, 2023. Since there is limited availability of V2G-capable DC EVSE currently on the market, this requirement effectively

freezes the deployment of V2G-capable DC EVSE until SB-certified DC EVSE are more widely available. The new V2G Equipment List recently launched by the California Energy Commission serves as a common public database of UL-certified V2G-capable DC EVSE, and currently lists three chargers, none of which are certified to UL 1741 SB.[12] In order to ensure V2G DC EVSE continues to be deployed in the near term, VGIC recommends that the Commission consider a temporary exemption for V2G DC EVSE from the UL 1741 SB requirement. This would provide critical support to V2G DC EVSE deployment efforts in New York and would align well with recent developments in other leading V2G efforts. For example, in recognition that availability of UL 1741 SB-certified inverters is extremely limited, the California Public Utilities Commission (CPUC) recently pushed back the implementation of UL 1741 SB to August 29, 2023.

Question 12: How can managed charging programs reduce upfront infrastructure needs?

Unlike the ALM approaches discussed above, managed charging programs do not directly reduce the upfront infrastructure needs of EV charging equipment itself, but instead help mitigate grid system upgrades and the ongoing costs and impacts of EV charging on the grid. Managed charging programs can encourage EV owners to shift their charging load to off-peak periods and/or limit charging load during periods with high grid stress, thereby avoiding high energy costs during peak periods as well as reducing the need to build out distribution and transmission infrastructure to accommodate higher peak loads. When incentivized to take such actions, MHD EVs can have outsized impacts due to their large battery capacity and potential for coordinated response as part of fleets. From the fleet owner's perspective, managed charging also provides an opportunity to lower charging costs, making the economics of electrification more favorable.

[12] California Energy Commission. V2G Equipment List. https://v2gel.energy.ca.gov/Home/ProcessView

However, managed charging programs can indirectly help reduce upfront costs by encouraging the adoption and use of the ALM approaches discussed above. ALM technologies can both help limit upfront infrastructure costs and allow EV charging sites to participate in managed charging. For example, co-located or integrated battery storage can limit site utility service demand to avoid or reduce upfront infrastructure upgrades and also enable load shifting by charging during off-peak periods and serving EV charging load during on-peak periods. Similarly, power-sharing software and other EV charge management solutions can maintain EV charging peak demand set-points as well as optimize ongoing energy costs with automated actions. Managed charging and ALM incentives should consider the various benefits that these technologies can deliver to customers and the grid at large.

The Commission recognized the benefits of managed charging for MHD EVs when it directed the Joint Utilities to file Commercial Managed Charging Programs in Docket 22-E-0236. VGIC and NY-BEST look forward to engaging in that docket on the specific designs of the proposed programs. Additionally, as discussed in VGIC's reply comments in Docket 18-E-0138, the Commission should direct the VGI Working Group to, among other tasks, explore steps to incorporate managed charging and VGI into the Joint Utilities' demand response programs.

Conclusion

VGIC and NY-BEST appreciate the opportunity to provide these comments and look forward to working with the Commission, the joint utilities, and other stakeholders to ensure the success of New York's transportation electrification efforts.

Respectfully submitted,

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