



CHAdeMO

ASSOCIATION & PROTOCOL



APRIL 2019

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

World's 1st DC charging protocol

Enabling EV charging

from **6 to 400kW**
(400A x 1kV)



preparing for

900kW
(900A x 1kV)

COLLABORATION
WITH CHINA

for vehicles of all size



and various applications



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

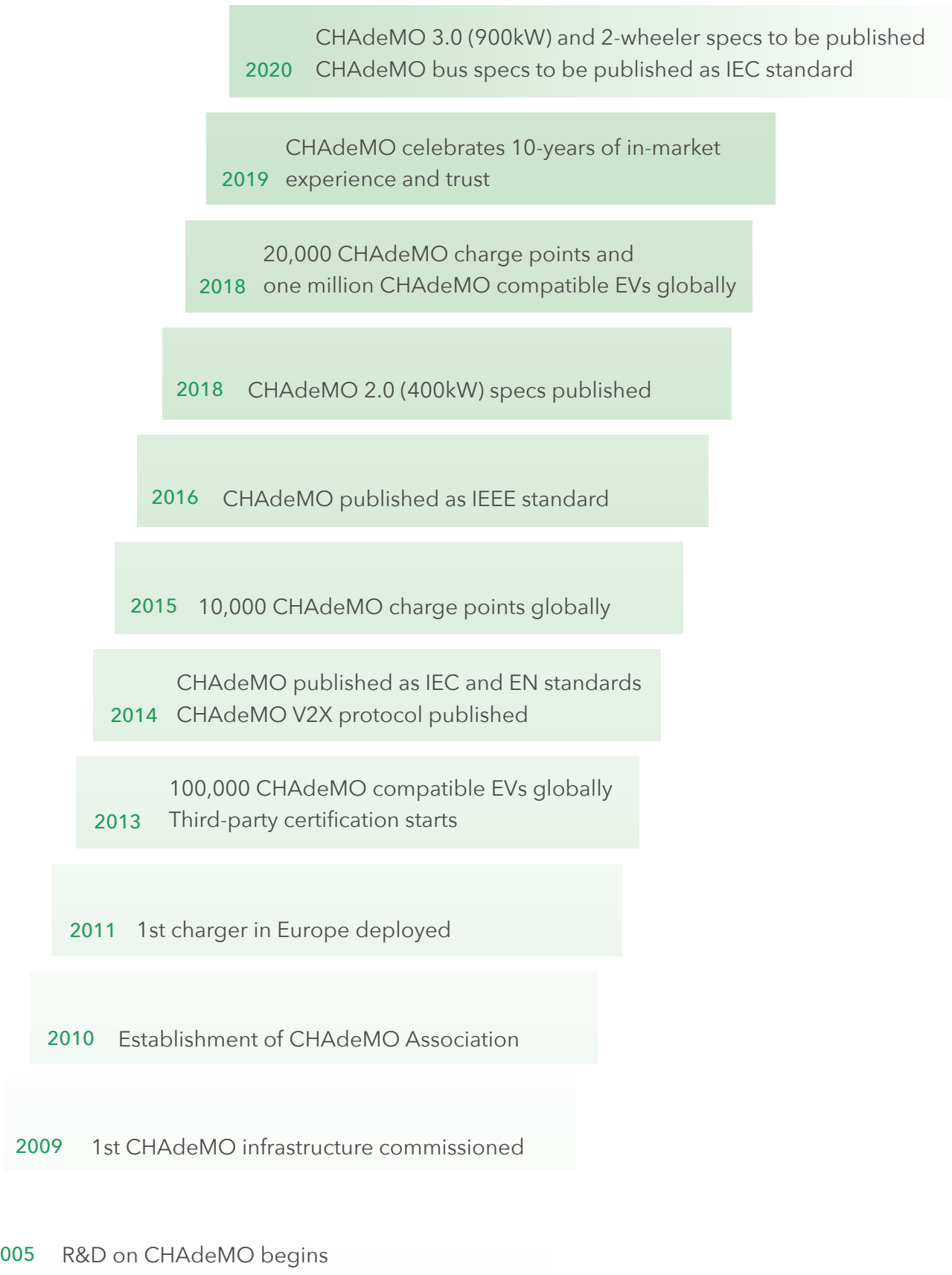
The protocol works with CAN communication, making its integration with the rest of the car easy and reliable.



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.

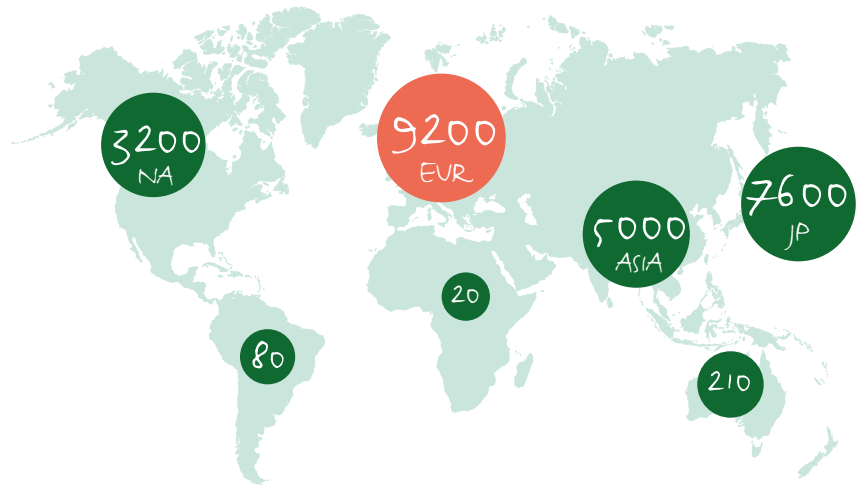
ELECTRIC JOURNEY OVER A DECADE



LEADING BY NUMBER

| 1 | The largest global installation base

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



71 COUNTRIES ON 5 CONTINENTS HAVE CHAdEMO CHARGERS

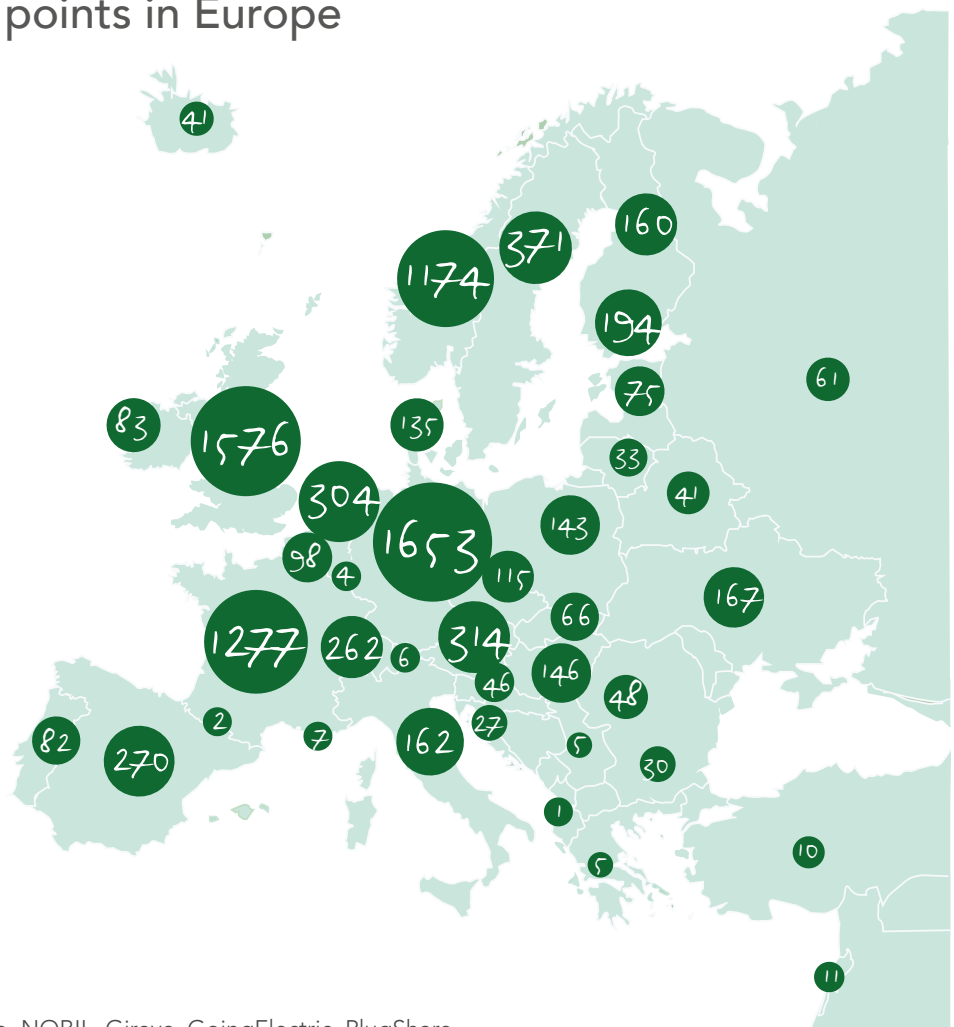
25300

CHAdEMO CHARGE POINTS ARE AVAILABLE TO EV DRIVERS GLOBALLY

CHAdEMO charge points in Europe

9200

TOTAL CHAdEMO CHARGE POINTS IN EUROPE



Note: as of April 2019

Source: ChargeMap, EAFO, Zap-Map, NOBIL, Gireve, GoingElectric, PlugShare

LEADING BY NUMBER

| 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 260. 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



SIGNET systems
(Korea)



Delta Electronics
(Taiwan)



ABB
(Switzerland)



Magnum CAP
(Portugal)



EVTEC
(Switzerland)



IES Synergy
(France)



Efacec
(Portugal)



Hitachi
(Japan)



Tritium
(Australia)



Nichicon
(Japan)



Circontrol
(Spain)



Fuji Electric
(Japan)



Schneider
(France)



ENEL
(Italy)



ENDESA
(Spain)



Nissan
(Japan)



Takaoka Toko
(Japan)



Hasetec
(Japan)



Ingeteam
(Spain)



BTCPower
(USA)



Takasago
(Japan)



GS Yuasa
(Japan)



Lafon
(France)



NS-TEXENG
(Japan)



SHINDENGEN
Electric
(Japan)



Hong Kong
Productivity Council
(Hong Kong)



Andromeda
(Italy)



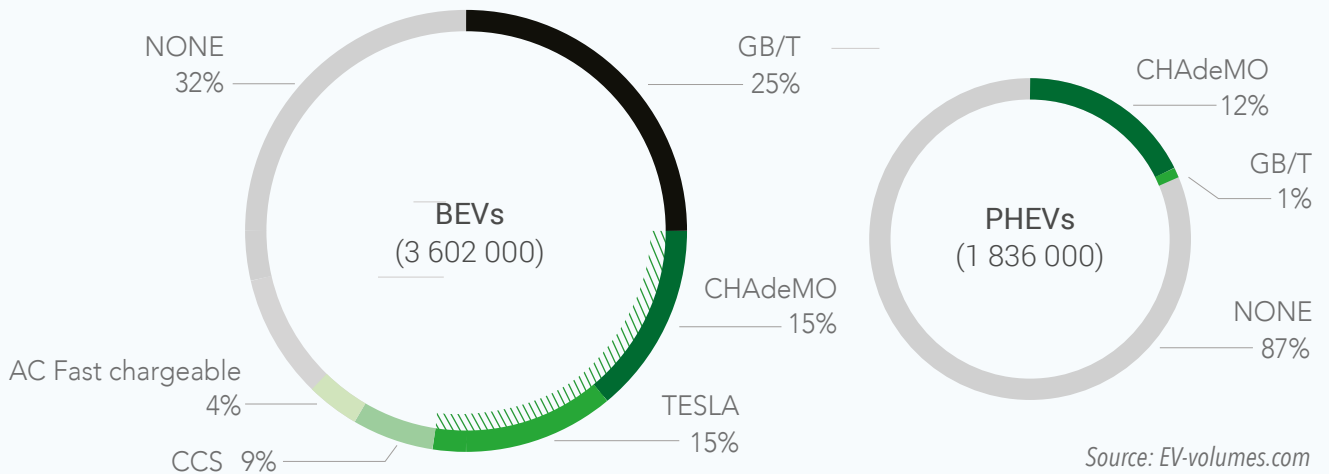
DBT
(France)

| 3 | CHAdeMO compatible EVs in the market

While the greatest number of BEVs are equipped with China’s GB/T inlet, CHAdeMO chargers are compatible with the greatest number of plug-ins, including PHEVs and Tesla EVs.

Global plug-in sales by fast charging inlet

Cumulative 2008-2018 (including LCVs)



CHAdeMO compatible EVs



LEADING BY NUMBER

| 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

420

GLOBAL MEMBERS

130

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.

260

CHARGER MODELS
HAVE BEEN
CERTIFIED TO DATE

7

THIRD PARTY CERTIFICATION
BODIES ARE AUTHORISED
TO CERTIFY CHADEMO CHARGERS

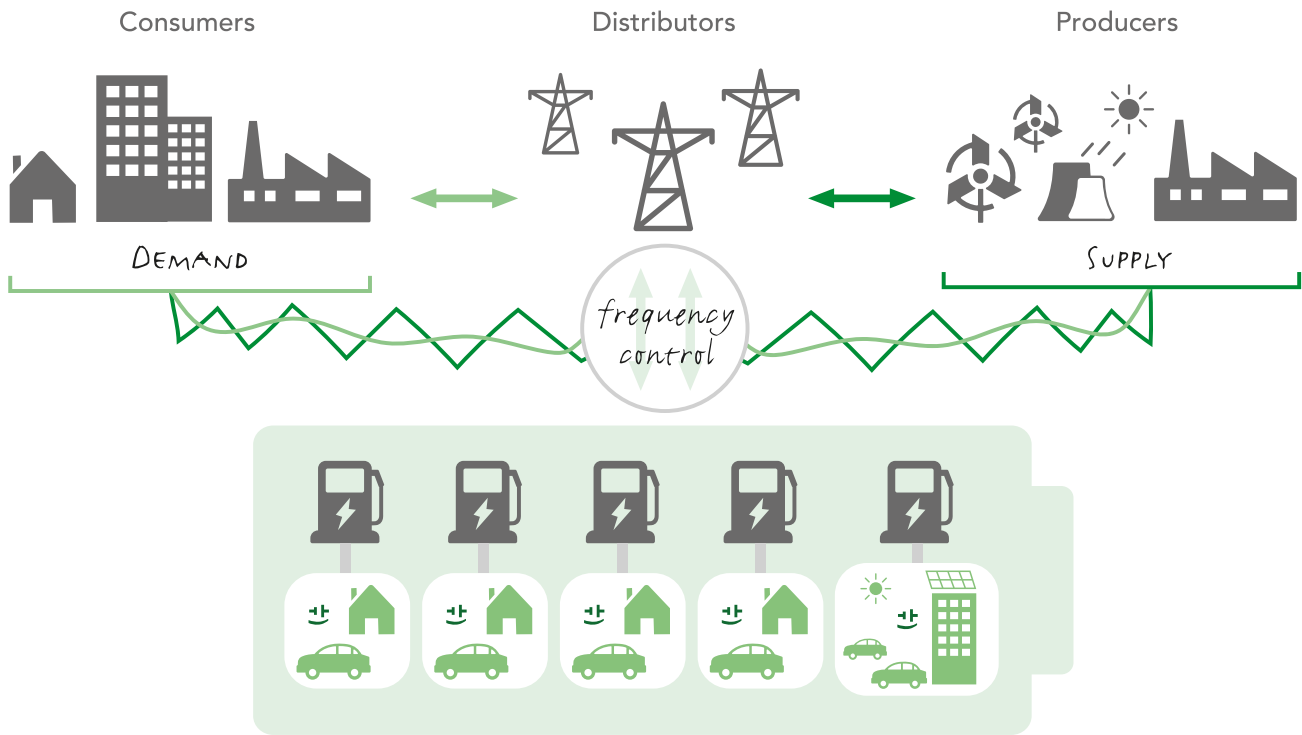


VtoH/L

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

INNOVATING VGI

Vehicle-to-grid integration (VGI) or Vehicle-to-Grid (V2G) already a reality at CHAdeMO



A crucial element for a switch to renewables, V2X technology enables using EVs as both vehicles and mobile batteries. With V2X devices, EVs can provide financial benefits to the EV owner :

- Save costs by optimising energy usage (e.g. charge from PV and use later)
- Make money by providing services to the Grid. CHAdeMO EVs are the only mass-produced cars readily capable of V2X.

"By 2025 V2G could provide additional revenues and cost savings of US\$2 billion to global energy suppliers and offer consumers 15% savings on household energy bill"

ABI Research

CHAdeMO V2X products

V2L (Load)



Honda
9kW



Nichicon
4.5kW



Mitsubishi Motors
1,5kW



Toyota Industries
9kW

V2H (Home) / V2B (Building) / V2G (Grid)



OVO



Nichicon



Takaoka Toko



Maxell



EVTEC



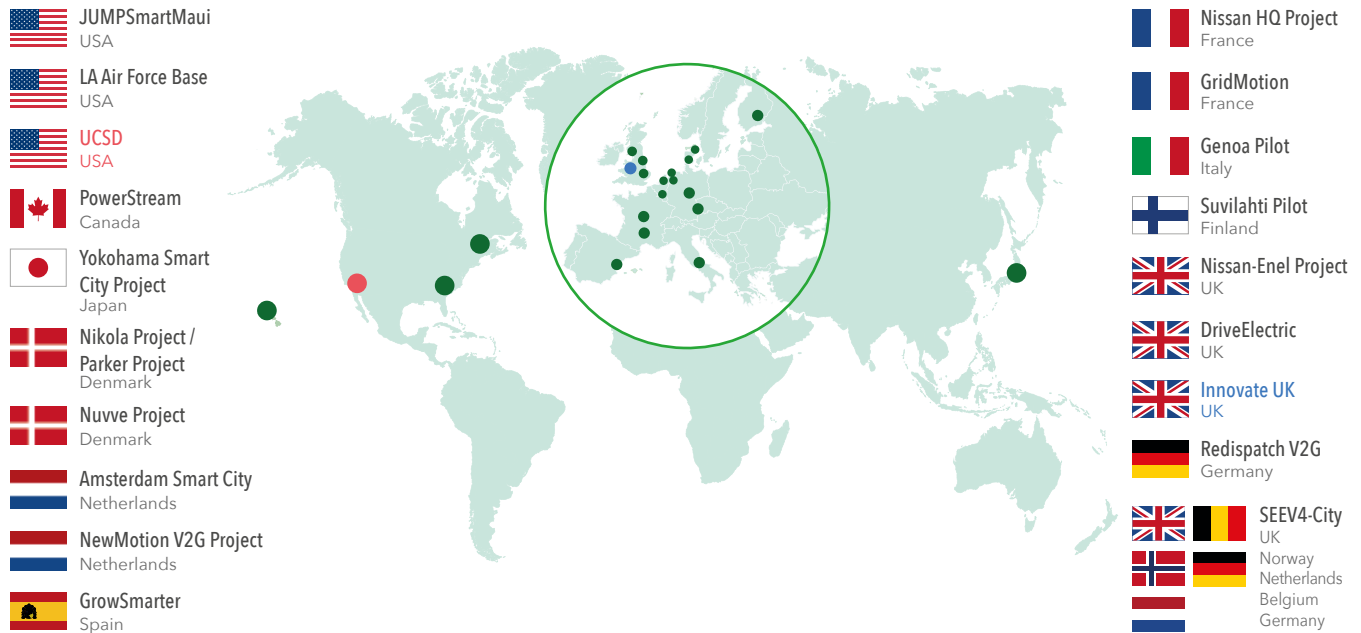
eNovates



Nichicon

VGI PROJECTS IN THE WORLD

Some 50 projects demonstrate(d) the technical and commercial viability of VGI/V2G



UCSD INVENT (2017-2020)

The UCSD INVENT (Intelligent Electric Vehicle Integration) demo project deploys 5 shared EVs providing grid services to help power university buildings and facilities. The EVs are used as part of the free nighttime on-campus shuttle service.

The goal of this project is to optimise unused and renewable energy, saving both money and energy, helping UC San Diego become carbon neutral by 2020. This \$7.9 million project received \$4.2 million grant from the California Energy Commission (CEC).

INNOVATE UK (2018-)

Innovate UK, a U.K. government agency, has awarded a total of £30 million to fund 20 V2G projects with the aim of developing and testing the core vehicle-to-grid technology and its commercial opportunities. Of these 20 projects, eight are real-life trials deploying 2,700 plug-in vehicles in total.

e4Future

A total of 1,000 commercial fleet vehicles participate across the UK to help alleviate pressure on the National Grid by feeding the surplus electricity from the vehicle's battery during peak times. This £9.8 million project is a 3-year trial, co-funded by two other government grants.

Sciurus

The world's first widely available domestic vehicle to grid project. Under a two-year trial with the budget of £4.7 million, 1,000 6kW bi-directional (V2G) chargers will be available free of charge for Nissan LEAF drivers, allowing them to sell surplus energy from the EV batteries back to the grid.

TRENDING IN E-MOBILITY

High power CHAdeMO connection tests



5

AUTOMAKERS



4

CHARGER
MANUFACTURERS

Increasing the stipulated power to 400kW with CHAdeMO 2.0, another round of high-power connection tests took place in Lucerne, Switzerland in June 2018.

5 EV/PHEVs and 4 HPC chargers participated, completing all the tests successfully. 100kW+ charging with current close to 300A was demonstrated using the boost mode and production-type non-cooled cable.

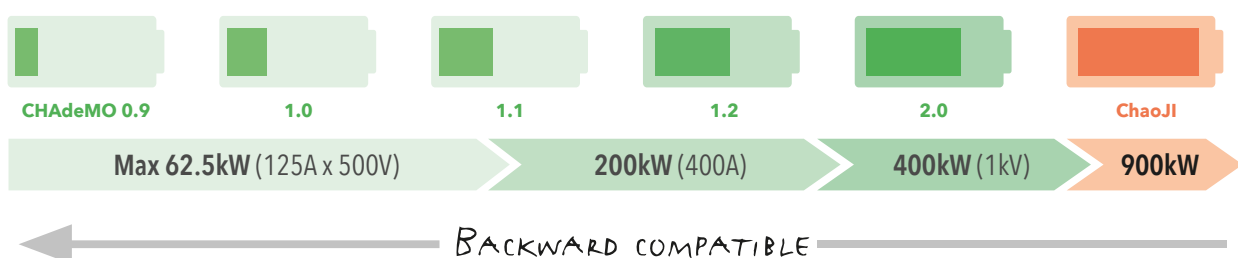
CHAdeMO-CEC collaboration : Ultra-Fast Charging

CHAdeMO and **China Electricity Council (CEC)** are co-developing the next generation ultra-fast EV charging standard.

The new ultra-fast charging standard will ensure **backward compatibility** with both current CHAdeMO and GB/T standards, in order not to penalise current EV users.

Both **Japanese and Chinese governments support this industry initiative**, which is expected to lead the way towards a harmonised future standard.

The new protocol with the working title of **ChaoJI** is to be published in **2020**, aiming at **900kW** of power.



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



BOOTHS AT
TRADE FAIRS



PROTOCOL
DEVELOPMENT



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

SPECIAL

- ✓ 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 for details!
Our website: www.chademo.com