

Optimal planning and management of electric vehicles and charging stations

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Submission code: 8xran

Electric Vehicles (EVs) are rapidly increasing all over the world as a consequence of the strategies at international level to reduce greenhouse gas emissions. This new type of vehicles will have a huge impact on the power network because they represent very large loads often aggregated in the same area. New technologies, like the Vehicle-to-Grid (V2G), i.e. the possibility for the vehicle to inject become a prosumer injecting power into the network, and Smart Charging (SC) are some of the best solutions to handle these kinds of problems, in order to have secure and reliable systems and provide ancillary services to the distribution grid (like demand response (DR) and reactive power regulation). In this scenario, the figure of the electrical vehicles aggregator (EVA) represents a new retail market participant that can provide regulation services to the distribution grid. Moreover, the operational management of EVs in a smart grid should be integrated with the optimal planning and positioning of the Charging Stations (CSs), which can deeply modify the transportation network and lead to important operations on the electrical grid.

The proposed Open Invited Track will seek contributions related to models, methods and technologies for the optimal planning and management of electric vehicles and charging stations. Theoretical methods, algorithms, and tools, as well as validation using real case studies through high fidelity simulations, will be considered. The topics of the proposed Open Invited Track are specifically related (but not limited to) to the following methods and application areas:

- Optimal management of EVs in Smart Microgrids
- Optimal scheduling of EVs charging process
- V2G management of a smart grid
- Participation of EVs Aggregators to retail market
- Demand response of aggregated EVs for distribution grids
- Power management of EVs charging stations
- Routing of EVs fleets
- Optimal planning of charging stations in a territory
- Demand assessment for electrical vehicles.