



Empowering
the **next level**
of green mobility
and energy

CharIN – Charging Interface Initiative e. V.

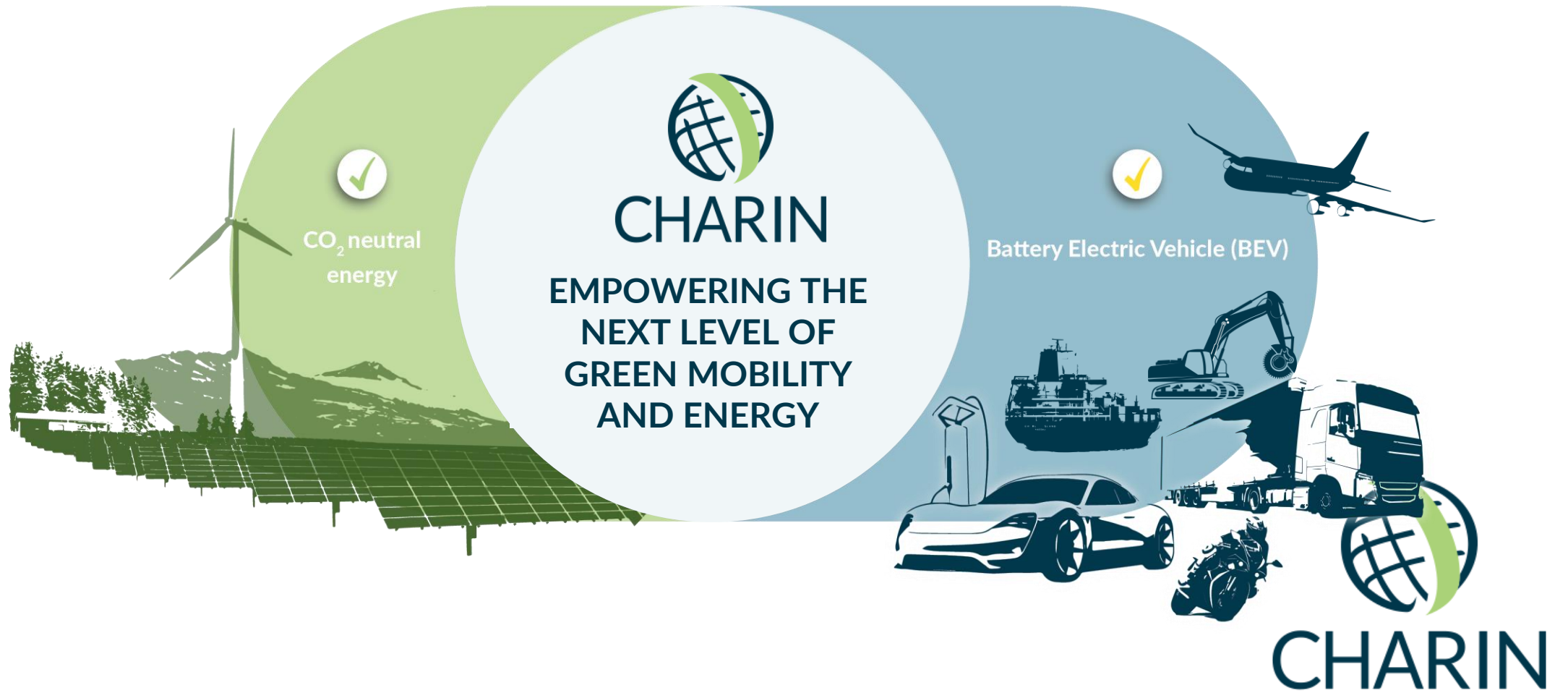
CharIN: interoperability for EV charging

Pacific Islands EV standards workshop, Auckland, October 2024



VISION:

BIG PICTURE



CharIN's vision

Overall scope

- The Charging Initiative e.V. (CharIN) is a **non-profit association**.
- Promotes the **interoperability of global charging solutions** for vehicles of all types.
- Defines requirements for the **evolution** of charging-related standards.
- Works on the certification of **CCS** and **MCS** based charging products.
- Promotes the adoption of charging standards like **CCS, MCS, ISO/IEC 15118**.




CharIN's Value Chain

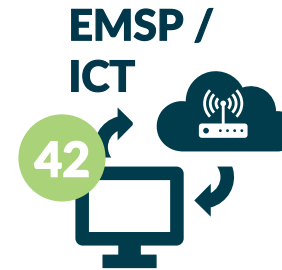
Over 300 members as at March 2024

- 165 Core Members
- 141 Regular Members
- 2 Associated Members

- 179 Europe
- 73 Asia / Australia
- 54 North America



13 Grid Operators / Energy Providers



42 EMSP / ICT



90 EVSE



55 OEM



51 CPO



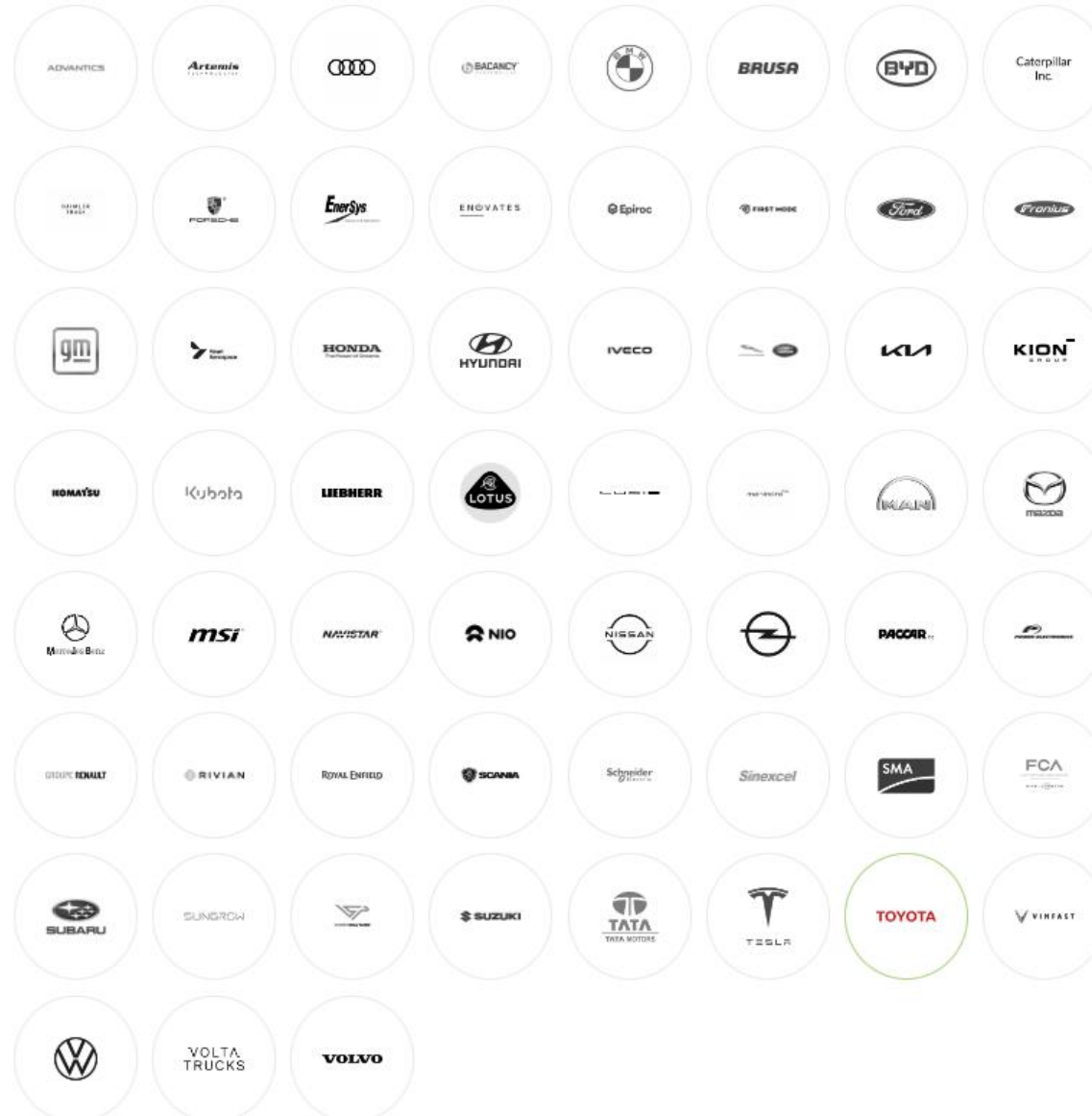
63 Plug / Cable / Sub Supply



81 Testing / Standardization

CharIN OEM members

As at October 2024



All you need to know about CharIN!

Explanatory Video



One system for all

CCS and MCS



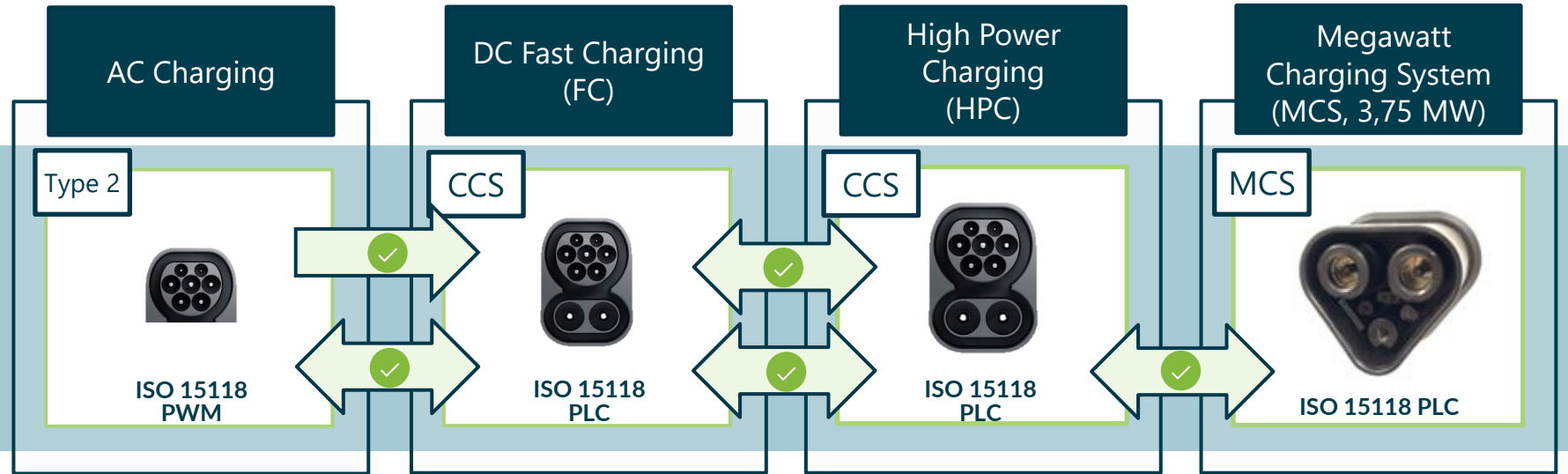
✓ Interoperable



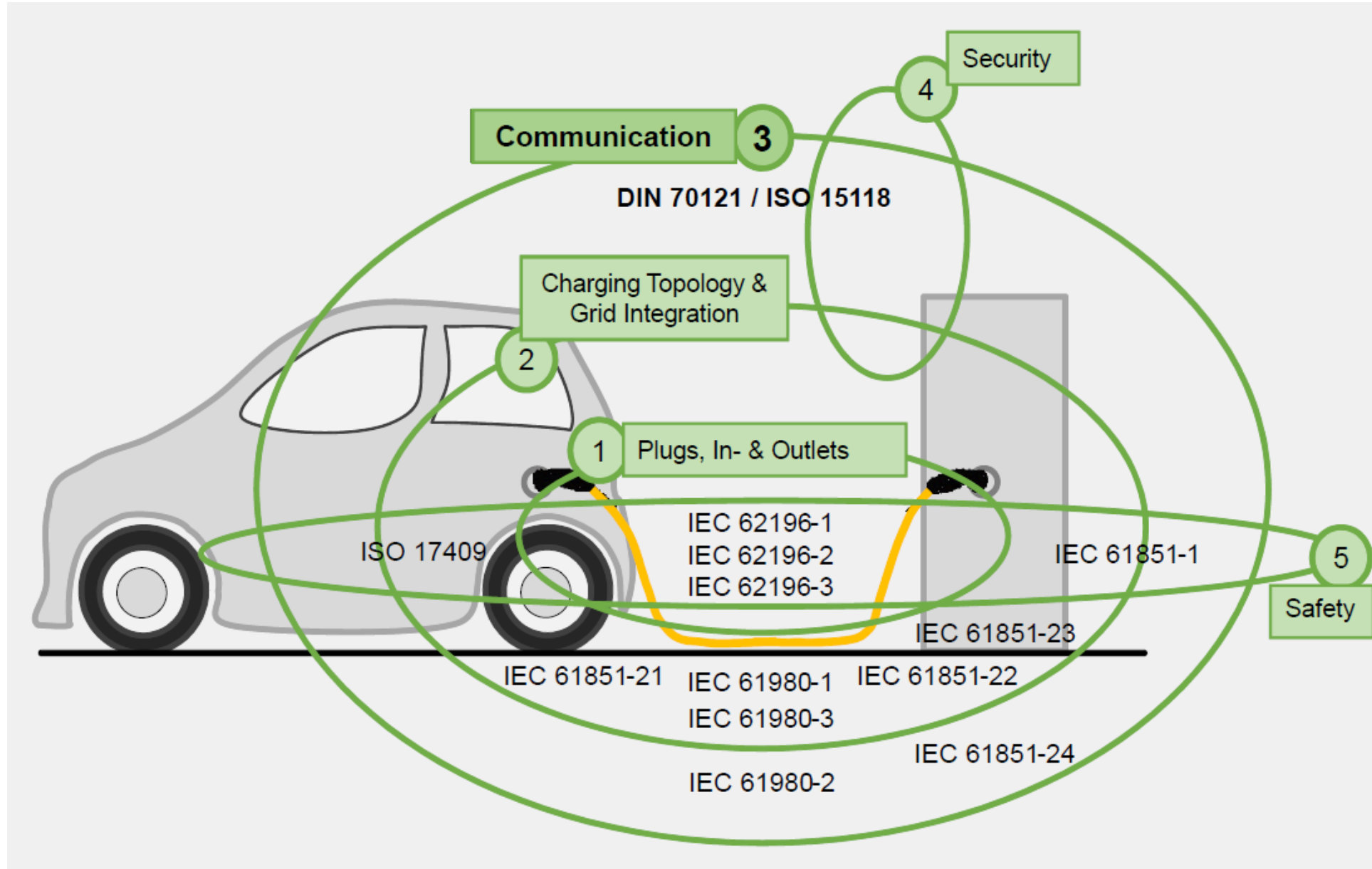
Global

DC-Connector

Communication



Relevant Standards in the CCS Ecosystem



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.

Bidirectional Charging

Vehicle to load (V2L) after Cyclone Gabrielle, New Zealand



“We have had no power for two days, three nights. The V2L system has been running our fridge, lights, charging appliances, internet wifi and the odd appliance like a toaster and coffee machine” Source: [autocar.co.nz](https://www.autocar.co.nz)

North American Charging System (NACS): SAE J3400

CharIN North America Charging Interoperability (NACI) Task Force



Why CharIN Supports SAE J3400

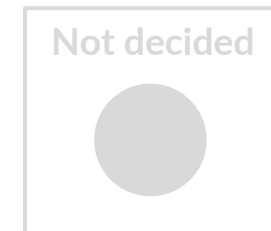
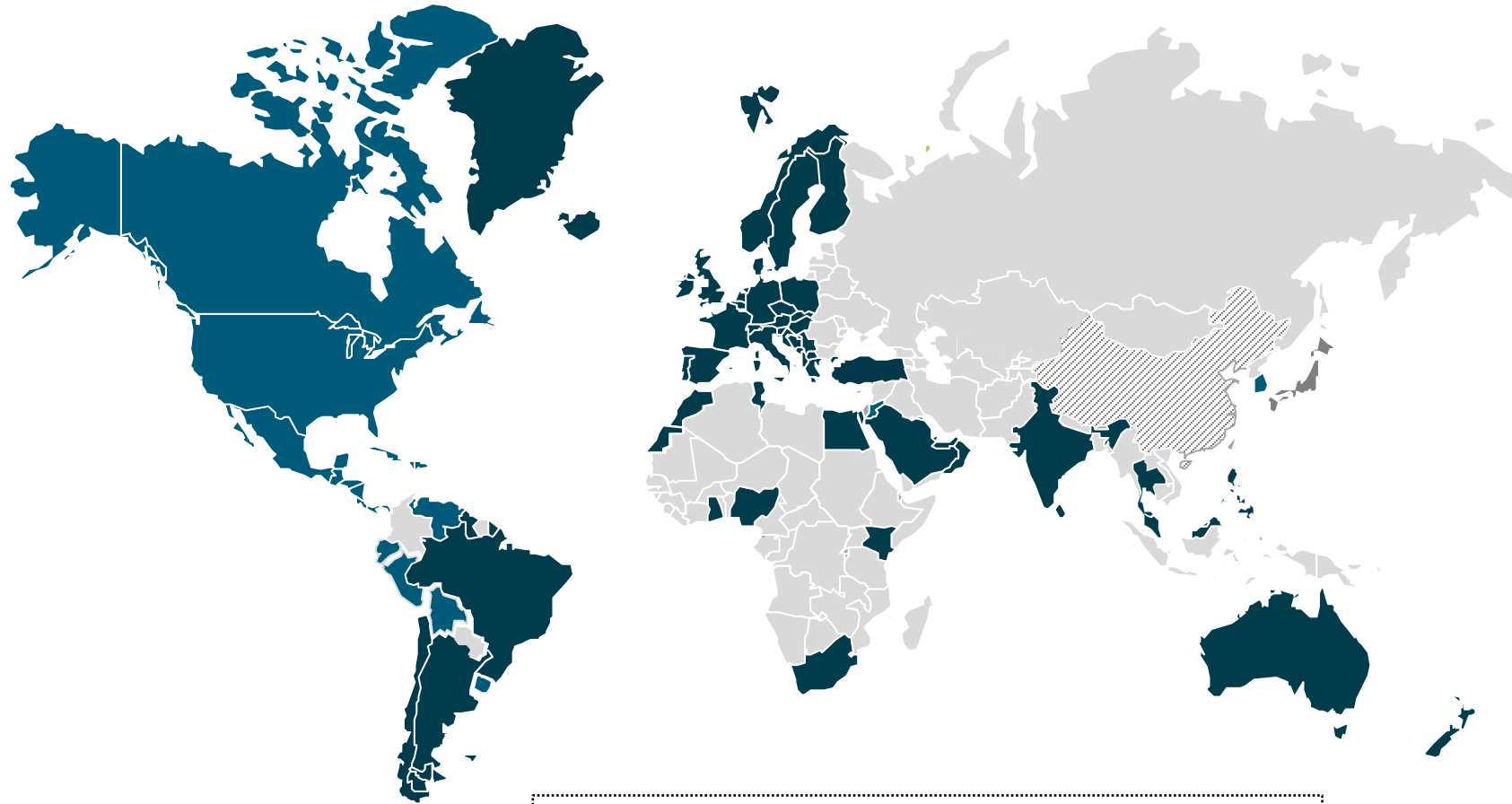
At CharIN, we foster cooperation among stakeholders to create a superior charging experience for all EV owners, promote interoperability, and strive for common, inclusive solutions. We acknowledge that Tesla and its NACS charging connector system have played the key role in the initial development of electric transportation and EV charging and will continue to accelerate EV adoption in North America. As the premier convener of stakeholders working towards an interoperable charging system, CharIN has the responsibility to examine the impact of SAE J3400 adoption and encourage the standardization process.

SAE J3400 and CCS share common communication protocols, DIN SPEC 70121 and ISO 15118 based on power line communication (PLC). These communication protocols were initially designed for CCS, but have proven to be versatile, and capable of bridging across various charging standards in North America, extending their applicability even beyond SAE J3400.

The SAE J3400 and CCS charging standards have the potential to offer a seamless user experience. As demand for electric mobility grows, maintaining trusted and convenient charging solutions is paramount. Consumers demand that both SAE J3400 and CCS continue evolving to meet expectations for charging reliability, which requires consistent interoperability.

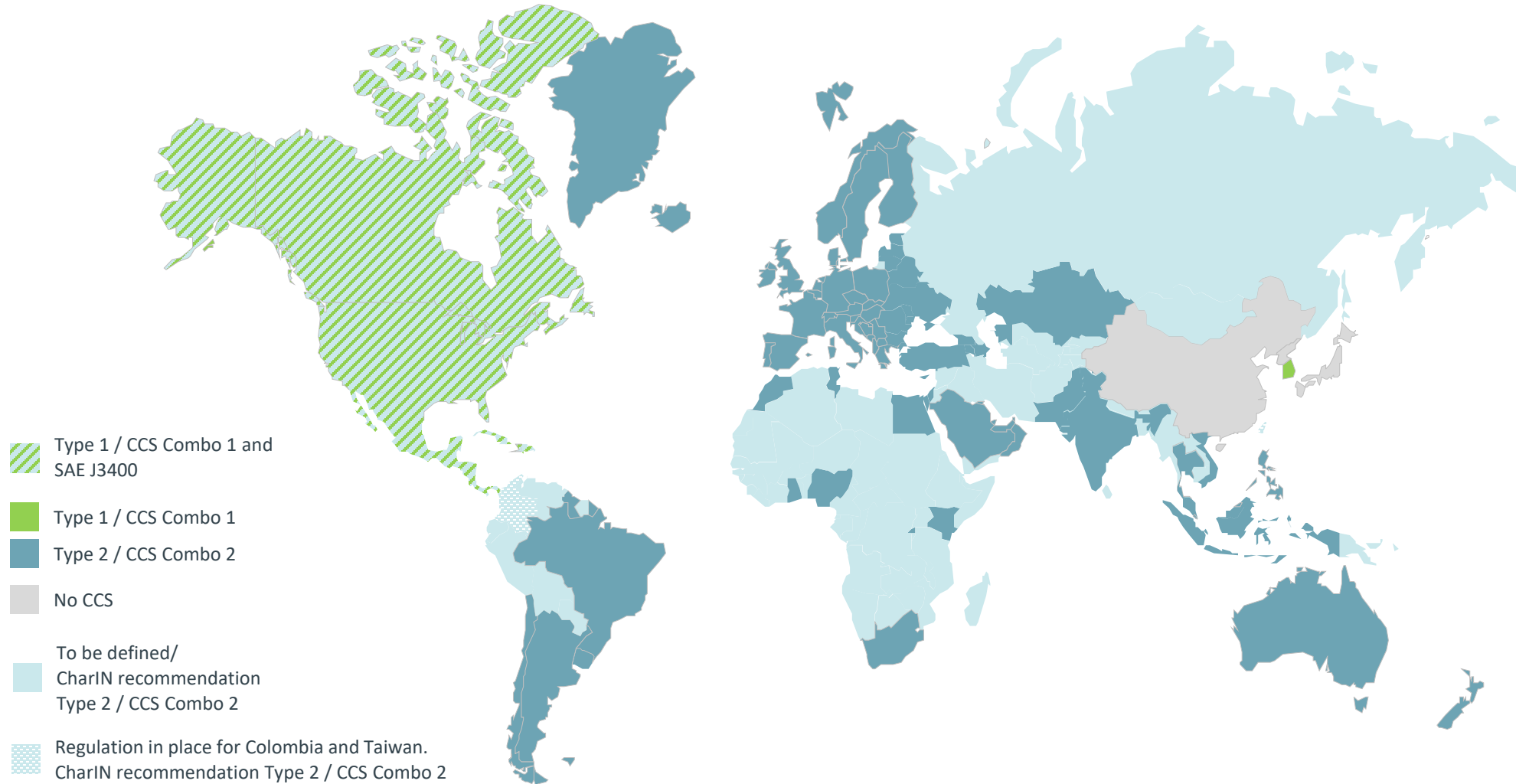
Collaboration will help improve user experience and reliability, as well as safety – all while reducing market complexity, eliminating consumer confusion, and accelerating EV adoption.

World Map of EV Charging Systems



CharIN Recommendations

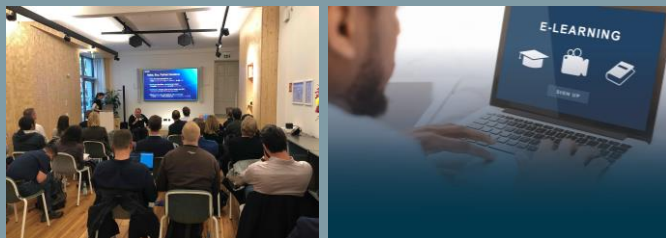
Harmonized connector approach per geographical region



EDUCATION

Need to **level-up know-how** of incumbents & new entrants

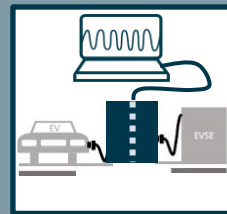
- ✓ global trainings for everyone
- ✓ leading industry experts
- ✓ all areas of the charging ecosystem covered
- ✓ interactive and practice-oriented courses
- ✓ networking opportunities



CERTIFICATION

Guarantee the minimum requirements of so-called “CCS” product for charging interoperability by **CharIN mark**

- ✓ Interoperability Testing & Certification Committee: Quality and Monitoring
- ✓ Testing house: Reporting and Certification
- ✓ CCTS Vendor: CharIN Conformance Test System



EVENTS

It's all about testing:

- ✓ CharIN Festival embraces the challenge of interoperability
- ✓ Conformance and interoperability tests for electric vehicles and charging infrastructures
- ✓ Controller tests
- ✓ Networking with international technology experts
- ✓ Different locations and countries around the globe



Thank you for your kind attention!

Any questions?

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