International Transport Forum

EXPERT WORKSHOP

Mapping standards for low- and zero-emission electric heavy duty vehicles

17-18 February 2020 – Paris, France

CharIN e.V.

Perspective on standardization developments

CHARIN

CharIN association

Organisational Structure

- Claas Bracklo
- Michael Keller
- André Kaufung

Audi, BMW, Daimler, Ford, GM, Mahindra Electric, Volkswagen, ABB, Mennekes, NXP, Opel, Phoenix Contact, Porsche, TÜV SÜD

Focus Groups

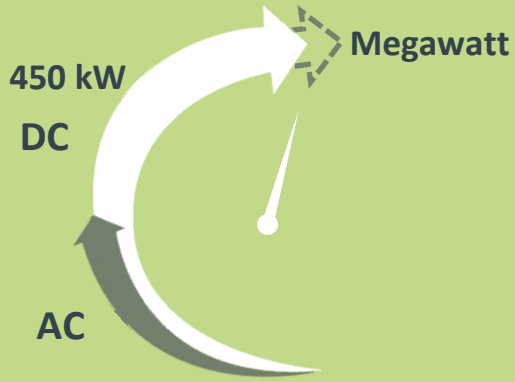
Charging Connection	Charging Communication	Charging Infrastructure	Conformance Test | Interoperability	Grid Integration

Summary

CCS Scope

Performance
up to

450 kW

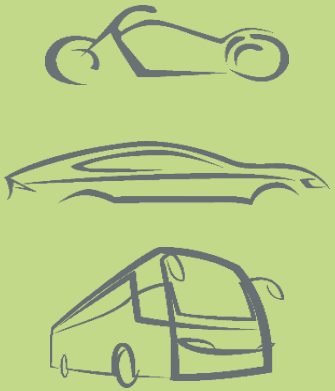


Added Value

Extended
Functionality
Vehicle to grid &
Vehicle to home

Worldwide

Asia
Europe
North America

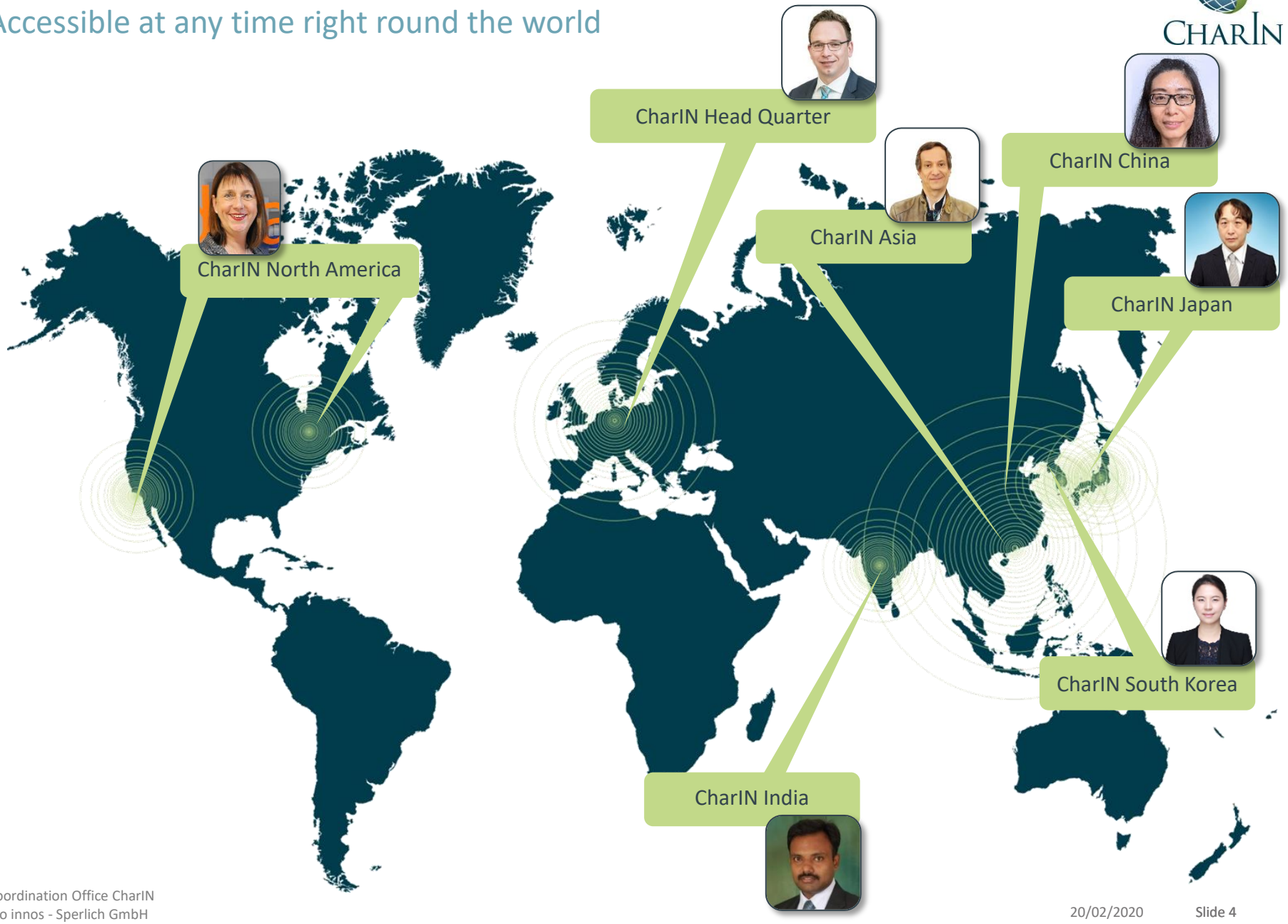


Scope of application

Motorbike
Car
Bus | Truck

CharIN e.V.

Accessible at any time right round the world



CharIN association

Our members – currently **188** (total) **1/2**

Core Members

CharIN **Core members: 104**

CharIN association

Our members – currently **188** (total) **2/2**

CHARIN

Regular members: 82

Regular Members

Associated Members

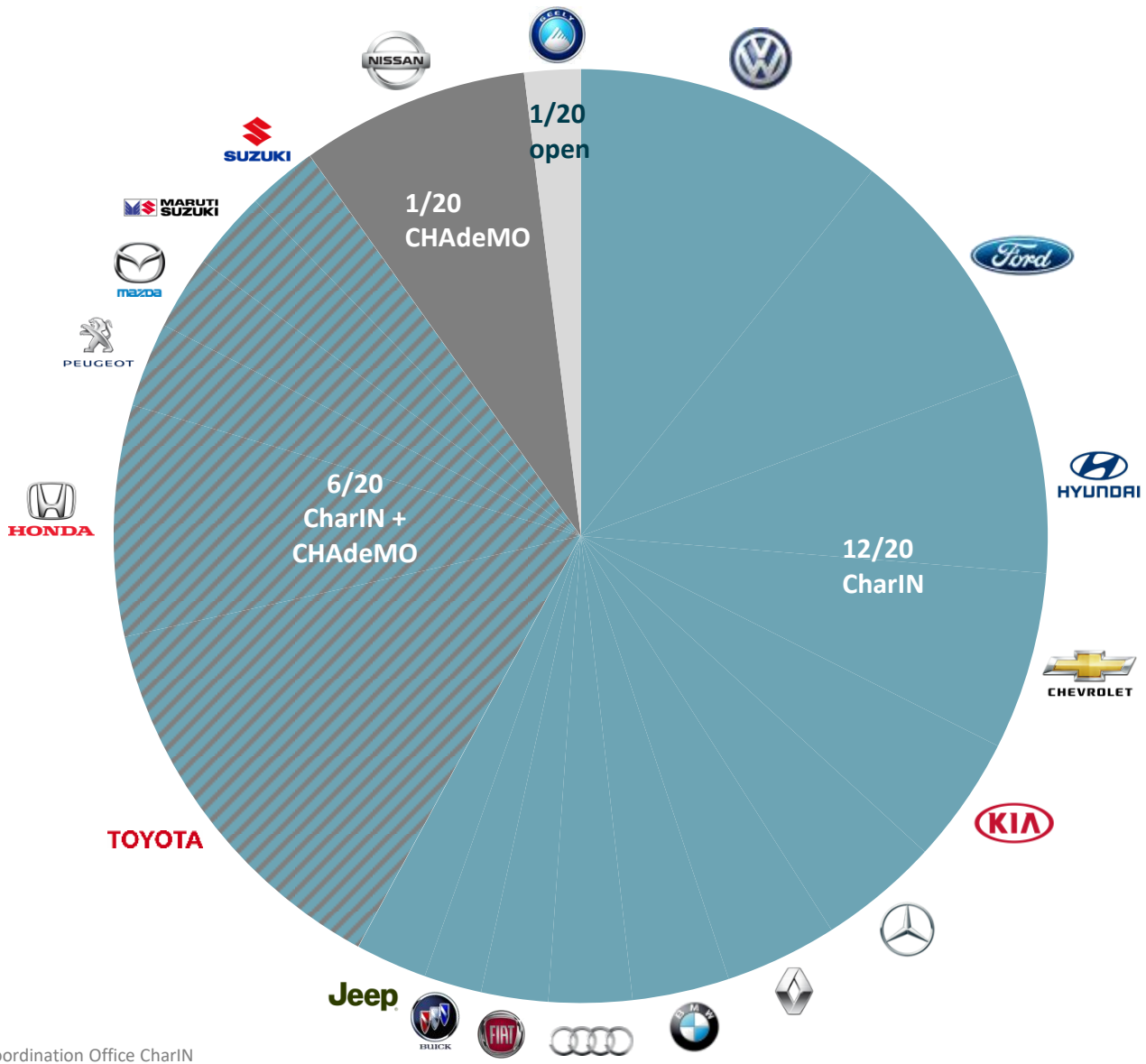
Supporters of CharIN

Cooperations of CharIN

Supporters of CharIN: 16

Membership Share

Top 20 passenger car brands 2018 by volume



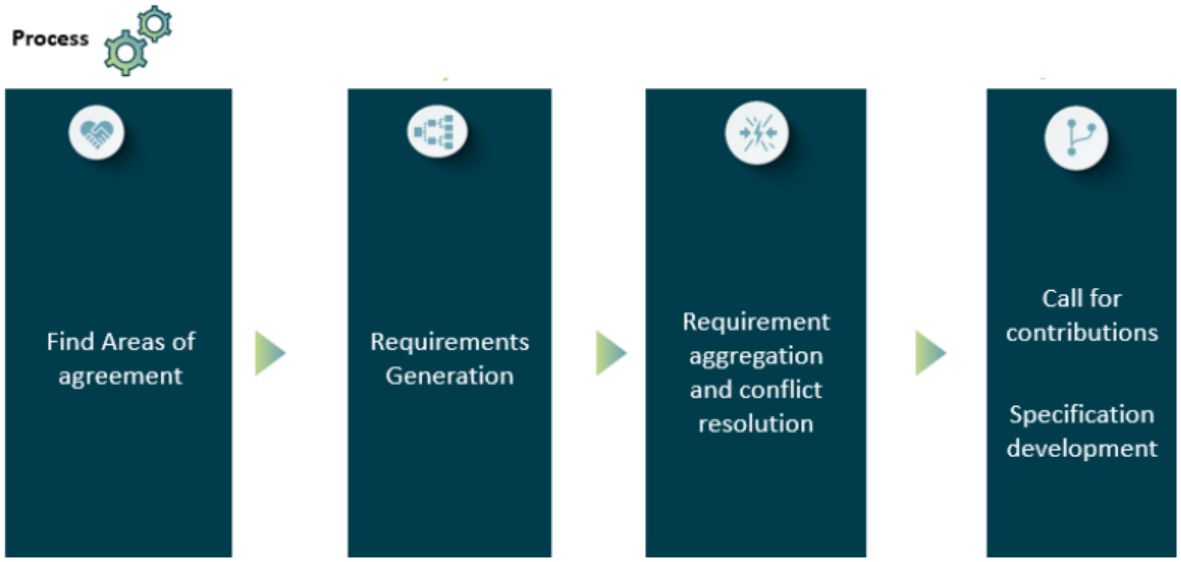
18 of the top 20 car brands are represented in CharIN

High Power Charging for Commercial vehicles

Task Force HPCCV

A CharIN task force was formed in March 2018 with the following purpose statement:

"Define a new commercial vehicle high power charging standard to maximize customer flexibility." It was named the High Power Charging for Commercial Vehicle Task Force (HPCCV for short)

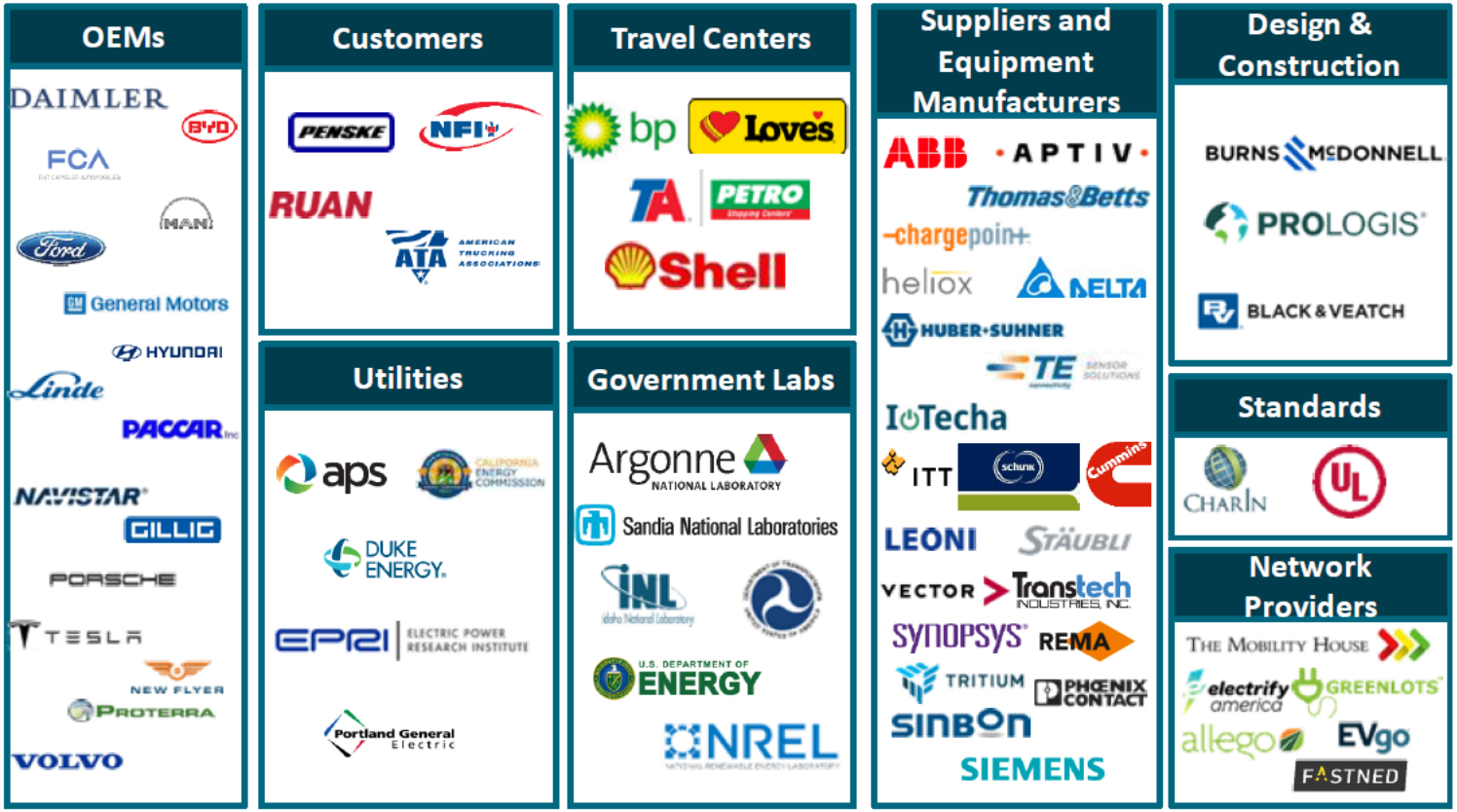


CharIN Appointed Task Force Lead

Rustam Kocher
DTNA - EMG

HPCCV

The team



HPCCV

The requirements

Process

- The HPCCV held a requirements-gathering process including all stakeholders.
- Subgroups were formed and created their requirements, which were then aggregated.
- An in-person meeting was held in September 2018 to gain group agreement on the requirements. They were later finalized during online meetings.
- Those requirements were then approved by the CharIN Board of Management on Nov 28, 2018
- For complete list please visit: https://www.charinev.org/hpccv/?no_cache=1

Requirements (not a complete list)
o single conductive plug
o max 1500 DCV
o max 3000 DCA
o PLC + ISO/IEC 15118
o touch-safe (UL2251)
o on-handle software-interpreted override switch
o adheres to OSHA and ADA requirements
o FCC Class A EMI
o located on the driver side of the vehicle, hip-height
o capable of being automated
o UL (NRTL) certified
o cyber-secure
o V2X (bi-directional)

There are many public DC charging standards...but none are sufficient for commercial trucks

USA-Japan	Europe	USA-Japan-Europe	China
Combo 1: Combined AC & DC	Combo 2: Combined AC & DC	Chademo	GB/T
			

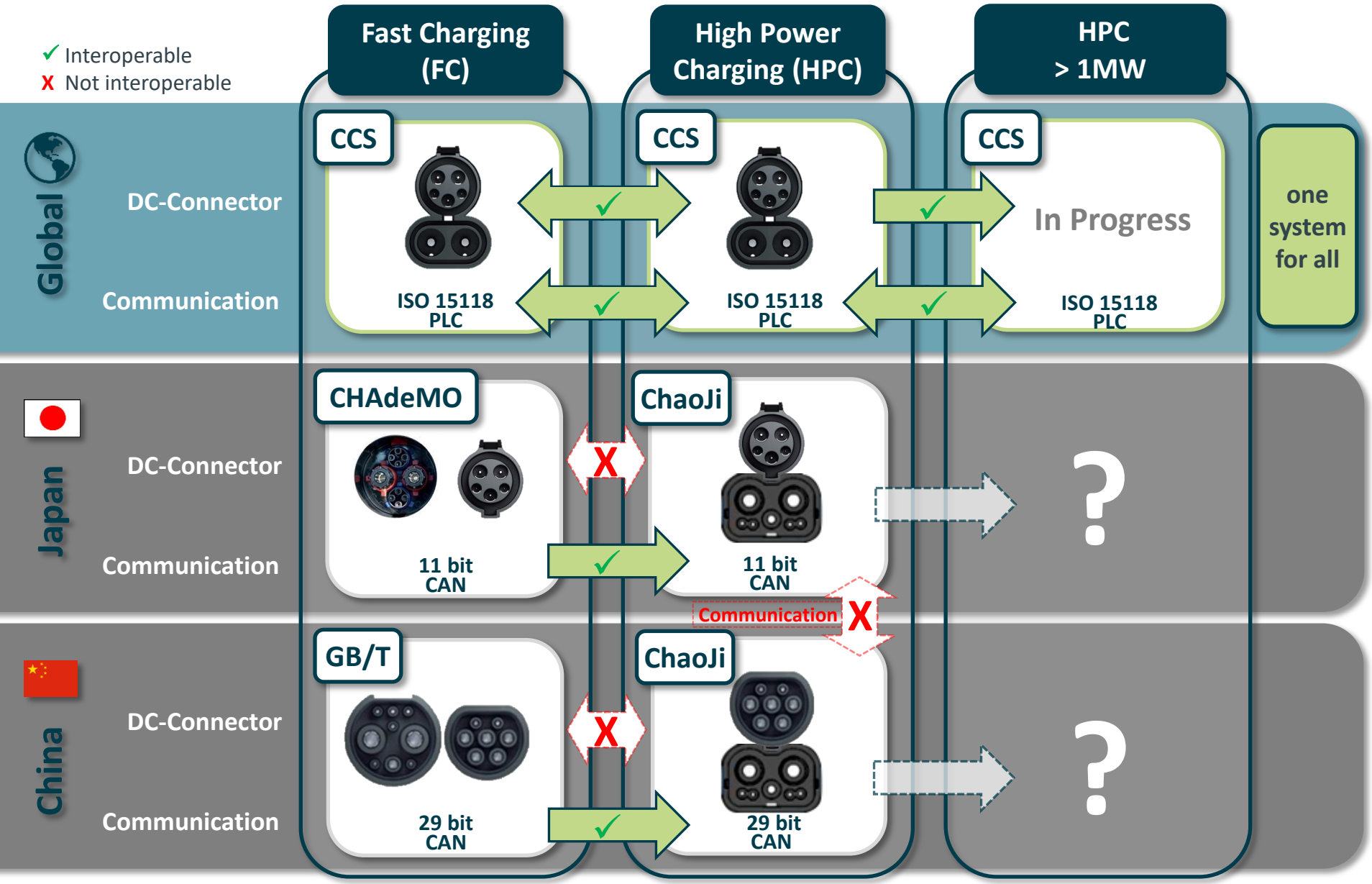
They were all designed to quickly charge passenger cars, not commercial trucks. Existing and future passenger car charging limits are 500-600A.

In order to charge a truck carrying 200-600 kWh batteries in 20-30 minutes, the charge time requested by customers, trucks will require power levels of **over 2 MW and current over 2000A**.

None of the existing public standards are capable of providing the power needed to quickly charge commercial trucks, which will require 4 to 10 times higher charging power than existing passenger car charging systems!

HPCCV

The charging systems



HPCCV

The status of evalutation

- **Selection has been made, iterative development is underway**: After a call for submission to solve the requirements, 5 propositions have been presented. The HPCCV task force voted in May 2019, and there was overwhelming consensus to pursue a hand-held conductive charging plug and socket capable of 3000 A.

- **The Task Force is now focused on iterative testing and validation of this selection** : Ongoing weekly technical meetings discussing details of the future standard, including voltage range, current capability and associated thermal performance, plug/socket geometry fit and function, etc.

- Multiple stakeholders have agreed to build **prototypes by Q1 2020**.

- The goal of the task force is compile a complete requirements document, including plug geometry, which can be submitted to a standards defining organization in 2020 to **become the worldwide standard for charging commercial vehicles.**

HPCCV

The way of standardization

- Full committment of German truck CTO´s to bring HPCCV to international standardization
- Task to German Norms and Standards Authority (NA AA37) and DKE to start the process
- Standardization Kick Off workshop at December 13th 2019 to define scope, organization and process
  - Agreement on HPCCV requirements set
  - New DC coupling device will be based on already standardized definitions for System C (CCS), with DC only
  - Input of the HPCCV TF will be respected in the further steps of standardization
  - A new work item proposal to start the connector standardization will be applied in IEC TC69 as a new part of IEC62196 → end of 02/20
  - Preparation of a system description proposal to be inserted into the CCS related international standards where necessary (e.g. IEC61851-series, ISO15118, ISO17409, ISO 21498-1) → end of 2020
- Project Kick Off workshop at February 6th 2020 for creating a HPCCV corridor project
  - Four european OEMs with grid companies, technology providers, logistics and CPOs

Thank you for your kind attention!

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