

A vehicle-to-grid response: Electric vehicles fed power into Australian grid during blackout, says report

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Senior Research Fellow Dr. Bjorn Sturmborg. Credit: Crystal Li/ANU

During a major storm event that eventually cut power to tens of thousands of homes, a fleet of electric vehicles (EVs) were able to feed

power back into Australia's electricity grid, according to [a new report](#) from The Australian National University (ANU).

According to lead author of the study, Senior Research Fellow Dr. Bjorn Sturmberg, it's the first time in the world this type of vehicle-to-[grid](#) response to an emergency has been demonstrated.

"It shows electric vehicles can provide the backup we need in an emergency like this," he said.

"We have a fleet of 51 EVs across Canberra that monitor the grid whenever they're plugged in and can quickly inject short bursts of power to rebalance the system if the national grid rapidly loses power. They're essentially big batteries on wheels.

"The event in February—caused by storms in Victoria—was the first real-world test of our vehicles and chargers. We now know a vehicle-to-grid system can work."

At the time, 16 EVs were plugged in at properties across Canberra. Four were charging, while 12 were idle.

"These vehicles quickly stopped charging and within seconds started discharging power into the grid, as they've been programmed to do," Dr. Sturmberg said.

"In total, they provided 107 kilowatts of support to the national grid. To put that in perspective, 105,000 vehicles responding in this way would fully cover the backup required for the whole of the ACT and NSW.

"For context, there were just under 100,000 EVs sold in Australia last year."

Dr. Sturmberg said there is still work to be done to balance the growing demand for vehicle charging with grid security.

"With the number of EVs on our roads growing fast, the grid won't be able to cope with everyone charging at the same time when they get home in the evening," he said.

"Additionally, in the case of the February emergency, once the vehicles had provided power for ten minutes some resumed charging by default. There would be little cost or inconvenience in delaying charging for an hour or two in this kind of situation.

"It may call for an industry adjustment, for instance, to require EV manufacturers to program their vehicles to stop charging during a grid emergency, with an option for drivers to override for urgent charging.

"Stopping just 6,000 EVs charging would have kept the power on for those 90,000 customers whose power was cut on February 13.

"Our results show that vehicle-to-grid can be a powerful contributor to our power system's security, and that all [electric vehicles](#) have an important role to play."

More information: Bjorn C. P. Sturmberg et al, Vehicle-to-grid response to a frequency contingency in a national grid – successes and shortcomings (2024). [DOI: 10.21203/rs.3.rs-4445838/v1](https://doi.org/10.21203/rs.3.rs-4445838/v1)

Provided by Australian National University

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