Graduation project SolarMiles: Reduce electricity grid load by controlling the charging of electric vehicles.

About SolarMiles

SolarMiles is about charging electric (shared) vehicles with locally produced solar energy. The goal of the project is to design solutions for sustainable mobility in local communities. With more and more electricity produced with solar PV (photovoltaic) panels, the grid will increasingly experience imbalances. Peaks can be lowered by charging the batteries of electric cars. In SolarMiles, new concepts are developed for optimizing the match between the production of solar energy and car charging in such a way that the electricity grid will experience the lowest possible peak load during the day. To realize that, the vehicles should be charged when electricity from solar PV is abundant and/or the existing local electricity demand is low.

Research assignments

The assignment focusses on analyzing the load on the electricity grid in the neighborhoods we are considering. Using the current grid-load as starting point you add extra PV production and electricity demand for electric vehicles (EV). The time-distribution of PV production depends on the sun and cannot be changed. However, the amount of PV can be changed (more or less PV panels in the neighborhood). Charging electric vehicles represents more possibilities: the moment of charging can be variable. More advanced options include the use of power from the EV batteries to deliver energy to the local grid.

We are looking for last year students with experience in Excel and/or data science and an interest in renewable energy, solar panels and/or electric vehicles. Besides being able to analyze data, this assignment also asks for structural and creative thinking. Different possibilities (scenarios) should be analyzed and the corresponding (peak) load on the electricity grid should be determined. Which scenario has the lowest peak demand?

Location: Energy Academy Europe

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Background information:

https://www.hanze.nl/eng/research/strategic-themes/energy/organisation/overviews/news/solarmiles