e-gomotion - GA 265987

Final Publishable Summary Report

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The Consortium

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Executive summary

The shifting into an electric road transport paradigm will require new dimensions to the traditional skills and capabilities of road transport engineers and technicians. The transition requires not only new approaches to vehicle manufacture and development, but also to road transport education. To be able to actually realize the transition into hybrid vehicles, battery electric vehicles and electric-fuel cell vehicles, there are a number of barriers that need to be addressed. The e-gomotion project (original name JobVehElec) describes them as "The talent challenge in electro mobility" and they are:

- the need of academy and industry common agenda and strategies to innovate education and research and to educate the automotive engineers of tomorrow,
- the need to integrate electrification into the traditional applied mechanics educations,
- the need of innovative people to solve technical challenges and bottle-necks within electrification,
- the need to introduce a more system-oriented engineer, able to use fundamental engineering art in more innovative and cross-cutting ways,
- the need to attract the young people to electro mobility.

To meet these challenges, the e-gomotion project aimed at raising awareness of young people in the field of sustainable and electro mobility. Indeed, the project was designed to meet young people, primarily high school students, to educate them about electro mobility and to raise their awareness of possible educational paths and job opportunities within this field. With a three-stage rocket – roadshow, competition and web school – the e-gomotion project created a meeting place where highschool students can meet the academy and the industry on their own.

Taking into account its results, the e-gomotion project may be considered very successful. Indeed the above mentioned goal was reached with the following results:

- over 1.000 high school students involved in the road shows and 150 students in the challenge
- 1.032 likes on Facebook and 6.009 visualizations of the videos on e-gomotion Youtube channel
- over 100 articles and news issued on e-gomotion on printed and online media in Italy, France, Germany and Spain, including leading newspapers such as La Repubblica, La Stampa, etc.

Summary description of the project context and the main objectives

In the process of transitioning to a greener road transport system, Europe needs to be able to bring about an economically and environmentally sustainable reduction in vehicle emissions; vehicle electrification will play a significant role in this process.

The skills and capabilities needed for successfully developing the infrastructure, vehicles and research breakthroughs that will enable a competitive transition to electric vehicle transport must be the focus of tailor-made educational programs. In fact, this transition requires not only new approaches to vehicle manufacture and development, but also to specific educational paths.

The competences needed in vehicle electrification are often fragmented across different education lines, departments and research centers. The difficulty is aggravated by the fact that road transport electrification requires interdisciplinary skills from diverse educational fields such as mechanical, chemical, electronic, electrical and industrial design engineering. This leads to uncertainty, and challenges young people who are facing important education and career decisions.

For Europe to be able to competitively develop a leading edge in future vehicle electrification, young people need to be aware and have a deep understanding of the current problems relating to mobility as well as knowing about the many opportunities that exist in this field.

Raising awareness in this field will require targeting young people at various stages in their education who have the opportunity to make decisions about the education and career paths to pursue but who are not aware of the opportunities within vehicle electrification, or which competence development paths that can lead to such opportunities. Secondly, it will require an in-depth awareness of where the leading edge of research within vehicle electrification is today, and what the field of vehicle electrification will look like over the coming decade, to ensure long-term relevance. Thirdly, it will require a close integration with and understanding of the industry perspective, as it will be industry need and industry capacity that will drive the creation of future job opportunities within vehicle electrification. Without these three components, any attempts at awareness raising will be ineffective, short-sighted, and lacking in real-world grounding.

If it is possible to gather actors together under a common vision with the capacity to target young people appropriately, with exceptional educational and research capacity within the relevant fields, and with a close connection to and understanding of the industry perspective, an awareness raising campaign can have immense positive impact for Europe.

The opportunity for positive environmental impact by developing new engineers to drive the shift to emissions free electric vehicles is largely unquestioned – vehicle emissions are contributing to the increased concentration of gases that lead to climate change. The International Energy Agency approximates that 23% of all CO_2 emissions stem from the transport sector of which road transport generates roughly 73%. In Europe road transport represents 93% of total transport CO_2 emissions (international aviation excluded) and slight more than 19% of total greenhouse gas emissions according to the European Environment Agency, making it the second largest key category in the EU-15. Furthermore, the transport sector is the fastest growing source of greenhouse gases.

The potential for positive impact on European global competitiveness is also clear, as Europe is currently the largest automotive market in the world and hosts some of the world's strongest road transport actors. The sector turns over €490 billion annually, employs over 12 million people and is the largest private R&D investor in Europe with an annual spending of €20 billion. More than 800 million vehicles, 50% of which is urban-based, are operating in road transport today worldwide. By 2050 the number of vehicles in road transport will grow to over 1500 million. It is obvious that it will not be possible to affect a leading and competitive role in this development by relying only on traditional competences and careers in combustionbased, fossil fuel vehicles.

The e-gomotion (formerly JobVehElec) project responds to the growing demand for qualified professionals working on all aspects of research, development and innovation in the road transport sector, with specific reference to the emergence of electrification. The project aims at raising awareness on the major challenges, problems and solutions concerning mobility as well as of the opportunities in all sectors and fields relating to the shift towards road transport electrification.

The project creates the basis for the development of a new class of electrification professionals who will support global systems for managing and reducing the environmental impact of road transport through electrification solutions. To do so, the project engages in coordination activities aimed at:

- ✓ Evaluating and demonstrating job creation in the electrification sector;
- ✓ Encouraging young people to seek jobs in electrification of road transport;
- ✓ Involving and stimulating young people through dedicated communication campaigns.

Within the specific objectives of the e-gomotion project, the most important is the development of an educational method in which higher education institutions support high schools in teaching young students about smart mobility. Indeed the first introduction to the subject is provided visiting high-schools, then the education is deepened by working on the challenge and cooperating with mobility experts in the development of the concept for the competition. Finally the education process continues on the web portal through the Academy and the summer school.

The implementation of such method, together with the organization of several dissemination activities (such as roadshows, seminars, etc..) allows to disseminate the project achievements and to raise the awareness of young people regarding mobility issues and mobility-related educational paths.

The following picture (figure 1) shows the e-gomotion rasising awareness model.

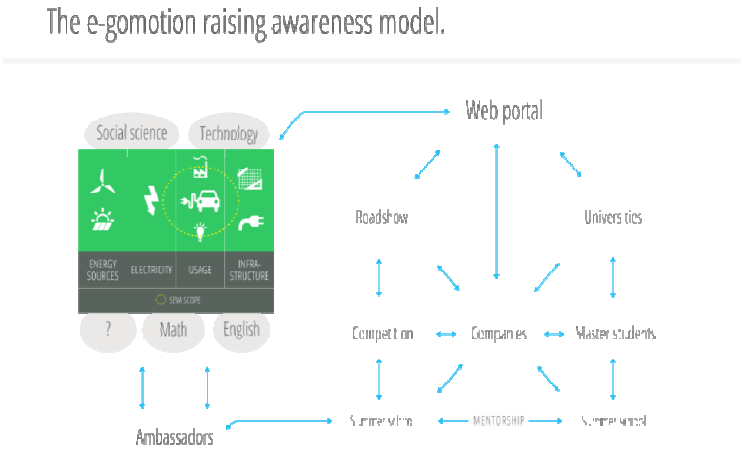

Figure 1: Education is the base for the e-gomotion raising awareness activities– roadshow, competition and summer school – which are all connected to the webportal.

Description of the main S&T results/foregrounds

As already stated in the previous, the e-gomotion project wanted to create the basis for the development of a new class of electrification professionals who will support global systems in managing and reducing environmental impact of road transport through electrification solutions. In order to do so the project carried out several coordination activities toward the specific objectives of:

1. Evaluating and demonstrating job creation in the electrification sector;
2. Encouraging young persons to seek jobs in electrification of road transport; and
3. Involving and stimulating young people through dedicated communication campaigns.

A visualization of the objectives and the related actions in e-gomotion is presented in figure 2.

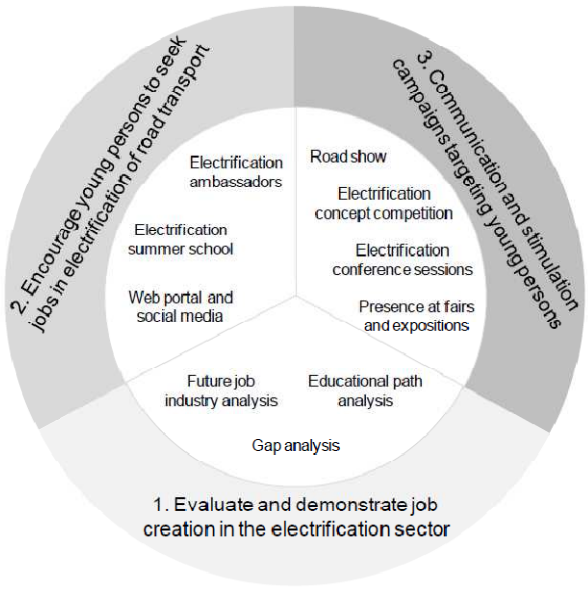

Figure 2: e-gomotion objectives and related actions

e-gomotion's work plan for raising awareness of the availability of jobs in the field of electrification was strategically designed to maximize the outputs and impacts of the project activities, ensure an effective

management and communication of the project and to achieve efficient dissemination of project results. An overview of the Work Packages is shown in the figure 3.

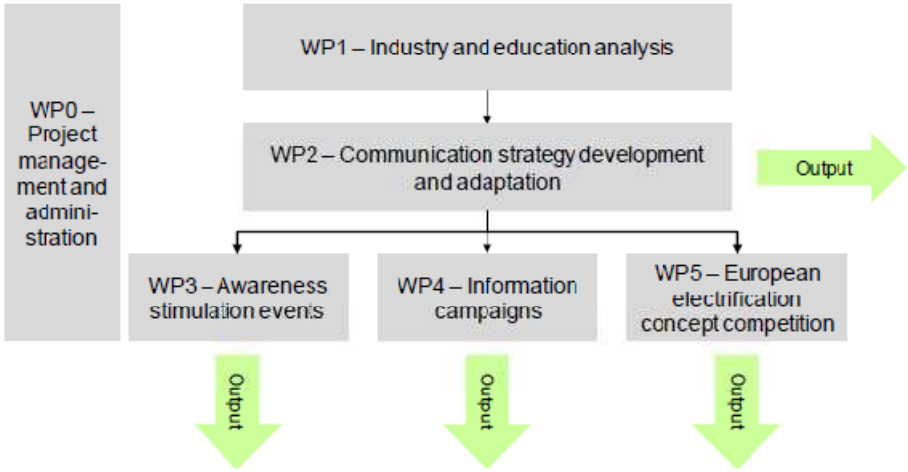

Figure 3: e-gomotion work package overview

The work plan consisted of six Work Packages.

The first Work Package (WP0) was a management and administration Work Package.

It aimed to manage and coordinate the project in order to ensure an effective awareness raising process on a European level and to ensure compliance with the call and EC requirements.

WP1 focused on industry and education analysis. Its purpose was to identify and analyze the future job profiles and career trends in the electrification industry in relation to existing and future education and research. WP2 strategically adapted the planned communication actions based on the knowledge created in WP1 and provided e-gomotion with the appropriate tools for effective awareness raising ensuring coordinated European level activities.

The three last Work Packages were communication actions and represented the core of the project. WP3 focused on awareness stimulation events including a road show, presence at automotive and student fairs and expositions and by arranging electrification conference sessions. WP4 involved the information

campaigns at schools and universities by means of electrification ambassadors, the summer school and the creation of a project web portal and an electrification online community. WP5 aimed to raise awareness of future job opportunities in road transport electrification and educational paths to reach these jobs through hosting regional electrification competitions for high schools with a joint European final. In this competition high school student teams competed in developing visions for the future of electric road transport, supported by university mentors.

In the following there is a detailed description of the above mentioned work packages (with the exception of project management), their main objectives, the related activities and most of all their results.

WP1: Industry and education analysis

WP leader: RWTH

The main objectives of WP1 were:

- To identify and analyze the future job profiles and career trends in the electrification industry in relation to existing and future education and research;
- To assess the current education possibilities in the field of vehicle electrification with respect to their appropriateness to the future industry demands.

In order to achieve these goals the following actions were planned:

1. **Future job industry analysis**: an analysis of the employment trends in the electrification industry, aiming at identifying the job profiles of the future industry to ensure accuracy in the communication. The analysis takes a starting point in market reports and input from the Advisory Board. Not only European conditions are considered, but also Japanese and US expertise in the Advisory Board and in the personal networks of the Core Team. Thus, the analysis covers an international perspective. The project group takes the analysis of future technological trends in the electrification of vehicles as a basis to deduce the future industry needs on job profiles and qualifications of future employees. Therefore, in a first step, scenarios for the development of road transport and the role of electrification are identified and compiled. Those scenarios are based on the expertise of all involved project partners, existing trend analyses from leading market forecasting and consulting companies,

existing technology roadmaps delivered by organizations involved in the topic such as ERTRAC, ERTICO, different JTPs, as well as different national agencies and authorities. With respect to the above mentioned scenarios, technical qualifications and job profiles are identified. These job profiles show the increasing interconnection of various technical disciplines, such as mechanical engineering, electrical engineering, electronic engineering or informatics. The analysis not only covers the vehicle and infrastructure in a narrower sense, but also considers a more integrated perspective, which includes energy, economic and social aspects.

2. **Educational path analysis**: a broad analysis of existing education offers related to the electrification of vehicles. The analysis takes a starting point at the curricula of the involved Core Team universities, and then comprises other education offers in Europe and worldwide. To guarantee an appropriate quality level of the offered education, the analysis is based on traditionally accepted university rankings (Times Higher Education Ranking, Webometrics Ranking, etc,). As the exact shape of future vehicle industry is still unclear, educational areas outside of the subject area are also included, such as economics (future business models), chemistry (battery technology), etc. In addition, the analysis in particular highlights education offers on European scale, such as joint master programs, however it makes a comparison with the Japanese and US education offers, giving inputs on how to keep the European education offers competitable in an international perspective. As the gender equality seems to be less of a problem in Asia, certain attention is made to this matter.
3. **Gap analysis**: a comparative analysis to identify gaps between future jobs of the industry and the existing education and research is conducted. The identified education offers are assessed with respect to their sustainability and appropriateness to produce enough graduates for the industry to face the future challenges as identified in the constructed scenarios and job profiles.

The work package started with a sound analysis of the market perspective for vehicles with alternative drive trains, including a description of the external motivation factors for a paradigm shift in drive train technology. The analysis includes a broad technical analysis of different drive train technologies, also serving as a basis for the compilation of information material and/or course material for the European Competition. The market

perspective analysis concluded with a scenario-based prognosis of the future market relevance of alternative vehicles.

Based on the market analysis, the research demand for the improvement of competitiveness of alternative vehicles has been identified, bringing together information from science (e.g. technical research topics from public funded projects) and industry (announced innovations) and balancing those with the current technical status of alternative vehicles. Based on this, it was possible to deduct technical qualifications, showing which competencies are prerequisite to fulfill the future research tasks. These qualification profiles allow naming education demands for the future electro mobility engineer. Anyhow, a presentation of "one" qualification/education profile was not possible, as too many different fields of work exist for engineers working in e-mobility related topics. As an alternative, the relevant range of technical and non-technical qualifications could be named.

The necessary education demand was set in context with current education offers, analyzing education offers of 296 international universities. 42 education offers have been identified, with 13 special degrees in e-mobility and 29 engineering degrees with single subjects in e-mobility. With most of the programs offering excellent education regarding content and organization, there are still gaps between current education and the education demands mentioned above. These gaps were identified and named in a final gap analysis. All intermediate and final results were discussed with members of the industry advisory board (technical experts & HR departments) to ensure validity and accuracy of the analysis. Extending this, the presence at international conferences and arrangement of special sessions led to a continuous influx of external perspectives into the work package analysis. Despite specific efforts to pay attention to gender issues (in desktop research, interviews, etc.), the WP only touched this issue.

In addition a broad benchmark of existing education offers was conducted to allow a sound planning of all relevant project campaigns. In addition, the knowledge of best practice examples from inside and outside Europe allowed the consortium to establish personal contact with relevant international stakeholders. Based on this, a benchmark trip to the US took place in May 2012, installing partnership agreements and international collaboration.

All the achieved results were published in a public WP1 report, already sparking interest from other research actors from the EU and the US.

WP2: Communication strategy development and adaptation

WP leader: Chalmers until April 2013, then POLITO

The main objectives of WP2 were the adaptation of the communication actions to the findings of WP1 and the provision of appropriate tools for effective awareness raising, ensuring coordinated, European level activities. This included providing all partner universities with a set of tools to be used for the dissemination and communication campaign and a joint communication strategy for the delivery of those activities.

In particular, the following actions were carried out:

1. **Communication strategy coordination**: creating the e-gomotion communication strategy in order to efficiently let young people know that electrification is an important topic. The communication strategy is not to be seen as a milestone, but rather as an ongoing process during the main part of the project. Complementing the strategy, the Project Management Team developed tools to be used by the partners in executing the communication strategy.
2. **Assessment of project outcomes**: e-gomotion used the deliverables as a basis for evaluating the status of the project and its level of success. However, specific activities to evaluate the different awareness raising activities and adapting the communication in the communication Work Packages were assessed through specifically defined direct indicators for each communication action and through a questionnaire/survey. The questionnaire/survey was developed and submitted to all the participants in the e-gomotion challenge final.
3. **Report creation**: three very important reports were created from the e-gomotion project: **e-gomotion Analysis report**, **e-gomotion awareness raising report**, **Longterm Impact report**

The work with the communication strategy began with a target group analysis, meeting two different groups of high school students (age 15-19), one consisting of girls only. Very early the project team realized that the name of the project “JobVehElec”didn’t communicate well to the young people. A name change (from

JobVehElec to e-gomotion) was made, where "e" stands for electricity, "go" for the future and "motion" expressing movement and mobility. The "e-go" also fits well in this context, as with an education in vehicle electrification, young people can build a good future for themselves and for the whole society, taking responsibility their own future.

Central for all communication in e-gomotion were three core values – Inclusion, Trustworthiness and Engagement and the new name along with very bright, eye-catching logotype, communicated these values. The slogan "The talent challenge in electro mobility" was used in all our events and dissemination activities. Figure 4 shows the new logo.

Figure 4:e-gomotion logo and slogan

During the first period also the vision, mission and underpinning idea were established as follows:

- **Vision:** electric cars are that attractive to the young generation, that they become the driving force for greener transport and modern mobility.
- **Mission:** e-gomotion creates physical and virtual meeting places between high schools, universities and industries, to educate and raise awareness of the grand future within electro mobility. e-gomotion provides a three-stage rocket for electro mobility – R*oadshow* for the wider audience, *Competition* to get deeper and *Summer School* to start the journey to become an expert. All activities are mirrored on the *Webportal,* where anyone can share the new knowledge and development of the modern mobility. Looking at this mission statement, one realizes that the whole project is in fact one

integrated communication strategy, where the work packages are means of communicating (communication channels).

- **The underpinning idea:** the e-gomotion raising awareness model is to use education as the base for raising awareness of the grand possibilities and great fun, that comes with the development of electro mobility. Working together with high school teachers, master students and employees at the industries and universities take the responsibility to educate and raise awareness for long term impact. A network of e-gomotion ambassadors will support the project and will have special access to the training material that e-gomotion provides.

Subsequently the visual identity was developed and all the needed communication tools were identified. In particular:

- **Graphic identity**: e-gomotion entrusted experienced professionals in the field of graphic and web design with the task of elaborating its corporate design. The colors, logo, icons, fonts, graphic elements and illustrations chosen were designed keeping in mind the main target groups as well as the very spirit of the project: they reflected both the need to address young people with the language they are most used to speak – resulting appealing and visually enjoyable – and the necessity to mirror the academic content of e-gomotion's activities.
- **Website:** being targeted mainly at young people, e-gomotion invested great attention and energies into the web. The project implemented a website, which is to be intended as a virtual platform, where all those who have interest in the world of electro and sustainable mobility can gather, exchange knowledge, learn, share information, find out about the job and educational opportunities in Europe and discover the latest news and developments of technology. e-gomotion website also hosts *The Academy*, the web school which provides to the broader and non-specialized public clear and tailor-made education material realized by the partner universities.
- **Events and face-to-face communication**: face-to-face communication is crucial to stimulate enthusiasm, educate and make students feel active part of the future challenges of mobility. Organizing exciting activities with high-quality content – mixing lectures with practical experience as for instance test-drives, giving young people a central role and having them carried out by young

educators, able to understand the students' needs and language and to effectively communicate with them, is the key for the success of e-gomotion activities. Furthermore, e-gomotion took advantage of the viral potential of peer-to-peer communication among young people: the students involved in the project were the first ambassadors of e-gomotion's messages within their environment. Face-to-face communication was also crucial to carry out a fruitful dialogue with schools, partners, collaborators, sponsors and public administration representatives.

- **Printed material**: being present on the territories where it exists with events, conferences and activities, e-gomotion needed to have also a physically visible presence. The graphic designers involved in the e-gomotion project developed paper material for all the main events (Regional finals and European final event) and also for long-term dissemination. The material was prepared in English and some times also in the local language.
- **Press:** traditional as well as online media can be powerful tools to raise awareness among the general public. e-gomotion specifically addressed the media with press releases and tailor-made material, as visibility was crucial both to comply with e-gomotion's main goal of raising awareness, but also to establish the project as a grounded and solid entity, making it more appealing in the eyes of possible future collaborators and sponsors.
- **Videos**: short, internet-friendly videos represent an extremely effective tool to report on activities and events and secure a great visibility. e-gomotion, thanks to the collaboration with professionals from its partner universities, realized a broad range of audiovisual material, the aim being to keep track of the activities which were carried out, raise visibility and trigger the viral effect.
- **Social media**: since social media are part of the everyday life of the greatest majority of the younger generations, e-gomotion consortium thought that they could have represented a powerful instrument to convey the most disparate messages. e-gomotion decided to focus on two of the currently most diffused social media (Facebook and Twitter) creating an e-gomotion fan page and a twitter account.

A very high stimulus to the project was given since April 2013 with the strenghthening of innovative means of communication such as the social networks, the website and the youtube channel. Furthermore a person dedicated to communication was hired together with others which supported POLITO in the project management activities. The e-gomotion communication strategy was updated and the second draft was strictly related to the long-term impact of the project and thus to the real opportunity to carry out the project activities. The aim was to acquire a very high visibility on the social media and on the media in general in order to enhance the number of involved people and thus the project impact.

To this end since April 2013 a facebook page, a you tube channel and a twitter account were created. The social networks, the web, the press relations and the videos were strengthened. Furthermore POLITO decided to hire a person in charge of the communication activities and which may facilitate the contacts within the partners and their communication actions (indeed such person, besides being a communication expert, speaks all the languages of the partners, in addition to english).

The performance and results achieved by the e-gomotion's communication activities was regularly assessed throughout the course of the project, as well as at the end of it. The main indicators to evaluate the performance of the project include:

- The number of students – and people in general – reached with the events organized within the framework of the project.
- The performance of the project on social media (number of likes, posts and interactions on Facebook, visualizations of the videos on e-gomotionYoutube channel, followers on Twitter).
- The amount of promotional material printed and the frequency of these communication actions.
- The number of articles, posts, tweets, reports and news issued about e-gomotion on printed and online national, international and local media.

Furthermore, in order to evaluate the effectiveness of the awareness raising activities and especially the e-gomotion Student Challenge, a special survey was conducted with the students and teachers that were the regional winners of their specific region. These students and teachers not only have been working on their e-gomotion Student Challenge projects for several months, but also joined the final event in Barcelona.

Therefore, this group of people had the most complete overview of the activities that have been undertaken by the e-gomotion core team. Their feedback was a very important input in order to improve activities of these kinds in the future.

Finally within WP2 three very important reports were prepared. The first one (the e-gomotion analysis report) was described in detail inside WP1 description. The other two were:

- **e-gomotion awareness raising report**

A short executive report of the execution of the awareness raising activities in e-gomotion, which summarizes the final communication strategy used, the created communication tools, the marketing and exhibition material and the conclusions drawn in the project. This report may be seen as a guideline handbook for future awareness campaigns that could be of benefit for the European Commission and could be transferred to other industries.

- **Longterm Impact report**

Based on the conclusions in evaluation and assessment, the longterm impact report which includes the actions already taken in order to disseminate the project after its completion. Furthermore the report suggests actions on how to keep raising awareness of electrification in the future society. Strategic issues are defined, in order to ensure compliance with EU requirements as well as on an international basis. A longterm action-plan was prepared, including lobbying these strategic issues, in order to create the best possibilities for future electrification in road transport.

The project was very successful in terms of communication results. Taking into account the indicators identified in the previous paragraphs, it appears immediately clear that the project fully achieved its goals. Indeed the goal to raise awareness of young people in the field of sustainable and electro mobility was reached with the following results:

- over 1.000 high school students involved in the road shows
- 150 students participating in the challenge
- 1.032 likes on facebook
- 6.009 visualizations of the videos on e-gomotion Youtube channel

- 109 followers on Twitter
- promotional material prepared and printed:
    - regional events (for instance in Turin 400 postcards and two roll-ups)
    - final event in Barcelona: 650 postcards and 1 roll-up + conference proceedings
- over 100 articles and news issued on e-gomotion on printed and online media in Italy, France, Germany and Spain, including the leading newspapers La Repubblica, La Stampa, Aachener Zeitung, ABC and La Vanguardia
- more than 2.000 votes for the communication competition
- final video of the competition

Furthermore it seams interesting to take into account the results of the questionnaire which was submitted in Barcelona to the participants in the European final challenge.

All the participants agree that projects like e-gomotion are important to raise the awareness of the chances ad challenges of sustainable mobility in the society. Most participants also think that such projects will contribute to a change in the mobility behavior.Finally all participants except one state that they personally benefited from their participation in the e-gomotion project.

This means that the concepts of the e-gomotion events were highly interactive, giving the participants of these events the possibility to actively give their input to the topics being discussed or worked on.

WP3: Awareness stimulation events

WP leader: POLITO

The main objective of WP3 was raising awareness of future job opportunities in road transport electrification and educational paths to reach these jobs through different actions, through the organisation of road show and electrification conference sessions, presence at automotive and student fairs and expositions, and organisation of job/career days and dissemination events. Indeed the main foreseen actions were:

- event preparation
- Road Show
- Electrification conference sessions

- Presence at fairs and expositions, organization of job/career days and divulgation events

In the first 18 month the main goal of WP3 was to prepare, in cooperation with the Advisory Board, the models of the events (road show, electrification sessions, contribution to fairs and exposition), which included the common material and general organization of each event type. The models were included in the Event Core Package. The other goal of the first reporting period was to organise the general plan of the events.

Subsequently many road show events were organized with the aim to stimulate young students and, at the same time, to involve also university students, educators and young professionals (from research centres, large industries and SMEs), policymakers and opinion leaders, reaching out to a wider audience. The e-gomotion Road Show addressed senior pupils (1-2 years to graduation from schools, preferably from courses in technical or natural sciences) with the aim to inform them about the emerging job opportunities in the field of electro mobility. By providing detailed information about future job profiles, the relevant courses of studies and the description of their future daily working life, the pupils were disposed to go for a professional career in this area.

As a general proceeding, e-gomotion project representatives visited schools in the regional area around the five participating universities (RWTH Aachen University, Chalmers University of Technology Göteborg, Politecnico di Torino, ParisTech, Karlsruhe Institute of Technology) and informed the pupils by:

- giving presentations about future importance of electro mobility and education offers,
- providing information material about relevant courses of study, curricula and job perspectives for students,
- explaining basic functionalities and technical specifications of an electric vehicle (using sample vehicle),
- offering test drives,
- describing student life (structure, content, and course of study),
- establishing contacts to industry companies (member of e-gomotion Industry Advisory Board).

The high schools were selected based upon the support from the local institutions, enterprises and companies, so that the public and private sectors would work together to create the conditions needed to have the electric vehicles and to keep them going.

The Road Show were designed as half-day-events, travelling to the schools in a group of approximately 3 people: team member of the e-gomotion project (preferably at Professor or PhD level), one industry delegate (from Member Company of the Industry Advisory Board) and one student worker (active student in relevant course of study). The group brought a rented electric vehicle as a demonstration object, to explain substantial differences to ICE vehicles and related advantages of the technology. The events took place at the respective schools.

Furthermore, in cooperation with established automotive conference organizers (for example SAE, ATA, EAEC), members of the project team:

- ✓ arranged electrification sessions at different road transport conferences in EU;
- ✓ promoted dedicated international symposia on “Vehicle Electrification Roadmap” in EU; and
- ✓ instituted an award for M.Sc. graduation projects consisting in the possibility for the students to present their M.Sc. activity in the electrification session of an international conference. If the practical and financial prerequisites exist, a similar award could also be instituted for PhD students.

The target audience of the action was primarily university students, but also high school students as well as a general audience of professionals, researchers and experts of the transport sector. The objective of the action was to enable the different actors of the target audience to meet and discuss together in a barrier-less friendly environment.

Finally, the project team, with assistance of the Advisory Board, brought together contributions from enterprises active in electrification, technical associations, local chambers of commerce as well as from national and local governments to organize three types of events:

- ✓ dedicated workshops on “Vehicle Electrification Roadmap” road transport expositions and student fairs;
- ✓ job/career days for university students and graduates;
- ✓ dissemination events for non-specialised audiences.

Regarding the WP3 results, as already stressed in the communication work package, the road shows allowed for the involvement of more than 1000 highs chool students which is a very important result. Furthermore the constant presence of e-gomotion partners within high-standing transport conferences and seminars allowed the e-gomotion project to have a very strong visibility inside the academic community and also inside the media. For example, the "Vehicle Electrification Roadmap" workshop was held during some of the most relevant automotive expositions in Europe and the many fairs and student fairs organized across Europe in the field of road transport. This encouraged university students that were looking for an internship, a diploma/graduation thesis or a first job opportunity to focus on the advancement of the electrification of road transport. It also gave professionals, researchers and experts of the road transport sector an environment in which they can have a direct feedback about awareness of job opportunities in vehicle electrification about young people and directly interact with them.

The most important result was achieved with the final event in Barcelona which included the participation in the Smart City Expo World Conference with the self-organised conference session ("Smart education for sustainable mobility") and the participation as speakers in the Electric Vehicle Symposium 27 (session Promotion and Education). This experience allowed also for the beginning of new collaborations with universities and research centers all over Europe.

WP4: Information campaigns

WP leader: ARMINES

The main objective of WP4 was raising awareness of future job opportunities in road transport electrification and educational paths to reach these jobs through designing large scale information campaign. This included targeting high school students and university students directly and young people, especially young professionals in the road transport industry, indirectly by three means of:

- **creating an online community**: the aim was to create and maintain a web portal, bringing together students, companies and universities into an online community. This included attracting young people to join the community via social media and social networking sites,

- **educating electrification ambassadors**: the aim was to educate and provide material to electrification ambassadors such as teachers and university and public career service professionals, facilitating daily awareness raising for students and unemployed young persons. The ambassadors were teachers at high schools and also career advisors at schools and thereby reach a larger population. Pedagogic material helping electrification ambassadors, such as teachers and career service professionals, were designed and realized. These materials included:
  - ✓ a presentation of the foreseen future road transportation (based on the outcome of WP1). This presentation will introduce the new key jobs; and
  - ✓ interactive media presenting the main competences needed with possible educational pathways.
- **hosting an electrification summer school**: creating a European electrification web school with online lectures for high school and university students from all Europe. Based on the gap analysis performed in WP1, the lecture topics were defined. For each topic, lecturers from university or industry were selected and contacted. A detailed summary of each lecture was created and iterations with lecturers helped to design coherent lecture program and content. Potential participants were informed about this event using a large scale e-mail campaign.

This WP started with the beginning of the e-gomotion project by designing and creating a Web Portal dedicated to:

- promote the project activities;
- present the technology and the motivations to take the path of electro mobility;
- reach young people and present to them the job opportunities;
- create a debating online community (including young people and experts).

The Web Portal (www.e-gomotion.eu) was launched at the beginning of 2012.

Immediately after the development of the electrification ambassadors started. The electrification ambassadors were identified to be:

- university and high school teachers;
- industry representatives;
- young people themselves.

A literature review was performed to identify the main issues related to:

- Electricity storage issues;
- Electrification architectures;
- Electrification impact on the electrical network;
- Safety;
- Standardization.

This literature review was used to produce the learning materials.

The electrification ambassador kit was created and it includes the following presentations:

- Introduction on electro mobility
- Aims and challenges of electromobility
- Body design
- Energy storage systems for electric vehicles
- Heating and cooling of hybrid and electrical vehicles
- New mobility concepts

Finally, during the second reporting period *The Academy* was included in the e-gomotion website. The Academy is the web school which provides to the broader and non-specialized public clear and tailor-made education material realized by the partner universities. The web portal was developed to host the Academy and to allow any person to attend the uploaded lectures at any time.

The switch from a traditional summer school to a Web School aimed to increase the impact of this campaign by reaching a higher number of Europeans and to have a long term impact since the Web School will last after the project end.

The Academy objective is to provide technical and scientific material about the different challenges in the electrical mobility domain. The target group is young university students. They should be able to get the whole picture about the electrification problematic but also to dig in detail a specific topic.
Contributions are mostly academic but some topics are introduced by industry in order to give the industrial dimension.
The Web School is organized in two types of sessions:

1. **PLENARY SESSION** (giving the whole picture with transverse contents)**:**
   - ✓ Aims and challenges of electromobility (25 min) (Assaad Zoughaib, Mines ParisTech)
2. **TECHNICAL SESSIONS** (dealing with one topic. Each technical session will have at least two contents; an introduction of the topic from industry and a technical presentation from academy)**:**
   - ✓ New mobility concepts (23 min) (Nils Neumann and Markus Thoennes, IKA)
   - ✓ Energy storage systems for electric vehicles (30 min) (Chantal Maatouk, Mines ParisTech)
   - ✓ Heating and cooling of hybrid and electrical vehicles (25 min) (Florent Breque, Mines ParisTech)
   - ✓ Body design (22 min) (Andreas Breidenbach, Thyssen Krupp and Bjôrn Hôren, IKA)

The web school software uses an open source javascript platform for showing via the web presentations with an audio comment. Each author provides the material in the form of a powerpoint or pdf presentation and an audio file (mp3) containing the speech. A short presentation of the author is published next to the presentation.
The main result of this work package was the final definition of the web portal which now represents a powerful tool also for the future activities. Furthermore the creation of the Academy is a great success. Until now more than 100 students participated to the web school and this web school will continue attracting students also after the end of the project and its contents will be updated constantly.

WP5: European electrification competition

WP leader: KIT

The main objective of WP5 was raising awareness of future job opportunities in road transport electrification and educational paths and how to reach these jobs through hosting regional electrification competitions for high schools with a joint European final. This allowed for making a large number of young people (core group age 15-18) aware of the topic of electrification of road transport and generated interest for careers in the field of electrification of road transport. The main action carried out was the **electrification concept competition**. The aim was to arrange a competition for high school student teams with university student coaches, competing in developing visions for the future of electric road transport. The results were presented at regional events dedicated to the electrification of road transport. The winners from each regional competition competed against each other at a European final, held in Barcelona during the EVS27 and the Smart City Expo. The Core Team universities recruited students at regional high schools motivated to participate in the competition. Each participating school/class worked on developing their vision of the future of electric road transport (e.g. vision 2030 or 2050). In order to do this they worked under the supervision of their teachers and had the possibility to interact with referents at the university but also with businesses and regional mobility planning institution, which they got to know during the bonding phase. The "future concept" contained indications on new technological solutions and new business opportunities.

The different "future concepts" designed by the participating schools were presented at regional events dedicated to the electrification of road transport and its impact on society, business and job opportunities. Each partner University organised one such event comprising:

- ✓ a session on the electrification of road transport;
- ✓ presentations by researchers on the challenges and perspectives for the electrification of road transports;
- ✓ presentations by regional planners;
- ✓ presentations by business people on the implication of the electrification for road transport industry;
- ✓ a session on the presentation of the future concepts.

The best "future concepts" of each region competed against each other on European level. The final jury was composed of the members of the Advisory Board.

In order to increase the participation in the project, two competition were carried out in parallel with the high school challenge.

CREDITS IN MOTION: e-gomotion set up a collaboration with Albe Steiner Art School in Turin (Italy) for the realization of the opening credits of its videos. The contest, launched in May 2013 and open to all Albe Steiner students, awarded the team which realized the best opening credits. Such team had the chance of joining the *e-gomotion Challenge* European Final in Barcelona in November and creating the videos on the event. The contest, in addition to providing the project with the opening credits for the videos, is also to be seen as a way to involve other students from a different perspective, yet enlarging the range of people reached by the awareness raising activities.

COMMUNICATION COMPETITION: the competition was launched to stimulate students to communicate and disseminate their concepts. On November 17th more than 1.250 people had voted. The winner was the CO2 IDEE team from Turin which was able to stimulate its school mates and make them vote for their project.

The e-gomotion challenge allowed for the involvement of 150 students in four different regions. 30 concepts were submitted to the regional juries and the best four (one for each region) were selected to participate in the European final event in Barcelona. Moreover the parallel competitions allowed for the involvement of other students and of many persons from the general population.

Another very important result was the development of some of the students' concept. The students which won the competition (CO2 IDEE) developed the idea of a scholastic car pooling platform and are very eager to really make it work. Not only, they decided that a carpooling platform was too little and so they want to develop the first social network focused in mobility. The Politecnico di Torino (and the e-gomotion project as a whole) is supporting them in this path. Lately Politecnico di Torino signed a contract with an Italian Association (Corrente in Movimento) which deals with smart mobility. They will develop the database and the API needed to participate in several Hackathons, first of which the Rome Cleanweb Hackathon which will take place in Rome, 17-19 January 2014. The Hackathon is a competition between developers which fight to

create the best app. In this case the developers will be asked to create a beta version of the first social network on smart mobility.

Finally it must be stressed that representatives from private companies and local administrations were invited to the Final Event in Barcelona in order to involve them in the 2015 Challenge. Indeed the e-gomotion consortium is willing to carry on the e-gomotion competition also in the following years.

Potential impact (including the socio-economic impact and the wider societal implications of the project so far) and the main dissemination activities and the exploitation of results

The expected impact of the program is increased awareness about job and education opportunities within the field of electro mobility, as well as enhanced familiarity with what these career paths have to offer, the skills most required and the most appropriate education backgrounds.

This should translate into a larger number of students choosing career paths in the field of electro mobility as well as into a larger number of skilled engineers and technical experts participating in the development of electric vehicles, infrastructure and new business models and services.

In the long term, this is expected to result in a substantial mitigation of the global environmental impact of road transport and a significant acceleration of the shift towards an electric transport paradigm.

The e-gomotion approach to change the attitude of young people towards sustainable mobility used education as the basis for raising awareness of the great possibilities and fun, that comes with the development of such alternative mobility. Working together with high school teachers, master students and employees from the industries and the universities allowed to educate and raise awareness for long term impact.

The main objectives regarding dissemination and awareness raise of the e-gomotion project were:

- reaching out to the target groups, being present both within their physical environment and on the web;
- raising awareness and spreading knowledge on the main problems and challenges of sustainable and electro mobility among the target groups;
- stimulating young people to enthusiastically join public and private research centers on mobility;
- spreading knowledge and awareness by making technology- and science-related content accessible and appealing to young people.

The main target was high school students and secondly the general population. e-gomotion aimed at raising awareness among young people mainly through activities carried out with high school students.

In order to get in touch with the target many activities were carried out. The most important ones were:

- **Seminars and Test Drives**: face-to-face communication is crucial to stimulate enthusiasm, educate and make students feel active part of the future challenges of mobility. Exciting activities with high-quality content – mixing lectures with practical experience (for instance test-drives) were organized. The events were carried out by young educators, able to understand the students' needs and language and young people had a central role. This allowed to effectively communicate with them and to have a great success.
- **e-gomotion Challenge**: e-gomotion Challenge is an innovation competition on sustainable mobility. Students were asked to focus on a mobility-related problem in the area where they live and propose environmentally, economically and socially sustainable solutions. The concepts proposed during this first edition of e-gomotion Challenge ranged from goods delivery on electric vehicles to systems to improve the quality of public transport and promote the diffusion of e-bikes. The best concept - a carpooling platform for a secondary school, proposed by Team CO2Idee from Torino - was awarded on November 19th in Barcelona, Spain, during EVS 27, The International Electric Vehicle Symposium & Exhibition and Smart City Expo World Congress. The professionals who got in touch with the students were chosen on the basis of their age, expertise and communication abilities: having young, inspiring, determined and competent people follow the student means in fact to get the best out of them. Indeed educators reach out to their target only when they incarnate a positive and inspiring model, with whom participants can easily identify.
- **Credits in Motion**: e-gomotion set up a collaboration with Albe Steiner Art School in Torino (Italy) for the realization of the opening credits of its videos. The contest Credits in Motion was launched in May 2013 and was open to all Albe Steiner students. The team which realized the best opening credits was awarded and had the chance to join the e-gomotion Challenge European Final in Barcelona and to see his work actually used for all the e-gomotion's videos. The contest, in addition to providing the project with the opening credits for the videos, represented a way to involve other students from a different perspective, yet enlarging the range of people reached by the awareness raising activities.

- **Communication Competition**: the communication competition was launched in July 2013. Anyone that had a face book account could vote for the e-gomotion challenge concepts on the e-gomotion fan page www.facebook.com/egomotioneu. The team which collected the highest number of votes (CO2IDEE, Turin) was awarded in Barcelona during the e-gomotion final event. This competition had the main goal to increase the visibility of the projects developed by the students and to stimulate them to promote their work. Obviously, as a secondary result, the number of students reached and informed raised very much.

In order to better address the students, to stimulate their participation and to have something to leave them during the events implemented during the project, promotional material was prepared and printed. In particular flyers, leaflets, posters and banners aimed, not only at inviting people to join, but mainly at informing students, teachers, possible sponsors and collaborators about the goals and activities of the project.

Besides the promotional material, the electrification ambassador material was prepared, a real kit that electrification Ambassadors (researchers and professional from the world of smart mobility) use to promote sustainable and electro mobility and to stimulate the involvement of young people in the sector.

In order to involve more and more young students, and to keep alive the participation of the ones which were already involved, it becomes essential to exploit the results obtained by the e-gomotion project and give the students the idea that they are truly useful and that they are contributing to the development of new and better society. For this reason many activities should be carried out after the end of the project, among which:

- the realisation of some of the students' concepts. The winning team for example is working, with the support of the Politecnico di Torino, at the creation of the first social network focused on mobility;
- the involvement of the created community. The community which was created within the project will be involved constantly by means of social network in order to exchange bets practices and experiences on the mobility issue;
- the creation of the e-gomotion ambassador network. They will support the project long-term impact and will have special access to the training material that e-gomotion prepared;

- the availability of the guides. All the deliverables which were created during the project and which could be useful to carry out the challenge and apply the educational method elsewhere, will be made available. In particular the "Electrification ambassador materials", the "E-gomotion competition concept" and the "e-gomotion challenge guide", together with the material for long-term dissemination.

Furthermore a long-term impact strategy was developed. Such strategy will give the already involved stakeholders, together with new ones, the opportunity to create a permanent meeting place for young students and professionals from universities and road transport industry.

The main purpose is to continue the e-gomotion project mission and to expand both the target and the objectives (i.e. from high school students to university students and young researchers, from electro mobility to smart mobility, etc..).

The long-term strategic objectives are to:

1. Raise awareness on smart mobility through education
2. Make the e-gomotion competition an annual event and expand it also to university students
3. Create a new competition, an INNOVATION THINK TANK open to young researchers
4. Establish strategic alliances with other universities, local administrations and private companies, thus creating a real network
5. Find sponsors and supporters
6. Turn into reality the students'concepts
7. Keep the online smart community which was created within the e-gomotion project alive
8. Establish permanent ownership of the e-gomotion web portal and set the rules for the long-term impact activities

The target groups for long-term impact are different from the target groups of the project. For long-term impact purposes, it's necessary to include policy makers and decision makers on a higher level representing organisations that are open and willing to share the project results in an open community, having the opportunity to invest in a long-term perspective.

The preferred target, is an actor who will take responsibility for the talent challenge either on a local or on a European level. These targets are to be found in the following groups:

EUROPEAN LEVEL:

- European Commission – possibly DG Research or DG Education
- European Higher Education Area (EHEA), launched along with the Bologna Process for more comparable, compatible and coherent systems of higher education in Europe
- Public authorities governing education and recruitment issues as well as cooperation between industry and academy

NATIONAL AND REGIONAL LEVEL:

- Regional clusters with specific interest in transport and public authorities which deal with transport
- Universities and Research Centres
- Long-term research establishments, knowledge centers or targeted researchers who would benefit from a communication platform with young people
- International Associations which have interest in green transport, young people future, education and research agendas (i.e. SAE, TRA and other similar associations)
- NGOs

The key audience of the long-term activities will be:

- Highschool students (age 15-18, with an interest for science, transport and environment) and teachers, which need to establish a good communication flow with universities
- Universities ofTechnology, Departments of Physics, Chemistry, Applied Mechanics, Electro, Mecatronics and more, which need to create relationships with highschools in order to raise the attractiveness of the above mentioned subjects
- Bachelor and master students, professors who want to be trained on smart mobility and to become part of a joint education and research agenda in electro mobility, together with industry and society
- Industry research and development departments, who need to:
    - train their staff and keep their knowledge updated
    - prioritize the development of smart mobility
    - recruit new competences
    - open up their departments for high school student trainee jobs and master degree jobs

- have an active dialogue and joint programs with high schools and universities
- strengthen their brands with a sustainability motto and corporate social responsibility

- Policy makers
- General public

The main actions for long-term impact will be:

1. **Raise awareness on smart mobility through education**

Sustainable mobility is not taught at the high schools today. Change that and help to integrate this subject to the schedule of high school program would be the most effective strategy to raise awareness within young people. The e-gomotion project has established a method: the higher education support the high schools in teaching smart mobility to young students. The idea to visit high schools with a first introduction to smart and electro mobility, then deepen the education in working with the tasks of the competition and to be able to continue the smart mobility education on the web school, is successful and needs to be further developed. The objective is to make this method permanent and included in the various education programs in science, technology, social science, math and other subjects that the high school teachers find suitable.

Working together with high school teachers, master students and employees at the industries, the universities will take the responsibility to educate and raise awareness for long-term impact. The academy will provide training materials and tutoring of both students and teachers. Raising awareness activities such as roadshow, competition, summerschools or webschools and the webportal will maintain a positive communication flow between high schools, universities and industries.

2. **Make the e-gomotion competition an annual event and expand it also to university students**

To effectively attract young people, they need to be involved and included in real problem solving. They need to feel that the adult world needs their help. The e-gomotion competition has showed to be a great opportunity to get the students involved, at the same time establishing valuable links to their teachers. Since teachers need consistency to be able to plan extra events in their schedules a long time ahead, an annual event will help create a brand for e-gomotion.

e-gomotion Challenge is an innovation competition on smart mobility, where students propose environmentally, ecomically and socially sustainable solutions to improve mobility in their hometowns. Workshops, seminars and test drives allow participants to get a clearer picture of the most urgent issues and best practices and experience first hand the latest news from technology.

Experts and researchers from universities, companies and public administrations advise participants and evaluate their ideas.

The idea for the future is to continue with the high school students and include also university students, which are able in this way to get in touch with researchers and professors from all over Europe and deepen their studies and researches. Universities and private companies which take part in the challenge, on the other hand, may attract students to mobility-related studies and jobs. Figure 5 shows the schedule for the next two years.

Figure 5: schedule for the next two years

3. **Create a new competition, an INNOVATION THINK TANK open to researchers**

Starting from 2015, e-gomotion Challenge wants to broaden its target from students to professional researchers. Our vision is an innovation think tank, where the synergy between universities, companies and public administrations gives researchers the chance of proposing smart mobility solutions and work on their actual realization.

Public administrations will express their needs and private companies could make available the technology while researchers develop new ideas and try to realize them.

4. **Establish strategic alliances with other universities, local administrations and private companies and thus create a real network**

Relations and joint visions are connecting people and enabling the goals to come true. Strategic alliances with the mission to create a fundament for smart mobility education on EU-level would be effective for many reasons:

- Lobbying – identifying the strategic issues and influence the policy makers, decision makers and other shapers of the future transport arena, to establish a fundament for smart mobility education on EU-level.
- Participation in EU-programs – for instance Horizon2020, Lifelong learning, Regional Development Fund.

These alliances would also have good chances to apply for EU-grants. The strategy is on shorter term as the EU-projects mostly are only three years, however they are on an continuing basis. Given the expected enhancement of Private Public Partnerships and larger projects, meaning impact on a wider level, the vision of e-gomotion, should be valuable to the EU and could evolve under the next program period.

5. **Find sponsors and supporters**

In order to continue tha project in the following years, the Consortium is already working on the fundraising. In particular the following opportunities for funding are being investigated:

- Private and public sponsorships:

- private companies in the fields of electrification, electrified vehicles, vehicle manufacturing and all the companies who would like to get in touch with young people and universities
- public bodies which are involved with education (both at high school and university level) and/or environment and sustainability

- EU funded programmes, sucha as HORIZON2020

In order to increase the possibility to collect sponsors, the consortium is already asking for the support of International and National Institutions which could give prestige to the project. Furthermore promotional material (video, flyer and web presentation) was prepared. Such material will be sent to potential sponsors in order to give them a clear idea of what we are doing and what we want to do in the future.

Finally in January all the partners will organize in their own city a seminar with the local stakeholders to involve them in the project from the beginning.

6. Turn into reality the students'concepts

One of our most important goals for long-term impact is to make the students' ideas become reality. For this reason, from the beginning, we supported the students participating in the challenge and helped them getting in contact with interested private companies and local administrations.

The students which won the competition developed the idea of a scholastic car pooling platform and are very eager to really make it work. Not only, they decided that a carpooling platform was too little and so they want to develop the first social network focused in mobility. The Politecnico di Torino (and the e-gomotion project as a whole) is supporting them in this path. Lately Politecnico di Torino signed a contract with an Italian Association (Corrente in Movimento) which deals with smart mobility. They will develop the database and the API needed to participate in several Hackathons, first of which the Rome Cleanweb Hackathon which will take place in Rome, 17-19 January 2014.

The Hackathon is a competition between developers which fight to create the best app. In this case the developers will be asked to create a beta version of the first social network on smart mobility.

7. **Keep the online smart community which was created within the e-gomotion project alive**

The online smart community which arised from the e-gomotion project should be kept alive through a series of initiatives such as the academy (which should be updated periodically), the social networks (in particulare twitter) and the web portal. All these tools will be used to keep the interest alive and also many events will be organized in the following months to involve more and more people.

8. **Establish permanent ownership of the e-gomotion web portal and set the rules for the long-term impact activities**

The e-gomotion web portal has great value in its design and functionality. Without a permanent ownership of the portal, the risk is that web portal is soon forgotten after the end of the project. An agreement between partners regarding the intellectual property of the website and how to treat background (stemming from e-gomotion project as such), and foreground is needed.

In order to better deal with the sponsorship the creation of an international association will be taken into account and analysed.