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Beyond lithium ion battery, how the electrified and connected vehicles are creating waves of innovations

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The steady increase in oil prices and awareness regarding environmental risks due to carbon dioxide emissions are promoting the current interest in electric vehicles (EVs). However, the current relatively low driving range (autonomy) of these vehicles, especially compared with the autonomy of existing internal combustion vehicles, remains an obstacle to their development. We will discuss in this presentation the contribution of range calculation and network modeling in order to help EVs' drivers to enhance their utilization of EVs in a good way, by reducing time waste and cost. Indeed, beyond the capacity of the current batteries, the drivers of EVs could plan, a priori, their different missions or trips through simple interfaces.

In addition, we will introduce some open research questions such as the management of battery charging/exchanging stations; the management of electric grid; the ability to level energy demands on the energy network; the management of interfaces with customers; the complex economic equation and business models and taxes related to EVs; etc. Indeed, beyond the energy and ecological issues, EV programs are yielding waves of innovations and job opportunities. Many key actors or stakeholders in the EVs' ecosystem are involved in the implementation of infrastructures and associated services. The knowledge of all stakeholders surrounding the EVs throughout their whole lifecycle is important. For each of these stakeholders, the knowledge of his expectations and needs helps greatly in well designing the EVs and associated services in order to best integrate them sustainably in their environment. These stakeholders should probably cooperate and join unique structures, where each contributes with his own competence to meeting the EVs' success. We assist today at many emerging partnerships between EVs' manufacturers and energy companies, telecom companies, parking owners, etc.

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