Strategies for EV charging resiliency during natural disasters

Consulting case study

April 13, 2021

Key takeaways

- A large northwestern utility hired E Source to investigate mobile and deployable EV charging options to enhance charging resiliency during natural disasters.
- E Source investigated the feasibility of several products currently on the market that are designed to be deployed to provide sufficient energy to stranded EV drivers in a natural disaster or other emergency.
- The utility began conducting additional research and was able to begin implementing E Source's recommendations.

The challenge

With natural disasters such as hurricanes, snowstorms, and wildfires occurring more frequently and intensely than ever before, utilities are developing strategies for supporting their EV customers during a disaster-caused outage. In fact, some state regulators are requiring utilities to plan for how they'll assist EV customers if grid-tied charging stations are deenergized.

Is your EV charging resiliency strategy in need of an update?

Fill out this short form to start a conversation about your needs and how we can help.

The solution

The disaster-preparedness plan E Source crafted included the use of mobile and deployable EV charging technologies. The charging capacities of each potential solution varied significantly—from products as small as a suitcase that could ride in a tow truck to flatbed-sized battery arrays that can charge scores of cars. And some offered additional features like built-in solar capacity that allows the unit to self-charge. We then right-sized the potential solutions and identified preferred deployment locations by examining traffic volume and patterns, local penetration of EVs, and EV sales forecasts for the next several years.

The results

E Source experts analyzed several technology options, including mobile, deployable solutions designed to address a variety of outage durations and driver demand.

Vendor	Product	Approximate number of cars that can receive a 40-mile charge	Product size or platform
Tesla	Megapack Mobile Supercharger	54 to 154	Fits on a semi-truck flatbed
Dannar	4.00	6 to 25	About the size of a high-profile sport utility vehicle
Lightning Systems	Lightning Mobile	9	3,700 pounds; fits in the back of a cargo van or midsize cargo trailer
Freewire Technologies	Mobi	4	Slightly larger than a shopping cart
Beam (formerly Envision Solar)	EV Arc 2020	1 to 2	Fits on a midsize trailer
SparkCharge	Roadie	Less than 1	Each module is about the size of a suitcase; up to five modules can be connected

We also investigated more-permanent solutions, such as deploying a diesel generator to power EV equipment as well as well as islanding a microgrid that, while not mobile, would include local charging stations.

There are several use cases for EV drivers in an emergency and each required a different solution. Ultimately, E Source's EV charging resilience strategy included a recommendation to deploy several of the battery-based solutions described above as well as diesel generators. We also strongly advised the client to consider

islanding a microgrid for a longer-term solution. The client is conducting additional research and will soon begin implementing E Source's recommendations.
