



Background

With an ambition to replace fossil fuels with renewable energy such as wind and sun, the future power system will experience growing challenges in securing the necessary grid capacity and balancing the electricity grid. Furthermore, ambitious international and European strategies to reduce CO2 emission necessitates the electrification of the transportation sector. This electrification means that the power system needs to prepare to deal with a new demand for power and energy.

The electric vehicle can potentially play a key role in meeting such challenges and contributing to balancing the future power system. By using the properties of the electric vehicle as a power resource, electric vehicles can actively support the grid. The project, Parker, seeks to pave the way for this unique capability of the electric vehicle and thereby ensure the role of the electric vehicle as a contributor to securing an economic and reliable power system, based on a high share of renewable energy.

Parker builds on two previous projects, the EDISON and Nikola projects, which have already laid the foundation for understanding the electric vehicle's potential in balancing the Danish power system. Parker represents the next technology readiness level by allowing balancing services to be applied to a fleet of electric vehicles.

The project

The objective of the project, Parker, is to validate that series-produced electric vehicles as part of an operational vehicle fleet can support the power grid by becoming a vertically integrated resource, providing seamless support to the power grid both locally and system-wide. Furthermore, Parker seeks to ensure that barriers regarding market, technology and users are dealt with to pave the way for further commercialization and not least to provide an evaluation of specific electric vehicles' capability to meet the needs of the grid.

Ultimately, Parker will contribute to ensuring the role of electric vehicles as contributors to securing an economic and reliable power system based on a high share of renewable energy.

To meet the objective of the project, Parker builds on the following three pillars:



Grid applications: The project will study the practical applications of power and energy services on contemporary electric vehicles in order to identify technical, economic and regulatory barriers for these applications and to finally identify viable business cases.



Grid readiness certificate: Parker will specify the technical parameters (grid keys) needed by electric vehicles to provide power and energy services to the grid. Furthermore, the project will produce a Grid Integrated Vehicle (GIV) certificate that demonstrates the ability of electric vehicles to support such parameters.



Replicability and scalability: The project will promote replicability of the investigated applications across geographies, technologies and user groups. Also, Parker will investigate the economic and technical impacts of the applications on the power system and markets.





Research and development in the project is carried out as a multidisciplinary collaboration between commercial OEMs, technology providers, fleet owner and customers as well as academic institutions. Furthermore, Parker will interface with, and be supported by the world's first commercial pilot of series produced V2G cars providing system services, the Frederiksberg Pilot. Such collaborations will contribute to the likelihood of market adoption and ensure that the results will be applicable and re-usable to the power system in Denmark and elsewhere.

Facts about Parker

Partners: The project partners are Nissan, Mitsubishi Corporation, Mitsubishi Motors Corporation, PSA ID, NUVVE, Frederiksberg Forsyning A/S, Inero A/S, Enel and DTU Electrical Engineering (PowerLabDK).

Duration: The project period is August 2016 to July 2018.

Funding: The project has an overall budget of DKK 14,731,471 which is financed by ForskEL.

Technology: The technology used by the project has been thoroughly tested and validated. This includes the vehicles (Nissan, Mitsubishi, PSA ID), charging infrastructure (ENEL) and aggregation software (NUVVE). The use of such mature components reduces the technology-related risks in the project.

Read more on: www.parker-project.com

