



Support for BUILD UP Skills EU exchanges and analysis on construction skills

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Technical Working Group 2 Mutual Recognition

Final report, 10 July 2017

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1 Introduction

The purpose of this Report is to present the work accomplished in the Technical Working Group 2 on Mutual recognition of skills and qualifications across EU Member States. The contributors to this report are: Frantisek Doktor (chair of the group), Anna Moreno (Vice-chair), Bojan Milovanovic, Risto Ivanov, Vaidotas Sarka, Rossella Martino, Maria Zheleva, Rebecca Kanellea (EASME), Andrew McCoshan and Katarina Svatikova (Trinomix).

1.1 Aims of the group

The purpose of this Technical Working Group was to discuss the issue of mutual recognition of skills and qualifications across the EU Member States. The main objective was to discuss and analyse how to ensure that skills and qualifications recognised in one Member State are recognised in another Member State. This is important in particular for cross-border and migrant workers in construction. As such, we can compare the issue of mutual recognition with the issue of mobility of workers in the EU. This topic has not yet been discussed extensively within the BUILD UP Skills (BUS) initiative, however, some countries within the BUS initiative have already expressed their interest for a system of mutual recognition and have started to explore the possibilities.

The following specific topics were discussed during the meetings:

1. Definition of the objectives of the mutual recognition system in practice: What does the employer need? What does the employer need to know about the employee?
2. Definition of the scope of mutual recognition: Which occupations should be included? Which forms of education and training (formal, non-formal, informal)? Should we use a pilot approach, starting with a few occupations with the possibility to add more? Should we focus on energy efficiency and use of renewable energy sources in buildings only, or on a wider scope?
3. Definition of the focus of the mutual recognition: Should we focus on private sector mutual recognition and/ or on public sector mutual recognition (will a construction worker recognise or do we also need the state to recognise)?
4. How can non-formal and informal learning of workers be recognised in different countries?
5. What mechanisms/ proposals for tools can be used to achieve mutual recognition? There are a variety of ways how to achieve mutual recognition, each with their independent set of pros and cons that can be explored and decisions made upon.

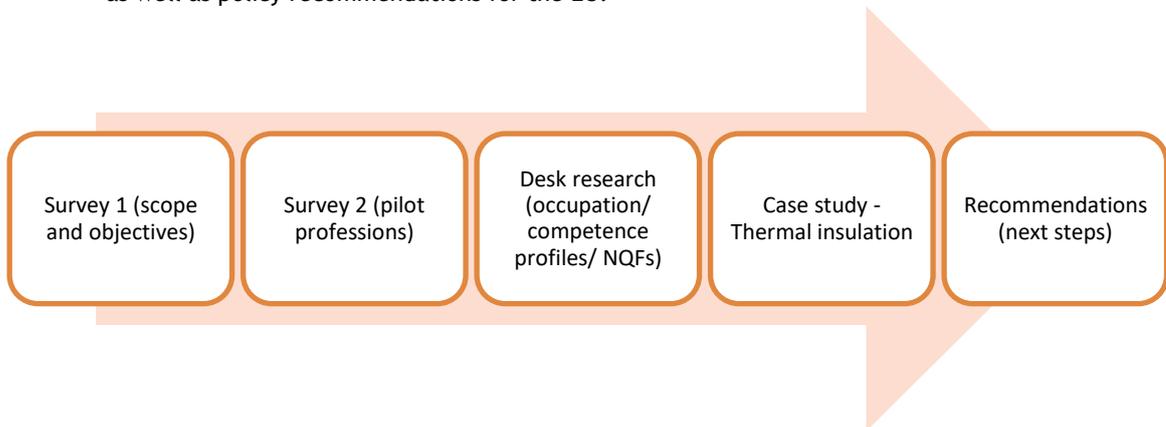
1.2 Methods used

During and between the EU exchange meetings, several activities took place:

- ✓ Before the 7th EU exchange meeting, a survey was run among all BUS participants to determine the scope and objectives of this technical working group. Questions addressed the type of occupations, training, qualifications and skills this TWG should focus on, as well as the form of mutual recognition participants are interested in (e.g. private sector or public sector recognition) - see the questionnaire attached in Annex B.
- ✓ Another survey was run before the 8th EU exchange meeting on the selection of pilot professions to initiate fostering of mutual recognition. The survey asked TWG2 participants to

indicate high/ medium/ low priority on a list of professions. Eight professions were selected: plasterer, roofer, tinsmith, floorers, bricklayer, insulator, lighting systems operator, machine operator with a possibility to extend the group by HVAC and RES equipment installers - see the questionnaire in Annex C.

- ✓ Desk research was conducted on existing information on the selected professions from national databases of occupation profiles or competence profiles for these professions. In addition, collection of existing information on relevant qualification standards and requirements from the national qualification frameworks for these professions took place, if available.
- ✓ An analytical framework was developed to map the skills and competences for priority professions, which was subsequently refined to one profession to identify the methodology to be implemented. Thus, a detailed case study on thermal insulator profession was conducted to investigate competences for this profession in different countries, exemplifying how a mutual recognition system could be set up.
- ✓ Recommendations were formulated on the next steps to be taken in ongoing/ future projects, as well as policy recommendations for the EU.



Results of the first survey on the objectives of the group

26 representatives of the BUS project partners from 13 EU Member States and FYROM of Macedonia responded to the survey. There was a balanced response from the key stakeholders (although the largest group were employers and employers' organisations). The regulation of the professions that are in the scope of BUS differs greatly between the Members States. Nevertheless the mutual recognition of skills and qualification may help in facilitating free movement of construction professionals in the EU.

There was no clear preference for the scope of TWG in regards to the level of professionals to be covered (crafts, blue collar, middle- or senior level professionals), in terms of regulated versus non-regulated professions and in terms of type of required qualification of the professionals - secondary level, tertiary level, further education and training (levels 4, 5 and 8 of EQF). Therefore, it was decided that the TWG should decide how to refine the scope by piloting a smaller group of professionals with possibility to replicate successful results with other professionals.

In terms of focus on EE and RES versus wider focus, the majority of responses preferred to focus on skills and qualifications related to EE and use of RES in buildings. There was also no clear preference between covering qualifications and/or skills and/or training. A similar outcome was observed

regarding inclusion of the public (by competent authorities) recognition versus private (by the market) recognition.

The results of the desk review showed that:

- Different countries have different responsible authorities - however, the Ministry of Education seems to be predominantly involved.
- Not all countries have national qualification frameworks and rather depend on regional references of qualifications, which makes collection of such information difficult and very complex (e.g. Italy).
- Some countries develop qualifications based on learning outcomes, others do not (they should have nationally recognised occupational standards, but this might also not be the case).
- Within countries, some occupations are covered, some are not, hence gaps exist for the selected professions.
- Reporting on this information is inconsistent (between and within countries), sometimes difficult to interpret due to its availability only in the local language, or it can be outdated.
- Comparisons can be challenging due to lack of corresponding case studies.

1.3 Value added

The surveys, discussions and comparative analysis of the qualification standards for thermal insulators have been very useful for the participating organisations. They have assisted in recognising the problems for implementation of the European Qualification Framework (EQF) and National Qualification Frameworks (NQFs), identifying the barriers that exist and are being created by new requirements and licencing schemes, whilst highlighting the very fragmented implementation throughout Europe.

The group covered a number of Member States, however, the objective was not to provide EU28 analysis. The results helped to shape activities of the participating organisations within their own projects and (future) actions at national level to be more effective and efficient in developing schemes of mutual recognition using existing tools.

Another value added of this group has been to ascertain what cannot be done with respect to mutual recognition of construction skills, or in other words the mobility of workers. The difficulty of setting up such a system were exacerbated by the fragmentation of the construction sector, diverse professional structures and the lack of standardisation of these professions at EU level.

2 Case Study: Thermal Insulator

2.1 Purpose of developing case study

2.1.1 Background context and rationale

The work of the group highlighted the difficulties in making different qualifications systems comparable and especially when it comes to dealing with numerous professions related to energy efficiency. At the same time, the work of the group had highlighted the need for a methodology for European workers for

self-evaluation which will help them to understand if when moving from one country to another new competencies might be required. It was therefore proposed to take the role of a thermal insulator as a case study and to devise a methodology to examine in some detail the competencies required in different countries. The thermal insulator was chosen because it was a professional skill needed in any country but, at the same time, the practice may differ substantially between Southern and Northern Europe because of the contrasting requirements incurred by the different climatic zones.

2.1.2 *The method*

To this end, a spreadsheet was devised taking the learning outcomes in the thermal insulation qualification in Italy as a reference point and asking group members to indicate, where possible, whether the same or different learning outcomes exist in their countries. In this way a step would be taken in identifying a methodology for mutual recognition based on learning outcomes rather than qualification systems.

In order to compare the situation in different countries, information was also gathered (in an information sheet) regarding the structure of qualifications/competence profiles¹, learning outcomes and the ways in which knowledge, skills and competences are dealt with. Additional data was collected to ascertain if any key differences existed between the country concerned and the reference country (Italy), and if any major learning outcomes, skills or competencies could be transferred between nations. This comparison would also assist in comparing the hours required for subunit completion, allowing trainers to garner an understanding of training depth and hours required to gain certification.

2.2 Cross-country analysis

2.2.1 *Presentation of Excel spreadsheet including description of categories used*

The spreadsheet lists nearly 200 learning outcomes and therefore is comprehensive in its coverage of the competences required in thermal insulation. The spreadsheet indicates whether a learning outcome concerns knowledge, skills or competences, using the following definitions bearing in mind the European Qualifications Framework:

- **'knowledge'** is the body of facts, principles, theories and practices that is related to a field of work or study
- **'skills'** means the ability to use know-how to complete tasks and solve problems, and they can be cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments)
- **'competence'** is the capacity to apply, in daily work, the knowledge and skill, i.e. someone knows how to do a task besides knowing the theory.

Group members were given an option to indicate whether the learning outcome was present in their country's qualification/competence profile or not, in addition to selecting if there was a 'direct or indirect correspondence'²:

¹ Countries might have qualifications or competence profiles

² Please note, this is the group's own translation/ interpretation, there might be a better terminology used to reflect 'direct and indirect correspondence'.

- **Direct correspondence** means that it was possible to clearly identify the learning outcome in a country.
- **Indirect correspondence** means that the learning outcome was not explicitly mentioned in a country but was nonetheless included or implied in the learning outcomes that exist.

2.2.2 Analysis

Four countries were able to complete the spreadsheet comparing learning outcomes to the Italian reference point: Cyprus, Bulgaria, Lithuania and Estonia. Analysis of the spreadsheet shows that a large number of learning outcomes exist in the 5 countries, with either direct or indirect correspondence between one another. Interestingly, cross-country correspondence is strongest in what might be regarded as “core” thermal insulation learning outcomes (rows 6-68 in the spreadsheet) covering thermal insulation materials, coating techniques, and installation procedures. In the areas of basic knowledge of building envelope energy efficiency and basic knowledge of efficient plant in building services, correspondence is more inconsistent. These two areas are intersecting courses in Italy that may be taken by any worker to enable understanding between crafts.

Other countries indicated that it would not be possible to make the comparison due to asymmetry in developing competencies in relation to thermal insulation, or due to contrasting approaches regarding learning outcomes. For example, Portugal indicated that a qualification or competence profile had not yet been defined although training under the Build Up Skills Initiative (FORESEE) *has as its title “Installer of thermal insulation in construction - initiation”*. Even in the case of Bulgaria, where the spreadsheet was completed, the difficulties of doing so were highlighted. The State Educational Requirements (SER) were used as a reference point but it was noted that as a result of the implementation of Pillar I and Pillar II of the Bulgarian BUS initiatives, the VET Agency (NAVET) has submitted proposals for additions and changes in the state requirements for the specialties related to energy efficiency and RES in buildings. These amendments are expected to be implemented by 2018 at the latest. In addition, BUS Pillar II in Bulgaria produced 10 training programmes for EE and RES in buildings which are aligned with the national requirement and will be provided upon request (paid courses). However, these are not included in the SER yet, therefore they were not taken into consideration when compiling the spreadsheet.

In FYR of Macedonia, it was not possible to complete the spreadsheet as the learning outcomes for thermal insulations listed are incorporated in various occupations within the national classification of occupations (including façade workers, plasterers, roofers and thermal insulators). In addition, the occupation standards for facade workers refers to key tasks instead of learning outcomes. This standard is prepared by the VET center and it is used for verification of programs for non-formal education. Within BUS Pillar II two programmes for EE skills (façade workers and roofers) were developed, however they are still not verified by the Adult Education Center (state authority body for verification of qualifications through non-formal education). The program for formal secondary education does not include the qualification of thermal insulation, therefore this could not be included in the spreadsheet according to the required criteria.

In Lithuania, the definitions for competences and professions stem from the technology processes involved. For the example of thermal insulation, they have two main facade insulation: rendered facades and ventilated facades. For every technology they formulate descriptions, followed by

competence requirements and also test practical tasks. The general structure of topics for every technology is as follows:

1. Preparation activities, general requirements for technology implementation, main technology process activities, finishing, quality control and safety;
2. Description and requirements covering all directly related topics, such as cross crafts as these are also important from implementation point of view (even from operations perspective) with other related technologies (example: joints with roof, windows, RES and so on);
3. Basic energy efficiency knowledge.

A general consideration is that the qualification profiles are superficially indicated in each national/regional system, as the onus is given to the relevant training centre to organize courses. This, in the opinion of the Italian coordinator, highlights the fact that employers do not necessarily trust the “official” qualification and only trust their own judgment during a training period. In Italy for example, the training centre must be accredited by the regional authority to organize qualification training courses (the qualification must be in the regional repertory). If this is not the case, the training centre can organize the training as it wishes, but participants cannot gain qualifications, only attendance certification.

2.2.3 Challenges encountered

The case study of thermal insulation highlights a number of challenges in developing an understanding of the knowledge, skills and competencies required for the same role/profession in different countries:

- ✓ **Thermal insulation is dealt with in different ways in different countries.** In Bulgaria, for instance, the following professions and specialties are covering the subjects related to building envelope thermal insulation:
 - Builder. Specialties: internal coating and plastering, external coating and plastering, roofing, plaster and mortar;
 - Installer. Specialties: joinery and glazing, construction insulation
 - Energy equipment and installations technician. Specialties: thermal energy, hydro energy, gas technology, RES, thermal technology.Hence, the structure of the Bulgarian programmes and the corresponding learning outcomes are different to its Italian counterpart. Furthermore, the relevant subjects in Bulgaria are scattered in different specialties and at times the topics are overlapping. The specialty “construction insulation” for instance, encompasses not only thermal insulation components, but also principles of retrofitting, insulation materials and sustainable construction basics. This is because ‘construction insulation covers a wider area of activities’. Even though the joinery and glazing specialty seems purely conventional, the programme comprises not only doors and windows, but also principles of insulation of PVC windows and doors. In Estonia, different competences apply to different professions, e.g. carpenter, plasterer, mason.
- ✓ **Learning outcomes are dealt with in different ways in each country.** In Croatia, completing the spreadsheet was not viable, owing to the way learning outcomes are described (the box below provides an example). Such variations are not uncommon: as research by Cedefop has shown, there can be variation in the level of detail (or “granularity”) of learning outcomes between countries’ qualifications systems. In the Croatian example, outcomes are broadly described compared to the Italian reference point used in the spreadsheet.

Example of Croatia - Competences required of an Insulator (Fasader)

According to the source: Jedinstveni nastavni plan i okvirni obrazovni program za zanimanje fasader, Republic of Croatia, Ministry of economy, work and entrepreneurship, Zagreb, 2007; after the completion of the education programme, certified installers have to:

1. Acquire knowledge regarding the health and safety, safe working conditions, protection of own health during different working and weather conditions, safe working at height and other measures of worker and environment protection.
2. Be familiar with properties and application of materials, tools, accessories and other aids
3. Have basic knowledge regarding building elements and their function within the building assembly
4. Gain basic knowledge regarding the importance of façades and its role within the building assembly
5. Have basic knowledge about different types of façade systems, the importance of choosing adequate façade systems and accept the importance of using compatible systems during construction.
6. Gain knowledge about different types of rendering, their properties and installation procedures
7. Gain knowledge about reading the bill of quantities, technical leaflets of different manufacturers, directions for installation of different finishing works
8. Gain skills regarding how masonry works with facade bricks (straight and curve walls), as well as skills about the masonry of multi-layered façade walls
9. Gain skills of plastering and rendering using different types of plasters and renders, including their curing. Basic knowledge regarding silos, machines and tools for plastering and rendering.
10. Gain knowledge regarding the correct installation of thermal insulation
11. Gain knowledge on how to prepare the subsurface for new façades on old buildings
12. Gain knowledge regarding different types of rehabilitation of walls after damage caused by capillary moisture
13. Gain knowledge and skills on how to apply all kinds of finishing layers which are being used for facades, their properties and application possibilities
14. Gain knowledge on the importance of environmental conditions during the façade work and possible damage that can occur because of extreme weather, as well as damage caused by poor installation
15. Learn how to reconstruct architectural profiles and cornices on facades
16. Gain knowledge on assembly of all types of scaffolding
17. Learn how to calculate material consumption, time needed to complete the work, as well as how to complete the bill of ordinance for specific insulators works
18. Develop the sense of responsibility on how to rationally consume materials and energy, as well as to respect the rules of environmental protection

The duration is 3 years, with more than 300 hours of practical work per school year.

- ✓ **Setting competence requirements follow a different approach in different countries.** For example, in Lithuania, there is a so-called technology process approach (mentioned above) to set up the list of needed competences and professions. With respect to thermal insulation, it has two separate technology descriptions: ventilated facades and rendered facades. Competence requirements are then set to cover each of these technologies, to which professions are mapped. This means that it is difficult to compare the knowledge, skills and competences with the Italian example of learning outcomes.
- ✓ **Relevant qualifications can be positioned at different EQF levels:** level 4 in Italy, 2-3 in Cyprus, 4 in Bulgaria, whilst in Lithuania discussions are ongoing whether it should be level 3 or 4. One would expect therefore the learning outcomes to show differences not just as a result of differences between countries in the nature of thermal insulation practice, but also because of the difference in the level.
- ✓ **The emphasis placed on theoretical knowledge and practical skills can vary country to country.** In Cyprus the focus is described as being more on technical skills and the installation of thermal insulation in practice, with theoretical courses being supportive to increase knowledge. Compared to Bulgaria, it seems that practical experience is greater in Italy.
- ✓ **The relevance of knowing the number of hours needed to acquire the skills/ competences -** some group members were of the opinion that it is not relevant to know how many hours of training are needed to gain particular competences, as the worker could also gain the competence in an informal manner. Others noted that it was impossible to estimate the number of hours due to the differences in how thermal insulation is defined in their national framework (a very short description without giving too many details on learning outcomes, e.g. Croatia, Slovakia).
- ✓ **It can be difficult to understand technical terms** between countries. English was used in the spreadsheet but this first required translation from Italian and despite the care taken it was sometimes difficult for terms to be understood across borders.

3 Lessons Learnt

3.1 Reflections on the case study

The case study has been useful in highlighting a number of important issues in mutual recognition. First of all, it has shown the scale and nature of the differences that exist between countries in terms of how thermal insulation is dealt with as a role or profession. Secondly, the study has emphasized the structure and level of detail in learning outcomes (within qualification systems) at the present time. The method has been useful in shedding light on the complexity of the issues involved.

The case study took the Italian learning outcomes as a reference point, but the next step could be to elaborate a common set of knowledge, skills and competences on the basis of the responses from all five countries, and use these as a reference point. This could be the basis for the development of European standards around a common “core” of knowledge, skills and competences. In such a way a

worker who wants to transfer could certify his competences following the ISO 17024 procedure for example, in order to be recognized in any European country or beyond. This progressive method of standards development could be used by any profession, however, domain experts should evaluate the robustness and accuracy of the vocabulary used.

ISO 17024 is an international standard accepted across the world which refers to the certification system to be set up for recognizing the competences of a professional whenever a standard, describing his competences, has been approved. It is, for instance, a very well-known and worldwide accepted certification of welders. They are identified through ISO standards:

- ✓ ISO 9606-1:2012 Qualification testing of welders -- Fusion welding -- Part 1: Steels
- ✓ ISO 14732:2013 Welding personnel -- Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials

The case study also showed that countries have different approaches to setting learning outcomes:

1. **Profession based** followed by a general structure of learning outcomes (e.g. thermal insulator). This seems to be the approach taken in most countries, however this approach also creates the most difficulties when trying to compare different countries, **as different names of professions and structures in practice are set in different countries**. This could be due to different practice, climate, technologies available, or even due to country size, taxes and economic situation.
2. **Technological process related structure approach** and then setting some general structure of learning outcomes, grouped to professions (e.g. Lithuanian case described above).

Based on this, a potential future action could be:

- a) Select a group, area or a profession name (e.g. thermal insulator - facades);
- b) Create a list of main related technologies processes for all countries (e.g. rendered facades, ventilated facades, etc.). This list of technologies could be country-specific, but it would simplify setting up the main scope of technologies for all countries.
- c) Use rules for competence and learning outcomes structuring (grouping)

The case study has also shown how different the situation is “on paper” compared to “on the ground” where mutual recognition has to overcome many hurdles. For example, development of national databases of qualification standards increases transparency of requirements at national level, but the lack of a European approach in formulating units of learning outcomes (ULOs) has led to substantially increased complexity of descriptions of qualification requirements that cannot be compared across Member States. This means that mutual recognition becomes even more difficult to achieve.

From the discussion the following recommendations can be made:

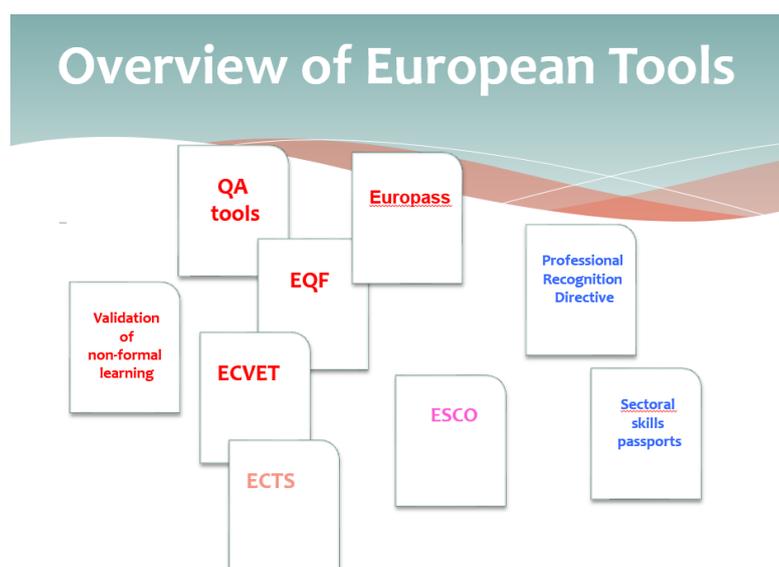
- More European standardisation is needed to harmonise descriptions of required skills and knowledge as it has been done for welders (for example, through common set of descriptors) or to develop European qualification standards that would facilitate coordination of the qualification requirements;
- New certification and/or licencing schemes such as ETICS should be reviewed for compliance with EU competition law and prohibitive pricing;

- New regulatory proposals on energy performance of buildings should be required to produce an impact analysis of how resulting new qualification requirements and certification/licencing schemes will affect mutual recognition and access to qualifications, including price capping for required training and relevant certification/licencing.

3.2 Potential of European tools

The method could also be useful as part of a package for supporting the mobility of workers in Europe. A range of European tools designed to assist in mutual recognition are shown below.

Figure 1 Overview of European Tools



Many of these tools could potentially provide a supportive framework to address the problems of mutual recognition being dealt with in BUS. However, they are at various stages of development and implementation in EU Member States and the rate of progress depends on stakeholders beyond those involved in BUS, e.g. in VET governance. For example, common European quality assurance arrangements are at different stages of development in different countries and require action within education and training systems. Credit systems and the validation of non-formal and informal learning are less relevant to the issues discussed in TWG2 but also remain significantly under-developed in most countries. Europass tools which require use by individuals are less relevant to the structural issues discussed in BUS. The tool could (and should) benefit from BUS rather than the other way round: ESCO has a rolling programme for identifying the knowledge, skills and competences required in occupations and, in this case, the outputs from BUS via work done in the learning outcomes spreadsheet could feed into the process.

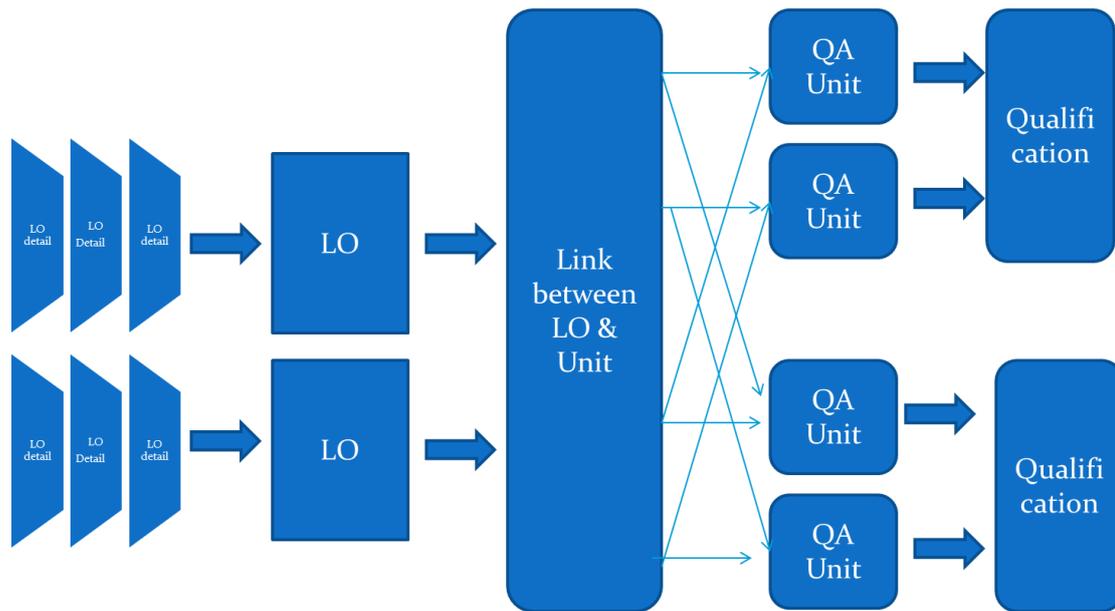
Table 1 Issues mapped against potential European tools as solutions

Problem/ solution	European Qualifications Framework	ECTS	ECVET	Professional Qualifications Directive	ESCO	Europass framework	Common European quality assurance arrangements	Validation systems for non-formal learning, e.g. sector-specific
Weak recognition of qualifications between MS	✓	✓	✓	✓				
Lack of mutual understanding of differences/ similarities between occupations between MS				✓	✓			
Obstacles that inhibit the training undertaken/ skills acquired in one country being recognised in another			✓		✓	✓		
Poor transparency in quality standards underpinning qualifications that inhibits employers in one country trusting qualifications in another							✓	
Lack of common systems for the acknowledgement of skills acquired through non-formal and informal learning								✓

3.3 The relevance of industry recognition vs public recognition

In light of the foregoing, it would be most appropriate for the focus to be on industry as opposed to public recognition. In this respect, the Skills Bank project provides inspiration. It concerns a registry currently in use by the chemical industry, which could serve as stimulus for the thermal insulation example that this TWG currently is dealing with. The idea would be that if an insulation professional is registered in such a Skills Bank, employers would be able to easily compare and assess potential employees. Such skills bank would serve other target groups as well (e.g. course providers) but that was not dealt with in detail. The way such a bank works is by defining a set of descriptors in order to describe a qualification. Units of learning (QA) are created, and by linking those to learning outcomes (LO), the description of a qualification can be determined.

Figure 2 Example of functioning of a Skills Bank



The following table illustrates an example of the way the system of the Skills Bank presents a qualification:

Table 2 Example of a qualification in a Skills Bank

Title of the Qualification	Master Floristry Craftsperson				
Total ECVET Points	100				
EQF Level					
NQF Level	AT	DE	FR	NO	SI
Units of Learning outcomes	U1	Accounting and Controlling			
	U2	Budgeting, Calculation and Financing			
	U3	Entrepreneurship			
	U4	Human Resources Management			
	U5	Tutoring			
	U6	Marketing and Sales Management			
	U7	Customer services and support			
	U8	Floristry production			
	U9	Assessment, quality assurance and documentation of process and product			
	U10	Quality and Security Management			
	U11	Vocationally-specific Business Administration			
	U12	Communication in an international context (<i>country specific unit</i>)			
Cross sectional Learning Outcomes	To acquire the learning outcomes properly the following qualifications are essential: <ul style="list-style-type: none"> ▪ s/he is able to act with social and ecological responsibility, ▪ s/he is able to adopt a quality management, ▪ s/he is able to use information and communication technology. 				

Furthermore, there are other European funded projects that could test and take forward the methodology developed in TWG2:

- One is Net-UBIEP that intends to define the competences that BIM experts should possess in order to design NZEB buildings. The project foresees the definition of competences for all the actors of building supply chains and considers as its target: officers of public administrations;

architects and engineers involved in design and construction, constructors, facility managers, installers, etc.

- A CEN committee could define the professional schemas needed for NZEB buildings starting from the activity already done in the BUS project. For instance, BRICKS has defined eight national standards, which could be used as a starting point to develop European standards. The presence of European standards could promote the certification of competences at European level. This means that a worker certified, following an EN standard, could work in any European country.

In Italy a Decree published by the Ministry of Welfare in 2013, defined the procedure to recognize the competences gained in non-formal and informal environments but few examples are available and are generally scoped towards social sectors than in the building sector. The existence of a system based on learning outcomes could facilitate the recognition of competences needed to improve the energy performance of a building. A requirement of the employment of qualified workers for the Energy Performance Contract (EPC) could speed up the process.

3.4 How far we can go in formulation of a standard

The standardization process has always been the precursor of new era. The industrialization started when standards on screw and bolts were agreed. Similarly, a Common European Market has started since European standards have set the performance of products with an EU label. The same has to happen for workers, once the standards will be agreed, they will easily move from one country to another as far as their languages competences come along the professional competences. If European standards are defined for each field, the problem of mutual recognition will be solved, the workers will know exactly what they should know in order to work in a specific sector and the ESCO or stakeholder interested in renovation would have a list of qualified workers in any country and the region they are available.

The following observations were made during the group meetings with respect to the possibilities in formulating a standard:

- Energy performance contracting (EPC) has been given as an example of how to oblige participants to qualify. Such a contract would have to be signed only if workers are qualified to ensure the return of investment foreseen by EPC.
- To obtain any kind of standard in qualifications, one needs EU level pressure on Member States as national authorities are under pressure from businesses to have less standards and regulation. Standardization could happen for example through CEN standards that each MS could/should adopt whenever public investment are foreseen (Austria example).
- Another discussed idea was to standardize a select number of common descriptors for skills and knowledge.
- RGE certification in France, for companies who want access to public money, zero interest rates for loans, and other benefits. These benefits apply only if the work itself is done by the RGE certified worker themselves.
- It is important to set the European standard on how you qualify people.

4 Recommendations

4.1 Recommendations for future actions:

It is important to start a standardization process as when the rules are not clear there is more conflict and uncertainty, which ultimately is not beneficial for the market. In general, people say that it is better to have a bad standard than no standard at all. Standardization process is usually a long process but even a draft standard can help the training system to gradually go in the right direction and train workers in the correct way. The suggestion is therefore:

- ✓ To create European standards for learning outcomes for some of the professions;
- ✓ Harmonise the qualification standards and formulate Units of Learning Outcomes (ULOs) in order to increase comparability;
- ✓ Set up a minimum standard at EU level required for each profession, i.e. a kind of 'driving license' for a key set of competences which would be the minimum requirements to do the job. This action would not require further standardization.

The three above actions, in sequence, could solve the problem of the complexity and variety of MS qualification systems.

4.2 Recommendation for the European Commission

The following are recommendations for the European Commission. This includes some more general policy recommendations to increase the demand for trained and qualified workers:

- ✓ To have a dedicated call to set up the standards, i.e. a European standard on professions - to develop a qualification scheme and develop a certification for that qualification scheme. The standards should be based on Units of Learning Outcomes (ULOs).
- ✓ To harmonise the use of subsidies connected to the qualification of people (in Austria, there is a law that if a company wants public money for renovation they need to use certified people, in France, there is a RGE system), and link this, for example, to an implementation deadline (e.g. 2020/ 2025).
- ✓ To develop a roadmap for the energy performance contracting (EPC), for example, by asking that the EPC has to be done by qualified workers in a given time period, or relate the requirement for a qualified worker to the amount of money. To elaborate, if you build a school or hospital, you need to use certified people, below a certain threshold value of a renovation, you are not obliged to use a qualified worker.
- ✓ Set aside a certain percentage of social funds to be used for training workers in the building sector, for formal and non-formal education. This would help combat the common problem of workers in the construction sector not attending training.
- ✓ Train the builders on site and recognize this training as formal training (as normally a training is not recognized if it is done on a building site rather than a training centre, with a few exceptions). Something should be done so that the building site can be recognized as a training site.
- ✓ Continuation of cooperation among the H2020 construction skills projects, as there is relevance for the subject of mutual recognition.

5 Next steps - cooperation of relevant H2020-EE-14 projects

A key message in TWG has been that there is a need for an extended BUILD UP Skills initiative or a new European action that allows the method developed to be taken to the next level. TWG2 can bring added value through having active exchange on the work being developed in H2020 (construction skills) projects that have an impact on the development and harmonisation of qualification standards at national and/or European levels. The cooperation with the TWG2 community could provide a further source of validation and additional feedback for fine-tuning of the projects' deliverables.

Moreover, it was agreed by the TWG2 members that it is rational for continuing the work of TWG2. This will facilitate cooperation between the projects by enabling mutual recognition of qualifications and ensuring transparency of the qualification requirements between Member States. For example, there are several projects pertinent to implementing BIM that will formulate qualification requirements for BIM professionals, as well as qualification requirements for construction and energy professionals that will use BIM (e.g. public servants in the permitting authorities, public procurement etc.). It would be beneficial for mutual recognition and consequently to allow free movement of workers to ensure alignment of these requirements across the EU.

It is therefore recommended to share presentations on these projects in order to create synergies at the next scheduled meeting.

Information on some of the relevant projects:

Innovative training schemes for retrofitting to nZEB-levels (Fit-to-nZEB)

Reaching the 2020 and 2030 energy and climate objectives represents a major challenge to the construction sector, which needs to be ready to deliver high energy performing renovations and, in particular, nearly zero-energy buildings. This goal requires a major effort to increase the number of qualified construction specialists at all levels, which is directly related to the accessibility and quality of the training and educational programmes and the inclusion of training on intelligent energy efficiency and RES solutions in building renovation. Responding to these needs, the project is designed to:

- ✓ Elaborate a set of technological competences and learning outcomes on deep energy renovation;
- ✓ Develop new large-scale training schemes and programmes on deep energy renovation at all levels of the vocational education and training (VET) system;
- ✓ Review the national educational plans and initiate the necessary changes;
- ✓ Establish capacity for professional training of trainers and train a sufficient number of trainers;
- ✓ Support and monitor pilot courses on the new programmes on deep energy renovation at all levels.

The leading objective of the Fit-to-nZEB project proposal is to deliver all necessary requisites for the introduction of educational content on deep energy renovation of buildings in the curricula at all levels of the educational and training system in South-eastern Europe. This will be done both through incorporation of new educational content in existing curricula and through the development of new specialized programs. This process will be guided by the understanding of the complex nature of

building retrofit, combining various building disciplines and allowing integrated design and cross-craft understanding with special focus on practical exercises and demonstrations. An essential element of the project is the creation and deployment of certification schemes and accreditation procedures corresponding to the EQF.

Network for Using BIM to Increase the Energy Performance (Net-UBIEP)

The project proposes BIM Qualification Models integrated with energy competences, to proliferate a better comprehension of energy issues along all value chains of the building industry, so that both existing and new building will have better energy performances. Public administrations, professionals (engineers/ architects), technicians (installers/ maintenance workers) and tenants will be therefore involved in the Net-UBIEP activities.

The definition of the BIM Qualification Models will pass through the identification of specific energy BIM competences for each of the above target needed to implement BIM models during the whole building life cycle. During the project, the “integrated” BIM Qualification Models will be validated by stakeholders thanks to the delivery of different training activities (seminars/ classrooms courses/ e-learning courses) addressed to at least six BIM professional profiles: BIM managers, BIM evaluators, BIM coordinators, BIM experts, BIM facility managers and BIM users. Once the schemes are validated, they will be proposed for standardization to find a broader acceptance at European and international level through regulatory organizations (CEN/ ISO).

The following activities foreseen for the project may be of interest for the mobility of workers employed in energy performance:

- ✓ Harmonization of existing BIM profiles to EQF
- ✓ Identification of the requirements for energy efficiency building design and construction based on BUS experiences
- ✓ Translation of energy efficiency requirements in specific BIM competences for the different target groups
- ✓ Elaboration of a three dimensional matrix for the identification of roles and competences for each target group when implementing BIM
- ✓ Elaboration of schemes for qualification and certification of competences for at least four BIM profiles
- ✓ Information material for PA to teach how to identify BIM requirements
- ✓ Didactical material for engineers and architects on BIM competences on energy efficiency
- ✓ Didactical material for installers and workers to enable them to work within BIM
- ✓ Information material for owners and facility managers on the use of BIM
- ✓ Workshops and seminars for PA decision makers and owners/tenants associations
- ✓ Training sessions for engineers and architects to use BIM for the energy performance
- ✓ On-site trainings to teach installers and workers how to use BIM on the building site
- ✓ Surveys amongst all stakeholders involved in the validation process and feedback analysis
- ✓ Fine tuning of BIM qualification models
- ✓ Standardization of training schemes for BIM Models at the European level
- ✓ Standardization of BIM qualification and certification schemes at the European level

New competences for building professionals and blue-collar workers - certified qualification schemes to upgrade the qualification of building professionals and blue collar workers to ensure the high quality of nZEB buildings (NEWCOM)

The focus of the project “NEWCOM” is to set up large-scale qualification schemes to implement missing professional qualifications and certifications of blue collar workers and building inspectors with a special focus on the possibility of mutual recognition between different Member States. These schemes will enable the building workforce to be qualified for the construction and renovation of nZEB buildings.

Main project objectives relevant to the TWG2 subject:

- ✓ Development of needed qualification and certification schemes for blue collar workers and building inspectors;
- ✓ Preparation of mutual recognition of the developed certified qualification schemes between different Member States (including the preparation of a European database of certified building professionals).
- ✓ Development of strategies to raise market demand for the certified qualification schemes developed in order to guarantee sustainability beyond the project lifespan as well as to replicate them across the EU by involving national associations and training centres.

6 Annex A List of Participants

First name	Last name	email	Country	Project	Role
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7 Annex B Build Up Skills EU Exchange Meeting - Mutual Recognition TWG - Survey

The objective of this survey is shaping the goals and activities of the Technical Working Group (TWG) on Mutual Recognition. Please provide us inception information for preparing our long-term objectives and plans for 2016.

TWG will meet during the EU exchange meetings and will organise ad-hoc conference calls to pursue its activities aimed at delivering the objectives agreed at the first meeting during the EU exchange meeting on 18 and 19 January 2016.

Please indicate in the end of the questionnaire how you would like to cooperate on the issues of mutual recognition.

Tell us something about you and your country:

1. Name

2. Surname

3. Country

4. Organization:(select as many options as needed)

- employer
- association of employers
- chamber of commerce/industry
- education and training provider
- certification body
- public administration
- other

5. Are any building construction craft and on-site worker professions regulated in your country (i.e. do your statutory requirements include qualification requirements for working on the construction site)?

Yes/No

If yes, please list the regulated crafts and professions:

6. Apart from profession of architects, are there any other middle and/or senior level construction professions regulated in your country (i.e. do your statutory requirements include qualification requirements for middle and senior level professionals involved in planning and construction of buildings)?

Yes/No

If yes, please list the regulated professions:

7. Overall, how would you describe your level of knowledge of mutual recognition?

- I am regularly involved in mutual recognition as part of my job
- I am sometimes involved in mutual recognition as part of my job
- I am familiar with mutual recognition although it's not part of my job
- I have a basic understanding of mutual recognition
- Mutual recognition is a new topic to me

Tell us more about your opinion on future activities of the TWG on Mutual Recognition and/or about the needs of your building sector:

8. What types of occupations should the mutual recognition (and the relevant TWG) address?

- Crafts and on-site workers

- Middle level professionals
- Senior level professionals
- Other groups of professions

If you selected "Other groups of professions", please specify

9. Should the mutual recognition focus on:

- Regulated professions (i.e. occupations which can only be entered if someone possesses certain formally validated)
- Not regulated professions (i.e. occupations which do not require any formally validated qualifications)

10. What professions you would like to be regulated at European level (currently only profession of architects is regulated at EU level)?

(please list the professions)

11. What professions you would like to be regulated at National level (from those not yet regulated)?

(please list the professions)

12. What types of training/learning outcomes should the mutual recognition address?

- Apprenticeships (at secondary level)
- Tertiary level education
- Further education and training

13. Should the focus of the Mutual Recognition TWG be:

In terms of subjects:

- energy efficiency and use of renewable energy source in buildings
- wider focus

In terms of type of recognition:

- recognition in one country of qualifications acquired in another country
- recognition in one country of skills acquired in another country
- recognition in one country of training undertaken in another country

In terms of validity of the mutual recognition:

- recognition by competent authorities (formal recognition)
- recognition by employers (de facto recognition)

14. In what way would you be interested to work on mutual recognition with the Mutual Recognition TWG?

- I want to be a member of the TWG and take part in the meetings (during Build Up Skills EU exchange meetings) and conference calls (normally once between EU exchange meetings)
- I want to make contribution to the work by providing feed-back via e-mail
- I am not interested in any cooperation

If you are interested in any type of cooperation, please, provide us your e-mail contact:

If you would like send us any relevant document or additional remarks and proposals in writing, please attach the file here:

8 Annex C BUS TWG Mutual Recognition - Survey

This survey is organised to select a pilot group of construction crafts and professions to be considered for mutual recognition action supported by BUS TWG 2 - Mutual Recognition.

Name:

Surname:

Phone number:

E-mail:

Organisation:

Main mission of your organisation is representing:

- Authorities or public interest
- Employer
- Education and training organisation

Priorities in selecting crafts and professions

In the following list of professions, please assign to each craft/profession priority from point of view of your organisation. Priority 1 is the highest priority, Priority 5 is the lowest priority.

After assigning priority, please enter the name of the craft/profession in your own language. Please use only latin characters.

Bricklayer - The universal profession of bricklayer changed significantly in recent years. The original profession involved also tilers, plaster-layers, assemblers of masonry systems and recently also assemblers of ETICS. In the process of the building shell constructions, bricklayers work (along with other professions) on foundations, and vertical and horizontal structures.

Priority:

Name of the craft/profession in your nomenclature in your language:

Installers/assemblers of concrete and steel structures - A profession that split off from traditional bricklayers with the development of assembled prefabricated monolithic structures. The installer/assembler is much more dependent on a precisely predefined technology of installation. Assembly works may be used in foundations, walls and horizontal skeletal structures.

Priority:

Name of the craft/profession in your nomenclature in your language:

Concrete worker, Steel worker - Professions that originated in bricklayers' work after specialised and monolithic concrete structures had been developed. These include construction of formwork, reinforcement, concreting and welding.

Priority:

Name of the craft/profession in your nomenclature in your language:

Plasterer - Professions involving the application of plaster to walls, ceilings, or other surfaces.

Priority:

Name of the craft/profession in your nomenclature in your language:

Machine operator - A worker assigned to or skilled in the operation of a particular kind or class of industrial machine used at construction sites.

Priority:

Name of the craft/profession in your nomenclature in your language:

Scaffolding assembler - A person who assists in the building and dismantling of scaffolding in the field.

Priority:

Name of the craft/profession in your nomenclature in your language:

Insulator - A person who is significantly involved in perimeter walls works, putting insulation layers on vertical and horizontal structures of a building.

Priority:

Name of the craft/profession in your nomenclature in your language:

Plumber, Installer of sanitary equipment - A person who installs water, sewage and gas distribution pipelines, hot water piping and sanitary equipment. This profession seriously affects the passive houses concept, which in particular means where pipes are located and how they are insulated against heat loss, how they cross building structures, and the type of installed energy saving appliances.

Priority:

Name of the craft/profession in your nomenclature in your language:

Carpenter - The traditional understanding of the profession was associated with roofs. Development of wooden houses expanded this profession to the entire shell construction. Carpenters are involved in making walls, roofs and floors, in a building. The traditional knowledge about the basic material (wood) is enhanced by the requirements to be familiar with various composite structures, and their interaction.

Priority:

Name of the craft/profession in your nomenclature in your language:

Roofer - A roofer works on the roof structure. Roofs are made from roof tiles. In case of metal roofs, the work is replaced by the tinsmith profession, and in the case of flat roofs (or roof coatings) he is replaced by the insulator. The traditional roof is changing; there are changes in composition, ventilation, auxiliary insulation, new materials are being added, the range of additional parts is growing, and demands on knowledge is increasing.

Priority:

Name of the craft/profession in your nomenclature in your language:

Tinsmith - person who works on and installs roof accessories, eaves, gutters and all metal roofing. Requirements on tinsmiths are similar to roofers as these professions are linked.

Priority:

Name of the craft/profession in your nomenclature in your language:

Joiner - Joiners today work as installers/assemblers of doors, windows and other objects filling in structural openings, be it from wood, metal or plastic materials. A joiner needs to know and respect the concept of interior space physics and needs to accurately install their products, especially when mounted on the perimeter wall of a building.

Priority:

Name of the craft/profession in your nomenclature in your language:

Floorers - This profession is often divided into sub-specializations depending on material and technology. Due to the energy requirements for passive houses and their heating, the right choice of materials and proper construction of the floor is often of key importance.

Priority:

Name of the craft/profession in your nomenclature in your language:

Painters, Wall paper layers - The final look of a building usually depends on the work of painters and wall paper layers. Whilst their work cannot change the structural conditions of a building, the choice of finish layer, may change the diffusion resistance of a building structure.

Priority:

Name of the craft/profession in your nomenclature in your language:

Bricklayer in associated building production - Currently, this covers in particular ETICS layers carrying out complete insulation works, including the final finish.

Priority:

Name of the craft/profession in your nomenclature in your language:

Heavy-current electrician - The work of an electrician is becoming increasingly challenging due to building requirements and the physical properties of walls, especially in sandwich structures. Minimizing the energy demand, new ways of lighting, location and selection of lights are new challenges for this profession.

Priority:

Name of the craft/profession in your nomenclature in your language:

Electrician of light-current wiring - Efficient operation of a building is only possible through 'smart' regulation. On the market, there are more and more complex control systems available. These (and other) systems are installed by a light-current wiring electrician.

Priority:

Name of the craft/profession in your nomenclature in your language:

HVAC installer - The job of the HVAC installer includes fitting, installation and cleaning of air distribution systems and recuperative units. Ventilation also requires the attention of all brick and installing professions related to transits between construction structures and the provision of space for wiring and vents. Coordination with other plumbing professionals is important.

Priority:

Name of the craft/profession in your nomenclature in your language:

Additional suggestions:

If you would like to suggest any additional high priority craft/profession to be considered for the pilot group of professions, which is not included in the list above, please add the name (in English) and a short description below.