QUICKCHARGING AND BEYOND

20 July 2016 EV Roadmap 9
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PRESENTATION PLAN

- CHAdeMO Overview
  - Organization and members
  - Wide variety of products
  - Latest installation and EV plug share
  - CHAdeMO as international standards

- QUICKCHARGING AND BEYOND
  - Future vision of charging
  - High power CHAdeMO
  - V2X
CHAdEMO Overview
Organization and members

350 GLOBAL MEMBERS
33 COUNTRIES

[Logos of global members]
CHAdeMO Overview
Wide variety of products

50
CHARGER MANUFACTURERS

200
CERTIFIED CHARGER MODELS

+ VARIETY OF PLUGS

ABB (Switzerland)
IES Synergy (France)
Elacec (Portugal)
DBT (France)
ENDESA (Spain)
EVTEC (Switzerland)
Delta Electronics (Taiwan)
Takada 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)
Hase tec (Japan)
Schneider (France)
e8energy (Germany)
Ingeteam (Spain)
CHAdEMO Overview

TOTAL Installations

11726

(as of June 2016)

Global plug-in sales by fast charging inlet

Source: IHS Automotive; 2010-2015 cumulative data
CHAdEMO Overview
CHAdEMO International Standards

Published on the IEC website as well as CENELEC’s national committee websites
QUICKCHARGING AND BEYOND
Future vision of charging

Charging needs:
- Normal (3-7kW) @ Home, Office (w/V2X)
- Medium (10-25kW) @ Destination (stores)
- High/Super High @ Highway, Long drive use

Increased energy to charge

Varied charging behaviors
- Long distance driving
- Top-ups
- Needs-based charge time

More capacity as energy storage

Smart charging / V2X
- RES integration
- Financial incentives
- Emergency back up

Bigger battery
Longer range
QUICKCHARGING AND BEYOND
CHAdEMO high power roadmap

150 kW

50kW

100/150-200kW
(Cont./Peak)

350-400kW

Standalone type

Multi-stand (power share) type

Forced cooling connector & cable

Dynamic power control  (Real time adaptive control)

2016  2018  2020
CHAdemo specifications for 150kW (350A/500V) are taking shape

- Safety for overcurrent: fuse in the gun (not in the charger body)
- Threshold of cable temperature:
  - part to be held below 60 °C
  - part to be touched below 85°C (ref UL2251)
- Cable temperature control:
  - thermo-sensor at gun and/or cable
  - Direct current control by sensor feedback

Changes mainly concern connector and not the specifications or charger body design
Electricity supplied by EV to electrical devices in homes when black-out

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

Back-up for blackout
Electricity supplied by EV to electrical devices in homes when black-out

Electricity peak shaving
Peak shaving by charging at night and discharging by day

Connecting w/ solar power
Solar power used at night if it is stored in EV during the day
QUICKCHARGING AND BEYOND
CHAdeMO V2X products in market

V2L (Load)

V2H (Home)

V2B (Building)

V2G (Grid)
QUICKCHARGING AND BEYOND
CHAdeMO V2B case studies (emergency back-up)

- **Local governments**

- **Office buildings**
  - For business continuity
  - Elevators, water pumps, lights powered by EVs

- **Apartment complex**
  - Shared EV
  - Emergency electricity supply powered by EV battery: 10 days
    - TV, radio, lights, mobile phone chargers…
Smart Grid in Maui, USA

200 EVs and 40 houses for smart charge for a virtual power plant with V2G

V2B with EV and used Battery

Quick Charging and Beyond
CHAdeMO smart charging demo projects
THANK YOU

150 kW UPCOMING

V2X A REALITY

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