The EDISON project

(**E**lectric vehicles in a **D**istributed and **I**ntegrated market using **S**ustainable energy and **O**pen **N**etworks)

Electric vehicles (EVs) provide a unique opportunity to reduce the CO2 emissions from the transport sector. At the same time, EVs have the potential to play a major role in an economic and reliable operation of an electricity system with a high penetration of renewable energy. EVs will be a very important balancing measure to enable the Danish government's energy strategy, which implies 50% wind power penetration in the electric power system. An EV will be a storage device for smoothing power fluctuations from renewable resources especially wind power and provide valuable system services for a reliable power system operation. With the proper technology the cars can run on wind power and at the same time enable an increased share of RES in the power system for supply of the conventional electricity demand, and thereby, provide an overall economic, reliable, and sustainable energy system.

Denmark does not have a car industry, and the Danish background for development of EVs themselves is limited. On the other hand Danish companies and research institutions have a very strong knowledge and competence regarding design, development, and operation of power systems with high penetration of distributed generation. Furthermore, Danish industry is involved in technologies, which are critical to a widespread use of EVs such as strategy for optimised battery charging/discharging, and power electronics related to battery charging/discharging. This forms an ideal base for development of systems and integration solutions for EVs.

The Danish competence can be utilised to develop optimal system solutions for EV system integration, including network issues, market solutions, and optimal interaction between different energy technologies. Furthermore, the Danish electric power system provides an optimal platform for demonstration of the developed solutions, and thereby, provides the commercial basis for Danish technology export. Furthermore, the advantage of being a "first mover" constitutes a business advantage, as well as, a possibility of a strong Danish influence on future standards for system integration of EVs, whereby optimal utilization of the EVs in the power system is obtained.

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