Light Electric Vehicles - Charging Strategy and Implementation

Suddhasatta Kundu

Senior Manager (Technical Advisory) - India Smart Grid Forum

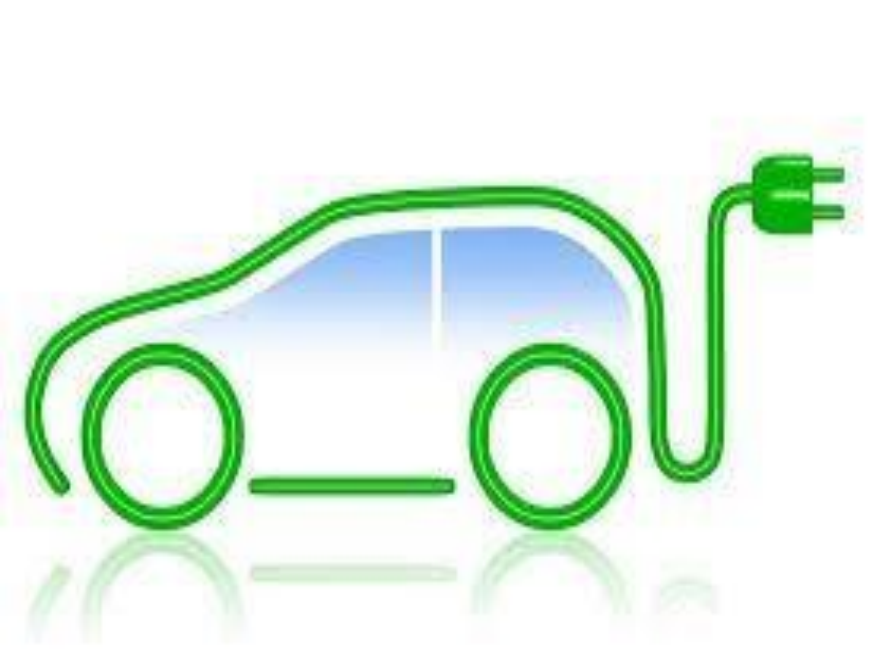
About ISGF

- *A Public Private Partnership initiative of Ministry of Power, Government of India*
- *Responsible for accelerated development of smart grid technologies in the Indian power sector*
- *200+ members comprising of ministries, utilities, technology providers, academia and research*
- *Evolved as a Think-Tank of global repute on Smart Grids and Smart Cities*

Key projects – Electromobility

1. Establishment of Charging Infrastructure for Deployment of Electric Buses in Kolkata
2. Planning Electric Vehicle Charging Infrastructure in Bangalore City
3. Study on Infrastructure and Enabling Environment for Road Electric Transport in SAARC Member States
4. Implementation Roadmap for Electrification of Public Transportation in Kolkata
5. Conducting a Feasibility Study on Introducing Electric Vehicles in the Indian Sundarbans
6. Preparation of RFP and Operators Agreement for WBTC for Procurement of Electric Buses
7. Study of Smart Grid and Electric Vehicle Market Scenarios in India
8. Electric Vehicle Charging Stations Business Models for India
9. Study report on Electric Vehicle Policies and Electricity Tariff for EV Charging in India

Which should come first ??



or

Key push factors – Consumer preference, Electrical network, Charging requirement, Charging tariff – Need for public charging station

Charging infrastructure development – Key drivers

- *Policy and standards*
- *EV penetration*
- *Location*
- *Grid upgradation*
- *Battery characteristics of EV*
- *Charging time*
- *Charging tariff*
- *Service fee*

→

- Too many stakeholders
- Revenue??

Government initiatives

- 2636 charging stations in 62 cities
- 14 states have EV policies and more than 13 states have special tariff for EV charging
- Charging station at every 100 km on each side of highways
- 20% parking space for EV charging

Charger Type	S. No.	Charger Connectors*	Rated Output Voltage(V)	No. of No. of Connector guns (CG)	Charging vehicle type (W=wheeler)
Fast	1	Combined Charging System (CCS) (min 50 kW)	200-750or higher	1 CG	4W
	2	CHArge de MOve (CHAdeMO) (min 50 kW)	200-500 or higher	1 CG	4W
	3	Type-2 AC (min 22 kW)	380- 415	1 CG	4W, 3W, 2W
Slow/ Moderate	4	Bharat DC-001 (15 kW)	48	1 CG	4W, 3W, 2W
	5.	Bharat DC-001 (15 kW)	72 or higher	1 CG	4W
	6.	Bharat AC-001 (10 kW)	230	3 CG of 3.3 kW each	4W, 3W, 2W

EVSE Planning Tips

- Right Location: Choosing the right location to minimize capex (grid upgrades, right of way), convenience of customers, maximizing revenue, minimum land cost, expansion capabilities
- Right Sizing: Choosing correct size of EVSE – aligned with the charging needs and battery characteristics of the EVs in region
- Planning Studies: Need to conduct detailed modelling studies on the grid to assess the impact of EVSE before granting new connections to Bus Depots and Public Charging Stations (PCS)
- Right Business Model: Utility owned charging station, fleet operators, PSUs, bundling with highway cost or toll, provision for ancillary services etc.

Thank You

Suddhasatta Kundu
s.kundu@indiasmartgrid.org
+91-9674446886