

Energy to power tomorrow's electric vehicles

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Credit: European Union

Sales of full electric and plug-in hybrid electric vehicles have been rising steadily in many parts of the world, including Europe. These are motor vehicles, including personal cars, which can be recharged from an external source of electricity, such as a wall socket or a charging pole.

But are European [power](#) grids ready to deal with a major influx of these environmentally friendly vehicles? Today's electricity distribution networks were not designed to serve fleets of [electric vehicles](#). If they start to appear on our roads and in our driveways in massive numbers, without coordination of their battery charging needs, it could present a real challenge to conventional power networks, especially at the local distribution level.

The EU MERGE project ('Mobile Energy Resources in Grids of Electricity'), led by Greece's Public Power Corporation, was aimed at addressing the issue of electric vehicle deployment without major changes to existing power [network infrastructure](#).

The project's first priority was to develop a set of management and control concepts that would facilitate the safe integration of plug-in vehicles within [electrical grids](#), using as much renewable energy for battery charging as possible.

Next, project partners developed a suite of computer simulation tools, which they used to analyse the behaviour of power systems (generation, transmission and distribution) as more and more electric vehicles come on the grid.

Potential problems that could be caused by large numbers of these vehicles include sudden voltage drops in distribution grids due to their simultaneous charging, for example during the morning rush hour, or more global changes in load profiles, which would impact hourly generation scheduling.

The MERGE simulation suite makes it possible to identify necessary related policy and regulations, as well as to plan the technical evolution of the power grid.

The potential social and environmental impacts of the project are far-reaching. The main impetus for the propagation of electric plug-in vehicles is the reduction of CO₂ emissions and mitigation of climate change, and MERGE has done much to further that cause.

But electric vehicles are also quieter than conventional vehicles, meaning an improvement in quality of life, especially for people living in urban environments. And the EU as a whole stands to benefit as an exporter of

related technologies.

More information: MERGE www.ev-merge.eu/

Provided by CORDIS

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