# Charging station energy storage 7 kWh

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Armenta-D?u, Carlos, and Luis Sancho. 2024. "Sustainable Charging Stations for Electric Vehicles" Eng 5, no. 4: 3115-3136. https://doi /10.3390/eng5040163

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It is a classic chicken-or-egg situation. People will be reluctant to buy a BEV if they worry that it will run out of juice. But unless more BEVs are sold, the charging infrastructure will not be built to serve them.

Second, there are the economics. Although direct-current fast-charging (DCFC) stations with 150 kilowatts of power can fill up a BEV sedan in about 30 minutes, they can cost up to $150,000 to install; a 50-kilowatt DCFC station can cost $50,000. The kilowatt number refers to the maximum amount of energy that can be drawn every hour; a higher kilowatt delivers more electricity faster. DCFC stations are also expensive to run.

A demand charge is a fee based on the highest rate, measured in kilowatts (kW), at which electricity is drawn during any 15- to 30-minute interval in the monthly billing period. This is separate from the charge paid for the actual energy consumed, which is measured in kilowatt-hours (kWh).

Even though Business A and B use the same amount of energy, Business B needs twice as much maximum energy every hour and therefore incurs a higher demand charge.

In the specific case of BEV charging, as soon as a car plugs in, the station owner must pay a demand charge.

This is based on several factors, including the number of chargers on the site, the maximum power in kilowatts used by the car when it plugs in, and the number of cars charging at the same time in any 15- to 30-minute segment.

Here is a hypothetical situation. A DCFC station has four 150-kilowatt chargers. In an average month, two or three cars a day show up to charge, none at the same time. Each car uses energy at a rate of 150 kilowatts and charges for at least 15 minutes; the peak is therefore 150 kilowatts for that month. If two cars showed up during the same 15 minutes, though, the peak energy used would be 300 kilowatts, which would double the demand charge for the month.

In addition, the costs of batteries are decreasing, from $1,000 per kWh in 2010 to $230 per kWh in 2016, according to McKinsey research.7 7.David Frankel and Amy Wagner, "Battery storage: The next disruptive technology in the power sector," June 2017. So are the costs of the rest of the system, such as the inverter, container, software and controls, site design, construction, and connection to the grid.