



PROPOSED TITLE

Smart Charging of Electric Vehicle Batteries for Load Balancing Strategies

BACKGROUND

Sweden has made progress in recent years towards a more secure, sustainable energy future. The country has an almost carbon-free electricity supply and has phased out oil use in residential and power sectors. Now Sweden must take concrete steps to realise its vision of a fossil-fuel-independent vehicle fleet by 2030 and no net greenhouse-gas emissions by 2050. Achieving this will have a direct impact on our urban energy systems as we know them today, with increasing complexity, decentralization and diversification of the energy sources.

Electric vehicles are key towards a decarbonized transport sector. However, their increased adoption might lead to capacity shortages due to the augmented load and consumption in the grid. One promising solution to the previous issue is to implement load balancing strategies such as smart charging and discharging of the vehicle batteries. The latter one has the potential to serve the electricity needs of buildings during peak-price hours. The aim of this project is then to demonstrate load shifting with help of stationary batteries and electric vehicles for residential buildings in Sweden.

GOALS

The overall objective of this project is to be able to model different scenarios for load balancing strategies on electric vehicles taking into consideration the relevant technical and economic aspects surrounding the topic.

MAIN DELIVERABLES

- Final project report and presentation comprising description of project, implementation of models, their validation assumption and final suggestions
- Flexible model: scripts, user guidelines / instructions.

LOCATION AND DURATION OF THE PROJECT

The project is to be performed at the Department of Energy Technology at KTH Stockholm Campus. The project should start in January 2018 and is expected not to exceed **6 months**. Specific starting date to be discussed.

SUPERVISION AND CONTACT

Main Supervisors

Monika Topel, PhD – *Post-doctor*

Examiners

Björn Laumert, PhD – *Associate Professor*

Apply by sending your CV, motivation letter and grades to: topel@kth.se