



Empowering
the **next level**
of e-mobility

CharIN – Charging Interface Initiative e. V.

LATAM Training Program Unit 2: EV Charging Standards

September 27th, 2022

Mechthild Maria Mohr



General Goal:

The CO₂ neutral Mobility



CO₂ neutral
energy



CHARIN

Solution provided by the
Combined Charging System (CCS)
& Megawatt Charging System (MCS)



Battery Electric Vehicle (BEV):
Forecast 40 – 60 Mio. vehicles
and >20% electrified trucks
by 2030 in Europe

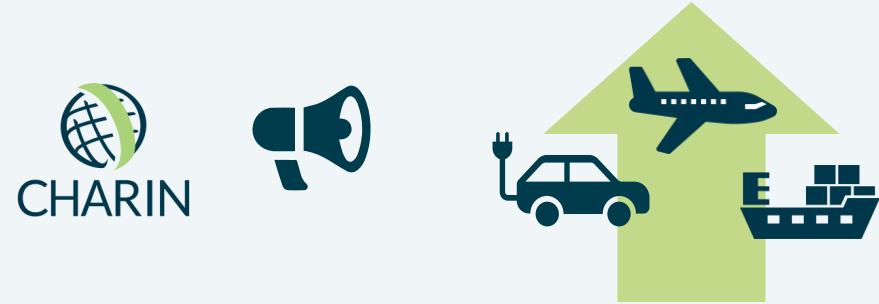


CharIN´s Vision

The overall scope



The Charging Initiative e.V. (CharIN) is a non-profit association promoting **interoperability of global charging solutions** for vehicles of all types, and to define requirements for the **evolution** of charging related standards and for the **certification** of CCS based charging products.



The alliance strongly promotes the **adoption of charging standards**, including, but not limited to, **CCS, MCS, ISO/IEC15118** and related standards, together with all measures and services connected therewith.

CharIN undertakes **activities in the different world regions** to promote charging of electric vehicles as well as charging in the aviation and marine sector, supporting battery powered mobility and related technologies.



CharIN at a glance

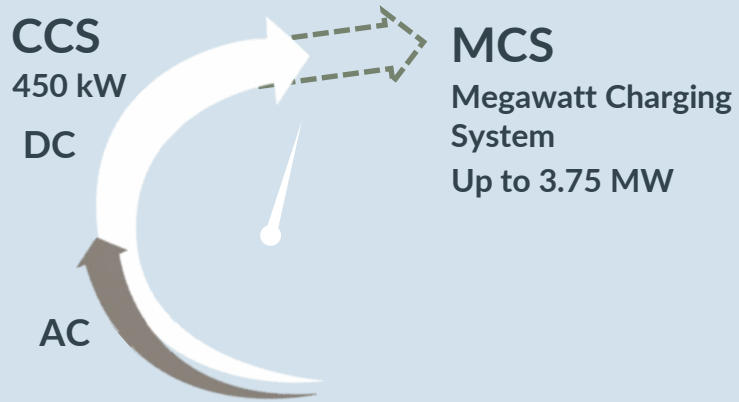
CCS scope



Performance up to

450 kW (CCS)

3.75 MW (MCS)



Added Value

Extended Functionality
Plug and Charge
Vehicle to grid &
Vehicle to home



Worldwide

Asia

Europe

North America

Middle East



Scope of application

Motorbike
Car
Bus | Truck
Airplane
Ship

Charging System Standards

Key facts for Combined Charging

- **Single System approach for AC and DC combined in one connector**
- **Only one communication module for AC and DC charging**
- **Charging voltage up to 1.000 V and current up to 500 A**
- **Charging power up to 450 kW**



- **Interoperability secured CharIN CCS Test System**
- **Powerline Communication (PLC) for Charging and advanced services**
- **Certified payment and accounting system**
- **State of the art communication via HomePlug GreenPHY enables integration V2H and V2G**

CCS - global, cross industry, and holistic

One System for all: Combined Charging System (CCS)



Interoperability by using ISO15118 also for additional features

Comprehensive infrastructure incl. High Power Charging (HPC) stations (min. HPC250)

Customer Comfort Features (e.g. Plug and Charge, Automated Conductive/Wireless Charging)

Enabling the environment for easy **infrastructure construction and roll-out**

Creation of an open PKI ecosystem enabling further Plug and Charge rollout

Intelligent Load Management including the vehicle battery in the grid

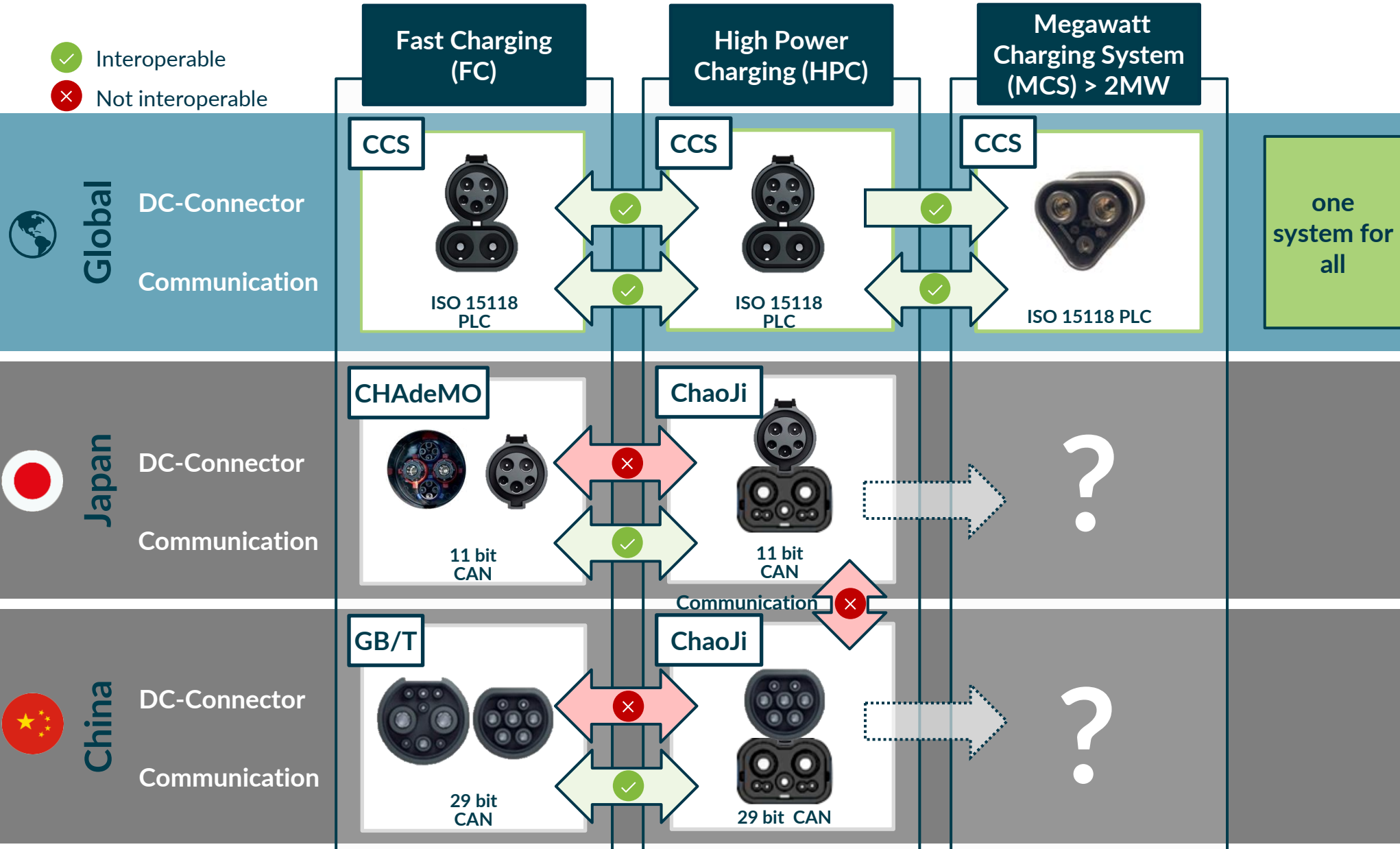
Megawatt Charging System (MCS) for commercial vehicles, suitable for Aviation and Marine

Vehicle to Grid Management (V2G) with reverse power transfer

Charging System Standards worldwide

CCS and ChaoJi

- ✓ Interoperable
- ✗ Not interoperable



Charging System Standards worldwide

Advantages of ISO 15118 Communication Protocol

Charging System	Communication Protocol	DC	AC	TLS	PnC	SCF	BiDi	WPT	ACD
CCS 1 CCS 2 MCS (Global)	ISO 15118-20 Ed1 (Q1 2022)	✓	✓	✓	✓	✓	✓	✓	✓
	ISO 15118-2:2014 Ed. 1	✓	✓	✓	✓	✓	X	X	X
	DIN SPEC 70121:2014 Ed. 2	✓	X	X	X	X	X	X	X
CHAdeMO 3.0 (Japan)	Tbd (ChaoJi-2, CAN 11bit*)	✓	X	X	X	✓	✓	X	X
CHAdeMO (Japan)	IEC 61851-23/24 (CAN 11bit*)	✓	X	X	X	X	✓	X	X
ChaoJi (China)	Tbd (ChaoJi -1, CAN 29bit*)	✓	X	X	X	✓	?	X	X
GB/T (China)	GB/T 27930 (CAN 29bit*)	✓	X	X	X	X	X	X	X

AC – Alternating current charging

ACD – Automatic connection device

BiDi – Bidirectional charging

DC – Direct current charging

*Limited bandwidth due to CAN bus based physical layer

PnC – Plug & Charge

SCF – Smart charging function

TLS – Transport Layer Security

WPT – Wireless Power Transfer



ISO 15118-20 Ed. 1 adds additional features and charging methods

For the first time, implementation of ISO 15118-20 Ed. 1 will serve all use cases to enable seamless introduction of electric vehicles.

Why MCS?

The motivation to develop a Megawatt Charging System

Quick charging of large batteries

**To charge 200-600 kWh batteries in 20-30 minutes
→ power levels exceeding 1 MW are required**

No sufficient and safe charging solution available

Common development of a solution that is adopted by all relevant players

One system for all

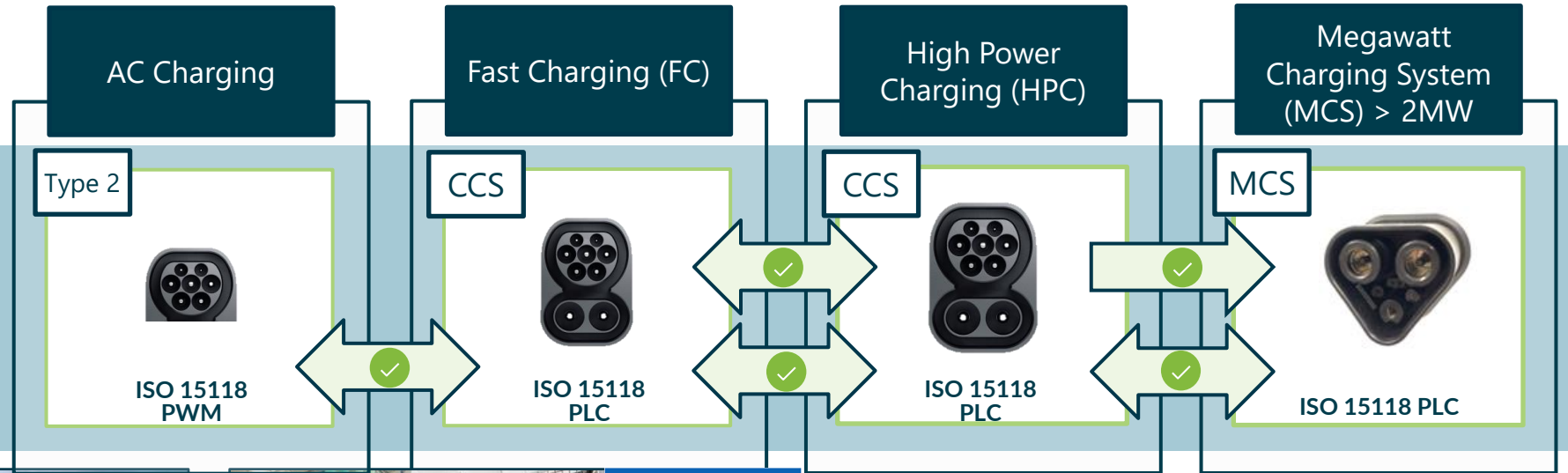
CCS and MCS

✓ Interoperable



Global

DC-Connector
Communication



MCS



Promote interoperability based on the Combined Charging System (CCS & MCS) as *the* global system for charging electric vehicles of all kinds

1

Spread the word

Promote awareness on benefits of a common CCS standard

2

Broadening the tent

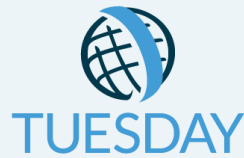
Collaboration in EV charging, incl. regulators, industry and EV related associations

3

See it means believe it

Proof of concept by testing. Information, education and demonstration to a wider public

Conferences, Exhibitions & Round Tables



Social Media, Positions



Focus Groups



Projects



Liaisons/Strategic Partners in EU



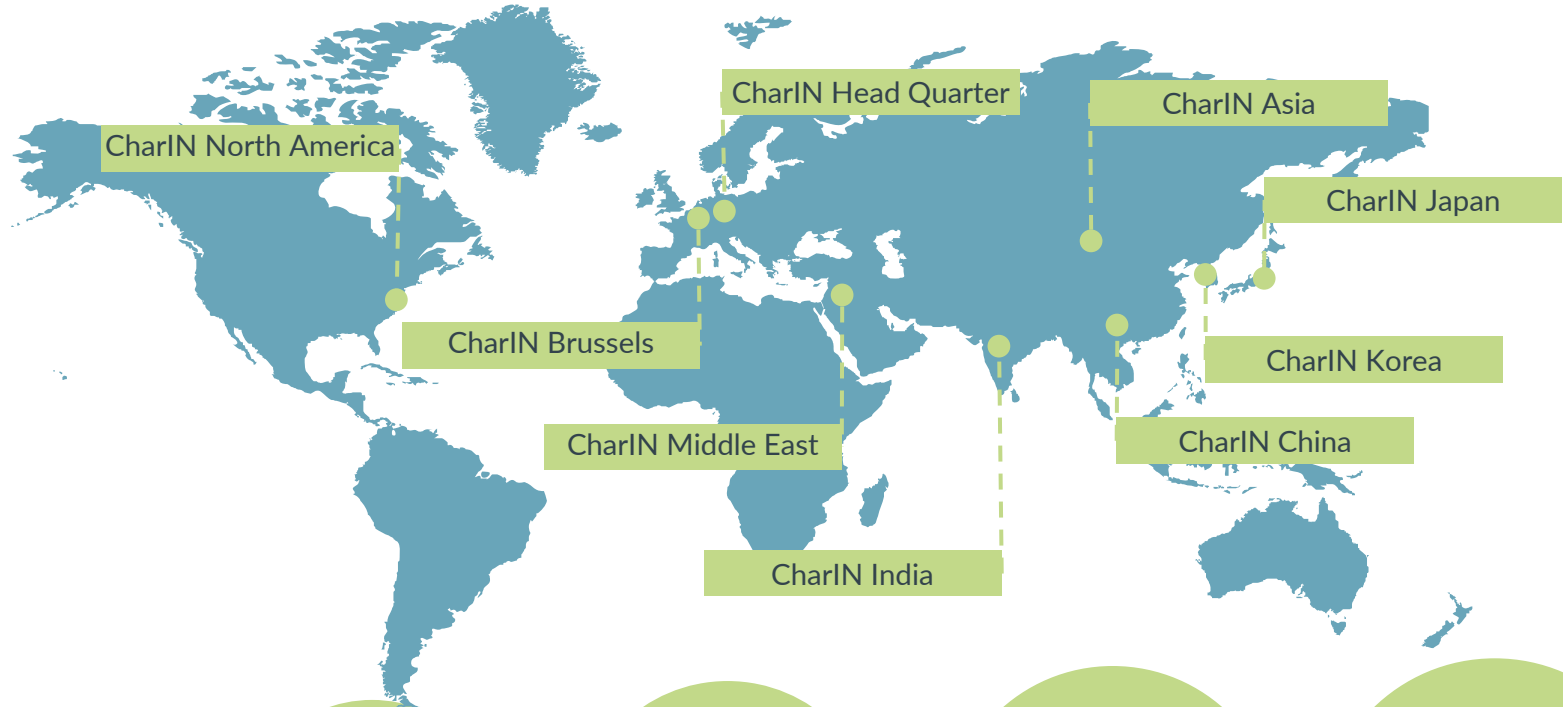
Dashboard ([here](#))

Status Quo CharIN

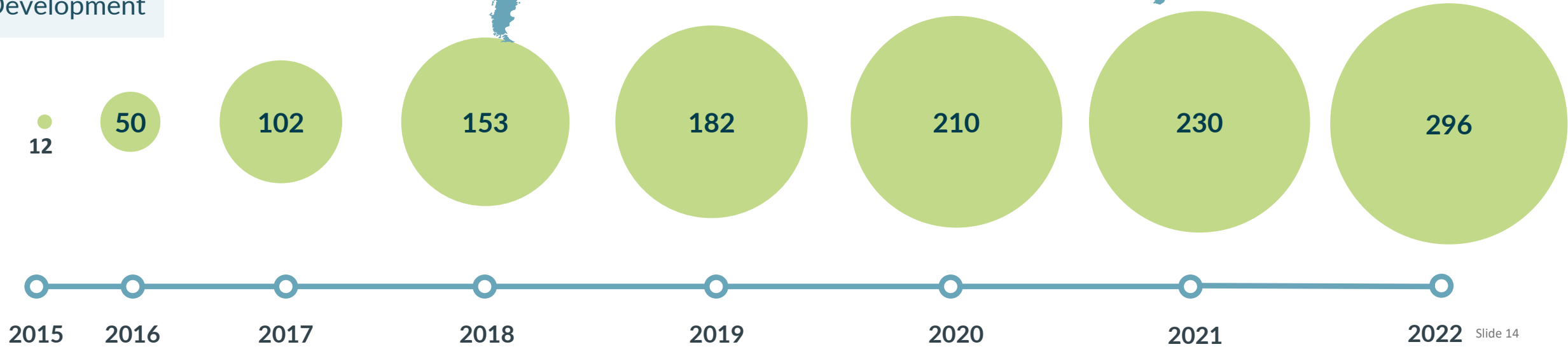
Membership development



Regional Offices



Member Development




CharIN's Value Chain

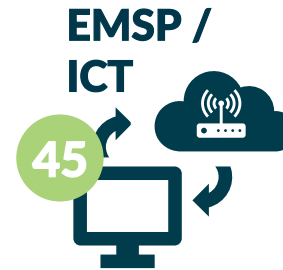
As of June 14, 2022

- 153 Core Members
- 129 Regular Members
- 2 Associated Members

- 176 Europe
- 58 Asia / Australia
- 50 North America



16 Grid Operators / Energy Providers



45 EMSP / ICT



87 EVSE



52 OEM



39 CPO



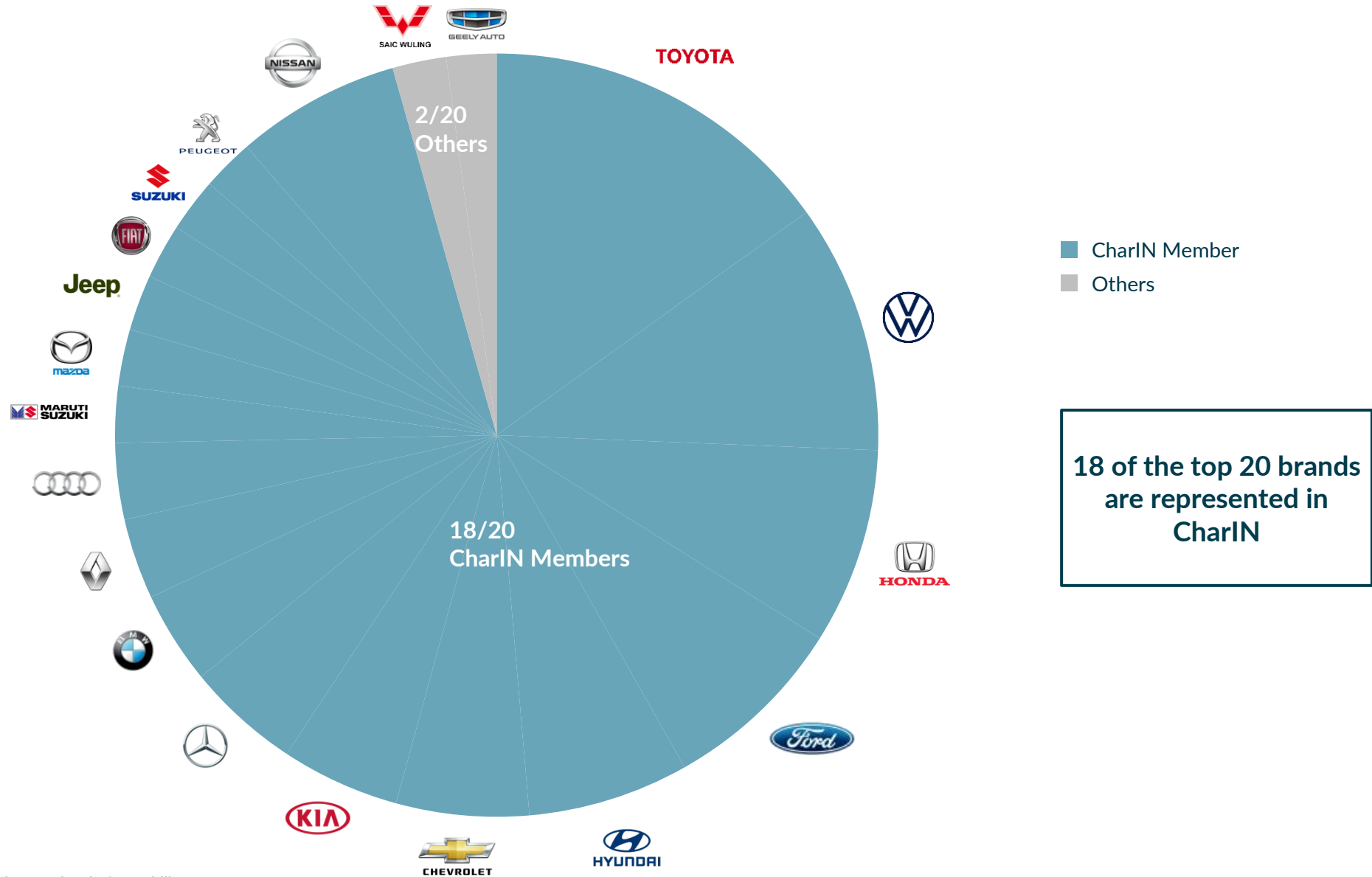
62 Plug / Cable / Sub Supply



68 Testing / Standardization

Membership Share

Top 20 brands 2020 by volume



CharIN around the globe

Think globally, act locally.




André Kaufung
Managing Director




Glenn Cezanne
Head of Public Affairs EU



Erika Myers
Executive Director, CharIN NA
(CharIN Inc.)



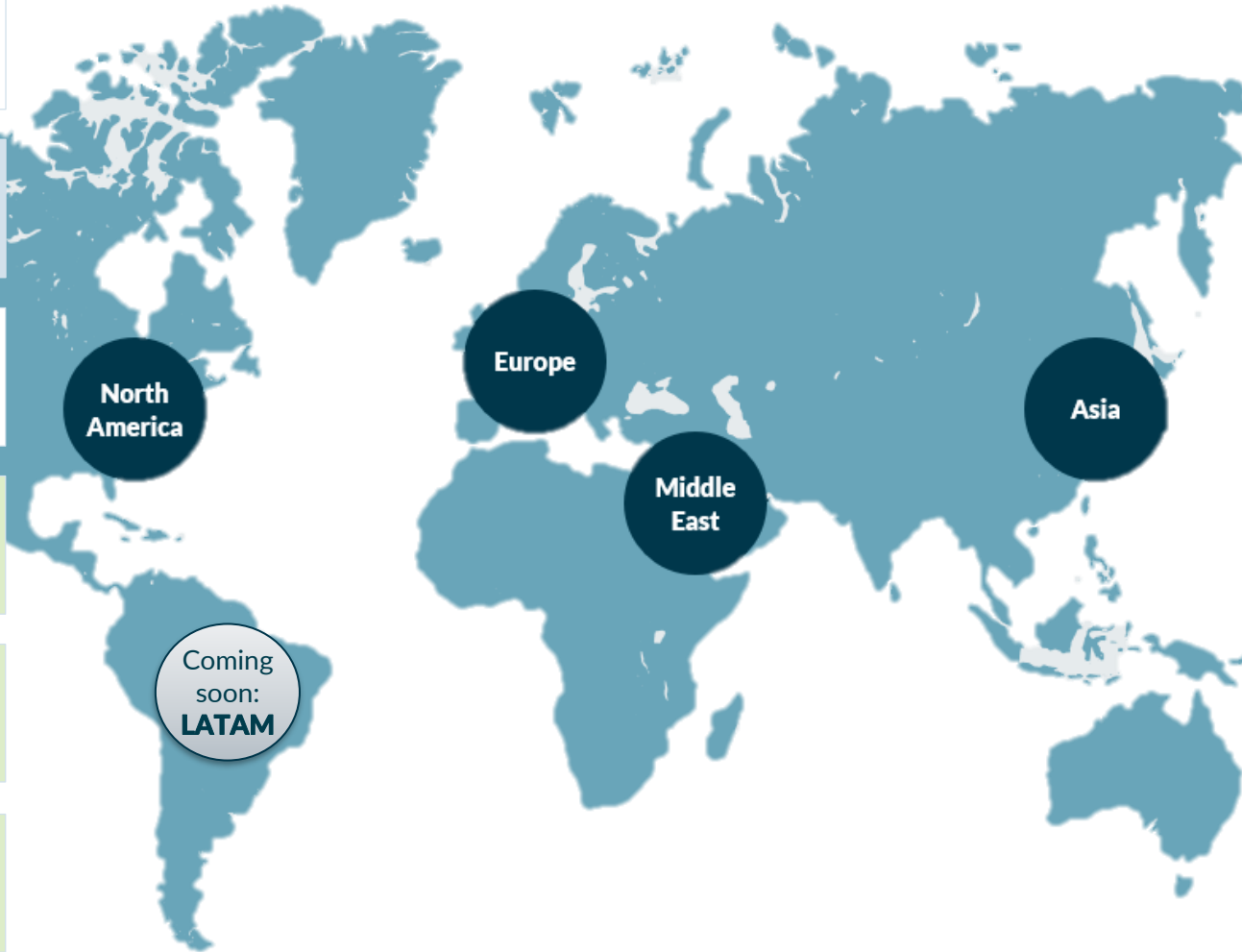
Adriano Mones Bayo
Ambassador Spain



Ahmed Samir Elbermbali
Ambassador Middle East



Roger Atkins
Ambassador UK




Jacques Borremans
Managing Director Asia



Meike Hendriksz
Managing Director China



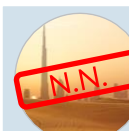
Kageki Shimamura
Managing Director Japan



Sivam Sabesan
Managing Director India



Min-Jung Lee
Managing Director South Korea



Managing Director
Middle East

Community

Ambassadors Program

CharIN Ambassadors:

- CharIN Ambassador Middle East: [Ahmed Samir Elbermbali](#) from Clean Energy Business Council (CEBC) MENA
- CharIN Ambassador Spain: [Dr. Adriano Mones Bayo](#) from Phoenix Contact
- CharIN Ambassador Great Britain: [Roger Atkins](#) from Electric vehicles outlook

Ambassadors represent CharIN to...

- Actively support CharIN activities in their respective regions
- Increase CharIN's exposure and awareness
- Speak on behalf of CharIN at relevant e-mobility events
- Connect relevant local e-mobility & charging stakeholders from politics & industry to CharIN Executive Board & Steering Committee members for common exchange
- Encourage expertise exchange in the respective region and between global regions
- Help companies in the respective region in their transition towards clean transportation and cooperate with their Business Development
- Educate newcomers on CharIN Best practices e.g. explaining the most efficient approaches for EV-adoption

CharIN Ambassadors



Ahmed S. Elbermbali
Clean Energy Business Council (CEBC)



Dr. Adriano Mones Bayo
Phoenix Contact E-Mobility GmbH



Roger Atkins
Electric vehicles outlook



MOU Chile Ministerio de Energía

- CharIN met a Chilean delegation at the EVS35 fair in Oslo on June 14, 2022
- The representants of the Chilean Government were looking for a partner to implement the charging standard in their country
- Together with CharIN Ambassador Dr. Adriano Mones Bayo, CharIN is currently preparing a strategic partnership with Chilean Government

Biobío Energía 2022 11° Congreso Internacional in Concepción, Chile (October 25 – 28, 2022)

- CharIN Chairman Claas Bracklo and Ambassador Adriano Mones Bayo will both speak on behalf of CharIN at the congress
- Meetings with governmental representatives from LATAM countries are planned
- **Do you plan to attend the Congreso?**
- Welcome to reach out to coordination@charin.global to make an appointment for an in-person exchange!

CharIN intends to grow its **network in LATAM and to support the development as an education and knowledge partner.**

Get in contact with us for more information on strategic partnerships with CharIN:

Coordination@charin.global



Technical Groups

Overview



CHARIN Technical Groups

Focus Groups

Open for **Members** only
(core: all 5 FG's; regular: 1 FG)



FG Charging Connection



FG Charging Infrastructure



FG Grid Integration



FG CT & IOP



FG Charging Communication

Task Forces

Open for **all** interested parties
(members & non-members)



TF PKI



TF HPC



TF Cybersecurity

Special Projects

Specific commitment upfront needed
(e.g. financial, legal, resources)



Plug and Charge
Europe



Wirkkette Laden
Verbundprojekt

Powered by
CHARIN

Thank you for your kind attention!

Any questions?

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You want to learn more about CharIN and CCS?

Send us an e-mail:

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¿Quieres saber más sobre CharIN y CCS?

Envíenos un correo electrónico:

coordination@charin.global



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