



**BEFORE THE STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION**

IR 22-076

ELECTRIC DISTRIBUTION UTILITIES

**Investigation of Whether Current Tariffs and Programs are Sufficient to Support Demand
Response and Electric Vehicle Charging Programs**

Fermata Energy Initial Comments

I. Introduction

Fermata Energy is the nation's leading provider of commercially proven vehicle-to-everything (V2X) technology that enables vehicle-to-grid (V2G), vehicle-to-building (V2B), and vehicle-to-load (V2L) services, which we are operating at customer sites across the United States. We design, supply, and operate technology that integrates EVs with buildings and the electricity grid, turning EVs into valuable storage assets that combat climate change, increase energy resilience, and reduce energy costs. We provide a complete V2X solution which includes charger options, a cloud-based software platform, system design, and a network of strategic partnerships to leverage electric vehicles (EVs) as a new and widespread type of mobile energy storage solution. As an equipment manufacturer and service provider, Fermata Energy is one of very few technology companies actively working to advance commercial implementation of V2G technology. Our V2X technology benefits our users, transforming EV charging from a cost center to a revenue-generating, grid-supporting asset. Drawing from our experience as a hardware and software provider with multiple V2X projects across the country with utility and commercial partners, we offer the following recommendation to maximize benefits for ratepayers.

II. Recommendations

Fermata Energy appreciates the New Hampshire Public Utilities Commission opening this investigative docket to evaluate whether current tariffs and programs are sufficient to support

demand response and electric vehicle charging programs. There are a number of areas where the PUC can significantly accelerate progress for Vehicle Grid Integration (VGI) throughout the state, while also supporting expanded access to clean transportation for equity communities. Those areas include Make Ready programs, demand response programs, and EV/Distributed Energy Resource (DER) rates. Fermata Energy offers the following specific recommendations to the NH PUC:

- **Offer utility Make Ready programs that support all EV charging options and expand utility Make Ready Programs throughout the state**
- **Consider V2X in demand response program design**
- **Investigate innovative incentive programs and rates, such as those that incorporate market-based pricing**

A. Offer Make Ready That Supports All EV Charging Options

Make Ready is needed to help New Hampshire adopt EV technology, including V2G technology. Make Ready accelerates transportation electrification by helping drivers and fleet owners offset the cost of EVSE infrastructure. Most utility make ready programs were designed for V1G/unidirectional charging, and so V2G technology is often ineligible for these incentives. The NH PUC and utilities have an opportunity to correct the misaligned design of Make Ready programs to enable V2G technology to qualify (e.g., lack of technology neutrality, not addressing the status of the different types of V2X, and or confusing V2X with the needs of unidirectional chargers).

So that NH can design a Make Ready program that enables NH residents to access the greatest benefits of Make Ready investments, we offer the following specific recommendations for reforming existing programs or the design of new programs. The following recommendations for NH design of a Make Ready program draw upon our observations and experience in helping customers apply for Make Ready in other markets.

- **Allow Behind the Meter EVSE installations on the same service drop to qualify for Customer-side Make Ready programs:** Some forms of V2X, such as V2B, which can provide critical services such as backup power/resiliency, do not qualify for Make Ready

funding. Many utility Make Ready infrastructure programs fund front-of-the-meter equipment, requiring chargers to use a separate service drop and to be individually metered on an EV rate. Because V2B systems are designed to power buildings during outage events and to provide customer bill management, they require a direct connection to a building's electrical panel and are considered behind-the-meter. As a result, they do not qualify for many Make Ready programs. While the site preparation/installation costs for a bidirectional charger are comparable to that of V1G EVSE, without access to make-ready funding, bidirectional EVSE are at a major disadvantage. A solution to this problem could be to let V2X qualify for Make Ready programs even when installed behind the meter and on the customers' existing electrical service. We strongly believe that certain V2B use cases, such as demand charge management, demand response, and backup power, must be eligible for Make Ready programs. If funding is not made available to V2B use cases, it will create a significant market barrier for the growth and adoption of V2B technologies that can provide cost effective solutions to outages, peak reduction, and the transition to renewable energy in New Hampshire.

- **Include CHAdeMO as an eligible connector type:** We recommend including CHAdeMO Make Ready, because the CCS integrations for V2G are still in development. Whereas CHAdeMO is a third-party verified standard that includes V2G, the CCS standard is self-certifying such that every charger and automaker has a different interpretation of it. CHAdeMO V2G is available today but CCS V2G is still in development.
- **Allow low power DC chargers (<50kW) to qualify for Make Ready**
- **Make Ready increase for V2G until UL1741-SB V2G chargers are developed:** UL1741-SB is a performance standard required by ISO-NE as of October 1, 2023 and it will significantly increase installation and interconnection costs for V2G customers.

B. Consider V2X in Demand Response Program Design

To support the state's transportation electrification goals and accelerate VGI, the NH PUC should ensure that V2G technology can participate in demand response programs. Allowing V2G technology to access demand response revenue helps lower the total cost of ownership of

EVs, making them more affordable for average EV owners. To ensure that V2G can access demand response revenue streams, program designs should take into consideration the following:

- a. Technology Neutrality: Stationary storage and V2X should be eligible
- b. Agnostic battery programs: Battery programs should be agnostic as to whether the battery is stationary or mobile
- c. Dual participation and value stacking: EV owners can provide everyday value by responding to time-of-use pricing and capacity by discharging batteries for demand response during critical periods for the grid. Coordinate signals for coincident peaks so that customers are not excluded from DR if they are part of an everyday TOU rate.
- d. Pay for performance: Fermata Energy recommends that V2X programs and incentives for homes and commercial sites be weighted towards performance-based incentives, lowering the risk of non-performance. Well designed, performance-based programs can directly support V2B and V2G activity by incentivizing EVs to charge and discharge similarly to stationary systems, particularly when linked to market and carbon signals. These performance-based incentives can be structured with upfront rebates for equity groups. If there are concerns about the performance of bidirectional EVSE, performance-based incentives can validate to what extent V2G can deliver the same benefits as stationary storage. With a performance-based incentive, no penalties are needed for under or non-participation. For example, Connected Solutions, a pay for performance, distribution-level demand response program offered by Eversource, Unitil, UIL, Rhode Island Energy, and National Grid in MA and CT, offers \$200/kW to \$400/kW to small batteries such as those that can be leveraged by V2X for grid services. Connected Solutions is also technology neutral and penalty free.¹ While Eversource NH does offer a residential version of this program, we recommend expanding Connected Solutions to business and commercial customers throughout the state, and modeling it on the programs and participation options (e.g. Daily Dispatch option for commercial and industrial customers) offered in other northeastern markets.²

¹ [Program Materials for Connected Solutions for Commercial / Industrial Customers, 2021](#)

² For an example of the Connected Solutions Daily Dispatch option, which offers a performance-based, penalty-free, and technology neutral \$300/kW incentive, please see : <https://www.rienergy.com/RI-Business/Energy-Saving-Programs/ConnectedSolutions>

- e. Greater compensation for V2G than V1G: Bidirectional EVs can export power to the grid, in addition to reducing charging load via managed charging, and should be compensated for the additional benefits to the grid of doing so. We recommend making a clear distinction between V2G and V1G services. V2G provides greater grid benefits than just V1G, so compensation for both curtailed/managed charging in addition to actual exports to the grid should be considered.
- f. Upfront rebates for LMI customers: adding equity elements to compensation is key to ensuring that benefits don't accrue solely to affluent EV owners

C. Investigate innovative incentive programs and rates

To incentivize mobile batteries and maximize V2X bidirectional charging value, utilities should offer EV rate designs that incorporate market-based pricing. Utilities, ISO/RTOs, and regulators have made considerable progress in designing temporal rates. However, utilities should expand upon existing temporal rates, such as EV TOU rates, by working with regulators and ISO/RTOs to design pricing signals that incentivize EVs to provide battery services in specific locations based on time of day, week, and season. These temporal rate designs would leverage a major benefit of V2X bidirectional charging—that it is a mobile, swappable battery asset. The battery can be available at a particular time of day in the day.

III. Fermata Energy V2X Case Studies

A. New Hampshire Electric Cooperative (NHEC) Transactive Energy Rate (TER)

NHEC's Transactive Energy rate is a prime example of how market-based pricing can maximize the benefits of mobile batteries to provide demand flexibility services. NHEC partnered with Fermata Energy to pilot an innovative TER for its members. Other DERs, not just V2X, will also be eligible to participate in market-based pricing via the TER.

The project at Plymouth State University discharged over 1 MWh into the grid, generating over \$1,700 in credits for the university in less than 6 months of deployment. As bellaWatt shared in a case study about the project: “The rate enables participating members to

arbitrage hourly prices using their DER devices like bidirectional EVs, solar with batteries, and more. NHEC partnered with Bellawatt to ...design, build, and pilot the underlying technology for a TER.”³ Bellawatt’s TER software sends “NHEC's day-ahead price signals to DER devices like V2G Chargers, receives daily device usage reports, and then posts them to NHEC's billing system. Participating customers are able to charge and discharge their DER devices based on energy prices and see device-level usage and credits reflected on their monthly bill.”

B. V2X Earnings from Connected Solutions Demand Response Program in Rhode Island and Massachusetts

In May of 2021, climate-tech start-up Electric Frog Company provided an all-electric Nissan LEAF to the Burrillville Wastewater Treatment Facility in Rhode Island to facilitate commercial V2X operations in support of the New England utility grid. To allow charging of the EV for everyday use and discharge power on demand, Electric Frog partnered with Fermata Energy. Fermata Energy installed its FE-15 bidirectional charger and proprietary V2X software to manage the charging of the EV at the Burrillville facility and deliver power, on-call, to the building. The project earned \$4,200 in Connected Solutions demand response revenue over the summer 2021 season. Combined earnings from the 2021 and 2022 demand response seasons, coupled with demand charge management savings over the past two years, amount to over \$8700. “These results help to give us confidence that electric vehicles can be a reliable partner in providing a clean and resilient electricity grid for the future,” said John Isberg, the then Vice President of Customer Sales and Solutions at National Grid (following the sale of the The Narragansett Electric Company from National Grid to PPL, the project is now in Rhode Island Energy’s service area).⁴

IV. Cost-Effectiveness of V2X vs Stationary Storage

³ “DER Transactive Energy Rate Strategy & Technology, Client: New Hampshire Electric Co-op (NHEC),” <https://www.bellawatt.com/nhec-case-study/>, 2023.

⁴“Electric Vehicle Generates Revenue and Energy Savings Paving the Way for Mainstream Adoption of Vehicle-to-Everything (V2X) Technology,” <https://fermataenergy.com/article/electric-vehicle-generates-revenue-and-energy-savings>, Jan 2022.

Because stationary storage systems remain expensive, their batteries are often limited in size.⁵⁶ An EV, however, can provide several times the energy storage of these stationary systems and can be remotely charged to be driven back to the owner's home or workplace. For example, an off-board 7 kW bidirectional DC EVSE is estimated to cost \$5,000-\$7,000 (purchase and installed price) compared to a more typical level 2 AC charging station (\$600-1,500).⁷ While this is a premium compared to a normal charging station, it is still far less than a comparable home storage system. It is very expensive to purchase long-duration storage to deploy at a home or business. In addition to the cost effectiveness of V2X systems vs stationary storage, V2X technology helps offset the TCO of EVs and makes EVs more affordable for average drivers. Based on the significant savings we have demonstrated across the country, averaging \$200 per month for a 15 kW V2X charger, these savings could be applied to help any driver, especially LMI drivers, afford EVs.

V. Conclusion

Fermata Energy appreciates the opportunity to provide these comments and looks forward to continuing to work with the Commission, staff, and other stakeholders to ensure the success of New Hampshire's transportation electrification efforts.

Respectfully Submitted,

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⁵ "Typically, residential consumers' batteries can reach 5 kW / 13.5 kilowatt-hours (kWh)." Source: IRENA (2019), Innovation landscape brief: Behind-the-meter batteries, International Renewable Energy Agency, Abu Dhabi.

⁶ https://atb.nrel.gov/electricity/2022/residential_battery_storage

⁷ The Wallbox Quasar, a bidirectional DC charger for home use, is expected to retail for \$4,000.

⁸ <https://electrek.co/2022/01/03/wallbox-quasar-2-bidirectional-v2h-ccs-combo-dc-charger-announced-turns-evs-into-huge-powerwall/>