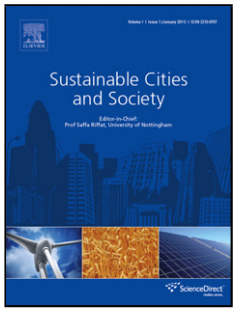

Title: Stochastic Charging of Electric Vehicles in Smart Power Distribution Grids

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Stochastic Charging of Electric Vehicles in Smart Power Distribution Grids

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Highlights

- Electric vehicles charging impact on distribution grid is assessed.
- The temporal characteristic of electric vehicle loads is considered.
- Price based smart charging is performed for EVs owner ensuring congestion.
- This methodology ensures the stability of distribution network.
- We used a scenario-based method to deal with the uncertainties that involved.

Abstract—

This work investigate the substantial factors that impact a consumer's choice with regards to the electric vehicle reception. There are numerous viewpoints that rely on the selection of the electric vehicle. Henceforth, social and additionally psychological components have a place with the center choice of the selection. In this work, authors have managed the area enveloping the distinctive hypotheses that can anticipate the conduct of the purchasers.In this paper, the impact of different electric vehicles charging methods on distribution grid is assessed. This comparison is based on reduction of network peak load demand and improvement in its operating condition in perspective to voltage violations. In another charging strategy, wind power flow and resulting variation in electricity price is considered with stochastic availability of electric vehicles, i.e. arrival and departure times. Then, the charging cost is optimized (minimized) and consequently the resulting network constraints are evaluated by performing simulations. Further, in study the improvement in integration of the electric vehicles with modification in network, i.e. reformation is also suggested.

***Keywords* —Electric Vehicles, Distribution Grid, Greedy Charging, Smart Charging, Smart Grids, Feeder Deformation**

Notations:

S_{bd}^{i}	Complex demand of base load
S_{EVd}^{i}	Complex demand of electric vehicle
S_{d}^{i}	Total demand at each node
PI_P	Performance index with respect to active power