Electric Cars for Electric-Power Backup

People who have been out of electric power for several days due to the recent extreme weather might be interested in the fact that electric cars soon will be able to be used as backup power for houses during power outages.

A large refrigerator requires about 500 watts of power and a powerful fan requires about 100 watts. Other appliances require power at about 100 watts or less. A small window air conditioner uses about 2 kilowatts (kW=1000 watts) (about 6,800 BTU/hour) of power.

A medium-sized electric car, such as the Nissan LEAF that I drive, more than meets the power requirements of essential appliances and some lighting in a modest house. (CFL and LED lights require much less power than do standard incandescent lights for the same amount of light.)

Multiplying power in kW by the hours of use gives the energy used in kilowatt-hours (kWh). (Look at a monthly electric bill to see how many kWh of energy your house used that month.) A refrigerator cycles on and off during the day; if it is on 10 hours during a day and its power requirement is 500 watts, it uses 5 kWh of energy a day. If one uses 10 appliances and/or light bulbs that require 100 watts power each and they are on 5 hours per day, their energy used is 5 kWh per day. So, one needs about 10 kWh electric energy to keep a refrigerator and 10 appliances and/or light bulbs running for a day.

If a window air conditioner that requires 2 kW power (~6,800 BTU/hour) is run 5 hours a day, one needs 10 kWh of electric energy each day. Adding this to the energy needed for a refrigerator and 10 appliances, the energy used is 20 kWh.

All of the appliances and lighting to be used during grid-power outages need to be on a single circuit wired for easy switching of incoming power from the grid to from the electric car.

The 2012 Nissan LEAF has about 21 kWh of usable energy when the battery is fully charged. (The battery holds 24 kWh, but not all of it is usable.) If the LEAF had the capability of providing backup power and a Quick-Charging station (level-3/480-volts charging station which can charge the LEAF to 80% of battery capacity in 30 minutes) were nearby at a location that had grid power, the LEAF could provide backup power for a house by charging the LEAF briefly every day at the nearby charging station. (Don't open the refrigerator door while the car is away being charged.)

A Nissan backup-power option for the LEAF (http://reviews.cnet.com/8301-13746_7-20072622-48/in-a-blackout-nissan-wants-leaf-to-power-your-house/) is planned to be available in Japan very soon; I expect that it will be available here in a year or so. Other car companies that have or are developing electric cars will surely come out with backup-power systems for their electric cars.

Quick-Charging stations are rapidly being installed all over Tennessee and many other states. (Why not in Virginia?)

As more extreme weather is generated by global warming and backup-power systems become available for electric cars, demand for electric cars will climb.

In addition to providing backup power for houses, millions of electric cars eventually will provide storage for renewable-energy power on the grid to level out the load (Vehicle-to-Grid = V2G). See http://en.wikipedia.org/wiki/V2g . The cars' batteries will be charged in early morning hours during minimal grid load and discharged into the grid in mid-afternoon hours during peak load. The difference in electricity rates for those time periods will reduce the cost of driving an electric car that participates in the V2G program. (Already, both fuel and maintenance costs for electric cars are about one-fourth the costs for gasoline cars.)