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Vocational Training on Sustainable Buildings Maintenance and Refurbishment

Final Report

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Executive Summary

FORMAR project is aimed at carpenters, painters, bricklayers, building technicians, and installers of solar panels. Since the professionals targeted by the project acquire their training in vocational training centres and professional training schools, these are the main target groups of the FORMAR project. Other relevant stakeholders can also benefit from the outcomes of the project, like building companies and the national qualification agencies.

The main objective of the FORMAR project is to develop training materials to improve the skills of workers of the building sector on sustainable construction. In order to do so, a set of 25 hours training units will be developed and integrated in the vocational training of carpenters, painters, bricklayers, building technicians, and installers of solar panels. Also a transversal unit on sustainable construction will be developed, concerning basic concepts, principles, strategies and building techniques. FORMAR project has also the objective of improving the information provided to clients and building owners, through the development of guides to support the decisions they do when they need to buy, rent or refurbish a building, contract building professionals or buy building products and materials.

The FORMAR project partnership is composed of 10 organizations from three EU countries (Portugal, Spain and France). The partnership includes one research centre in the areas of energy and sustainability in the building sector, one vocational education and training provider for the building sector and an advisory group (composed by the associated partners) in each country.

The project started with the analysis of needs and existing training materials for each profession concerning sustainable construction and the identification of best practices and constraints in each country.

The next steps are related to the development of the training materials and of the clients' guides for each profession in English (working language). Followed by their translation for Portuguese, French and Spanish and evaluation in sequential phases by the partners and by several stakeholders of the building construction, maintenance and refurbishment sector, according to the FORMAR project Quality Management Plan. This evaluation starts with the associated partners (advisory group), to which follows local stakeholder's evaluation (in each country).

After these two evaluation steps, the training materials were tested in classrooms. After the evaluation and testing, the training materials were then being edited in the three languages and they are publicly available in the project website.

Then, a final FORMAR conference was organized in Lisbon to present the project results and also two final workshops took place in Spain and France with the same purpose.

In terms of dissemination, three scientific papers were presented and published in conference proceedings among other dissemination activities.

Also, the final materials that are to become publicly available will be uploaded to the Erasmus+ dissemination platform.

By the end of the project, the partnership prepared the procedures for the integration of the training modules in the National Catalogue of Qualifications in each country, as well as the respective applicant dossiers.

Further information can be found in the project website at <http://formarproject.eu/>, in the Facebook page: [fb.me/FormarProjectEU](https://www.facebook.com/FormarProjectEU) and in the LinkedIn page: <https://www.linkedin.com/company/10061722>.

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1. Project Objectives

What are the objectives of the FORMAR project?

When we buy, or rent a house to live in, we all expect to find a building with good construction quality for a very reasonable price, located in an adequate neighbourhood that can provide us the quality of living we are looking for. We also expect that the house was built in a way that we do not need to spend too much money in energy bills during the years we are going to live there. And, last but not least, we also look for a safe internal environment, meaning that we expect that walls, ceilings and floors were built and treated in a way and using paints, varnishes and other materials that cause no harm for our health.

Then our house will need maintenance or refurbishment works. When that happens, we want to contract good professionals that are able to do the work in a proper way for a reasonable price. And as a result of those works we also want our house to become safer and more energy-efficient.

Sustainable construction deals with these matters. It consists of several principles, strategies and techniques that allow designing, engineering, maintaining and refurbishing safe, environmentally sound and energy-efficient buildings to live in or to work at.

In the last years, sustainable construction has become an important priority of the European Union for the building sector. There are already building companies, architects and engineers implementing sustainable construction in their work, and also more and more clients are demanding it, whether they are private companies, public organizations or families.

It has been noticed, however, that there is a lack of training concerning these issues among the different professionals of the building sector. Professionals like painters, carpenters or bricklayers are often not fully aware that, during the course of their work, they can use techniques and choose products and materials that are more consistent with sustainable construction.

In this sense, the main objective of the FORMAR project is to develop training materials to improve the skills of workers of the building sector on these matters. In order to do so, a set of 25 hours training units will be developed and integrated in the vocational training of carpenters, painters, bricklayers, building technicians, and installers of solar panels. Also, a transversal unit on sustainable construction will be developed, concerning basic concepts, principles, strategies and building techniques.

But there is also the need to act at the demand level, and because of that the FORMAR project has also the objective of improving the information provided to clients and building owners, through the development of guides to support the decisions they do when they need to buy, rent or refurbish a building, contract building professionals or buy building products and materials.

Who are the target groups of the FORMAR project and how are they involved in the project?

Since the professionals targeted by the project acquire their training in vocational training centres and professional training schools, these are the main target groups of the FORMAR project. Also, other relevant stakeholders of the building sector can benefit from the outcomes of the project, like building companies, consultants, business associations, universities, and the national qualification agencies.

FORMAR was prepared in a way that allows all these stakeholders to contribute to the outcomes of the project and thus ensure that the final products are of good quality and consistent with the objectives of the project. These companies and organizations are involved in the project through their participation in the National Advisory Groups (NAG) as associated partners of the project.

The associated partners were called to evaluate the training materials and the clients' guides, either using the project website through a dedicated communication platform, either by the participation in evaluation workshops.

Furthermore, stakeholders that are not associated partners of the project also had the opportunity to contribute to the project. FORMAR includes a second evaluation step that involved these other institutions, thus promoting a wider dissemination of the project outcomes and a multiplying effect of the project impact. Also, the partnership decided to organize open workshops in the end of three project meetings (Madrid, Zaragoza and Anglet), which was also an opportunity to involve local relevant stakeholders.

What is the potential impact upon the target groups and what are the benefits to the target groups?

During the duration of the project, FORMAR offers to its associated partners free access to the training materials and also visibility of the institution in the project materials.

Furthermore, the partnership is very committed to developing training materials with such a quality that they may be integrated in the National Catalogues of Qualifications, once they are evaluated and tested. For this purpose, Portugal have already a dossier of a propose to the National Agency for Qualifications and Vocational Training concerning the integration of the material developed under FORMAR Project on the National Catalogue of Qualifications

However in Spain and France, it was not possible due to the incompatibility of requirements demanded for their qualification organization with the specifications of the FORMAR project (Spain) and because the inclusion in the French national catalogue is a more complex process (France). Nevertheless, the Spanish and the French qualifications organizations will be informed of the work carried out in the FORMAR project.

The resultant products derived from FORMAR do not match exactly with the elements of description of the Spanish qualifications and their integration would imply a Qualifications reviewing (professional performances, among others), which is a complex process already regulated and that we cannot force to initiate. Anyway, projects such as FORMAR or Build Up Skills, serve as stimulus to introduce sustainable construction criteria in the Qualifications reviewing.

The CNCP (Commission Nationale de la Certification Professionnelle) is responsible for the management of new vocational and qualification training. It leads the process of integration of new vocational training and but don't assess the quality of the proposal. The assessment is confided to federation of building workers as FFB or CAPEB, which are involved in the French NAG. The process of evaluation is very long and before the end of the project it was not possible to launch the processes. The French NAG validated the idea to test during one year the USTs before launching the processes.

In Portugal, the national qualification agency – associated partner of the project – will review the training materials in order to improve their potential to be integrated in the national catalogue of qualifications. Other organizations are interested in the materials developed, like some associated partners as well as the project partners (LNEG, CENFIC, FLC, CIRCE, NOBATEK and FCMB) and professional training school.

This interest will allow reaching the main target groups of the project also after it is finished. Vocational training centres and professional training schools will be able to offer vocational training on sustainable construction for carpenters, painters, bricklayers, building technicians and installers of solar panels. Furthermore, the development of training materials with transversal contents on sustainable construction will be available to other professions. So, the professionals of the building sector will have the opportunity to acquire skills that are more adjusted to the market needs.

An adequate dissemination of the training materials and the clients' guides through the stakeholders of the building sector will contribute to increase the demand for training materials concerning sustainability issues. In order to do so, the project website will continue after the end of the project and the materials will be disseminated too in others websites and social networks with the aim of spread as much as possible the materials developed under the FORMAR project.

2. Project Approach

What is the methodology applied?

The project aims to develop 25 hours training units and clients' guides for carpenters, painters, bricklayers, building technicians and installers of solar panels, as well as a 25 hours training unit with transversal content on sustainable construction.

In order to do so, a methodology with 10 steps was applied in the FORMAR project:

- 1) Analysis of needs and existing training materials for each profession concerning sustainable construction in each country;
- 2) Identification of best practices and constraints in each country;
- 3) Development of training modules, which means the unit program and the session plans;
- 4) Development of the training resources, which means the training contents, practical exercises, and the trainer's manuals;
- 5) Development of the clients' guides for each profession (and the one related to the transversal unit);
- 6) Translation of the final materials from English to the languages of the countries participating in the project: Portuguese, Spanish and French.
- 7) Evaluation of the training materials by the NAG and other stakeholders of the building sector:
 - a. A first evaluation done by the NAG, either on-line using the project website, either in 2 evaluation workshops per country;
 - b. A second evaluation done by other relevant stakeholders that were identified by the project team in each country.
- 8) Testing of the training materials: it done in classrooms and were organized by the vocational training organizations that are partners of the FORMAR project;
- 9) Improvement of the training materials as a result of the evaluation and testing.
- 10) Editing the final translated training resources and printing the clients' guides.

What has been done?

It is all finished and it has been decided by the partnership that all training materials and client's guides are available for free for use in training sessions or other educational purposes with acknowledgment of the source and, in case of the Trainers Manual and the Clients Guide, according to the rights of use of Creative Commons license. The contents cannot be commercialized.

What is the added value of the project approach?

The added value of the project approach is closely related to the involvement of the stakeholders of the building sector in the evaluation of the training materials. The establishment of national advisory groups in each country – the NAG, as well as the initiative of a second step of evaluation allowing the participation of other relevant stakeholders that are not associated partners of the project and the testing of training materials in classrooms, are ways of optimizing the quality of the materials developed under

the project and of the final results. Because it is very clear to the FORMAR project partnership that only good quality training materials will allow the project to reach its objectives.

So, the training materials were evaluated by research institutions, business associations, industry associations, government agencies, companies of several activities, construction products supplier, universities, training centres, professional schools, national qualification agencies and workers of the building construction, maintenance and refurbishment sector for which the training materials are developed.

A good functioning of the NAG, either using the communication platform of the project website or the organization of well-organized workshops, allowed not only the improvement of the training materials, but also to reach other relevant stakeholders of the building sector using networking strategies through the channels of the associated partners. These other stakeholders were also had the opportunity to contribute to the project and, if the training materials are good enough, they will also facilitate the dissemination of the project outcomes.

Other add value of the FORMAR project are the specifically developed evaluation methodology, because it ensures that a great number of stakeholders (European, national and local) give inputs into the development of the training materials towards sustainability.

Therefore, the learning experience obtained by the project core partners, associated partners and other stakeholders that had the opportunity to participate in the different project activities, will allow more consistent and relevant training materials, which could be then adapted to the specific conditions of other European countries and other vocational sectors, i.e., it is a replicable process.

What is the dissemination and exploitation strategy of the project?

The dissemination strategy is a key element for the success of the implementation of the project. It includes the definition of the target groups, and the definition of proper internal and external communication tools.

In order to reach the widest audience possible, several different types of instruments was used during the project, namely:

- Project website;
- Facebook and LinkedIn pages;
- One final workshop in Spain and France to present the project results to the national advisory groups and other stakeholders;
- One final European Conference organized in Portugal;
- Dissemination through the associated partners' channels;
- Dissemination through existing networks in the building sector, on sustainable construction and on vocational training in Europe;
- Participation in scientific conferences;
- Publication of project related information in others websites and social networks.

The project website is the main channel to disseminate and promote the project activities and results for the partners and the public in general. The project website includes a platform for the communication between the core partners, as well as between the core partners and the associated partners in each country.

The exploitation strategy of the FORMAR project aims at maximizing the exploitation potential of the project results and allowing the maintenance of the project website and the update of the developed products after the project funding.

it has been decided by the partnership that all training materials and client's guides are available for free for use in training sessions or other educational purposes, but the contents cannot be commercialized.

3. Project Outcomes & Results

What are the major achievements and results?

The project deliverables are all done.

The major achievements and results with interest to the trainers, teachers and trainees are:

- power-points (with notes for the trainer for each training unit);
- Training Modules (for each training unit);
- e-book of Trainers Manual with hyperlinks to the power-points (for each training unit);
- e-book of Client's Guide (for each training unit);
- videos (one per country – with the goals of the project and recommendations for trainers or teachers).

Where can they be found?

All training materials, indicated above, are available in the public part of the FORMAR project website. The printed version of the Clients Guide they will be sent to all associated partners as well as to other organizations, including professional associations, for further dissemination to the professionals concerned. They will also be sent, for example, to organizations of consumer protection, for further dissemination to end users.

These printed version of Clients Guide can also be obtained by contacting LNEG in Portugal (paula.duarte@lneg.pt) , CIRCE in Spain (izabal@unizar.es) and NOBATEK in France (ccantau@nobatek.com).

4. Partnerships

What is the added value of the multi-country partnership in executing the project?

The FORMAR project partnership is composed of 10 organizations from three EU countries (Portugal, Spain and France). These three countries have adopted the principles of the European Qualifications Framework, and have similar interests regarding vocational profiles. The partners were invited according to their experience and complementary skills, expertise and competences, in order to ensure the production of high quality training materials that meet the needs of the target groups.

The partnership includes one research centre in the areas of energy and sustainability in the building sector, one vocational education and training provider for the building sector and an advisory group (composed by the associated partners) in each country. The partners are recognized institutions, both at national and international level.

The European cooperation that is established in the context of the FORMAR project will allow the exchange of experiences between three different networks of stakeholders (national advisory boards), with very similar problems and different local conditions and constraints regarding the building sector and vocational training needs. The learning experience obtained by the project core partners, associated partners and other stakeholders that will have the opportunity to participate in the different project activities will allow the development of more consistent and relevant training units, which can be used in and adapted to the specific conditions of other European countries.

Also the multi-country partnership established in the context of the FORMAR project will allow:

- Providing the project partners with an innovative common European approach, adjustable to their national contexts;
- Considering the methodological principles of the European Credit System for Vocational Education and Training in the development of the training units;
- Providing an opportunity for the development of better training itineraries, allowing the adaptation of existing skills to the demands of the present job market, increasing the employability and the labour mobility;
- Making the connection between the areas of sustainability, the construction sector and pedagogical concerns related to the need of appropriate qualified professionals, giving the possibility to national stakeholders to learn from the experience of stakeholders from other European countries, and discuss how to better adapt the lessons learned to their own national and local conditions.

What are the benefits of the partnerships established with the target groups?

The project activities have already led to some experiences of cooperation between the project partners and other institutions, namely the associated partners, which are members of the NAG, in each participating country.

In Portugal, Spain and France, beyond the dissemination of the project, all the workshops that has been for evaluation or for presentation of the final results have become an opportunity of cooperating with other EU projects and expanding the network around the project. The optimization of the synergies between projects it is also an opportunity to

discuss new possibilities of cooperation with relevant local stakeholders related to vocational training and the building sector.

The partners in the Partnership with training activity have the opportunity to inform trainers or training managers (direct target group) the existence of these training resources, which are freely available and useful to complement their own resources or create specific courses.

5. Plans for the Future

What are the plans to the future?

The development of the materials for the training units oriented to carpenters, painters, bricklayers, building technicians and installers of solar panels, and a transversal unit on sustainable construction are done.

The training materials developed provide innovative concepts, techniques and the acquisition of new skills in the sustainable construction, improving the quality of teaching practices and the use of pedagogical tools, for the benefit of learners and vocational training institutions. The partnership believe that it is important that the offer of vocational training includes qualifications in the field of sustainable construction and that these should be broadly available and adapted to all professionals.

So, it is very important the dissemination of the training materials through the stakeholders of the building construction, maintenance and refurbishment sector that will promote and increase the demand and application of training materials concerning sustainability issues. In order to do so, the project website, the videos, as well as the Facebook and LinkedIn pages, will boost further the dissemination and mainstream of the project outcomes. Also, all institutions involved in the FORMAR project are continuously promoting and disseminating the project outcomes, which results in a multiplying effect of the project impact.

6. Contribution to EU policies

How does the project contribute to key EU policies, objectives and priorities?

The training materials developed under the FORMAR project will provide innovative concepts and the acquisition of new skills on sustainable construction, which are expected to improve the professional performance of carpenters, painters, bricklayers, building technicians and installers of solar panels. The contents of the training materials are relevant to the needs of the labour market, thus facilitating employability and mobility. In this way the FORMAR project will contribute to the development of quality lifelong learning and to promote high performance, innovation and a European dimension in the practices of the building sector, especially in maintenance and refurbishment of buildings.

Also, the introduction of new skills on sustainable construction allows meeting the need to bridge the lack of contents and pedagogical resources that can improve the quality of vocational training in the building sector, thus helping improving the quality, attractiveness and accessibility of the opportunities for lifelong learning available within Member States.

FORMAR project will allow the development of products that can provide new skills tailored to the needs of labour market in EU countries, particularly in matters that specifically are related with sustainable construction, facilitating the employability and mobility of the construction professionals. And because the development of the training materials will follow the methodological framework on the national catalogue of qualifications of each country, and the principles of ECVET, it will support improvements in quality and innovation in vocational education and training systems, institutions and practices, in each country.

The development of the training materials was tested by all partners in each country, and the final results will be disseminated in conferences and workshops and in the project website. These outcomes will be oriented to professionals in the construction sector and will benefit from the technical contributions and the transfer of know-how between all partners, thus facilitating the development of innovative practices in the field of vocational training, and their transfer, including from one participating country to others.

The training materials developed under the FORMAR project were developed based on the description of learning outcomes, leading to qualifications, grouped by units. Procedures and criteria were developed for the assessment of learning outcomes and the development of a proposal for the allocation of credits. The experimentation of qualifications and quality standards for ECVET will be made in the national contexts of the partnership. For this reason, FORMAR project addresses the priority of implementing ECVET for transparency and recognition of learning outcomes and qualifications.

FORMAR project will also contribute to combat all forms of discrimination and promote equal treatment because it aims to develop training units that will be integrated into National Catalogue of Qualifications and/or in other offer of vocational training courses. These units will be available for carpenters, painters, bricklayers, building technicians and installers of solar panels, who intend to get more skills in the field of sustainability, independently from their sex, racial or ethnic origin, religion or belief, disability, age or sexual orientation.

FORMAR project also demonstrates complementarities with other EU policies, namely the Europe 2020 Strategy, because it aims to improve the skills on sustainability issues of workers of the building sector, adapting the existing skills to the demands of the present job market. Thus, it will contribute to attain the employed target through the empowerment of people by developing their skills, increasing the employability and the labour mobility. FORMAR project will also contribute to the 20/20/20 climate/energy targets, because the

contents of the training materials include construction techniques aiming at the construction and refurbishment of buildings that are more energy-efficient.

EU thematic strategy on the urban environment is also addressed by the FORMAR project. This European strategy considers sustainable construction as a priority and the FORMAR project aims at improving the skills of different professions of the building sector so that they can contribute to produce and renovate buildings and a built environment that:

- Is attractive, durable, functional, accessible, comfortable and healthy to live in and use;
- Is resource efficient, in particular with respect to energy, materials and water, favouring the use of renewable energy sources;
- Respects the neighbourhood and local culture and heritage, and a competitive price.

Due to the contents of the training materials developed under FORMAR project it is also important to mention that the project is in line with the goals of the renewable energies directive (2009/28/EC) and the buildings energy performance directive (2010/31/EU).

