Smart Charging & V2X with ISO 15118

EV Roadmap 12
ISO 15118: Secure communication

ISO 15118 specifies the secure digital communication between charger and electric vehicle.
Integration of the EV into the energy grid in order to enable a flexible load control and the provisioning of value added services without compromising the driving habits of consumers.

The ISO 15118 implementation of the intelligent communication enables implementation of Smart Charging functionalities.
Smart Charging Functionalities

ISO 15118 enabling smart charging beyond Plug&Charge?

• Integrate renewable energy integration into electricity offers
• Help with grid load leveling
• Enable cheaper energy based on time and other DER states
• Forecast the energy demand and optimize grid or microgrid utilization
• Provide time-variable tariffs
• Use non-moving vehicles for temporary storage
Use Case: Smart Charging

- Charging preferences – fast or cheap
- Cheapest possible charge rate
- Full charge by departure time
- V2G revenue stream

- Load management – Peak Shaving
- Load management – Demand Response
- Optimized charging and dynamic pricing
- Generation / Renewable energy integration

Smart Charging
Customer Driven

Smart Charging
Utility Driven
Use Case: Vehicle-to-Grid (V2G)

- Bi-directional energy flow
- Distributed Energy Resource (e.g. Vehicle battery as storage)
Smart Charging & V2X: Business Use Case

School Bus

- Bus starts morning fully charged
- Normal route use: 6-10am and 2pm-5pm
- Recharges between 10am-2pm with solar energy
- Stores and discharges between 5-10pm with remaining power (excess renewable power generated)
- Recharges with low cost night time power applying load shifting and shaping smart charging
- Results: grid gets renewable integration, bus operator charges on cheapest energy and makes money on V2G
Goods Movement

- Vehicles start morning fully charged
- Smaller battery means charging at both ends of round trip (optimized for energy costs, some storage)
- V2G discharge at end of shift
- Full charge overnight on cheap power
- Results: grid gets renewable integration, fleet operator charges on cheapest energy and makes money on V2G, possible public charging for cost recovery when fleet vehicles have not reserved plug
Complete Charging Ecosystem

Regardless of whether it’s AC, DC, Wireless, public or private charging, ISO/IEC 15118 provides a single standardized EV-to-EVSE interface and protocol. Only by standardizing an EV-to-EVSE protocol can large scale interoperability be achieved.
Thank you!

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