

OCA \ CHAdeMO – Webinar



www.chademo.com

www.OpenChargeAlliance.org



December 3rd, 2020

Agenda – JWG

Welcome	Martijn Siemes
Introduction to CHAdeMO Association	Imazu Tomoya/Tomoko Blech
Introduction to Open Charge Alliance	Lonneke Driessen
Introduction to Joint Working Group	Nick Coghlan
Translation Table	Tetsu Yamada
Sequence diagrams	Milan Jansen
Showing CHAdeMO Data In OCPP Device Model	Franc Buve
Questions & Answers	All



CHAdeMO basics

CHAdeMO Secretariat

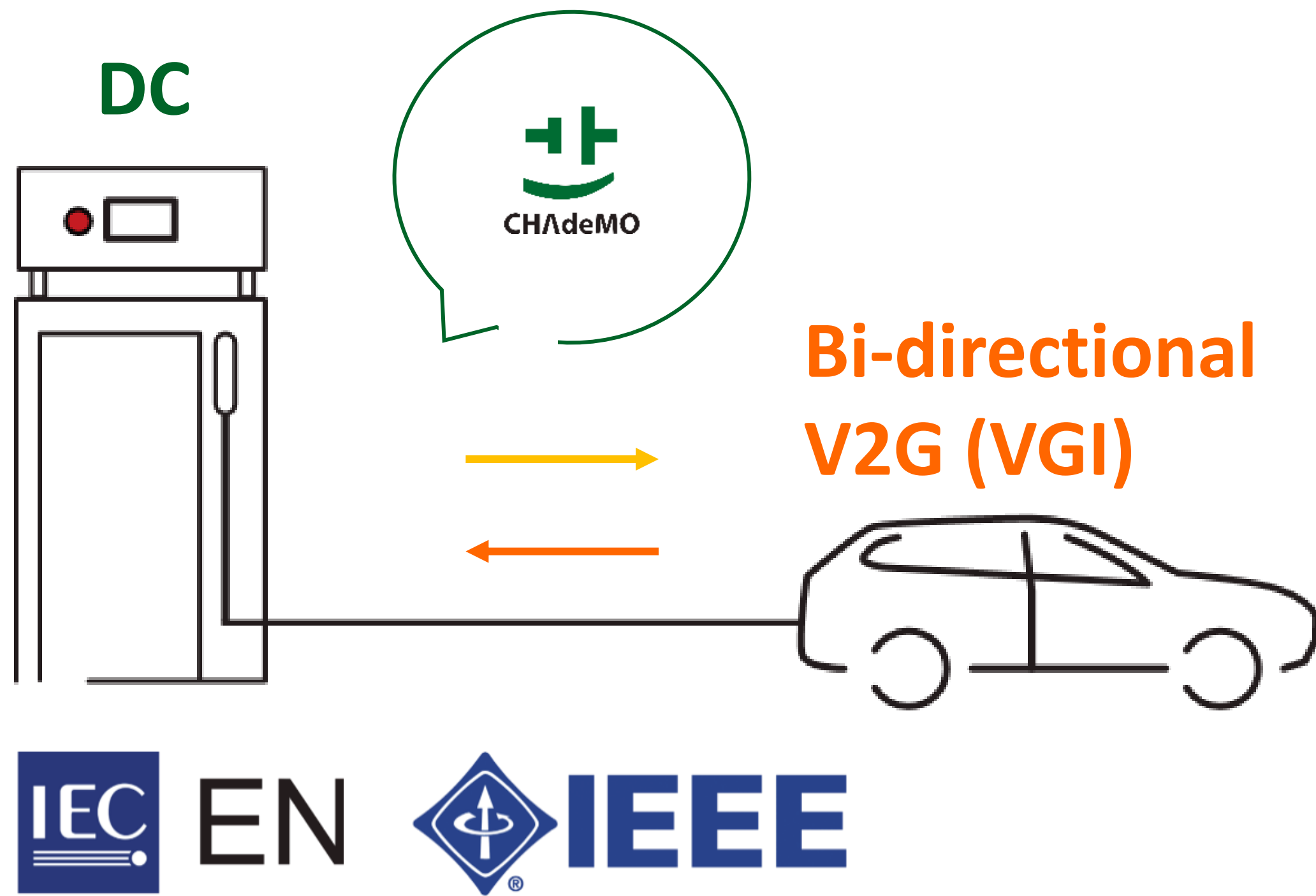
3 December 2020

info@chademo.eu



What's CHAdeMO?

Standard



Association




develop


certify


promote

Mission: Bringing safe, affordable and interoperable charging to EV drivers

Comprised of a wide variety of e-mobility players



Our members:

479

entities from

45

countries

And many, many more..

Who make a great many chargers

TOTAL

89

countries

35 600

charge points

6000
North
America

16100
Europe

7700
Japan

5100
Asia

100 Africa

100 South America

500
AU & Oceania

 Countries with CHAdeMO

Note: as of Autumn 2020; not exhaustive; not including V2H systems
Source: ChargeMap, PlugShare, EAFO, Zap-Map, NOBIL, Girève, GoingElectric, ChargeHub

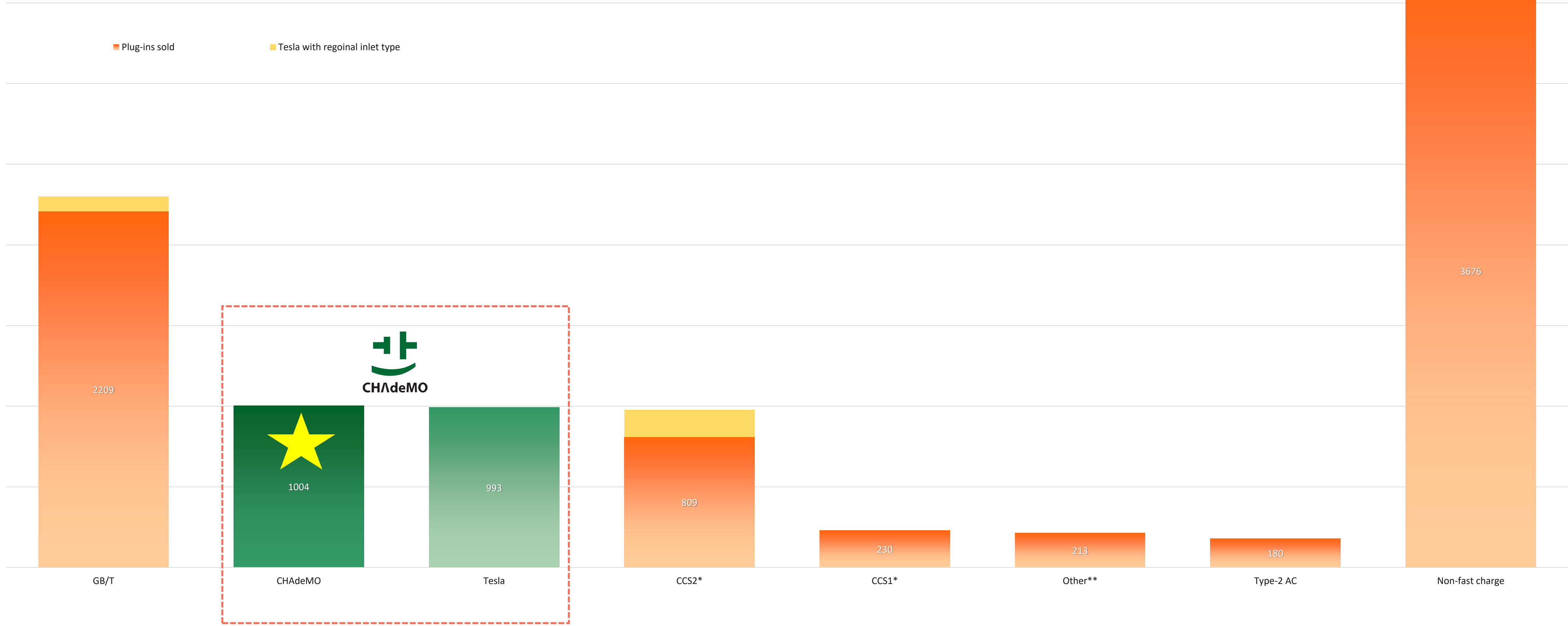
An international DC charging standard

		CHAdeMO (Global)	CCS 1 (US, Korea)	CCS 2 (EU)	GB/T (PRC)	TESLA (PROPRIETARY)
Connector						
Vehicle Inlet						
 		✓	✓	✓	✓	
 		✓	✓ (SAE)			✓ (UL)
 		✓		✓	Multistandard = de facto in EU	
 		✓	✓	✓	✓	
 		✓ (Reference)			✓	

Serving 2 million CHAdeMO-compatible EVs

THOUSANDS

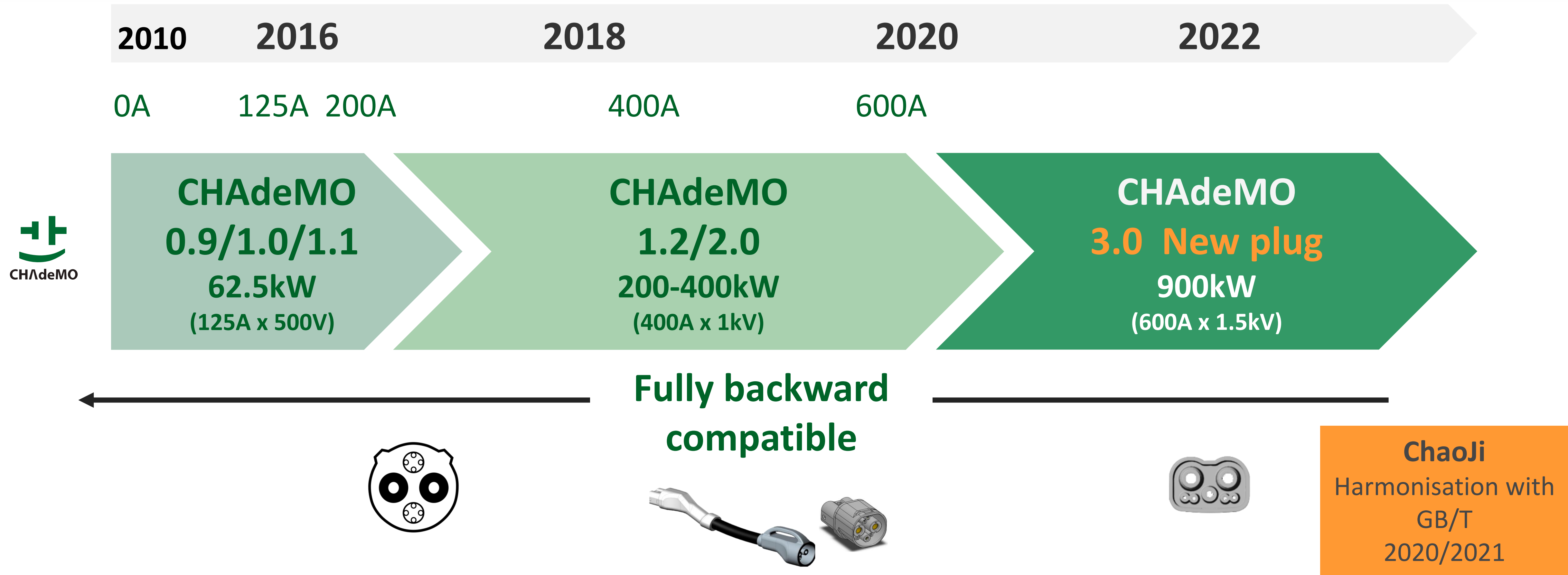
Global plug-in sales by inlet type (2009-2020/10, global)



Source: EV-Volumes.com, BEV + PHEV, including LCV; Global total = 9.8 million vehicles

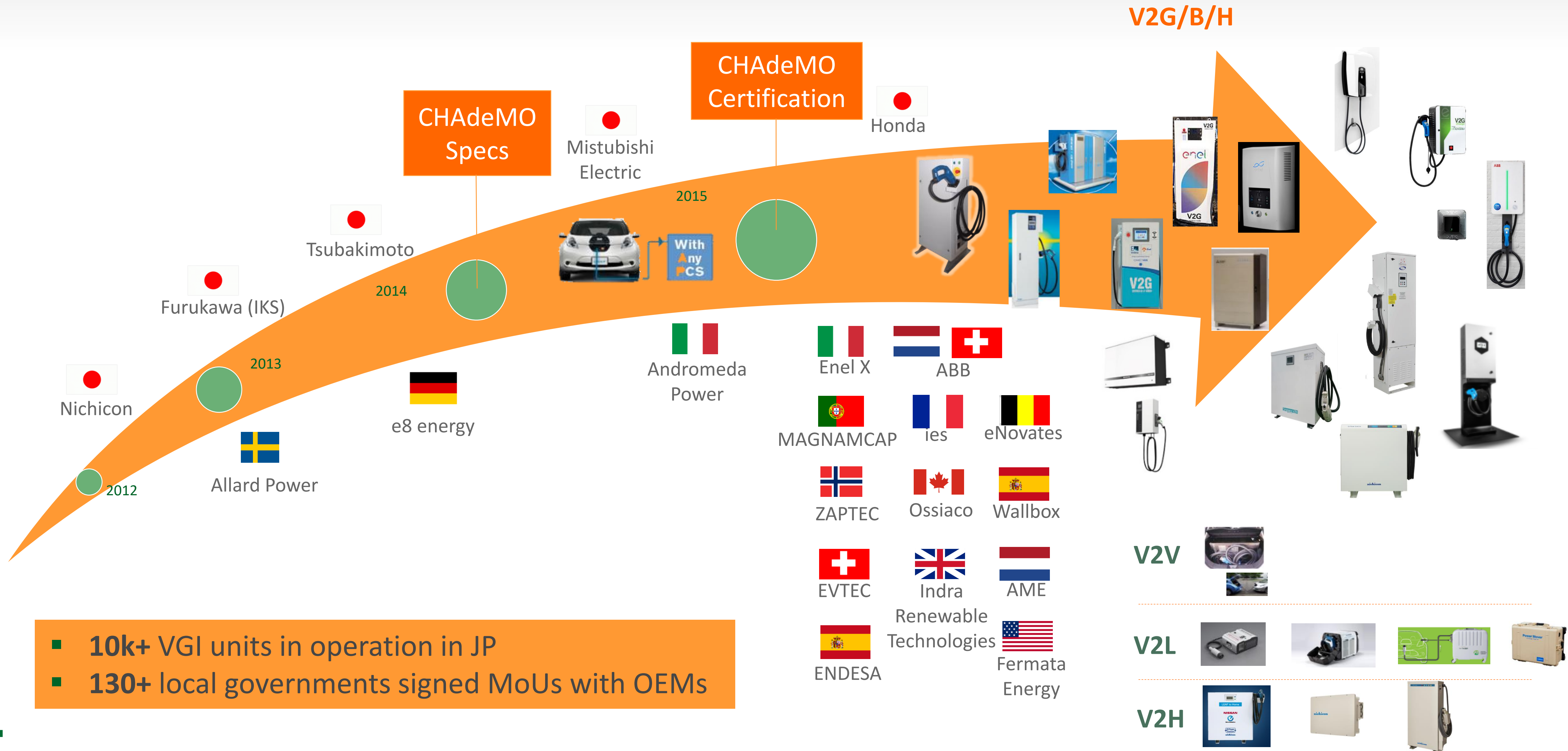
Note: *CCS1 and CCS2 breakdown unknown. We assumed the Americas = CCS1, Europe, Africa & ME = CCS2, and prorated the Asia Pacific (80K). **Other includes unspecified, unknown, optional, and BYD.

Constantly evolving and sustainable



CHAdeMO evolves with full backward compatibility

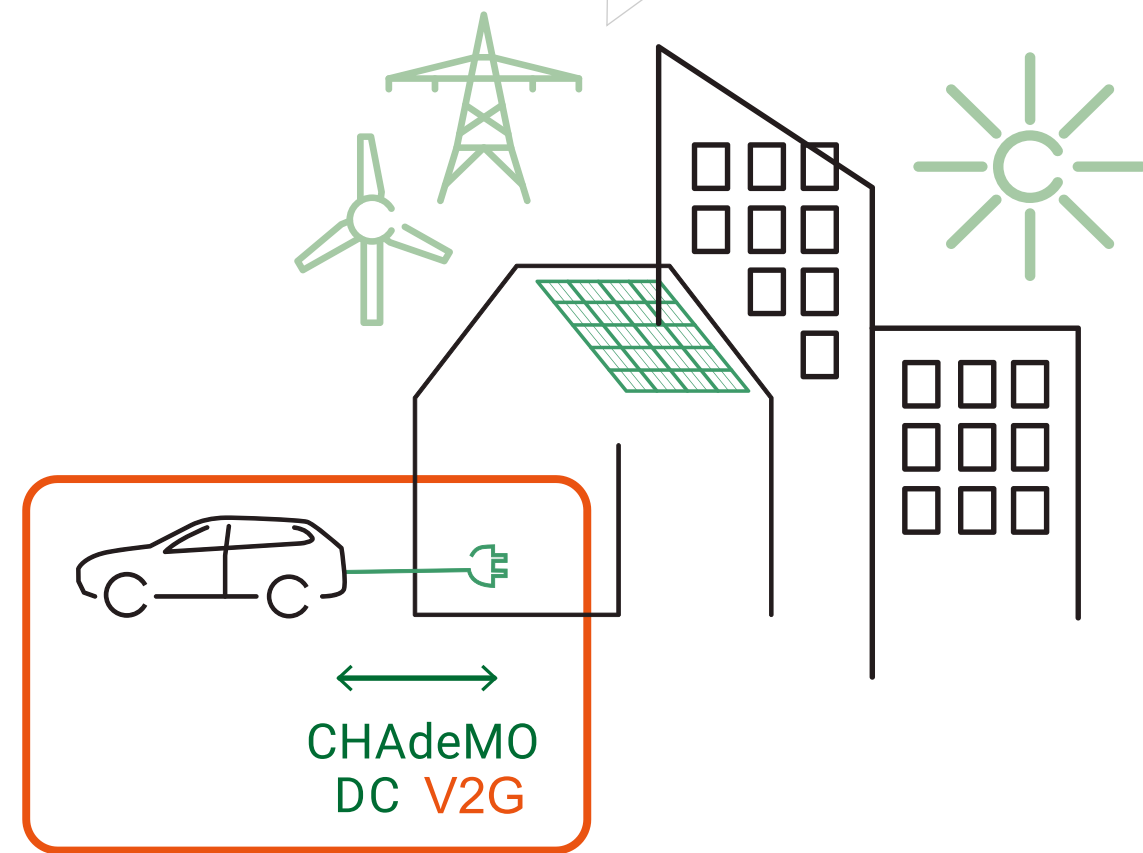
VGI/V2G products in the market since 2012



- 10k+ VGI units in operation in JP
- 130+ local governments signed MoUs with OEMs

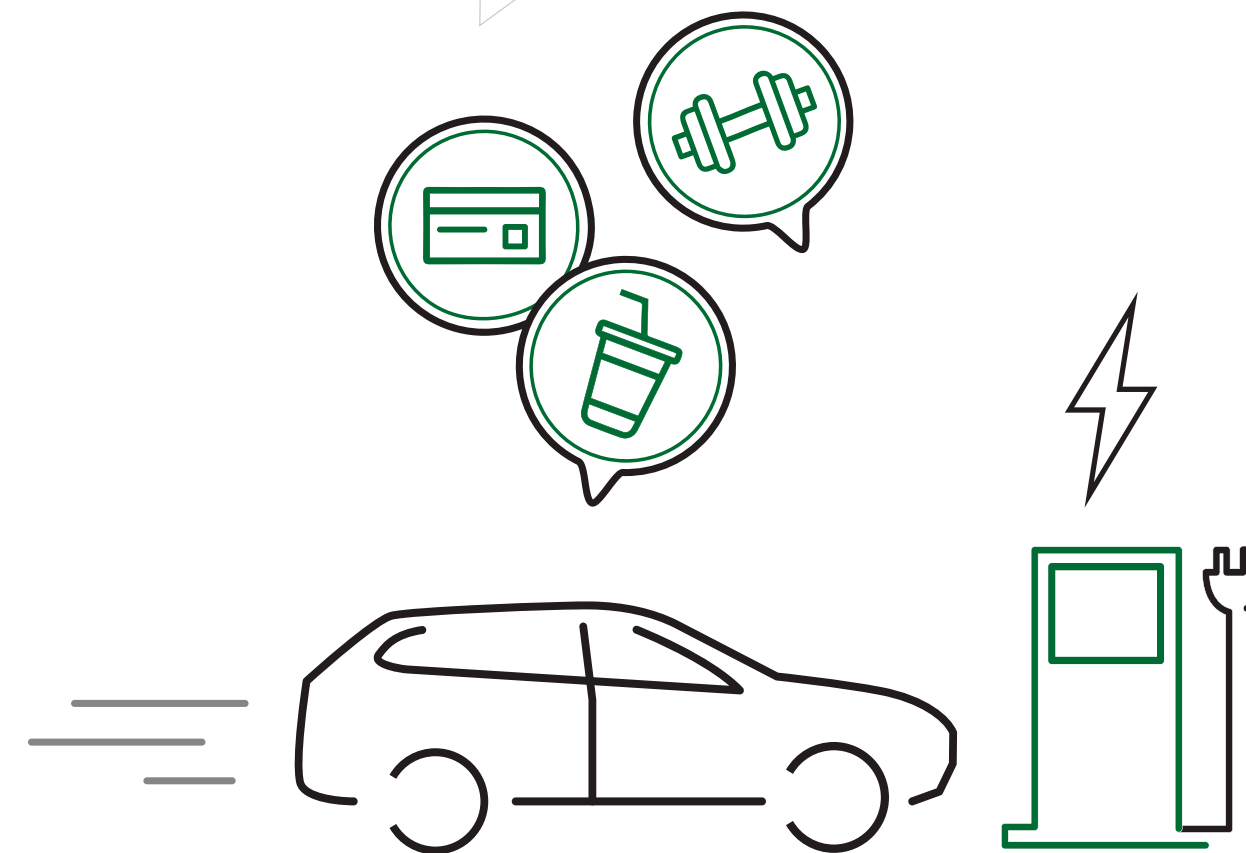
All possible with CHAdeMO

Low Power
VPP DR via V2G



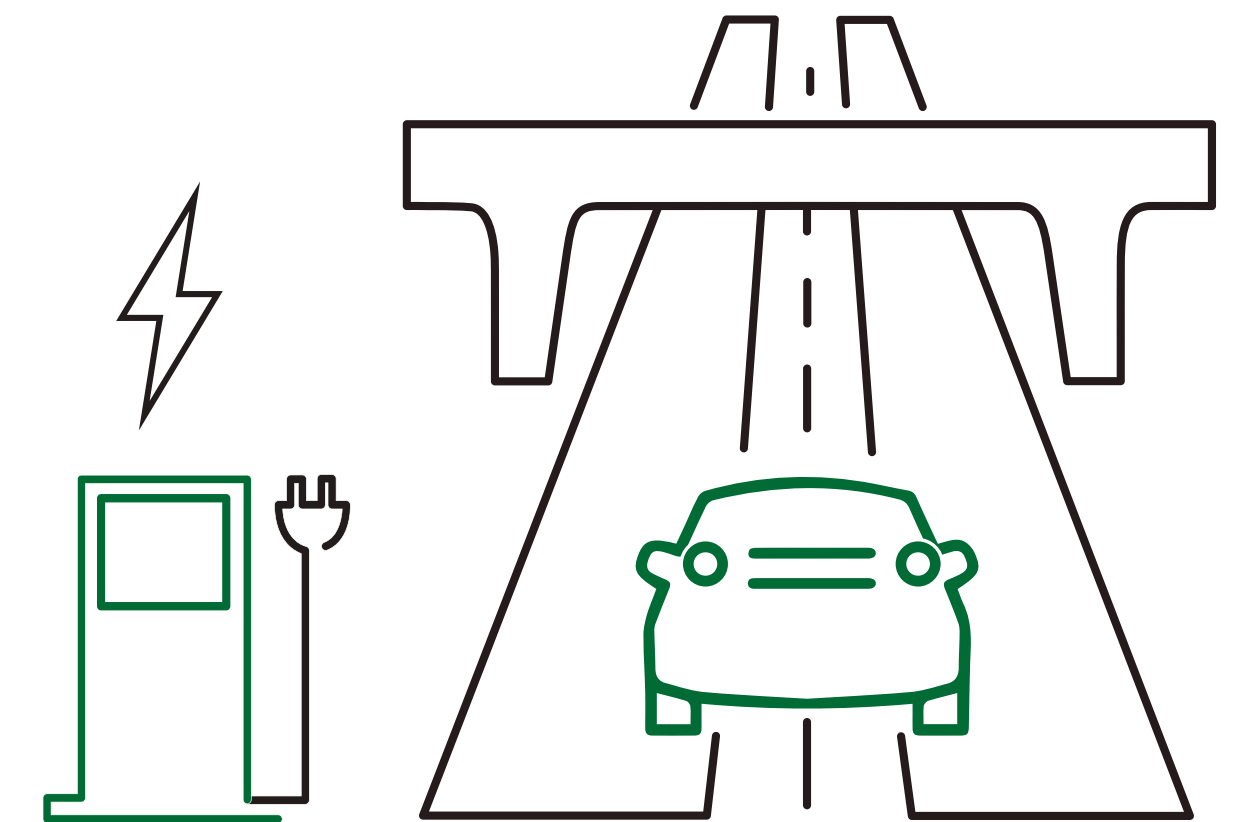
OFFICE/HOME CHARGING

As fast as
needed



DESTINATION CHARGING

High Power
Ultra-high-power
Pantograph Wireless
Dynamic



PATHWAY CHARGING

Vehicles of all size



Billing
Authentication PnC





CONTACT
info@chademo.eu

Introduction to OCA



www.OpenChargeAlliance.org



December 3rd, 2020



The Open Charge Alliance

- A non-profit organization
- Dutch Foundation founded in January 2014
- 188 members currently
- Everyone is welcome to join

- ✓ Open standards
- ✓ Free to use
- ✓ Pragmatic approach
- ✓ Extensive working groups
- ✓ Widely adopted and deployed

[JOIN US](#)



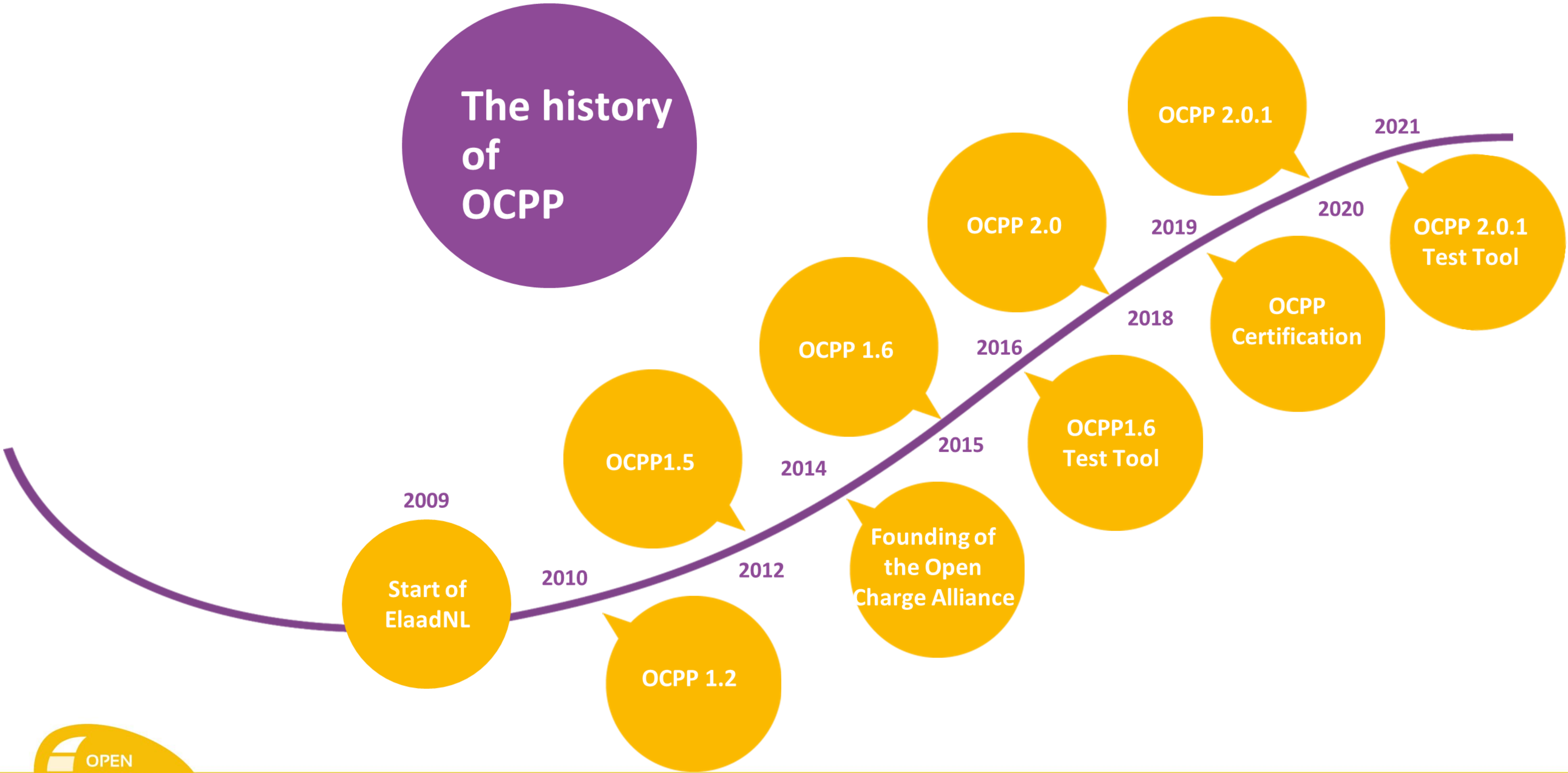
DOWNLOAD
PROTOCOLS

OCPP 2.0

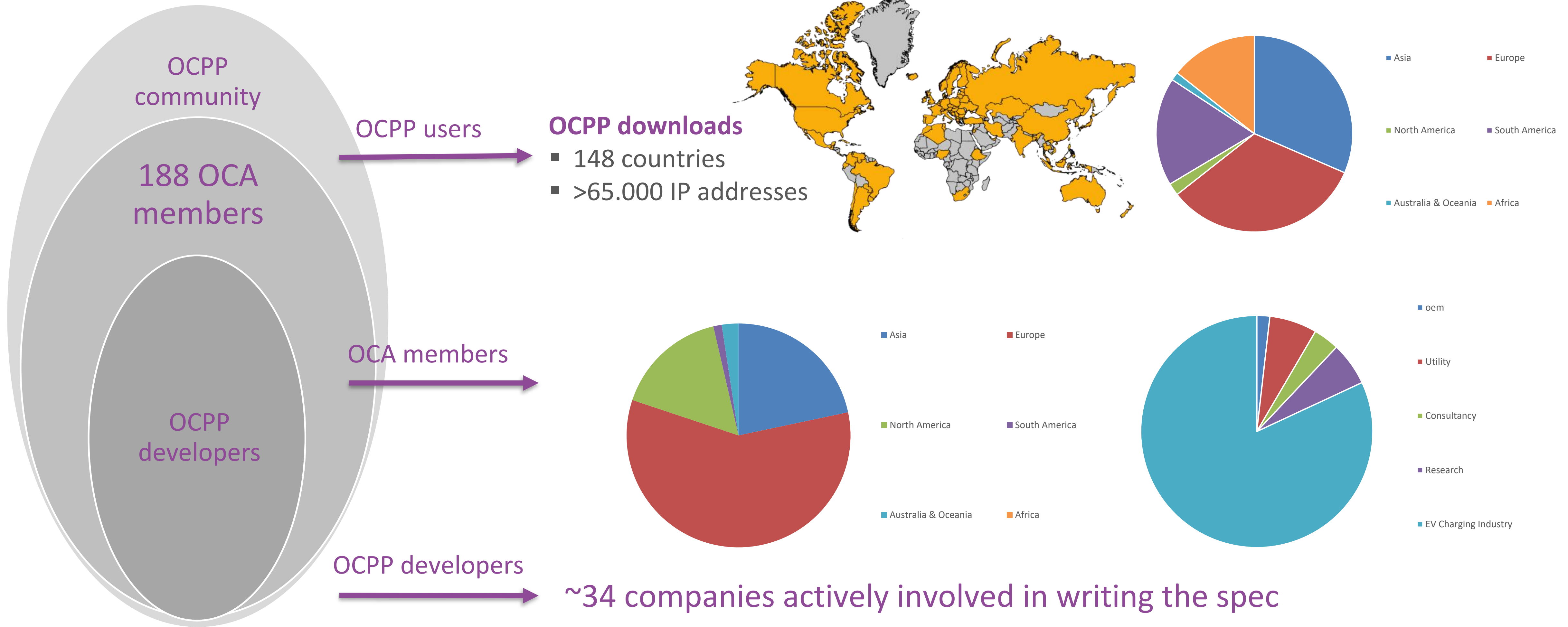
FILE OCPP 2.0 (all files)

DOWNLOAD

Short introduction of OCPP



The OCPP community



OCA activities

Development of the OCPP protocol

J01 - Sending Meter Values not related to a transaction

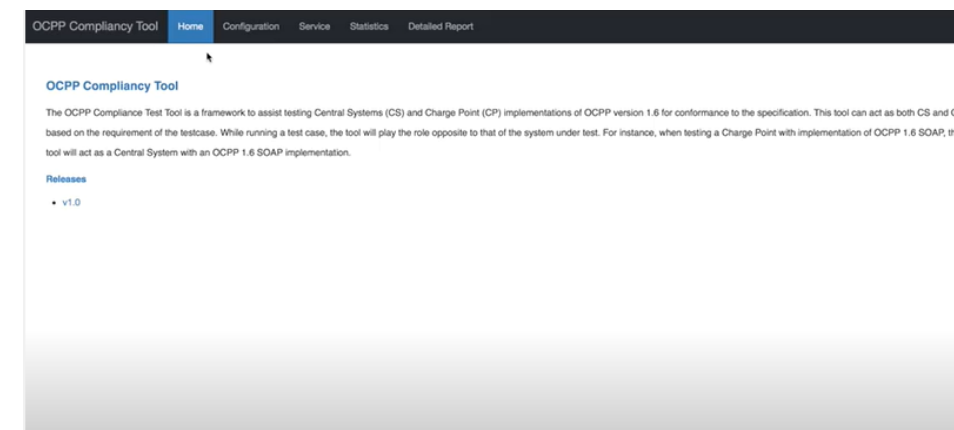
Table 139. J01 - Sending Meter Values

No.	Type	Description
1	Name	Sending Meter Values not related to a transaction
2	ID	J01
3	Functional block	J. Meter Values
4	Objective(s)	To sample the electrical meter or other sensor/transducer hardware to provide information about the Charging Station's Meter Values.
5	Description	The Charging Station samples the electrical meter or other sensor/transducer hardware to provide information about its Meter Values. Depending on configuration settings, the Charging Station will send Meter Values.
Actors		
Charging Station, CSMS		
Scenario description		
1. The Charging Station sends a MeterValuesRequest message, for offloading Meter Values to the CSMS. 2. Upon receipt of a MeterValuesRequest message, the CSMS responds with a MeterValuesResponse message.		
6	Prerequisite(s)	The Charging Station is configured to send Meter values every XX seconds. No transaction is running.
7	Postcondition(s)	Successful postcondition: n/a Failure postcondition: n/a

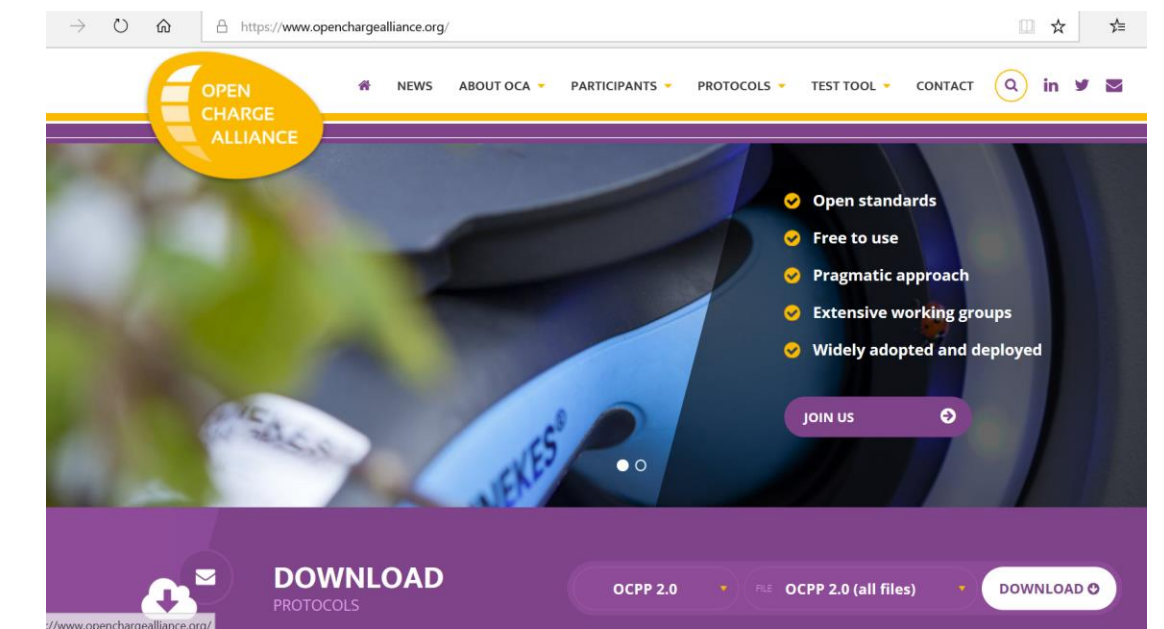
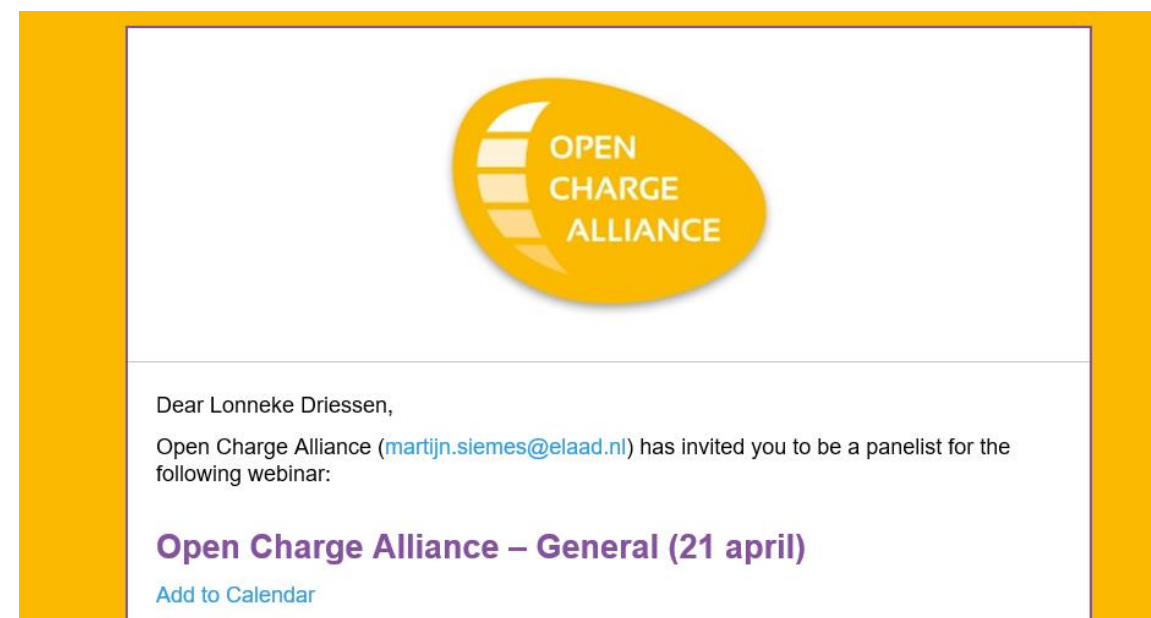
Figure 88. Sequence Diagram: Sending Meter Values

7	Error handling	Any Meter Values that don't belong to a transaction MAY be discarded.
8	Remark(s)	The phase field is not applicable to all Measurands. Each sampleValue element contains a single value datum. The nature of each sampleValue is determined by the optional Measurand, context, location, unit and phase fields. The optional SignedMeterValue field can contain digitally signed binary meter value data.

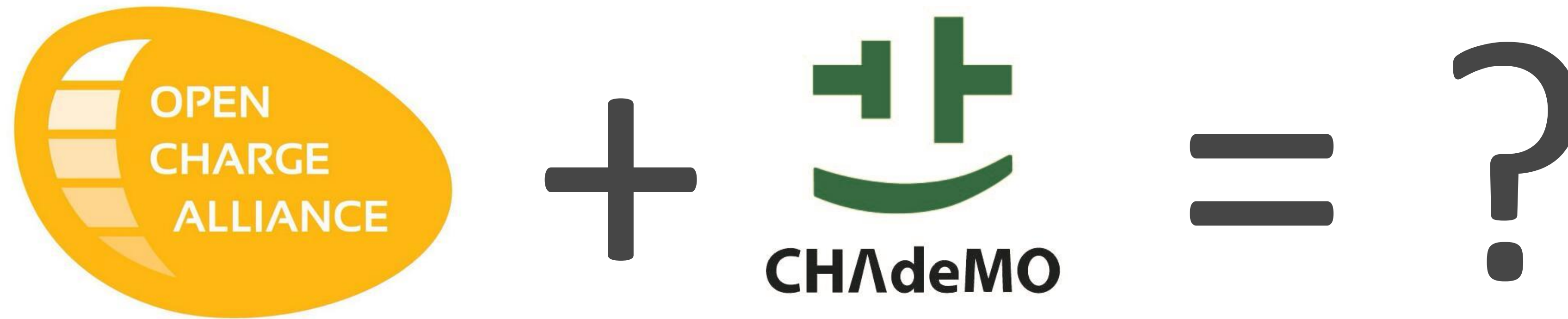
Development of compliancy testing and certification



Promotion of OCPP



Introduction Joint Working Group



Introduction Joint Working Group

Scope:

- OCPP 1.6 & OCPP 2.0.1
- CHAdeMO 1.1 & CHAdeMO 2.0

Work items:

1. Align terminology - translation table
2. Align events - sequence diagrams
3. Align charge session data - device model recommendations



Translation Table

- Definitions
- Charger States



Translation Table – Definitions example

OCPP 1.6 EDITION 2 SECTION 2. TERMINOLOGY AND CONVENTIONS		OCPP 2.0.1 PART 2 - SPECIFICATION SECTION 2. CONVENTIONS, TERMINOLOGY AND ABBREVIATIONS		CHADEMO 1.1 SECTION 3. TERMS AND DEFINITION		CHADEMO 2.0.1 SECTION 3. TERMS AND DEFINITION	
Definition	Description	Definition	Description	Definition	Description	Definition	Description
Charge Point	The Charge Point is the physical system where an electric vehicle can be charged. A Charge Point has one or more connectors.	Charging Station	The Charging Station is the physical system where EVs can be charged. A Charging Station has one or more EVSEs.	Quick charger/Charger		Quick charger/Charger	
Central System	Charge Point Management System: the central system that manages Charge Points and has the information for authorizing users for using its Charge Points.	CSMS	Charging Station Management System. The system that manages Charging Stations and has the information for authorizing Users for using its Charging Stations.	N/a		N/a	
EV	Electrical Vehicle, this can be BEV (battery EV) or PHEV (plug-in hybrid EV)	EV	Electric Vehicle, distributed energy resource with a remote battery and socket.	Electric vehicle/Vehicle	A vehicle using an electric motor as a powertrain.	Electric vehicle/Vehicle	A vehicle using an electric motor as a powertrain.
Connector	The term "Connector", refers to an independently operated and managed electrical outlet on a Charge Point. This usually corresponds to a single physical connector, but in some cases a single outlet may have multiple physical socket types and/or tethered cable/connector arrangements to facilitate different vehicle types.	Connector	The term Connector, refers to an independently operated and managed electrical outlet on a Charging Station. In other words, this corresponds to a single physical Connector. In some cases an EVSE may have multiple physical socket types and/or tethered cable/Connector arrangements(i.e. Connectors) to facilitate different vehicle types.	Charging connector	A connecting apparatus equipped to charging cable that complies with IEC62196-3 Standard Sheets Configuration AA	Charging connector	A connecting apparatus equipped to charging cable that complies with IEC62196-3 Standard Sheets Configuration AA



Translation Table – Charger States example

OCPP 1.6 EDITION 2 SECTION 4.9. STATUS NOTIFICATION		OCPP 2.0.1 PART 2 - SPECIFICATION SECTION 3.16. CHARGINGSTATEENUMTYPE & 2.6.4.1. TXSTARTSTOPPOINT VALUES		CHADEMO 1.1 APPENDED TABLE 3.2.3 DEFINITION OF STATE OF CHARGER		CHADEMO 2.0.1 APPENDED TABLE 3.3.3 DEFINITION OF STATE OF CHARGER	
State	Description	State	Description	State	Description	State	Description
Available (Connector)	When a Connector becomes available for a new user (Operative)	Idle	Idle status is referred as the state in which a charging station is not performing any use case related tasks. Condition during which the equipment can promptly provide a primary function but is not doing so.	State A / Standby	Unconnected with vehicle	State A / Standby	Disconnected with vehicle
Preparing	When a Connector becomes no longer available for a new user but there is no ongoing Transaction (yet). Typically a Connector is in preparing state when a user presents a tag, inserts a cable or a vehicle occupies the parking bay (Operative)*	EVConnected	There is a connection between EV and EVSE, in case the protocol used between EV and the charging station can detect a connection, the protocol needs to detect this for the state to become active. The connection can either be wired or wireless.	State B / Standby	Connected with vehicle	State B / Standby	Connected with vehicle



Sequence diagrams

- Purpose of the sequence diagrams
- Sequence diagrams overview
- Example



Sequence diagrams - Purpose

- Combining OCPP & CHAdeMO sequence diagrams
- Graphically show in chronological order which messages are exchanged between:
 - EV and Charging Station
 - Charging Station and CSMS (Charging Station Management System)



Sequence diagrams - Overview

1. Starting a charging session
2. Stopping of a session by charging station
3. Abnormal termination of a session by charging station
4. Stopping of a session by EV
5. Abnormal termination of a session by EV
6. Dynamic Control

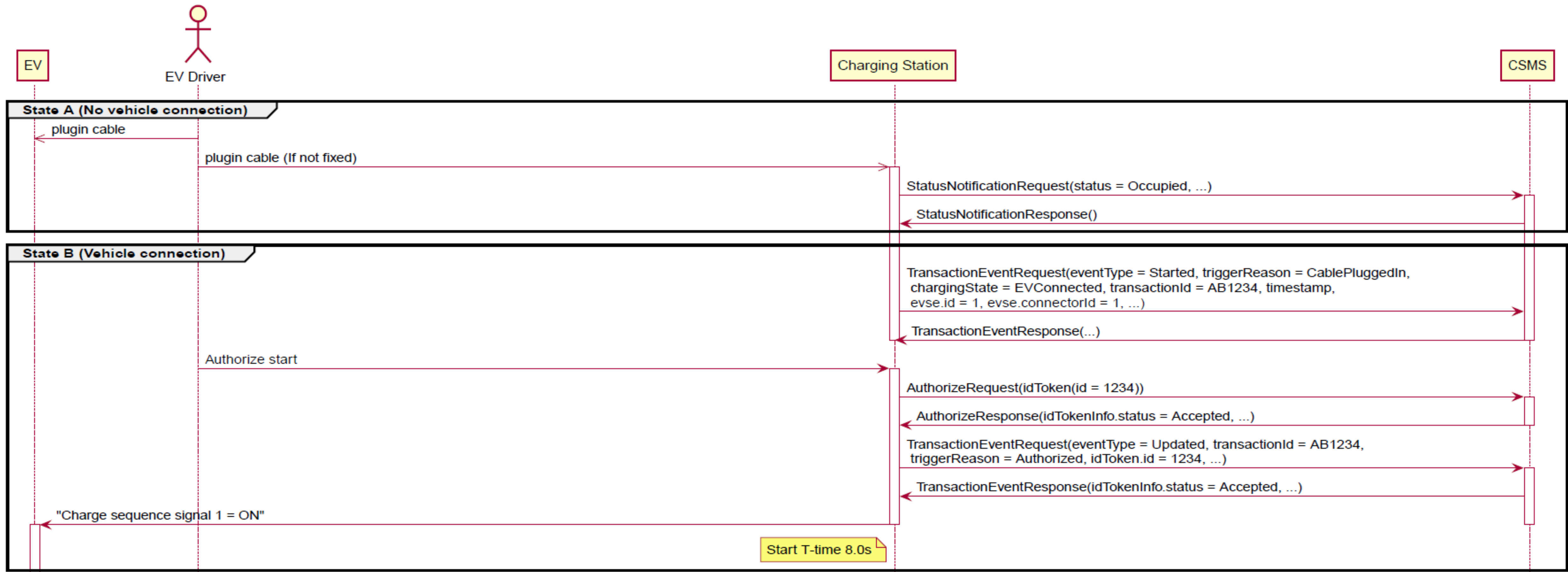


Sequence diagrams - Overview

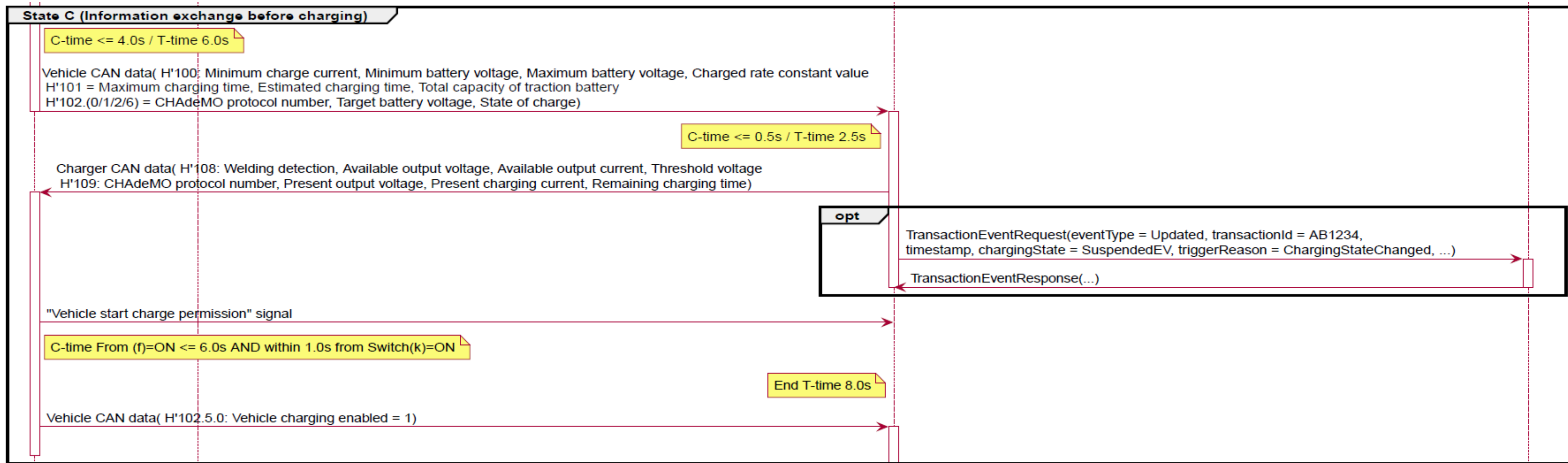
1. Starting a charging session
2. Stopping of a session by charging station
3. Abnormal termination of a session by charging station
4. Stopping of a session by EV
5. Abnormal termination of a session by EV
6. Dynamic Control



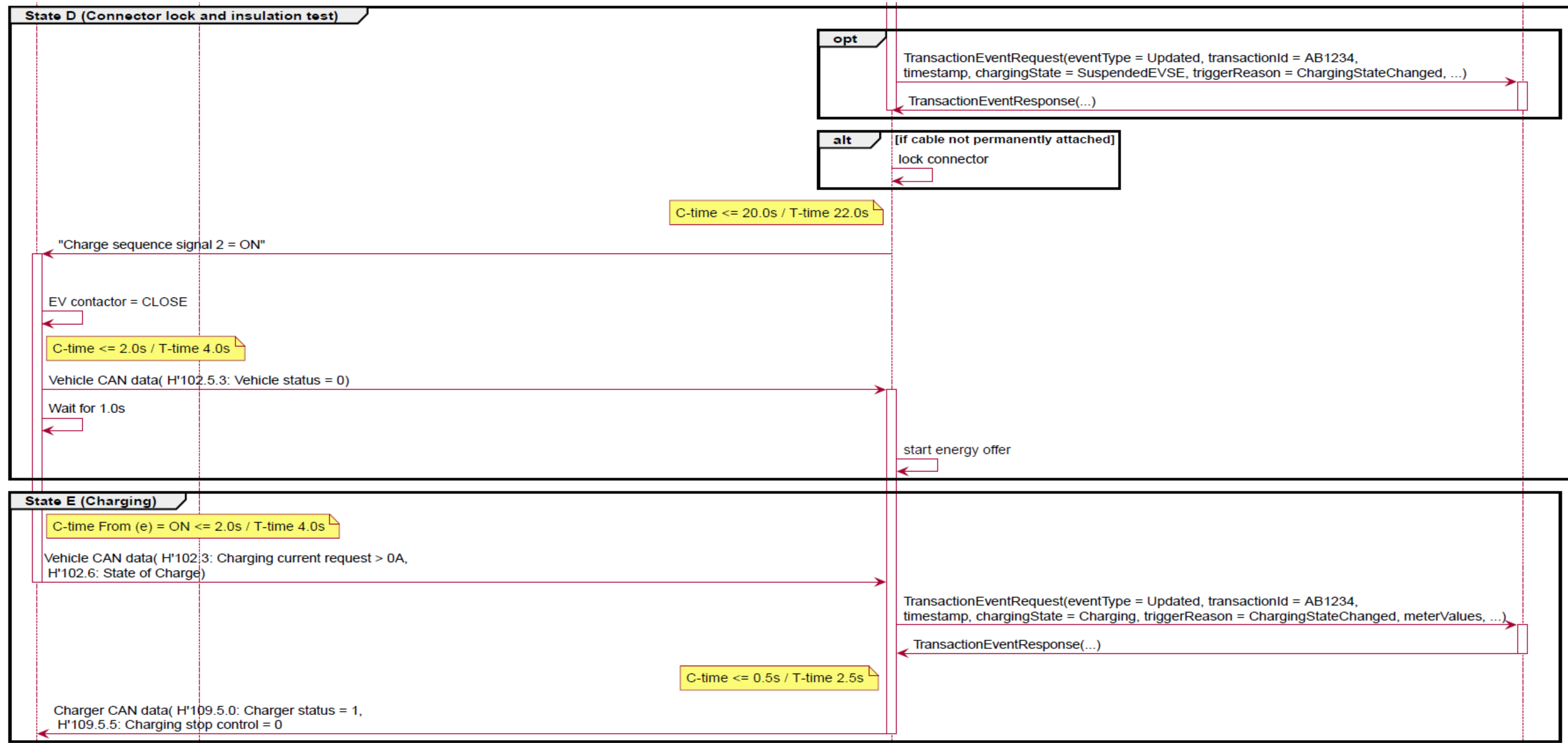
Example – Start Charging Session (1/3)



Example – Start Charging Session (2/3)



Example – Start Charging Session (3/3)



Showing CHAdeMO Data In OCPP Device Model

- OCPP Device Model
- ConnectedEV Variables
- Charging Station decides



OCPP Device Model

- A way to report charging station component data to CSMS (back-office)
- Charging station reports data about connected vehicle in a **ConnectedEV** component
- CHAdeMO information reported, e.g.
 - Charging current and voltage
 - Total capacity of battery
 - Estimated charging time
 - State of charge



ConnectedEV Variables (A/V)

ConnectedEV	Unit	CHAdemo value
Available	boolean	(true when connected EV data available)
DCCurrent.minSet	A	Minimum charge current (H'100.0)
DCCurrent.target	A	Charging current request (H'102.3)
DCVoltage.minSet	V	Minimum battery voltage (H'100.2,3)
DCVoltage.maxSet	V	Maximum battery voltage (H'100.4,5)
DCVoltage.target	V	Target battery voltage (H'102.1,2)



ConnectedEV Variables (Wh/%/s)

ConnectedEV	Unit	CHAdemo value
EnergyImport.maxSet	Wh	Total capacity of traction battery * 100 (H'101.5.6)
RemainingTimeFull.maxSet	s	Maximum charging time (H'101.2)
RemainingTimeFull	s	Estimated charging time * 60 (H'101.3)
StateOfCharge.maxSet	%	Charged rate reference constant (H'100.6)
StateOfCharge.actual	%	State of charge (H'102.6)



ConnectedEV Variables (status)

ConnectedEV	Unit	CHAdeMO value
ChargingState.valuesList		
	BatteryOvervoltage	Battery overvoltage (H'102.4.0)
	BatteryUndervoltage	Battery undervoltage (H'102.4.1)
	ChargingCurrentDeviation	Battery current deviation (H'102.4.2)
	BatteryTemperature	High battery temperature (H'102.4.3)
	VoltageDeviation	Battery voltage deviation (H'102.4.4)
	VehicleChargingEnabled	Vehicle charging enabled (H'102.5.0)
	VehicleShiftPosition	Vehicle shift position (H'102.5.1)
	ChargingSystemError	Charging system error (H'102.5.2)



Charging Station Decides

- Charging station decides which attributes it wants to publish in DM
- Use of this data is completely optional
- Valuable info for smart charging
 - Tailoring the schedule to the connected vehicle



Questions & Answers



Release Whitepaper: 'Using OCPP with CHAdeMO'!

- The Whitepaper can be found at:
- OCA website
<https://www.openchargealliance.org>
- CHAdeMO website
<https://www.chademo.com>

