



CHAdemo



2013 Activities Report

(1 April 2013 ~ 31 March 2014)



CHAdemo Association

From the President



First of all, I would like to express my deepest gratitude to all of you for your continued support of CHAdeMO Association's EV and quick charger promotion activities.

The Association is now in its fifth year, having been established in March 2010. In 2013 the installation of the charging infrastructure made rapid progress. In Japan the environment for the charging infrastructure has been extremely favorable. In addition to the "Next-generation Electric Vehicle Charging Infrastructure Establishment Promotion Project" by the Ministry of Economy, Trade and Industry, four automakers jointly started the "PHV, PHEV and EV Charging infrastructure Assistance Project". Installation has also increased overseas, including in Europe, with the total number of quick chargers deployed reaching over 4,000 units worldwide.

In the standardization field, one of the pillars of our activities, we also noted significant progress. The standards for DC charging station and communication protocol received IEC approvals, and will be published as JIS (Japanese Industrial Standards) soon. The V2H standard is also being developed in cooperation with the related national organizations.

The certification process has entered a new stage: we started the tests for ver.1.0 Specification and the certification service was transferred to external certifying bodies.

CHAdeMO Association will continue to push forward with the deployment of charger infrastructure to help bolster the diffusion of electric vehicles, reducing CO2 emissions and helping to curb global warming. Your continued understanding and support will be greatly appreciated.

Toshiyuki SHIGA
President
CHAdeMO Association

CHAdeMO as IEC international standard

CHAdeMO protocol was published on the IEC website as DC charging international standard IEC61851-23/24 in April 2014

Since 2009, when the first fast charger compliant with the CHAdeMO protocol was commercialized, we have been working to achieve international standard status. In January 2014, the members of the IEC (International Electrotechnical Commission) approved the FDIS (final draft international standard) of IEC61851-23/24. This was followed by the official acknowledgement of CHAdeMO as part of the IEC DC standards on their website in April.

History of CHAdeMO

Jul 2009	Market launch of i-MiEV (Mitsubishi) and Plug-in Stella EV (Subaru), the first CHAdeMO-compatible EVs
Aug 2009	Foundation of CHAdeMO Association preparatory group
Nov 2009	NWIP (New work item proposal) submission for 61851-23, followed by 61851-24, 62196-3
Mar 2010	Inauguration of CHAdeMO Association
Apr 2010	Publication of CHAdeMO standard specifications rev.0.9
May 2010	Start of charger certification procedure
Aug 2010	Launch of Specifications Work Group
Dec 2010	Market launch of Leaf (Nissan)
Jun 2011	Launch of Connector WG
Oct 2011	Launch of Specification 1.0 WG and V2H Extension Guideline WG
Jan 2012	Publication of CHAdeMO standard specifications rev.0.9.1
May 2012	CD review for IEC 61851 finalized in IEC meeting (Tokyo), CDV to be reviewed
Sep 2012	Publication of JIS standard specification (TS D0007)
Apr 2013	CDV status for IEC61851 approved in IEC meeting (Toronto)
May 2013	Publication of CHAdeMO standard specifications rev.1.0.1
Nov 2013	Release of V2H Guideline 1.0
Jan 2014	FDIS approval of IEC 61851-23, 61851-24

DC fast charging systems approved as IEC standards

	System A CHAdeMO (Japan)	System B GB/T (PRC)	System C	
			COMBO1 (US)	COMBO2 (DE)
Connector				
Vehicle Inlet				
Communication Protocol	CAN		PLC	

Activities of Technical and Infrastructure WGs

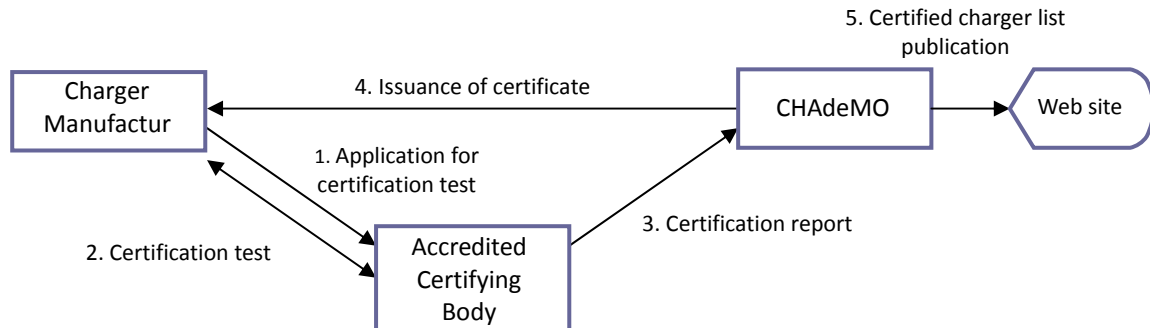
Certification WG for CHAdeMO ver.1.0

The Technical WG has continued to work on the publication of the Certification Guideline for CHAdeMO ver.1.0, a draft of which was released in May 2013. After one month of receiving comments from members and evaluating each of them, Certification Guideline 1.0.1 Amendment and Certification Guideline 1.0.1 were published in August 2013.

In parallel with publication of the Certification Guideline, the Technical WG had the objective of finalizing the certification process involving third party certifying bodies. By February 2014, the development of all test items was completed. As a result, we now have the prospect of delegating the charger certification service to third-party organizations. We have registered, as of March 2014, the following five organizations as accredited certifying bodies.

- IDIADA (Spain)
- UL Japan (Japan)
- TUV Rheinland Japan (Japan)
- Intertek (Japan)
- TERTEC (Taiwan)

Hereafter, charger manufacturers shall apply to the accredited certifying body, have their charger tested, and only then, based on the test results reported by the accredited organizations, CHAdeMO shall issue an official certificate as well as publish the data of the charger certified on its website.



CHAdeMO V2H WG

In terms of extension of the discharging function for the CHAdeMO interface, a proposal was made in October 2011 to set up a Specifications WG within the Technology WG. However, in November 2011, following guidance from the Ministry of Economy, Trade and Industry, a new group called the “Research committee on the use of fuel cells and other batteries” was established. The reasoning behind this decision was that in order to best exploit battery-fueled vehicles (not only EVs but also PHV and fuel cell cars) as a source of power for the general household, it was necessary to establish technical standards and security guidelines for such electrical devices. 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.

With this, CHAdeMO Association suspended its stand-alone activities of the V2H extension WG and joined

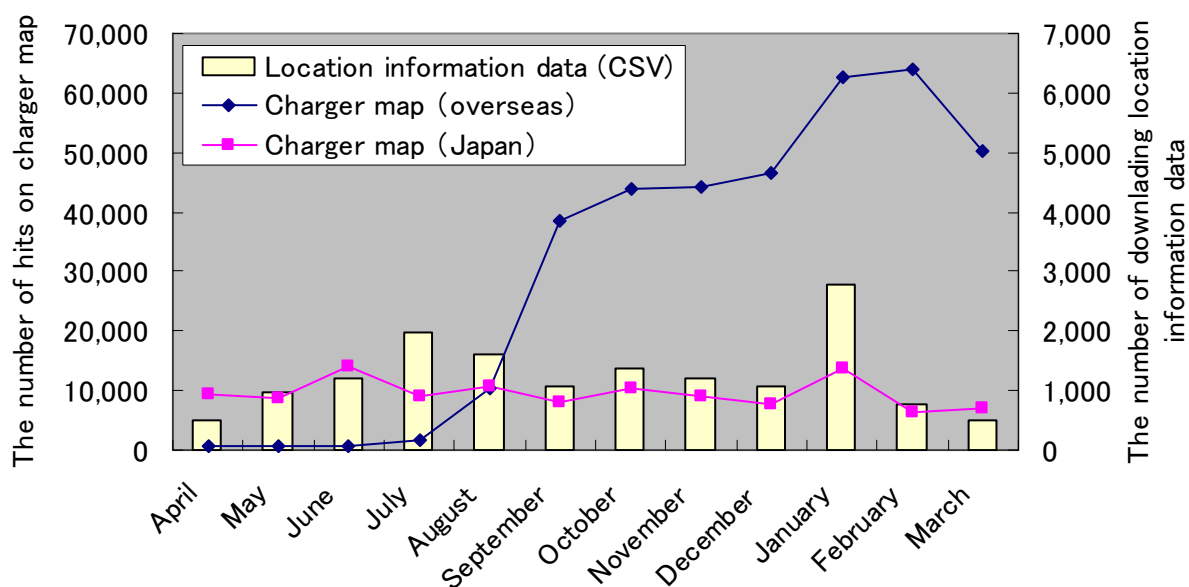
in discussions with these two organizations in order to align on the extended specifications. As a result, in May 2013, EVPOSSA published its first V2H protocol, “Charging and discharging system guideline for EVs V2H for DC”. However, this initial guideline remained an overview of such system and a new sub-group, named V2H-WG, was formed in June 2013 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 v2.0 in April 2014.

Charger Location Information WG

In terms of the fast charging infrastructure deployment, thanks to the support from the Japanese government and automakers, over 2,000 fast chargers are already installed in Japan. With the increased charger installation, the importance of sharing accurate charger information is a common concern to charging infrastructure stakeholders. Many comments were heard from companies and organizations voluntarily sharing such information on the difficulty of collecting and sharing such information, as well as on the need to set up a real-time charger data system that allows for swift information exchange.

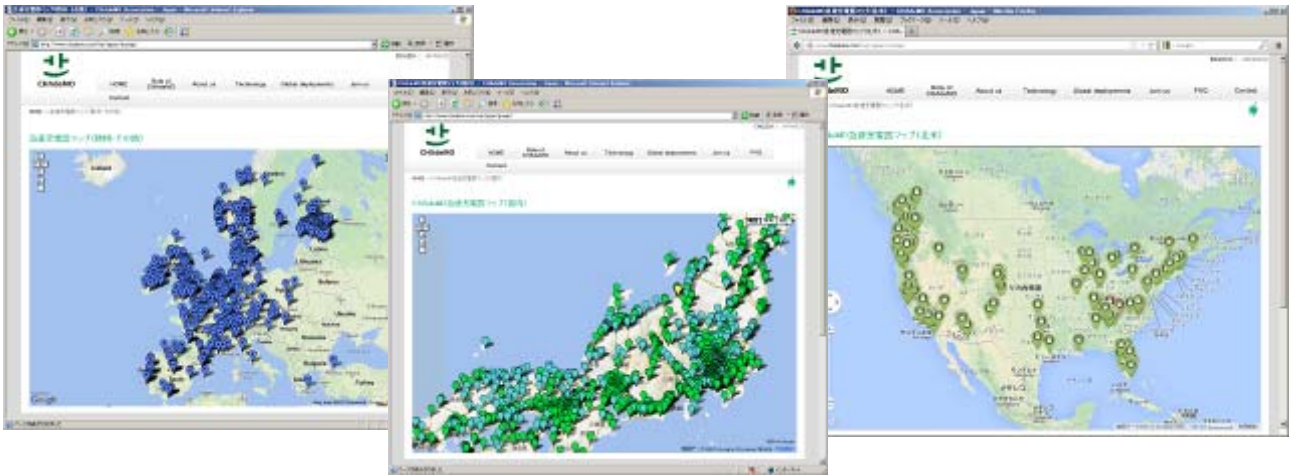
Amidst this backdrop, CHAdeMO Association has set up a Location Information WG to evaluate the different frameworks of collecting and sharing charging station information. In March 2013, on CHAdeMO Association website, we started sharing key information on charging stations in the CSV format. The location data that we share includes, for each fast and normal charger (100V/200V), its location information (latitude and longitude), as well as the information that can be easily used by data companies, such as operation hours, mode of utilization, price, etc. In the Location Information WG, data is updated every 3 months after the start of its service and the data is used at a steady rate.

On the other hand, the number of people accessing the charger location information on our Google map by EV users has seen a sharp increase starting in the second half of the fiscal year. Whereas in Japan, as the number of chargers installed increased, a number of charging service providers and location information providers have sprung up, outside of Japan, they may still be at the outset of accelerated charger installation and hence mapping.



For North America, where it was relatively difficult to collect charger installation information compared to Japan and Europe, we have established a collaborative arrangement with Recargo, a company that runs a

website called Plugshare. With this, starting February 2014, the Plugshare charger location information is distributed from the CHAdeMO website, which allows us to share charger location information in Europe, North America and Japan in the same format.



CHAdEMO Activities in Japan

Charging infrastructure promotion project

In March 2013, METI launched a large-scale project named “Next generation Electric Vehicle Charging Infrastructure Establishment Promotion Project” using 100 billion JPY of supplementary budget for Fiscal Year 2012. With the objective of strategic and quick deployment of charging infrastructure, this project has encouraged municipalities and expressway operating organizations nationwide to issue charger deployment plans, which were made public starting in April 2013.

This groundbreaking project not only subsidize the cost of chargers but also $\frac{2}{3}$ of the installation costs for the municipalities and organizations who intend to install public chargers based on their published charger deployment plan, which shall accelerate the deployment of charging infrastructure along the principal routes nationwide.

In addition to the government support, in July 2013, four automakers – Toyota, Nissan, Honda, and Mitsubishi Motors – announced the launch of the “PHV, PHEV and EV Charging infrastructure Assistance Project”. However, as these projects are quite large-scale, many municipalities were not able to follow through on the concrete installation plan within the initially set time frame. As a result, a one year extension to the original February 2014 deadline for application for these funds was agreed.

Such a push from all fronts accelerating charging infrastructure deployment nationwide has brought heightened attention to EVs and PHEVs. Not only that, overseas automakers such as Tesla Motors, BMW, Kia and Volkswagen have announced that they will launch CHAdEMO-compatible EVs in the Japanese market.



EV Super Seven fast charging journey

CHAdeMO Association supported an EV tour, “EV Super Seven fast charging journey around Japan with CHAdeMO” organized by the Japan EV Club. The objective of this journey was to promote the fun and environmental aspects of EV driving, as well as the importance of fast charging infrastructure, by going on a challenge tour around Japan in a Caterham EV Super Seven with a 13kWh Li-ion battery (with an autonomy of 120km).

A number of CHAdeMO member companies, such as Mitsubishi Motors, sponsored this project. Thanks to this support, the Super Seven EV that departed from a car park in front of METI (Kasumigaseki, Tokyo) on 24 September 2013 returned on 17 November 2013 to the Tokyo Metropolitan Government bureau, after running 8,000 km with 161 fast charging sessions.

On 17 December 2013, Mr. Tateuchi delivered a project report at the CHAdeMO Infrastructure WG meeting. In his presentation, he reported the status of the operations of frequently-used fast charging stations, such as those in expressway service areas and at convenience stores, and offered suggestions on how to improve the usability of user identification and payment systems that are being implemented. He also shared with the group his valuable input on the necessity of information management of charging stations nationwide and the importance of user interface and information sharing from the EV driver point of view.



Smart City Week 2013

The Smart City Week 2013 exhibition was held from 23 (Weds) through 25 (Fri) October at the Pacifico Yokohama, with 17,000 visitors in total. This was the third time that CHAdeMO Association had participated in this fair, co-exhibiting with 10 member companies.

From visitors who dropped by at the CHAdeMO booth we received various questions and comments, not only on the exhibited products but also on the progress and prospects of the charging infrastructure promotion projects, Combo chargers and multi-standard chargers in Europe, to name but a few.



- **EVS27** (Barcelona, Spain, November 2013) - CHAdeMO drew attention of all visitors being on the central alley exhibiting with 10 collaborators from 7 countries. (Right picture)



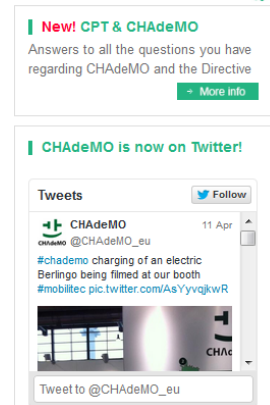
CHAdeMO informs through various media

In the drive to increase the visibility of the CHAdeMO protocol, chargers and EVs as well as to unite its members and followers, CHAdeMO Europe has established three main channels of regular communication:

- **Newsletter** – a monthly Newsletter provides regular updates to CHAdeMO members on topics around CHAdeMO fast charging. With information on the activities of the association, the status of the standardization process, events organized by CHAdeMO and the successes of its members, as well as the growing number of CHAdeMO chargers on the continent, the newsletter provides a channel of direct communication between the Secretariat and the members.
- **Twitter** - CHAdeMO activities and news concern not only its members but also EV fans and the industry as a whole. A Twitter account was established to reach out to both groups and enable real-time CHAdeMO updates and conversations. The number of followers of our account (CHAdeMO_eu) constantly increases - articles, photos and links that we tweet are regularly picked up by various media and passed on in the form of tweets or articles, adding to the visibility of the protocol and its fast chargers.
- **Articles** – stories about the fast charging deployment, fast charging successes of our members, reactions to the standardization process in the EU and updates on the activities of the association are some of the categories of articles we post on our website. The articles are frequently cited by EV media and help CHAdeMO communicate its views.



- **CHAdEMO Website** - In addition to regular article updates and existing content, a Twitter box and an FAQ section about the CPT directive were added to the side bar on the front page, attracting our regular readers' attention and appealing to new readers alike.



CHAdEMO speaks out at conferences

CHAdEMO Europe has participated in a number of speaking opportunities, sharing its experience and learning from projects by the innovative first movers.

- **Oslo** – CHAdEMO Association founder, Takafumi Anegawa, spoke to an engaged audience with anecdotes from his early years with CHAdEMO, advocating multi-system chargers for the first time in public. (Left picture)
- **Lille** – CHAdEMO Europe Secretary General, Tomoko Blech, delivered her first speech at the EPE'13 – ECCE Europe conference, asking for collaboration and cohabitation. (Left picture)
- **Munich** – at the 5th International Conference for Electric and Hybrid Mobility, CHAdEMO Board Member Takanori Yoshii, President of Mitsubishi Motors R&D Europe GmbH drew on CHAdEMO members' early experience and accentuated the indispensable role that fast charging plays in e-mobility. (Right picture)
- **Barcelona** – a CHAdEMO joint paper was delivered at the Charging Infrastructures session of EVS27, a prestigious EV conference with the longest history.
- **Brussels** – at the Intermodes Conference in Brussels, Tomoko Blech presented CHAdEMO members' early findings to representatives from scores of municipalities in Europe.
- **Monaco** – Natalia Kozdra gave a presentation on the applicability of CHAdEMO fast chargers in cities during the Roundtable dedicated to electric mobility in smart cities, part of an annual EVER conference.



CHAdEMO reunites– 4th European member meeting in Barcelona

The general assembly of CHAdEMO Europe FY2013 took place in Barcelona, Spain during EVS27. Over 60 participants from 17 countries actively participated in technological discussions and business model presentations. In the technical workshop, targeted at our Regular members, Takeshi Haida and Tomoya Imazu from the secretariat reported on the progress of the CHAdEMO 1.0 certification process and V2X protocol respectively, followed by a very lively Q&A session. (Left picture)



In the afternoon sessions that were open to the public, there were presentations by entrepreneurs of innovative projects, such as a national charging network on highways, an EV roaming market place, a new type of charger integrating batteries to mitigate grid impact and contain demand charge, and an all-EV car sharing back-end system design, to name but a few. Passionate, eager to share & discuss, and provocative at times, the speakers made strong and lasting impressions on the participants. (Right picture)

CHAdEMO demonstrates fast charging in an EV rally in France

To showcase just how far an EV can go using fast chargers and to encourage a debate about the fast charging infrastructure, a CHAdEMO-colored C-ZERO ran 1,000 km over 4 days in the South-West of France in September 2013, covering around 325 km per day. As part of an EV rally, Tour Poitou-Charentes, which covered 350 km over 2 days, the CHAdEMO team upped the challenge by driving 650 km to the start of the rally and back, 100% electrically, using the fast chargers available along the way, reporting on the adventure in real-time through social media. The trip demonstrated that thanks to CHAdEMO chargers it is perfectly possible to drive long distances in an EV that has about 120 km of autonomy. A number of regional and specialist media wrote about the CHAdEMO team's challenge.



Activities in 2013

	2013 April	May	June	July	August	September	October	November	December	2014 January	February	March				
Board Meeting	★	★	★	★	★	★	★	★	★	★	★	★				
General Assembly · European me		★(5/22) CHAdeMO General Assembly							★(11/20) European meeting							
Technical Workshop		★(5/21) Publication of draft ver.1.0 test specification and amendment of CHAdeMO specification														
			★(6/25) Publication of JIS TS (English version)													
				★(8/5) Publications of ver.1.0.1 test specification and ver.1.0.1 technical specification amendment 1												
						★(11/15) Release of V2H guideline										
Infrastructure Workshop				★(7/11)			★(10/21)		★(12/17)			★(3/4)				
Location Information	★(3/29) Release			★(7/4) Update			★(10/4) Update		★(1/10) Update			★(3/28) Update				
Installation/Operation guidelines WG				★(7/24)ver.3改訂												
IEC meeting	★(4/9-19)IEC TC69 @Tronto							★(11/18-22)IEC TC69/WG4@Barcelona				★ 61851-23/24 FDIS approval				
Certification test	★Hitachi	★EFACEC (Portugal)														
		★Nation-E (Switzerland)														
		★Fuji Electric														
		★Tritium (Australia)														
		★Nitto Kogyo														
						★Hitachi	★Schneider (France)				★PNE SOLUTION (Korea)					
							★Delta Electronics				★TAKAOKA ELECTRIC MFG.					
							★NIPPON STEEL & SUMIKIN TE				★HASETEC					
							★Nissan				★Nitto Kogyo					
								★Hitachi		★Andromeda Power		★ABB				
								★Nissan		★Nissan		★JFE Engineering				
							★HASETEC		★Nissan		★NICHICON					
PR activity, etc.	★(4/8-12)Hannover Messe		★(5/15)World EV Summit @Oslo													
			★ Launch of joint project by 4 automakers to promote charging infrastructure													
			★(8/15) Pan European Networks Government Articles published													
			★(9/17-19) EV rally 'Tour VE Poitou-Charentes'													
			★(9/25-11/18) EV super 7 fast charging journey													
			★CHAdeMO charger units reach over 3,000													
			★(10/15-17) eCarTech@Munich													
			★(10/23-25) Nikkei Smart City Week @Yokohama													
			★(11/17-20) EVS27@Barcelona													
			★CHAdeMO charger units reach over 1,000 in Europe													
			★(2/6) Intermodos @Brussels													
			★(3/26) EVER @Monaco													

Specification. • Certification WGs

	Date	Main Agenda
18th/20th	11-Apr	Connector check sheet, test specifications, amendment
19th/21th	15-May	Test specifications, amendment, publication schedule
20th/22nd	26-Jun	Discussion on comments of draft test spec and amendment
1st (1.0)	6-Sep	Specifications for charging cable, discussion on issues raised by V2H-WG
2nd (1.0)	25-Dec	Compatiblity with extended V2H specification
3rd (1.0)	10-Jan	Compatiblity with extended V2H specification
4th (1.0)	29-Jan	1.0 test procedure, extended V2H specification, measures for electric quality
5th (1.0)	25-Mar	Europe Technical WG, extended V2H specification

WG participant company :

Nissan, Mitsubishi motors, Toyota, Subaru, Honda, Suzuki motor, Mazda, Takaoka, Hasetec, Takasago, Fuji electric, NS-ELEX, YAZAKI, JFE Engineering, HITACHI, Shindengen, Japanese Cable Makers' Association, Vector Japan, Kikusui Electronics, Nichicon, TÜV Rheinland, TEPCO (chair,

Connector WG

	Date	Main Agenda
20th SWG	20-Jun	Connector certification test, connector for V2H
21th SWG	5-Feb	Connector for V2H

WG participant company :

Yazaki (chair), Fujikura, Sumitomo Electric, Japan Aviation Electronics, Dyden, Hitach Cable, Furukawa Electric, TEPCO (secretary)

CHAdeMO V2H WG

	Date	Main Agenda
1st	7-Jun	Defining scope of the activity, sorting out issues
2nd	20-Jun	Categorizing prorposed issues
3rd	4-Jul	Overall policy and schedule, discussion on issues
4th	24-Jul	Discussion on comments according to task list
5th	8-Aug	Discussion on comments according to task list
6th	29-Aug	Discussion on comments according to task list
7th	13-Sep	EVPOSSA guideline disclosure policy, discussion on issues
8th	26-Sep	Discussion on comments according to task list
9th	17-Oct	Differences with CHAdeMO Specifications, discussion on issues
10th	31-Oct	Guideline description policy, discussion on issues
11th	14-Nov	Enhanced function impact study, discussion on issues
12th	28-Nov	Guideline editing policy, discussion on issues
13th	12-Dec	Discussion on issues, information passed on to Specification WG
14th	25-Dec	Discussion on issues, Specification WG report
15th	19-Jan	V2H guideline
16th	13-Feb	Compatibility test, connector SWG discussion report
17th	20-Mar	Compatibility test, V2H Guideline Final draft

WG participant company :

Nissan (chair), Mitsubishi Motors, Toyota, Honda, Denso, Panasonic, Sharp, Hitachi IE system, Mitsubishi Electric, Fuji Electric, Takasago, Hasetec, NS Elex, Yazaki, Sumitomo Electric, TEPCO (secretary)

Infrastructure Workshop

Date	Participant	Main agenda	Presenter
18th 11-Jul	154	Next-generation Vehicle Charging Infrastructure Establishment Promotion Project Smart community activity in NEDO Smart community system demonstration project in Malaga, Spain NEDO Hawaii project . Outline of smart house and grid and the current trend	Next Generation Vehicle Promotion Center NEDO Mitsubishi Heavy Industries Hitachi Waseda University
19th 21-Oct	145	Current status of charging infrastructure in UK and Europe Electric bus "ELEMO-AKITA" Development of V2H "EV power station" Interim report of travel by "EV super 7" Promotion conference of EV+PHV town initiative "SMART MOBILITY CITY 2013" Introduction of billing machine	Zero Carbon Futures Akita Prefecture NICHICON CORPORATION Japan EV Club METI Dentsu Inc. Fuji Electric Co., Ltd.
20th 17-Dec	128	Promotion of charging infrastructure by 4 OEMs "Q Ta Lo", a carrier car with a EV quick charger EMC test facility for power electronics products Final report of "EV super 7" journey Maintenance service for EV quick charger CHAdeMO Europe meeting report	Nissan Mobility Plus Co.Ltd KEC Japan EV Club Mint Wave CHAdeMO Association
21st 26-March	112	Tesla Motors DC Charging in Japan NEXCO Nakanihon's quick charging service for electric vehicles and its challenges New method to detect DC earth fault	Tesla Motors NEXCO Nakanihon Seiko C & E

Location Information Sharing WG

	Date	Main Agenda
21st SWG	23-Apr	System development schedule, request for information provision
22nd SWG	29-May	Cost for system development, Open data update
23rd SWG	7-Jun	Cost for system development
24th SWG	3-Jul	Data update annual schedule, subsidy
	5-Jul	Open data update
	4-Oct	Open data update
	10-Jan	Open data update
	28-Mar	Open data update

WG participant company:

INCREMENT P (chair), Mitsubishi Motors, Fujitsu TEPCO (secretary)

Board meeting

Date	Main Agenda
12-Apr	2012 activity report, 2013 general assembly plan, V2H guideline
10-May	2013 general assembly plan
14-Jun	Certification schedule, consultant contract, CCS
12-Jul	CCS, European activity plan, JIS
23-Aug	Certification schedule, European meeting plan
27-Sep	V2H guideline, structure of technical workshop
24-Oct	Certification schedule, operating structure, V2H guideline
29-Nov	1.0 certification test plan, European meeting report, European CPT report
20-Dec	1.0 certification test plan, European technical WG, IEEE
24-Jan	Consultant contract, transfer of 1.0 certification test, single-phase charger
1-Feb	Incorporation of the association, Certification test scheme
28-Feb	Incorporation of the association, Technical problems of normal charging
14-Mar	V2H Certification test scheme, Technical WG and Certification test in Europe