eCo-FEV Mobility2.0 Mobincity

Clustering Activities

Common Deliverable

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Revision and history chart

Version	Date	Comment
0.1	23/10/2012	LENARDI: deliverable structure and first content
0.2	30/11/2012	Inputs from : • LIN, LENARDI (Hitachi Europe, eCo-FEV) • KOVACS (BroadBit, Mobility2.0) • SORIANO (ITE, Mobincity)
0.3	18/12/2012	Previous input harmonized in one document (EICT)
0.4	19/12/2012	Inputs of 19 December by each assigned editor
0.5	20/12/2012	Harmonized version for final check by LENARDI (Hitachi Europe)
1.0	21/12/2012	Final version of Release 1 sent to the three Project Officers

SEVENTH FRAMEWORK PROGRAMME

The 3 EC FP7 projects eCo-FEV, Mobility2.0, and Mobincity aim at satisfying the objective GC-ICT-2011.6.8 "ICT for fully electric vehicles".
The EC requested common actions among the 3 projects, in particular on possible synergies and clustering strategies.

eCo-FEV	Mobility2.0	Mobincity
AT A GLANCE	**AT A GLANCE**	**AT A GLANCE**
Specific Targeted Research Project (STREP)	Specific Targeted Research Project (STREP)	Specific Targeted Research Project (STREP)
Project coordinator: Hitachi Europe Limited, Massimiliano LENARDI	**Project coordinator:** BroadBit Andras KOVACS	**Project coordinator:** ITE Sixto SANTONJA
Partners: Hitachi Europe, CEA, Centro Ricerche Fiat, EICT, Politecnico di Torino, Renault, TU Berlin, SITAF, Facit Research, Département de l'Isère, ENERGRID, Institute for Economic Research and Consulting, BlueThink	**Partners:** BroadBit, EXTRA, Barcelona Digital, ICCS, Municipality of Reggio-Emilia, ARMINES, University of Twente, Privé, NEC Europe	**Partners:** ITE, Fraunhofer ESK, ETRA, EIHP, ENEL Distribuzione S.P.A., CIT Development S.L., Elektro Ljubljana Podjetje Zadistribucijo Elektricne Energije DD, Hrvatski Telekom, Technomar Gmbh, SZ-Oprema Ravne D.O.O., ETREL Svetovanje in Druge Storitve D.O.O., CRAT, Zabala Innovation consulting S.A.
Duration: September 2012 – May 2015 (33 months)	**Duration:** September 2012 – February 2015 (30 months)	**Duration:** July 2012 – June 2015 (36 months)
Total cost: 4,265,317 €	**Total cost:** 2,691,580 €	**Total cost:** 3,927,530.00 €
Programme: 7th EU Framework Programme	**Programme:** 7th EU Framework Programme	**Programme:** 7th EU Framework Programme
Further information: www.eco-fev.eu	**Further information:** www.mobility2.eu	**Further information:** www.mobincity.eu

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Executive summary

This Deliverable, common to all three projects eCo-FEV, Mobility2.0 and Mobincity, aims at synchronising key milestones and achieving overall synergy with each other. The three projects will also participate in any official concertation process.

Taking into account the specific project goals, the clustering objective is to actively work towards alignment in common work towards standardization, common awareness actions (e.g. joint demonstration events, workshops, webinars, joint final event), coordination and synergy in dissemination activities (e.g. presentation of the cluster achievement in conferences); possibly, the projects will try to align also in system concept and definitions, high level architecture and standard interfaces, interoperability.

This common Deliverable is a living document, with three releases planned. The 1st Release is providing the clustering activities' initial contributions/ideas and will be updated with further plans and concluded activities for the 2nd Release and 3rd/final Release, respectively planned (tentatively) for October/November 2013 and January/February 2015.

1 Standardization

This chapter provides first the Bodies involved in standardization related to the 3 projects, and then a list of common standards, which could be simply adopted by the 3 projects or to which the 3 projects contribute within the standardization Bodies.

1.1 Bodies

Standardization of aspects related to electromobility is becoming an important issue and a pre-requisite to increase the EV penetration. The role of these standardization activities is to define technical solutions for interfaces which will ensure interoperability between the vehicle and the supporting infrastructure. Moreover, to encourage innovation and to create larger acceptability, standards should also concentrate on performance aspect rather than being descriptive. The main Standards Development Organization's (SDO's) involved in standardization of electromobility and related concepts in Europe and around the world are depicted in **Error! Reference source not found.**.

In this context, European Commission has delivered a standards mandate to CEN/CENELEC and ETSI (Mandate 468) concerning the charging of electric vehicles. CEN/CENELEC has formed a focus group on European Electro-Mobility and provided a report as reply to the mandate. ETSI is playing an observation role in this focus group. According to CEN's focus group the current perspective of SDO's in EU with respect to electromobility is:

- Ensure interoperability and connectivity between the electricity supply and onboard chargers of electric vehicles, so that they can be connected and be interoperable in all EU States
- Ensure interoperability and connectivity between "off-board" chargers and the electric vehicle and removable batteries
- Consider any smart-charging issue with respect to the charging of electric vehicles
- Consider safety risks and electromagnetic compatibility of the charger of electric vehicles in the field of relevant directives

The report mentioned in [1] has done an analysis on the specific standardization requirements for European electro-mobility and provides several recommendations on the future standards needs of eMobility in multiple aspects, e.g. charging or connectors. The present project groups are realizing R&D activities in relationship with some of important gaps identified by this report. It is expected

that the project outputs will be provided to standards works. In particular, the following aspects pointed out by the report can be contributed by projects (i.e. eCo-FEV):

- Wireless communication directly between EV and operator.
- Wireless charging of electric vehicles.
- V2G based on wired or wireless communications.

The key standardization groups that the clustering activity aims are summarized in **Error! Reference source not found.**

Table 1: Key Standardization Bodies

STANDARDIZATION GROUP/BODY	GOALS AND INFORMATION
ETSI TC ITS WG1 ITS0010031	- work item started in June 2012, but is empty so far - scope: communication before recharging phase (planning) - possibility to develop work item by the three projects - networking aspects should be considered, e.g. electric vehicles - Charging spot reservation
ISO/IEC 15118 - 6 -7	- promotes access, protocol and application technologies - V2G interface: standard to develop vehicle to grid interface - new work item started in July to define wireless communication during inductive charging (which is in the scope of eCo-FEV, i.e. inductive charge while driving) - important to promote G5 technology, which is used by the three projects - define which access technologies will be used
ETSI – TC I2M	- ad-hoc group for smart charging: i.e. architectural aspects - standardization group possibly not ready yet
Electro-mobility coordination group on smart grids:	- coordination of ISO, ETSI and M2M to avoid overlapping of activities - group seems to be in need of further developments
IEEE Transport Electrification	Co-ordinates various IEEE standards to achieve cooperative electromobility e.g. IEEE P2030.1, IEEE 1901, IEEE 1609

1.2 List of standards

This section aims at defining a list of common standards required by the three projects.

The lists of standards are drawn up on the basis of the projects' functional requirements, specifications, system concepts and definitions. In the present document, which is the 1st Release of the common Deliverable, three tables separately identify the standards related to each project. At a later stage, after analysing all collected standards, these tables will be merged into a single table that will only contain the shared standards, that is the existing standards relevant to eCo-FEV, Mobility2.0 and Mobincity. Standards in a drafting stage will be considered, too.

Clustering group has set up a list of relevant standards to projects. This list of standards can be grouped in three categories:

- Standards on the domain of ITS, traffic management and telematics services such as Cooperative ITS standards, road infrastructure information exchange standards and telematics services standards; these standards are developed to support mobility and traffic management applications and services.
- Standards on the domain of EV charging, including conductive and inductive charging technologies.
- Standards on the communications, to support information exchanges and interoperability.

According to the relevance of the project and its development needs, a standard may be implemented and tested in a project. Testing results and lessons learned will be provided to the standards bodies as dissemination activities. Furthermore, some partners are actively contributing to some on-going standard development procedure, specifications developed in the project can be provided as inputs to Standards bodies during standards development process.

Given the large number of regional and international standards developed or under development, it is important to harmonize and coordinate standardization activities. European commission has issued relevant standard mandates for this purpose:

1. Mandate related to the charging of electric vehicles M468.

   See in section 1.1

2. Mandate related to the smart grid (M490).

   CEN, CENELEC and ETSI joint Working Group on standards for smart grids worked between June 2010 and March 2011 on the production of a report addressing standards for smart grids. Based on this report [2], a coordination group on smart grid is established, in order to coordinate standardization activities in different standard bodies. In the scope of cluster projects, each project will identify the need to follow or contribute to the standardization activities in smart grid. Due to the absence of power supply operator in the

project consortium, the standard dissemination for the smart grid related standards may be limited.

3. Mandate related to smart metering (M441):

Cluster project do not consider to provide standard dissemination activities in the scope of smart metering, because out of scope of project.

1.2.1 eCo-FEV

Table 2: List of Standards 1related to the project eCo-FEV

No.	Title	Current status
ITS, traffic management and telematics		
ISO IEC 15118	Vehicle 2 Grid Communications Interface	On going
ETSI TS 101 556-1	Intelligent Transport Systems (ITS); Infrastructure to Vehicle Communication; Electric Vehicle Charging Spot Notification Specification	published
TS 101 556-3	Intelligent Transport Systems (ITS); Infrastructure to Vehicle Communications; Communications system for the planning and reservation of EV energy supply using wireless networks EV charging using wireless networks	Work in Progress
DATEX2 (easyway)	DATEX 2 protocol for information exchange in traffic management infrastructures	release V2.1 published
CEN ISO/TS 18234-Series	TPEG applications and specifications	TPEG 1 published, TPEG 2 under development
Charging		
IEC 61851	Electric vehicle conductive charging system	ongoing
IEC 62196 - 2	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles	unknown
no standards available	Inductive recharging	not available
Communication		
ISO 21210 of ISO Technical Committee TC204 working on ITS	Intelligent transport systems -- Communications access for land mobiles (CALM) -- IPv6 Networking	published

ETSI TS 102 636-6-1 V1.1.1 (2011-03)	"Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking Protocols"	published
RFC 3963 of IETF	"Network Mobility Basic Support Protocol (NEMO)	published
RFC 5177 of IETF	"Network Mobility (NEMO) Extensions for Mobile IPv4"	published
RFC 5454 of IETF	"Dual Stack Mobile IPv4"	published
draft-petrescu-autoconf-ra-based-routing-02.txt of IETF	"Router Advertisements for Routing between Moving Networks"	Work in Progress
draft-kaiser-nd-pd-00 of IETF	Prefix Delegation extension to Neighbor Discovery protocol	Work in Progress
draft-mouton-mif-dhcpv6-drlo-02.txt of IETF	Default Router List Option for DHCPv6 (DRLO)	Work in Progress
TS 102 636-4-1	Intelligent Transport Systems (ITS); Vehicular communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality	published, EN revision work in progress

1.2.2 Mobincity

Table 3: List of Standards related to the project Mobincity

No.	Title	Current Status
Communication		
ETSI ES 202 663 Reference DES/ITS-0040015	Intelligent Transport Systems (ITS); European profile standard for the physical and medium access control layer of Intelligent Transport Systems operating in the 5 GHz frequency band	published
ETSI TS 102 636	Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking;	published
Intelligent Transport Systems		
ETSI TR 102 863 Reference DTR/ITS-	Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications;	published

0010006 [3]	Local Dynamic Map (LDM); Rationale for and guidance on standardization	
ETSI EN 302 895 Reference DEN/IST-0010005	Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Local Dynamic Map (LDM) Specification	drafting stage
CEN/TS 16157	Intelligent transport systems - DATEX II data exchange specifications for traffic management and information	not avaialble
ETSI TR 101 607 Reference DTR/ITS-0001	Intelligent Transport Systems (ITS); Cooperative ITS (C-ITS); Release process and Release 1 Cooperative ITS Release 1	drafting stage
ETSI TS 102 985 Reference DTS/ITS-0020028	Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281)	published
Energy Infrastructure		
ISO/IEC 15118	Vehicle to grid communication interface	drafting stage
IEC 61851-1	Electric vehicle conductive charging system - Part 1: General requirements	published
IEC 62196-2	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles	published
IEC 61850	Communication networks and systems in substations	published

1.2.3 Mobility 2.0

Table 4: List of Standards related to the project Mobility2.0

No.	Title	Current status
EV Charging Infrastructure & Grid		
ETSI TS 101 556-1	CS Location/Booking	published
OCPP		
IEC 61851-1, -22(AC), -23(DC)	Charging Modes	
IEC62196 (Type2,3), SAE J1772 (Type1)	Connector	
IEC/ISO 15118	Communication	
IEC 61850-n	Communication	
IEC/ISO 15118	Communication	

IEEE P2030.1		Under development
Communication		
ETSI ITS G5	Communication	

1.3 Contribution to existing standards

Next releases of this living document will in this section describe contributions of the three projects to existing and new standards.

2 Possible common activities

In this section cluster's current activities and future plans are introduced.

2.1 Overview

The agreed activities to be performed within the cluster are organised through two main lines of action:

1. Organisation of workshops, phone conferences and meetings in order to share common experiences in person, manage common activities and share the outcomes with the community.
2. The second main line is based on the information sharing and common information production. In this line the expected foreground activities comprise common dissemination activities and information sharing (comprising business models, public deliverables as well as relevant use cases).

These activities shall lead us to define and follow common paths within the three projects and to agree in a common pre-standardisation process

2.2 Workshops/Symposia

Three common workshops or symposia are planned throughout the cluster´s lifespan. The initial proposal for the meetings can be summarized as follows:

- **Use cases and architecture** workshop: around October 2013. In this workshop we will share the architecture and business use cases that are common to the three projects. The objective of this workshop is to present the synergies among the three projects in terms of interfaces, architecture design, and use cases. By that date the use case and requirement analysis and the technical design shall be already performed in the three projects. In this workshop we will prove how the design and requirements of the three projects have influence each other.

- **Proof of concept and standardisation** on October 2014. Presentation of the common reference architecture where the interfaces and synergies between the projects will be proved. Reporting on the pre-standardisation process where the detected gaps in the current standards will be presented together with the line of actions to try to close them. Present and future activities with standardisation bodies will be discussed and presented.

- **Final demo and exploitation of the technologies** on April 2015. Final demonstration of the synergies among the projects in the cluster. Presentation of the conclusions and final report on standardisation.

Due to the different ending dates of each project (Mobility 2.0 on 02/2015, eCo-FEV on 04/2015 and Mobincity on 06/2015) and the logistics implied for the demos it shall be evaluated the convenience or not of celebrating this common workshop. The alternative is to make independent workshops in the final stages of each project.

2.3 Meetings

The cluster shall meet every two months on a regular basis for monitoring and control of common activities and for setting up a common forum of discussion.
All the common activities related to standardisation procedures, dissemination activities and convergence activities (through common use cases and business modelling) shall be discussed in these meetings.
Specific meetings can also be arranged when required at request by any member
The following table shows the meetings already done.

Date	Item	Contribution	Participants
04.10.2012	Web conference	• Presentation of clustering activities. • First ideas regarding common deliverable • Editing plan and structure for the common deliverable: 1. List of standards 2. Standardization bodies 3. Possible activities/workshops 4. Liaison Information exchange	Massimiliano Lenardi Andrea Tomatis Lan Lin Henrike Inhülsen Anja Winzer Andras Kovacs Andreas Festag Raul Soriano
02.11.2012	1st Draft deliverable	Provide draft template	
06.11.2012	2nd Clustering Call	• "Architecture responsible" per project • Chapter authors for the "Clustering deliverable" • Timeplan for deliverables development • Possibility to circulate project newsletter via other project mailing lists? • Further standardization bodies	Massimiliano Lenardi Lan Lin Henrike Inhülsen Andras Kovacs Raul Soriano Sixto Santoja
23.11.2012	2nd Draft Deliverable	Provide Input to 1st Draft Project description p.4 Executive Summary p.7 1. Standardization / Bodies p.8 1. Standardization / List of standards p.9 2. Possible Common Activites p.10 3. Information Exchange / Liaisons p. 11 4. Conclusion p.12	

30.11.2012	3rd Clustering call	• Review of the common deliverable	Massimiliano Lenardi Lan Lin Henrike Inhülsen
18.12.2012	4th Clustering call	• Delivery planning of the clustering deliverable's first version • Review of document editing tasks and responsibilities per section • Next conference call to discuss clustering input to the EM-AHG document. • Use case sharing among the projects	Massimiliano Lenardi Lan Lin Henrike Inhülsen Andras Kovacs Maslekar Nitin Angela Budroni Raúl Soriano

To get a better overview withal the projects together and who is responsible for them, please have a look at the following table:

Projects	eCo-FEV	Mobility 2.0	Mobincity
Responsible	Massimiliano Lenardi Lan Lin Henrike Inhülsen	Andras Kovacs	Raul Soriano Sixto Santoja

2.4 Cluster's common dissemination activities

At least a common paper shall be submitted with the results of the cluster's activities. It shall be decided the final subject of the paper (or papers) and where to present it (conference proceedings, specialized publication, etc.).

Possible subjects can include standardization processes, collaboration models, common outcomes, results, etc.

Possible events to attend:

- ITS World Congress 2015 in Bordeaux. The congress will be in October, deadline for submission is in February 2015
- ITS T 2015 Conference
- ITS Europe Congress 2015
- ITS C (probably in Spain)

2.5 Business modelling

A possible exchange of information on business modeling activities among the clustering members can be beneficial and lead to synergies. A common business model might be agreed if such synergies are detected and a deep inter-project integration is achieved. These synergies will be carefully studied in future meeting of the clustering group.

2.6 Projects' deliverables and use cases sharing

Public deliverables and use cases from each of three clustering projects may be reviewed by the other two projects. All projects may profit from the commonalities of each other.

This reviewing process may come out with a common architecture of the common shared interfaces between all the projects.

Public deliverables related to requirements, use cases, architecture design, communication standards, and business models are firm candidates to be shared.

3 Liaisons/Information exchange

This chapter provides information on Liaisons between eCo-FEV, Mobility2.0 and Mobincity, and Liaisons of one of the 3 projects with other projects/entities relevant for the other 2 clustering projects.

3.1 Clustering Liaison and Information Exchange

This Deliverable represents formally the Liaison among eCo-FEV, Mobility2.0 and Mobincity clustering projects.

Furthermore, when other Deliverables of one project are Public, they are automatically provided to the other 2 clustering projects. If a Deliverable is Restricted, it will be discussed case by case if possible to share it among the 3 clustering projects, if agreed to be relevant.

3.1.1 Shared Deliverables

None so far / a list may be provided

3.2 Other Liaisons and Information Exchanges

None so far.
A correlation diagram of Liaisons between each of the three projects and other entities might be included later.

4 Conclusions

This Deliverable reports the clustering activities of the three projects eCo-FEV, Mobility2.0 and Mobincity. These activities mainly include synchronization on the system architecture achieved by common standardization targets, and common dissemination actions.

This common Deliverable is a living document, with three releases planned. The 1st Release is providing the clustering activities' intentions and will be then updated with further plans and concluded activities in the 2nd Release and in the 3rd/final Release, respectively planned (tentatively) for October/November 2013 and January/February 2015.

At first, in the 1st Release, the three projects identify separately the Standardization Bodies' Committees which are relevant for the clustering activities. For each Committee, the relevant existing standards or the possible clustering contributions are and will be discussed through dedicated meetings or confcalls and reported in the next Releases of this Deliverable.

Also, the three projects identified and report in this 1st Release about possible common Dissemination activities, including Workshops, Webinars or Symposia, information exchanges (the projects' other deliverables), and possibly a common conference paper. More details will be reported in the next Deliverable Releases.

This Deliverable represents formally the Liaison among eCo-FEV, Mobility2.0 and Mobincity clustering projects.

Abbreviations

References

[1] "Standardization for road vehicles and associated infrastructure", CEN,CENELEC, Focus Group on European Electro-Mobility, Oct. 2011

[2] "Recommendations for smart grid standardization in Europe Standards for Smart Grids" CEN,CENELEC, ETSI Focus Group on Smart grid.

[3] "ETSI TR 102 863 v1.1.1 - Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Local Dynamic Map (LDM); Rationale for and guidance on standardization" Technical Report, Jun. 2011.