



**HEMIS**

**ELECTRICAL POWERTRAIN HEALTH MONITORING  
FOR INCREASED SAFETY OF FEVs**

**DELIVERABLE D8.2-v3.0**

Project dissemination and communication plan

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### Document History

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0.1	31/08/2012	POLIMI	First draft of the document with the sections 2 (Introduction) and 3 (Dissemination Strategy)
1.0	14/09/2012	CEIT, MIRA, Y-EMC JEMA VTT	Contribution to Sections 2 and 3. The dissemination activities already performed and planned by each partner have been added in Section 3.
1.1	22/09/2013	POLIMI	Incorporation of amendments requested by the reviewers following the first project review. The modifications of the document have been discussed during a consortium meeting with all the partners. 1) an executive summary has been added; 2) more details on the organization, members, and activities of the Industrial Advisory Panel and their involvement in the production of the deliverables have been added; 3) Connection with the standardization committees and the feedback of project results with them has been more clearly described; 4) the target audience of the dissemination activity has been better specified and a new Section 4.1 'identification of the target audience' has been added; 5) a strategy for the engagement of external stakeholders, standardization bodies, FEY OEMs and industry has been defined; 6) the connections and interactions between the dissemination activity and the business model have been clarified; 7) the feedbacks on the dissemination activities that will be collected have been defined. Target objectives for the proposed metrics have been added;
1.3	23/09/2013	CEIT	Revision and contribution to the executive summary and Sections 2, 3.1-3.6. Contributions to a better definition of the Industrial Advisory Panel
2.0	24/09/2013	ALL	Revision of the document modifications. Contribution to the definition of a strategy to engage external stakeholders and to a better definition of the target audience (Sections 3.3,3.4 and 3.5)
2.1	15/11/2014	POLIMI	Revisions of the document in order to highlight the dissemination activities planned for the third year. Particular emphasis has been given to the plan for stakeholder engagement.
3.0	05/03/2015	CEIT	Minor format changes

## EXECUTIVE SUMMARY

The present deliverable is dedicated to the illustration of the HEMIS dissemination and communication plan. The objective of the plan is to establish the strategy to raise awareness of the HEMIS project and its outcomes, as well as define target goals which will provide feedback of the results of the dissemination and communication activities.

The dissemination and communication strategy is based on the definition of key target groups and their corresponding communication strategy, key message and metrics of results. The target groups identified are the technical and scientific community, the fully electrical vehicle (FEV) potential users, the potential end-users of HEMIS Prognostics and Health Monitoring (PHM) and ElectroMagnetic Compatibility Guides, standard bodies and organizations, and students.

The knowledge generated during the project and the achieved results will be published on international indexed journals and on proceedings of international conferences.

Dissemination activities towards fully electrical vehicle (FEV) potential users will be supported by communication materials, such as a web site, leaflets, posters, news-letters and a blog. Furthermore, long-term relations to national and local media will be encouraged.

An Industrial Advisory Panel (IAP) formed by FEV manufacturers and Tier 1 automotive suppliers will be established. Its main objectives are to keep the project in line with the practical aims of the European electric vehicles industry and to enhance the visibility of the project and of the partners in the community of the manufacturer of electrical vehicles and of vehicle traction motors and drives. In practice, the IAP should allow a prompt and effective dissemination of the HEMIS results towards the European FEV industry. In addition to this, dedicated meetings with external stakeholders will be organized.

The project partners will actively participate to national and international standardization bodies and organizations. In particular, the HEMIS low frequency emission measurement results and measurement methods will be presented in order to influence changes to standards.

Finally, the activities of the HEMIS project will be illustrated to a high number of engineering students and other students of technical disciplines.

The main target groups for internal communication are project partners and the members of the Industrial Advisory Panel.

To facilitate the communication, a graphical identity will be created, with logo and templates for text documents and presentations.

The dissemination plan is intended as a living document which will be updated and enriched with the forthcoming contribution from partners. To this purpose, we will deliver each year a document containing the dissemination and communication actions performed during the year. Furthermore, the dissemination and communication plan will be adapted during the project development in order to take into account the identified business models.

During the last period of the project (third year), emphasis will be given to dissemination activities which aim at approaching major European car manufacturers and standard bodies and organization and making them aware of the project and its results. In this respect, it is considered that it is of fundamental importance to be able to communicate that:

- a) new PHM algorithms have been developed and tested with success;
- b) low cost hardware has been developed for the implementation of the PHMS and tested with success;
- c) the overall PHMS system has been validated and the obtained results are satisfactory. Its use allows remarkably improving FEV safety and reducing maintenance costs.
- d) standard bodies and organization will benefit from the results obtained in work package 5.

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## 1. LIST OF ACRONYM

EMC: ElectroMagnetic Compatibility

EMF: ElectroMagnetic Fields

FEV: Fully Electrical Vehicle

PHM: Prognostics and Health Management

PHMS: Prognostic Health Monitoring System

## 2. INTRODUCTION

The main goal of dissemination and communication is to bring our project to the attention of as many relevant people as possible.

The main purposes of this document are to formalize the dissemination and communication actions planned for the project, to provide guidelines on the approach and to set out the key dates associated with the planned dissemination and communication actions, to ensure that the information is shared with the appropriate audience on a timely basis and by the most effective means.

More specifically, the objectives of the dissemination and communication plan are:

- To establish and maintain mechanisms for effective and timely communication;
- To inform the stakeholders of the progress of the project and encourage interactions between stakeholders;
- To coordinate all levels and types of communication in relation to the project;
- To establish objectives for the dissemination activities and to collect feedbacks on their results.

We intend this document as a living document, which will be continuously updated and enriched with the forthcoming contribution from partners. Furthermore, the dissemination and communication plan will be adapted during the project development in order to take into account the identified business models.

### 3. DISSEMINATION STRATEGY

The HEMIS dissemination strategy is based on the following steps:

- identification of the target audience (groups that we want to reach with the dissemination activities);
- for each target audience:
  - definition of the key messages to be transmitted;
  - identification of the proper dissemination strategy. In practice, this requires the partners to select the communication materials to be used and to plan the proper communication actions. For each dissemination action we will indicate the type of activity, the location and the responsible partner;
  - definition of metrics and target goals.



### 3.1 Identification of the target audience

The target audience for the dissemination and communication strategy is identified by taking into account the results which we expect to obtain during the project. According to the project objectives, the main expected results are:

- 1) the generation of scientific knowledge;
- 2) the analysis on the gaps in current EMC standards regarding FEVs, the EMC measurement and testing methods for FEVs and the EMC Design Guidelines;
- 3) the development of a PHMS for FEVs which will enhance the vehicle reliability and safety and allow the application of a predictive maintenance policy.

With respect to the scientific knowledge which will be generated during the project, the target audience which we want to reach with the dissemination strategy is formed by the technical and scientific community and by engineering and other technical discipline students.

The target audience which we want to reach with respect to the analysis on the gaps in current EMC standards regarding FEVs, the EMC measurement and testing methods for FEVs and the EMC Design Guidelines is mainly constituted by manufacturers of vehicle electric drives, standardization boards, OEMs, Tier1 and homologation companies.

Finally, the target audience of the dissemination activities which concern the development of a PHMS for FEVs is constituted by FEVs end users, manufacturers of electric vehicles, OEMs and Tier1. In particular, we assume that manufacturers of electric vehicles, OEMs and Tier1 will be interested in the development of a PHMS for FEVs only in the case in which the PHMS is attractive for the FEVs end users.

In the following Sections, the target audience here identified will be divided in four different classes:

- 1) technical and scientific community (Section 4.2)
- 2) FEVs potential end users (Section 4.3)
- 3) potential end-users of HEMIS PHM/EMC including manufacturers of electric vehicles, manufacturer of vehicle electric drives, OEMs and Tier1 (Section 4.4)
- 4) Standard Bodies and Organizations (Section 4.4) including also homologation companies
- 5) Students (Section 4.5).

### **3.2 Target Audience 1 = Technical and scientific community**

The technical and scientific community which we want to reach with the dissemination activities is mainly formed by researchers interested in Electric Vehicles, Prognostics and Health Management, Safety and Electromagnetic Compatibility.

#### **3.2.1. Key messages to be transmitted**

The key messages that we want to transmit to the technical and scientific community concern the scientific knowledge which will be generated during the project and the results that will be achieved. Knowledge that will be transmitted regards the RAMS model of the FEV, the PHM algorithm, the gaps in current EMC and EMF testing for FEVs, techniques/methods for evaluating the levels of electromagnetic fields and the duty cycles in FEVs according to the ICNIRP guidelines, mitigation techniques, EMC measurement and testing methods and design guidelines. Considering the project objectives, at the end of the project we expect to achieve the following results: we have been able to develop an innovative PHMS for selected FEV subsystems; the developed PHMS has been shown to increase the safety of the vehicle; with respect to the EMC and human exposure to electromagnetic fields, we have contributed to improve on the limitations of current legislative requirements.

In order to disseminate to the scientific community this message, each work package should transmit the following messages:

- WP2: we have developed an accurate RAMS model of the FEV;
- WP3: we have identified the degradation mechanisms and their consequences of the FEV subsystems of interest;
- WP4: we have identified the appropriate physical characteristics to be monitored for PHM; we have developed accurate PHM algorithms; the developed PHM algorithms are able to manage hybrid data;
- WP5: we have identified the gaps in current EMC and EMF testing for FEVs, we have developed appropriate techniques/methods for evaluating the levels of electromagnetic fields and the duty cycles in FEVs according to the ICNIRP guidelines. We are proposing effective mitigation techniques. We have provided FEV manufacturers and standardization boards with proposals for EMC measurement and testing methods and design guidelines;
- WP6: we have designed and implemented an effective monitoring system for the FEV subsystems of interest; we have defined the Design Guidelines for FEV manufacturers regarding low frequency electromagnetic emissions;
- WP7: we have demonstrated the performance of the developed PHMS on a real prototype.

### 3.2.2. Dissemination strategy

The dissemination methodology will be based on the continuous collaboration among project partners and will use different dissemination methods such as:

- 2) Communications to international conferences in the fields of Safety, PHM, Electric Vehicles and Electromagnetic Compatibility. The communication will include: the presentations of works illustrating the HEMIS project aims and main results, the organization of special technical session at international conferences, the participation at international conferences with booth.
- 3) Publication of journal papers in international SCI indexed magazines. The following journals will be considered:
  - Reliability Engineering and System Safety Journal. ELSEVIER
  - IEEE Transactions on Electromagnetic Compatibility. IEEE
  - IET Science Measurement and Technology. IET
  - Risk Analysis
  - Probabilistic Engineering Analysis
  - Others
- 4) Active participation in associations and thematic networks. The following association and thematic networks will be considered:
  - ESRA (European Safety and Reliability Association)
  - Italian Chapter of the IEEE Reliability Society
  - eMobility Technology Platform
  - EARPA (European Automotive Research Partners Association)
- 5) Participation in clustering events organized to coordinate European projects on topics related to Safety, PHM, Electric Vehicles and Electromagnetic Compatibility.

### 3.2.3. Planned Activities for the third year

During the third year, we plan to continue to transmit to the technical and scientific community the knowledge generated during the project. In particular, we expect to disseminate the main results of the project by providing practical examples of applications of the developed PHMS and of the methods for evaluating the levels of electromagnetic fields and the duty cycles in FEVs.

The dissemination methodology will be based on the continuous collaboration among project partners and will use varied dissemination methods such as:

1) Communications to international conferences in the fields of Safety, PHM, Electric Vehicles and Electromagnetic Compatibility. The communication will be focused on the presentations of works illustrating main results. In this context, for the remaining part of the project we plan:

- the participation and presentation of works describing the methodological development and the results obtained during the project the following international conferences:
  - European Safety and Reliability Conference ESREL 2014, September 14-18, 2014, Wroclaw, Poland HEVC 2014, 5-6 November 2014, London, UK
  - 13th European EMC Symposium, September 2014, Gothenburg, Sweden
  - Second European Conference of the Prognostics and Health Management Society 2014, July 8-10, 2014, Nantes, France.
  - COMPEL 2014 - Fifteenth IEEE Workshop on Control and Modeling for Power Electronics
  - European Electric Vehicle Congress, 3rd-5th December 2014, Brussels
  - HEVC 2014 5th Hybrid and Electric Vehicle Conference, 5th-6th November, Hatfields, London
  - EMC UK 2014, 7th-8th October 2014, Newbury, UK
  - ICCVE 2014 - The 3rd International Conference on Connected Vehicles and Expo, 3rd-7th November, Vienna, Austria

2) Publication of journal papers in international SCI indexed magazines. The following journals will be considered:

- Reliability Engineering and System Safety Journal. ELSEVIER
- IEEE Transactions on Electromagnetic Compatibility. IEEE
- IEEE Transactions on Power Electronics
- IET Science Measurement and Technology. IET
- Risk Analysis
- Probabilistic Engineering Analysis
- Others

With respect to the remaining part of the project, we plan to submit at least one further manuscript to a SCI indexed international journal. The work is expected to be an extension of the work “A procedure for practical prognostic and health management of fully electric vehicles for enhanced safety and reliability” that we intend to present at the ‘HEVC 2014’. Authors will be

all the partners involved in the activity. A SCI indexed journal will be chosen according to the work contents and results. Other works illustrating the developed PHMS algorithms for the prediction of the capacitor Remaining Useful Life and the monitoring of the loss of magnetic field in FEV motors are expected to be written and submitted, once the methods will be fully validated using field data.

3) The project coordinator has been invited to present the progress achieved in HEMIS at the EU projects day organized for the European Electric Vehicle Congress that will be held from 2nd to 5th December 2014 in Brussels.

4) Active participation in associations and thematic networks. The following associations and thematic networks will be considered:

- ESRA (European Safety and Reliability Association)
- eMobility Technology Platform
- EARPA (European Automotive Research Partners Association)

Newsletters illustrating the results obtained in the project will be sent to other FP7 project's coordinators and uploaded on the HEMIS website. Furthermore, at the end of the project, we plan to publish on the newsletter of the European Association ESRA (European Safety and Reliability Association) an overview of the project and its outcome.

#### **3.2.4. Metrics and target goals**

The following metrics will be used to evaluate the effect of the dissemination activity towards the scientific and technical community:

- Number of works accepted for presentations at international peer-reviewed conferences in the period 2013-2015. Our target is 3.
- Number of scientific articles published in international indexed journals. Our target is to have at least one publication submitted and one accepted by December 2014.

### **3.3 Target Audience 2 = FEVs potential end users**

FEVs potential end users are expected to include a very large audience. Our dissemination activities will be focused on two different types of FEV end users: i) individual FEV owners which are expected to be interested in the enhancement of safety and maintainability ii) operators of fleet of FEVs which are expected to be interested in the possibility of performing a predictive maintenance policy in order to reduce maintenance costs and, thus, improve business and increasing profits

### **3.3.1. Key messages to be transmitted**

The key message that we want to transmit is that the project outcomes are relevant to our everyday lives. In particular, the HEMIS project outcomes are expected:

- to increase the safety and reliability of Fully Electric Vehicles;
- to make FEV easier to maintain;
- to contribute to the reduction of energy consumption and CO2 emissions;
- to contribute to improve on the limitations of current legislative requirements with respect to electromagnetic compatibility and also to help to counter fears amongst some sectors of the population about the perceived health threats of electromagnetic field exposure in FEVs and HEVs, thereby enhancing public confidence in these technologies;
- to enhance in vehicle reliability and safety/predictive maintenance by the PHMS development.

### **3.3.2. Dissemination strategy**

The dissemination methodology will be based on the continuous collaboration among project partners and the use of different dissemination methods such as a logo, a graphical identity, a web site, a blog, press releases and training activities.

### **3.3.3. Planned Activities for the third year**

The main objective of the dissemination strategy towards the FEV potential users during the third years will be the communication to the largest possible public of the potential benefits of the project and their relevance for our everyday lives.

The activities planned to this purpose will include:

- 1) continuous updating of the website to report recent project activities, progress and achievements. Pages dedicated to the achieved main results will be added to the website which has already been modified in order to allow it. We will also link the website to other relevant websites such as those related to other EU research projects;
- 2) The possibility of subcontracting a communication video at IDIADA's premises during testing in WP7 will be considered. The video would be made public through the HEMIS webpage;
- 3) the leaflet will be updated in order to include the main results of the project;
- 4) continuous stimulation of the discussions in the blog; improve the blog graphics and design;
- 5) press releases for press and audiovisual media will be published when major achievements will be made and at the end of the project. Appropriate material will be distributed from the coordinators to provide help for partner and to make the message reasonably uniform. This work flow does not preclude national and regional tailoring;

- 6) invitation of press representatives at important events and achievements of the project;
- 7) the use of other media such as twitter will be considered for further dissemination of the Project.

#### **3.3.4. Metrics and target goals**

The metrics proposed in the dissemination plan to verify the effectiveness of the communication to this target audience are:

- Number of visitors to the website; the target is to have 450 site visitors during the second year and 500 during the third year.
- Number of press releases and media coverage. The target is to deliver 3 press releases during the project and have 20 pieces of news on national journals and websites in at least three different languages.
- Number of posts on the blog; the target is to have 20 posts on the blog.

### **3.4 Target Audience 3 = Potential end-users of HEMIS PHM/EMC**

Potential end-users of HEMIS PHM/EMC are manufacturers of electric vehicles such as Volvo, Jaguar Land-Rover, Valmet Automotive, Renault, Fiat, BMW, Volkswagen, Tofas, Peugeot, Hidroneu, Hiriko, manufacturers of vehicle traction motors and drives, such as Magnomatics, Siemens, Michelin, Protean Electric, Mavilor, and manufacturers of Power Electronics such as Zytec Automotive, Maser, Bosh, Siemens, Lear, Green Power and Infranor.

#### **3.4.1. Key messages to be transmitted:**

The project results have contributed to the safety, reliability and competitiveness of FEVs and to the introduction of new technologies:

- the Monitoring System (PHMS) provides information on the failsafe state of the electric powertrain and enables to apply a condition based maintenance policy on its subsystems in order to improve the safety and the maintainability of the vehicle;
- design guidelines regarding electromagnetic compatibility and the health impact of ElectroMagnetic Fields (EMF), as well as low frequency emissions testing methods, have been provided to the FEV manufactures.

#### **3.4.2. Dissemination strategy**

With respect to the potential end-users of HEMIS PHM/EMC, the dissemination strategy will be based on:

1) the participation of an Industrial Advisory Panel (IAP). Its main purposes are to keep the objectives of the project in line with the practical aims of European FEV industry and to disseminate information about the results of the project at an early stage to the European FEV industry. Members of the IAP will include FEV manufacturers and Tier 1 automotive suppliers. To this purpose, the HEMIS project has contacted representatives of the following manufacturers: Valmet Automotive, Volvo, Jaguar Land Rover, Magnomatics. The IAP members are expected to actively participate to periodic workshops.

The IAP members which will sign a confidentiality agreement will have access to some project deliverables through the internal website and they will be asked to comment them. They will have the possibility to propose modifications to the documents in order to drive the project development towards the real European electric vehicles industry necessity. They will also be contacted in case of important decisions for the project. The IAP members which will not sign the confidentiality agreement will be invited to the workshops and will have access to the corresponding minutes. Comments of the IAP members on the project activities will be included in a dedicated Section of the dissemination report.

2) the development of a HEMIS strategy for the engagement of external stakeholders including FEV industry and manufacturer. The strategy will be based on the preparation of a presentation to be used for the illustration of the HEMIS activities and results to external stakeholders. In this respect, we are considering the possibility of planning dedicated meetings to be held in the premises of the external stakeholders.



3) participation at international conferences of the automotive community. During one conference, the HEMIS project will organize a booth for the dissemination of the project activities and results. Possible conferences for these activities are:

- International Federation of Automotive Engineering Societies World Congress 2014;
- FISITA-International Federation of Automotive Engineering Societies.
- IEEE International Electric Vehicle Conference;

4) participation in associations and thematic networks devoted to the automotive industry and the electrical vehicles such as European Bus System of the Future (EBSF), to European Technology Platforms, or their national mirrors will also be encouraged;

5) press release: press releases for specialized media will be published at strategic times;

6) training: illustration of the project aims and results in professional training courses;

### **3.4.3. Activities planned for the third year**

Once the main results of the work-packages will be achieved, the objective of the dissemination activity towards the Potential end-users of HEMIS PHM/EMC will be to communicate that the project has contributed to the safety, reliability and competitiveness of FEVs and to the introduction of new technologies. In the last part of the project, the dissemination strategy will be focused on the engagement of stakeholders. To this purpose, a detailed plan has been discussed within the consortium. The plan is based on:

- meetings for the illustration of the project results and the investigation of possible future collaborations with the major European OEMs. Partners, depending from their contacts, will approach at least one of the following industrial companies: Autosar members, VW Spain, NR Drives, Volvo and FCA. Furthermore, we expect to be able to contact Renault, Nissan, Jaguar Land Rover, Infineon and other OEM representatives at conferences such as HEVC 2014 and EEVC 2014 and at the EV Day (York, December 2014).
- Meetings with Tier 1 for motor and control components such as ALCONZA will be organized.
- OEMs clients of vehicle homologation services will also be contacted and the project results shown to them.

Other dissemination activities which will be performed in the third period are:

- 1) the participation of the Industrial Advisory Panel (IAP). To this purpose, a third workshop will be organized at the end of the Project. The objectives of the workshop are to present the achievements of the project and contribute to the business plan. As a final validation, opinions and reactions of the companies of the IAP will be collected;
- 2) presentation of the project main results at international conferences of the automotive community. In particular, two works have been accepted for presentation at the 5th Hybrid and Electric Vehicle Conference, HEVC 2014, 5-6 November 2014, London, UK

(see Section 3.1, page 7) and one work has been submitted to 5th Hybrid and Electric Vehicle Conference, HEVC 2014, 5-6 November 2014, London, UK and one has been submitted to the 3rd IEEE/TRB International Conference on Connected Vehicles (see Section 3.1, page 7);

- 3) participation and contribution to important events in the automotive industry.
- 4) prepare and publish contributions to trade magazines; An analysis of the more suited trade magazines is being performed and the following possibilities have been identified:
  - Automotive Design magazine
  - Automotive Engineer
  - Electric Vehicle Research
  - Charged Electric Vehicles Magazine
  - Design World
  - Eureka
  - OEM Off-Highway
  - Interference Technology
  - Technology EMC Europe Guide 2015
- 5) create a twitter HEMIS account and disseminate information through it;
- 6) Project members will Post on LinkedIn groups information about the HEMIS project;
- 7) deliver a press release at the end of the project in order to present the main results achieved;
- 8) project members will update the presentation to be used for the illustration of the HEMIS activities and results to external stakeholders in dedicated meetings to be held in the premises of external stakeholders during the third project year;

the project leaflet will be updated in order to include the main results of WP4 and WP5.

#### **3.4.4. Metrics**

Since we believe that the involvement of the IAP is of paramount importance for the project success, we will consider the following metrics:

- Number of active members in the IAP. The target is to have 3 active members with complementary competences;
- Number of workshops with the IAP. The objective is to have 3 workshops during the project.

Other metrics that will be considered are:

- Number of meetings with industrial companies. The objective is to have 15 meetings with industrial companies potentially interested in the project activities and results;
- Number of participation at international conferences of the automotive community. The target is to participate to 4 conferences organized by the automotive community.

### **3.5 Target Audience 4 = Standard Bodies and Organizations**

This target audience is constituted by standard bodies and organizations which are responsible for the definition of standards in the technologies developed within HEMIS as well as EMC and EMF testing and homologation companies for FEVs.

#### **3.5.1. Key messages to be transmitted**

The research performed by HEMIS helps to:

- establish the levels of EMFs and the duty cycles for switching devices, so that these can be compared to the primary reference ICNIRP Guidelines and European EMF requirements for General Public and Occupational exposure; hence identifying a suitable human health hazard limit;
- analyze the gaps in current EMC standards regarding FEVs;
- provide standardization bodies with proposals for low frequency emissions requirements and EMC testing methods. These methods could be incorporated as a part of an emissions standard specific to Electric Vehicles or as an addition to CISPR 12 or UNECE Regulation 10;
- establish EMC Design Guidelines to be followed by manufacturers of vehicle electric drives.

#### **3.5.2. Dissemination strategy**

The dissemination strategy is based on an active participation of the project partners to standardization bodies and organizations such as the British Standard Institute, the Society for motor manufacturers and traders (SMMT), the European Committee for Electrotechnical Standardization (CENELEC).

Presentations on the LF emission measurement results and measurement methods will be made to CISPR/CENELEC/UNECE in order to influence changes to standards. The measurements methods would be expected to be incorporated as a part of an emissions standard specific to Electric Vehicles or as an addition to CISPR 12 or UNECE Regulation 10.

Moreover, an FEV EMC Design Guide will be made available as a download for FEV/Drive manufacturers. Ideally this would again be adopted by the standards bodies and made available to manufacturers, but referenced by the appropriate standards.

#### **3.5.3. Activities planned for the third year**

The planned activities for the third year will aim at enhancing the interaction with standardization bodies and organizations. Project partners will try to influence the upcoming/maturing standards with the HEMIS results. To this purpose, dissemination activities will include:

- 1) Participation at 13th European EMC Symposium with presentation of a work reporting the main results of Work package 5
- 2) participation in activities relating to human exposure to electromagnetic fields with the UK Health and Safety Executive following publication of the occupational exposure directive (2013/35/EU).

- 3) invitation of representatives of standardization bodies and organization to participate to the IAP meetings
- 4) involvement of project members in the activity of standards bodies regarding the definition of EMC standards.

#### **3.5.4. Metrics**

The following metrics will be used to evaluate the effect of the dissemination activity towards Standard Bodies and Organizations:

- Number of presentations at CISPR/CENELEC/UNECE or national standardization bodies; the target is to have 4 presentations.
- Number of downloads of the FEV EMC Design Guide. The objective is to have 100 download of the FEV EMC Design Guide

### **3.6 Target Audience 5 = Students**

This target audience encloses engineering students and other students of technical disciplines. The main project output to be transmitted to the students is the scientific knowledge provided by HEMIS development and practical examples of PHMS and EMC measures.

#### **3.6.1. Key messages to be transmitted**

The following messages will be transmitted to this audience:

- Fully Electric Vehicles (FEVs) can contribute greatly to the reduction of energy consumption and CO2 emissions, but they must be safe, reliable and easy to maintain;
- importance of developing accurate and robust PHMSs;
- problems to be tackled during the developments PHMS for FEV subsystems;
- examples of PHMS for FEVs subsystems developed during the HEMIS project.

#### **3.6.2. Dissemination strategy:**

The dissemination methodology will be based on lectures and seminars for engineering master and PhD students. Some interested students will be also asked to prepare project works on the HEMIS project topics. Lecture and seminar slides will be made available to the students and disseminate through the HEMIS website.

#### **3.6.3. Activities planned for the third year**

We plan to continue during the third project year with lectures and seminars for engineering master and PhD students. We also plan to prepare a lecture on the development of prognostic and health management system for new design component illustrating the methods and the application developed during the HEMIS project. The slides of the Lecture will be published on the project website. Furthermore, we are planning to collaborate with the European Project 'Innovation through human factors in risk analysis and management' (INNHF) financed by the European Union within the 7<sup>th</sup> framework program as "Initial Training Networks". In particular, we plan to present the project to the Marie Curie PhD students of the network and involve the interested students in the research activities.

#### **3.6.4. Metrics**

- Number of Students following the lectures/seminars. The objective is to have 300 students following lectures on the objectives and results of the HEMIS project.
- Number of Laurea Thesis and PhD thesis on the project topics. The objective is that 4 students work on topics related to HEMIS during their Laurea and PhD thesis.