

The future of e-mobility

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As the world is running towards decarbonization, e-mobility has become a leading trend and an increasing number of companies strive to become a player in this market.

On April 5th, 2022, THINX was invited to talk at a webinar organized by LES Italy on e-mobility during which we mainly discussed about technical issues, as several companies required us to assist them in securing their inventions in this field.

Drivers' fear not to have sufficient energy to cover the road distance needed to reach their destination is limiting e-mobility market, therefore companies are looking for new solutions pushing innovation to solve the range anxiety issue.

However, the solution cannot be only increasing the number of batteries or their capacity. In the last years, companies pushed on innovating charging stations to provide more power and reduce charging time. Just think that in 2013 charging stations provided only 2x3,5 kW, while the new DC HPC systems provides up to 350 kW.

Increasing the power provided by charging station, nevertheless, causes collateral problems to fix i.e., charging cables must be refrigerated, vehicles batteries must be able to support such an amount of power. Companies like Tesla have therefore patented different solutions to refrigerate the cables, to improve communication between charging station and vehicle to regulate and optimize the power provided.

Moreover, as the number of charging points increases, additional problems arise connected to the balance of the electric grid. Patents have been granted to fix these challenges and different solutions thought.

Other companies have overcome the obstacle of range anxiety from a different point of view: i.e., to avoid fast charging and to provide centers able to swap a low battery with a charged one. Solutions have already been tested on field but there's a need for standardization of batteries and battery housings on vehicles of different brands.

A further possibility is wireless charging, a technology that allows to charge vehicles batteries while the vehicle is moving. The idea is per se quite simple: a wireless power transmitter transmits an electromagnetic wave that is received by a receiver placed on the vehicle. The receiver gets the electric power and charges the batteries. However, the technical implementation raises several concerns: e.g. transmitters shall be placed on the road, generally below special concrete layers, in order to resist to the weight of the vehicles; they should be activated only when the vehicle is reaching in order not to waste energy; wrong power levels can cause overvoltage damaging the vehicle's battery.

Independently from which charging solution we consider (battery swapping, fast charging, wireless charging), there's a need for improving vehicle's communication capabilities. Vehicles and charging operators will need to be in close communication for a driver to find a charging point that is free and is on the road to the driver's destination. Charging stations will need to communicate with a control center and with the vehicles both to balance the network and to provide information on their charging status.

In conclusion, e-mobility is crucial for the world we want for our children but there are still many technical problems that are faced by companies. We can therefore expect e-mobility will make huge steps in the next year and THINX will be there helping companies to secure their technical solutions.