

Turning an EV Charger into a Grid Powerhouse

New York | *Deployed on 4G LTE & 5G networks*

SCENARIO

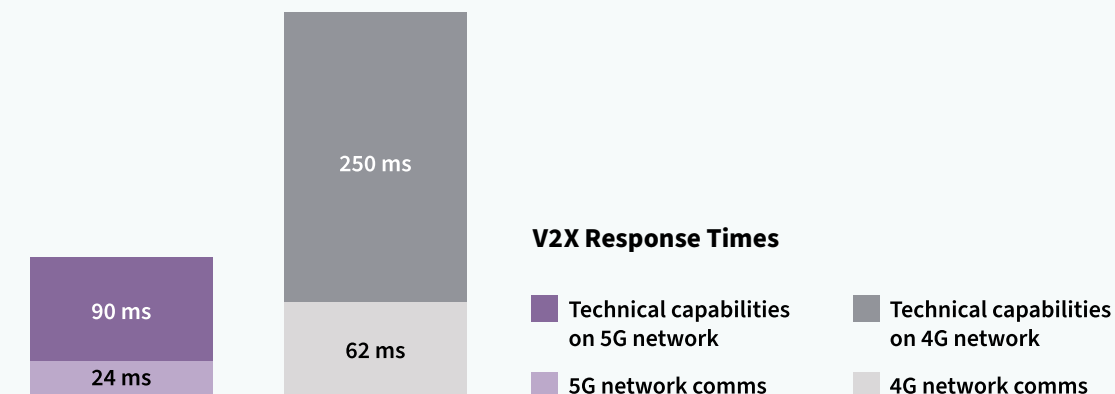
Fermata Energy’s Vehicle-to-Everything (V2X) technology turns electric vehicles (EVs) into battery storage assets, enabling EVs to send energy to a building or the grid and support grid resilience. Brooklyn-based technology accelerator Newlab discovered its power during Hurricane Ida.

At the beginning of the storm, Newlab and Verizon were demoing a Nissan LEAF plugged into Fermata Energy’s FE-15 bidirectional charger and managed by the Fermata Energy V2X cloud software. Throughout the rest of the meeting and that night, the Fermata Energy V2X platform managed the energy load of the Newlab building.

This demo spurred further thinking. Utility substations need to be able to respond swiftly to changing grid conditions, especially given the growing density of distributed energy systems and the fleets of EVs connected to them. Applications that involve photovoltaic (PV) smoothing and frequency response require low latency and high reliability between the controls that process decisions and the chargers that execute them.

How would different communications networks affect these functions, including a utility’s ability to deliver data in near real time and quickly load-balance and optimize the grid?

No other systems right now work as quickly as 5G and edge computing, a distributed computing paradigm which brings computation and data storage closer to where it is needed, improving response times and saving bandwidth.



SOLUTION

To answer this question, Verizon compared 4G LTE and 5G technology performance on V2X's vehicle-to-building system.

Using one Nissan Leaf EV paired with Fermata Energy's bidirectional charger, the team linked the software with a wavelength Amazon and Verizon product called the EDGE. The goal: see how fast it would communicate with the EV. Instead of using 4G LTE, the team enabled the system with the latest Verizon 5G network.

The team used the Fermata Energy cloud control system to monitor the state of vehicle chargers and the energy load of the building. VPN tunnels over cellular connections link the system to the remote networks containing the chargers and building load meters.

RESULTS

With a normal response time of under 100 milliseconds, the Verizon 5G/AWS Wavelength network pathway outperformed Newlab's existing 4G LTE/datacenter pathway, which reported a normal response time of over 300 milliseconds.

Today the Fermata Energy V2X charger is either charging EVs or powering the Newlab building, with the ability to power 10% of the building's electrical load.

Fermata Energy has created utility protocols for its platform and is working closely with utilities to design programs and optimize utility signals for sending energy from EV batteries to buildings.

This technology can also be used for microgrids, compressed versions of the larger electrical grid, and virtual power plants, which are anticipated to become highly valuable resources as hurricanes, wildfires, floods, and other natural disasters impact communities more frequently.