

AFIR & OCPP

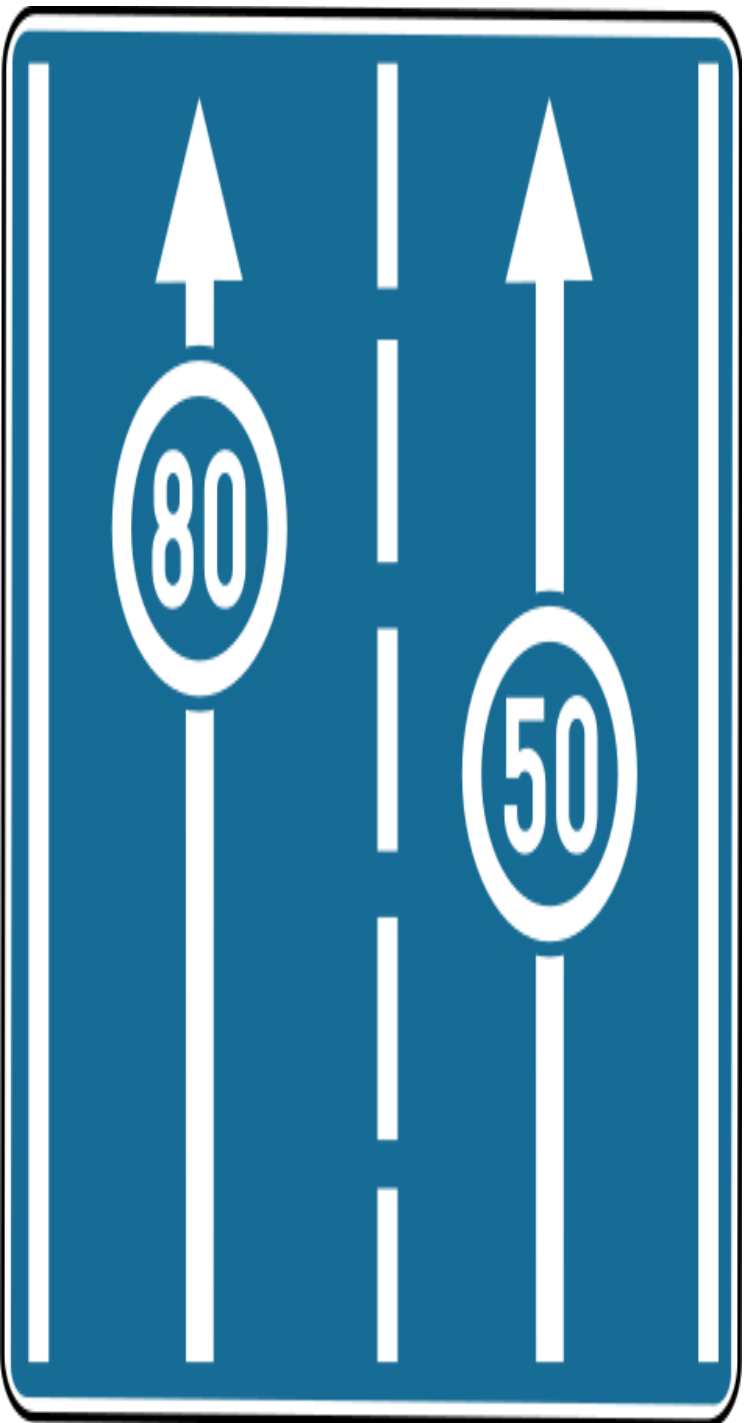
Franc Buve
January 9th, 2024

www.OpenChargeAlliance.org



AFIR

- Alternative Fuels Infrastructure Regulation in EU
- Regulation of
 - charging infrastructure
 - hydrogen infrastructure
 - liquified methane (for trucks)
 - shore-side electricity & hydrogen in ports
 - shore-side electricity for aircraft
- Into force as of April 13, 2024

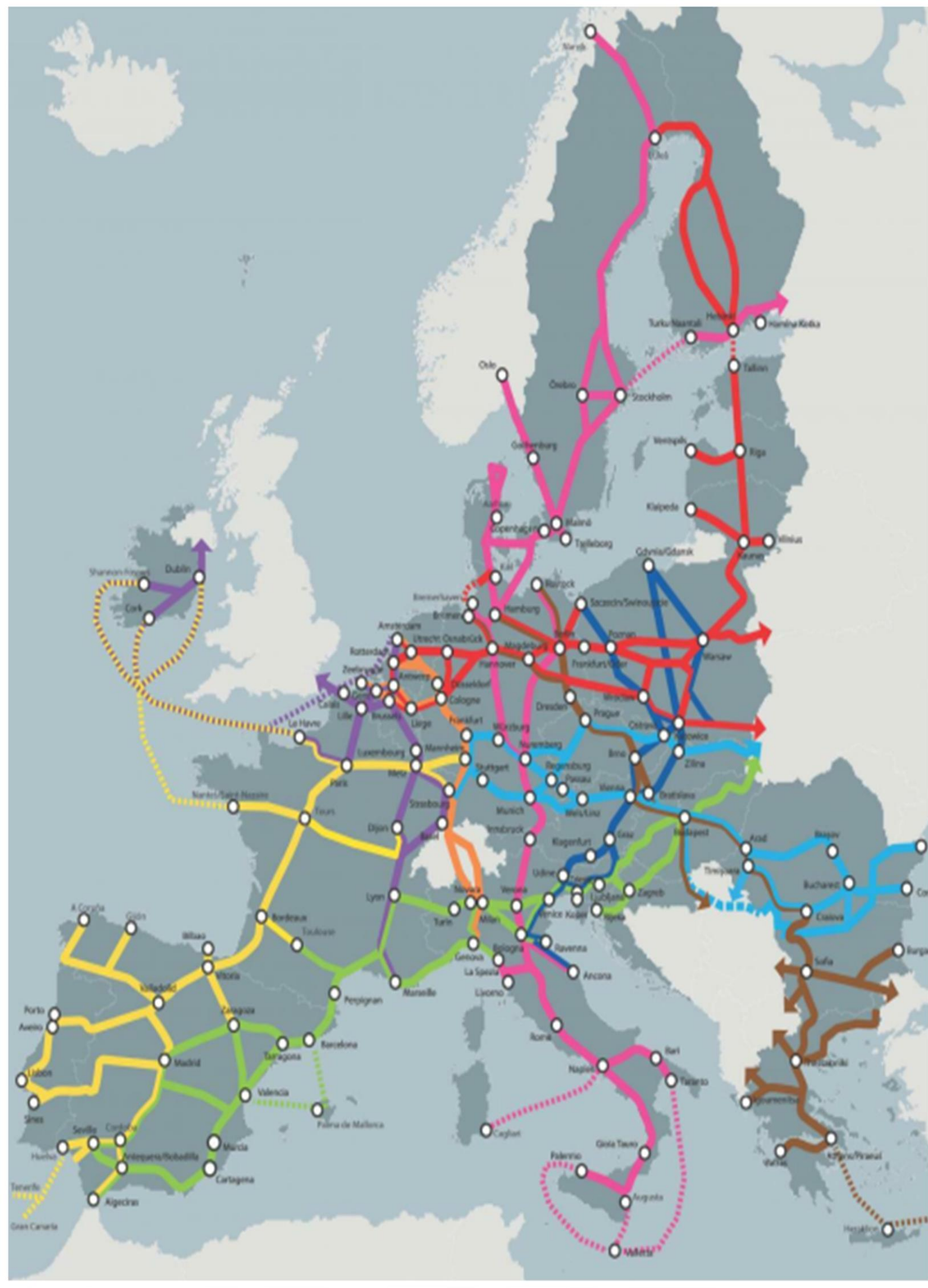


AFIR articles

- AFIR consists of 26 articles.
- Relevant for charging infrastructure are:
 - 3 Targets for recharging infrastructure dedicated to light-duty electric vehicles
 - 4 Targets for recharging infrastructure dedicated to heavy-duty electric vehicles
 - 5 **Recharging infrastructure**
 - 20 Data provisions
 - 21 Common technical specifications



Article 3 & 4 – Targets



- **Light-duty EVs:**
Across TEN-T core road network **every 60 km** a charging location with:
 - (end 2025) over **400 kW** in total, at least one 150 kW EVSE.
 - (end 2027) over **600 kW** in total, at least two 150 kW EVSE.
- **Heavy-duty EVs:**
Across TEN-T core road network **every 60 km** a charging location with:
 - (end 2027) half length of network with over **2800 kW** in total, with at least two EVSEs of 350 kW.
 - (end 2030) same for full length of network.

Article 5 – Recharging infrastructure

Ad hoc payment



- Publicly accessible charging stations must support ad hoc payment.
- EVSE \geq 50 kW must accept payment cards via internal or outdoor payment terminal.
- EVSE $<$ 50 kW may rely on mobile app or website, e.g. via QR code.
- Customer must be able to overrule automatic authentication, e.g. AutoCharge or Plug&Charge.

Article 5 – Recharging infrastructure

Pricing

- Pricing must be non-discriminatory.
- Ad hoc price must be based on kWh delivered.
 - may contain an idle fee as price per minute.
- For EVSE \geq 50 kW: price shown on display of EVSE.
- For EVSE $<$ 50 kW: price shown somewhere visible.
- No requirement to show a running cost on display.
- MSPs must show their prices in own app/website.
- No extra charges for cross-border e-roaming allowed.



Article 5 – Recharging infrastructure

Connectivity and smart charging

- All public charging stations must be digitally connected (as of Oct-14, 2024).
- All public charging stations must be capable of smart charging.
 - new stations as of Apr-14, 2024
 - renovated stations as of Oct-14, 2024
- No details on how smart charging is performed or which roles are involved.



Article 20 – Data provisions

- Static and dynamic data via APIs.
- Static info
 - location
 - charging properties: connector type, power.
 - etc.
- Dynamic info
 - Availability (in use/not in use/out of order)
 - Ad hoc price
 - Electricity is renewable (yes/no)

Article 21 – Common technical specs

- Article refers to Annex II
 - Lists all technical specifications adopted by Commission
- Technical specifications for many areas still missing.
 - Charging station protocols with CSMS or EV are not yet defined
- Connector types are defined
 - AC EVSEs: Type 2 (Mennekes)
 - DC EVSEs: CCS2 (Combo)
 - AC EVSEs L-category: Type 3A (Scame)

INTERNATIONAL
STANDARD

ISO
15118-2

First edition
2014-04-01

Road vehicles — Vehicle-to-Grid
Communication Interface —
Part 2:
Network and application protocol
requirements

Véhicules routiers — Interface de communication entre véhicule et
réseau électrique



IEC

IEC 61850-7-420

Edition 2.0 2021-10

INTERNATIONAL
STANDARD

NORME
INTERNATIONALE



Communication networks and systems for power utility automation —
Part 7-420: Basic communication structure — Distributed energy resources and
distribution automation logical nodes

Réseaux et systèmes de communication pour l'automatisation des systèmes
électriques —
Partie 7-420: Structure de communication de base — Ressources énergétiques
décentralisées et nœuds logiques d'automatisation de la distribution



Customer: Franc Buer-Nb. of Users: 1 - Contents: Open Charge Alliance
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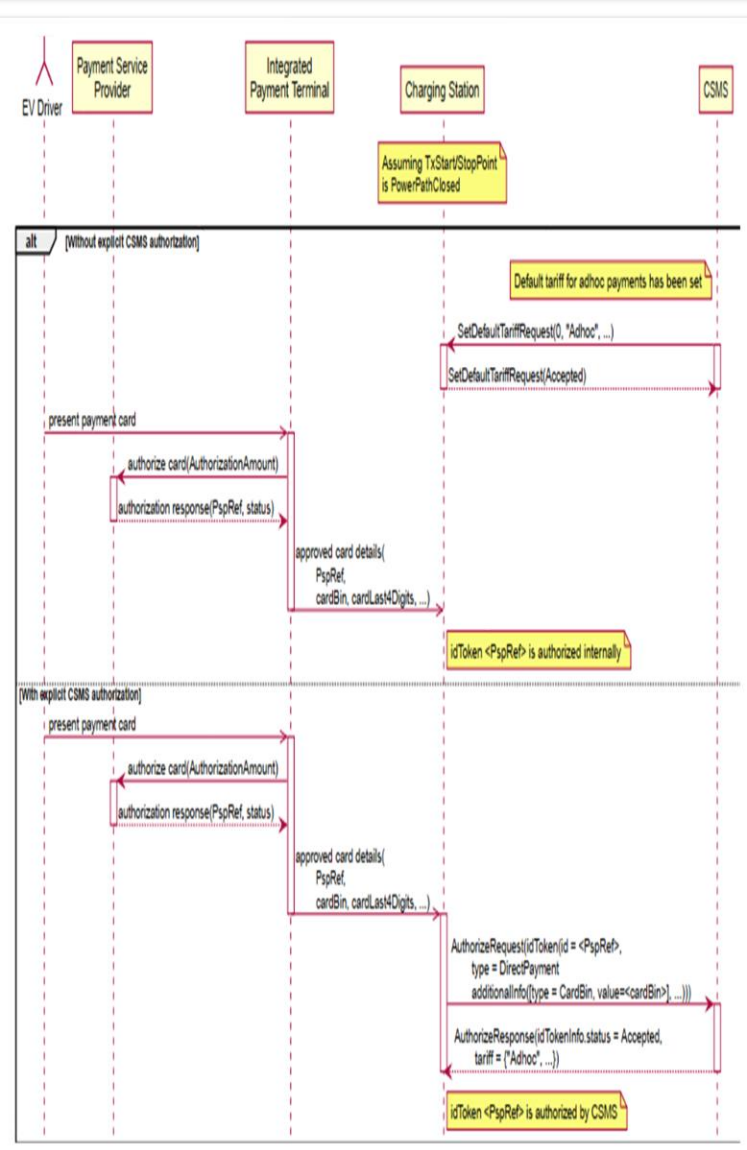
Using OCPP to comply with AFIR



Fulfilling Article 5 with OCPP

Ad hoc payment

- Need to support (integrated) payment terminals.
 - Additional card data needs to be sent to CSMS.
 - Cost and settlement info to be exchanged.
- **OCPP 1.6** requires customizations for this (DataTransfer).
- **OCPP 2.0.1** can send the card info and cost
 - needs custom message for settlement info.
- **OCPP 2.1** standardizes ad hoc payment flow
 - Adds standard message for settlement info.



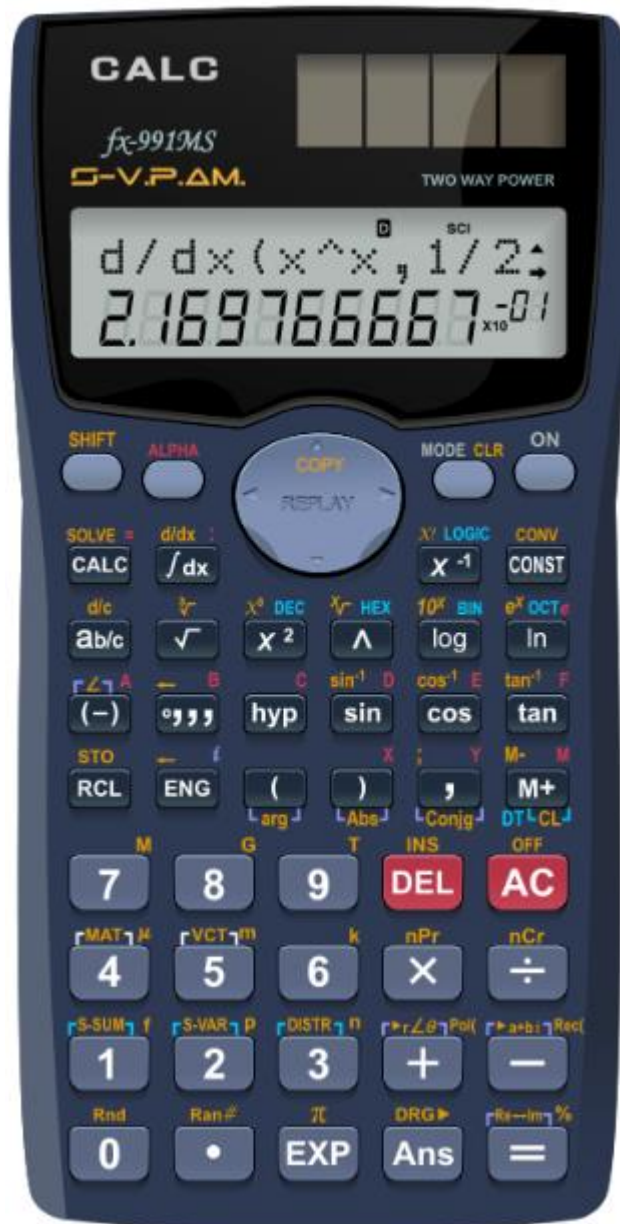
Fulfilling Article 5 with OCPP

Pricing

- **OCPP 2.0.1** offers SetDisplayMessage to show pricing

Cost calculation

- **OCPP 1.6/2.0.1** assume cost calculation in CSMS
 - Local cost calculation is supported with “CTEP” customization
https://www.openchargealliance.org/uploads/files/ocpp_and_dms_evse_regulation-v2.0.pdf
- **OCPP 2.1** supports tariff plans for local cost calculation
 - Complex tariffs possible.
 - Compatible with OCPI, OICP, OCHP tariffs.



Fulfilling Article 5 with OCPP

Smart charging

- All OCPP releases as of 1.6 support smart charging.

Bidirectional charging

- Not mandated by AFIR.
- A reference in article 14 to include bidirectional charging in reporting
- A reference in article 15 to assess contribution of bidirectional charging to reducing user/system cost.
- **OCPP 2.1** supports bidirectional charging.



Summary

- OCPP 1.6/2.0.1 charging stations will comply with AFIR with a minor customization to support ad hoc payment.
- OCA will provide ad hoc customization for OCPP 2.0.1.
- Upcoming OCPP 2.1 provides native support.

AFIR topic	1.6	2.0.1	2.1
Ad hoc payment	Customization	OCA customization	supported
Pricing display	OCA customization	Supported	supported
Cost calculation	OCA customization	central: supported local: OCA customization	supported
Smart charging	supported	supported	supported
Bidirectional	not supported	not supported	supported



Thank you!

