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Solar Journey

MOBILE/OFF-GRID CASE STUDY

SYSTEM SPECIFICATIONS	
Location	Mobile vehicular; emergency deployment
System Power	7.2kW PV/solar system
Components	• FLEXware inverters/chargers • FLEXmax 60 charge controller • MATE system display and controller • HUB system control and communication

OVERVIEW

Solar Journey USA is a project of Columbia University doctoral students Garrett Fitzgerald and Rob van Haaren. As part of their studies at the School of Engineering and Applied Science, Fitzgerald and van Haaren developed a plan to drive across the United States with a solar-equipped trailer to demonstrate how the combination of an electric vehicle (EV) and solar energy could create zero-emission travel. The duo's ultimate goal was a 3,200 mile cross-country trip, but they got their first opportunity to educate the public about solar power when Hurricane Sandy hit New York.
Solar Journey USA spent Thanksgiving at Rockaway Island in New York, where its 6.5kW solar panels powered Saint Gertrude Church's community dinner, which served hundreds of residents who were still without power in their homes.

CHALLENGE

- Educate the public about the potential of zero-emission transportation through a combination of electrical vehicle and solar power technology
- Engineer photovoltaic (PV) solar panel arrays and system components into a trailer capable of powering a cross-country trip
- Support a community's post-Sandy efforts by powering local events and charities

SOLUTION

Solar Journey USA built its solar PV array in a parking garage at Columbia University. The organization designed its system around equipment from OutBack Power, including two FLEXware inverters, 12 combiner boxes, three FLEXmax 60 Maximum Power Point Tracking (MPPT) charge controllers, and MATE and HUB system control and programming components. With OutBack Power's help, Solar Journey USA drove its solar-equipped trailer to Rockaway Beach, where it ultimately provided electricity to a community youth center and Saint Gertrude Church's Thanksgiving-day dinner for residents recovering from Hurricane Sandy.

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01/2020

OUTCOME

- OutBack Power's MATE system display increases public understanding of solar power capabilities by showing real-time power input and output
- By storing energy from the PV array in batteries charged by the OutBack inverter and system, Solar Journey USA's cross country trip can draw on a battery charge from any excess solar energy production
- The two separate FLEXware systems can generate both 120V for typical AC appliances and 240V to power the electrical vehicle
- The fuel offset created by solar EV charging equals 30 to 45kWh of electricity during summer days, or 9 gallons of fuel, which would cost $3 if purchased from a utility. It also saves 96 pounds of carbon emissions, or up to 150 pounds of carbon emissions saved during the summer daytime hours

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