



# CHAdemo

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ASSOCIATION & PROTOCOL

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# CHAdEMO ASSOCIATION & PROTOCOL

## In a nutshell

### Who we are

We are an e-mobility collaboration platform around CHAdEMO DC charging protocol. As an ecosystem of companies offering CHAdEMO-related products and services we work together to promote and enable electric mobility on a global scale.

### What we do



**WE DEVELOP THE PROTOCOL** adapting it to the market needs and our members' requests.



**WE CERTIFY CHARGERS** ensuring compatibility between the infrastructure and the EVs.



**WE PROMOTE FAST CHARGERS** by actively disseminating their benefits and data through various communication channels.

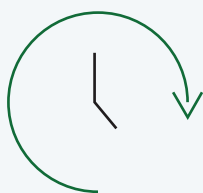
## About CHAdEMO Protocol

CHAdEMO is a DC charging protocol currently enabling EV charging with power from 6kW to 50kW with a possibility of 150kW in preparation. It follows 4 principles:



#### SAFETY

CHAdEMO believes that in the context of high power, electrical safety is crucial and mandates strict guidelines in designing chargers.



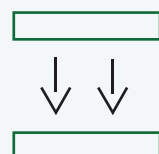
#### FUTURE-PROOF

CHAdEMO is Smart Grid-ready through its bi-directional charging capability. It is also compatible with any local or optional functions beyond charging.



#### EASE OF APPLICATION

The protocol works with CAN communication, making its integration with the rest of the car easy and reliable.

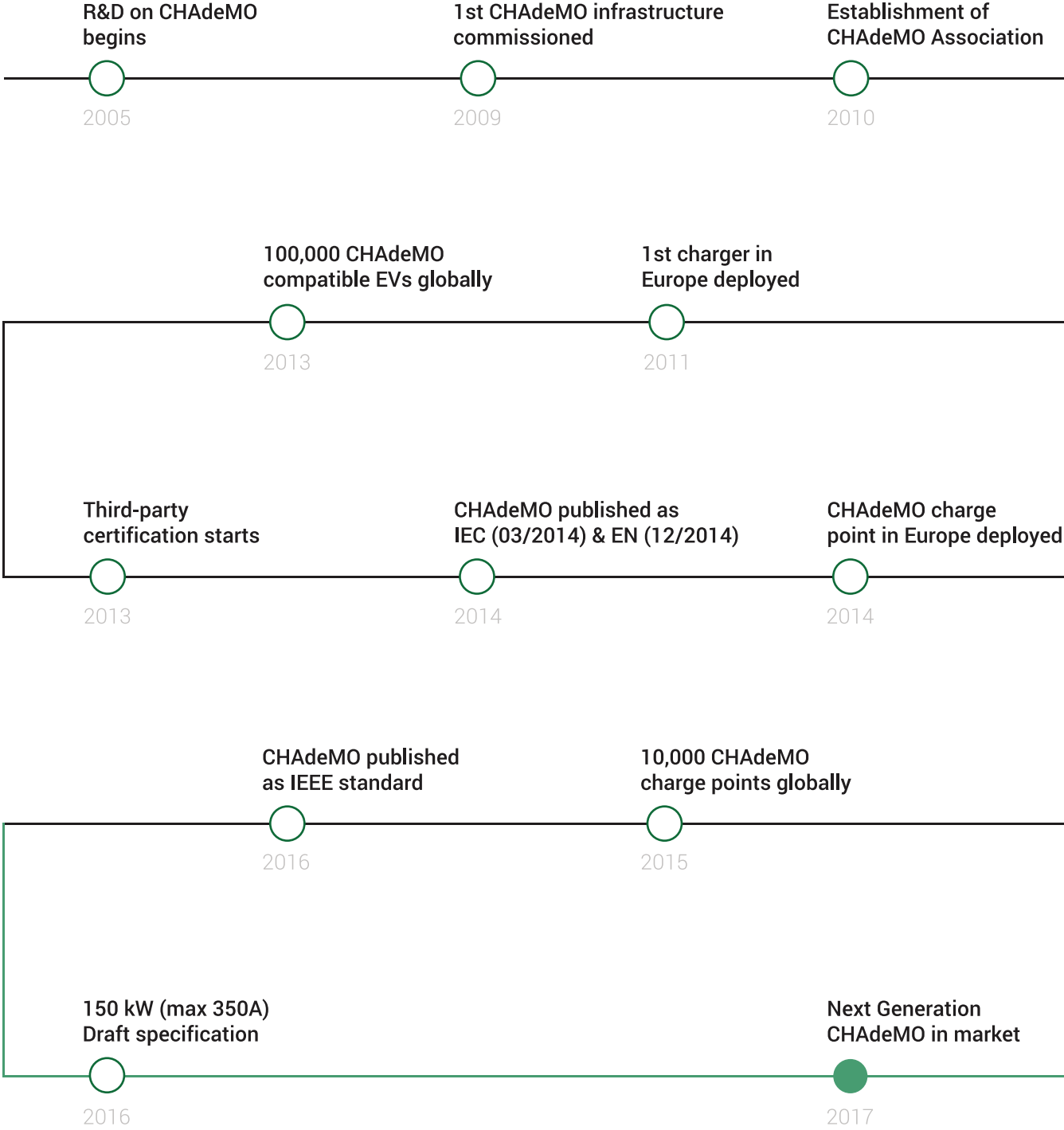


#### UNIFORMITY

CHAdEMO connector is identical across the globe and is a stand-alone plug that can be with or without an AC connector. It saves costs for EV makers and enables cross-continental EV travels.

# DECADE LONG ELECTRIC JOURNEY

## and planning for higher power



# 150kW

To respond to the ever-increasing capacity of EV batteries and to keep the charge time to a minimum, development of the next generation CHAdeMO for higher power is on-going.

# LEADING BY NUMBERS

## 1 The largest global installation base

CHAdEMO-equipped chargers are the most popular EV fast charging infrastructure choice in the world.



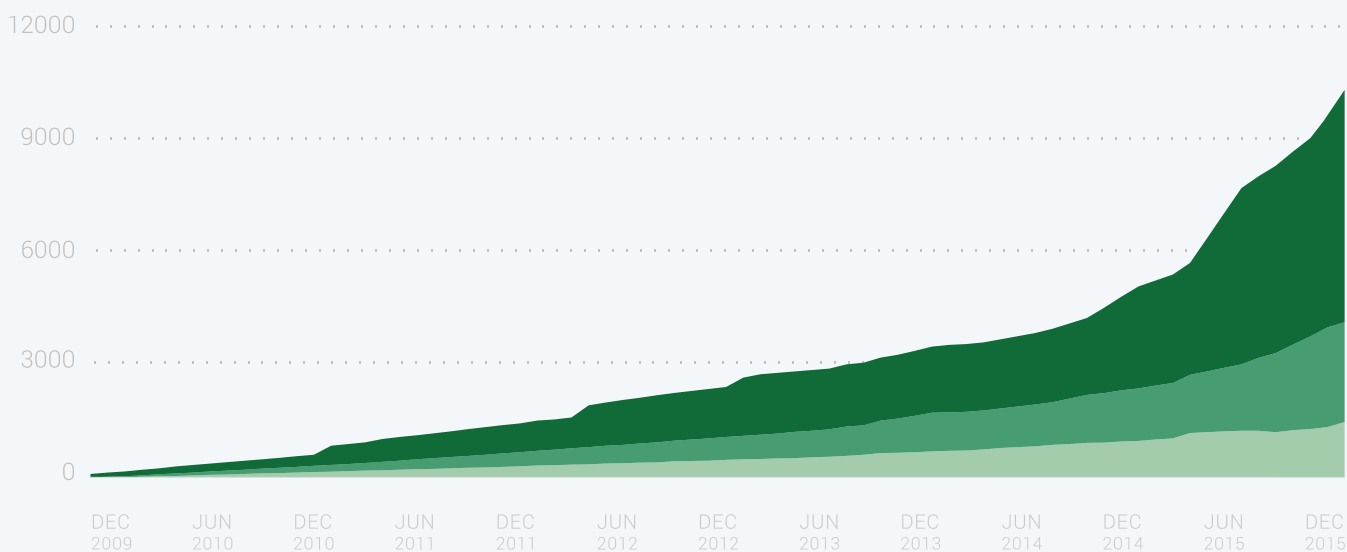
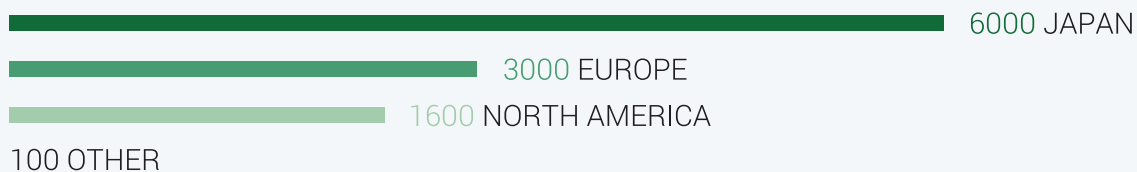
50

COUNTRIES ON 5  
CONTINENTS  
HAVE CHADEMO  
CHARGERS

10700

CHADEMO CHARGE  
POINTS ARE  
AVAILABLE TO EV  
DRIVERS GLOBALLY

## CHAdEMO charge point evolution



# 2 The largest number of certified charger models

First generation CHAdeMO chargers hit global roads in 2010. Since then, the portfolio of certified chargers increased to 220. All leading charger manufacturers as well as a broad range of SMEs providing fast charging infrastructure are our members, testimony to the Association's reach and global recognition.

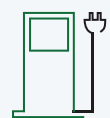
# ALL

TOP DC CHARGER  
MANUFACTURERS  
ARE CHAdeMO  
MEMBERS



# 50

COMPANIES  
PRODUCE  
CHAdeMO  
CHARGERS



## CHAdeMO chargers



ABB  
(Switzerland)



IES Synergy  
(France)



Efacec  
(Portugal)



DBT  
(France)



ENDESA  
(Spain)



EVTEC  
(Switzerland)



Delta Electronics  
(Taiwan)



Takaoka Toko  
(Japan)



SIGNET Systems  
(Korea)



Siemens  
(Germany)



Andromeda  
(Italy)



Tritium  
(Australia)



Petrotec  
(Portugal)



Hong Kong Productivity  
Council (Hong Kong)



Fuji Electric  
(Japan)



JoongAng Control  
(Korea)



Hitachi  
(Japan)



Takasago  
(Japan)



PNE Systems  
(Korea)



GS Yuasa  
(Japan)



Circontrol - CirCarLife  
(Spain)



Lafon  
(France)



Nichicon  
(Japan)



Nissan  
(Japan)



Hasetec  
(Japan)



Schneider  
(France)



e8energy  
(Germany)



Ingeteam  
(Spain)

And more...

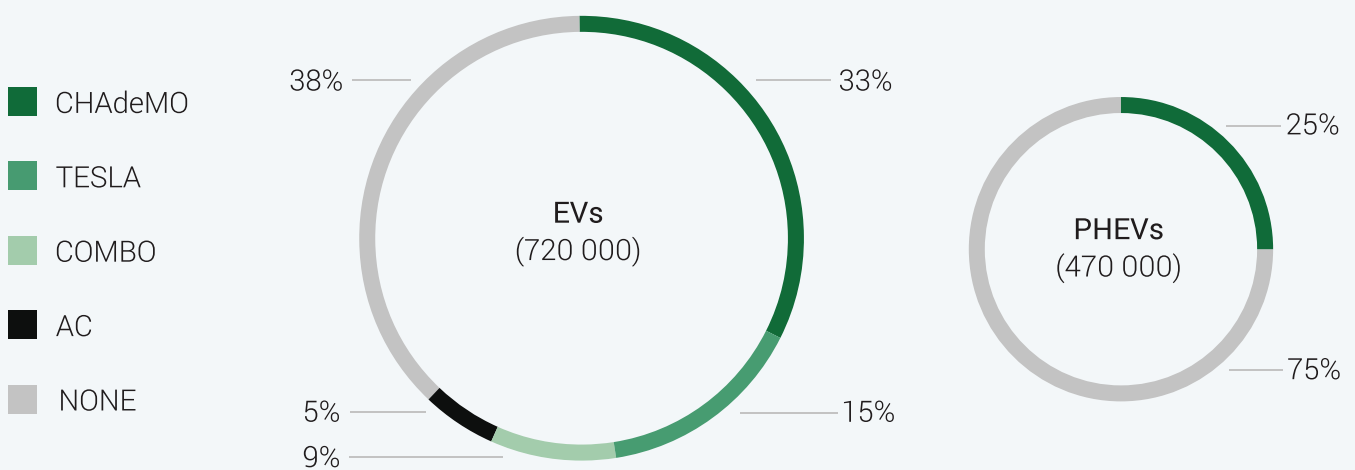
# 3 CHAdeMO compatible EVs in the market

CHAdeMO leads in the number of EV models using the protocol, including some of the most popular EVs on the market.

## Global plug-in sales by fast charging inlet

Source: IHS Automotive

Cumulative 2010-2015



## CHAdeMO compatible EVs



Nissan: LEAF



Mitsubishi: Outlander PHEV



Citroen: C-Zero



Peugeot: iOn



Nissan: e-NV200



Tesla Model S (with adapter)



Citroen: Berlingo



Peugeot: Partner



KIA: Soul



Mitsubishi: i-MiEV



Mitsubishi: MINICAB-MiEV



Mitsubishi: MINICAB-MiEV



BD Otomotiv: eTRAFFIC



Mazda: Demio EV



Honda: Fit EV



Toyota: eQ



Subaru: Plug-in Stella



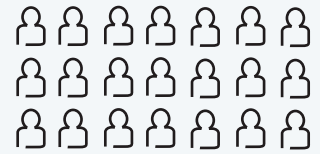
BD Otomotiv: eSCUDO

# 4 Largest member base as fast charging coalition

The DC charging ecosystem around CHAdeMO brings together top players from various sectors in e-mobility: automakers, utility companies, operators, manufacturers of chargers, connectors, and battery management systems. Together, they make sure CHAdeMO develops according to market needs and continues its growth.

“ By enabling drivers to charge faster and encouraging the deployment of the infrastructure CHAdeMO has been instrumental in promoting electric mobility.

Senan McGrath, CTO, ESB eCars



# 340

GLOBAL MEMBERS

# 70

MEMBERS IN EUROPE

## CHAdeMO Association - selection of members



# STANDARDISED AND CERTIFIED

## A European and international standard

Confirming its global relevance, CHAdeMO has been published as various international standards by IEC, CENELEC (Europe) and IEEE (US).



**EN**

61851-24,  
61851-23,  
62196-3



**IEEE**

2030.1.1

The European Union recognises the importance of CHAdeMO by explicitly endorsing multi-standard chargers in its directive on the deployment of alternative fuels infrastructure.

// *Interface to charge electric vehicles could include several socket outlets or vehicle connectors as long as one of them complies with the technical specifications set out in this Directive, so as to allow multistandard recharging.*

**Recital 33, Directive 2014/94/EU**

## Unique DC charging certification system

One of its kind dedicated to DC charging for EVs, the impartial and transparent process enables any company to build, certify and sell CHAdeMO devices. CHAdeMO certified means the charger conforms to the highest safety standards mandated by CHAdeMO and is fully compatible with all CHAdeMO EVs.

220

CHARGER MODELS  
HAVE BEEN  
CERTIFIED TO DATE



5

THIRD PARTY CERTIFICATION  
BODIES ARE AUTHORISED  
TO CERTIFY CHADEMO CHARGERS



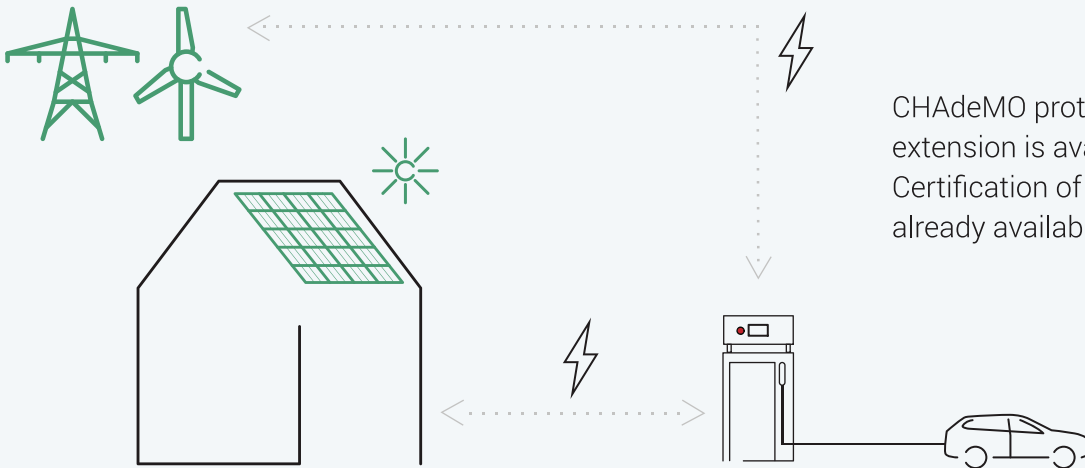
V<sub>to</sub>H/L

1ST IN THE WORLD  
CERTIFICATION OF  
DC "VEHICLE TO HOME"  
AND "VEHICLE TO  
LOAD" DEVICES



# SPECIAL FOCUS

## Vehicle to X (V2X) already a reality at CHAdeMO



CHAdeMO protocol detailing V2X extension is available to Members. Certification of V2H/L chargers is already available in Japan.

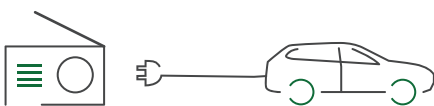
A crucial element for a switch to renewables, V2X technology enables using EVs as both vehicles and portable batteries. With V2X devices, EVs can store energy from home PV panels to use later or feed to the grid and help balance the energy supply, all the while providing financial benefits to the EV owner. Currently, CHAdeMO EVs are the only mass-produced and marketed cars capable of V2X.

// Worldwide revenue from V2G frequency regulation will grow from less than \$900,000 annually in 2013 to \$190.7 million by 2022.

**Navigant Research**

### CHAdeMO V2X products

#### V2L (Load)



Honda (9kW) Mitsubishi Motors (1500w)

#### V2H (Home) & V2G (Grid)



Mitsubishi Electric (6kW) Endesa (10kW) Nichicon (6kW) e8energy (10kW) Tsubakimoto (5kW)

# WHAT'S UP IN EUROPE

## CHAdeMO charge points in Europe

# 3028

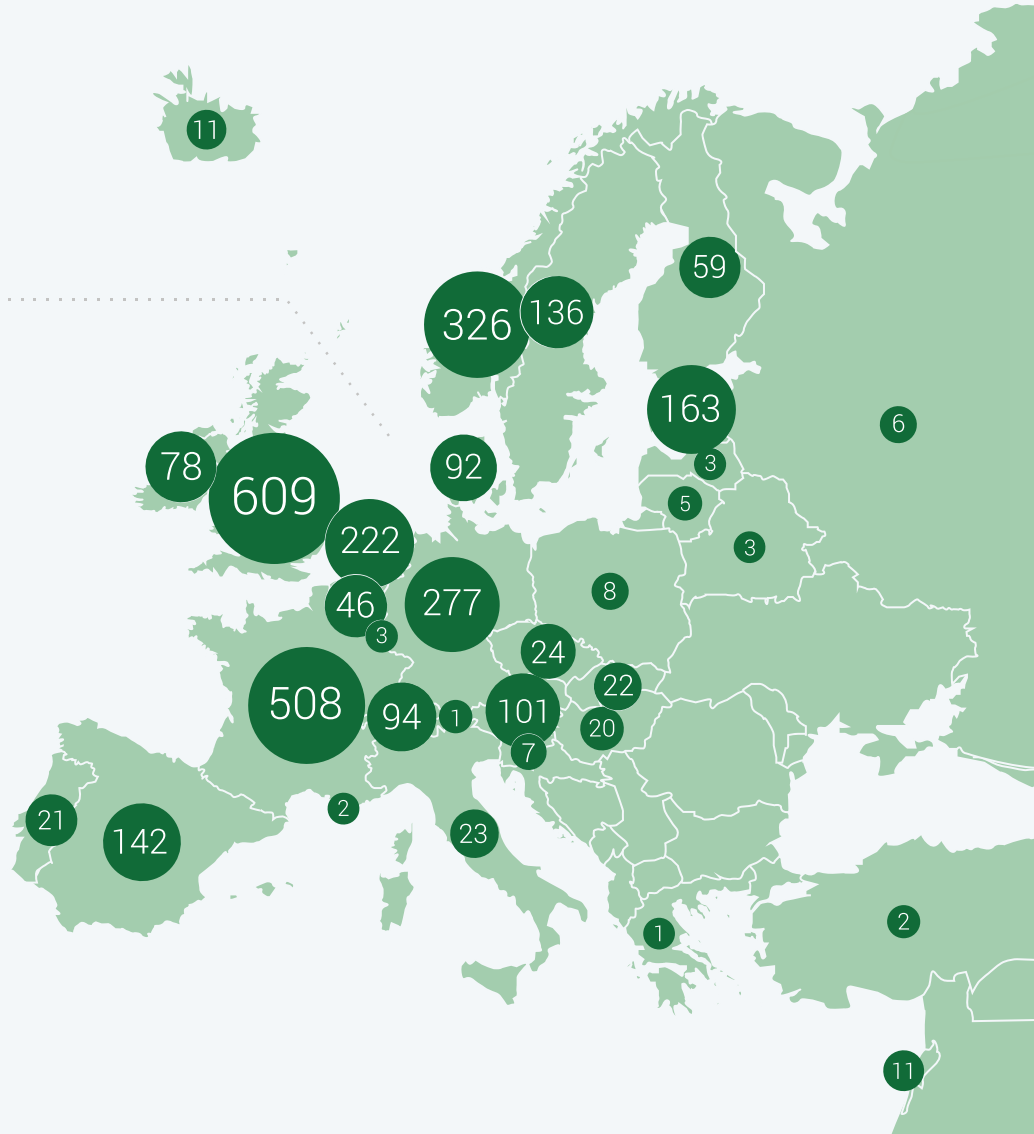
TOTAL INSTALLED

### TEN-T projects

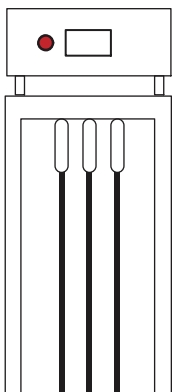
About 1,000 multi-standard chargers with CHAdeMO will be built in Europe as part of the EU-funded TEN-T scheme, offering up to 50% financing for chargers deployed on key transport corridors.

# 1000

CHARGERS PLANNED



### Multi-standard chargers



A European invention, multi-standard fast chargers capable of powering all EVs on the market are now used in close to 100% infrastructure projects in Europe, and thus have become a de facto standard. They offer benefits to all:

#### USERS

no anxiety about next charge point being compatible with their EV

#### OPERATORS

speeding up the recovery of investment with limited incremental cost

#### AUTOMAKERS

enables focus on core product (EV) and not with plug type

# TRENDING IN E-MOBILITY

## CHAdEMO-based V2X demo projects



**JUMPSmartMaui**  
USA



**LA Air Force Base**  
USA



**Nikola Project**  
Denmark



**Amsterdam Smart City**  
Netherlands



**Yokohama Smart City Project**  
Japan



## Working together: BMW/Nissan

The success of CHAdEMO has been enabled by the collaborative spirit that permeates its activities. CHAdEMO members regularly join hands with other e-mobility stakeholders to develop fast charging infrastructure globally. One such collaboration between Nissan and BMW will see over 100 chargers deployed across 3 countries.



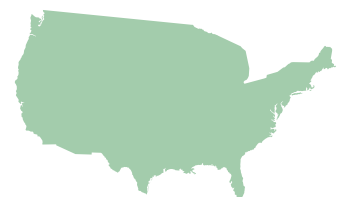
TBC

SOUTH AFRICA



20

MEXICO



120

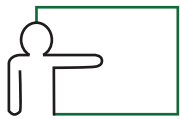
USA

# CHADEMO ASSOCIATION

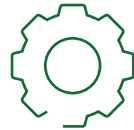
## Working with and for the members

CHAdEMO develops the protocol but also provides a variety of services that help its members promote their products and keep them updated with the evolution of the market/protocol.

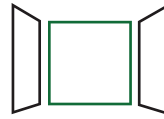
### Member services



**WORKSHOPS**



**PROTOCOL  
DEVELOPMENT**



**BOOTHS AT  
TRADE FAIRS**



**MEMBER  
NEWSLETTER**



**TECHNICAL  
ASSISTANCE**

### Member benefits

#### REGULAR

- ✓ Participation in Member meeting
- ✓ Association's newsletter
- ✓ Featuring in marketing materials
- ✓ Participation in joint trade fair stands
- ✓ Certified product listed on CHAdEMO website
- ✓ Access to the protocol
- ✓ Right to certify a product
- ✓ Participation in Technical Workshop

#### SUPPORTING

- ✓ Participation in Member meeting
- ✓ Association's newsletter
- ✓ Featuring in marketing materials
- ✓ Participation in joint trade fair stands
- ✓ Certified product listed on CHAdEMO website

#### OBSERVER

- ✓ Participation in Member meeting
- ✓ Association's newsletter
- ✓ Featuring in marketing materials

### Join us

Joining the association is very easy – email us at [info@chademo.eu](mailto:info@chademo.eu) for details!