



ELEVTRA - TRAIning for ELEctric Vehicles

Progress Report

Public Part

Project information

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Executive Summary

ELEVTRA revolves around the TRAIning for ELEctric Vehicles. The arrival of friendly environmental technologies to the automotive sector has produced the design and development of electric vehicles. The promotion of the e-mobility is supposed to play an important role in the economy, reactivating the automotive sector and its auxiliary branches and the energy industry. The use of clean technologies, with the positive impact in the environment this entails, the easiness of driving and the energy efficiency that characterize the electric vehicle strengthening the e-mobility sector though they are not enough to generate a balance market. There is a need for the supply and demand to meet for a sustainable development of the sector. The boost of the demand requires not only to offer a good product, with a proper quality-cost relationship, but also to cover a good customer service. Therefore, there is a need to make sure that the electric vehicle not only fulfil the expectations of the clients and offer an adequate service but there should be also an horde of specialists to solve any technical problem that may occur.

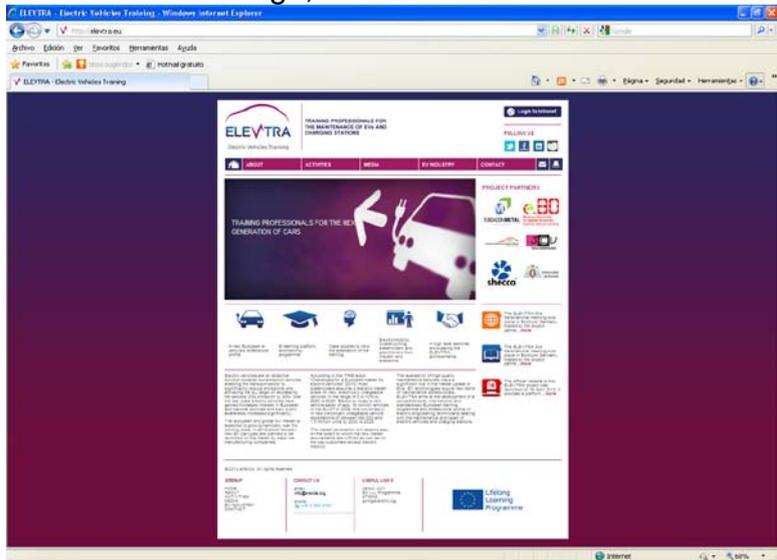
The traditional qualification programs in the automotive sector, despite their continuous upgrade, are not sufficient to deal with the electric vehicle. The specifications of the electric vehicle have yielded a set of requirements to respond to new assignments.

The VET system, along with other educational levels, must give answer to the needs of the labour market by offering a wide range of qualifications and related activities. Pursuing the general aim of improving the VET system, ELEVTRA is focused on creating the training resources to cope with the workforce demand in the productive sector of the e-mobility. For such purpose, the project has identified the professional profile of the technician in the maintenance and repair of electric vehicles and charging stands that, according to the EQF, covers the qualification requirements in terms of knowledge, skills and competences. This serves as the reference model for the development of the didactic material –under development, following the ECVET– that is supposed to address all the professional requirements previously detailed. This training resource, organized in a modular system and distributed in twelve units, will be tested by means of a training action following the training program that specifies the incoming profile of trainees, the methodology, the syllabus and other topics of relevance. For the course, the project has created an e-learning platform as the resource to allow this distance, individualized and flexible training approach; the tools also will allow the use of demos for a better understanding and assimilation of contents. The objective of the e-course is to evaluate the extent to which the didactic material meets the needs of the productive sector; the further hands-on exercise, with practical executions in real settings, will help to complement the analysis not only on quantitative parameters but also qualitative. Throughout case studies, the partnership will be able to put together the results obtained in the previous activities to analyze the training material under the standards of satisfaction, learning and performance (according to Kirkpatrick, 1994) and to reflect on the potential revision of the profile or adjustments in the didactic material. The partnership ensure the proper and expected standards of these activities and the resulting products by monitoring their quality according to the EQAVET.

Throughout these activities, ELEVTRA intends to meet the demand of the automotive sector, above all in the near future once the e-mobility market will take off definitely.

On one hand, ELEVTRA will allow prospective trainees (employees and the unemployed) to get ready for new positions and, therefore, offer their qualified services; on the other hand, car companies and workshops specialized in the repair and maintenance of vehicles will be adapted to cope with the customers demands; finally, the society as a whole will benefit from the reduction of noise and gases emissions brought by electric vehicles.

For the project to exceed its impact beyond the partnership, so all stakeholders will be reached, ELEVTRA is developing a dissemination strategy relying on outstanding products such as the logo, as its institutional image, the leaflet and newsletters. The website www.elevtra.eu is designed as the main tool for a worldwide dissemination, specifically at European level, targeting training providers and trainees, policymakers, automotive OEMs and industry associations. The website offers general information of the project, partners, specific products and other relevant items for the valorisation of the project and it is complemented by other social media measures.



ELEVTRA foresees the creation of a cluster inviting stakeholders to participate in the project, expanding, therefore, its area of influence. The partnership will organize a Final Seminar in Brussels in order to present the project results and set the basis for its further exploitation.



ELEVTRA has been conceived and, as such, is being developed with a cooperative and constructive approach where VET centers, research organizations and a communication and marketing company -represented by Fundación Metal Asturias (ES), the University of Oviedo (ES), ISSA Brno (CZ), School Center Velenje (SI), Hochschule Bochum (DE) and shecco (BE)- bring the project their specific capabilities and expertise.

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1. Project Objectives

ELEVTRA pursues a general aim of *improving the VET system* through the updating of training resources and activities to allow the professional development of individuals and, therefore, enlarge their employment opportunities in the labour market. The VET system must be responsive to the demand of competences for a qualified workforce; from this perspective, the start up of the electric vehicle industry has brought the birth of a new area of specialization in the automotive industry. A new qualification is then required to cover the knowledge, the skills and the competences that the maintenance and repair of electric vehicles need; that is to say: ELEVTRA deals with *new skills for a new job*.

The wide range of partner institutions directly involved, with varied characteristics in terms of their nature, area of specialization and nationality, confers the project the resources to reach the objective of *improving cooperation* towards a common goal.

ELEVTRA has been designed with an European and innovative dimension. On one hand, the project revolves around a standardized professional profile at cross-European level and, on the other hand, it supports the innovation in the industry, complementing the needs of the human factor for the development of this productive sector. Therefore ELEVTRA is focused to support the *innovation in the VET field* in order to meet the increasing innovative professional demands in the European labour market.

ELEVTRA also addresses the goal of *promoting the use of ICT for learning purposes*, facilitating the accessibility to training resources beyond traditional means, with the benefits this entails, such as the lack of time and space restrictions, the chance for continuous upgrading of contents and the possibility to customize the organization of the training actions and the delivery of learning contents.

ELEVTRA is centered on boosting the *transparency and recognition of qualifications*. The standardization of the professional profile of technicians in the maintenance and repair of electric vehicles and the array of common training resources for their qualification will make it possible to upgrade their knowledge, skills and competences, to improve their employability and to facilitate their mobility, throughout Europe.

The project has been conceived, to *combat gender discrimination*. Following a gender equality approach, ELEVTRA is promoting the training and further employment of woman in the automotive sector which is typically masculine.

Upon completion of the above, ELEVTRA pretends to *support a more competitive and sustainable economy* across Europe by the promotion of a skilled workforce through the identification of emerging training needs, developing learning paths and contents for such purpose.

2. Project Approach

The European dimension of ELEVTRA is based on the three pillars over the project has been designed.

On the hand, the European Qualifications Framework is the reference tool for the identification of the professional profile regarding the maintenance and repair of electric vehicles and its main characteristics in terms of capabilities and other requirements.

On the other hand, the European Credit system for Vocational Education and Training sets the basis and minimum requirements for the training material to be developed.

Finally, the European Quality Assurance in VET offers the scheme to evaluate the project internally in order to ensure its proper development according to European standards. The quality of the whole process and its resulting products is monitored by means of the Deming Cycle and its four steps: the “plan” phase is under development, with the identification of the professional profile (already accomplished) and the design of training programs (including the development of didactic material, in process); the “do” stage will be reached by the organization of the training action whereas the hands-on exercise will constitute the “check” step; finally, the cycle will be completed with the in-depth analysis of quantitative and qualitative reports dealing with the training program and that will be performed in case studies as “act” phase.

Therefore, internal evaluation has a formative character with an utilization focus. To this end, and in order to avoid any subjective analysis, the internal evaluator is not assigned to design and develop any training material, though it will certainly take part in the “check” and “act” steps, respectively.

The project is organized, contentwise, according to the characteristics of partner organizations so the workload has been distributed on the basis of their technical competences, resources and organizational capabilities.

Finally, ELEVTRA counts on a dissemination strategy with meaningful items for such purpose. The valorization of the project will be reinforced during the second half of its lifetime once ELEVTRA has delivered tangible results and the core activities are accomplished.

3. Project Outcomes & Results

The workplan that gives shape to ELEVTRA has been designed to meet the aim and objectives it pursues. Every single result of the project is planned to address the different goals specified to improve the VET system, particularly in the productive sector of the automotive industry.

The constructive cooperation amongst partners has made it possible to identify the professional profile of technicians in the maintenance and repair of electric vehicles available at www.elevtra.eu

To this end, in order to assure its validity at cross-European level and following the specifications of the European Commission in the field of VET, the activity has been developed according to the European Qualification Framework. From its perspective, the participating organizations took into consideration their national VET systems, legal restrictions and training offers in order to reach a consensus in terms of minimum and further requirements of target trainees. The analysis of the different geographical frameworks, pointing out common items and discussing around others debatable, delivered the aforementioned professional profile standardized for all partners and, thus, valid in the countries present in the consortium. The definition of the profile in terms of knowledge, skills and competences is a step forward for the transparency of qualifications at European level.

Based on the profile, the partnership has elaborated the training design, (also available at www.elevtra.eu) as an overview of the process for the qualification of prospective trainees. This specific project product details the incoming professional requirements of trainees and the methodology, resources and contents of the training action itself. The organization of the didactic material mirrors the European Credit system for VET in order to boost the recognition of the qualification acquired upon successful completion of the training program.

The didactic material, currently under development, addresses the knowledge, skills and competences detailed in the professional profile according to the specifications of the training design. This pedagogic resource is organized in 2 modules, dealing with the electric vehicle itself and the charging stands, which content is distributed in different units. This modular system confers flexibility to the learning process, depending on the previous training of participants. Every unit will offer a demo, taking advantage of IC technologies, in order to ease the acquisition of contents.

The ELEVTRA's e-learning platform will be issued as soon as the whole didactic material is available in all partner languages. This learning resource, already designed, will be accessible via the project website for the trainees and their supervisors at work and will include both the theoretical content and the demos previously elaborated.

During the second half of the project lifetime, the partnership will conclude the development of the didactic material and, after its uploading in the e-learning platform, it will be tested under quantitative and qualitative parameters with the issuance of the respective reports. To this end, an e-course will be organized followed by an hands-on exercise in real settings. During the final stage of the

workplan, the partnership will debate on the suitability of the professional profile and the training material for the proper qualification of technicians in the e-mobility sector.

The activity will be focused on the analysis of results, in terms of the satisfaction, learning and performance of participants, which conclusions will be described in a specific report.

The workplan has been designed in the order to assure its inner validity. For such purpose, the different stages correspond to the phases of the Deming Cycle. This formative and with a utilization focus approach, under the European Quality Assurance Reference Framework, serves to monitor and assure the expected quality of outputs, with its direct impact in the VET System.

ELEVTRA counts on valuable products for its proper dissemination. The meaningful logo, the leaflet and the successive newsletters, along with the comprehensive website help the project to become more visible for stakeholders. The valorisation of the project will be boosted by the creation and promotion of the cluster, inviting third parties to participate in the project.

Throughout the first half of the project lifetime, the partnership has proved itself its capability to overcome difficulties and move on successfully: despite the withdrawal of a partner and the shutdown in the workplan until its replacement, the consortium has made it possible to catch up on its activities to date, with minor adjustments.

On occasion of the kick off meeting the project was presented on the Media: information was spreaded throughout different radio stations, newspapers and TV station at regional and national level. As result, ELEVTRA has already created expectations according to the requests of further information and participation from the general public, that are supposed to be greater once tangible results are available and stakeholders will take an active role by means of the e-course, the hands-on exercise and the cluster, to be created to assure the correct exploitation of the project.

4. Partnerships

The most notable characteristic of the partnership is the multifactorial consortium specifically created for covering all organizational competences required to develop ELEVTRA project successfully. Based on the experience and action scope of each partner (VET, research centres and marketing & communication company), the whole partnership benefits the rest points of view and perspectives.

Fundación Metal Asturias, Issa Brno and SC Velenje develop their activity in the VET frame while UNIOVI and Hochschule Bochum are deeply involved in educational research activities of automotive applications. By other hand, shecco contributes with its outstanding expertise in communication reaching the project stakeholders in Europe.

The assigned roles and distribution of tasks and workloads were carefully planned and commonly agreed according to the specific competences of each partner:

Fundación Metal Asturias is a reference VET centre in the Principality of Asturias devoted to improve qualifications in the metal sector and industry in general. Amongst others, the organization counts on a Department of Electricity and Renewable Energies and Building Automation and has been developing activities for the car industry. Along with its training activity, it develops consultancy activities for the industry and it is involved in several projects at international, national, regional and local level as a research and development activity in an array of topics in order to respond to the needs of the market and of the organization itself.

UNIOVI. Campus of International Excellence – Cluster of Energy, Environment and Climate Change. Department of Electric Engineering and Electronics of Computers and Systems. The University of Oviedo has got about 25.000 students, wherefrom around 4.000 engineering students are studying at the Campus of Gijón, and where it can be counted with the research support and education knowledge of around 400 teacher and professors specialized in the following engineering fields: 1. Renewable Energy Generation, 2. Storage and Transport of Energy (electricity), 3. Basic research on Energy (batteries for electrical vehicles), 4. Environmental aspects related with; Energy production, Air Quality and Contaminated Soils Remediation (Heavy metals) and 5. Climate Change.

Issa Brno does not have previous experiences with EV, given that there is no education in this specialisation in the Czech Republic but their participation in the project is due to the real labour market need; it will need such specialists in short time, as the quantity of EV will rise and the specialists will be demanded. They plan to include the EV course in their Autotronic study specialization and offer it as a "partial specialization" for the people already working in the automotive branch.

SC Velenje counts on a Department of Energy Management. It is one of the largest VET centres in Slovenia with 2.691 students on initial, secondary and higher level, serving by 287 teachers, trainers and other staff. Modern role of staff and teachers as professionals, innovators, project managers, mentors, colleges with experience in usage of ICT, self - instruction, lifelong learning concept, and adult education reflects the integration of the education institution in the priorities of the regional and local development. The VET centre keeps close relationship with companies in the field of

solar cells and photovoltaic for mutual cooperation in research and development in VET. Therefore, its interest in EV is of growing concern.

shecco SPRL is an integrated marketing & communications company to support its European and international partners to market their environmentally friendly products and solutions, and effectively communicate on progress made in the global electrified vehicles industry. Its business-to-business platform www.cars21.com was established in 2009 to promote knowledge exchange among the EV industry worldwide through a global expert community, through discussion forums, as well as through daily news focused on technology developments, market barriers and policy initiatives affecting the market uptake of low-carbon mobility solutions.

Hochschule Bochum is deeply involved in education, research and development activities of components for automotive applications, hybrid and electric vehicles. Related to the Department of Electrical Engineering and Computer Science, the Electric Vehicle Institute, develops the following activities: Development of components of the electric power train (power electronics, battery management systems and wheel hub motors), design and optimization of the electric drive train, travel manager for electric and hybrid vehicles to optimize fuel consumption, qualification and training for high-voltage systems in motor vehicles. For over 10 years, University of Bochum designs and builds electric vehicle trials where developed systems are tested. In cooperation with the Academy of Registration Ruhr, the institute offers courses for electric vehicles for service employees in the motor vehicle industry, for the maintenance of hybrid and electric vehicles.

5. Plans for the Future

ELEVTRA started running in October-2011 at full speed. A bit later, the project suffered a breaking due to a partner's withdrawal; fortunately, the partnership got over this setback with the inclusion of another organization as a replacement. Since then, the project restarted its activities according to the workplan. Throughout this process, the partnership has demonstrated its capacity to overcome difficulties and react accordingly. Therefore, despite the delay, the consortium is attaining the expected results with some adjustments in terms of organization of workload - timewise- and the distribution of resources.

As planned, during the second half of project lifetime, the partnership will finalize the development of the didactic material, activity that is foreseen to be done by July-2013. Four out of the six partner organizations are fully involved on this, that can be regarded as core activity. This step will be completed with the development of demos to illustrate the units giving shape to the modules dealing with the electric vehicle and the charging stands, respectively.

The whole material will be edited to HTML language, continuing the tasks already initiated, in order to feed the e-learning platform. This training tool, in current working order, will offer the didactic units in the different linguistic versions of the partnership: English, Spanish, Slovenian, German, Czech, French and Dutch.

Once the content is uploaded and the e-learning platform is checked in terms of functionality, it will start the training action with an expected duration of 500 hours, including practical executions for each module. Upon completion, trainees will undergo a hands-on exercise during an average of 200 hours. These two activities are meant to test the didactic material from different perspectives: whilst the training action itself will be evaluated under a quantitative point of view, focused on the satisfaction and learning of participants, the hands-on exercise will analyse the didactic material under qualitative standards. Both parameters will be put together for an in-depth analysis in form of a case-study. The purpose of this exercise is evaluate the extent to which the training material covers the knowledge, skills and competences required for the proper accomplishment of tasks in the maintenance and repair of electric vehicles and review potential modifications in the professional profile.

Meanwhile, the partnership will invite different stakeholders to join ELEVTRA by means of a cluster, web-based, where all those interested in e-mobility will be invited to participate.

The project will conclude with the organization of a Final Seminar, to be held in Brussels; the event will serve to present the results of the project and to draw general conclusions. ELEVTRA is expected to reach the peak of dissemination during the second half of its lifetime, once tangible results will be available and third parties (trainees, companies and other stakeholders) will take an active role.

6. Contribution to EU policies

ELEVTRA was conceived to expect the future needs in the field of Vocational Education and Training in order to meet the demand of new qualifications in the labour market and boost the Electric Vehicles industry worldwide.

ELEVTRA revolves around the e-mobility as a new sector of activity and its effects in the labour market. The new profile of technicians in the maintenance and repair of e-vehicles requires to design learning processes valid at cross-European level.

On one hand, ELEVTRA aims to pursue the objectives of the European Commission in environmental issues, materialized in an array of policies, mainly set up back from 2007 onwards based on the Kyoto Protocol. The different policies developed since then stem from the objective to reduce greenhouse emissions and harmful gases in road transport. The PPP Green Cars Initiative can be regarded as the culmination of the willingness of the European Commission to promote and support environmental friendly measures focused in the e-mobility.

The impact of these new technologies deploys a range of advantages that meets the EU objectives: Electric engines of electric vehicles are more *energy efficient* than internal combustion motors of traditional vehicles and they also make it possible to use *renewable energies* that, according to the rationality of the supply/demand axis, will boost this new power source. This will favour the use of locally-produced energy and will, therefore, benefit the European economy instead of continuously relying on petroleum derivatives with the additional costs this entails. Furthermore, the characteristics of electric vehicles will lead to a better *welfare* of citizens as result of the reduction of pollutants gases and noise. Finally, this new products in the automotive sector requires the supply of electronics and IC technologies what is supposed to *expand the industry* as a whole.

On the other hand, ELEVTRA addresses the European target in matters of Vocational Education and Training. The project revolves around the setting-up of a common space for the *recognition of knowledge, skills and competences* at workplace throughout Europe, facilitating the *mobility* of workforce and its *professional development*. To this end, the project is based on specific frameworks to ensure the attainment of this aim: the professional profile of technicians in the maintenance and repair of electric vehicles has been designed according to the European Qualifications Framework whereas the didactic material for their training is being developed to cover the knowledge, skills and competences based on the European Credit system for VET.

Therefore, ELEVTRA is a project conceived with a European dimension targeted to European aims in the industrial and VET fields, respectively.

