Does fast charging damage batteries

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While there is research that shows that frequent rapid (DC) charging can somewhat degrade the battery quicker than AC charging, the effect on battery heath is very minor. In fact, DC charging only increases battery deterioration by about 0.1 percent on average.

Treating your battery well has more to do with temperature management than anything else, as lithium-ion (Li-ion) batteries are sensitive to high temperatures. Luckily, most modern EVs have built-in temperature management systems to protect the battery, even while fast charging.

One common worry is around the impact of fast charging on battery degradation - an understandable concern given that EV manufacturers such as Kia and even Tesla recommend sparing use of fast charging in the detailed spec description of some of their models.

Power outputs vary between charging stations, but DC fast chargers can deliver between 7 and 50 times more power than a regular AC charging station. While this high power is great for quickly topping up an EV on the go, it also generates considerable heat and can put the battery under stress.

Some studies, such as Geotabs" research from 2020, found that over the course of two years, fast charging more than three times a month increased battery degradation by 0.1 percent compared to drivers who never used fast charging.

Another study by the Idaho National Laboratory (INL) tested two pairs of Nissan Leafs, charging them twice daily over a year, with one pair only using regular AC charging while the other exclusively used DC fast charging.

After almost 85,000 kilometres (almost 53,000 miles) on the road, the pair that was solely charged using fast chargers lost 27 percent of their original capacity, while the pair that used AC charging lost 23 percent of their initial battery capacity.

As both studies show, regular fast charging does decrease battery health more than AC charging, although its impact remains fairly small, especially when considering real-life conditions are less demanding on the battery than these controlled tests.

Because DC fast chargers are much bulkier, expensive to install, and require a much higher voltage to operate, they can only be found in certain locations, and tend to be considerably more costly to use than AC public charging stations.

In one of our REVOLUTION Live podcast episodes, FastNed"s Head of Charging Technology, Roland van

der Put, highlighted that most modern batteries are designed to be fast charged and have integrated cooling systems to handle the higher power loads from fast charging.

This is important not only for fast charging but also for extreme weather conditions, as your EV battery will suffer from very cold or very warm temperatures. In fact, your EV"s battery operates optimally in a narrow range of temperatures between 25 and 45?C. This system allows your car to keep working and charging in low or high temperatures but might extend charging times if the temperature is outside the optimal range.

It"s undeniable that fast charging remains an essential part of the electric mobility landscape and a crucial tool for practical long-distance travel with EVs. And as we have seen above, occasional fast charging won"t harm your battery or decrease its capacity in any significant way.

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