

Forget storage batteries and gas generators. Electric vehicles are powering homes when utilities go down

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Soon you'll be able to say goodbye to gas-powered generators and storage batteries if you want to power your home during a utility outage.

Your backup [power](#) source will be sitting in your driveway or garage, ready to keep your lights on, your fridge cold and your air conditioner blowing.

Best of all, your [power source](#) will run silently, emit no dangerous exhaust, and be capable of safely running inside or outside during hurricanes and for at least a couple days afterward while your utility works to restore power.

Electric vehicles with bidirectional charging capabilities are starting to hit the market as the auto industry transitions away from internal combustion engines. Just a handful of vehicles with so-called Vehicle-to-Home (V2H) capabilities are available now—and require costly aftermarket gear—but industry analysts expect their numbers to increase as more EVs come to market.

"It's still evolving because you don't have standard technologies to do this," says Seth Blumsack, co-director of the Penn State University Center for Energy, Law and Policy. "It's not as 'plug-and-play' as you might want."

Bidirectional charging, as the term implies, is the capability to both receive and send power, and its availability in electric vehicles could provide a valuable layer of security to homeowners as severe weather events become more frequent and destructive.

One of the few vehicles with bidirectional charging capability is also one of the nation's best-selling trucks: Ford's F-150 pickup. The new electric version, called the F-150 Lightning, is targeted to truck owners who haven't been enticed by small electric sedans and crossover SUVs.

In addition to touting its big-truck size and towing capacity, Ford is promoting the Lightning's ability to provide power to homes during

outages as a added value, Blumsack said. "It's going to have a lot of appeal to those who live in areas where the grid is vulnerable to disruption from hurricanes or severe winter weather."

'More than just an EV'

Ford spokeswoman Debra Hotaling said Ford intended the F-150 Lightning to be more than just an electric vehicle. "It had to provide compelling features and fun that went way beyond how it's powered," she said by email. "Bidirectional power is part of that. We debuted it on the F-150 Lightning and customers are telling us it gives great comfort knowing the truck can seamlessly supply power in an outage."

Since Ford began taking orders for the vehicle in August 2021, Sawgrass Ford in Sunrise, Florida, has sold more than 400, including 200 during its first week of availability, said David Menten, owner of the dealership.

Four models are available. Prices range from around \$42,000 for the base model to just under \$94,000 for the Platinum version currently on display on Sawgrass Ford's showroom floor.

High demand and supply-chain issues plaguing the global automobile industry has forced buyers to wait as long as a year for delivery, but that hasn't hurt sales, Menten said. "I don't think Ford expected to sell as many as it has," he said. "Now they're building them as fast as possible."

Ford is betting that once Lightning owners become acquainted with the truck's ability to share its batteries' stored power, they will make an additional investment in the components needed to feed that power back to their homes when needed, Menten said.

The Lightning can provide some power without owners having to buy anything extra. It comes standard with USB ports for personal electronic

devices and eight 110-volt outlets that can run power tools and other job-site machinery. Homeowners can run extension cords into those outlets during outages if they're content to run just a few things at a time, like a small fridge, a couple of lights, a fan and a TV.

This is a common feature of electric vehicles. A growing number come with 110-volt outlets, and consumers can buy adapters to add outlets to vehicles not sold with them.

The Lightning goes much further: It also comes with an EV charging plug outlet that can charge other electric vehicles, including Teslas, if they become stranded.

Ford says the truck can store enough power to run an entire house for three days. That, of course, depends on the size of the house and what needs to be powered. The standard-range battery can store 98 [kilowatt hours](#) and the optional extended-range battery stores 131 kWh. Typical houses consume about 30 kWh a day, but that's tough to maintain if a house is running a central air conditioner, computers, TVs, washer and dryer and other comforts. You might have to make choices.

You'll need to install extras

To power your entire house, you'll need to purchase a few additional components and hire an electrician.

First, you'll need Ford's Charge Station Pro, a home charging port which costs about \$1,310 but comes standard on extended range models, according to a May story in Car and Driver. The Charge Station Pro is an 80-ampere device that can charge the truck in eight hours, compared to the 30 hours required to charge with a typical 110-volt outlet.

You'll also need a Home Integration System that converts high-current

DC from the Charge Station Pro into AC power needed by your house. It costs \$3,895 and connects between your home's utility power meter and your main power panel. Before drawing power from the truck, it disconnects your home from the grid.

Installation costs will depend on your home's current setup, whether your panel needs to be upgraded, and how much cable must be installed to reach the charging port.

To handle installation of the Home Integration System, Ford is partnering with Sunrun, a nationwide solar system installer. Sunrun can pair the Home Integration System with solar panels because the system can also function as an inverter for the panels, transferring power generated by the solar panels to the Lightning battery to extend the amount of time that the truck can power the house.

In such a setup, the Lightning serves as the solar panels' battery storage system. If used regularly, the setup can reduce the amount of power that homeowners need to purchase from the grid.

That's the setup that Delray Beach resident Glen Hammer is considering in lieu of adding storage batteries to his rooftop solar system.

It comes with several advantages, Hammer said by email.

"I need an auto anyway, so although more expensive than a standard gas-burning vehicle, it would act as the back-up instead of a generator or battery array," he said, adding that the vehicle and inverter would rival the cost of storage batteries or a whole-house generator.

"I can fuel up for pennies as my solar roof would keep the battery charged. So I would avoid the \$3.50 a gallon problem we are facing. This is great, as we may not have an annual hurricane, but we will always need

energy for cars. A generator is only usable during an outage. This would be usable constantly."

Another advantage, he said, is "I would be further supporting clean energy."

The EV industry is watching

Only a few other vehicles currently have bidirectional charging capabilities when paired with inverters from various third-party manufacturers. They include the Nissan Leaf and Mitsubishi Outlander PHEV, according to the website cleanenergyreviews.info. Volkswagen's ID.4 will include the feature beginning with the 2022 model year, Car and Driver reported.

Tesla, the world's most popular electric [vehicle](#), has not yet announced bidirectional capabilities for its products, but Blumsack says the company is likely working on it.

Another potential application for bidirectional charging is storage from the grid. EV owners served by utilities that charge less for electricity during hours of low demand could charge their cars when power is cheapest, then sell back to the grid when prices are highest and turn a profit. Such a plan, which could help utilities serve the increased demand that will accompany wider acceptance of electric vehicles, would depend on utilities' willingness to pay a premium for power stored in customers' EV batteries.

Blumsack expects it will take a couple of years before home charging becomes an affordable and common feature of [electric vehicles](#).

"If the Lightning shows itself to be capable of doing what Ford claims and manufacturers get lower-cost options for the garage charging

stations into the hands of consumers, my guess is other EV makers will be looking with interest at the Lightning and saying, 'How do we do this?' "

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