Smart EV charging

Challenges

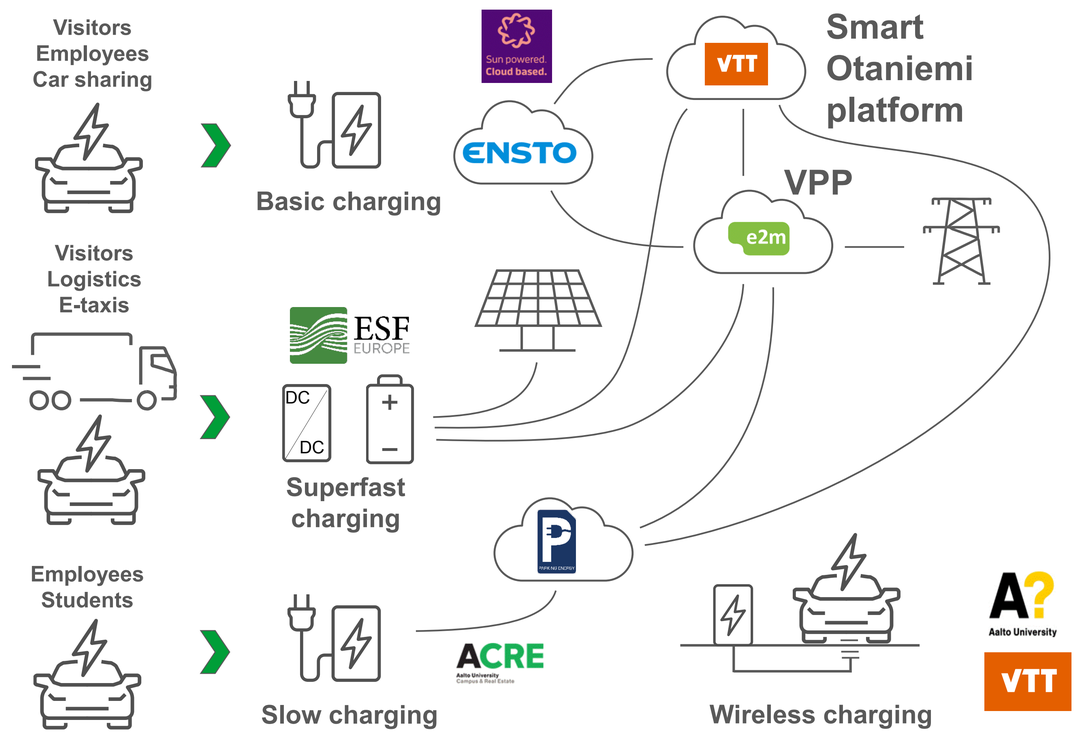
Large scale Electric Vehicle (EV) charging can potentially cause problems in local and distribution grids in the future, if the charging is unmanaged. Smart EV charging has potential to minimize the impact from electric vehicles. In addition, Smart EV charging enables an increase in use of renewable energy sources, such as wind or solar, by utilizing the electric vehicles as flexible consumers. Aggregation of EV charging can be a viable business for the electricity markets, but this has not been piloted yet in Finland.

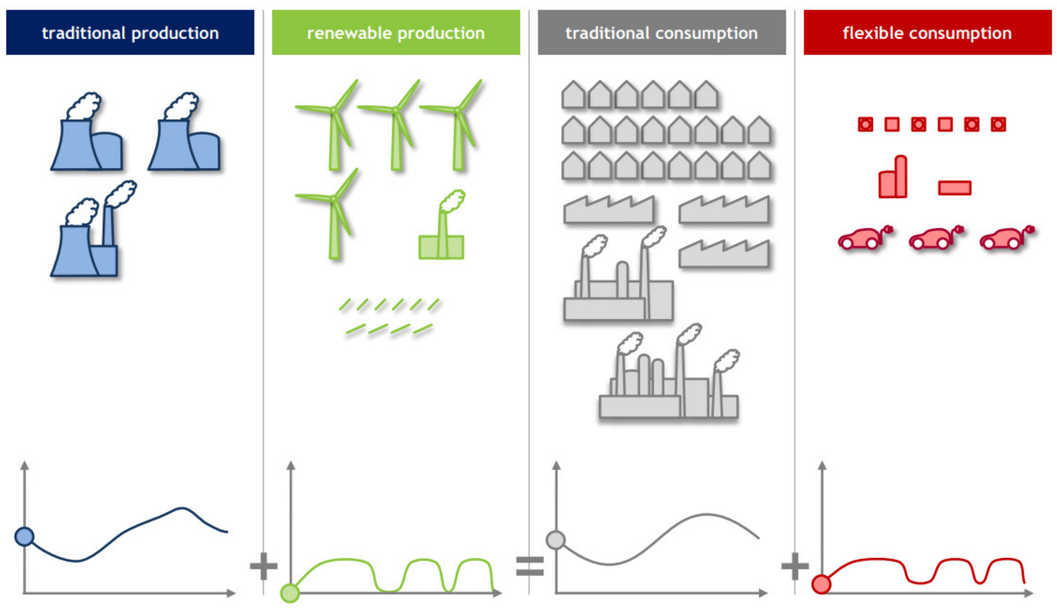
Goals

Smart EV charging pilot aims at creating a platform for testing of Smart EV charging in all levels – building, distribution grid and transmission system. We aim at piloting the aggregation of EV charging to Fingrid FCR-N market (Frequency Containment Reserve, Normal operations), and learn in the process about the requirements of the sub-aggregator and aggregator roles. Our goal is also to create a business model of the aggregation of EV charging. The pilot includes also new innovative EV charging methods.

Results

Initial results have shown the difficulties in engaging real estate owners and investors to invest in EV charging, as the pilot has been struggling to find possible piloting locations in Otaniemi. Charging aggregation pilots have been agreed to be performed in other geographical locations, but the work will continue to create the test platform also in Otaniemi. An initial plan is to be ready for the electricity market bidding by the end of 2019. Work is on-going to pilot three different innovative EV charging systems, including wireless charging for light and heavy duty vehicles, and superfast charging system with an integrated battery.





Picture: EnergyVille, ”What is the potential of EV flexibility in the current electricity market?”, 2017

Example

150 EV's charging @ 6.6 kW => 1 MW controllable load

Pilot partners

ENSTO · PARK NG ENERGY · e2m · Aalto University · ESF EUROPE · MOVEKO · Sun powered. Cloud based. · VTT

Contacts:
Marko Paakkinen
Senior Scientist, Certified Project Manager
Tel. +358 40 183 0255
Email: marko.paakkinen@vtt.fi