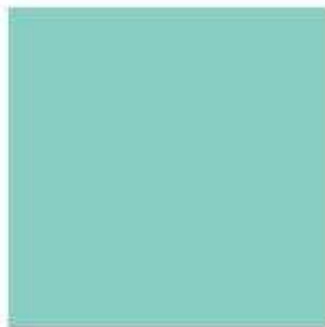




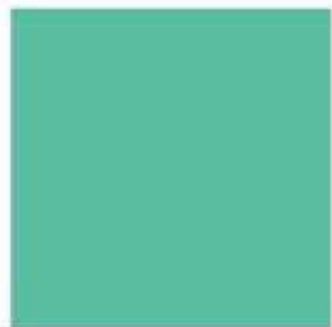
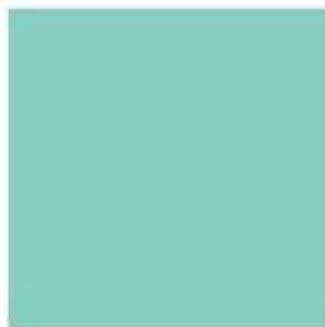
CHAdEMO



2014

Activity Report

(1 April 2014 ~ 31 March 2015)



CHAdEMO Association

From the President



First of all, I would like to extend my deep gratitude to all of our members for their generous support for CHAdeMO Association's Electric Vehicle and Quick Charger promotion activities.

The Association was established in March 2010 and is now already in its sixth year. Looking back on the activities in 2014, the installation of the charging infrastructure has rapidly improved both in Japan and overseas and I feel that electro mobility is now moving into the early majority phase.

In Japan, in conjunction with the Next-generation Electric Vehicle Charging Infrastructure Establishment Promotion Project by the Ministry of Economy, Trade and Industry, Nippon Charge Service LLC has begun operating with four vehicle manufacturers.

Abroad, with new installation accelerating mainly in Europe, 2,000 new quick chargers were installed in the past year (up 50% over the year before) and the total number of chargers has surpassed 6,000 globally.

The standardisation of the CHAdeMO protocol, one of our primary activities, has seen steady progress as well.

We extended the V2H (Vehicle-to-Home) functionality of the CHAdeMO protocol by publishing standardised specifications and enhanced the certification system of the charging standard by externalising the certification process as well as upgrading the protocol.

In the coming years, we shall strive to further develop EV and its infrastructure. We will continue our ongoing efforts to expand our contribution to balancing grids taking advantage of V2H, explore new possibilities and improved usage for chargers by connecting to the Cloud information network, and nurture better understanding for CHAdeMO through continuous dissemination of information to the world.

I look forward to your continued understanding and strong support for our Association.

Toshiyuki Shiga
President
CHAdeMO Association

Activities in Standardisation

IEC DC charging standard published as JIS standard in Japan;

CHAdeMO IEEE standardisation on-going in North America

Standards related to DC charging were approved by the International Electrotechnical Commission (IEC) and published as IEC61851-23/24 and IEC62196-3 from March to July in 2014. These standards define the DC charging system, digital communication and connector specifications.

The IEC standards have been embraced as national standards. Consistency between international and national standards means that internationally-standardised products can be used in a country without changing specifications. This contributes to the development and facilitation of international trade. The CHAdeMO standard has been adopted as domestic standards in each country and region.

In Japan, the JIS standards, which are compatible with the IEC standards, were published as JIS D61851-23/24 and JIS D62196-3 in October 2014. In Europe, the IEC standards have been adopted as EN standards (EU), as well as DIN standards (Germany) and BS standards (UK).

In North America, DC charging standard is being evaluated at the Institute of Electrical and Electronics Engineers. IEEE SA – P2030.1.1, based on the IEC standards, has been deliberated and is expected to be approved in the near future.

Technical WG Activities

The Technical WG started a third-party certification test for ver. 1.0 chargers in fiscal 2014, but only two charger manufacturers have taken the test over the past year. The reason for the decline in applications for the test is considered to be the increased cost involved in development and the test of requirements relating to power quality, including EMC, newly added in ver. 1.0.

Around that time, in Japan, the Ministry of Economy, Trade and Industry (METI) expressed its support for four vehicle manufacturers' EV charging infrastructure assistance projects and, due to this, most charger manufacturers focused on delivering existing products within the fiscal year instead of developing new products.

On the other hand, in Europe, there was a concern over the possibility that CHAdeMO be phased out from the market. However, the European Union decided that CHAdeMO chargers can be deployed if they are equipped with Combo connectors. Now, chargers supporting both CHAdeMO and Combo, called multi-standard fast chargers, have become mainstream. However, official test standards for Combo chargers have not yet been established, leading to a situation whereby commercialisation of multi-standard chargers is ahead of the certification system.

Technical WGs will implement the following measures to tackle these issues.

- ✓ Provide new value, including Smart Charging, to incentivise upgrading to ver. 1.0

- ✓ Develop a certification system for multi-standard fast chargers in cooperation with Combo standards
- ✓ Establish efficient testing methods, including retesting guidelines in collaboration with the certifying organisation

Specifications WG

The WG issued Technical Specifications ver. 1.0.1 and Amendment 1 in 2013, focusing on improving their completeness as technical specifications. Requirements for hardware safety and the EMC performance and measuring methods are detailed in the specifications. In 2014, the WG reviewed the specifications to improve the functions of ver. 1.0.

The WG released the draft revision of ver. 1.0.1 to the regular members in March 2015. It includes the following proposals.

- ✓ Dynamic control of maximum charging current: This function allows the charger to dynamically change the available output current during charging. With this, the charger can optimise control for simultaneous charging of multiple vehicles.
- ✓ Requirement for small (diameter) charging cable: Low-capacity fast chargers provide advantages such as user-friendliness and cost reduction.
- ✓ Adopting manufacturers' optional codes: This function enables vehicle and charger manufacturers to have their own unique functions using the CHAdeMO interface.

V2H WG

The WG started discussions about adding the V2H (Vehicle-to-Home) discharging function to the CHAdeMO interface in October 2011. In addition, when provisions of electrical facilities were reviewed at the Investigation Committee of Use of Fuel Cell in March 2013, the WG participated in the examinations and the V2H discharging function was included in the revised version of the Interpretations of Technical Standards for Electric Facilities in June 2013. In April 2012, EVPOSSA (Electric Vehicle Power Supply System Association) was founded to discuss and review the interoperability and security of normal chargers, as well as their application to V2H.

In May 2013, EVPOSSA published its first V2H protocol, Charging and Discharging System Guideline for EVs V2H for DC. A new sub-group, named V2H WG, was then formed in order to stipulate the details for the interface, as well as to review its conformity with the standard specifications. This resulted in the V2H Guideline DC 2.1 in November 2014. In addition, V2H Test Specifications for the domestic market were published in March 2015 and the WG has started accepting applications for the test.

In order to make cooperative operation between the V2H system and power system available in the future, CHAdeMO has decided to conduct two tests on chargers. One checks its compatibility with the CHAdeMO protocol and the other checks its operation as a power system.

CHAdeMO will also develop a certification test to check chargers' operation as a power system in Europe in cooperation with overseas members.

Infrastructure WG Activities

CHAdEMO values sharing information, from project best practices to new products and services around EV charging. This year, two Infrastructure WG Workshops were held for such purposes.

Workshop #22 (18 July 2014) provided CHAdEMO members with the opportunity to learn about the detailed features of Nissan's first electric commercial cargo van, e-NV200. Midas Lab presented Andromeda Power's ORCA Inceptive, a rescue vehicle for stranded EVs on the route, with an on-site demonstration of how its EV to EV quick charger works. A representative from the Vehicle Information and Communication System Center (VICS Center) spoke about the next generation VICS services taking advantage of augmented FM transmission, to be implemented in 2015. This new system will enable communication of real-time data such as urgent disaster information and quick charger utilisation.

Workshop #23 (18 December 2014) focused on charging infrastructure deployment. Two major charging service providers in Japan, Charging Network Development (CHAdEMO Charge) and Nippon Charge Service, LLC (NCS), prior to their merger, talked about their deployment of the respective charging networks as well as how the upcoming new services are expected to enhance their offerings. Representatives from Nissan, Mitsubishi Motors and Next Generation Vehicle Promotion Center presented best practices of workplace charging, as well as the subsidies available for workplace charging projects.



Charger Location Information WG

Since March 2013, the Charger Location Information WG has made public the charging station data from the CHAdEMO Association's website in a CSV format. Shared data include the location (latitude/longitude), opening hours, method of use and the charge price for each fast and normal charger (100v/200v). Data is updated every 3 months and we have seen a steady number of downloads from our website as per the below graph.

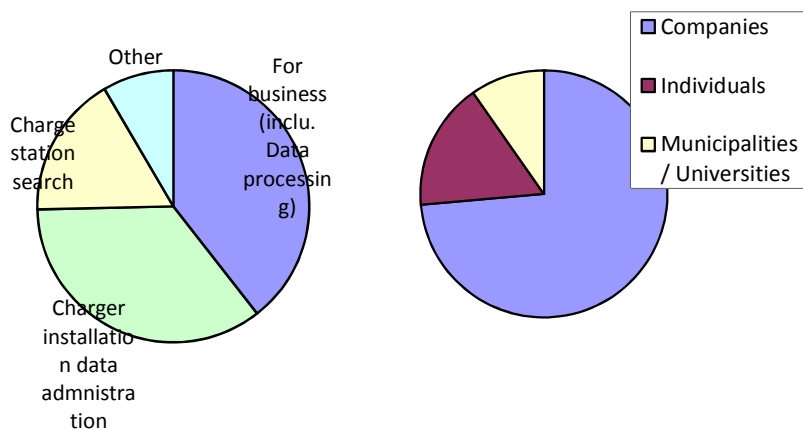
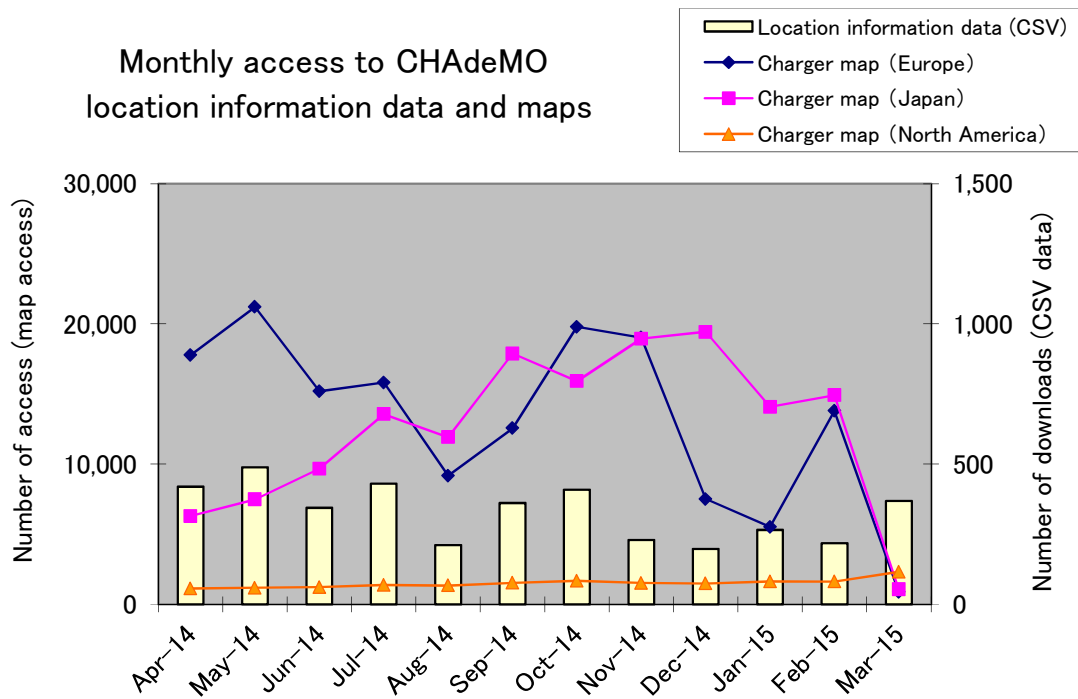
Starting in October 2014, we have been collecting feedback from the users of CSV data downloads

on a voluntary basis. As a result, on top of the number of accesses and downloads, we now have a better understanding of how our data set is used.

- ✓ Corporate users process our data for business purposes and many of them follow the evolution of charger installation through regular downloads.
- ✓ Most individual users obtain our data for charger location search.
- ✓ Many municipalities use the data to follow the deployment of chargers in their own area.

Around 10,000 accesses have been observed both from Japan and Europe for the charger location maps for the public on our website, which are based on Google Maps. This service was interrupted in March 2015 due to the API changeover on the Google site, but after development work the map was restored in April.

Our North American map is accessed around 1,000 times per month and we believe this stems from the fact that many users in the U.S. go directly to the charger location map provided by our partner, PlugShare.



	Number of new users	Number of respondents
Oct-14	34	19
Nov-14	28	9
Dec-14	12	6
Jan-15	21	9
Feb-15	21	16
Mar-15	11	6

Data download objectives

User profile

Activities in Japan

Charging infrastructure promotion project

In addition to the government's support, four vehicle manufacturers – Toyota, Nissan, Honda and Mitsubishi Motors – announced the launch of the “PHV, PHEV and EV Charging infrastructure Assistance Project” and, in May 2014, with the participation of the four companies, Nippon Charge Service LLC was established with additional funding from the Development Bank of Japan Inc., Tokyo Electric Power Company, Incorporated, and Chubu Electric Power Co., Inc..

The new company compensates for the installation cost not fully covered by government subsidies and provides car owners with a universally-accepted charging card, enabling them to use all the chargers in NCS' charging station network. The system will accelerate the spread of charging infrastructure. (Compensation terminated at the end of February 2015.)

Once chargers are connected to NCS' network, the following signs are put on them. This allows electric vehicle drivers to easily recognise which type of charger is available. NCS' charging network is steadily expanding with the prospect of installation of 11,000 chargers in total (4,700 fast chargers and 6,400 normal chargers) within 2015.

This public-government activity encourages the spread of user-friendly charging infrastructure.



Reference <http://www.nippon-juden.co.jp/news/>

CHAdeMO in Europe

CHAdeMO as EN standard

Following the publication of International Electrotechnical Commission (IEC) DC fast charging standards, CENELEC, an official standardisation organisation for the European Union, recognised CHAdeMO as one of the EN standards along with

Combo2 (IEC/EN 61851-23 & -24, IEC/EN 62196-3). Coinciding with the favourable result of the EU Directive that went into effect in autumn 2014, CHAdeMO this year has become both the *de facto* and *de jure* global standard in DC fast charging, solidifying its legislative base and accelerating charger installation in Europe. The CHAdeMO European secretariat also strengthened its services both for members and for the general public.



Member services

European Technical Group established and hard at work

Responding to requests from its members regarding their greater involvement in the development of the protocol, at the beginning of 2014, CHAdeMO Europe established a European Technical Group composed of Regular Members from Europe, which met regularly online to work on updates to the protocol. The collaborative, cross-continental effort and commitment from both participating companies and the Japanese technical team enabled fruitful discussions and brought about important changes to the protocol that directly reflect the needs and wants of the European market.

CHAdeMO joint stands now a regular feature at major shows

Having embraced hosting joint stands for its members in FY 2013, CHAdeMO Europe continued its collaborative approach to exhibitions at two major European fairs:

- **Hannover Messe** (Hannover, April 2014) – joined by seven collaborators, the Association presented a variety of CHAdeMO products, including a CHAdeMO-equipped cargo van; fast chargers that were stationary, trolleys and equipped with battery storage; and newly CE-marked connectors.



- **eCarTec** (Munich, October 2014) – together with six members, CHAdeMO showcased 2 electric vans (Nissan e-NV200 and Citroën Berlingo Electric), connectors and three chargers. This combined with the annual member meeting, Munich was the meeting place for many of our European members during this FY.

5th European annual member meeting in Munich

Keeping up the tradition of yearly meetings, CHAdeMO Europe organised its 5th European member meeting, this year coinciding with the eCarTec exhibition in Munich. After the plenary session in the morning, two sessions were proposed in the afternoon to the 70+ CHAdeMO members who joined from around 20 different countries:

- **Plenary session** – The European activities of CHAdeMO, IEC/EN standardisation, third party certification and the EU directive were the main topics covered in this session. A lively discussion on the future of the Association in Europe enabled an exchange of ideas. Its results will be reflected in the strategy of the organisation for the coming years.



- **Technical workshop** – Building upon the work done online all through the year as part of the European Technical Work Group, experts from the CHAdeMO Technical Team, Takeshi Haida and Tomoya Imazu, heads of CHAdeMO protocol revision and V2H extension work groups respectively, conducted a face-to-face technical workshop with the European members. This “Intro to CHAdeMO” covered article by article the CHAdeMO 1.0 protocol, spending time on the points that were being revised and changes made

for the V2H extension, as well as on the 1.0 certification key points. The first “Intro” session in Europe was very well attended and widely appreciated by the Regular Members as it enabled a direct exchange on the updates to the CHAdeMO protocol.



- **1st Fast Charging Europe Conference** – Strongly committed to inter-standards cooperation and exchange, CHAdeMO organised the first Fast Charging Europe Conference, a meeting place embracing all standards and aimed at sharing best practices and exchanging experiences in fast charging. Speakers from the UK, Sweden, France, Spain, Austria, Japan and Norway gave presentations on their projects, giving the public an insight into their work and sharing their views on ‘what works, what doesn’t and what should be improved’. The information presented was

an important contribution to the ongoing conversation on how to better the experience of fast charging, both for those that run the charging networks and those that use them.



EU Directive takes effect: 2 European PR tours completed

As part of the efforts to ensure that the European governments are well informed of the new EU directive (Directive 2014/94/EU) and to encourage their continuous support for CHAdeMO, two PR tours were organised to meet with government officials and speak about the directive, its meaning and its impact on the market.

- **Northern Europe tour** – With Northern European countries being at the forefront of fast charging developments, it was only natural that the first targets for the PR tour be Sweden, Norway, Finland and Estonia. A core CHAdeMO team of 3 from the European Secretariat, headed by our advisor Hiroyuki Aoki, joined by zero-emissions experts from Nissan, received a warm welcome and had many valuable exchanges with the government officials of the countries visited. The highlight of the tour was meeting the Estonian Minister of Economic Affairs and Communication, Anne Sulling, who shared her commitment to CHAdeMO, which goes back to 2011 and the project to deploy 160 fast chargers.



- **Eastern Europe tour** – The next targets selected were those among the less advanced countries in terms of e-mobility, especially in Central to Eastern Europe: Austria, Slovakia and Hungary. Meeting Ministry representatives, charger manufacturers/distributors, operators and e-mobility associations, these encounters not only allowed for information dissemination and a more accurate assessment of the situation in these countries, but also for recruitment of new CHAdeMO Europe members.

General PR activities

Conference participation

CHAdeMO places a high value on dissemination of fast charging knowledge and promoting the work completed by first movers in fast charging infrastructure deployment. In order to shine a light on their work and also to enable newcomers to learn from existing experiences, CHAdeMO Europe participated in various conferences:

- **Smart City Conference (Amsterdam, May 2014)** – represented by Jorge Sanchez from the European President company Endesa, CHAdeMO shared emerging information from fast charging projects.



- **EEVC 2014 (Brussels, December 2014)** – Hiroyuki Aoki, Head of Innovative Research, TEPCO London Office and Advisor to CHAdeMO Europe, delivered our point of view on the multi-standard trend in Europe.
- **ASSISES (Nice, February 2015)** – CHAdeMO Europe's Secretary General Tomoko Blech presented at the leading French conference dedicated to charging infrastructure, ASSISES, and spoke about the EV market evolution and the development of multi-standard chargers in Europe.

Charging and driving: PR through the WAVE rally

Reaching out to the general public and promoting the benefits of fast charging continues to stay high on our agenda. That's why in 2014 the CHAdeMO Team joined the world's biggest EV rally 'the WAVE Trophy'.

The Team, led by Natalia Kozdra from the European Secretariat, traversed Germany, Austria and Switzerland, driving 2,000km in total over 10 days, 100% electrically. The team was supported in its mission of promoting fast charging by a portable CHAdeMO charger from Swiss member company EVTEC, on board a CHAdeMO-compatible Peugeot Partner. With an additional mission of providing fast charging top-up to 11 CHAdeMO-compatible EVs participating in the rally along the way, the team clocked in 66 charging sessions in total and helped two teams gain 2nd and 3rd places in the 'Popular WAVE' category, proving the benefits of fast charging in real-life.



Communication for members and for the public

Last but not least, CHAdeMO Europe continued throughout the year a steady stream of communication services through various media outlets, both for members as well as for the public.

- **Newsletter:** bi-monthly email newsletters providing updates to the members on topics around CHAdeMO fast charging. It features information on the Association's activities, the status of the standardisation process, events organised by CHAdeMO and the successes of its members. The Newsletter continues to serve as a channel of direct communication between the Secretariat and the members.
- **Twitter:** our Twitter account ([CHAdeMO_eu](https://twitter.com/CHAdeMO_eu)), created in FY 2013, has tripled its followers this year despite rather sporadic Tweets from our side. Particularly popular are our quarterly updates of European CHAdeMO charger counts, retweeted by various members of the community and picked up by the media.
- **Articles:** stories about fast charging deployment, reactions to the standardisation process in the EU and updates on the activities of the association are some of the categories of articles we post on our website.
- **Interviews:** members of the media, researchers, consulting firms, students and educational institutions are some examples of the people coming to CHAdeMO Europe with questions, interview requests and in search of information. It is our job to respond to each of them with sincerity.

Activities in FY 2014

	2014 April	May	June	July	August	September	October	November	December	2015 January	February	March
Board Meeting	★	★	★	★	★	★	★	★	★	★	★	★★
General Assembly • European meeti		★(5/20) CHAdEMO General Assembly					★(10/23) European member meeting					
Technical Workshop	★(4/21) Release of V2H Guideline DC 2.0	★(5/8) Release of Connector Performance Confirmation Ver.1.1						★(11/14) Publications of V2H/L Guideline DC 2.1		★(1/22) Release of V2H/L Test Specs DC1.0		
											★(3/27) Release of V2H/L Test Specs DC1.1	
Infrastructure Workshop				★(7/18)#22					★(12/18)#23			
Location Information Sharing WG			★(6/27) Update			★(9/30) Update			★(12/26) Update		★(3/27) Update	
IEC meeting	★(4/24) IEC P2030.1.1				★(8/18) PT23 Compliance SWG				★(12/6) TC69 Plenary meeting@Tokyo			
		★(5/12) IEC 62196-3 published					★(10/20) published				★(3/30) IEC MT5@Munich	
								★(11/4-7) IEC MT5@Tokyo				
Certification test		★PNE SOLUTION (Korea)		★NIPPON STEEL & SUMIKIN TEXE		★SAIKAWA						
		★INGETEAM POWER TECHNOLOGY (Spain)		★KYUHEN								
		★HASETEC		★Shinder		★Andromeda (US)						
		★Ensto Finland Oy		★SINFONIA TECHNOLOGY								
		★Hong Kong Productivity Council										
PR activity, etc.	★Hannover Messe					★Japan EV rally Hakuba 2014						
		★WAVE rally 2014					★(10/21-23) eCarTec Munich					
							★ Nikkei SmartCityWeek					

Specifications WG

	Date	Main Agenda
Specifications SWG	3-Apr	EMC performance
Specifications SWG(2)	18-Apr	EMC performance
6th Specifications WG	13-May	Extended specifications items, insulation resistance of vehicle
7th Specifications WG	17-Jun	Extended specifications items, H/W additional requirements
8th Specifications WG	28-Jul	Extended specifications items, optional functions
9th Specifications WG	16-Sep	WG organisational structure, draf revision of the Specifications
10th Specifications WG	10-Oct	Specifications editorial policy, draf revision of the Specifications
Circulation of a draft rev	14-Nov	
11th Specifications WG	20-Jan	Comments on the draft revision
12th Specifications WG	2-Mar	Comments on the draft revision
1st high power SWG	2-Mar	High power extended specification

WG members :

Nissan, Mitsubishi motors, Toyota, Subaru, Honda, Suzuki motor, Mazda, Isuzu, Motors, Tesla, Takaoka Toko, Hasetec, Hitachi IE, Takasago, Fuji electric, NS-ELEX, YAZAKI, Sumitomo Electric Industries, Shindengen, KIKUSUI ELECTRONICS, Nichicon, Vector Japan, TÜV Rheinland, HYUNDAI MOTOR, TEPCO (chair and secretary)

CHAdEMO V2H WG

	date	Main Agenda
18th	24-Apr	Activity schedule, guideline plan, test specifications check
19th	29-May	Cooperation with EVPOSSA, V2H Guideline, V2L certification test policy
20th	12-Jun	Power system WG report, test specifications check
21st	26-Jun	Test items
22nd	17-Jul	Test items
23rd	29-Jul	Localization of requirements, power system WG report, test policy
24th	22-Aug	METI HEMS-TF report, power system WG report
25th	18-Sep	Structure of WG, test specifications
26th	25-Sep	V2L certification test, V2H comment sheet, ECHONET-Lite
27th	16-Oct	V2L certification test, V2H comment sheet
28th	30-Oct	V2H comment sheet, draft revision of test specifications
29th	20-Nov	Power system certification WG report, draft revisions of test specifications and guideline
30th	4-Dec	Power system certification WG report, V2H/V2L test specifications
31st	10-Dec	Power system certification WG report, V2L test specifications
32nd	16-Dec	Test specifications, self-reported form
33rd	24-Dec	V2H/V2L test specifications
34th	15-Jan	Power system specifications, test operation policy
35th	28-Jan	V2H/V2L test criteria, power system test items
36th	12-Feb	Connector performance confirmation, certification test documents
37th	26-Feb	Test standards and documents
38th	10-Mar	Test standards and documents

Mitsubishi motors, Toyota, Honda, DENSO, Panasonic, Sharp, Hitachi IE system, Mitsubishi Electric, Takasago, Fuji electric, Nichicon, YAZAKI, Sumitomo Electric Industries, TEPCO, TSUBAKIMOTO CHAIN, Nissan (chair and secretary)

Connector SWG

	Date	Main Agenda
11th	16-Apr	Standard sheet, validation procedure

Connector WG members :

Yazaki (chair), Fujikura, Sumitomo Electric Industries,
Japan Aviation Electronics, DAIDEN, FURUKAWA ELECTRIC

Infrastructure Workshop

Date	Participant	Main agenda	Presenter
22nd 18-Jul	98	Nissan "e-NV200" "ORCA Inceptive", EV to EV quick charger Next VICS service and provision of EV charging station information Japan EV rally in Hakuba – Guinness World Record Challenge-	Nissan Motor Co., Ltd Midas lab VICS center Japan EV Club
23rd 18-Dec	110	Activity report of "Chademo charge " NCS network service Participants Charge Installation of quick chargers in car parks for commuter vehicles Subsidies for quick chargers in worksite parking lots for commuter vehicles	Charging Network Development Nippon Charge Service, LLC Nissan Motor Co., Ltd Mitsubishi Motors Corporation Next Generation Vehicle Promotion Center

Board meeting

Date	Main Agenda
11-Apr	2014 General Assembly, V2H guideline, CENELEC report
30-May	New executive member (Panasonic), organisational structure, V2H certification test
13-Jun	Certification test (V2H power system), organisational structure
25-Jul	Overseas vehicle, V2V charging system, organisational structure
29-Aug	IEC activity report, Japan German charge JTWG report, certification test (V2H power system) WG
29-Sep	IEEE activity report, IECreport, certification test (V2H power system) WG
31-Oct	Japan German charge JTWG report, European meeting report, technical document management
29-Nov	Certification test (V2H power system), V2H installation guideline, organisational structure
19-Dec	V2H pacemaker, infrastructure workshop plan, organisational structure
16-Jan	V2H pacemaker, admission and withdrawal of memebtrs, organisational structure
13-Feb	METI infrastructure project, issues of technical WGs, organisational structure
12-Mar	European office, activity budget, organisational structure
27-Mar	Communication WG report, standards trend in India, organisational structure

Board members : Nissan, Mitsubishi motors, Toyota, Subaru, TEPCO
Honda, Hitachi, Fuji electric, Panasonic