



Via Electronic Submission

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**Comments of Fermata Energy
on the MPSC Staff's April 1, 2024 V2G and ESS Tariff Discussion**

Introduction

Fermata Energy appreciates the opportunity to provide comments to the Michigan Public Service Commission (the "Commission") based on the presentations and discussion that took place during the Commission staff workgroup session held on April 1, 2024 to explore alternative vehicle-to-grid ("V2G") and energy storage system ("ESS") export compensation approaches.

Founded in 2010, Fermata Energy is a leading Vehicle-to-Everything ("V2X") bidirectional charging services provider. Fermata Energy designs, supplies, and operates the technologies required to integrate electric vehicles ("EVs") into homes, buildings, and the electric grid. Fermata Energy's V2X platform incorporates CHAdeMO and CCS connectors in a bidirectional charger and management software platform that connects the EV and electricity user to the grid. Fermata Energy's V2X platform extends the value of an EV and allows the vehicle to act as a dispatchable energy storage resource when the vehicle is not in use.

Fermata Energy's customers today are earning thousands of dollars per EV and EVSE pair through Vehicle-to-Grid ("V2G") and Vehicle-to-Building ("V2B") programs nationwide. The company's bidirectional EV charging system is the first to be certified By UL Solutions in North America to UL 9741, the Standard for Bidirectional EV Charging System Equipment and is the first to earn approval in the U.S. from a major OEM for battery warranty.

In addition to developing the hardware and software required to perform V2X activities, Fermata Energy has spent over 10 years studying how V2X can unlock additional value streams from EVs, including those that are commercially viable today without regulatory intervention and how to best monetize these value streams. Fermata Energy has extensive experience with

analyzing use cases, monetization mechanisms, and business models to maximize the benefits of V2X technologies. Vehicle Grid integration (“VGI”) encompasses both V1G (smart and managed charging solutions) and V2X (bidirectional power transfer to the grid, building, home, microgrid, or any other external load source). While V1G enables EVs to participate in off-peak charging programs and provide automated load management, V2X unlocks additional value streams and benefits for ratepayers and the grid by enabling the discharge of power stored onboard an EV. V2X unlocks the value of EVs to provide all of the services that that V1G does, in addition to backup power/resilience, demand charge management, demand response, system-wide peak shaving, and ancillary services, among others.

The interest in V2X commercialization is widespread and accelerating. In addition to the launch of the Ford Lightning (EV F150 pickup truck) V2H (“vehicle-to-home”) offering, 2023 saw several EV manufacturers announce plans to make their EVs bidirectional including full vehicle-to-grid capabilities.¹ Furthermore, several electric vehicle supply equipment (“EVSE”) manufacturers announced plans to bring bidirectional chargers to market, expanding the limited number of bidirectional chargers that are available today.²

The Benefits of Bidirectional Charging and V2X

According to the Smart Electric Power Alliance, a non-profit organization focused on smart grid topics, the 2.1 million EVs currently in circulation in the U.S. have approximately 126 gigawatt-hours of battery storage or five times more than the current grid-connected battery storage.³ Bloomberg New Energy Finance (“BNEF”) projects that 90 percent of all lithium-ion batteries manufactured through 2045 will be in EVs.⁴ The stationary storage segment will remain a small fraction of the total available energy storage capacity relative to that of the nation’s EVs.

Michigan has an historic opportunity to incorporate bidirectional charging as a core component of the transportation electrification and grid modernization efforts by assuring a level of V2X export compensation that attracts significant investment in bidirectional charging. The benefits to state residents would be significant and include the following:

¹ See Automotive News, GM to offer bidirectional charging on all EVs by 2026 available at <https://www.autonews.com/mobility-report/gm-evs-have-bidirectional-charging-technology-2026> and CleanTechnica, Tesla Plans To Adopt Bi-Directional Charging By 2025 available at <https://cleantechnica.com/2023/08/19/tesla-plans-to-adopt-bi-directional-charging-by-2025/>.

² See electrek, Wallbox and Kia team up to try and bring bidirectional charging capabilities to EV9 owners available at <https://electrek.co/2023/08/25/wallbox-kia-bidirectional-charging-capabilities-ev9-owners-home/> and

³ See Smart Electric Power Alliance, The State of Bidirectional Charging in 2023 available at <https://sepapower.org/resource/the-state-of-bidirectional-charging-in-2023/>.

⁴ See Bloomberg Law, Electric Vehicles to Drive Massive Battery Demand: BNEF Chart available at <https://news.bloomberglaw.com/environment-and-energy/electric-vehicles-to-drive-massive-battery-demand-bnef-chart>.

Support Achievement of Climate Goals

Just like stationary storage, V2X bidirectional charging platforms can reduce carbon and criteria pollutant emissions from generators by shifting electricity consumption to the cleanest hours of the day and removing the need for dirty thermal peaker plants to generate electricity. Batteries can absorb excess renewable generation, reducing the curtailment of wind and solar and then releasing that energy back to Michigan homes and businesses when needed. V2X, however, is more cost-effective than stationary storage, as ratepayers don't have to pay for the purchase of the EV battery and can accelerate the transition to renewable energy given the ability to deploy V2X quickly and at scale.

Provides Valuable Grid Services

With V2X bidirectional charging, utilities gain a large new flexibility resource that can provide the same grid services that stationary energy storage projects provide today. V2X can play an important role in addressing the intermittent production of solar and wind power generation. Furthermore, V2X can be a valuable demand response ("DR") resource providing peak shaving services during periods of grid stress.

EVs in other states have already proven to be valuable resources participating in electric distribution company's ("EDC's") DR programs. For example, in Massachusetts the EDCs' ConnectedSolutions DR programs have enabled V2X projects to generate revenues for EV owners. Highland Electric Fleet's Beverly Public School fleet electrification project demonstrates the viability of electric school buses as bidirectional V2G resources, receiving revenue via National Grid's ConnectedSolutions program and providing a template to scale the service at additional deployment sites.⁵ BlueHub Capital and Fermata Energy recently launched the first V2G pilot program in the nation for multi-family affordable housing. The pilot is designed to increase affordable access to EVs for low-income drivers through an innovative V2G car lease program that is partially financed by earning Eversource ConnectedSolutions revenue.⁶

⁵ See CISION PR Newswire, Highland Electric Fleets Coordinates Electric School Buses' Summer Job - Supporting Local Grid with Vehicle-to-Grid Technology available at <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>.

⁶ See Enterprise Mobility, First-in-Nation Pilot to Provide Low-Income Driver with Affordable Access to EV Launched in Boston by BlueHub Energy, Fermata Energy, Enterprise Holdings & Codman Square Neighborhood Development Corp. available at <https://www.enterprisemobility.com/news-stories/news-stories-archive/2023/09/pilot-for-affordable-access-to-evs--launched-in-boston.html>.

Lower Vehicle Ownership Costs

EV owners can earn money by selling electricity back to the grid earning revenue, significantly cutting the cost of vehicle ownership. Offsetting the cost of owning and maintaining an EV through the revenue earned from bidirectional charging can accelerate EV adoption. The BlueHub Capital and Fermata Energy pilot referenced above uses the revenue from Eversource's ConnectedSolutions program to reduce the monthly EV lease payment for a low-income household. Bidirectional charging and V2G can provide equitable EV access to low-income households using this innovative approach, a segment that has not seen significant EV adoption given the EV cost barrier.

Increase Community and Household Resiliency

Unidirectional charging is a grid load. V2X bidirectional charging cost-effectively supports grid resilience. During blackouts, EV owners with bidirectional chargers can power their homes, businesses, and critical infrastructure. The energy in an EV can power a typical home for three or more days. Using EVs as a source of backup power for homes or within a larger microgrid also avoids emissions from gasoline- or diesel-based generators.

Ratepayers Savings

EV adoption has already been shown to significantly benefit utility ratepayers as more revenue is generated from the sale of electricity for EV charging.⁷ Several studies have demonstrated that bidirectional charging and V2G offers significant benefits beyond smart charging or V1G.⁸ A 2018 Electric Power Research Institute study projects \$1 billion in annual ratepayer benefits in California if 50 percent of chargers were bidirectional with V2G technology.⁹ While no similar study has been done yet for Minnesota, the potential for significant ratepayer benefits from bidirectional charging exists and should be explored.

⁷ See Synapse Energy Economics, Electric Vehicles Are Driving Electric Rates Down available at https://www.nrdc.org/sites/default/files/media-uploads/evs_are_driving_rates_down_dec_2022_update_0.pdf.

⁸ For example, Tarroja and Hittenger (2021) estimate that the value of smart charging only reaches \$87 per vehicle-year while that for vehicle-to-grid can reach \$2,850 per vehicle-year in California, see Energy, The value of consumer acceptance of controlled electric vehicle charging in a decarbonizing grid: The case of California available at <https://www.sciencedirect.com/science/article/pii/S0360544221009397>.

⁹ See The Electric Power Research Institute, Vehicle-to-Grid: \$1 Billion in Annual Grid Benefits? Available at <https://eprijournal.com/vehicle-to-grid-1-billion-in-annual-grid-benefits/#:~:text=V2G%20technology%20can%20provide%20%241,peak%20shaving%20and%20ramping%20support>.

Comments

Three different approaches were presented during the April 1, 2024 V2G and ESS tariff discussion. DTE presented the concept of the Distributed Generation Outflow Rate recommending the use of wholesale energy market locational marginal prices (“LMPs”) for export compensation. Alternatively, 5 Lakes Energy presented a rationale for why the full retail rate for energy should be used as a basis for V2G and ESS export compensation. Finally, MPSC staff shared the view that the existing approach used to determine compensation levels for demand response resources should be applied to V2G and ESS exports.

Rather than debate the merits of these alternative approaches to determine the appropriate level of compensation for V2G and ESS exports, Fermata Energy would like to offer an alternative approach specifically for V2G resources. The approach is based on providing a level of compensation that is necessary to attract investments in bidirectional charging. Economists often refer to the “missing money” challenge, whereby the existing market value for a new technology is not sufficient to attract investment into the space.

There are many reasons that a “missing money” gap can exist including the nascent nature of the technology and the lack of scale needed to drive down costs. In addition, new technologies such as bidirectional charging bring significant positive economic externalities that are not reflected in current market values.

This alternative approach to V2G resources compensation raises an important and often overlooked point about the positive economic externalities that emerging technologies often embody. These externalities include reduced greenhouse gas emissions, stabilization of the grid by providing energy during peak demand, and even the potential for lowering electricity costs for all users if implemented on a large scale. Yet, these benefits are not easily quantified in the short-term market prices, leading to the “missing money” issue. This issue discourages investment as the financial returns do not immediately reflect the societal benefits generated.

To address this gap, it may be beneficial to consider a compensation model that incorporates these externalities explicitly. Such a model could involve a combination of market-based rates and additional incentives that acknowledge the long-term environmental and grid benefits of V2G. This could take the form of higher rates of compensation for the energy provided back to the grid during critical times. Higher compensation could be justified based on what other load management programs are provided. Allowing V2G to qualify for existing incentives for transportation electrification and DERs could also help address the “missing money” problem. By directly addressing the financial viability of V2G technologies, these measures could spur broader adoption and investment in this field.

The “missing money” issue has been recognized in other jurisdictions with appropriate accommodations to promote investments in critical new technologies. For example, New York State recently increased its energy storage target from 3 GW by 2030 to 6 GW and explicitly

acknowledged an existing “missing money” challenge for energy storage in the state.¹⁰ New York’s 6 GW Energy Storage Roadmap states:

“The 2018 Roadmap identified cost as a significant barrier to storage deployment. Since then, the cost challenge has been exacerbated by supply chain and materials costs. While the ITC now available under the IRA provides significant support to storage projects, it is insufficient on its own to overcome the remaining cost gap. Furthermore, current wholesale market revenue is insufficient to support energy storage deployment. Ultimately, the gap is expected to be addressed by higher market revenues for storage in a future zero-carbon grid; in the meantime, however, alternate sources of financial support are required to incentivize deployment of energy storage. Current wholesale market revenue inadequacy is a combination of opportunities and markets not yet developed, market pricing not fully representative of system needs, and the fact that market prices are based on current system conditions. Much of the value energy storage will provide will be in high-renewable and tighter supply-demand conditions expected in the future.”¹¹

New York directly addressed the “missing money” gap for energy storage through developing incentive programs for retail and wholesale energy storage segments.¹²

Engaging in pilot programs that allow for real-time data collection and analysis could provide the empirical evidence needed to adjust tariffs and compensation mechanisms effectively. These programs would help in understanding the actual impact of V2G technologies on the grid and in assessing their economic benefits in real-world conditions. This data could then inform more precise and equitable compensation schemes that better reflect the value of the contributions these technologies make to the grid and the environment.

Finally, there needs to be an ongoing dialogue among stakeholders—including utility companies, technology providers, regulators, and consumer representatives—to ensure that the compensation mechanisms evolve with the technology and the market. Regularly scheduled reviews of the compensation rates, supported by transparent methodologies and clear metrics, would help maintain fairness and encourage continued investment in bidirectional charging

¹⁰ See New York State Department of Public Service and the New York State Energy Research and Development Authority New York’s 6 GW Energy Storage Roadmap: Policy Options for Continued Growth in Energy Storage CASE 18-E-0130 In the Matter of Energy Storage Deployment Program available at <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Energy-Storage/ny-6-gw-energy-storage-roadmap.pdf>.

¹¹ Ibid., page 31

¹² Ibid.



infrastructure. This collaborative approach would not only bridge the "missing money" gap but also propel the energy sector towards more sustainable and efficient practices.

Conclusions

Bidirectional charging should be central to the build-out of EV charging infrastructure in Michigan given its potential to provide a vast flexibility resource for the grid and ratepayer benefits. The technology has already been demonstrated in other jurisdictions to create value for ratepayers providing valuable grid services. Significant resources will be invested in EV charging infrastructure in Michigan in the next decade. Now is the time to ensure that this investment moves beyond the one-way charging and that Michigan stakeholders embrace the huge potential that bidirectional charging can bring to Michigan ratepayers.

Fermata Energy appreciates the opportunity to share comments with the Commission. Please contact me directly if you have any questions or need additional information on bidirectional charging and V2X technology.

Sincerely,
/s/ Steve Letendre, PhD
Senior Director of Regulatory Affairs
Fermata Energy

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