

DOCKETED

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Vehicle-Grid Integration Communications Standards Workshop

CEC

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Mercedes-Benz

Why Have eV Sales Not Reached the Level of Success That We Have all Anticipated?.....

The Customer Experience.....

The Personal Use Customer

The Fleet Use Customer

Why Does Daimler Support the Standardization of ISO15118 in the US?

- 1: ISO – International Organization for Standardization
- 2: RFID – Radio-Frequency Identification
- 3: SEP2.0 – Smart Energy Profile 2.0
- 4: EV – ElectricVehicle

Why is ISO¹⁵¹¹⁸ so important?

- Customer Centric/user friendly eV solution
- Automatic Authentication
- Charging Convenience (No RF ID²s/Credit Cards etc)
- Contract Handling
- Active load management through EV feedback (Negotiation)
- Possible for both **Time-based** and **Tariff-based** charging process

Risk to OEMs if ISO¹⁵¹¹⁸ is not standardized

- EVs⁴ unable to negotiate/mitigate unwanted charge interruption
- OEMs will need to support three different communication protocols (SEP³2.0, Telematics, ISO¹⁵¹¹⁸)... Additional SW/HW development
- OEM development of protocol translator required
- Increased Cyber Security Risk over Multiple Links

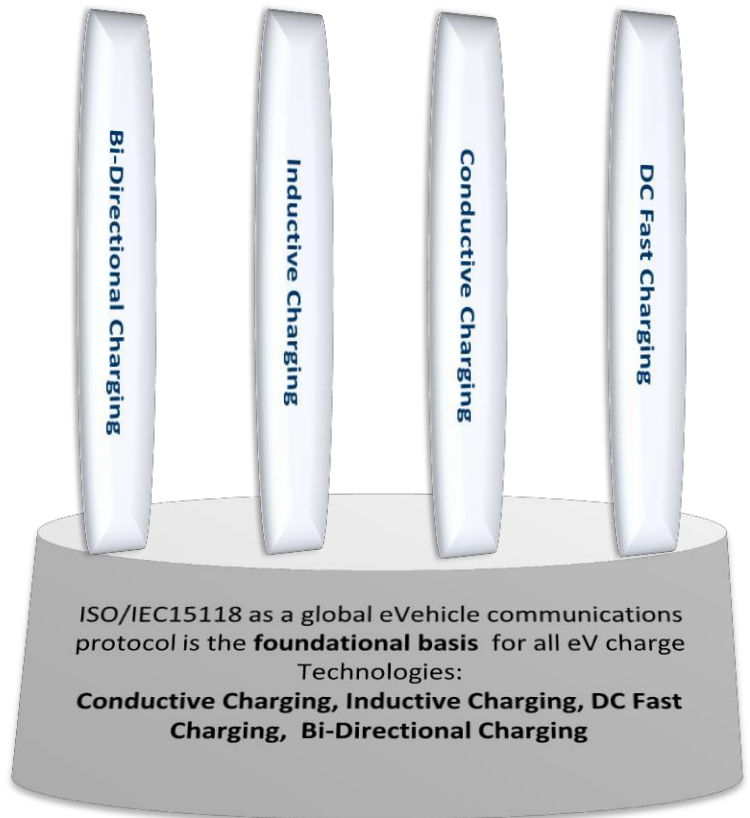
How to close the gap in the US

- Influence U.S. based OEMs , regulatory bodies, standardization bodies
- Demonstrate the benefits of ISO¹⁵¹¹⁸ to key stakeholders including competitor OEMs

Use Cases	ISO 15118	SEP ³ 2.0
Plug'n Charge	✓	✗
eVehicle Roaming	✓	✗
Optimized Load Management	✓	✓
Optimized Load Management for Fleets	✓	✓
Optimized Load Management with Renewable Energy	✓	✓
Optimized Load Management for Home Area Networks	✓	✓

✓ Fully Support
 ✓ Partially Support
 ✗ Does Not Support

ISO¹⁵¹¹⁸ vs SEP³ 2.0 from Use Case Standpoint



ISO 15118 is a Turn key Standard that Enables the Functionality in an eV that Will Drive an Improved eV Customer Experience
...ISO¹⁵¹¹⁸ offers a level of eV functionality that other Communications Protocols Do Not, and is therefore the most viable option for standardization in the US.

Official Statement from the Working Group „Electric Vehicle Grid Integration“

Which communications standard between the EVSE and the EV is preferred for load management and grid integration (VGI)?

- ▶ **The German Automotive Industry fully supports the use of ISO 15118 for AC and DC charging**
- ▶ The ISO 15118 may facilitate load management functions under multiple different business model structures centered around the vehicle
- ▶ Vehicles are gradually being fitted with ISO 15118
- ▶ We reject an expansion of PWM-Signals
- ▶ Even after the integration of ISO 15118 in AC charging points, AC charging based on the communication according to IEC 61851-1/ SAE J1772 and IEC TS 62763 should still be possible
- ▶ Edition 2 documents of the ISO 15118-2 are currently being edited and are expected to be published in 2018



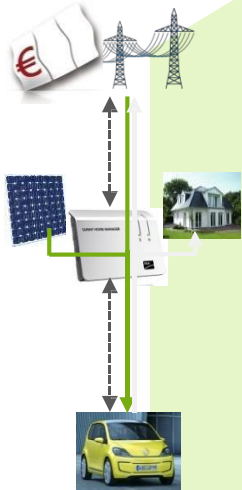
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Electric Vehicle Grid Integration

Premises for the grid integration of BEV and PHEV

- The premises for the highest level of integration of BEV and PHEV have been agreed upon across brands and manufacturers.
- Future business models and customer functions resulting from them, are to be related to this framework and these conditions.



The vehicles are **not controlled** by the grid operators/energy provider/HEMS/charging station without the agreement of the user

The grid operator/energy provider/HEMS sends **monetary incentives** to the vehicle specific to the business model utilized.

The **decision** to charge/to discharge lies with the **vehicle**

The charging management decision is determined by mobility conditions (departure parameters, battery status, etc.) and informed by grid/facility conditions (market energy prices, local distribution impacts, etc.)

Energy demand and grid performance data of the vehicle can be captured by the vehicle, an additional metering device is not needed.

A **central server** through which the charging relevant information flows can utilize 15118 communication functionality to support innovative ways to engage customers and utilities in grid services



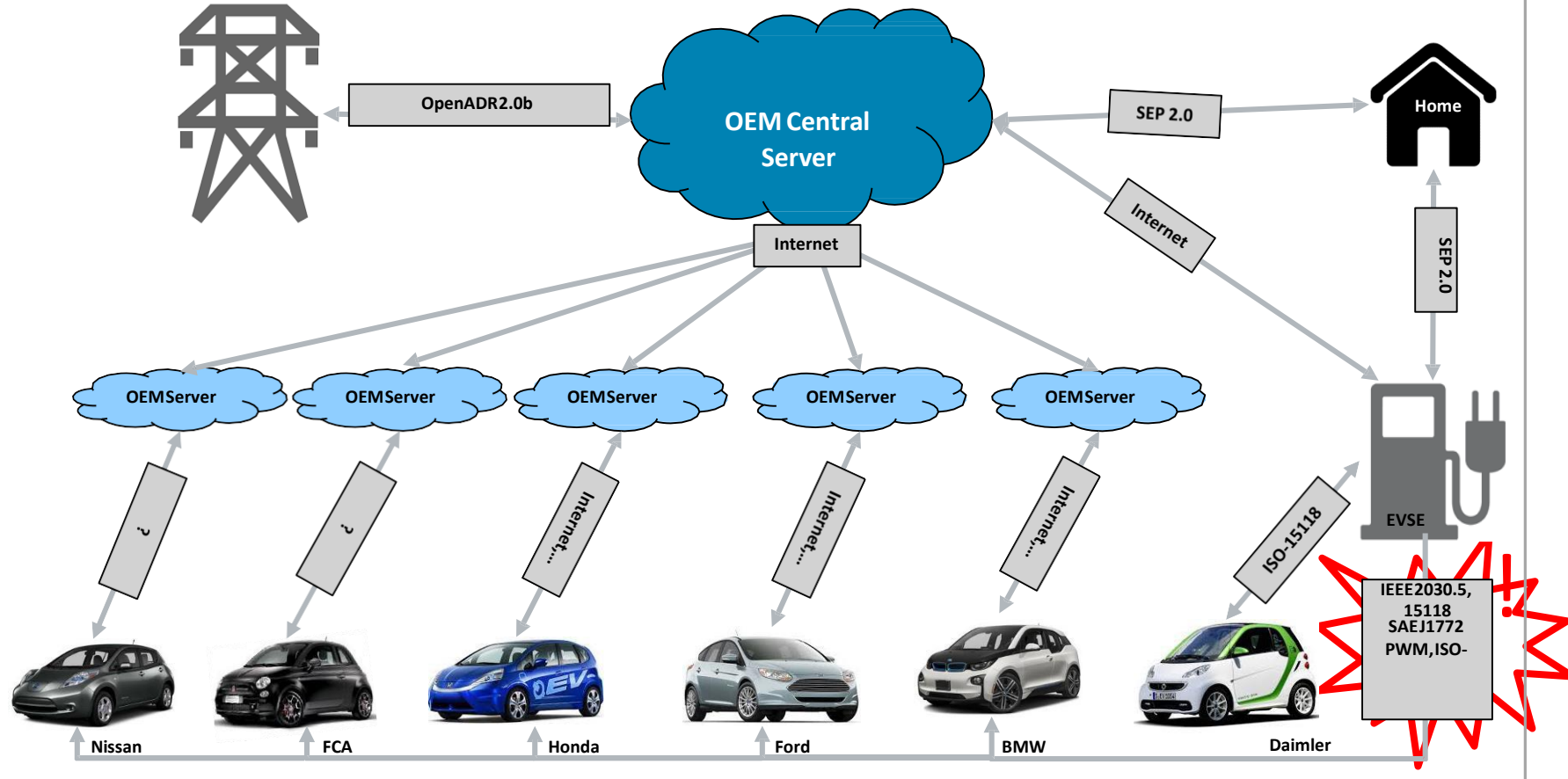
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The OEM Central Server (OVGIP) can Co-exist with Multiple Communications Protocol Links to the EVSE

➤ Currently EV to EVSE interfaces are planned based on following standards:

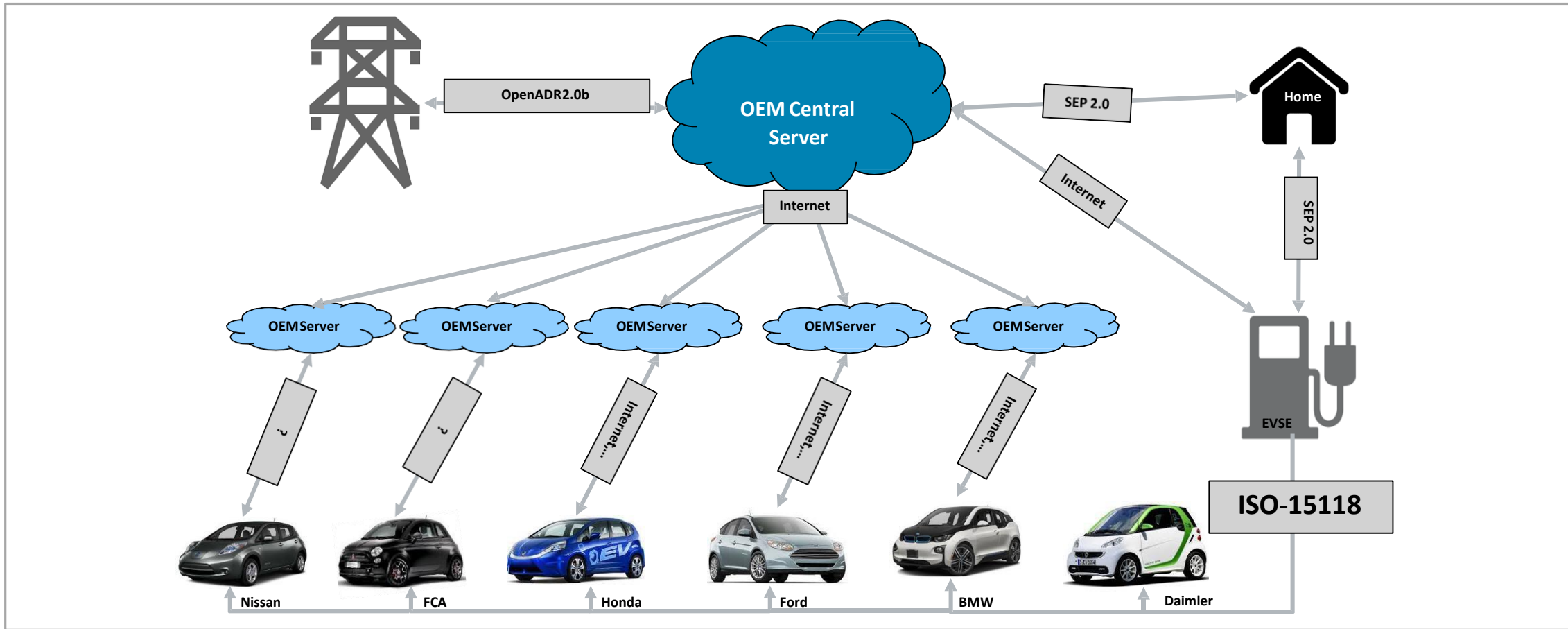
- IEEE 2030.5 (SEP 2.0) [Zigbee, WLAN, PLC]
- OpenADR 2.0b
- ISO15118



However:

3 different Interfaces, i.e. Telematics, SEP 2.0 and ISO-15118 would greatly increase infrastructure design complexities for EVSE manufacturers and also increase Cyber Security Risks for all stakeholders

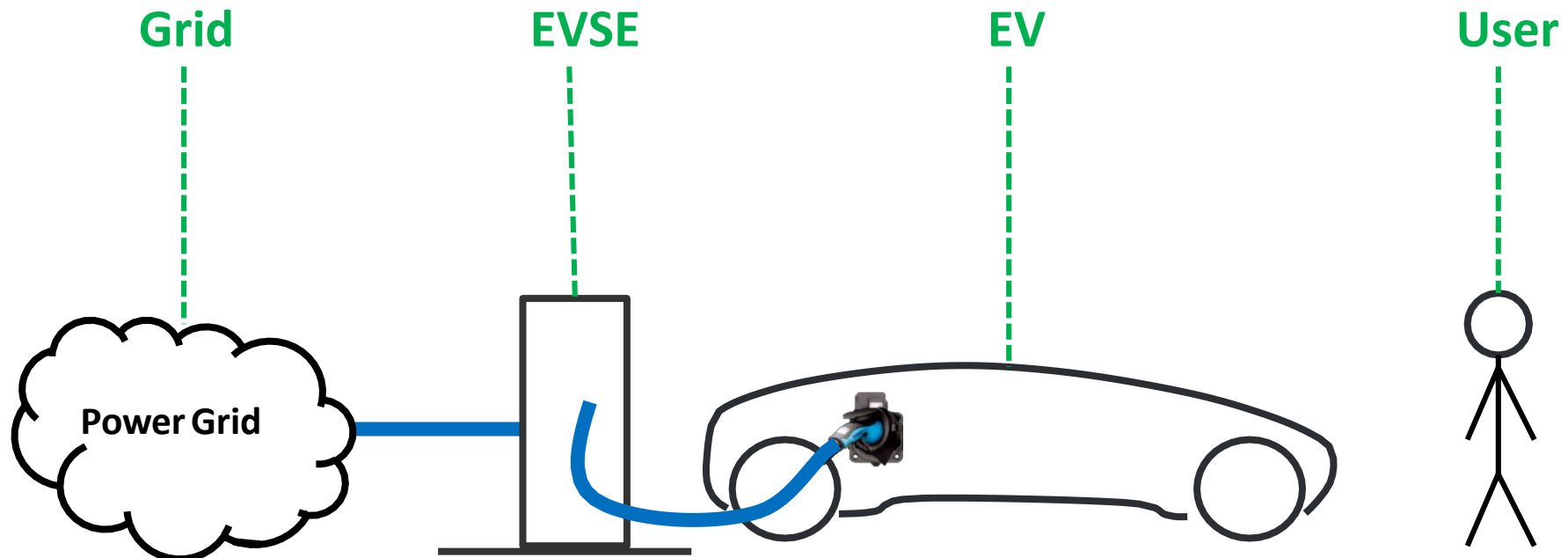
A simplified EV-EVSE interface ensures a more secure, less complex interoperable infrastructure design: The September 2016 CPUC Ruling



Daimler Supports the September 2016 CPUC Ruling

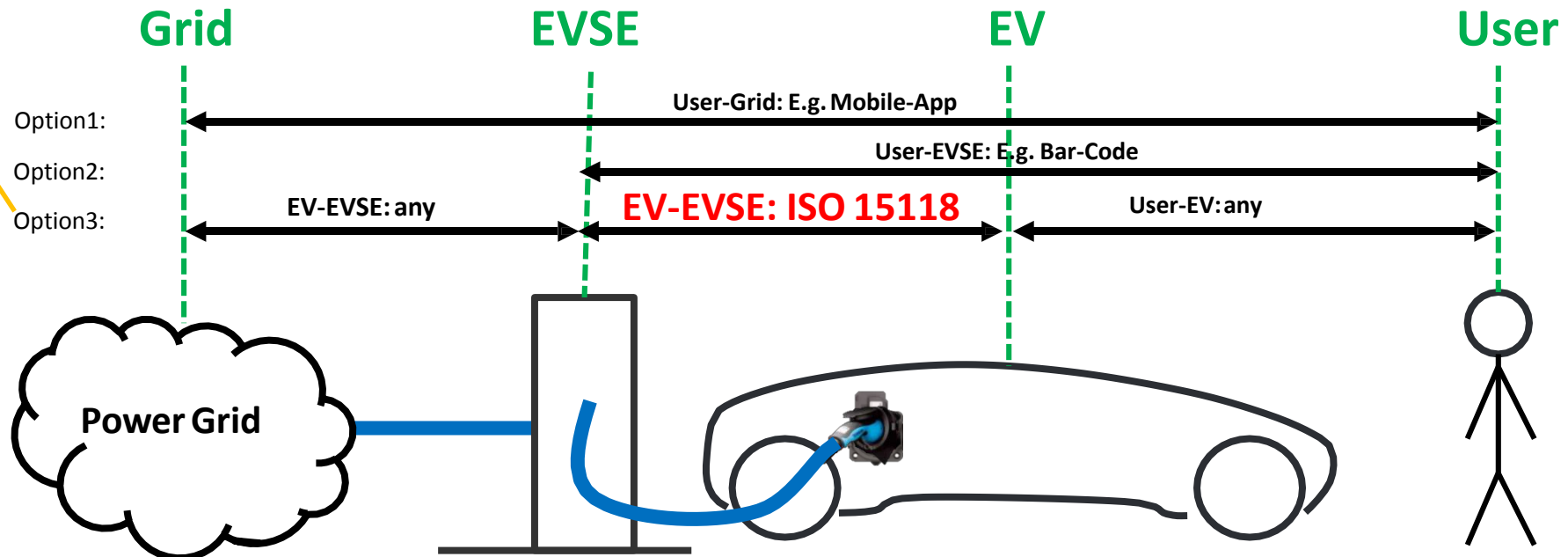
Problem: What to Standardize?

- Information Exchange requires different interfaces
- Which communications protocol should be standardized ?

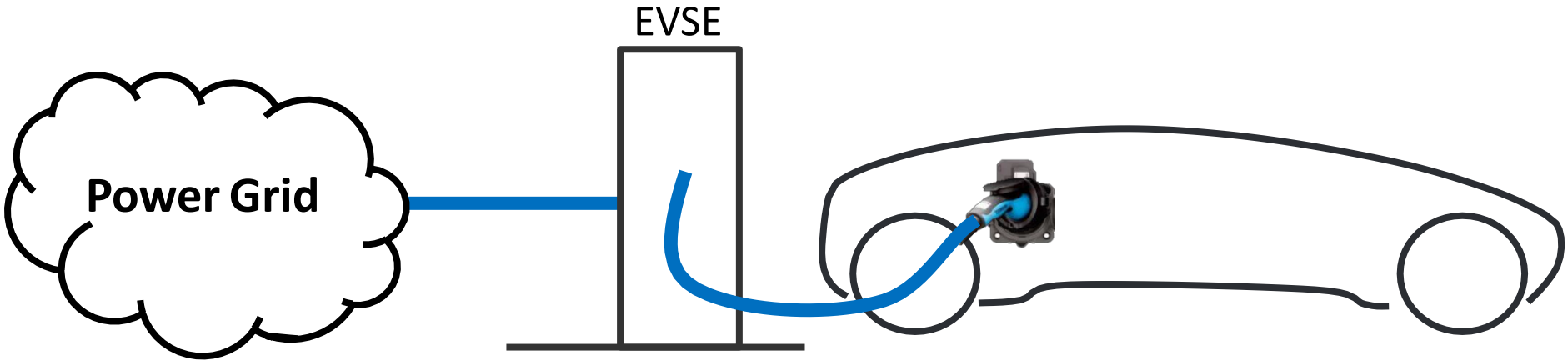


Solution: Standardized Communication Link Between the EV and the EVSE

- OEM: Any protocol, Individual user interface, Individual look and feel for user
- Utility/Network Provider/Mobility Operator: Any protocol



Turn Key Solution: Plug n Charge, eV Authentication, Grid Load Management



I can deliver 22kW →

← Here is my ID for authentication/ payment

OK, the ID is valid, please go ahead →

← Please provide 12kWh for charging, I will leave at 9am

I can provide 10kW and for 3ct/kWh from 1pm to 8am →

← Ok, I will adjust my plans. & charge at 6kW from 3am to 5am

Turn Key Solution =

Improved Customer Experience = Broader Acceptance of eVs in the US Market

ISO 15118
Enables
The Desired Customer Experience.....
via

Standardized Communication Between the eV and the EVSE

Thanks for Your Attention