BUILD UP Skills Pillar II
Overview report

Deliverable D2.10

Of the contract EASME/H2020/EE/2015/008 to 'Support for BUILD UP Skills EU exchanges and analysis on construction skills'
for the Executive Agency for Small and Medium-sized Enterprises (EASME)

Written by Trinomics with support of Visionary Analytics
February 2018

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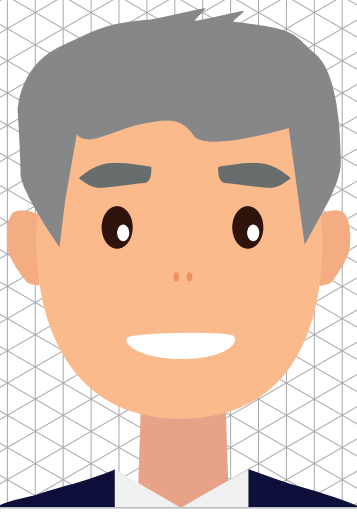

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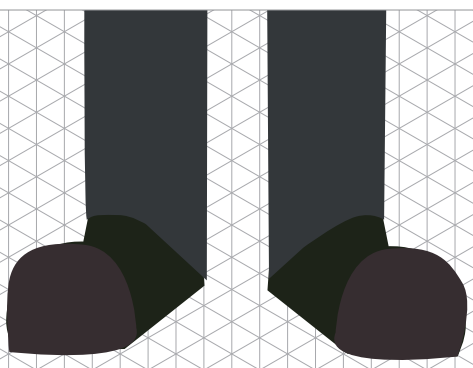

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Renovation &/or construction of high-energy performance buildings

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2011 2012 2013 2014 2020 ...AND BEYOND!

1 Overview of the BUILD UP Skills Pillar II programme

1.1 HOW BUILD UP SKILLS STARTED

BUILD UP Skills is a strategic initiative which started in 2011 under the Intelligent Energy Europe (IEE) programme to boost continuing or further education and training of craftsmen and other on-site construction workers and systems installers in the building sector. Its primary aim is to increase the number of qualified workers across Europe to deliver building renovations which offer high-energy performance as well as new, nearly zero-energy buildings.

The initiative is addressing skills in relation to energy efficiency and renewable energy systems and measures in buildings therefore contributing to the European objectives of two flagship initiatives of the Commission's 'Europe 2020' strategy — 'Resource efficient Europe' and 'An Agenda for new skills and jobs'.

BUILD UP SKILLS

Figure 1. BUILD UP Skills logo

In practice, this has been done in two stages or 'Pillars'. The first calls for BUILD UP Skills proposals took place in 2011 and 2012. Against the backdrop of the 2020 energy targets of the EU, projects across 30 EU countries (EU-28, the Former Yugoslav Republic of Macedonia and Norway) were funded to understand the individual situation and needs in each country. These projects developed national qualification platforms and roadmaps that would serve to successfully train the building workforce in order to meet the targets for 2020 and beyond. In doing so, a host of local and national stakeholders have been mobilised. This phase is known as Pillar I.

1.2 BUILD UP SKILLS PILLAR II

As a follow up, new calls for proposals were launched in 2012, 2013 and 2014. A total of 22 projects were then funded to help implement the roadmaps developed in their countries. This second phase, known as Pillar II, aimed to design and implement new qualification and training schemes and/or upgrade existing schemes, based on the roadmaps developed in Pillar I.

1.3 EU EXCHANGE MEETINGS

Figure 2. Plenary Session at the 7th EU Exchange Meeting in Brussels in January 2016

Throughout the Pillar I and Pillar II of BUILD UP Skills, EU Exchange Meetings have been organised for project coordinators to gather together and share their projects' results and experiences. The most recent meeting meetings were held in Brussels (January 2016), Budapest (June 2016), Athens (December 2016) and Rotterdam (May 2017). The summaries of the outcomes of those events as well as the presentations and posters presented, are available on the BUILD UP Skills website page dedicated to these exchange meetings: www.buildup.eu/skills/eu-exchange-meetings.

PILLAR II

BUILD UP SKILLS GEOGRAPHICAL SCOPE AND BUDGET

21 COUNTRIES

22 PROJECTS

11500000€ INTELLIGENT ENERGY EUROPE FUNDING

1.4 FOUR THEMATIC TECHNICAL WORKING GROUPS

Four Technical Working Groups (TWGs) were formed at the end of 2015 in order to deal with four sets of issues that are key to the BUILD UP Skills projects: finance (the long-term sustainability -continuation- of the projects), mutual recognition of qualifications, innovative training materials and methods, and market acceptance. The TWGs gathered at each of the aforementioned EU Exchange Meetings, have worked together also between the EU Exchange Meetings, and have created the following useful deliverables available via the BUILD UP Skills website.

TWG 1
Finance (sustainability)

TWG1 work has culminated in a report synthesising sources of finance for training courses, best practice cases for financing training courses, situation of mandatory training in the EU, and based on that formulated short-, medium- and long-term policy measures recommended in order to ensure the sustainability or continuation in the future of training schemes in the construction sector.

TWG 2
Mutual recognition of skills and qualifications

The final deliverable of TWG2 is a report analysing the needs and bottlenecks to free movement of building workers and giving an overview of work around mutual recognition of skills and qualifications through the case study of thermal insulator.

TWG 3
Innovative training methods and incentives

TWG3 has resulted in an innovative database covering training activities developed by the 22 Pillar II and 5 Horizon 2020 Construction Skills projects, accompanied by a report analysing the trends (e.g. details of training courses and the target group(s), innovativeness, strengths and weaknesses) with respect to main types of training infrastructures, training methods and training materials and summarising good practices, insights and recommendations for each of the training categories.

TWG 4
Market acceptance (incl. marketing and communication)

TWG4 has produced a report which formulates a number of suggestions designed to help projects market themselves and short-, medium- and long-term policy measures recommended in order to ensure effective marketing.

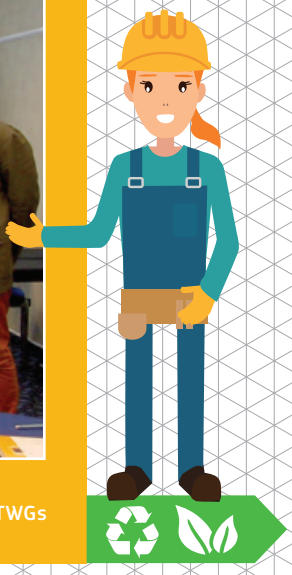


Figure 3. BUILD UP Skills and H2020 Construction Skills coordinators working in their TWGs

2 Results achieved by Pillar II BUILD UP Skills Projects

This section provides an overview of the impacts that the BUILD UP Skills Pillar II projects have had in the construction sector's energy efficiency skills arena.

IMPACTS PURSUED	ACHIEVED RESULTS
Number of training courses developed	805
Number of people trained	8,570
Number of hours taught	27,726
Costs to qualify each trainee (median, EUR/ trainee)	638
RES production (toe/year)	77,976
Primary energy savings (toe/year)	572,766
Reduction of GHG emissions (tCO_2e/year)	2,070,457

Table 1. Impacts achieved by BUS Pillar II projects (BUS-22)

2.1 TRAINING COURSES TRIGGERED BY THE ACTION

The projects have generated **805 training courses** of different nature, ranging from a **3-4-hour on-site course**, **to 10-day courses**, pilot courses and fully-fledged on-site/ off-site courses, courses for workers vs. courses for trainers. Given these characteristics of the courses, the majority of the projects aimed to develop less than 10 training courses.

2.2 NUMBER OF PEOPLE TRAINED

The total number of **people trained** (workers, trainers and people qualified through the training courses developed by the projects) is **8,570**. The **median value** shows that a **BUS project** typically trained around **266 people**. Some projects offered 'train the trainer' programmes, with an underlying idea that each trainer trained would then train other people. However, this «snowball effect» of training other people is not captured by the project indicators. As the objective of BUILD UP Skills is not to fund the actual running of training schemes, the training courses organised where essential conceived as pilot phases.

2.3 NUMBER OF HOURS TAUGHT

The **median value** is approximately **775 hours taught**. The differences between projects are due to the different number of training courses offered as well as the varying length of the courses offered.

2.4 COSTS TO QUALIFY EACH TRAINEE

The average cost to qualify a trainee (Euro/trainee) also varies considerably between the projects, ranging from as little as 134 Euro/trainee to as high as 2,914 Euro/trainee. This depends on the nature and varying length of the courses offered. The **median cost** for all projects is around **638 euro/ trainee**.

2.5 PRIMARY ENERGY SAVINGS

20 out of the 22 projects set primary energy saving targets. The **median primary energy savings** per BUS project has been **1,955 toe / year** compared to a target of 2,270 toe per year.

2.6 REDUCTION OF GHG EMISSIONS

20 out of the 22 project set greenhouse gas emission reduction targets. The **median GHG emissions reduction** per BUS project has been **4,357 tCO_2e** per year compared to a target of 8,054 tCO_2e per year.

2.7 SCOPE OF BUILD UP SKILLS PROJECTS AND SPECIFIC OUTPUTS

Common to all projects were the dissemination of training information (mainly through project websites and developed communication plans), development of training schemes, modules and qualifications (mainly development of qualification schemes, training schemes and pilot courses), training delivery (mostly training of trainers, seminars and workshops), the development of training materials and the delivery of training.

Impacts achieved by BUS Pillar II projects (BUS-22)

8,570
PEOPLE TRAINED

805
TRAINING COURSES DEVELOPED

27,726
HOURS TAUGHT

77,976
RES PRODUCTION (TOE/YEAR)

572,766
PRIMARY ENERGY SAVINGS (TOE/YEAR)

2.07 M
GHG EMISSIONS REDUCTION (TCO_2e/YEAR)

RESULTS ACHIEVED - MEDIAN VALUES

638€
AVERAGE COST TO QUALIFY A TRAINEE

RANGING FOM 3H TO 10 DAYS
COURSE DURATION

775
AVERAGE # OF HOURS TAUGHT / PROJECT

266
AVERAGE # OF PEOPLE TRAINED / PROJECT

1,955
MEDIAN PRIMARY ENERGY SAVINGS (TOE/YEAR)

4,357
MEDIAN GHG EMISSIONS REDUCTION (TCO_2e/YEAR)

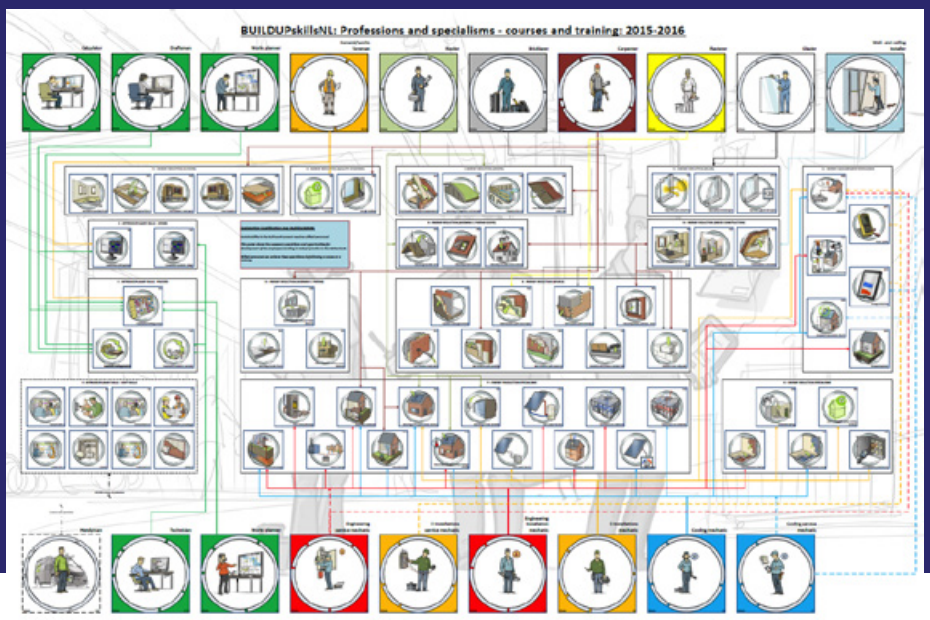
Good practise examples of specific outputs: BUS BEET (The former Yugoslav Republic of Macedonia)

BUS BEET made a pioneering step towards the introduction and validation of previous non-formal and informal learning in the former Yugoslav Republic of Macedonia. During the project, a process for recognition of previous learning was developed. This process consists of identification, documentation, evaluation and certification. The process is completely compatible with the recommendations for necessary phases from the European Training Foundation. This new recognition process was well received. Most of the construction companies in the former Yugoslav Republic of Macedonia acknowledged the new recognition process. During the project, 967 workers were certified through the process of recognition of energy efficiency skills. The candidates for skill recognition indicated the following benefits of the recognition of previous learning:

- Much shorter process than the previous training that led to the same qualification;
- Validated qualifications increase employability;
- Valorisation of previous knowledge, skills and experience;
- Qualifications can be acquired without formal training;
- The certificate is identical to the one obtained through more formal training;
- Insufficient competences can be completed by partial or modular training.

Good practise examples of specific outputs: BUS N@W (Netherlands)

The project developed and implemented a qualification structure for post-initial training. in cooperation with the most important actors and stakeholders. This qualification structure was set out to complete the schemes for post-initial training and to unlock the available courses and trainings for the workforce. The developed qualification has helped bridge the gap between initial and post-initial education in both the building and the installation sector as well as between post-initial and initial education. In post-initial education, the visualisation of the qualification structure made professional HR-advice for sustaining the built environment possible. In initial education, the developed qualification structure led to the development of several add-ons to the traditional curriculum.



Good practise examples of specific outputs: BUS Construye 2020 (Spain)

BUILD UP Skills Construye 2020 carried out an Energy efficiency and renovation awareness campaign 'on wheels'. The Spanish BUILD UP Skills project, toured 15 Spanish cities in June - July 2016 in order to raise awareness and inform the public on best practices of energy efficiency and energy renovation. At each stop, the BUILD UP Skills project coordinator Fundación Laboral presented the Construye 2020 project to local authorities in a public event and responded to citizens' questions regarding energy efficiency and renewable energy in buildings.

2.8 ANALYSIS OF SKILLS TARGETED

The skills targeted by BUILD UP Skills Pillar II projects were indeed relevant and differed from country to country as they addressed the **needs and skills gaps identified in each country** as part of the former phase (Pillar I) Status Quo analysis and Roadmap. These skills can be grouped into **five broad categories**:

1) **Building fabric** (e.g. façade workers/ plasterer (building envelope, roofers, outdoor/ indoor, carpenters, bricklayers, insulation installer);

2) **Building services** (e.g. electrical installers, ventilation, air conditioning installation, heating systems installation);

3) **Energy** (e.g. skills in energy efficiency, renewable energy systems, heat pumps, boilers);

4) **Building management** (e.g. foremen);

5) **Building misc** (e.g. migrant workers).

Most of the skills targeted by the projects were in the categories of building fabric, building services, and energy sources. While looking inside those categories, the following specific skills were the most popular:

- Insulation installers;
- Heating system installers;
- Rnewable energy systems installers;
- Ventilation and air conditioning installers;
- Façade workers;
- Plasterers (building envelope);
- Roofers;
- Electrical installers;
- Heat pump installers.

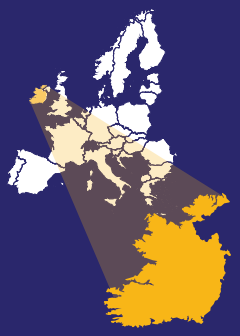
Example from a cross-craft case

Cross-craft understanding is the ability to grasp one's work as part of the overall project. This requires the ability to know the role and needs of other occupations in the construction process, work flows and interfaces between trades. This does not mean that every worker needs to acquire the skills that other specialised professionals have, but that professionals in one occupation should be aware of how their work links to that performed by its peers in another occupation. This is particularly important when talking about energy efficient construction, for instance, in the area of air tightness, so that the contractor placing the windows does not affect the work done by the insulation contractor.

Example from a cross-craft case: CROSSCRAFT (Austria)

CrossCraft was the only project targeting all five skill categories. This project aimed to develop a qualification scheme for a cross-the-crafts training of professionals in the construction industry. Firstly, the project developed a concept for such scheme (together with the training material, curricula, requirements and standards) and a strategy for the establishment of the course scheme within the continuing education and training sector. After that the scheme was piloted by having 21 pilot courses all over Austria. These training courses, especially the short (two days) on-site training courses, received a strong market demand and can be considered as a success story. Education providers will integrate the two days basic CrossCraft training module in their training offers. In addition, the four days CrossCraft compact course is being integrated into the existing training schemes for general foremen and timber constructors.

Example from QualiBuild about the uptake of the training courses by education providers



The proposed general training of BUILD UP Skills QualiBuild is EQF 4 and is the equivalent contact of 3 days or 24 contact hours. This means that the content can be introduced into the school curriculum as part of construction studies or similar. The QualiBuild Foundation in Energy Skills course handbook has been already issued to a couple of schools in Ireland to trial out as an addition to the existing construction studies course at Leaving Cert level (final year of secondary school) to 17/18-year olds. The results or evaluation of interest is yet to be determined but understanding the principles of air tightness and insulation and ventilation can easily become part of the curriculum.

An alternative network for the training programmes includes the apprenticeships. Although each apprentice is learning a specific craft trade, it is important to understand the main principles of construction at a holistic level. Understanding communications is equally important. This 3-day course can run alongside the existing apprenticeship preferably in the first year.

3 Sustainability of the projects in the long term

3.1 REPLICABILITY

BUILD UP Skills training courses, methods to establish voluntary qualification schemes, competences frameworks, and methodologies for the recognition of previous learning developed by BUILD UP Skills projects can be replicated in other countries, by other construction occupations, and in some cases possibly by other sectors. The factors influencing to what extent this can be done are: the characteristics of the construction market in a country, the legal frameworks for construction skills education / qualifications, language and geographical characteristics. Some examples that have tackled this are:

- The Foundation in Energy Skills (FES) course of the QualiBuild project (Romania) has been taken up via the **Train-to-NZEB Horizon2020** project in countries such as Romania, Czech Republic, Turkey, and for it one unit of six of the course needs to be adjusted to be able to reflect the national situation with regard to regulations.
- **BUS BEEP** (Finland) developed materials in Finnish, Swedish, English, Russian, and Estonian.
- **BUS EnerPro's** materials have been translated to English and are currently being used in a follow up Horizon 2020 project.
- The training courses developed by the **Construye 2020** project (Spain) were applied through an Erasmus+ programme to train two groups of window installers from France and Italy.

3.2 CONTINUATION

Continuation is ensured firstly through the outputs e.g. learning materials, which are largely available through the BUILD UP Skills project websites each. Furthermore, the work is already continuing or planned to continue at local level, national level and EU level.

Continuation via interested parties

- In Spain, the training courses developed by the **Construye 2020** project are now being offered through the State Foundation for Education at Work (FUNDAE).

- In Latvia, the training programs developed by the **FORCE** project have been integrated in five training centres in Latvian regions.

- In Sweden, two trade organisations, the Swedish Construction Federation and the Employers' Association representing the Swedish plumbing and electrical industry (Installatörsföretagen) will run the training courses developed by the **SWEBUILD** project in the coming years until 2020.

Continuation prompted by legislation (National Level)

- The **BUS QualiShell** consortium in Romania is trying to promote better regulation (for skills) in Romania in terms of improving regulation on minimum air tightness requirements for construction.

- The **BUS N@W** project in the Netherlands is similarly attempting to influence policymakers for formal accreditation of qualifications.

Continuation prompted by legislation (National Level)

The BUILD UP Skills initiative has been continued via the construction skills strand of the European Horizon 2020 research and innovation programme aiming to support and further develop multi-country qualification and training schemes. These are mostly transnational projects consisting of BUILD UP Skills consortia (BUStoB, ingREeS, MEnS, PROF-TRAC, Train-to-NZEB, Fit-to-nZEB, NEWCOM, BIMplement, Net-UBIEP, BIMEET). The Coordinators are in some cases the same as in the Pillar II projects. Some of the earliest Horizon 2020 projects also participated in the BUILD UP Skills EU Exchange Meetings, which allowed them to come together to exchange experiences and create synergies amongst the projects.

4 Lessons learnt

There are several lessons that can be learnt from the BUILD UP Skills projects that are of interest to other professionals concerned with advancing the skills of the construction sector workforce.

4.1 TRAINING COURSES OFFERED SHOULD FILL A GAP IN THE MARKET AND BE MOSTLY PRACTICAL

- **Originality of the course** – Course providers should make sure that the training schemes that they develop are not already covered in courses that companies offer themselves. In addition, company specific training may work best in some cases.
- **The importance of practical training and demonstrations** - 'On-site' training courses provide the possibility of discussion and communication among craftsmen from different professions, which is imperative for cross-craft understanding and consequently the quality of the works. All kinds of practical demonstrations (i.e. blower-door tests, pressurisation tests, etc) delivered via face-to-face training are very attractive and useful in courses. Although classroom work is needed, the practical component of training needs to be at least half -preferably more- of the total hours.

4.2 TRAINING SHOULD BE FLEXIBLE TO CATER FOR THE DIFFERENT NEEDS EACH WORKER MIGHT HAVE

Every worker has different needs. There is no one-size-fits-all training that will cater for the needs of all workers. Flexibility is key in the training offer in order to appeal to as many trainees as possible.

- **Local training facilities** – Having to travel long distances for training can be off-putting. The closer the training takes place, the easier it is for the craftsmen to attend it (and overcome the important 'time' barrier previously mentioned). The regional training infrastructure must be able to provide such a variety of locations.
- **Daytime and evening classes** - Larger companies tend to favour daytime training while smaller companies or individuals often favour courses in the evenings. Therefore, to ensure maximum participation, an idea is to offer a day and an evening option. This would enable many workers to attend the course around their working days. In some countries, short and targeted trainings are being favoured by companies (e.g. 4 hours training in Sweden).
- **Wide variety of material in different formats** – This is necessary to ensure a wider adoption and acceptance for use as not every student is the same. Online materials do not work for everyone (they do for trainers but not always so well for blue-collar workers) but are at the same time a great (additional) resource for those who are keen on this type of learning.
- **Option to spread learning across time** - The demand for short courses is generally favoured but long on-site training courses may be needed for a wider skillset. What is important in the latter case is to offer trainees the option to spread the hours or course days across a reasonable amount of time (e.g. 4 days course spread across four months).

4.3 STAKEHOLDER INVOLVEMENT IS KEY TO THE SUCCESS OF THE TRAINING SCHEMES DEVELOPED

Stakeholder involvement creates synergies and facilitates a customer-oriented approach. Stakeholders can be involved early in the process or even be part of the consortium.

- **Involvement of industry (incl. construction federations / associations or Chambers of Commerce) & construction companies** – This would help understanding of the market needs and facilitate acceptance of the training schemes developed. These stakeholders are interesting due to their know-how and also for endorsement purposes. They could be involved in dissemination and promotion, allowing for a 'direct marketing strategy' to attract SME workers to the training schemes developed.
- **Involvement of training providers (e.g. VET providers)** – This is positive for collaboration purposes (e.g. training providers could offer their infrastructure for the training actions) and for reaching out to a wider audience when the training needs to be promoted at a later stage.
- **Involvement of the relevant governmental institutions** – Involving government authorities in

Figure 4. Training materials and guidelines for trainees and trainers developed by BUS UPSWING (Greece) for 3 targeted professions

Figure 5. Visual, descriptive slides developed by BUS BEEP (Finland) for 10 themes

the project is positive because it provides guidance and an early warning of any potential incompatibilities between project activities and national legislation. It can also help recognition i.e. accepting training materials as part of the national qualification and certification system.

Engagement of frontrunners can be effective - Companies with long-term experience in the market with building materials and energy efficiency services are often keener on training their workers. They may also be readier for longer training programs than the less aware companies. Involving such companies may help create a movement as they are effective ambassadors (spreading the word, giving credibility) for others to join.

4.4 BUDGETING OF TRAINING DEVELOPMENT AND IMPLEMENTATION ACTIVITIES NEEDS TO BE DONE CAREFULLY

BUILD UP Skills projects reported that the effort and budget allocated to a few of the activities had been underestimated in terms of the time that is needed to develop and/or implement these activities:

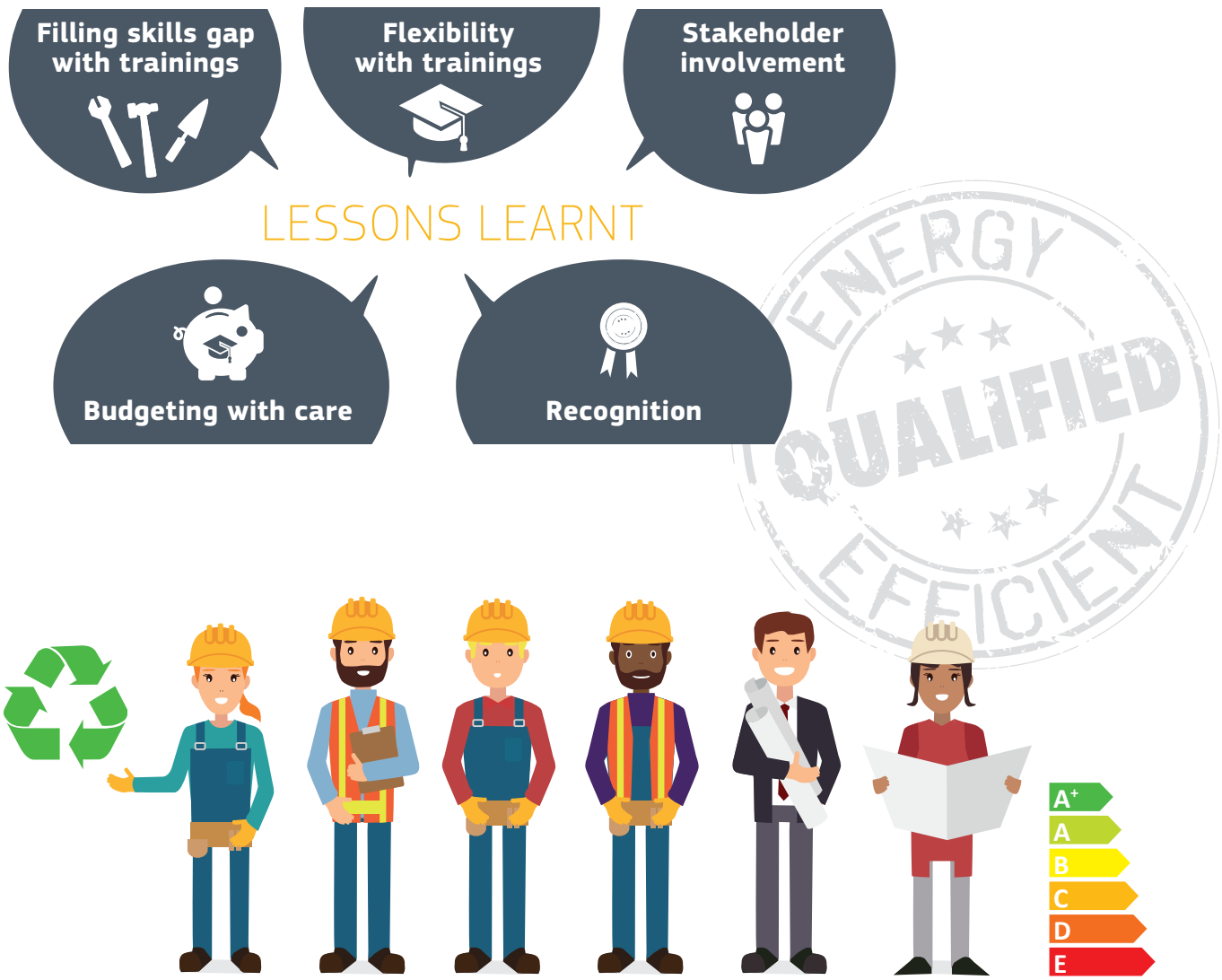
- **The selection process for trainers** - should be implemented very carefully, trying to reach candidates from all over the country, which in practice was more time consuming that foreseen.
- **Materials development** – Developing high quality materials whose contents and format comply with the requirements of the time and the market can be more time consuming that one may think. Particularly when an online (web-based) training is going to be developed, this may take many resources as it is a very time consuming and complex tool to develop.

4.5 RECOGNITION IS KEY TO STIMULATE DEMAND FOR TRAINING

- **Certification** - Qualifying those who attend a training event or course with a professional qualification standard (e.g. 'construction site manager') or with a specific professional 'training' qualification -in the case of trainers- is necessary to stimulate demand. This certification needs to be recognised by national public standards.

5 CONCLUSIONS

The BUILD UP Skills Pillar II has been a successful, relevant and timely initiative unique in its kind. In many countries, similar training courses did not previously exist, neither were any efforts made to analyse the need for such skills or to bring together the relevant stakeholders. These projects set the basis for education of construction workers, developed high quality and innovative materials, developed a good network and raised awareness (e.g. through appointed ambassadors, setting up national qualification platforms, developing new partnerships, dissemination activities) among construction workers and policy makers on the importance of energy efficiency, RES and cross-craft skills for blue collar workers. In order to bridge the skills gap and solve related macro-level issues such as mutual recognition of training, it is imperative that the legacy and the work of BUILD UP Skills is continued and further advanced.



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