Grid Integration Architecture
Customer Energy Management System
Customer Energy Management System
Communication Architecture Overview

Charging Station = AC, DC or wireless | EMS = Energy Management System | SMGW = Smart Meter Gateway | BSI Communication | International Standardized Communication EMS, Charger, Vehicle
Customer Energy Management System

Vision 2030

EMS = Energy Management System
SMGW = Smart Meter Gateway
HVAC = Heating, Ventilation & AC

Charging Station = AC, DC or wireless
Common Consumers (e.g. TVs, lighting, …)
Device Backend

OEM Backend

Aggregator

Utilities

SMGW Admin Backend

Home Energy Storage
Other smart energy devices
HVAC

EMS

Charging Station

Plugin Electric Vehicle

Utilities

CPO Backend

OEM Backend

Device Backend
Only a single certified meter shall be required.

Energy/Grid market signals are received by the EMS (e.g. price/kWh & power availability over time).

Customers are offered incentives or bonuses for offering flexibility (e.g. adjusting household consumption or even feeding into the grid).

Flexibility shall be a positive experience for the customer (e.g. the required energy is received but at a lower price).

The EMS automatically determines the amount of flexibility offered by the customer based on their energy demands (e.g. is it possible to charge the EV later).

Ripple Control Receivers shall be avoided.
Customer Energy Management System

Communication Protocols in 2020
Focused on DE & US

Legend:
- IP based EMS protocol. Standardized to ensure interoperability
- ISO/IEC15118. Standardized to ensure interoperability between EVs and Charging Stations (incl. home and public charging)
- VGI/Smart Grid protocol. Standardized to ensure interoperability
- No Standardization or interoperability required. OEMs may use proprietary protocols

DE: EEBus
US: SEP

Optional

Device x
Device y
Device z

*Could be integrated into a single system or device with the EMS. Focus is on automation not energy management

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