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Technology All technologies	Aspect Quality of the works	Country Romania
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## QualiShell: ROMANIAN QUALIFICATION SCHEMES FOR INSTALLERS OF OPAQUE BUILDING ELEMENTS AND/OR WINDOW SYSTEMS

The Romanian project ‘[BUILD UP Skills QualiShell](#)’ has as its main objectives to substantiate, develop and promote two national qualification schemes for the most relevant professions within the Roadmap to 2020 for the construction of energy efficient buildings [1], i.e. installers of thermal insulation composite systems and installers/fitters of high performance windows and doors systems. The intended approach is to ensure not only a high-quality installation of very efficient building envelope components, but also the achievement of high overall performance building envelopes. This is addressed by developing effective tools to embed the adequate knowledge and skills in the relevant occupations and to foster the evolution in the national qualification system and in the vision of key stakeholders in the construction sector, and move towards the actual implementation of nearly zero energy buildings in Romania.

Residential buildings <input checked="" type="checkbox"/>	Non-residential buildings <input checked="" type="checkbox"/>	Specific buildings: .....
New buildings <input checked="" type="checkbox"/>	Existing buildings <input checked="" type="checkbox"/>	

### Context

In the on-going process of implementing concerted and effective measures to achieve the 2020 targets, there exists a high need for ensuring appropriate training schemes for architects, engineers, energy auditors, craftsmen, technicians and installers, since the application of energy efficient techniques and renewable systems are often technically very demanding.

Within Pillar I of the BUILD UP Skills initiative, a qualification roadmap [1] was developed to achieve the sustainable energy policy objectives for 2020, by focusing on the blue-collar workers. The BUILD UP Skills QualiShell project represented a natural continuation of [BUILD UP Skills Romania \(ROBUST\)](#) project and supports the development and implementation of two large scale and long lasting national qualification schemes for the installers of external thermal insulation composite systems (ETICS) and high efficiency windows systems. The aim of the proposed approach is to ensure not only a high quality installation of very efficient building envelope components, but also the development of effective tools to combine the evolution in the national qualification scheme with the adequate knowledge and skills and move towards the actual implementation of nearly zero energy buildings in Romania. Thus, the two schemes which were developed together in the BUILD UP Skills QualiShell project could be seen as one large qualification scheme focused on the execution of building envelope, with two tailored components: opaque and glazed parts.



Figure 1: BUILD UP Skills QualiShell

## Objectives and problems addressed

The BUILD UP Skills QualiShell project “National Qualification Scheme for Construction Workers to Ensure High Performance Building Envelopes” is an EU co-funded project through the Intelligent Energy Europe programme under the European initiative BUILD UP Skills.



The main objectives of the BUILD UP Skills QualiShell action can be summarised as follows:

- ✓ to activate the relevant stakeholders in the National Qualification Platform and to use the extended National Consultation Committee to validate, implement and monitor the proposed qualification schemes;
- ✓ to substantiate the development of the qualification schemes for building envelope insulators and window system fitters by performing a thorough occupational analysis to detail the National Qualification Framework, by exploring internal and external resources for training and qualification in the construction sector and by defining an adequate procedural framework;
- ✓ to develop and validate a national qualification scheme for opaque building envelope insulation systems installers (ETICS installers) to ensure the need for qualified workers by 2020, by defining and improving the training courses curricula, content and evaluation tools;
- ✓ to develop and validate a national qualification scheme for window system fitters (installers of thermally insulated window frames and glazing) to ensure the need for qualified workers by 2020, by defining and improving the training courses curricula, content and evaluation tools;
- ✓ to raise awareness and to ensure an effective communication process between different major stakeholders as well as to develop effective mechanisms to support a large-scale implementation of the developed schemes until 2020 and beyond.

The problems addressed by BUILD UP Skills QualiShell can be specific for Romanian construction companies, such as a low interest for a continuous vocational training of own personnel, related to the lack of quality requirements and reduced investments in constructions. Also, general problems are tackled, so that the integration and coordination of national sub-systems of qualifications can be assured, the transparency of the system improved, the access for everybody to lifelong learning facilitated, and orientation of qualifications towards the labour market and to the civil society ensured. The QualiShell approach supports the increase of quality and compliance in the construction sector by creating the necessary tools and mechanisms for the qualification of the people involved in the execution of high performance buildings envelopes. Thus, the achievements of the QualiShell initiative should be considered as milestones in a broader perspective of an evolution process in the national qualification system and in the vision of key stakeholders in the construction sector, moving towards the actual implementation of nearly zero-energy buildings in Romania.

## Results of the project

The major outputs of the QualiShell action are summarised below:

- ✓ Involvement of relevant stakeholders within the Romanian Qualification Platform, in a sustained consultation process to support the implementation of key measures defined in the BUILD UP Skills Romania Roadmap.
- ✓ Detailed occupational analysis with modular definition of relevant competences for thermal insulators (ETICS installers) and insulated window systems installers. Occupational standards were developed for the addressed occupations.
- ✓ A clear procedural framework and evaluation mechanisms for labour and construction market was defined and the achievements could be considered as best practice examples to be followed for other occupations/ qualifications.
- ✓ Two national qualification schemes were developed: (1) for opaque building envelope insulation systems installers (ETICS installers) and (2) for window system fitters (installers of thermally insulated window frames and glazing), needed to ensure the need for qualified workers by 2020. The schemes contain all documents and tools to support the implementation of high quality training programs and are fully available for the qualification market.
- ✓ Mechanisms were defined to ensure a large-scale and long lasting implementation of the two developed qualification schemes, by:
  - use of existing networks;
  - evaluation of competences acquired in non-formal and informal environments;

- o proposals of regulatory measures and business models for the promotion of partnerships between the education system and the construction sector.

*Substantiating the qualification scheme - Revision of the occupational framework for the addressed qualification schemes*

The current occupational framework for the addressed qualification schemes was analysed and updated in order to define the qualification schemes for the two occupations relevant within the project: *Installer of opaque thermal insulation systems for buildings* and *Installer of thermally insulated fenestration systems*. The two mentioned occupations were introduced in the Classification of Occupations in Romania (COR Nomenclature), while thorough occupational analyses were performed and new occupational standards for education and training were developed, validated, approved and published in the National Qualification System [3].

Furthermore, the two occupations were introduced in the Romanian Nomenclature for Classification of Qualifications and the new qualifications are operative starting August 2014.

The concept of ‘qualification scheme’ was defined and implemented for the first time in Romania, by including, for the two-mentioned occupations, all the necessary documents and tools to perform training courses with final certification of competences in the framework of the national qualification system (see figure 2). These include occupational standards, curricula, training guides and materials (e.g. lessons descriptions, presentations, tutorials, guidelines for trainers etc.), examination guidelines and documents. Documentation and tools for the evaluation of competences acquired in non-formal or informal ways (in authorised centres) were also delivered by the project, which supports the increasing of the number of workers with certified competencies in the near future. The developed qualification schemes could serve as best practice examples for the future development of other relevant occupations as they have been identified in the National Roadmap [1] - new occupations/qualifications (e.g. PV system installer) or competencies completion within existing occupations (e.g. biomass system installer), in order to support the achievement of 2020-2030 targets with qualified workforce.

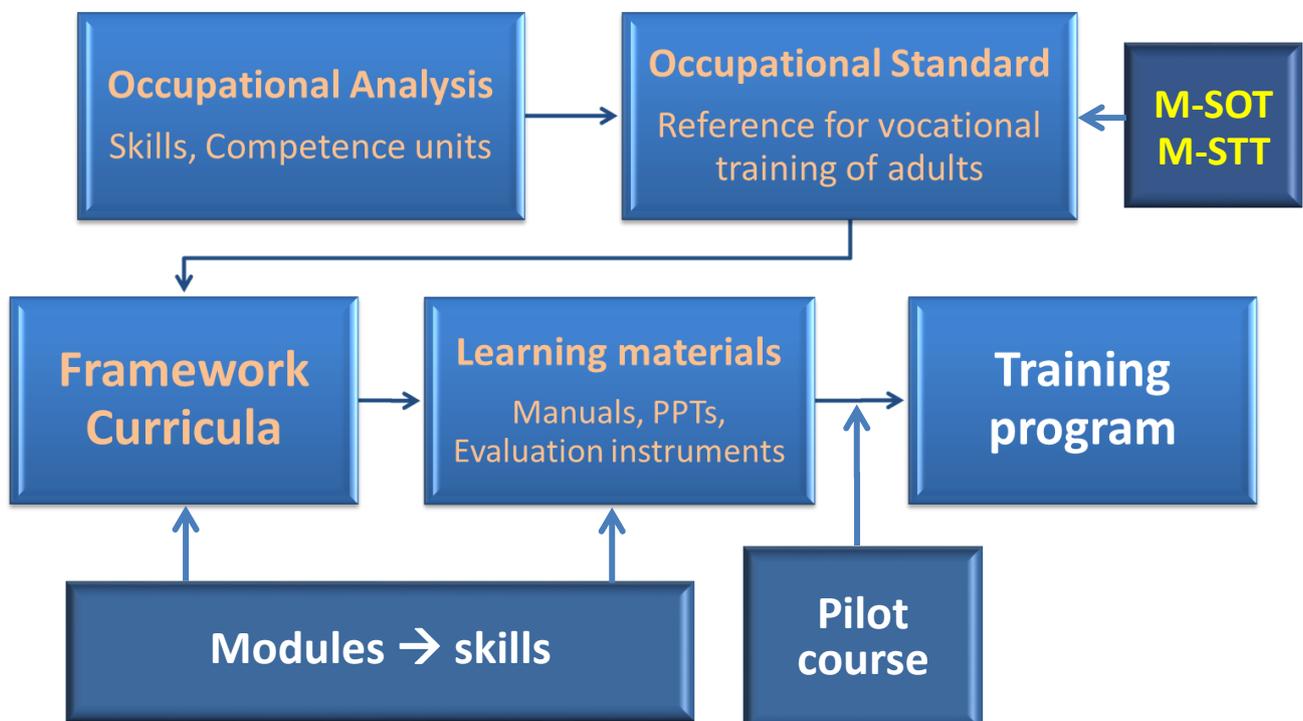


Figure 2: The concept of ‘Qualification scheme’

(M-SOT = Installer of opaque thermal insulation systems for buildings,  
M-STT = Installer of thermal insulation fenestration systems)

## Training courses for installers of opaque insulation systems for buildings and installers of insulating window system

The training course curriculum was developed together with the process of performing the occupational analysis of the newly defined occupation (installer of opaque thermal insulation systems for buildings) and for the revised occupation (installer of insulated window systems). The curriculum was defined for both occupations in a modular structure taking into account the general and specific competences detailed in the occupational standards for education and training.

Then a draft version of the training content was developed taking into account the defined curriculum for each occupation, which was used as support material for the trainees and for the trainers in the process of implementing trainings and qualification programs.



Figure 3: Course for installers of opaque insulation systems for buildings



Figure 4: Course for installers of insulating window system

Based on the already structured content of the training course, the evaluation matrix was developed for trainees' examination (factual knowledge topics, practical skills topics and Trainers' and Examiners' Guidelines).

The developed qualification schemes were tested within the implementation of two pilot courses (which were authorised for the training program according to the National Qualification legal framework) for 30 trainees (aiming to test and validate the qualification scheme rather than to do training *per se*). The pilot course for *installer of opaque thermal insulation systems for buildings* was implemented by the Group for Quality in External Thermal Insulation Composite Systems (QETICS), while the pilot course for *installer of insulating window system* was organised by the Ownership of Producers for Thermo-Insulating Carpentry (PPTT).

Furthermore, several training supplier organisations are already under authorisation to implement qualification programs for the relevant occupations (using ESF - European Social Fund programs). While the installer of opaque building insulation systems is a totally new occupation (recently introduced in the National Classification of Occupations and Qualification Registry), the installer of insulated windows is a revised occupation/qualification with newly defined competences and curriculum. It is estimated that at least 10 training providers will organise 3 courses/year with an average of 20 persons/class, which leads to 3,000 persons trained by 2020.

## Development of procedural framework for the addressed qualification schemes

In order to support the effective application of the defined schemes and their replication for other relevant qualifications, an Orientation Guide [4] was elaborated on how to develop and implement the qualification scheme based on the two occupations. The document was designed for workers in the construction industry, for training providers and for the companies in the construction industry that wish to qualify / requalify unskilled or partially skilled personnel in line with new technologies in the field. The guidelines describe the methods which could be used by workers in order to access other occupations at the same level or higher level, by attending specific training programs completed by qualification certificates evidencing the acquisition of new professional skills enabling construction workers to access the labour market.

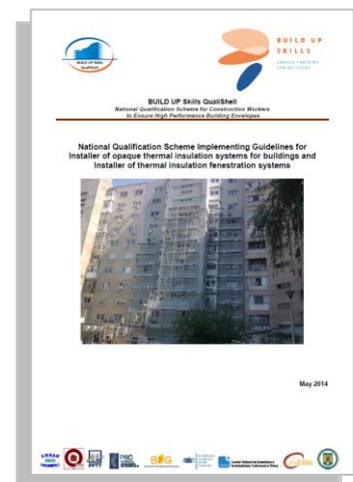


Figure 5: Oriented Guide for the application of QualiShell Scheme

*Mechanisms and measures to promote effective partnerships between education system and construction sector*

The effective implementation of the developed qualification schemes in order to produce qualified workers needs adequate tools and mechanisms. The promotion of the QualiShell scheme implementation was supported by an intensive consultation process performed within the National Qualification Platform and the interdisciplinary productive dialogue within the National Consultation Committee, involving stakeholders in different professional/expertise fields (i.e. construction sector, education and vocational training, energy efficiency and RES use, representing both authorities and building industry).

In this context, the concept of ‘Local partnerships for qualification’ was defined and implemented during the process of consultation and ‘matchmaking’ of relevant stakeholders, as this is essential to ensure the long-lasting and large-scale implementation of the qualification schemes. The concept (figure 6) is based on the creation of local or regional (geographical focus) voluntary partnerships between a training centre (or a vocational training school), a producer/supplier of construction materials/technology/system and a construction company. These partnerships are supported by the local authorities, and originate from ‘natural drivers’ consisting in matched offers and needs of implied actors (partners), e.g. specialised trainers and adequate accommodation for trainings, construction sites for practical lessons (including safety equipment and supervision), consumable materials etc. Until the end of the project several partnership agreements were initiated, of which 11 were signed and several others were initiated, with the view to start the implementation of qualification programs based on the outputs of the BUS QualiShell project.

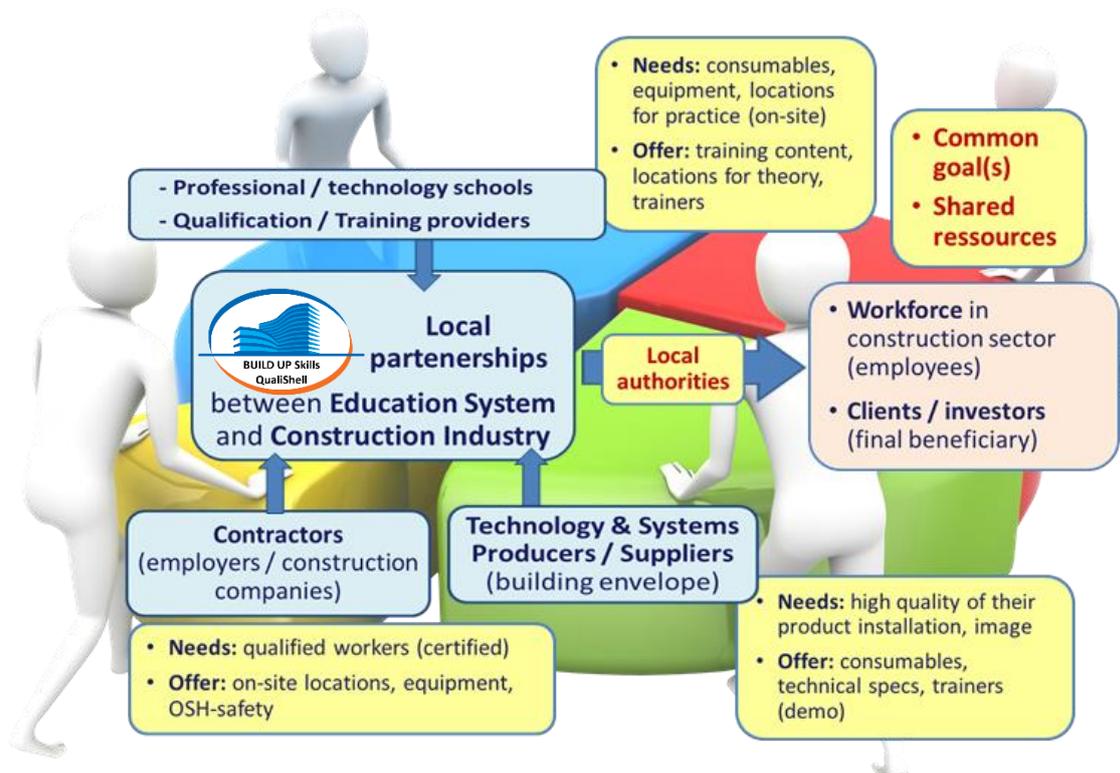


Figure 6: Partnership for qualification of the workforce in the construction sector

Currently the qualification certificate is not a prerequisite for any public or private funded construction project. However, the consultations organised within the National Qualification Platform and the dissemination activities strongly support the application of such requirements, starting from the building rehabilitation programs with public funding. This action should be implemented gradually, ensuring the existence of a sufficient number of qualified staff on the labour market; in a first phase tender specifications should be altered so that additional points could be granted to bidders with higher qualified staff should be promoted.

The qualification programs for the two occupations are defined under the National Qualification System with a course duration of 720 h (program finalised with the issue of recognised certificate of qualification), which may be reduced up to 360 h depending of the skills that the participants (trainees) have already acquired (this is checked by performing initial tests at the beginning of the training program).

The estimated cost of such a training program is around 1000 EUR and should be partly paid by the trainee, the employer or by dedicated funding from ESF. To ensure an effective implementation of the developed qualification schemes a healthy development of the training market is needed together with a definition of effective mechanisms and awareness actions for training suppliers, construction companies, technology suppliers and employees. One of the most effective way to ensure this is by creating local partnerships between the education system and the construction sector, by bringing together the training supplier/vocational school, contractors and construction products producers in voluntary agreements to implement together training programs (based on natural drivers to match their respective needs and offers). Thus, the costs incurred by the qualification programs could be realistically reduced to approx. 500 EUR by partial sharing of resources.

The QualiShell approach is basically transferable to other countries and other technologies (trades in the construction sector), both at local/regional level or national level, depending on the applicable legal framework for education/qualification in each country. The main requirement for the application of the QualiShell approach is the existence of a coherent qualification framework for the relevant trades in the construction sector, which should contain a detailed definition of competences for each occupation and provide recognised certification documents for qualified persons.

### *Mechanisms for evaluation of competences acquired in non-formal and informal ways relevant for the developed qualification schemes*

Key aspects regarding the evaluation of competences acquired in non-formal and informal ways were analysed and debated in the process of competences and skills definition (occupational analysis, curricula and standards development). The assessment tools for skills acquired in non-formal context were elaborated for the two occupations developed under BUILD UP Skills QualiShell.

A help guide was created for the use of the developed assessment tools for assessment and authorization assessment centres, while the tools themselves are made available free of charge through the Sector Skills Committee in Constructions ([CSCon](#)), upon request by assessment centres who wish to broaden their qualifications portfolio. The guide [6] includes all the skills assessment methods available, according to current regulations and methodologies, stages of evaluation process and summarizes the authorization procedure for the assessment centres.



Figure 7: Guidelines for the evaluation of competences

### *Lessons learned*

The national qualification system is under major changes in the evolution towards the European framework and requirements. Similarities with other systems have been identified (e.g. Spain) and some models could be successfully applied in Romania (e.g. special fund for training / qualification managed by tripartite body) if adequately promoted at political level. This could be one of the best drivers for boosting the training / qualification market in the construction sector.

There are many barriers and bottlenecks encountered by the qualification of the labour force in the construction sector in Romania, which could hamper the application of the developed qualification scheme: lack of sufficient financing sources open to construction companies to qualify their workers, poor recognition of high quality works in constructions, no mandatory requirements for certified qualified workers etc. In order to develop the qualification market to support the large scale and long lasting attributes and to ensure the necessary increase in the overall qualification level in the construction sector, drivers are needed, e.g.

- ✓ updated legal framework and procedures for the tendering process of investing in high energy performance buildings (new and renovation) with public money (to set up quality levels and requirements for certified qualification) and
- ✓ control enforcement ('sticks');
- ✓ dedicated financing sources and instruments for training and qualification on the construction sector ('carrots');
- ✓ authorities' involvement in stimulating partnerships between the education system and construction industry.

Current practices and the mentality in the construction sector should be altered: managers of construction companies should understand the importance of qualification level in relation to obtained quality, efficiency and productivity, but also employees need to develop a self-control attitude which could be obtained by qualification. The effective implementation of nearly zero-energy buildings requirements in the near future represents a great challenge which cannot be adequately undertaken without mastering the application of new concepts and technologies, which implies higher qualification level for workers.

## Conclusions and remarks

The BUILD UP Skills QualiShell project succeeded in developing two national qualification schemes for the training of the construction workers in the most important occupations related to building envelope, namely the installer of opaque insulation systems for buildings and the installer of insulated window systems. For both qualifications new occupational standards were developed with new definitions of competences based on a thorough occupational analysis. Full sets of guidelines and training tools are ready to be used in the training market to ensure the need for qualified workers for high performance building envelopes by 2020, so that the relevant qualification gap recognised by the Status Quo Analysis Report [2] and Roadmap for National Qualification of Building Workforce [1] can be filled.

The training courses curricula, content and evaluation tools supporting the newly developed qualification schemes were defined and improved, while effective mechanisms to ensure a large-scale and long lasting implementation of schemes were defined, including the use of existing networks, evaluation of competences acquired in non-formal and informal environments and definition and application of the concept of partnerships for qualification.

During the project implementation, the involvement of relevant stakeholders within the Romanian Qualification Platform was continued in a sustained consultation process to support the application of key measures defined in the BUILD UP Skills Romania Roadmap. Together with the relevant stakeholders and active involvement of key actors in the construction sector, policy making and regulatory bodies, representatives of education system and labour market, the grounds were set and advancements were made in fostering the evolution of the national qualification system and in the vision of key stakeholders in the construction sector, moving towards the actual implementation of nearly zero-energy buildings in Romania.

Starting from the experience and results of the BUILD UP Skills actions in Romania, the initiative for raising energy performance of the buildings will continue within other new projects supporting the implementation of nearly zero-energy buildings concept in Romania (i.e. H2020 ‘Train to nZEB’ Building Knowledge Hubs), while the introduction of the construction sector as priority sector within the new Operational Programme Human Capital 2014-2020 (ESF) represents an opportunity for the implementation of the qualification schemes on large scale and long lasting and an important achievement for the construction sector.

The National Qualification Platform can be used within other initiatives and updated as an open structure for active stakeholders’ consultation after the end of the project. The continuation of the National Consultation Committee was proposed, so that it could be formally established within an agreement proposal including sound objectives and activities.

<p><b>Level of complexity</b> (dark orange = simplest)</p>		<p><b>Prerequisites</b> Partial funding from external sources (e.g. ESF, training fund). Qualification requirements in public funded construction works and/or substantial reward for good quality of works regarding the areas covered by the scheme</p>
<p><b>Potential for replication</b> (dark orange = best)</p>		

<b>Hints</b>	<b>Pitfalls</b>
<ul style="list-style-type: none"> <li>✓ It is important for the examination and certification process for the qualification to be free.</li> <li>✓ It would be better if the scheme was obligatory instead of recommended and voluntary.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Long duration of the training program leads to reluctance from construction companies to send their employees to the qualification programs.</li> <li>✓ People need to understand the importance of compliance with the regulation regarding the energy performance of a building.</li> </ul>

## References

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