Scheduling, Infrastructure, and Standards of Electric Vehicle Charging Stations

Description

In this thesis the student will be conducting a literature review in the modelling and optimization of electric vehicle charging stations, finding an appropriate problem to solve, and implementing this in Python or Matlab.

Electric vehicles are becoming a more common choice in transportation however long distances can be a challenge due to their limited battery life. This can be mitigated by setting up charging stations, however the infrastructure, profitability and ecological benefits are not entirely understood and modelled yet. There are many parts of this problem that can be focused on, such as:

- Modelling the ecologic benefits of electric vehicles and charging stations (electric vs. fuel, battery usage, 2nd life batteries, renewable energies)

- Modelling the energy market

- Scheduling the charging of the energy storage system while taking the battery capacity fading and the peek energy times into consideration

- Charging technologies and standards

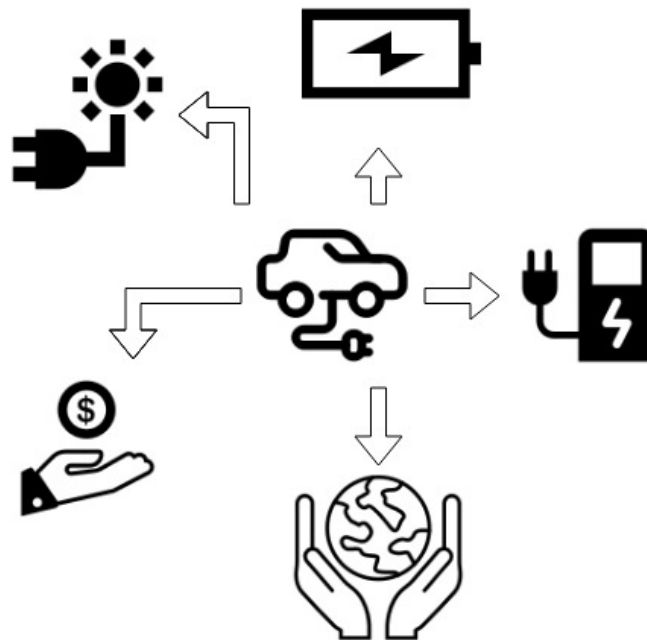- Choosing an energy storage system (batteries, electrochemical systems, etc.)

Figure 1: Electric Vehicle Charging Stations

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