Smart Charging & V2X

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Context: The Challenge

INTEGRATED ENERGY NETWORKS

Decarbonisation → Integration of Renewable Energy → Balance Generation - Demand → Storage

Challenge:
Uncertainty of availability of the flexibility provided by EVs

Electric mobility Deployment → Massive Energy Demand → EV Integration in the Grid → Mobile Energy Storage System

Annual demand for electric vehicles battery power (GWh)

Why it is important?

Economic savings related to:
- Investment in spinning reserves and stationary storage systems (Balancing)
- Investment in grid infrastructure improvements (Congestions)

Decarbonisation through electrification of transport and balance of energy system with high shares of renewables

Maintaining EV batteries durability and EV users comfort.

New incomes for EV users related to flexibility
Our Solution

- Flexibility Estimation Algorithmics
  - Routes Data
  - Forecast
  - User Preferences

- Smart Charging & V2X Technologies

- Charging Commands Optimization

- Comm: OCPP Protocol

- Costs: Battery degradation
- Incomes: LOSS / Load-shedding

- V2H Local Efficiency

- Solving grid congestions or unbalancing

- V2G Grid Stability

- Routes Data
- Forecast
- User Preferences

- Comm: OCPP Protocol

Main Advantages

Current energy storages (pump stations, big power Banks...) are more expensive to supply and require significant investments. As the number of EVs is continuously rising, electric cars provide a storage option with no extra costs.

When installing a charging device, step number one is to review the electrical system of the building. The electrical connection can become a hindrance to the EV charging installation project or increase costs significantly in case the connection needs to be upgraded.

The V2G concept can improve the performance of the electricity grid in areas such as efficiency, stability, and reliability. V2G vehicle offers reactive power support, active power regulation, tracking of variable renewable energy sources, load balancing, and current harmonic filtering.
Main Challenges

Battery Degradation
- Characterization of the effect of Charging / Discharging patterns
- Research in Advanced BMS

EV Users Comfort
- Routes Data
- Forecast
- User Preferences
- User Engagement APPs

Security Threats
- Cibersecurity Strategies
- ICT
Target Markets

### Different Target Users

- **Domestic Users**
- **EV Fleet Managers** - Aggregators
- **DSOs** - Energy Communities

### Different Income Sources

- **Peak-load management in buildings (V2H)**
- **Flexibility Markets** - Ancillary Services
- **Congestion Prevention** - Supply Quality
Gracias por su atención
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