



CWEEL: New England Demand Response Webinar

Vehicle to Grid (V2G) in New England Demand Response Programs

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November 19, 2024



Agenda

Company

Software

Value of V2G in Connected Solutions

Girls Latin Academy V2G Car Share Pilot

Fermata Energy Success Stories

Company

Fermata
Energy

Vehicle-to-Grid

What's needed to make V2X happen: 3 key pieces



1. Bidirectional Software

 Fermata Energy



2. Bidirectional Charger

 Fermata Energy

+ Others
(for light-, medium-, and heavy-duty EVs)



3. Bidirectionally Capable EVs

A Company of Firsts

Fermata Energy's...

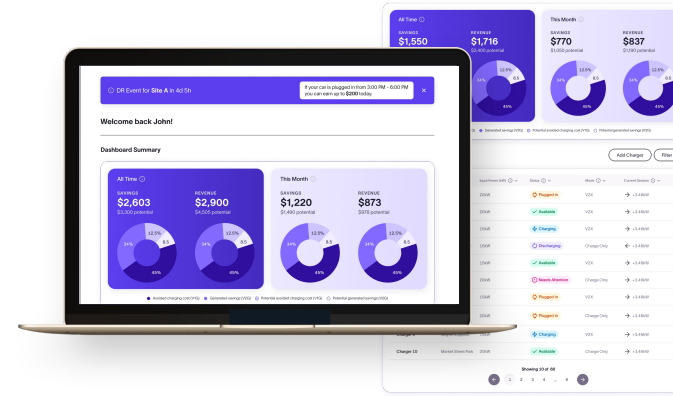
- FE-20 bidirectional charger was the **first to earn UL 9741 certification** in North America
- Vehicle-to-Everything (V2X) bidirectional charging platform was the **first to be commercially deployed** in the U.S. for light-duty vehicles
- V2X bidirectional charging platform was the **first to earn revenue for US fleet customers** - including payments from utilities, such as National Grid, Eversource, and others
- Vehicle-to-Everything (V2X) bidirectional charging platform was the **first to earn OEM approval for battery health**



Fermata Energy V2X Ecosystem

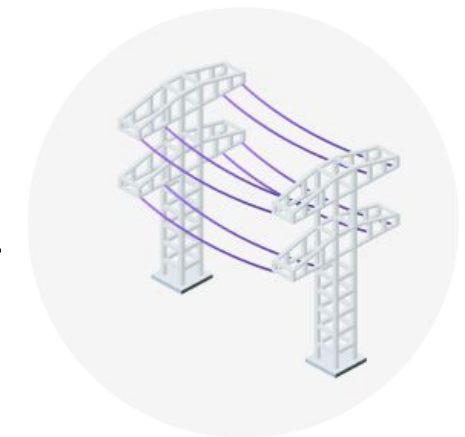
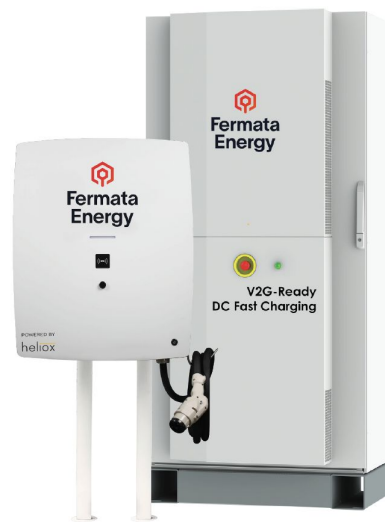
Fermata Energy V2X Platform

- V2G data science, forecasting and optimization
- V2G event notification
- Charge scheduling
- Site + building load monitoring
- Charger + EV data analytics



API Integrations

- Fleet/Charge Management Software
- Telematics
- Microgrids and addtl. energy resources (Solar, BESS, generators, etc)



heliox BORGWARNER

EV

- Manage + Preserve Battery Warranty
- Lower Total Cost of Ownership

Charger Integration

- FE-20 20kW bidirectional charger developed with Heliox
- Integrating with others

FE- Link

- Site Controller
- IoT Gateway
- Building Meter

Site Load Integration

- Load Management
- Site Resilience Support

Utility

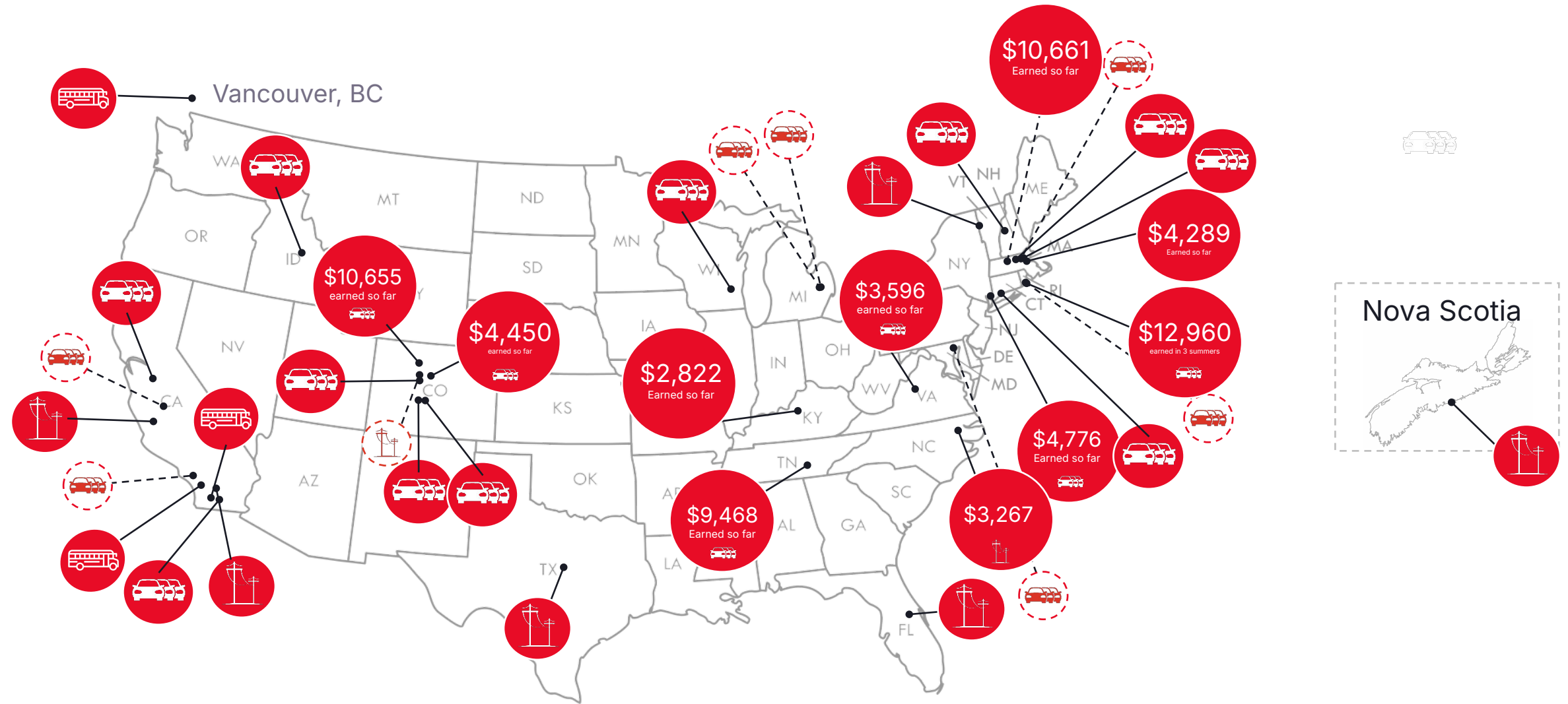
- DERMS integration
- Demand Response
- Interconnection
- Aggregation
- Grid Resiliency Support
- Use Case Development

V2G is Happening Now

October 2024

Verified V2G operations with:

- Utilities
- Federal government
- Municipalities
- Private deployments
- Automotive manufacturers



Fleet site operating



Fleet site in development



Utility site operating



Utility site in development

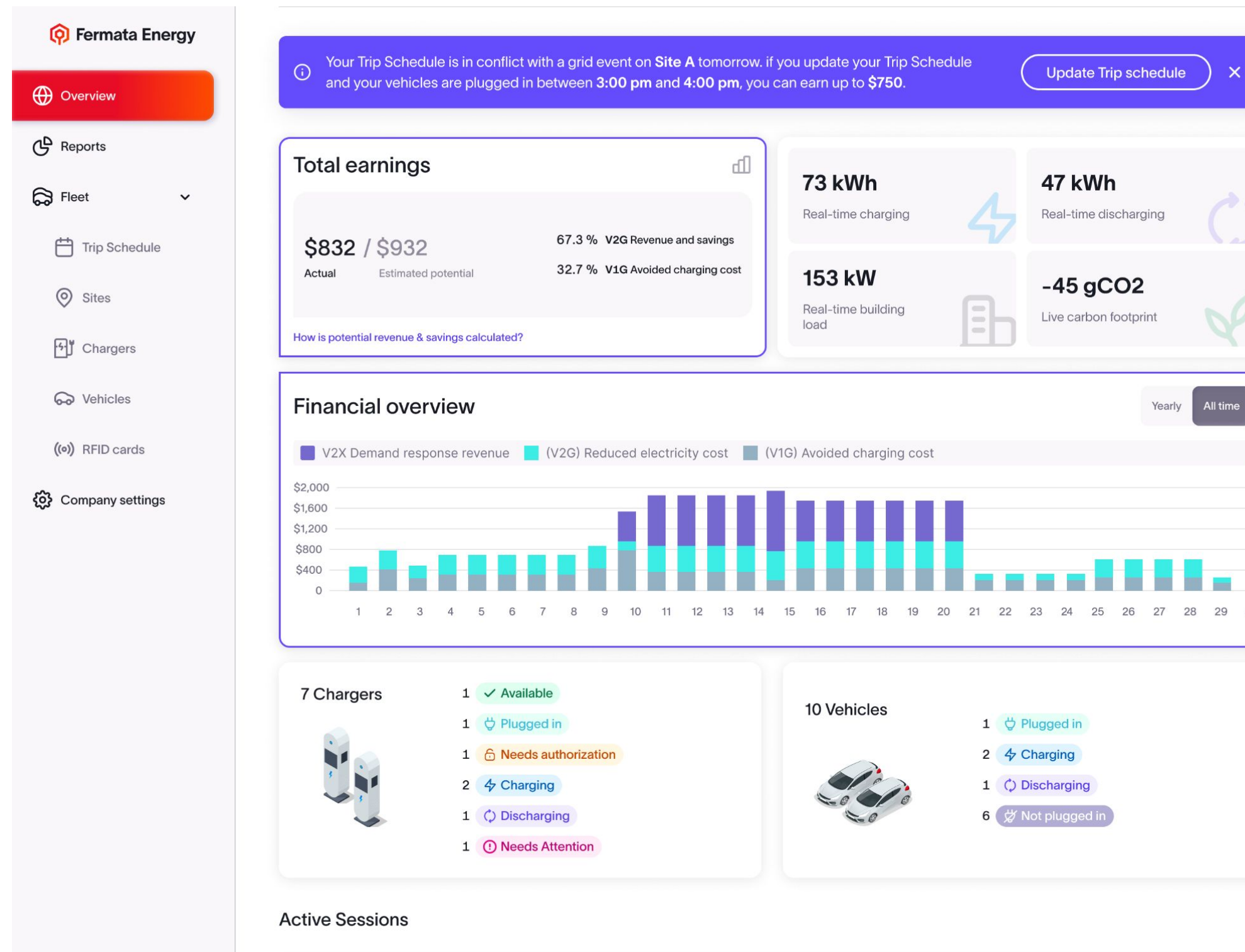
V2G earning for customers

Software



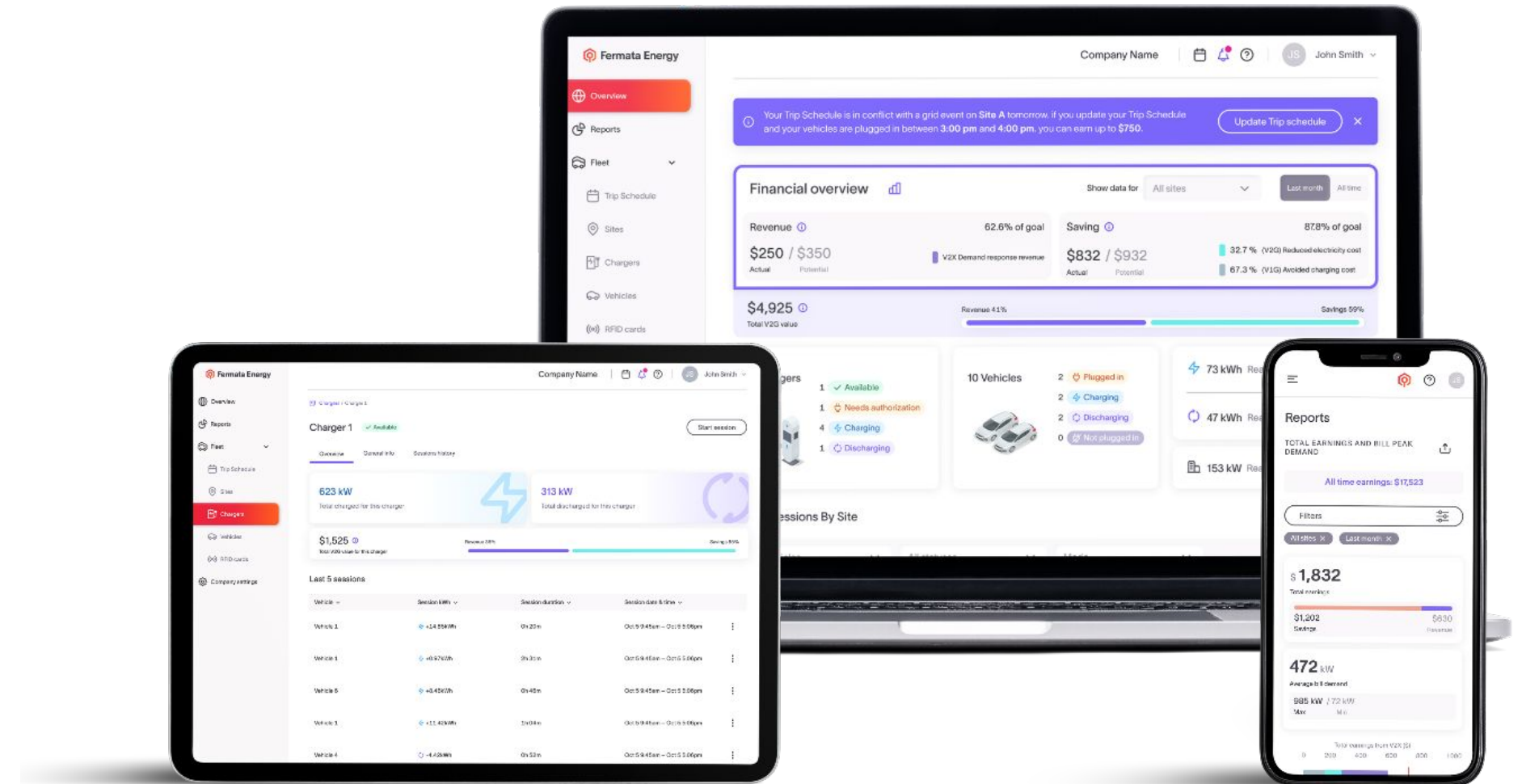
Fermata Energy Customer Portal

At Fermata Energy, we recognize the importance of user engagement and experience so we designed a best-in-industry customer portal, including notifications of upcoming grid events with their value and time.



Intelligent V2X Bidirectional Charging Platform

- A true machine-learning platform
- AI forecasts, optimizes, and **monetizes** grid value for EVs owners
- **Preserves EV battery health** for drivers and **OEM warranty**
- Integrates with utilities and buildings across the country
- Multiple **patents** issued and pending, including battery thermal management





Value of V2G in Connected Solutions

Connected Solutions: How much is V2X worth in MA and RI?

CONNECTED SOLUTIONS

STATE REGION

“DAILY DISPATCH”

“SMALL BATTERY”



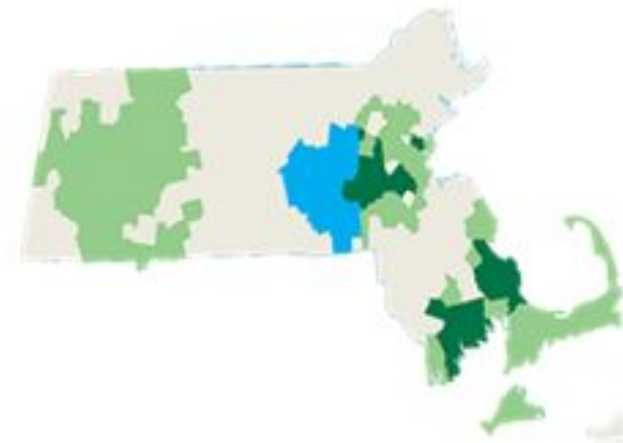
Rhode Island Energy™
a PPL company



\$300 / kW

\$400 / kW

EVERSOURCE



\$200 / kW

NA

Connected Solutions V2X Capacity Value



20

CHARGER kW



\$200

PER kW



100%

EVENT
PARTICIPATION



\$4,000

PER SUMMER



2-3

HOURS
PER EVENT



30-60

SUMMER
EVENTS

Connected Solutions: V2X for a Boston Car Share

CAPACITY
\$4,000
PER SUMMER

+

DEMAND CHARGE MANAGEMENT
\$3,360
PER YEAR

=

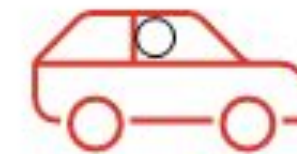
TOTAL V2X VALUE
\$7,360
PER YEAR



INSTALLED CHARGER



INSURED LEAF



FLEXIBLE DRIVER



Girls Latin Academy V2G Car Share Pilot

Low-income drivers are an underserved EV driver market



California
California wants everyone to drive EVs. How will low-income people afford them?

The state has several programs in place to assist residents - but they're already running out of funds



French Government Prioritizes Low Income Families For Electric Vehicle Subsidies, Wants More Locally-Produced EVs

BY THANOS PAPPAS | OCTOBER 21, 2022

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Electric vehicles for everyone? Climate justice programs help people of color, low-income Americans get moving

Bill Keveney USA TODAY

Published 5:17 a.m. ET March 28, 2022 | Updated 3:27 p.m. ET April 5, 2022

THE ASSOCIATED PRESS

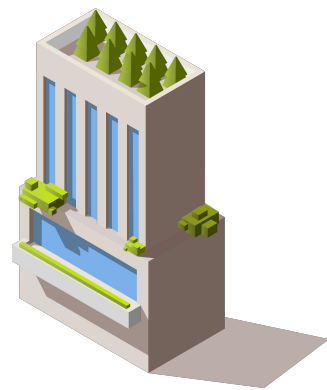
A FUTURE MADE IN AMERICA

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Partnership to provide a month-by-month EV for a driver at the Girls Latin Apartments

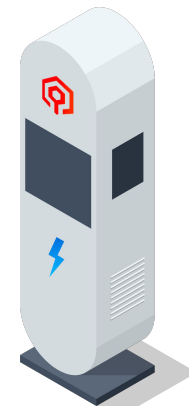
MISSION-DRIVEN COMMUNITY DEVELOPMENT FINANCE

Providing project finance and managing the relationship with Girls Latin Academy Apartments



V2X REVENUE

V2X charging for the Nissan LEAF and management of V2X revenues



ASSET MANAGEMENT

Own and manage the EV for the

Enterprise Inc.



V2G can earn \$4,000 per year - increasing EV access to a low-income Boston driver

Girls Latin Academy Apartments
Affordable Housing In An Environmental Justice Neighborhood



380 TALBOT AVE BOSTON MA

| STATISTIC | NEIGHBORHOOD | REST OF STATE |
|--|---------------|---------------|
| MEDIAN HOUSEHOLD INCOME | \$29K - \$66K | \$77K |
| MINORITY POPULATION (BLACK, HISPANIC, ASIAN) | 87% | 22% |

$$\begin{array}{ccccccc}
 \text{⚡} & & \$ & & \text{☰} & & \\
 \text{20} & \times & \text{\$200} & \times & \text{100\%} & = & \text{\$4,000} \\
 \text{CHARGER kW} & & \text{PER kW} & & \text{EVENT} & & \text{PER SUMMER} \\
 & & & & \text{PARTICIPATION} & &
 \end{array}$$

On-Demand Mobility: V2G earns **\$6,072**, increasing EV access to a low-income Boston driver

When:

Ongoing (activated June 2022)

What:

Vehicle-to-grid (**V2G**) demand response using Fermata Energy's bidirectional charging platform.

Customer Earnings/Savings:

Initial Pilot Phase (2022): \$2664 with one EV and one Fermata Energy FE-15 (15kW) bidirectional charger

Since launch of carshare (2023-2024): ~\$3500

Where:


Girls Latin Academy Apartments (Boston, MA)

Program:

Demand response (V2G) program participation at an affordable housing in an environmental justice neighborhood.



Girls Latin Academy Apartments (Boston, MA)



Other V2G Demand Response & Car Share Success Stories

Wastewater Treatment Plant Earns **\$13,000** via ConnectedSolutions

When:

Summers 2021 through 2024

Customer benefit:

Municipal wastewater system earned ~\$13,000 with 1 EV and 1 Fermata Energy V2X charger

Utility:

Rhode Island Energy - "ConnectedSolutions"

Program:

Affordable, efficient small battery capacity; providing DCM on non-demand response days



"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, Vice President of Customer Sales and Solutions at National Grid (now a Rhode Island Energy project).

Renewable energy supplier generates **\$10,600** in revenue with parked EV over 2 years via Connected Solutions

When:

Ongoing - activated May 2022

What:

Connected Solutions demand response and Behind-the-meter demand charge management using Fermata Energy's V2X bidirectional charging platform

Savings:

\$10,600 in demand response revenue with two FE-15 V2G bidirectional chargers from 2022-2023

Where:

Northfield Mountain Recreation and Environmental Center in Northfield, MA



V2B nonprofit carshare generates **\$8,200+** in savings with century-old building

When: Ongoing - activated June 2021

What: Vehicle-to-building (V2B) demand charge management + carshare

EV Delivers Savings: \$8,200+ with 1 EV and 1 Fermata Energy bidirectional charging platform

Where: The Alliance Center in Denver, CO - the first all electric building in Denver

Program: Reduced demand charge on electricity bills by discharging energy in an EV battery to offset high building electricity consumption. The project has provided CO Car Share members access to an emissions-free transportation option.



Demand Charge Management and Peak Shaving for Roanoke Electric Cooperative

When:

2019-current

What:

Demand response using Fermata Energy's V2X bidirectional charging platform

Savings:

\$3200+ since 2021 with 1 EV and 1 Fermata Energy V2X charger

Utility:

Roanoke Electric Cooperative, located at the utility's headquarters

Program:

Demand response, demand charge management, and voltage for building operations during a power outage; demonstrated use with HQ building in island mode



"The goal is to stabilize our rates, become more efficient as a utility and prove new ways to save our members' money," said former president and CEO of Roanoke Electric, Curtis Wynn.

Thank you.

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