

# Smooth and stable electric vehicle charging

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Siwar Khemakhem, Mouna Rekik, and Lotfi Krichen of the Control and Energy Management Laboratory at the National Engineering School of Sfax, in Tunisia, are investigating the potential of home energy

management based on plug-in electric vehicle power control in a residential smart grid.

Writing in the *International Journal of Digital Signals and Smart Systems*, the team explains how the advent of [electric vehicles](#) has shifted the pressure to some extent from [power](#) supply based filling a tank with a liquid or gas fuel at a station to generally charging one's vehicle from home. As more and more drivers switch to electric vehicles there is a need to make the supply of power smarter. The team has now proposed an optimal charge/discharge power management algorithm that can be used in residential areas and takes into account smart grid technology.

"The purpose of this control strategy is to ensure the [energy flow](#) exchanging between plugin electric vehicles and smart home to improve the [energy efficiency](#) and to achieve a flattened power load curve," the team writes. Their algorithm finds the optimal approach to charging for off-peak and home-to-vehicle [power supply](#). It also looks at how to cope when charging is needed during peak electricity demand periods. Simulation of the algorithm shows that it is capable of smoothing the power load curve and making the smart grid stable and secure by switching between four operating modes where discharging electricity from the vehicle's batteries occurs when demand is high but charging is boosted during off-peak times.

**More information:** Siwar Khemakhem et al. Home energy management based on plug-in electric vehicle power control in a residential smart grid, *International Journal of Digital Signals and Smart Systems* (2019). [DOI: 10.1504/IJDSS.2019.103369](https://doi.org/10.1504/IJDSS.2019.103369)

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