

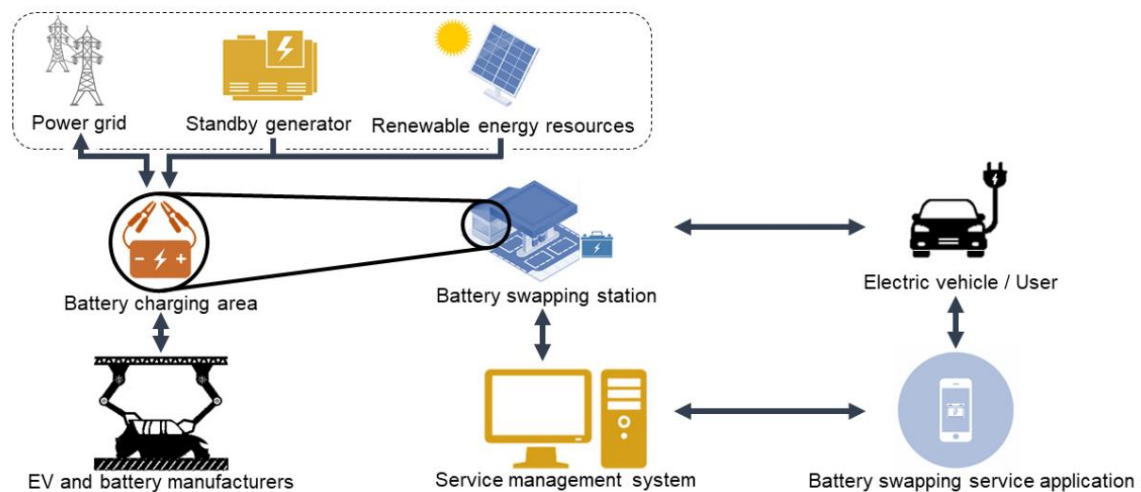


Remote Battery Swapping Station with 3 Multiple Energy Sources using Cost Optimization Algorithm



Short introduction about the work

This research assesses the selection and the performance of a cost optimization algorithm for the energy management of a battery swapping station, which is a business venture that is capable of replacing the depleted batteries of electric vehicles with a charged battery. Battery-swapping station discussed in this method consists of multiple energy sources, and an IoT platform, an adequate number of replaceable batteries, wherein IoT platform collects electric vehicle data such as SoC, SoH, electric vehicle location, and other user data which is used for the data analysis. Formulation of an objective function, calculation of minimum battery threshold required by the battery swapping station based on the worst-case scenarios, two optimization algorithms based on the objective function, and two prediction models to predict the demand was developed to optimize the energy management of the battery swapping station. Case studies representing real-life scenario are used to analyse the efficiency of each algorithm.



Key results

The final design come up with

1. The mechanism designed such a way that the battery can be replaced within minutes
2. For the sliding mechanism the bearings which is mounted on a fixed axis shaft were used, that can slide the battery smoothly, while replacing the batteries
3. And for the electrical connection, the Anderson connectors were used that can support up to 175A
4. The user can load the batteries to the swapper using a TROLLY
5. The two batteries are connected in series to deliver 24V to the three-wheeler
6. And this is how the Anderson connector is connected in the battery casing

Beneficiaries of the research (optional)

Sellers, consumers, industry partners, responsible government authorities, and persons who are engaged in research and development purposes.

Research team

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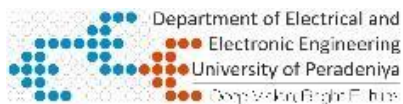
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