

Gridable (Plug-in) Vehicles - Smart Grid Integration

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Smart grid consists of conventional generations, wind, solar and gridable vehicles (GVs). Intelligent optimization methods results in reduction of cost of energy and emission. GVs operate in two modes: grid-to-vehicle (G2V, loads and storage), and vehicle-to-grid (V2G, sources). 'Smart parks with GVs' are as virtual power plants consisting of several small portable power plants (vehicles).



Dynamic load leveling is better than static load leveling
Transaction of GVs are handled by intelligent automatic agents
Smart grid with renewable energy and GVs is promising for emission reduction



- A. Y. Saber and G. K. Venayagamoorthy, "Intelligent unit commitment with vehicle-to-grid A cost-emission optimization," *Journal of Power Sources*, vol. 195, no. 3, pp. 898-911, Feb 2010.
- A. Y. Saber and G. K. Venayagamoorthy, "Efficient utilization of renewable energy sources by gridable vehicles in cyber-physical energy systems," [Submitted].
- A. Y. Saber and G. K. Venayagamoorthy, "Plug-in vehicles and renewable energy sources for cost and emission reductions," [Revised].