



Sustainable Energy Skills in the Construction Sector 2.0 [†]

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Abstract: In this workshop, we discussed the targets, current status, and future plans of 10 Horizon 2020 projects—ARISE, BUSLeague, TRAIN4SUSTAIN, BIMzeED, SEEtheSkills, HP4ALL, INSTRUCT, PRO-Heritage, The nZEB Roadshow, and CraftEdu—about how to increase the number of skilled building professionals and/or blue-collar workers across the building design, operation, and maintenance value chain.

Keywords: skill; energy; construction; building professionals

1. Introduction

The European construction sector is one of the areas with the highest potential when it comes to reducing annual energy consumption. Facing many challenges to achieve ambitious energy efficiency objectives, this sector aims to go forward by applying successful training initiatives and supporting policy instruments.

For this reason, the creation of BUILD UP Skills, an EU Initiative to improve the qualification and skills of Europe's building workers, acted as a springboard to stimulate the demand for energy efficiency skills. Furthermore, focusing on continuing education of craftsmen and other on-site building workers, this initiative is home to most of the projects presented during Sustainable Energy Skills in the Construction sector 2.0 workshop. Conducted during Sustainable Place 2021, this workshop was a continuation to the primary workshop with the same topic during the 2020 edition of this conference.

In this report, we are summarising the contributions of 10 Horizon 2020 projects on sustainable energy skills and trainings in the construction value chain, including ARISE [1], BUSLeague [2], TRAIN4SUSTAIN [3], BIMzeED [4], SEEtheSkills [5], HP4ALL [6], INSTRUCT [7], PRO-Heritage [8], The nZEB Roadshow [9], and CraftEdu [10].

2. ARISE

ARISE is revolutionising the learning process by monetising skills development and learning exchange with a dual digital system based on skills recognition rather and accreditation. ARISE is developing a Europe-wide distinguishable recognition scheme of digital energy-efficient BIM construction skills linked with a maturity-based digital ranking system for accounting CPD learning transactions. The open competency-based qualification scheme based on maturity levels that empower micro-learning will be the basis for making learning transactions count. The project team will be gathering and linking BIM modules, tools, and materials with the aim of establishing a BIM resource and skills recognition pathway that all stakeholders can utilise, deliver, and stimulate. This will provide BIM Energy Performance Alliance (BIM-EPA) partners and other stakeholders with an e-learning materials repository to contribute to, whilst also developing a CPD recognition pathway for the whole supply chain to access and utilise.

3. BUSLeague

The Horizon-2020-funded BUSLeague project works on both building capacity within the industry (supply side) and stimulating demand for energy efficiency upskilling. On the supply side, the main objective of BUSLeague is to upscale successful methods and training (e.g., by working with hardware stores). On the demand side, it aims at incentivising upskilling through recognition of skills, finance mechanisms (e.g., by introducing additional skills requirements to access public grants), and green public procurement (GPP). Public procurement constitutes approximately 14% of the EU gross domestic product. It, thus, has the potential to provide significant leverage in seeking to influence the market. As part of BUSLeague, the project partners will explore how public procurement could be used to incentivise energy efficiency upskilling.

4. TRAIN4SUSTAIN

The TRAIN4SUSTAIN (T4S) project stimulates the demand for skilled construction sector professionals (architects, contractors, SMEs, and workers) through raising acceptance of regional and national qualifications and skills on the EU construction market. The approach of T4S is the development of a European Skills Registry (ESR) web application based on the T4S Competence Quality Standard (CQS). The developed T4S CQS is a standard to identify and describe learning outcomes (LOs) for professions in a unified manner and communicate the competencies across domains (environment, society, economy, processes). Over 300 existing qualification schemes (QS) were evaluated and mapped to fill the T4S CQS with 67 QSs from all over Europe as well as non-EU countries. Furthermore, the T4S project provides guidance for public authorities in demanding and evaluating sustainable energy skills in Green Public Procurement and contracting processes.

5. BIMzeED

The BIMzeED project, cofunded by the EU Erasmus Programme as a Knowledge Alliance partnership, investigates the development of new and innovative training and education resources within the fields of BIM and nZEB. The partnership includes industry experts and academics from Ireland, Spain, Croatia, and Hungary. The main goal is to introduce additional learning resources within the field of BIM/nZEB into the existing accredited construction courses or create new standalone modules to improve training and knowledge transfer for the construction industry. BIMzeED developed 12 innovative learning units with the aim of increasing the understandings and skills of Building Information Modelling (BIM) and other digital tools to achieve nZEB within existing construction training curricula, thus capitalising on the opportunities that environmental protection can offer to the labour force.

6. SEEtheSkills

SEEtheSkills aims at uniting the best from BUS experiences in five countries: North Macedonia, Spain, Slovenia, Slovakia, and the Netherlands. Precedent actions in each of the countries are marked and become recognized by innovation and bravery to meet the challenges in the introduction of new approaches toward meeting needs for energy efficiency in the building sector. As they revealed different approaches in skilling and upskilling of the building workforce, their best experiences are a starting point to build upon and a subject of iterative improvement, upgrading, and implementation. The novelty of the SEEtheSkills idea is by acting through a 3V approach (visibility, validation, and value) to tackle direct stimulation of demand of energy skills in construction by spreading the actions on a wide inter-regional level to ensure easy uptake of results in partner countries and beyond.

7. HP4ALL

HP4ALL has at its core the desire to enhance the skills of those working in the heat pump sector and to promote these skills to the people who need to make decisions around the use of heat pumps. These decision makers could be owner-occupier, end-users, residential project developers, and housing department staff within local authorities or social housing organisations. Contact with all actors in the supply chain and with these decision makers is identifying the weak points in the systems. In each region, the existing policy measures will be acknowledged and results from interactions with the supply chain and with end-users will be communicated. It is hoped that this work will be helpful in the three pilot regions of Upper Austria, Andalusia, and Ireland in linking on-the-ground issues to policy and back into training offerings. Regional pilot activities are in the planning stage and will be conducted throughout 2022.

8. INSTRUCT

The objective of INSTRUCT is to increase the number of skilled building professionals and/or blue-collar workers across the building design, operation and maintenance value chain (designers, architects, engineers, building managers, technicians, installers, blue-collar workers, including apprentices, and other building professionals), with a specific focus on the engagement of SMEs. Tools facilitating the mutual recognition of energy skills and qualifications in the construction sector are part of the project for the development of sustainable energy skills passports/registers for workers at a regional/national level. The project will advance energy efficiency training at the EU level using mobile applications facilitating the comparison of workers' skills and qualifications between countries. INSTRUCT will develop partnerships with producers, retailers, and contractors for energy skills promotion. The project will give evidence on the sustainability and viability of the new technologies to produce zero and low emission energy.

9. PRO-Heritage

The partners of PRO-Heritage strive to offer skilled craftsmen an initial and permanent training that offers traditional competencies and skills for the built cultural heritage, based on best practice examples of the partner organizations. In addition, PRO-Heritage will create a structure and environment for regular journeys of journeymen in Europe to further promote the exchange of competencies and skills in Europe. The most important needs addressed in PRO-Heritage are: the protection of traditional competencies and skills for the built cultural heritage relevant to energy efficiency and renewable energy; the need to involve sufficiently trained professionals and craftsmen in the "gentle" maintenance and care; the need to certify these professionals and craftsmen so that their competencies and skills can be recognised.

10. The nZEB Roadshow

The nZEB Roadshow project will organize national-scale marketing and communication campaigns in five European countries, focused around nZEB days organized in three to five selected cities in each of Bulgaria, Croatia, Greece, Italy, and Romania. The nZEB weeks will consist of a multitude of events: construction products and real estate fairs, practical demonstrations and real-time nZEB construction, training courses for designers and construction workers (with inclusion of BIM-enabled VR and AR solutions), information sessions and free consultations for citizens active on the real estate market, on-site training at public building renovation sites, and career orientation centres and construction job fairs with focus on the local construction sector SMEs.

11. CraftEdu

The CraftEdu project has set up in the Czech Republic the national qualification and training scheme for craftsmen and on-site workers in the field of energy efficiency and use of renewable energy sources in buildings. It has also developed the training offer delivered via Slovak national scheme STAVEDU. Moreover, it led to: development of seven training programmes for further education of craftsmen and on-site workers in the field of energy efficiency; development of an on-site training course based on the training course developed by CrossCraft project (IEE project BUS Pillar II); setting up a permanent network of trainers delivering the programmes developed under the project; training of trainers for delivery of the programmes; development of an e-learning programme for targeted craftsmen and construction professionals in Austria, Bulgaria, the Czech Republic, and Slovakia; proposals to governments for incentives boosting demand for highly qualified workers [11].

12. Conclusions

Sustainable Places 2020 has been the starting point for the presented projects to map and identify joint activities. Such interactions are still ongoing in the form of joint publications, series of webinar and other disseminating and communication activities and are aimed to reinforce the skills and energy efficiency in the construction sector.

These interactions support the projects in achieving the objectives planned by the European Union within the established policy framework and directives in place. Among all revised EPBD 2018/844/EU and article 2a: long-term renovation strategies to encompass an overview of national initiatives to promote skills and education in the construction and EE sectors precisely highlighted the importance of trainings in the building sector.

These energy efficiency directives emphasize the significance of measures to support the increase in renewable heating, cooling, and qualified installers in this sector. In addition, launch of the renovation strategy published by the European Commission during October 2020 strengthened the importance of these measures. According to the Renovation Wave [12], the six general leading actions in this area are: set stronger regulations regarding the energy performance to improve incentives for public and private owners to undertake renovations; ensuring accessible financing; increase the capacity of developers to develop training development for workers; expand the market for sustainable building products and services; create a New European Bauhaus, with the support of an advisory board; and developing neighbourhood-based approaches for local communities to incorporate renewable solutions towards the path of zero-energy districts.

To conclude, the next funding opportunities and the current LIFE clean energy transition call were discussed and the five intervention areas of: developing the right policy framework for the clean energy transition, the technology rollout of new services and business models, attractive private financing, equally supporting the development of local and regional projects and empowering citizens in clean energy transition, were introduced.

Supplementary Materials: The recording of the workshop is available online at <https://www.sustainableplaces.eu/sustainable-energy-skills-in-the-construction-sector-2-0/>.

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References

1. ARISE Website. Available online: <https://www.ariseproject.eu/> (accessed on 22 November 2021).
2. BUSLeague's Website. Available online: <https://busleague.eu> (accessed on 28 October 2021).
3. TRAIN4SUSTAIN's Website. Available online: <http://train4sustain.eu/> (accessed on 28 October 2021).
4. BIMzeED's Website. Available online: <https://bimzeed.eu> (accessed on 28 October 2021).
5. SEEtheSkills' Page on Community Research and Development INFORMATION Service (CORDIS). Available online: <https://cordis.europa.eu/project/id/101033743> (accessed on 28 October 2021).
6. HP4ALL's Website. Available online: <http://hp4all.eu> (accessed on 28 October 2021).
7. INSTRUCT's Website. Available online: <http://www.instructproject.eu/> (accessed on 22 October 2021).
8. PRO-Heritage's Website. Available online: <https://www.pro-heritage.eu> (accessed on 22 October 2021).
9. The nZEB Roadshow's Website. Available online: <http://www.nzebreadshow.eu/#> (accessed on 28 October 2021).
10. CraftEdu's Website. Available online: <https://www.craftedu.eu> (accessed on 22 October 2021).
11. CraftEdu's Page on Community Research and Development Information Service (CORDIS). Available online: <https://cordis.europa.eu/project/id/785036> (accessed on 22 October 2021).
12. Renovation Wave: Doubling the Renovation Rate to Cut Emissions, Boost Recovery and Reduce Energy Poverty 14 October 2020 Press Release Page on the European Commission Website. Available online: https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1835 (accessed on 28 October 2021).