

NETWORK ARCHITECTURE FOR INTEGRATING MICROGRIDS & ELECTRIC VEHICLES



INVENTION

Battery charging for EV vehicles is by nature not quick as filling up a gas tank. The cost and time spent on charging depends on various factors, majorly, type of battery and type of chargers. This invention designs network architecture for allotment of optimal charging stations for electric vehicles (EVs) based on Software Defined Networking (SDN) in a smart-city environment. This method combines several optimization models which incorporate parameters like trading energy, total response time, traveling distance, current charging levels, discharging rates and energy price

MARKET SIZE AND GROWTH

2.2 million electric cars were sold in 2019 and this number tripled to almost 6.6 million cars in 2021, representing close to 9% of the global car market¹.

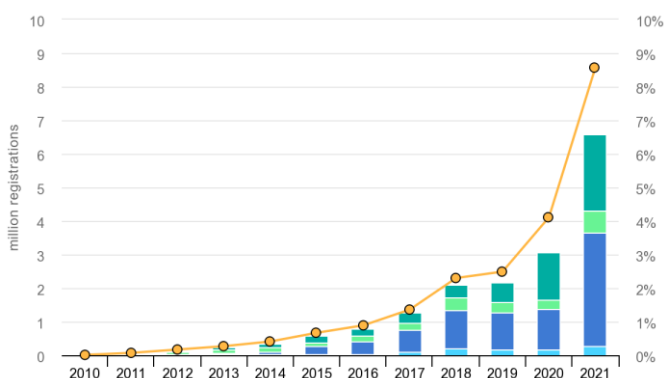


Figure 1 Global sales and sales market share of electric cars, 2010-2021¹

This explosive growth will lead to a corresponding increase in infrastructure for EV charging stations. The charging station market globally is expected to grow to 14,623 units by the year 2027 from 2,354 in 2022²

APPLICATIONS

This invention has applications in

1. Optimizing charge times for EV batteries.
2. Maximize savings for owner of EV vehicles.
3. Integration of various charging station in one application.
4. Optimal usage of charging infrastructure.

ADVANTAGES

- Optimization algorithm has factored in real world parameters
- Reduced charging cost to consumer while maximizing the number of vehicles charged by charging stations

PROJECT STATUS

- Optimization simulations has been run on real datasets from an electrical utility company and simulated in an urban city-like environment.
- Preliminary software based on Matlab has been developed.

LOOKING FOR DEVELOPMENT PARTNER

KFUPM would like to talk to companies that are interested in developing this method and apparatus.

- Comparison of the technology with state-of-art in the industry.
- Techno-Economic analysis needs to be performed.

PATENT PROTECTION

A patent application covering this method and apparatus is in progress.

ABOUT KFUPM

KFUPM was established in year 1963 and is located in Dhahran city of Saudi Arabia. KFUPM currently ranks at 186 in QS World University Rankings 2021.

For further information please contact
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¹ IEA, Electric cars fend off supply challenges to more than double global sales

²Research & Markets, Global Electric Vehicle Charging Station Market (2022 to 2027).